Regular Council Meeting Agenda

April 20, 2020, 6:00 pm

Location: https://www.youtube.com/user/EssexOntario

Accessible formats or communication supports are available upon request.Please contact the Clerk's Office at clerks@essex.ca or 519-776-7336 extension 1100 or 1101.

Pages

1. **Call to Order**

2. **Closed Meeting Report**

3. **Declarations of Conflict of Interest**

4. **Adoption of Published Agenda**

   4.1 **Regular Council Meeting Agenda for April 20, 2020**

   Moved by _____
   Seconded by _____
   That the published agenda for the April 20, 2020 Regular Council Meeting be adopted as presented / amended.

5. **Adoption of Minutes**

   5.1 **Regular Council Meeting Minutes for April 6, 2020** 1

   Moved by _____
   Seconded by _____
   That the minutes of the Regular Council Meeting held April 6, 2020 be adopted as circulated.

6. **Public Presentations**

7. **Unfinished Business**

8. **Reports from Administration**

   8.1 **Chief Administrative Officer (CAO) Verbal Report**

   RE: COVID-19 Town's Response Updates

   - Staffing
   - RV use
   - Seasonal Campground Use
   - Essential/Non-essential meetings

   8.2 **Economic Development Report 2020-03** 11

   - RE: March 2020 Building Report
   - Development Overview

   Moved by _____
   Seconded by _____

That Economic Development Report 2020-03 entitled "Building Report and Development Overview March 2020", prepared by Nelson Silveira, Economic Development Officer, dated April 20, 2020, be received.

8.3 Economic Development Report 2020-04 19

RE: Community Improvement Plan Update (Quarter 1 2020)

Moved by _____
Seconded by _____
That Economic Development Report 2020-04, entitled "Community Improvement Plan Update (Quarter 1 2020)", prepared by Nelson Silveira, Economic Development Officer, dated April 20, 2020, be received.

8.4 Drainage Report 20-02 24

RE: Appointment of an Engineer under Section 78 of the Drainage Act to review the Barrette Drain

Moved by _____
Seconded by _____
That Drainage Report 20-02, entitled "Appointment of an Engineer under Section 78 of the Drainage Act to review the Barrette Drain", prepared by Lindsay Dean, Drainage Superintendent, dated April 20, 2020, be received; and

That Council appoints Rood Engineering Incorporated under Section 78 of the Drainage Act to review the Barrette Drain.

8.5 Infrastructure Services Report 2020-02 29

RE: Windsor/Essex Region Stormwater Management Standards Manual

Moved by _____
Seconded by _____
That Infrastructure Services Report 2020-02 entitled, "Windsor/Essex Region Stormwater Management Standards Manual", prepared by Kevin Girard, dated April 20, 2020 be received; and

That Council adopt the Windsor/Essex Region Stormwater Management Standards Manual as the standard for design and review of the infrastructure within the Town of Essex.

8.6 Drainage Report 20-03 160

RE: Appointment of an Engineer under Section 78 of the Drainage Act to install a new culvert over the North Rear Road Drain South Side.

Moved by _____
Seconded by _____
That Drainage Report 2020-03, entitled "Appointment of an Engineer under Section 78 of the Drainage Act to install a new culvert over the North Rear Road Drain South Side" prepared by Lindsay Dean, Drainage Superintendent, dated April 20, 2020 be received; and

That Council appoint Rood Engineering Incorporated under Section 78 of the Drainage Act to install a new culvert over the North Rear Road Drain South Side.

8.7 Corporate Services Report 2020-01 164

RE: Town of Essex Shoreline Assistance Loan Program

- Corporate Services Report 2019-05 RE: Shoreline Assistance Loan Program
- Shoreline Assistance Loan Program Property Owner Agreement (DRAFT)
- By-Law 1908
  Being a by-law to authorize the Town of Essex Shoreline Assistance Loan Program and undertaking of flood and shoreline control/mitigation works on private residential property as local improvements

Moved by _____

Seconded by _____

That Corporate Services Report 2020-01 , entitled "Town of Essex Shoreline Assistance Loan Program", prepared by Jeffrey Morrison, Director, Corporate Services, dated April 20, 2020, be received, and

That Council authorizes the implementation of the Town of Essex Shoreline Assistance Loan Program (the "Program") and to further delegate to and authorize Administration to negotiate and enter into all Property Owner Agreements, and to take such steps to give effect to same pursuant to the Program in substantially the same form and manner as the proposed or draft Property Owner Agreement attached hereto, and

That By-Law 1908, being a by-law to authorize the Town of Essex Shoreline Assistance Loan Program and the undertaking of flood and shoreline control/mitigation works on private residential property as local improvements, be read a first, a second and a third time, and finally passed on April 20, 2020; and

That Administration be directed to come to Council with by-law(s) pertaining to Section 36 of Ontario Regulation 586/06 to authorize the imposition of said local improvement works as a "Special Charge" on participating properties in accordance with the Program and the Property Owner Agreements.

8.8 Legal and Legislative Services Report 2020-05

212

RE: Court of Revision for the Bayliss Drain (Bridge Replacements and Maintenance Schedule), Geographic Township of Colchester South, Project REI2016D024, Town of Essex, County of Essex

- By-Law 1904
  Being a by-law to provide for Bayliss Drain (Bridge Replacements and Maintenance Schedule)

Moved by _____

Seconded by _____

That Legal and Legislative Services Report 2020-05, entitled "Court of Revision for the Bayliss Drain (Bridge Replacements and Maintenance Schedule), Geographic Township of Colchester South, Project REI2016D024, Town of Essex, County of Essex", submitted by Robert Auger, Town Solicitor, Clerk, dated April 20, 2020, be received, and

That the following three (3) members of the Drainage Board: Kirk Carter, Percy Dufour and Luke Martin, be appointed to sit as members of the Court of Revision to be convened for the Bayliss Drain (Bridge

Replacements and Maintenance Schedule) Geographic Township of Colchester South, Project REI2016D024, pursuant to the Report prepared by Gerard Rood, Professional Engineer, Rood Engineering Limited, dated February 18, 2020 (hereinafter the "Report"), and such Court of Revision to be scheduled for 4:30 PM on May 21, 2020, via electronic meeting, and

That By-Law 1904 being a by-law to provide for Bayliss Drain (Bridge Replacements and Maintenance Schedule), Geographic Township of Colchester South, Project REI2016D024, Town of Essex, County of Essex, be read a first and a second time, and provisionally adopted on April 20, 2020.

8.9 Operations Report 2020-01

219

RE: Results of Request for Tender for the Supply of Tandem Drum Asphalt Compactor

Moved by _____
Seconded by _____
That Operations Report 2020-01, entitled "Results of Request for Tender for the Supply of Tandem Drum Asphalt Compactor", prepared by Jackson Tang, Assistant Manager, Business Services, dated April 20, 2020, be received, and

That Council awards the Request for Tender for the Supply of Tandem Drum Asphalt Compactor to Kucera Group Tecumseh in the amount $52,406.40 including non-refundable harmonized sales tax; and

That Council approves the additional funding of $2,406.40 above the allocated 2020 Supply of Tandem Drum Asphalt Compactor capital budget of $50,000.00 (Project Code: PW-20-0032) through transferring from the Development Charges Reserve.

8.10 Capital Works and Infrastructure Report 2020-03

222

RE: Results of Request for Tender - Supply of Three Pick Up Trucks 2020

Moved by _____
Seconded by _____
That Capital Works and Infrastructure Report 2020-03, entitled "Results of Request for Tender - Supply of Three Pick-Up Trucks 2020", prepared by Jackson Tang, Assistant Manager, Business Services, dated April 20, 2020, be received, and

That Council awards the Request for Tender - Supply of Three Pick-Up Trucks 2020 to Ken Knapp Ford in the amount of $117,652.87 including trade in value and non-refundable harmonized sales tax.

8.11 Planning Report 2020-06

225

RE: Climate Change Adaptation Plan - Progress Report 1

Moved by _____
Seconded by _____
That Planning Report 2020-06, entitled "Climate Change Adaptation Plan - Progress Report 1", prepared by Niharika Bandaru, Climate Change Analyst, dated April 20, 2020, be received.

9. Reports from Youth Members

10. County Council Update

11. Correspondence

11.1 Correspondence to be received

Moved by _____
Seconded by _____
That correspondence listed in Agenda Item 11.1 be received and, where indicated, to further share such information with the community using suitable methods of communication.

11.1.1 COVID-19 Virus Correspondence

11.1.1.1	Attorney General RE: Construction Act to be Exempt from Emergency Order Suspending Procedural Time Limits	232
11.1.1.2	Ministry of Municipal Affairs and Solicitor General RE: Operation of Seasonal Trailer Parks and Recreational Campgrounds - Amended Essential Business Order as of April 3, 2020	233
11.1.1.3	Media Release - Town of Essex RE: Town By-Law Officers to conduct enforcement of provincial orders (April 8, 2020)	237
11.1.1.4	Association of Municipalities of Ontario (AMO) RE: COVID-19 Update: New Emergency Orders (April 11, 2020)	239
11.1.1.5	Association of Municipalities of Ontario (AMO) RE: COVID-19 Update: Bill 189, Coronavirus Support and Protection Act, 2020 Receives Royal Assent (April 14, 2020)	242
11.1.1.6	Town of Midland RE: Direct Payment of Federal Funds to Municipalities to Waive Property Taxes for the Year 2020 - Financial help to alleviate the suffering from COVID-19 Pandemic Correspondence from the Town of Midland to the Prime Minister of Canada, dated March 23, 2020 asking that the Province of Ontario consider their proposal to direct payment of federal funds to municipalities to waive property taxes for the year 2020 to provide financial help to alleviate the suffering from COVID-19 Pandemic.	244
11.1.1.7	Ministry of Municipal Affairs and Housing RE: Development Charges Act (Proposed	246

Amendments)

11.1.2 Union Water Supply System 248

- April 15, 2020 Regular Meeting Agenda (Virtual Meeting via Zoom)
- April 15, 2020 Special Meeting Agenda (Virtual Meeting via Zoom)

11.1.3 Alcohol and Gaming Commission of Ontario 292

RE: Applications Undergoing Public Notice

- Cannabis Applications in Essex

11.1.4 Media Release - Town of Essex 294

RE: Town of Essex to Provide Sandbags for Residents (April 9, 2020)

11.1.5 Town of Tecumseh 295

RE: Two Board System for Police Services Boards (PSB) in Essex County

Correspondence from the Town of Tecumseh to the Town of Lakeshore, dated March 31, 2020 supporting Lakeshore's Police Services Board's proposal for a "two board system" for Essex County as its preferred option.

11.2 Correspondence to be considered for receipt and support

12. Committee Meeting Minutes

13. Financial

13.1 Bank Payment Report 297

RE: March 2020

Moved by _____
Seconded by _____
That the Bank Payments Report, including the March cheque register, cheque number 51172 to cheque number 51322 inclusive in the amount of $5,239,406.67, the Preauthorized Payments for the March 2020 in the amount of $430,932.65; and the Payroll for March 2020 in the amount of $457,528.55, be ratified as submitted.

14. New Business

15. Notices of Motion

16. Reports and Announcements from Council Members

17. By-Laws

17.1 By-Laws that require a third and final reading

17.1.1 By-Law 1906 309

Being a by-law to confirm the proceedings of the April 6, 2020,

Regular Meeting of the Council of The Corporation of the Town of Essex

Moved by _____
Seconded by _____
That By-Law 1906 being a by-law to confirm the proceedings of the April 6, 2020 Regular Meeting of the Council of The Corporation of the Town of Essex, be read a third time and finally adopted on April 20, 2020.

17.2 By-Laws that require a first, second, third and final reading

17.2.1 By-Law 1900 311

Being a by-law to authorize the borrowing of money to meet current expenditures of The Corporation of the Town of Essex

Moved by _____
Seconded by _____
That By-Law 1900 being a by-law to authorize the borrowing of money to meet current expenditures of The Corporation of the Town of Essex, be read a first, a second and a third time and finally passed on April 20, 2020.

17.3 By-Laws that require a first and second reading

17.3.1 By-Law 1909 313

Being a by-law to confirm the proceedings of the April 20, 2020, Regular Meeting of the Council of The Corporation of the Town of Essex

Moved by _____
Seconded by _____
That By-Law 1909, being a by-law to confirm the proceedings of the April 20, 2020, Regular Meeting of the Council of The Corporation of the Town of Essex, be read a first and a second time and provisionally adopted on April 20, 2020.

18. Adjournment

Moved by _____
Seconded by _____
That the meeting be adjourned at [TIME].

19. Future Meetings

19.1 Monday, May 4, 2020 - 6:00 - 9:00 PM - Regular Council Meeting

Location: TBD

19.2 Tuesday, May 19, 2020 - 6:00 - 9:00 PM - Regular Council Meeting

Location: TBD

The Corporation of the Town of Essex

Regular Council Meeting Minutes

April 6, 2020, 6:13 pm
This meeting was held electronically during a time of Declared Emergency, pursuant to the Town of Essex By-Law 1902.
Location: https://www.youtube.com/user/EssexOntario

Present:	Mayor Larry Snively Deputy Mayor Richard Meloche Councillor Joe Garon Councillor Morley Bowman Councillor Kim Verbeek Councillor Steve Bjorkman Councillor Chris Vander Doelen Councillor Sherry Bondy
Also present	Robert Auger, Town Solicitor, Legal and Legislative Services/Clerk Shelley Brown, Deputy Clerk, Legal and Legislative Services Chris Nepszy, Chief Administrative Officer Doug Sweet, Director, Community Services/Deputy CAO Jeffrey Morrison, Director, Corporate Services/Treasurer Lori Chadwick, Director, Development Services Kevin Girard, Director, Infrastructure Services

1. Call to Order

Mayor Snively called the meeting to order at 6:13 PM.

Councillor Bowman was electronically disconnected and deemed to have left the meeting, prior to the Call to Order.

2. Closed Meeting Report

3. Declarations of Conflict of Interest

There were no declarations of conflict of interest.

4. Adoption of Published Agenda

4.1 Regular Council Meeting Agenda for April 6, 2020

Moved By Councillor Verbeek
Seconded By Councillor Garon

(R20-04-097) That the published agenda for the April 6, 2020 Regular Council Meeting, be adopted as presented with the addition of correspondence from the Essex B.I.A., to be included as agenda item 11.1.6. **Carried**

5. Adoption of Minutes

5.1 Regular Council Meeting Minutes for March 16, 2020

Moved By Councillor Bjorkman
Seconded By Deputy Mayor Meloche

(R20-04-098) That the minutes of the Regular Council Meeting held March 16, 2020, be adopted as circulated.

Carried

5.2 Special Council Meeting Minutes for February 13, 2020

Moved By Councillor Bjorkman
Seconded By Councillor Vander Doelen

(R20-04-099) That the minutes of the Special Council Meeting held February 13, 2020, for the purpose of providing background information and receiving public comments concerning a proposed zoning amendment related to the vacant land on Gosfield Townline in Essex (Ward 1), be adopted as circulated.

Carried

6. Public Presentations

There are no delegations for the April 6, 2020 Regular Council Meeting.

7. Unfinished Business

7.1 Community Services Report 2020-03 (Amended)

At it's March 2, 2020 Regular Council Meeting, Community Services Report 2020-03 entitled "Rename Essex Community Centre to Maedel Community Centre", deferred the Director's report for one month to achieve public input (Resolution R20-03-065).

Community Services Report 2020-03 (Amended), dated April 6, 2020 has been amended to include the results of the public feedback.

Moved By Councillor Verbeek
Seconded By Deputy Mayor Meloche

(R20-04-100) That Community Services Report 2020-03 (Amended), entitled "Rename Essex Community Centre to Maedel Community Centre", prepared by Doug Sweet, Director of Community Services, dated April 6, 2020, be received; and

That Council approves the renaming of the Essex Community Centre located at 25 Gosfield Townline in Essex Centre to the Maedel Community Centre in hour of Edward Charles Maedel.

Carried

Councillor Bowman electronically reconnected and was deemed to have joined the meeting at 6:15 PM.

8. Reports from Administration

8.1 Chief Administrative Officer (CAO) and Director's Verbal Reports

RE: COVID-19 Town's Response Updates

Chris Nepszy, Chief Administrative Officer, Doug Sweet, Director, Community Services/Deputy Chief Administrative Officer, Jeffrey Morrison, Director, Corporate Services/Treasurer and Lori Chadwick, Director, Development Services, each provided an update to Council. The verbal reports included:

- Staffing
- Harbour/Parks/Facilities
- Building Department Operations
- Request to Council to consider waiving interest on Water and Wastewater until June 30, 2020
- Request to Council to consider that individuals who remove themselves from Preauthorized Payments (PAP)and once they rejoin for the month of July, their outstanding balance can be equalized over the remaining PAP payments for the year.
- Credit card payments over the phone that we cannot add a surcharge or service fee.
- Capital Projects and impacts.

Moved By Councillor Bowman
Seconded By Councillor Bjorkman

(R20-04-101) That Council approves waiving the interest on Water and Wastewater accounts until June 30, 2020.

Carried

Moved By Councillor Verbeek
Seconded By Deputy Mayor Meloche

(R20-04-102) That Council approves that individuals who remove themselves from Preauthorized Payments (PAP) and once they rejoin for the month of July, their outstanding balance can be equalized over the remaining PAP payments for the year.

Carried

Moved By Councillor Garon
Seconded By Councillor Vander Doelen

(R20-04-103)That the verbal reports presented Chris Nepszy, Chief Administrative Officer, Doug Sweet, Director, Community Services/Deputy Chief Administrative Officer, Jeffrey Morrison, Director, Corporate Services/Treasurer and Lori Chadwick, Director, Development Services, providing an update on Town’s response to the COVID-19, be received.

Carried

8.2 Capital Works and Infrastructure Report 2020-02

RE: Results of Request for Tender - Essex Soil Steel Structure Replacements and Bridge Deck Rehabilitation

Moved By Councillor Vander Doelen
Seconded By Councillor Bowman

(R20-04-104) That Capital Works and Infrastructure Report 2020-02, entitled "Results of Request for Tender - Essex Soil Steel Structure Replacements and Bridge Deck Rehabilitation", prepared by Jackson Tang, Assistant Manager, Business Services, dated April 6, 2020, be received; and

That Council awards the Request for Tender - Essex Soil Steel Structure Replacements and Bridge Deck Rehabilitation to Sterling Ridge Infrastructure Inc. in the amount of $502,582.47, including non-refundable HST.

Carried

8.3 Drainage Report 2020-01

RE: Appointment of an Engineer under Section 78 of the Drainage Act to replace a culvert over the Shepley Drain

Moved By Councillor Verbeek
Seconded By Councillor Bowman

(R20-04-105) That Drainage Report 2020-01, entitled "Appointment of an Engineer under Section 78 of the Drainage Act to replace a culvert over the Shepley Drain", prepared by Lindsay Dean, Drainage Superintendent, dated April 6, 2020, be received; and

That Council appoints Rood Engineering Incorporated under Section 78 of the Drainage Act for a replacement culvert over the Shepley Drain.

Carried

9. Reports from Youth Members

10. County Council Update

No updates were given.

11. Correspondence

11.1 Correspondence to be received

Moved By Councillor Vander Doelen
Seconded By Councillor Verbeek

(R20-04-106) That the correspondence listed in Agenda Item 11.1 be received and, where indicated, to further share such information with the community using suitable methods of communication.

Carried

11.1.1 Robert J. Swayze, Barrister and Solicitor

RE: Annual Report of the Integrity Commissioner for 2019

Correspondence reporting to Council on activity by the Integrity Commissioner for the Town of Essex during the 2019 calendar year.

11.1.2 Association of Municipalities of Ontario (AMO)

RE: Ontario's Flooding Strategy Released

Email dated March 10, 2020, from AMO Update notifying Council that the Ministry of Natural Resources and Forestry has released Ontario's Flooding Strategy: https://www.ontario.ca/page/protecting-people-property-ontarios-flooding-strategy

11.1.3 Municipal Engineer Association

RE: Municipal Engineers Association (MEA) 2020 Bursary Awards Program

Correspondence dated March 9, 2020 advising Council of the MEA's 2020 Bursary Program

11.1.4 Diocese of London

RE: Letter of gratitude for leadership and service during the coronavirus pandemic.

11.1.5 COVID-19 Virus Correspondence

11.1.5.1 Ministry of the Solicitor General

RE: Set Fines for Offences under the Emergency Management and Civil Protection Act (March 19, 2020)

11.1.5.2 Ministry of the Attorney General

RE: Court Services Division (March 23, 2020)

11.1.5.3 Ministry of Municipal Affairs and Housing, Tim Ryall, Municipal Advisor

RE: Ontario Closing At-Risk Workplaces to Protect Health and Safety (March 23, 2020)

- List of Essential Workplaces

11.1.5.4. NOTICE TO PUBLIC

RE: *Provincial Offences Act* Matters (March 23, 2020)

11.1.5.5. Media Release – Town of Essex

RE: Town of Essex Declares State of Emergency (March 4, 2020)

11.1.5.6 Ministry of Finance

RE: Deferral of Education Property Tax Remittance (March 25, 2020)

11.1.5.7 Media Release – Town of Essex

RE: Update of COVID-19 Response (March 26, 2020)

11.1.5.8 Municipality of Leamington

RE: Temporary Suspension of Leamington to Windsor (LTW) Transit Service (March 27, 2020)

11.1.5.9 Tourism Windsor Essex Pelee Island

RE: COVID-19 Updates – Positive stories from the business communities

11.1.5.10 Office of the Solicitor General/Ministry of Municipal Affairs and Housing

Emergency Orders (March 27, 2020)

11.1.5.11 The Ontario Association of Cemetery and Funeral Professionals (OACFP)

RE: COVID-19 Update and Information – Notice to the Membership (March 29, 2020)

11.1.5.12 Association of Municipalities of Ontario (AMO)

RE: COVID-19 Update – Ontario Extends COVID-19 Emergency and Closes Outdoor Recreational Amenities (March 31, 2020)

11.1.5.13 Media Release – Town of Essex

RE: Update on COVID-19 Response – Interest and penalties waived for property tax accounts, all recreational amenities closed (March 31, 2020)

11.1.6 Essex Centre BIA

RE: Consideration to lower or eliminating the 2020 BIA Levy

Correspondence asking Council to consider lowering or the elimination of the 2020 Essex BIA Levy.

11.2 Correspondence to be considered for receipt and support

11.2.1 Town of Essex Committee Appointments

Correspondence dated April 6, 2020 advising that Expressions of Interest were received by the Clerk's Office and that accordingly it is being recommended that the people so named be appointed to the Committees noted.

Moved By Deputy Mayor Meloche
Seconded By Councillor Bowman

(R20-04-107) That the correspondence dated April 6, 2020, recommending Committee Appointments, be received and supported; and

That the following individuals be appointed the Committees listed below, effective immediately:

Essex Accessibility Advisory Committee:
Breanna Caverhill
Fern Walsh

Arts, Culture and Tourism Committee:
Jeannette Kervoelen
Joseph Cornwall
Grant McGuire

Essex Fun Fest:
Ryan Harnadek
Heather Escobar; and

That Schedule A to By-Law 1777 the Town's Committee Appointment by-law, be amended accordingly.

Carried

12. Committee Meeting Minutes

Moved By Councillor Vander Doelen
Seconded By Councillor Bowman

(R20-04-108) That the minutes listed in Agenda Item 12, together with any recommendations noted therein, be received, approved and adopted as circulated.

- Consideration of Report Minutes – March 16, 2020
  RE: Bayliss Drain: Bridge Replacements & Maintenance Schedule

Carried

13. Financial

14. New Business

15. Notices of Motion

15.1 At the request of the each of the Presenters, the following Notices of Motion were deferred from the March 16th Regular Council Meeting and are being presented this evening for Council's consideration:

15.1.1 Councillor Bondy

RE: Tendering of Cold Roll Recycled Material and Pulverized Tar and Chip Material

Moved By Councillor Bondy
Seconded By Councillor Vander Doelen

(R20-04-109) That Council acknowledge having had a discussion with regards to road tendering of both the cold roll recycled material and the pulverized tar and chip material in order to provide a comparison of the two applications.

Carried

15.1.2 Deputy Mayor Meloche

RE: Town's Policy on Special Needs Street Signs and Warning Signs of Deer or Turtle Crossings

Moved By Deputy Mayor Meloche
Seconded By Councillor Garon

(R20-04-110) That Administration prepare a report on the Town's policy on Special Needs Street Signs and warning signs of Deer or Turtle Crossings.

Carried

15.1.3 Councillor Verbeek

RE: Consideration to the Installation of Surveillance Cameras at Co An Park as soon as possible

Moved By Councillor Verbeek
Seconded By Deputy Mayor Meloche

(R20-04-111) That Council discuss and have Administration look into having surveillance cameras installed as Co An Park; and

That Administration be directed to contact the Town of Amherstburg to obtain their corresponding commitment.

Councillor Bondy asked for a recorded vote.

Recorded	**Support**	**Opposed**
Mayor Snively	X	
Deputy Mayor Meloche	X	
Councillor Garon	X	
Councillor Bowman	X	
Councillor Verbeek	X	
Councillor Bjorkman	X	
Councillor Vander Doelen	X	
Councillor Bondy	X	
Results	**8**	**0**

With a recorded vote of 8 in support, the motion is Carried

15.1.4 Councillor Bjorkman

RE: Essex Region Conservation Authority Donation

Moved By Councillor Bjorkman
Seconded By Councillor Verbeek

(R20-04-112) That the Council of the Town of Essex discuss ways to appropriate funds through, but not limited to the sale of existing properties including part of the Colchester School House property and other developable properties in Colchester; and

Whereas the Town of Essex wishes to have a Tourist Information Centre in the south end of the Town, preferably on County Road 50; and

Whereas the businesses, wineries, restaurants, artists, gift shops, outfitters, golf courses, B & B's, breweries, On Farm retailers, flower shops, orchards, bike rentals, tour operators, etc. will benefit from the added exposure; and

Whereas the preferred location being the Old School House in Colchester Village is years and hundreds of thousands of dollars away from the use as a Tourist Information Centre; and

Whereas this Council understands that residential and commercial development in the south end of the Town is accelerating;

Therefore the Council of the Town of Essex resolves to donate $100,000.00 to the John R. Park Homestead Education Centre in return for a designated Tourist Information Centre named for the Town of Essex.

Deputy Mayor Meloche was electronically disconnected from the meeting at 8:35 PM, but reconnected immediately via cell phone and was able to participate in the discussion and vote.

Councillor Bondy asked for a recorded vote.

Recorded	**Support**	**Opposed**
Mayor Snively	X	
Deputy Mayor Meloche	X	
Councillor Garon	X	
Councillor Bowman	X	
Councillor Verbeek	X	
Councillor Bjorkman	X	
Councillor Vander Doelen	X	
Councillor Bondy	X	
Results	**8**	**0**

With a recorded vote of 8 in support, the motion is Carried

16. Reports and Announcements from Council Members

No reports or announcements.

17. By-Laws

17.1 By-Laws that require a third and final reading

17.1.1 By-Law 1898

Being a by-law to confirm the proceedings of the March 16, 2020, Regular Meeting of the Council of The Corporation of the Town of Essex

Moved By Councillor Bowman
Seconded By Councillor Bjorkman

(R20-04-113) That By-Law 1898 being a by-law to confirm the proceedings of the March 16, 2020 Regular Meeting of the Council of The Corporation of the Town of Essex, be read a third time and finally adopted on April 6, 2020.

Carried

17.2 By-Laws that require a first, second, third and final reading

17.2.1 By-Law 1905

Being a by-law to appoint a Drainage Superintendent for The Corporation of the Town of Essex
(Lindsay Dean)

Moved By Councillor Bjorkman
Seconded By Councillor Vander Doelen

(R20-04-114) That By-Law 1905 being a by-law to appoint a Drainage Superintendent for The Corporation of the Town of Essex, be read a first, a second and a third time and finally passed on April 6, 2020 and that By-Laws 376, 824, 1172 and 1895, be repealed accordingly.

Carried

17.3 By-Laws that require a first and second reading

17.3.1 By-Law 1906

Being a by-law to confirm the proceedings of the April 6, 2020, Regular Meeting of the Council of The Corporation of the Town of Essex

Moved By Councillor Verbeek
Seconded By Councillor Bowman

(R20-04-115) That By-Law 1906 being a by-law to confirm the proceedings of the April 6, 2020 Regular Meeting of the Council of The Corporation of the Town of Essex, be read a first, and a second time and provisionally adopted on April 6, 2020.

Carried

18. Adjournment

Moved By Councillor Vander Doelen
Seconded By Councillor Bowman

(R20-04-116) That the meeting be adjourned at 9:17 PM.

Carried

_____

Mayor

_____

Clerk

Report to Council

Department:	Development Services
Division:	Economic Development
Date:	April 20, 2020
Prepared by:	Nelson Silveira, Economic Development Officer
Report Number:	Economic Development-2020-03
Subject:	Building Report and Development Overview March 2020
Number of Pages:	2 pages and attachments

Recommendation(s)

That Economic Development -2020-03 entitled Building Report and Development Overview March 2020 prepared by Nelson Silveira, Economic Development Officer dated April 20, 2020 be received for information.

Purpose

To provide council with a monthly update on total construction values and real estate data in the Town of Essex.

Background and Discussion

Please refer to attached Building Report and Development Overview.

Link to Strategic Priorities

☐ Manage, invest and plan for sustainable municipal infrastructure which meets current and future needs of the municipality and its citizens.

☐ Create a safe, friendly and inclusive community which encourages healthy, active living for people of all ages and abilities.

☐ Provide a fiscal stewardship and value for tax dollars to ensure long-term financial health to the municipality.

☒ Manage responsible and viable growth while preserving and enhancing the unique rural and small town character of the community.

☐ Improve the experiences of individuals, as both citizens and customers, in their interactions with the Town of Essex.

Report Approval Details

Document Title:	Building Report and Development Overview March 2020 - Economic Development-2020-03.docx
Attachments:	- Building 2020-03.pdf - Development Overview - March 2020 (2).pdf
Final Approval Date:	Apr 14, 2020

This report and all of its attachments were approved and signed as outlined below:

Lori Chadwick, Director, Development Services - Apr 9, 2020 - 2:58 PM

Chris Nepszy, Chief Administrative Officer - Apr 14, 2020 - 10:51 AM

Report Number: Building 2020-03
Date: Apr 1, 2020
Subject: March 2020 Building Report

Number of Permits and Construction Value

Permit Type	Permits Issued	Prior Months	Year Total	Cancelled Permits	Monthly Construction Value	Prior Months Construction Value	Less Cancelled Construction Values	Mar 2020 Construction Values	Mar 2019 Construction Values
Single Family Residence								$ -	$ -
Ward 1	5	21	26		$ 2,706,000.00	$ 10,230,000.00	$ -	$ 12,936,000.00	$ 1,350,000.00
Ward 2	0	0	0		$ -	$ -	$ -	$ -	$ 990,000.00
Ward 3	2	0	2		$ 1,410,000.00	$ -	$ -	$ 1,410,000.00	$ 850,000.00
Ward 4	0	0	0		$ -	$ -	$ -	$ -	$ -
Multiple Residential	0	0	0		$ -	$ -	$ -	$ -	$ -
Addition/Sunrooms	2	2	4		$ 140,000.00	$ 157,000.00	$ -	$ 297,000.00	$ 375,000.00
Garages/Carports	3	3	6		$ 102.00	$ 160,000.00	$ -	$ 160,102.00	$ 100,000.00
Decks/Porches	0	0	0		$ -	$ -	$ -	$ -	$ -
Fences/Pools	6	1	7		$ 161,000.00	$ 1,000.00	$ -	$ 162,000.00	$ 38,000.00
Demolition	1	3	4		$ 5,000.00	$ 30,000.00	$ -	$ 35,000.00	$ 10,000.00
House Raising	0	0	0		$ -	$ -	$ -	$ -	$ 45,000.00
Pole Barns	4	0	4		$ 577,000.00	$ -	$ -	$ 577,000.00	$ 173,000.00
Commercial/Industrial	1	0	1		$ 1,302,400.00	$ -	$ -	$ 1,302,400.00	$ -
Miscellaneous	0	0	0		$ -	$ -	$ -	$ -	$ 28,600.00
Shed	0	1	1		$ -	$ 35,000.00	$ -	$ 35,000.00	$ -
Roof	1	0	1		$ 10,000.00	$ -	$ -	$ 10,000.00	$ 20,000.00
Septic System	1	1	2		$ 35,000.00	$ 25,000.00	$ -	$ 60,000.00	$ -
Sign	1	0	1		$ 2,500.00	$ -	$ -	$ 2,500.00	$ 76,500.00
Green Houses/Winery	0	0	0		$ -	$ -	$ -	$ -	$ -
Renovations	0	0	0		$ -	$ -	$ -	$ -	$ 190,000.00
Additions/Renovation-Commercial/Industrial/Inst	4	4	8		$ 877,000.00	$ 3,570,000.00	$ -	$ 4,447,000.00	$ 25,000.00
Plumbing only	0	2	2		$ -	$ 30,000.00	$ -	$ 30,000.00	$ -
Demolition Out Buildings	0	1	1		$ -	$ 5,000.00	$ -	$ 5,000.00	$ -
Total Permits/Construction Value	**31**	**39**	**70**	**0**	**$ 7,226,002.00**	**$ 14,243,000.00**	**$ -**	**$ 21,469,002.00**	**$ 4,271,100.00**

Permit Fee Totals	
Monthly Total	$ 37,452.48
Yearly Total	$ 123,882.03
Previous Year Total	$ 37,974.75

Monthly Building Permit Totals

Permit Categories	January	February	March	April	May	June	July	August	September	October	November	December	Total	Cancelled Permits	Year Total
Single Family Residence															
Ward 1	9	12	5									0	26		26
Ward 2	0	0	0										0		0
Ward 3	0	0	2										2		2
Ward 4	0	0	0										0		0
Multiple Residential	0	0	0										0		0
Addition/Sunrooms	2	0	2										4		4
Garages/Carports	2	1	3										6		6
Decks/Porches	0	0	0										0		0
Fences/Pools	0	1	6										7		7
Demolition	2	1	1										4		4
House Raising	0	0	0										0		0
Pole Barns	0	0	4										4		4
Commercial/Industrial	0	0	1										1		1
Miscellaneous	0	0	0										0		0
Shed	1	0	0										1		1
Roof	0	0	1										1		1
Septic System	0	1	1										2		2
Sign	0	0	1										1		1
Green Houses/Winery	0	0	0										0		0
Renovations	0	0	0										0		0
Additions/Renovation-Commercial/Industrial/Institutional	4	0	4										8		8
Plumbing only	1	1	0										2		2
Demolition Out Buildings	0	1	0										1		1
Total	**21**	**18**	**31**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**70**	**0**	**70**

Monthly Permit Fee Totals

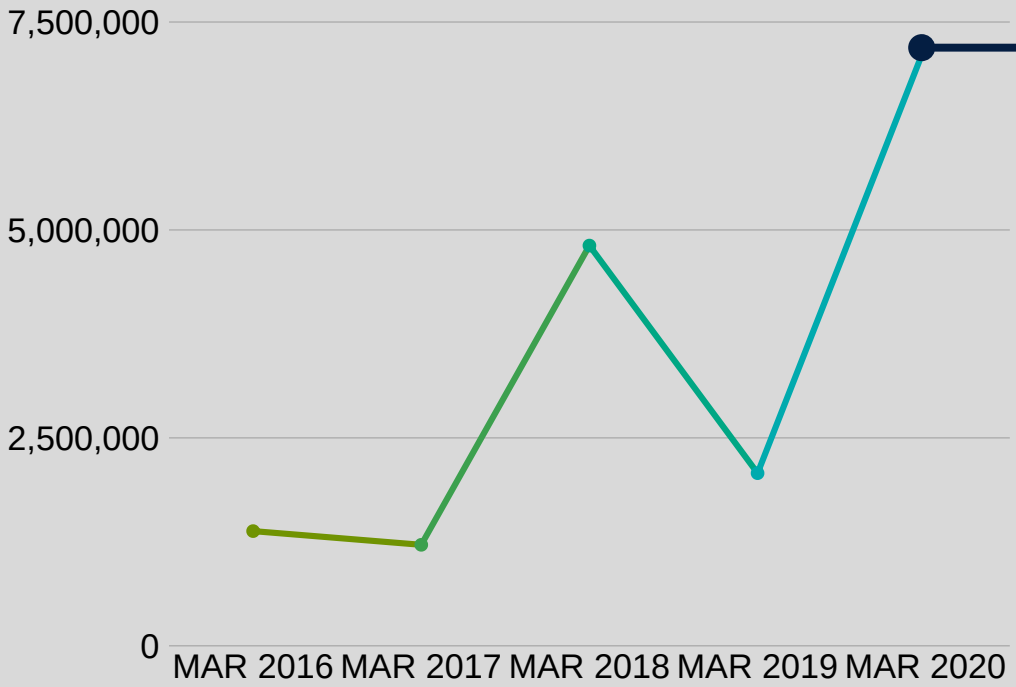
Permit Categories	January	February	March	April	May	June	July	August	September	October	November	December	Total	Cancelled Permits	Year Total
Single Family Residence	$ 25,213.15	$ 33,093.30	$ 20,452.06										$ 78,758.51	$ -	$ 78,758.51
Single Family Residence-Plumbing	$ 5,400.00	$ 7,200.00	$ 4,200.00										$ 16,800.00	$ -	$ 16,800.00
Single Family Residence-Septic	$ -	$ -	$ 700.00										$ 700.00	$ -	$ 700.00
Multiple Residential	$ -	$ -	$ -										$ -	$ -	$ -
Additions/Sunrooms	$ 1,770.00	$ 100.00	$ 576.80										$ 2,446.80	$ -	$ 2,446.80
Garages/Carports	$ 304.00	$ 247.50	$ 414.40										$ 965.90	$ -	$ 965.90
Decks/Porches	$ -	$ -	$ -										$ -	$ -	$ -
Fences/Pools	$ -	$ 60.00	$ 360.00										$ 420.00	$ -	$ 420.00
Demolition	$ 200.00	$ 100.00	$ 100.00										$ 400.00	$ -	$ 400.00
House Raising	$ -	$ -	$ -										$ -	$ -	$ -
Pole Barns	$ -	$ -	$ 2,333.60										$ 2,333.60	$ -	$ 2,333.60
Commercial/Industrial	$ -	$ -	$ 3,976.00										$ 3,976.00	$ -	$ 3,976.00
Miscellaneous	$ -	$ -	$ -										$ -	$ -	$ -
Shed	$ 100.00	$ -	$ -										$ 100.00	$ -	$ 100.00
Roof	$ -	$ -	$ 100.00										$ 100.00	$ -	$ 100.00
Septic System	$ -	$ 700.00	$ 700.00										$ 1,400.00	$ -	$ 1,400.00
Sign	$ -	$ -	$ 100.00										$ 100.00	$ -	$ 100.00
Green Houses/Winery	$ -	$ -	$ -										$ -	$ -	$ -
Renovations	$ -	$ -	$ -										$ -	$ -	$ -
Additions/Renovation-Commercial/Industrial/Institutiona	$ 11,591.60	$ -	$ 3,439.62										$ 15,031.22	$ -	$ 15,031.22
Plumbing only	$ 150.00	$ 100.00	$ -										$ 250.00	$ -	$ 250.00
Demolition Out Buildings	$ -	$ 100.00	$ -										$ 100.00	$ -	$ 100.00
Total	**$ 44,728.75**	**$ 41,700.80**	**$ 37,452.48**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 123,882.03**	$ -	**$ 123,882.03**

Monthly Construction Value Total

Permit Categories	January	February	March	April	May	June	July	August	September	October	November	December	Total	Cancelled Permits	Year Total
Single Family Residence															
Ward 1	$ 4,459,000.00	$ 5,771,000.00	$ 2,706,000.00										$ 12,936,000.00	$ -	$ 12,936,000.00
Ward 2	$ -	$ -	$ -										$ -	$ -	$ -
Ward 3	$ -	$ -	$ 1,410,000.00										$ 1,410,000.00	$ -	$ 1,410,000.00
Ward 4	$ -	$ -	$ -										$ -	$ -	$ -
Multiple Residential	$ -	$ -	$ -										$ -	$ -	$ -
Additions/Sunrooms	$ 145,000.00	$ 12,000.00	$ 140,000.00										$ 297,000.00	$ -	$ 297,000.00
Garages/Carports	$ 100,000.00	$ 60,000.00	$ 102.00										$ 160,102.00	$ -	$ 160,102.00
Decks/Porches	$ -	$ -	$ -										$ -	$ -	$ -
Fences/Pools	$ -	$ 1,000.00	$ 161,000.00										$ 162,000.00	$ -	$ 162,000.00
Demolition	$ 25,000.00	$ 5,000.00	$ 5,000.00										$ 35,000.00	$ -	$ 35,000.00
House Raising	$ -	$ -	$ -										$ -	$ -	$ -
Pole Barns	$ -	$ -	$ 577,000.00										$ 577,000.00	$ -	$ 577,000.00
Commercial/Industrial	$ -	$ -	$ 1,302,400.00										$ 1,302,400.00	$ -	$ 1,302,400.00
Miscellaneous	$ -	$ -	$ -										$ -	$ -	$ -
Shed	$ 35,000.00	$ -	$ -										$ 35,000.00	$ -	$ 35,000.00
Roof	$ -	$ -	$ 10,000.00										$ 10,000.00	$ -	$ 10,000.00
Septic System	$ -	$ 25,000.00	$ 35,000.00										$ 60,000.00	$ -	$ 60,000.00
Sign	$ -	$ -	$ 2,500.00										$ 2,500.00	$ -	$ 2,500.00
Green Houses/Winery	$ -	$ -	$ -										$ -	$ -	$ -
Renovations	$ -	$ -	$ -										$ -	$ -	$ -
Additions/Renovation-Commercial/Industrial/Institutional	$ 3,570,000.00	$ -	$ 877,000.00										$ 4,447,000.00	$ -	$ 4,447,000.00
Plumbing only	$ 15,000.00	$ 15,000.00	$ -										$ 30,000.00	$ -	$ 30,000.00
Demolition Out Buildings	$ -	$ 5,000.00	$ -										$ 5,000.00	$ -	$ 5,000.00
Total	**$ 8,349,000.00**	**$ 5,894,000.00**	**$ 7,226,002.00**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 21,469,002.00**	**$ -**	**$ 21,469,002.00**

DEVELOPMENT OVERVIEW
March 2020

Total Monthly Construction Value



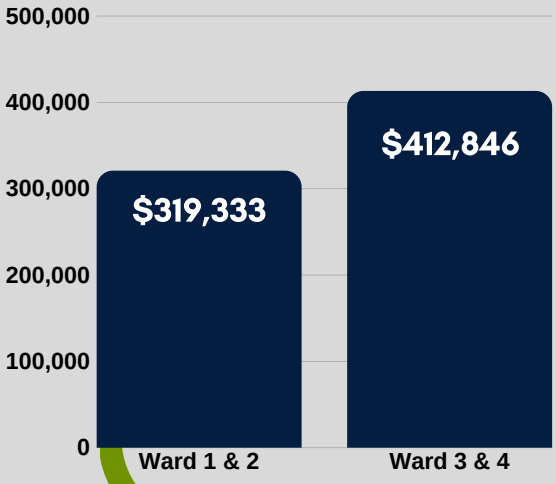
$7,226,002

Total construction value for March 2020 includes all new and expanding commercial, industrial, institutional and residential developments that required a building permit

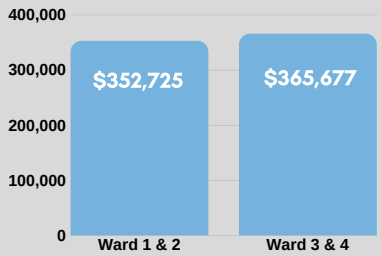
248%
from March 2019

Real Estate

Average Sale Price March 2020



Average Sale Price March 2019



Total Single Family Dwellings sold in March 2020

35

March 2019: 21

Ward 1&2: **16 Homes Sold**
Ward 3&4: **19 Homes Sold**

Total Homes Sold 2020

75

Report to Council

Department:	Development Services
Division:	Economic Development
Date:	April 20, 2020
Prepared by:	Nelson Silveira, Economic Development Officer
Report Number:	Economic Development-2020-04
Subject:	Community Improvement Plan Update (Quarter 1 2020)
Number of Pages:	4

Recommendation(s)

That Economic Development-2020-04 entitled Community Improvement Plan Update (Quarter 1 2020) prepared by Nelson Silveira, Economic Development Officer dated April 20, 2020 be received for information.

Purpose

The purpose of this update is to provide Council with a quarterly update on the status of Community Improvement Plan applications.

Background and Discussion

The Town of Essex Community Improvement Plans (CIP) were created to stimulate private sector investment through municipal incentive-based programs. The CIP has a variety of grant programs for eligible property owners that invest in façade improvements, new signage, and building renovations and improvements. These programs have facilitated and encouraged community change in a co-ordinated manner by providing grant funding for

new development in three separate projects that include Essex Centre, Harrow, and Colchester/County Road 50.

Quarter 1 2020 Update

While Essex Centre CIP applications historically garner the most interest and/or requests in the past few years, Harrow CIP interest and inquiries have surpassed that of Essex Centre in the first quarter of this year. Administration has also received interest from several property owners looking to leverage funding from the Colchester/County Road 50 CIP program. Although only several applications have been received so far in 2020 there remains interested property owners who have pre-consulted or have even simply inquired, but have not come forward to begin an application process. Administration maintains rapport with many of these individuals in effort to maintain interest and momentum in having them prepared when they decide to make the commitment. The tables below are an itemized list of completed projects in 2020, as well as a list of 2020 CIP projects that are currently underway.

Completed Projects

The following table describes completed projects that accessed CIP funding in 2020:

Address	Grant Program	Status of Grant	Total Grant Paid in 2020
26 Victoria St S Harrow Dry Cleaners (Harrow CIP)	Façade Improvement Grant Demolition Grant Landscaping and Buffering Grant	Projected Started 2019 Grant Paid – March 2020	$16,694.47
32 Munger St West Harrow Clinic (Harrow CIP)	Façade Improvement Grant	Project Started 2019 Grant Paid – March 2020	$5,918.88
Total			**$22,613.35**

Applications Received

The following table describes CIP projects that have commenced in 2020:

Address	Grant Program	Status of Work	Notes
16 Centre St Essex Free Press (Essex Centre CIP)	Professional Design Grant Façade Improvement Grant	Design Work in Progress	Applicant is in the exterior design phase for both 16 & 22 Centre St. Façade work to follow.
22 Centre St Wine O'Willie's (Essex Centre CIP)	Professional Design Grant Façade Improvement Grant	Design Work in Progress	Applicant is in the exterior design phase for both 16 & 22 Centre St. Façade work to follow.
68 Talbot St N Former Schinkel's Building (Essex Centre CIP)	Development Permit Fee Grant Façade Improvement Grant	Work in Progress	Applicant has commenced a complete façade renewal. Work will entail new building canopy, metal siding, lighting, and signage. Work to include creation of an additional commercial storefront.
2636 County Road 20 Classy Caps MFG Inc. (Harrow CIP)	Professional Design Grant Development Permit Fee Grant Façade Improvement Grant	Work in Progress	Applicant has commenced work on exterior to include stucco work, new windows and doors, signage, and lighting. This project includes the construction of a warehouse to store merchandise.
43-45 King St E Boudreau Group (Harrow CIP)	Development Permit Fee Grant Façade Improvement Grant Conversion Grant	Work in Progress	Applicant has commenced work on exterior to include stone veneer bottom, steel siding, and new windows. Creation of one new rental dwelling in upper portion of building.

Consultations

Heather MacDonald, Acting Manager, Finance and Business Services

Financial Impact

Early this year, Council approved a $100,000 2020 budget for the Essex Centre CIP and $100,000 for the Harrow and Colchester/County Road 50 CIP. Funds dispersed in the first quarter of this year in the amount of $22,613.35 and were from applicants who applied in 2019 and completed grant eligible works in 2020. Therefore, $77,386.65 remains in the Harrow and Colchester/County Road 50 CIP fund and the Essex Centre CIP fund remains at $100,000. Other projects are currently underway and funds are to be dispersed once invoices for completed work is received and a funding agreement is signed.

Link to Strategic Priorities

☐ Manage, invest and plan for sustainable municipal infrastructure which meets current and future needs of the municipality and its citizens.

☐ Create a safe, friendly and inclusive community which encourages healthy, active living for people of all ages and abilities.

☒ Provide a fiscal stewardship and value for tax dollars to ensure long-term financial health to the municipality.

☒ Manage responsible and viable growth while preserving and enhancing the unique rural and small town character of the community.

☐ Improve the experiences of individuals, as both citizens and customers, in their interactions with the Town of Essex.

Report Approval Details

Document Title:	Community Improvement Plan Update (Quarter 1 2020) - Economic Development-2020-04.docx
Attachments:	
Final Approval Date:	Apr 15, 2020

This report and all of its attachments were approved and signed as outlined below:

Lori Chadwick, Director, Development Services - Apr 14, 2020 - 2:37 PM

Chris Nepszy, Chief Administrative Officer - Apr 15, 2020 - 2:15 PM

Report to Council

Department:	Infrastructure Services
Division:	Drainage
Date:	April 20, 2020
Prepared by:	Lindsay Dean, Drainage Superintendent
Report Number:	Drainage-20-02
Subject:	Appointment of an Engineer under Section 78 of the Drainage Act to review the Barrette Drain
Number of Pages:	4

Recommendation(s)

That Drainage-2020-02 entitled Appointment of an Engineer under Section 78 of the Drainage Act to review the Barrette Drain prepared by Lindsay Dean, Drainage Superintendent dated April 20, 2020 be received, and

That Council appoint Rood Engineering Incorporated under Section 78 of the Drainage Act to review the Barrette Drain.

Purpose

The drainage report on the Barrette Drain has become outdated due to various changes that have occurred along the 13th Concession Road. To address these changes, an engineer can be appointed to review the Barrette Drain and provide an updated report addressing any changes to parcel boundaries and outlining any necessary repairs or improvements required to the drain.

Background and Discussion

The Barrette Drain runs along the north side of the 13th Concession Road from Lot 14 to its outlet into the Hyland Sideroad Drain located on the east side of Hyland Road.

The most recent report on the Barrette Drain was completed in 1966 and was passed by by-law. Since 1966, many residential lots have been severed along the 13th Concession Road with each one installing a culvert to cross the municipal drain to access their land. The culverts were not incorporated into the Barrette Drain by way of a drainage report, therefore, there are no records to indicate whether sizing of these culverts are appropriate to handle flows in the drain or if they were installed correctly. Additionally, the engineer will review whether the drain has the capability to handle the change of land use from vacant farmland to residential that has occurred since 1966. The engineer will also provide an updated schedule of assessment to be used for future maintenance of the drain and culvert cost sharing.

Under Section 78 of the Drainage Act, Council may appoint an engineer to make repairs or improvements to existing municipal drains that have been passed under municipal by-law. The Barrette Drain is a municipal drain that has been adopted by municipal by-law and any improvements made to the Barrette Drain would qualify under this section of the act.

Prior to the appointment of an engineer, notice must be sent to the Conservation Authority and after 30 days an engineer may be appointed to this project. An engineer appointment under Section 78 of the Drainage Act, gives the engineer authority to review the drainage works and prepare a report outlining their recommendations.

The procedures and appeals under Section 78 are followed in the same manner as Petition Drains, Section 4 of the Drainage Act. The general procedure is as follows:

- Council appointment of an engineer to prepare a report;
- Conduct an on-site meeting with affected landowners;
- Meeting to consider the report and passing of the provisional by-law;
- Court of Revision;

- 3rd and Final Reading of the by-law;
- Construction of drainage works.

Schedule

Should Council approve to proceed with the report and appoint an Engineer, the estimated schedule will be as follows:

- Council approval and appointment of Engineer –May 2020
- On Site Meeting – June 2020
- Preparation of the Report – October 2020
- Submission of Report and notification period –November 2020
- Consideration of the Report by the Drainage Board –November 2020
- Provisional By-law and Adoption by Council – November 2020
- Court of Revision –December 2020
- 3rd and Final Reading of the By-law – January 2021
- Construction if applicable (dependent on weather and agency approvals) - Early 2021

Financial Impact

The lands and roads assessed to the Barrette Drain will be responsible for all cost associated with the engineering, incidental costs and construction if applicable.

Link to Strategic Priorities

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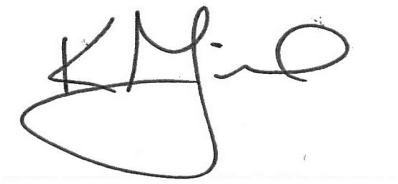
☐ Improve the experiences of individuals, as both citizens and customers, in their interactions with the Town of Essex.

Report Approval Details

Document Title:	Appointment of Engineer for Barrette Drain Review.docx
Attachments:	
Final Approval Date:	Apr 14, 2020

This report and all of its attachments were approved and signed as outlined below:

Norm Nussio, Manager Operations and Drainage - Apr 14, 2020 - 12:12 PM



Kevin Girard, Director, Infrastructure Services - Apr 14, 2020 - 12:45 PM

Chris Nepszy, Chief Administrative Officer - Apr 14, 2020 - 2:27 PM

Report to Council

Department:	Infrastructure Services
Division:	Infrastructure Services
Date:	April 20, 2020
Prepared by:	Kevin Girard, Director of Infrastructure Services
Report Number:	Infrastructure Services-2020-02
Subject:	Windsor/Essex Region Stormwater Management Standards Manual
Number of Pages:	129, including attachments

Recommendation(s)

That Infrastructure Services – 2020-02 entitled, "Windsor/Essex Region Stormwater Management Standards Manual" prepared by Kevin Girard dated April 6, 2020 be received, and

That Council adopt the Windsor/Essex Region Stormwater Management Standards Manual as the standard for the design and review of stormwater infrastructure within the Town of Essex.

Purpose

The purpose of this report is to inform Council of the recently completed Windsor/Essex Region Stormwater Standards Manual and have it adopted as the standard for design and review of development applications within the Town. The manual provides technical stormwater standards to ensure stormwater infrastructure is designed to meet a standard that is consistent with local conditions experienced within the Windsor-Essex Region.

Background and Discussion

Land development increases both the volume of stormwater runoff, and the rate at which runoff occurs. A principal purpose of stormwater management is to mitigate the potential for flooding to downstream landowners due to the hydrologic effects of development. Without stormwater management measures, the impacts of development can lead to increased flooding, damage to municipal infrastructure, degradation of water quality and aquatic ecosystems, stream erosion, and property damage. Left unmanaged, stormwater often leads to major public expenditures in infrastructure to solve flooding or erosion problems.

Why a Standards Manual is needed

Stormwater management requires a holistic approach on a watershed scale that considers both stormwater management constraints and opportunities. In the Windsor/Essex region, the prescribed standards for stormwater management systems vary considerably from municipality to municipality. This leads to a wide range of variation in stormwater management designs, which results in inconsistent stormwater management measures. There is a need for regional standards to:

- Provide a minimum standard and consistent level of service and protection of the environment throughout the region.
- Provide fair and equitable minimum standard for all.
- Address stormwater at the watershed scale without being limited by municipal boundaries.
- Streamline the review process to eliminate re-submissions and re-design efforts.

The New Stormwater Management Standards Manual

In 2015, the Essex Region Conservation Authority (ERCA) approached the City of Windsor, the County of Essex, and the local municipalities, including the Town of Essex, regarding the need for regional stormwater management standards. The lack of regional standards was resulting

in inconsistent requirements between local municipalities, varying levels of service for stormwater facilities, lack of clear guidance for developers and engineering consultants, significant review times, and the high potential for numerous review submissions.

Based on ERCA's request, the County of Essex and all local municipalities agreed to partner with ERCA to develop regional stormwater management standards. ERCA engaged the services of Stantec Consulting Ltd. as the principal consultant on the project. Engineering representatives from the Town, and from all partners, have worked collaboratively with ERCA and Stantec through an iterative process to develop the final stormwater management standards manual. This process included several meetings and draft reports leading to the attached final version of the manual.

Implementation of the stormwater management standards contained in the Manual will result in the following:

- Properly sized stormwater infrastructure based on up to date science and local conditions.
- Minimize the potential for future stormwater management storage issues at multi-phased developments by accounting for current development trends, local constraints and reviewing resiliency by stress testing the stormwater system for potential climate change impacts.
- Provide clear direction to developers and engineers on stormwater management requirements for new development within the Town.
- Create an even playing field for engineers providing proposals for stormwater management design.
- Provide a consistent watershed approach to stormwater management for all municipalities within the Windsor Essex Region.
- Reduce the number of reviews and re-submissions of plans. This should create efficiencies for municipal/agency reviews, expedite the approval process and reduce the proponent's design costs.

Since the manual's completion, the Town has been using this stormwater manual as its stormwater guidelines for infrastructure projects and new development. This is consistent with the practices of all municipalities in the Windsor/Essex region, ERCA, the City of Windsor, and the County of Essex. In addition, the approved 2020 capital budget includes the update to the Town's Development Standards Manual. The adoption of a stormwater standards manual will allow the Town to create a development manual that is consistent with regional guidelines, and provide clear direction to developers and engineers on stormwater management requirements for new and replacement infrastructure within the Town.

Financial Impact

There are no financial impacts as a result of this report.

Consultations

Lori Chadwick, Director of Development Services

Link to Strategic Priorities

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☐ Improve the experiences of individuals, as both citizens and customers, in their interactions with the Town of Essex.

Report Approval Details

Document Title:	Windsor-Essex Region Stormwater Management Standards Manual.docx
Attachments:	- WE-Region-SWM-Standards-Manual.pdf
Final Approval Date:	Apr 14, 2020

This report and all of its attachments were approved and signed as outlined below:

Chris Nepszy, Chief Administrative Officer - Apr 14, 2020 - 2:28 PM

Windsor/Essex Region Stormwater Management Standards Manual

Prepared by:
Stantec Consulting Ltd.

Prepared for:

Essex Region Conservation Authority
sustaining the place for life

on behalf of the Windsor/Essex Region, consisting of the following municipalities:

Version	Date	Description	Author
0	Oct. 12/18	Final Draft for Stakeholder Review	Stantec
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PREFACE

This document outlines stormwater management standards for the Windsor/Essex Region. The document presents what is considered to be the best practice for the region, given the state of the science at this time. It is to be viewed as a living document, to be reviewed, updated and improved. At a minimum, the document is to be reviewed every 5 years.

The standards provide practical, and at times, fairly prescriptive design criteria. **However, the designer is solely responsible for stormwater design and has the flexibility to deviate from the specified guidance provided that the supporting rationale and technical merit meets the stormwater objectives of the manual to the satisfaction of the Municipality, the Conservation Authority (ERCA or LTVCA) and other approval agencies**.

The document is presented in six sections as outlined below, along with a brief description of the section content.

SECTION 1: INTRODUCTION

This section is for ALL STAKEHOLDERS. It discusses why we need the manual.

SECTION 2: PLANNING

This section is for ALL STAKEHOLDERS. It highlights the importance of proper drainage planning, and how decisions made at the planning stage impact the ultimate drainage function.

SECTION 3: DESIGN

This section is for CONSULTANTS and MUNICIPALITIES. It presents design standards and requirements for stormwater design in the Windsor/Essex region.

SECTION 4 – PRIVATE DRAINAGE SYSTEMS

This section is for CONSULTANTS, MUNICIPALITIES and DEVELOPERS. It discusses the need for better coordination of municipal and private drain design as well as provides recommendations for private drainage system construction to mitigate basement flooding.

SECTION 5 – IMPLEMENTATION/CONSTRUCTION

This section is for CONSULTANTS, MUNICIPALITIES and DEVELOPERS. It discusses the requirements of proper implementation and construction of stormwater designs.

SECTION 6 – OPERATION AND MAINTENANCE

This section is for CONSULTANTS and MUNICIPALITIES. It discusses the minimum requirements for operation and maintenance manuals to support stormwater infrastructure.

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Abbreviations

AMC	Antecedent Moisture Conditions
BMP	Best Management Practice
CA	Conservation Authority
ECA	Environmental Compliance Approval
ERCA	Essex Region Conservation Authority
ESC	Erosion and Sediment Control
ETV	Environmental Technology Verification
GI	Green Infrastrucuture
ha	hectares
HGL	Hydraulic Grade Line
HWL	High Water Level
IDF	Intensity-Duration-Frequency
L/s	Litres per second
LID	Low Impact Development
LTVCA	Lower Thames Valley Conservation Authority
m	metres
m^3	cubic metres
m^3/s	cubic metres per second
mm	millimetres
MNRF	Ministry of Natural Resources and Forestry
MECP	Ministry of Environment, Conservation and Parks (formerly MOECC and MOE)
MOECC	Ministry of Environment and Climate Change
MTO	Ministry of Transportation Ontario
NRCS	National Resources Conservation Service
NWL	Normal Water Level
OGS	Oil/Grit Separator
RVC_T	Runoff Volume Control Target
SCS	Soil Conservation Service (now NRCS)
SWM	Stormwater Management
SWMF	Stormwater Management Facility
SWMP	Stormwater Management Practice
TSS	Total suspended solids
WQS	Water Quality Storm
WSEL	Water Surface Elevation

Glossary

1:5 year storm event (also referred to as 5-year storm	A storm event with a 1:5 year return period or 20% probability of occurrence in any given year.
Allowable release rate	A maximum specified flow rate at which development is allowed to discharge.
Antecedent moisture condition	The pre-storm soil moisture condition.
Backwater condition	A backflow condition or rise in water level which impacts conveyance capacity
Combined sewer	A combined sewer is a sewage collection system of pipes and tunnels designed to also collect surface runoff
Detention	The temporary storage of stormwater to control runoff discharge rates and promote settling of sediment.
Extended detention	A speficied volume to be detained over a minimum 24-hour period for water quality purposes.
Freeboard	The depth measured from the water surface elevation to a specified reference point (e.g. manhole cover, building opening, pond bank)
Holistic approach	An approach that considers in the context of the overall watershed.
Hydraulic grade line	The surface or profile of water flowing in an open channel or a pipe flowing partially full. If a pipe is under pressure, the hydraulic grade line is that level water would rise to in a small, vertical tube connected to the pipe.
Hydrodynamics	The study of motion of liquids, and in particular, water. A hydrodynamic model is a tool able to describe or represent in some way the motion of water.
Hyetograph	A graphical representation of the distribution of rainfall over time.
Level of service	Level of service refers to the efficiency of the drainage system to capture and convey runoff away from the surface and buildings. In the context of drainage, level of service is described in terms of a return period.
Major	In the context of stormwater, major relates to a major storm event. For purposes of design, the major storm event is typically quantified as a 1:100 year storm event.
Minor	In the context of stormwater, minor relates to a minor storm event. For purposes of design, the minor storm event is typically specified for storm sewer sizing with a return period of 1:2 year or 1:5 year.
Obvert	Elevation at the highest point of the inner surface of a pipe (i.e. interior top of pipe)

Permanent pool	The body of water which remains in the stormwater management pond.
Private drainage system	A system of underground piping, sump pump, roof leaders, rear yard catch basins, sewage ejector pumps, etc. which convey stormwater and sewage flows from private property to the municipal sewer(s).
Receiver	The receiving drain, watercourse or sewer.
Retention	The permanent storage of stormwater to control runoff discharge rates and volume by promoting infiltration, evapotranspiration and re-use.
Return period	A return period, also known as a recurrence interval is an estimate of the likelihood of an event, such as an earthquake, flood or a river discharge flow to occur
Runoff	Surface water, from precipitation, that flow over the land surface.
Stormwater	Stormwater is the water from rain or melting snow that is not absorbed into the ground.
Subcatchment	An area of land where all surface runoff converges or is assigned to a single point along a drainage feature. E.g. a storm sewer manhole.
Watercourse	An open channel that conveys water to a larger watercourse or waterbody.
Watershed	An area of land that drains into a watercourse or waterbody

1.0 INTRODUCTION

1.1 BACKGROUND AND HISTORY

Land development increases both the amount (volume) of stormwater runoff, and the rate at which runoff occurs. A principal purpose of stormwater management (SWM) is to mitigate the potential for flooding to downstream landowners due to the hydrologic effects of development.

The physiology of the landscape that predominates much of the Windsor/Essex region imposes special challenges to the effective implementation of SWM. There are two characteristics of the region in particular that create special challenges – the nature of the terrain and the type of soils that predominate the area.

Most of Essex County is very flat in comparison to other regions of the Province. Due to the limited land gradient, many of the receiving watercourses and trunk sewers flow near full during even moderate rainfall events. During extreme events many watercourses overflow. Most trunk sewers exhibit hydraulic grade lines that exceed the top of the sewer, and often match or exceed the surrounding ground elevations.

In addition to the flat topography, most of Essex County is underlain by impervious, clayey soils. This feature results in a larger percentage of the annual rainfall that the region receives being converted to runoff, as compared to areas that are underlain by sandy, pervious soils. The clayey soils create an additional challenge – clay soils limit the ability to infiltrate rainfall.

The focus of SWM has been evolving over the years. Prior to 1990, SWM focused on quantity control, to reduce post-development peak runoff rates to pre-development levels. In the early 1990s, the objective of SWM in Ontario was expanded to include quality control. Since 1990, many SWM facilities have been constructed in the region. Most SWM facilities that service larger developments (i.e., greater than a few lots) employ some form of pond. The ponds that were constructed prior to 1994 were normally dry ponds, intended to achieve quantity control. Those constructed since typically incorporate a permanent pool that is intended to provide an extended detention, quality control function.

1.2 WHY THE STANDARDS MANUAL IS NEEDED

In the Windsor/Essex region, the prescribed standards for stormwater management systems vary considerably from municipality to municipality. This leads to a wide range of variation in stormwater management designs, which results in inconsistent stormwater management measures. There is a need for regional standards to:

- provide a minimum standard and consistent level of service and protection of the environment throughout the region
- provide fair and equitable minimum standard for all

- address stormwater at the watershed scale without being limited by municipal boundaries.
- streamline the review process to eliminate re-submissions and re-design efforts

1.3 OBJECTIVE

The principle objective of this manual is to provide a clear, concise and consistent approach to stormwater design within the Windsor/Essex region. The proposed manual serves to identify the general policies and technical guidelines adopted by regulatory agencies. It provides direction to consulting firms and municipalities in the development and review of technical reports in support of new development. The manual is to be read in conjunction with the current Ministry of the Environment, Conservation and Parks 2003 Stormwater Management Planning and Design Manual (published under the former name, Ministry of Environment), and the current Ministry of Natural Resources and Forestry (MNRF) 2002 Natural Hazard Technical Guide. The manual is tailored to the local challenges of this region and in this respect, it is intended to supplement other applicable manuals/guides, and in some instances discourage practices that are not suited to this region.

The manual is intended to be prescriptive in certain aspects of design and establish minimum submission requirements that require absolutes. Notwithstanding, the designer shall continue to have flexibility in the design of stormwater management solutions and is solely responsible for their design for any given site.

1.4 WHY STORMWATER MANAGEMENT IS IMPORTANT

1.4.1 General

Land development results in increased rates and volumes of stormwater runoff. Without stormwater management measures, the impacts of development can lead to increased flooding, degradation of water quality and aquatic ecosystems, stream erosion and property damage. Left unmanaged, stormwater often eventually leads to major public expense in infrastructure to solve flooding or erosion problems.

1.4.2 In the Windsor/Essex Region

Stormwater management measures are being implemented by municipalities in the Windsor/Essex Region, however the approach has generally been isolated to individual developments and at the site planning level. This approach has the potential to lead to both inefficient and inconsistent implementation of stormwater management within a watershed. Stormwater management requires a holistic approach on a watershed scale that considers both stormwater management constraints and opportunities.

The Windsor/Essex region has relatively flat topography and poorly drained soils that create many challenges for effective management of stormwater. Many drainage systems in the region are affected by lake levels which can have a notable backwater effect. Moreover, the construction of stormwater management ponds in flat areas has artificially created a backwater condition that can surcharge sewer systems and potentially saturate home foundation walls. The lack of gradient has also contributed to a significant number of pumped outlets within the region.

1.5 UNDERSTANDING LEVEL OF SERVICE AND RISK

Level of service refers to the efficiency of the drainage system to capture and convey runoff away from the surface and buildings. In the context of drainage, level of service is described in terms of a return period – the likelihood that a storm event of specified magnitude will occur in any given year. For example, a 1:100 year storm event has a 1 in 100 or 1% chance of occurring in any given year. The return period can give a false sense of safety as a 1% chance is interpreted as an absolute rather than a statistical average.

To illustrate this point, the following table correlates return periods and probability of exceedance (or risk) over the design life.

Table 1.5 – Probability of Exceedance (Risk)

Return Period	Design Life					
	2	5	10	25	50	100
2	75%	97%	100%	100%	100%	100%
5	36%	67%	89%	100%	100%	100%
10	19%	41%	65%	93%	99%	100%
25	8%	18%	34%	64%	87%	98%
50	4%	10%	18%	40%	64%	87%
100	2%	5%	10%	22%	39%	63%

Risk (r) = $1 – (1-1/T)^L$, where T = return period and L = Design Life (MNRF, 2002)

For example, there is a 63% chance of exceeding a 1:100 year storm in the next 100 years. It should be acknowledged historical records used to derive return periods are often based on less than 100 years of data (61 years at Windsor Airport).

1.5.1 Defining Risk/Reliability

The acceptable risk for a project must ultimately consider the consequence of failure or capacity exceedance of the design. The minimum standard level of service has been defined herein as a 100-year design storm. This minimum standard does not guarantee that a given site will never flood but rather, it guides the design of mitigating measures to achieve a low risk of flooding.

Where an individual site's potential damages due to flooding are high, it is the practitioner's responsibility to design to a more conservative standard or to provide a sufficient emergency flow route in accordance with the proponent's site-specific needs.

The inverse of risk is reliability and is a standard term used in other engineering fields to define the design standard over the long-term or design life of the infrastructure. When evaluating infrastructure within a flood control perspective, reliability should be defined to clearly express the level of protection that the infrastructure is being designed to. As a specific example, the 1:100 year 24-hour rainfall amount based on Windsor Airport historical data is 108mm. A pond designed to this 1:100 return period has a 1% chance of exceeding its design high water level in any given year. However, the same pond has a 63% chance of exceeding its design high water level over the next 100 years. Conversely, the pond design can be said to have a reliability of 36% over of the next 100 years, where reliability is defined per Eq. 1.5.1 below.

Eq. 1.5.1: Reliability = $\frac{1}{Risk} = \frac{1}{1-\left(1-\frac{1}{T}\right)^{L}}$ where T = Return Period and L = Design Life

Assuming the same pond accounted for a minimum freeboard depth of 0.3 metres – as measured from the 1:100 year design water level to the top of bank and that said freeboard provided additional storage to contain a rainfall of 150mm, the return period would be 1:2,600 year and the pond would actually have a reliability of 96% over the next 100 years with regards to overtopping of the pond banks.

Defining flood risk in terms of reliability of the design provides a much clearer sense of the long-term level of protection or flood mitigation provided by the design and adjusts expectations on its performance.

1.5.2 Risk Assessment

The following definitions, adopted by MTO Highway Drainage Standards, provide general guidance on assessing the consequence of failure or capacity exceedance from the perspective of Public Safety, Traffic Delays, Damage due to Flooding, and Natural Habitat Impacts. These definitions do not include site-specific risks that may need to be considered, such as high consequence and damages due to loss of a specific high cost crop or downtime costs of an industrial site due to delayed delivery of products, to name a few.

Low Consequence:

- Public Safety – failure or capacity exceedance is not a significant risk to public safety
- Traffic Delays – there would be no significant traffic delays as there are alternative routes
- Damage due to Flooding – flooding would be local or would be limited to unimproved rural lands that would not be adversely affected by the flooding

- Natural Habitat Impacts – any impacts will be temporary (i.e. fish habitat not permanently affected and vegetation damage will generally recover within two growing seasons)

Medium Consequence:

- Public Safety – failure or capacity exceedance is not a great risk to public safety
- Traffic Delays – there may be road closure(s) causing delay or detouring (nuisance)
- Damage due to Flooding – land uses such as croplands or parking will be flooded
- Natural Habitat Impacts – temporary impacts anticipated that may take more than two growing seasons to recover

High Consequence:

- Public Safety – failure or capacity exceedance represents a significant risk to public safety
- Traffic Delays – road closure(s) causing significant impact on traffic or emergency vehicles
- Damage due to Flooding – buildings will be flooded
- Natural Habitat Impacts – permanent damage anticipated, requiring mitigation and/or habitat compensation

The consequence of failure or capacity exceedance shall be determined for each of the four categories (Public Safety, Traffic Delays, Damage due to Flooding, Natural Habitat Impacts). The worst-case impact (low, medium, high) from the four categories shall be used for selecting the Return Period that shall guide design.

1.6 STORMWATER PARADIGMS

The list below outlines general paradigm shifts that have occurred with respect to stormwater. Some of these paradigms may not coincide with the events or timelines experienced in our region. The brief history of past paradigms is intended to illustrate that solving one problem can create another more challenging problem. As such, history tells us that a cautious and progressive shift to a new paradigm is recommended.

1. Before sewers, stormwater and wastewater flowed along streets and in ditches. This led to unpleasant and toxic conditions of smell and disease.

2. The solution was to put this water in sewers (what we now call combined sewers) and discharge to the nearest river or lake.

3. This resulted in water quality issues with the receiving water and consequently with the drinking water that was being supplied by the same polluted waters. The solution was to

collect and treat wastewater through one sewer (referred to as a sanitary sewer) and convey stormwater through a second/separate sewer (referred to as a storm sewer). Priority was placed on draining stormwater away from the landscape as quickly and efficiently as possible.

4. By the 1970s, it became evident that the efficient storm sewer systems had created an unforeseen problem in the form of downstream flooding and channel erosion. The solution was detention of stormwater via pond storage with controlled outflow equal to the pre-development condition.

5. By the 1980s, new technologies led to stormwater master planning to find the preferred solution to the watershed flooding problems.

6. New studies focused on evaluating stormwater pollution, and by the 1990s, the inclusion of stormwater quality control was the new standard. Water quality evolved from pollutant removal to assessment of the larger ecosystem at the watershed scale, however it was becoming apparent that regional solutions were difficult to implement and did not address water quality and erosion issues at the community level. It was realized that watershed health issues were a cumulative impact of numerous individual sites and that this is where the problems needed to be addressed.

7. The early 2000s began to look at lot level controls as sustainable green infrastructure (also known as low impact development) that would more closely mimic the natural hydrology of undeveloped land. Our province is currently in the midst of a paradigm shift to low impact development, mainly driven by regulatory requirements that were developed in other regions of the province.

8. The latest of stormwater challenges are dealing with climate change and creating resilient stormwater systems.

2.0 PLANNING

The focus of this manual is not on stormwater planning, however planning is the first step of proper stormwater management and a necessary step to set objectives for stormwater design. The need for stormwater management is a direct result of land development. As a result, land use planning and stormwater design must be integrated to be most effective.

As stated in Ontario's 2014 Provincial Policy Statement (Policy 1.6.6.7), planning for stormwater management shall:

a) **minimize, or, where possible, prevent increases in contaminant loads;**
b) **minimize changes in water balance and erosion;**
c) **not increase risks to human health and safety and property damage;**
d) **maximize the extent and function of vegetative and pervious surfaces; and**
e) **promote stormwater management best practices, including stormwater attenuation and re-use, and low impact development.**

2.1 IMPORTANCE OF WATERSHED STORMWATER PLANNING

Good planning provides a fundamental basis for addressing stormwater requirements efficiently and cost effectively. Stormwater planning should be undertaken by municipalities to provide economies of scale at the watershed level.

In the absence of stormwater planning at the watershed/subwatershed level, the land developer and consultant are often responsible for defining stormwater management objectives through pre-consultation with local agencies and municipalities. This approach may result in the following:

- Watershed/subwatershed ecosystem and water management issues and priorities may not be identified.
- Cumulative impacts of development on flooding, water quality, erosion, and baseflow cannot be assessed at the site level without significant engineering evaluations being undertaken by the development engineer related to the receiving drainage system.
- The identification of natural area linkages and wildlife corridors is best accomplished at the watershed/subwatershed scale.
- Regional stormwater management approaches and/or improvements to conveyance features cannot be evaluated.

In instances where a watershed plan does not exist, individual developments have been allowed to proceed on the basis that stormwater measures match pre-development peak flow conditions. The rationale supporting this approach is such that the post-development outflow will not exceed the pre-development outflow for the same proposed development area and

thus should not create any adverse hydraulic impacts to the watershed (i.e. does not make things worse). The issue with this approach is that pre-development conditions cannot be properly assessed at the lot level scale of individual developments. **The potential consequence of this is incremental and cumulative negative impacts on the watershed**. Further discussion in section A-3.3.1.4 illustrates this point.

To ensure that development does not make things worse, it is imperative that pre-development conditions be evaluated on the watershed scale. **In the absence of watershed planning, interim measures shall be determined via pre-consultation with the Conservation Authority (ERCA or LTVCA) and Municipality.** Conservative assumptions may be warranted to simplify the watershed evaluations and make them manageable for small scale developments.

Undoubtedly, this will place a significant burden on development for which the only remedy is proper watershed planning. Ideally, watershed planning will not only ensure that development maintains existing conditions, but it can improve upon them and address existing issues with well planned development.

3.0 DESIGN CRITERIA

This section of the manual outlines standards for design criteria and input parameters to provide clear and concise guidance to stormwater management practitioners and ensure a consistent approach to stormwater design within the Windsor/Essex region.

3.1 DUTY OF CARE

! The designer is solely responsible for stormwater design and has a duty of care to consider and account for site specific conditions that may warrant variations in design criteria and parameters compared to those provided in this manual. In such instances where variations are proposed, the proponent will need to provide technical justification for review and approval by the Conservation Authority and Municipality. It is strongly urged that any proposed variations be proposed/reviewed at the pre-consultation stage or otherwise as soon as they become apparent in order to mitigate re-design efforts in the event that the proposed variations are not accepted. A "!" symbol is denoted throughout this section to remind the practitioner to read and acknowledge this section 3.1 when following the guidance of this manual.

3.2 STORMWATER DRAINAGE SYSTEMS

3.2.1 Rainfall Intensity

3.2.1.1 *Design Storm Intensities:* The design storm intensity shall be calculated using Equation 3.2.1.1. See **Appendix A** for supplemental information in reference to this section.

Eq. 3.2.1.1: Intensity (mm/hr) = $\frac{a}{(T+b)^c}$ where T = time of concentration in minutes

Table 3.2.1.1 below summarizes Intensity-Duration-Frequency (IDF) curve parameters (a,b,c) based on 61 years (1946-2007) of historical rainfall data from Windsor Airport (Station No: 6139525).

Table 3.2.1.1 – IDF Curve Parameters

Parameters	Return Period (Years)					
	2	5	10	25	50	100
a	854	1259	1511	1851	2114	2375
b	7.0	8.8	9.5	10.2	10.6	11.0
c	0.818	0.838	0.845	0.852	0.858	0.861

3.2.2 Storm Sewer (Minor) System

The minor system, typically a storm sewer, consists of drainage works that convey flows from the design minor storm event. These systems offer quick and efficient drainage of urbanized areas to limit the inconvenience of stormwater ponding.

3.2.2.1 *Standard Return Period:* The standard for new municipal storm sewer (minor) system design is a 5-year return period. Where new storm sewers are proposed to connect to existing sewers designed to the historical 2-year design standard, the new storm sewers shall be sized to the new standard 5-year with appropriate flow control to limit the flow to the available capacity of the receiving storm system. See **Appendix A** for supplemental information in reference to this section.

3.2.2.2 *Custom Return Period:* For non-typical municipal minor system design, the design return period shall be based on applicable MTO, MNRF or other applicable drainage design standard (see **Appendix C** for reference). The Municipality and/or the CA have the discretion to specify a return period that is greater or lesser than the standard design storm.

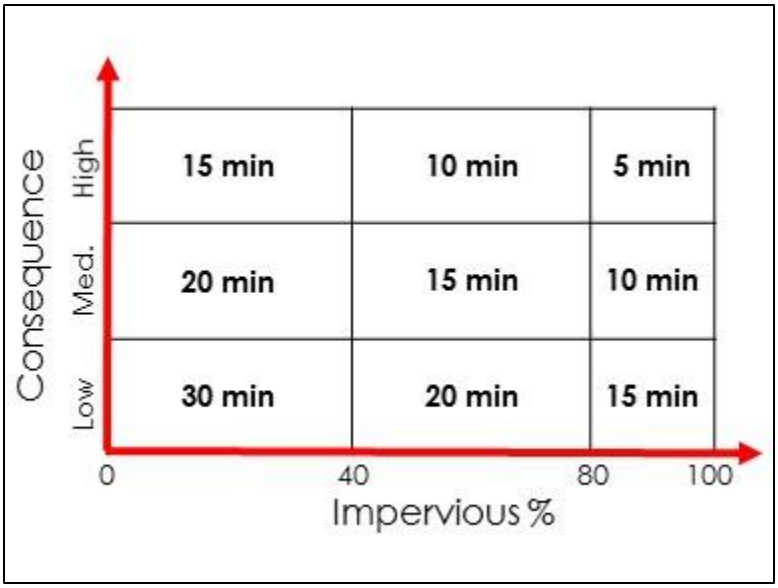
3.2.2.3 *Rainfall Intensity:* Rainfall intensity for stormwater design shall be based upon 3-parameter IDF curves derived from Environment Canada's Windsor Airport rainfall data. (See **Appendix A** for further discussion). Refer to **Table 3.2.1.1** for IDF Curve parameters.

3.2.2.4 *Sewer Design Method:* Storm sewer networks can be designed using the Rational Method for storm catchment areas where the time of concentration does not exceed two times the appropriate maximum inlet time per **Graph 3.2.2.6**. Larger catchment areas require hydrologic/hydraulic modeling to verify/confirm the capacity of the sewer system. Design storm hyetographs are discussed in section 3.7.8.

3.2.2.5 *Hydraulic Grade Line (HGL) Analysis / Surface Ponding:* For storm sewer design, the hydraulic grade line shall not rise above an elevation equal to 0.3 metres below ground elevation. The HGL analysis shall consider backwater conditions and minor losses. By satisfying the foregoing HGL requirement, the resulting standard is that no surface ponding shall occur under the minor storm event, except as defined in section 3.3.2.6 where parking lot storage is deemed acceptable.

3.2.2.6 *Sewer Inlet Times:* Inlet times shall generally follow **Graph 3.2.2.6** as maximum permissible values, which are dependant on impervious level and consequence of exceedance (as defined in Section 1.5.2).

! Graph 3.2.2.6 – Maximum Inlet Times



With consideration to the fact that stormwater management is not a one size fits all science, the above graph is an important tool for practitioners to exercise judgment on acceptable level of service for varying goals and objectives. The impervious level allows for dampening of runoff response with increased perviousness, in a way that models cannot always mimic. The consequence allows the practitioner to adjust the level of service based on the consequence of short-term exceedances to the design capacity.

Where the selection of consequence level is unclear, the Conservation Authority and Municipality shall guide practitioners in assessing the proper consequence level.

3.2.2.7 *Runoff Coefficients (C value):* C values shall generally follow **Table 3.2.2.7** as minimum design values to be used. These values are to be used only for Rational Method peak flow calculations. A reduction to the overall C value shall not be made on account of disconnected roofs. See **Appendix A** for supplemental information in reference to this section.

! Table 3.2.2.7 – Minimum C Values for Standard 5-Year Sewer Design

Land Use	C value
Asphalt, concrete, roof areas	0.95
Gravel	0.70
Grass – sandy soil	0.15
Grass – clay soil	0.20
Residential – Single family	0.60
Residential – Single family (lot size 500 m^2 or less)	0.70
Residential – Semi-detached	0.70
Residential – Townhouse / Row housing	0.80
Industrial / Commercial	0.90

3.2.3 Major System/Floodproofing

The major system consists of drainage features that convey flows during major storm events that occur less frequently. Typically, the major system consists of surface features such as roadways and overland swales that provide a pathway to safely convey runoff to the receiving outlet. The dual drainage concept is such that the minor system provides the convenient drainage for minor storm flows and the major system assists in conveying major storm flows in excess of the minor system capacity. The major system always exists, regardless of whether or not it is planned for.

3.2.3.1 *Standard Return Period:* The minimum standard for major system design is a 100-year return period. Refer to section 1.5 for discussion related to return periods, level of service and risk.

3.2.3.2 *Public Safety / Damage:* The depth and velocity of overland flow are to be limited to mitigate hazard to the public, erosion or other property damage. Refer to MNRF Flood Hazard Guide Figure 6-2, included in **Appendix C** of this document.

3.2.3.3 *Surface Ponding:* Surface ponding on roads and parking lots shall not exceed 0.3 metres in depth or less if required by the Municipality. For high traffic roadways (e.g. highways, arterial roads), lower depths may be required.

3.2.3.4 *Floodproofing Elevations:* The **minimum** lowest opening into all buildings shall be at least 0.3 metres above the Regulatory Flood Level or on-site calculated 100-year water storage elevation, whichever is greater. Additional floodproofing

measures may be warranted based on Building Code requirements and/or site-specific risks and potential for damages. Refer to section 1.5 for discussion related to risk.

3.2.3.5 *Access Routes:* Driveways, walkways, and local roadways essential to ingress and egress should be 0.15 metres above the 100-year monthly mean water level, or 0.3 metres below the Regulatory Flood Level, whichever is greater. Provision for "dry" (no surface ponding) access routes above the regulatory level shall be provided for institutional buildings servicing the sick, elderly, young or disabled, or essential public services.

3.2.3.6 *Overland Flow Routes:* Failure to plan for a major system can result in flood damage. The dual drainage concept reinforces the need for proper major system design to ensure that there is an overland flow route with sufficient capacity to convey flows to a stormwater management facility, and/or directly to a sufficient outlet. Overland flow needs to be considered carefully to ensure that the major system does not inadvertently convey flows to an existing low point at an unknown location. When overland flow routing is achieved via roadways, road grading shall limit intermediate high points to no more than 0.25 metres (preferably 0.20 metres) to allow for overflow depth.

3.2.4 Inlet Capacity

3.2.4.1 *Inlet Capture:* Under typical conditions, the practitioner shall ensure that sufficient inlet capacity is available to capture the storm sewer design flows.

3.2.4.2 *Inlet Controls:* In certain situations, there may be merit in implementing catch basin inlet controls to limit inflow to the storm and/or combined sewer system. This approach can mitigate sewer surcharging conditions, attenuate peak flows and maintain a lower hydraulic grade line under larger, less frequent storm events. There are also drawbacks to consider, such as maintenance/operation concerns and a lower level of service in the form of more frequent surface ponding and a less efficient/convenient drainage system. The suitability of inlet controls should be discussed during **pre-consultation** with the Conservation Authority and the Municipality.

3.3 STORMWATER QUANTITY CONTROL

Stormwater quantity control can be described as temporary storage of runoff in ponds, depressions or underground pipes/structures. Quantity control can also be achieved by infiltration measures, although not typically practiced in the Windsor/Essex region due to predominately clay soils. Infiltration measures are generally ineffective for most of the region, unless a pervious soil stratum is artificially created. Refer to section 3.8 for additional discussion

related to low impact development controls that promote infiltration measures as well as other volume reduction measures.

Stormwater quantity control is often necessary to mitigate impacts of urbanization and resulting increase runoff peak flow. Higher runoff peak flow from developments are detained and released at a controlled rate that the receiving watercourse or storm sewer can convey without adverse impacts.

3.3.1 Allowable Release Rate

3.3.1.1 *Watershed Study:* Ideally, the practitioner shall refer to the appropriate watershed planning study or drainage plan which should prescribe an allowable release rate for the watershed or subcatchments thereof. Hydrologic/hydraulic studies at the watershed scale should evaluate stormwater quantity control alternatives and determine the optimum balance of conveyance capacity versus detention requirements. Allowable release rates should always be prescribed on a **flow rate per hectare basis.**

3.3.1.2 *Pre-consultation:* In the absence of watershed planning studies or drainage plans, **pre-consultation with CA and municipalities is mandatory** to discuss and confirm an appropriate allowable release rate. The Municipality and/or Conservation Authority has the discretion to mandate a specific allowable release rate or to rely on the practitioner to determine an appropriate rate.

3.3.1.3 *Hydraulic Capacity Assessment:* It is recommended that watersheds adopt an allowable release rate based on the hydraulic capacity of the receiver(s). This approach relies upon a hydraulic analysis, which is objective and relatively certain or finite whereas an estimation of pre-development peak flow requires a hydrologic analysis which can be subjective, uncertain and variable based on a range of hydrologic parameters, buildout conditions and methods that can be used.

3.3.1.4 *Hydrologic/Agricultural Discharge Rates:* When the hydraulic capacity assessment of the receiver(s) is deemed impractical, the Municipality and/or Conservation Authority may accept that the allowable release rate be determined based on;

1) a hydrologic analysis using the SCS Type II distribution as specified in **Appendix B** with due consideration to the supplementary information provided in **Appendix A** or;

2) a specified agricultural Drainage Coefficient used with the following discharge equation;

Eq. 3.3.1.4: Discharge (L/s) $= 0.116\ x\ Area\ (ha)\ x\ Drainage\ Coefficient\ (mm/day)$

In the absence of site-specific Drainage Coefficients, the following values are recommended:

- For the RVC_T 32mm Storm as defined in section 3.4.1.3:
  Maximum of 25 mm/day
- For storms exceeding the RVC_T up to the 100-year Storm:
  Maximum of 50 mm/day

3.3.2 Storage Requirements

To determine storage facility storage volume requirements, a practitioner must evaluate inflow versus outflow. A facility with gravity type flow controls (weir, orifice, pipe) will have a varying outflow rate based on the varying levels in the pond and the varying levels of the receiving drain/storm sewer. In our region with relatively flat lands, it is common to expect that the varying drain levels will create a backwater condition that effectively reduces the facility's outflow to some undetermined amount and for some undetermined period of time. Often times, the amount and duration are difficult to determine.

Where backwater conditions are expected, a prudent and practical approach is to assume a constant high backwater level. In some instances, assuming no release rate (i.e. a discharge rate of zero) may be appropriate, albeit conservative. For this region, backwater conditions and relatively small allowable release rates are prominent and as such, this manual recommends standard storage volume requirements assuming zero discharge unless a reliable outflow condition can be expected. The standard storage depth provides a simple and standardized design approach that is easy to implement, review and approve and moreover, it provides a factor of safety and resiliency to storage facilities.

3.3.2.1 *Standard Storage Requirements:* The standard 100-year design storage volume to be provided is to be equivalent to the specified storage depth of runoff multiplied by the total catchment area. The specified storage depth varies based upon the Hydrologic Soil Group and impervious level and is to be calculated from the appropriate equation below. See **Appendix A** for details on the parameters and method used to calculate/develop the equations below.

! Designers shall refer to the discussion under Section 3.1 before using these equations.

For Hydrologic Soil Group A:

***Eq. 3.3.2.1a:** Storage Depth (mm) = $11 + 0.95x$ where x = impervious %, > 50%

For Hydrologic Soil Group B:

***Eq. 3.3.2.1b:** Storage Depth (mm) = $12 + 0.94x$ where x = impervious %, > 50%

For Hydrologic Soil Group C:

***Eq. 3.3.2.1c:** Storage Depth (mm) = $50 + 0.56x$ where x = impervious %, > 50%

For Hydrologic Soil Group D:

***Eq. 3.3.2.1d:** Storage Depth (mm) = $72 + 0.33x$ where x = impervious %, > 50%

3.3.2.2 *Storage Requirements with Reliable Outflow Conditions:* Where it can be demonstrated that the design outflow from the storage facility can always be achieved (i.e. pumped outflow with backup power, backwater conditions are not present or have been reasonably accounted for), then the storage volume requirements can be determined via a hydrodynamic analysis which considers the varying outflow rate in response to the stage-outflow relationship of the flow control element(s). Storage volume requirements are to be determined based on the most critical of the 100-year design storms as discussed in section 3.7.8 and tabulated in **Appendix B**.

For site less than 2 hectares, the Modified Rational Method may be accepted with the use of a 100-year Runoff Coefficient (100-year C value) based on the following equation;

Eq. 3.3.2.2: 100-year C value = $$\frac{\text{Storage } Depth\ (from\ Section\ 3.3.2.1)}{108\ mm\ (100\ Year\ 24\ hour\ Rainfall)}$$

Pre-consultation with the Municipality and Conservation Authority is mandatory to review proposed design outflow.

3.3.2.3 *Minimum Freeboard Depth:* A minimum freeboard depth – as measured from the 100-year design high water level to the lowest building opening – should be at least 0.3 metres.

3.3.2.4 *Acceptable Risk:* The minimum freeboard depth requirement in the preceding section is a floodproofing measure based on a minimum standard level of service, which has been defined herein as a 100-year design storm. Refer to section 1.5 for further discussion on level of service and risk.

Where an individual site's potential damages due to flooding are high, it is the practitioner's responsibility to design to a more conservative standard or to provide a sufficient emergency flow route in accordance with the proponent's site-specific needs. The Municipality and/or Conservation Authority may also, at their discretion, require a larger freeboard depth or other safeguards to minimize risk where appropriate (e.g. pond immediately adjacent to residential homes without a sufficient emergency flow route).

3.3.2.1 *Rooftop Storage:* Rooftop storage is not permitted due to lack of municipal control over the practice. Green roof infrastructure may be acceptable with supporting maintenance agreement and restrictive covenant with owner to prevent alteration to system. However, while green roof infrastructure may be acceptable and even encouraged where appropriate, the available storage capacity of any rooftop system will not be accounted for in the required available storage for any particular site/development since maintenance and prevention of alterations to the system cannot be guaranteed even with agreements in place.

3.3.2.2 *Parking Lot Storage:* Surface ponding on parking lots is prohibited for the first 32mm rainfall – defined as the RVC_T under section 3.8 and the Water Quality Storm (WQS) in **Appendix B**. All events up to the WQS shall be stored by stormwater practices other than parking lot surface storage (e.g. underground storage, surface swales/ponds, rain gardens, etc.). For storms exceeding the WQS, surface ponding on parking lots may be acceptable up to a maximum depth of 0.30 metres. Lower depths or "dry" (no surface ponding) may be warranted for institutional access or industrial operations. Refer to section 3.2.3.5 for access route standards.

3.3.2.3 *Hybrid Detention Approach:* A hybrid detention approach accounts for both on-site and regional detention, which is commonly implemented for commercial/ industrial developments. At a minimum, this standard recommends that at least 50% impervious be accounted for routing and regional storage design. This minimum is based on the assumptions and rationale discussed in **Appendix A**. A greater impervious level may be warranted for site-specific building coverages and surface ponding constraints.

For this approach to be successful, the stormwater management plan must clearly define the flow control rate and storage volume required for the individual sites on a per hectare basis (e.g. L/s/ha and m^3/ha). The stormwater plan shall also provide control elevations for buildings, roadways and overall property limits to ensure that runoff is contained to the overall site and that any overflow from on-site storage is directed via major system flow routes towards the regional facility.

3.3.3 Peak Flow Timing Issues

The implementation of detention storage to mitigate increased flow from urbanization can have a significant impact on peak flow. As urbanization increases, timing effects and superposition of prolonged outflows from detention facilities can have a cumulative impact on downstream discharge.

3.3.3.1 For smaller watersheds with a large proportion of existing or planned urbanization, a simple approach to deal with timing issues is to ignore any lag in flow routing throughout the watershed. In other words, peak outflows from the to-be developed subcatchments within the watershed should be assumed to coincide and sum up to an overall peak flow conveyed by the receiver. (See **Appendix A** for supplemental information)

3.3.3.2 For larger watersheds or watersheds with limited urbanization, it may be appropriate to account for basin lag and timing effects on overall peak flow. However, the practitioner and Municipality should have a clear understanding of the potential impact of future development on the watershed. (See **Appendix A** for supplemental information)

3.3.4 Volume Mitigation Issues

Development adds impervious surface, thus reducing infiltration and evapo-transpiration and increasing runoff from a given storm event. The additional runoff volume is typically addressed by detention storage which allows the development to maintain its pre-development release rate. However, the additional runoff volume from development increases flow duration which can lead to erosion and/or sedimentation problems downstream. (See **Appendix A** for supplemental information)

3.3.4.1 To the extent that is practical, stormwater management controls shall endeavor to reduce runoff volume created by development. Reference section 3.8 for guidance in this regard.

3.3.4.2 Increased volume can create or exacerbate flooding issues on pumped systems. The practitioner shall evaluate the potential impacts of additional volume on pumped systems. (See **Appendix A** for supplemental information)

3.3.5 Other Design Considerations

3.3.5.1 *Provisional Storage:* With uncertainty regarding potential future increases to the 100-year design storm due to climate change, it would be prudent for practitioners, municipalities and developers to consider provisions for potential future stormwater facility expansions to account for future increases in storage requirements.

3.3.5.2 *Multi-Use Facilities:* When applicable, consideration should be given to multi-use facilities such as depressed park areas that provide stormwater storage during infrequent flood events yet serve as recreational lands for the majority of the time. At a minimum, surface ponding in parkland should be limited to storms exceeding the minor 5-year storm, or greater, at the discretion of the Municipality.

3.3.5.3 *Outfall Conditions:* Outfall conditions are often an important factor in this region's stormwater design. It is difficult to determine the joint probability of both extreme rainfall and high lake levels (i.e. it is unknown what the probability of occurrence would be for both a 100-year storm event and concurrent 100-year lake level). Thus, designing to a specified level of service can vary significantly based on assumed lake/river levels.

To provide a consistent minimum standard, this manual recommends that outfall conditions be determined from maximum monthly mean levels based on annual maximums from 1918 to present. The minimum return period shall be selected based on the consequence of failure or capacity exceedance definitions in Section 1.5.2 and **Table 3.3.5.3** below. Designer to refer to discussion under Section 3.0 before using these values.

! Table 3.3.5.3 – Outfall Condition Minimum Return Periods

Consequence	Minimum Return Period (Years)
Low	5
Medium	10
High	25

Historical lake level source:
http://www.tides.gc.ca/C&A/network_means-eng.html

3.3.5.4 *Orifice Controls:* Past experience has shown that orifice plates used for flow control have, in some instances, been removed to eliminate the nuisance caused by frequent surface ponding. It is recommended that a short pipe section (2-3 times the orifice diameter) be used in lieu of orifice plate to mitigate the potential for tampering.

3.3.5.5 *Orifice Sizing:* Orifice diameters less than 100mm shall be only be permitted with proper protection against clogging, such as a perforated riser pipe and filtration measures to protect the orifice from debris. Alternatively, inlet control devices can be used in lieu of small orifice diameters to restrict low flows.

3.4 STORMWATER QUALITY CONTROL

Where stormwater is sometimes viewed as being as clean as rainwater, it can carry significant pollutants and have a significant negative impact on receiving watercourses. To mitigate adverse impacts from development, stormwater quality controls are applied – commonly

referred to as *Stormwater Management Practices* (SWMPs). This section discusses the quality objectives and requirements for the region.

3.4.1 Standard Quality Objectives

3.4.1.1 As a minimum standard of quality control, suspended solid removal via settling, filtration or hydrodynamic separation is required. Surface water quality objectives and land use are to be considered when evaluating the potential impact of development on the receiving watercourse. **Pre-consultation** with the CA and the Municipality is required to identify any specific water quality objectives for the watershed and receiving watercourse(s) in question.

3.4.1.2 The MECP provides specific water quality storage requirements based on receiving waters as outlined in Table 3.2 of their 2003 SWM manual. The minimum standard protection level is "**Normal**" for our region, which is generally suitable where a stable downstream habitat has adapted to moderate sediment loading – a typical condition in our region due to extensive long-term agricultural practices. However, site-specific conditions may require "Enhanced" protection. **Pre-consultation** with the CA and the Municipality is necessary to confirm the protection level requirements.

3.4.1.3 The MECP's proposed Low Impact Development (LID) Stormwater Management Guidance Manual – Draft Version 2.0 dated November 2017 specifies a Runoff Volume Control Target (RVC_T) of 32mm for our region based upon the 90th percentile rainfall event. This storm is representative of a frequent event to be retained on-site or captured and treated prior to release. The RVC_T shall be distributed based on a Chicago 2-year 4-hour storm as defined in **Appendix B** with time interval per **Graph 3.7.8.1**.

3.4.1.4 For all stormwater Best Management Practices (BMPs), the proposed MECP guidance requires that 90% (RVC_T) of the total runoff volume be captured and treated, while maintaining an overall removal efficiency of 70% for normal protection. For enhanced protection, the overall removal efficiency shall be at least 80%. The treatment efficiency is based on long-term average suspended solids removal based on a typical particle size distribution provided in **Table 3.4.1.4** below. Site-specific particle size distributions may be required to suit individual site characteristics.

! Table A-3.4.1.4 – Typical Particle Size Distribution

MOE 1994 Particle Size Distribution	
Particle Size (µm)	**% of Distribution**
< 20	20
20 – 40	10
40 – 60	10
60 – 130	20
130 – 400	20
400 – 4000	20

3.4.1.5 The OGS manufacturer shall measure Total Suspended Solids (TSS) removal efficiency based on the rainfall data provided in **Table 3.4.1.5** below. See **Appendix A** for supplemental information in reference to this section.

! Table 3.4.1.5 – Rainfall Intensity / Rainfall Volume Relationship

Rainfall mm/hr	% of Total Volume	Rainfall mm/hr	% of Total Volume
2	N/A	12	2.5%
3	13.2%	15	6.6%
4	9.6%	20	8.3%
5	7.5%	25	5.8%
6	6.0%	30	4.6%
7	4.8%	35	3.8%
8	4.1%	40	2.9%
9	3.6%	45	2.4%
10	3.2%	50	1.8%
11	2.8%	>50	6.6%

3.4.2 Customized Quality Objectives

Pre-consultation with the Conservation Authority and the Municipality to review of any applicable watershed planning studies, Source Protection Plans, etc. should be undertaken to identify any specific quality objectives for the development. Where discharges are close to a beach, a domestic water supply intake, an environmentally sensitive area or an area of concern, customized quality objectives may be required to target specific pollutants. For

example, gas stations will require oil/grease and spill containment in addition to suspended solids removal. Areas where high nutrient loadings are of concern will require additional phosphorus removal measures. Industrial sites may require filtration measures to target specific metals, etc.

3.4.3 Other Design Considerations

Water Quality Treatment Units: Water quality units shall be selected from technologies which have been verified by the Canadian Environmental Technology Verification (ETV) program. A listing of Current Verified Technologies can be found at; http://etvcanada.ca/home/verify-your-technology/current-verified-technologies/

3.5 IN-STREAM EROSION CONTROL

Many watercourses within the region have relatively flat gradients and correspondingly low flow velocities whereby in-stream erosion is not expected to be a prominent issue. Nonetheless, increased flow duration from extended detention may have a cumulative impact on the receiver and eventually lead to erosion issues.

3.5.1.1 In the absence of watershed specific erosion control requirements, a minimum 24-hour detention of the 32mm RVC_T or water quality storm (WQS) is recommended as erosion control. Refer to **Appendix B** for the recommended WQS distribution. This standard will apply to most watercourses in the region and is typically easily achieved by virtue of the relatively low allowable release rate to the receiving watercourse.

3.5.1.2 Specific watercourses in the Windsor/Essex region may require more detailed evaluations of erosive index, erosion potential, tractive force or velocity-duration data and continuous modelling. Specific watercourses should be identified by the CA and municipalities and confirmed during **pre-consultation** or added to this manual.

3.6 STORMWATER BEST MANAGEMENT PRACTICES

Stormwater best management practices are extensively covered in the MECP guidance provided by the 2003 Stormwater Management Planning and Design Manual as well as the Draft No.2 of Low Impact Development (LID) Stormwater Management Guidance Manual dated November 27, 2017 and numerous supporting resources list therein. This section outlines a few key standards to consider in conjunction with those of the MECP guidance.

3.6.1.1 *Ease of Access:* SWM facility design shall include safe maintenance access and operation considerations. Access roads are required to all inlets, outlets, spillways and sediment forebay.

3.6.1.2 *Rooftop Storage:* Rooftop storage is not permitted, except for green roofs with conditions as outlined in section 3.3.2.5.

3.6.1.3 *Pond Grading:* Side slopes shall be no steeper than 6:1 slope within 3.0m on either side of the normal water level (NWL). Average slope from NWL to top of bank shall be no steeper than 5:1 (i.e. terraced grading combining both 3:1 and 7:1 is acceptable, provided it is outside of the 3.0m buffer surrounding the NWL as prescribed above).

3.6.1.4 *SWM Facility Inlets:* Inlet pipe inverts shall be set to the NWL or higher. Where there is a preference to submerged inlets to the facility, the last section of pipe only (i.e. pipe length from inlet manhole to waterbody) can be dropped below the NWL provided that the obvert of the pipe is set below the maximum anticipated thickness of ice.

3.6.1.5 *SWM Facility Minor Storm HGL:* Where the downstream receiver is a SWM storage facility, the minor storm water level shall not exceed the inflow sewer obvert (i.e. shall not create a backwater condition on the minor storm system).

3.6.1.6 *Safety to Public:* Warning signage should be considered by the Municipality at pond access points to advise the public of the pond's function. An example warning sign is presented in Appendix C as referenced from the City of Pickering Standard Drawing P-1007.

3.6.1.7 *Anti-seepage Collars*: Anti-seepage collars or other approved impervious plug shall be installed on all outlet pipes or as directed by a geotechnical engineer.

3.6.1.8 *Sediment Drying Area:* A sediment drying area shall be designated for ease of future maintenance. The area should be sized for a minimum 10 years of estimated sediment accumulation assuming a height of 1.5m and slope of 5:1.

3.7 HYDROLOGIC AND HYDRAULIC ANALYSIS

Hydraulic analysis is relatively accurate when compared to hydrology. Pipe sizes are finite, drain sections are measurable and hydraulic capacity and grade calculations should not vary to a significant degree, if at all, from one practitioner to the next. Hydrologic analysis however is an inaccurate science that can vary tremendously. This section is intended to provide some consistency to the methodology and parameters used to perform hydrologic analysis in the region.

3.7.1 Use of Computer Programs

There are modelling computer programs that are hydrologic (i.e. measure how much rainfall becomes runoff and how often runoff occurs) and some that are hydraulic (i.e. measure how high water levels will rise and how fast stormwater drainage features can convey runoff). Many models are both hydrologic and hydraulic.

A computer model is a decision support tool. A model can analyze hydrologic and hydraulic conditions for various land uses and buildout scenarios however it cannot make decisions. Modelers should consider the level of detail required to make an informed decision. A higher level of detail should be driven by the need and benefit of achieving more reliable model results.

3.7.1.1 *Model Reliability:* There is a general tendency to view model results as inherently accurate. This may in part be due to the level of computational precision displayed by model results (e.g. the peak flow is calculated to be 1,219.852 m^3/s or the storage volume required is 15,938.149 m^3). While modeling software can certainly have a sound mathematical basis and perform complex algorithms, the "accuracy", or more perhaps more aptly defined "reliability", of the model output is a function of the user's skill and knowledge of the model software, which is relied upon to input parameters that will replicate actual conditions as closely as possible. Regardless of the user's skill and experience, the model is an estimation that does not warrant results to three decimal places. This manual recommends de-emphasizing precision and promoting better reliability.

The reliability of model output depends on the quality of the input data and the judgment of the modeler in making critical assumptions. When model inputs and assumptions have high levels of uncertainty, the results should be viewed with the same level of uncertainty. Performing reliable hydrologic modeling can be a challenge. Without gauged data to calibrate the model, the reliability of the model relies heavily on experience and professional judgment.

3.7.1.2 *Model Calibration:* This manual strongly recommends obtaining gauged data to assist modelers in building reliable models that can be relied upon as representing actual conditions. In this regard, it is recommended that a continuous gauged data program be implemented on a regional scale in cooperation between the Conservation Authorities and the various municipalities. An unreliable model can significantly over-estimate or under-estimate infrastructure needs, resulting in much greater costs (capital costs or damages) than the cost of collecting gauged data.

Stormwater modelling reference materials unanimously emphasize the need for calibrating and validating models to reliably reflect actual conditions. Even

complex and detailed models can generate different results for the same project based on minor variations in model inputs.

The following are general guidelines for calibration/validation:

1. If gauged data is available, hydrologic parameters can be calibrated to fit observed data. It is typically a good idea to first match flow volumes, then match peaks and timing.
2. After changing hydrologic parameters to fit observed data from specified calibration events, the results should be checked (validated) against events not used in the calibration process.
3. Adjustments to hydrologic parameters should be limited to a reasonable range.

3.7.2 Runoff Estimation Methods

3.7.2.1 *Rational Method:* The Rational Method is most widely used in runoff estimation due to its simplicity. This method was derived for peak flow estimation and should only be used as such within the limitations of section 3.2.2.4. The Modified Rational Method is not acceptable for estimating storage, except as specified in section 3.3.2.2. See **Appendix A** for further discussion regarding the Rational Method.

3.7.2.2 *Unit Hydrograph Methods:* A unit hydrograph represents the runoff response of the drainage basin. There are many unit hydrographs methods that have been derived from gauged basins to correlate hydrograph parameters (peak flow, time to peak, recession limb) to basin characteristics (area, slope, roughness). While this manual does not seek to identify preference to a particular method, it requires that the practitioner understand the relationships between the derived hydrograph and basin characteristics and whether those relationships are applicable and transferable to the basin being analyzed.

For example: The standard SCS unit hydrograph is based on "rolling hills" topography and a corresponding short recession limb equal to 1.67 times the time to peak, which is certainly not the case in this region. In many areas within our region, the typical SCS peaking factor based on "rolling hills" would require adjustment from the default 484 (US units) conversion factor to account for flatter lands, as well as a corresponding lengthening of the recession limb. Suggested peaking factor and limb ratio values are presented in **Table 3.7.2.2** below.

! Table 3.7.2.2 – Suggested Peaking Factor and Limb Ratio

General Description	Peaking Factor	Limb Ratio (Recession to Rising)
Urban areas; steep slopes	575	1.25
Typical SCS	484	1.67
Mixed urban/rural	400	2.25
Rural, rolling hills	300	3.33
Rural, slight slopes	200	5.5
Rural, very flat	100	12

3.7.2.3 *Kinematic Wave Model:* The kinematic wave model represents a more physical based approach to runoff estimation based on the application of fundamental laws of conservation of mass and momentum to describe free-surface flow over an idealized plane surface. While modeling efforts require more intensive inputs to sufficiently define the physical drainage characteristics of the watershed, this method provides a more accurate estimation of the actual runoff response in an ungauged watershed.

Care must be taken when defining the level of detail required for subcatchment delineation. As subcatchment size and flow lengths increase, the assumption of uniform sheet flow over a plane surface becomes less representative of actual sheet flow that concentrates into surface depressions and shallow flow pathways. In this case, the model assumption can lead to over-estimation of infiltration.

3.7.3 Time of Concentration

Time of concentration is defined as the travel time of runoff from the most hydraulically remote point in the contributing area to the specific outlet point of interest. Overland or sheet flow occurs in upper reaches of the contributing area over a short distance (typically in the range of 30m to 130m). Beyond this distance, flow tends to concentrate in rills and gullies as shallow concentrated flow which conveys flows to defined open channels or pipes as concentrated flow. Thus, time of concentration estimates are typically a sum of these three components as summarized by **Equation 3.7.3** below;

Eq. 3.7.3: Time of Concentration = $t_{sheet} + t_{shallow} + t_{concentrated}$

3.7.3.1 *Overland or Sheet Flow:* Overland flow travel time is commonly estimated using a version of the kinematic wave equation, a derivative of Manning's equation, given as Equation 3.7.3.1 below;

Eq. 3.7.3.1: t_{sheet} (min.) = $\dfrac{6.92\ L^{0.6}\ n^{0.6}}{I^{0.4}\ S^{0.3}}$

where: L = overland flow length, metres
n = Manning's roughness coefficient, see Table 3.7.4.1
I = rainfall rate, mm/hr
S = average slope m/m

3.7.3.2 *Shallow Concentrated Flow:* Shallow concentrated flow travel time can be estimated using a relationship between velocity and slope as shown in Equation 3.7.3.2 below;

Eq. 3.7.3.2: $t_{shallow}$ (min.) = $\dfrac{L}{60\ k\ S^{0.5}}$

where: L = shallow flow length, metres
k = intercept coefficient, see Table 3.7.3.2
S = slope, %

Table 3.7.3.2 – Typical Intercept Coefficients for Eq. 3.7.3.2

Land Cover/Flow Regime	k
Forest with heavy ground litter; hay meadow (overland flow)	0.076
Trash fallow or minimum tillage cultivation; contour or strip cropped; woodland (overland flow)	0.152
Short grass pasture (overland flow)	0.213
Cultivated straight row (overland flow)	0.274
Nearly bare and untilled (overland flow); alluvial fans in western mountain regions	0.305
Grassed waterway (shallow concentrated flow)	0.457
Unpaved (shallow concentrated flow)	0.491
Paved area (shallow concentrated flow); small upland gullies	0.619

3.7.3.3 *Concentrated or Channel Flow:* Concentrated flow travel time in open channels or pipes can be estimated using Manning's Equation to calculate average flow velocity. The travel time is estimated using Equation 3.7.3.3 below;

Eq. 3.7.3.3: $t_{concentrated}$ (min.) = $\dfrac{L}{60\ V}$

where: L = concentrated flow length, metres
V = Manning's velocity, m/s

3.7.4 Overland Flow Roughness

3.7.4.1 *Manning's Roughness Coefficients:* **Table 3.7.4.1** below provides typical roughness coefficients for hydrologic computations. For cultivated soils, the residue cover has a significant impact on the roughness coefficient and ultimately on the runoff response of the catchment. In the absence of gauged data to calibrate this parameter, it is suggested that conservative values be used in analysis.

! Table 3.7.4.1 – Typical Manning's Roughness Coefficients for Overland Flow

Surface	n
Smooth Asphalt/Concrete	0.013
Cultivated Soils - Residue Cover < 20%	0.06
Cultivated Soils - Residue Cover > 20%	0.17
Range (natural)	0.13
Grass - Short Prairie	0.15
Grass - Dense	0.24
Woods - Light Underbrush	0.40
Woods - Dense Underbrush	0.80

3.7.5 Impervious Level

3.7.5.1 Impervious percentages shall generally follow **Table 3.7.5.1** as minimum design values to be used. A reduction to the impervious level shall not be made to account for disconnected roofs. (See section A-3.2.2.7 of **Appendix A** for further discussion)

! Table 3.7.5.1 – Minimum Impervious Percentage

Land Use	Imp %
Residential – Single family	60
Residential – Single family (lot size 500 m^2 or less)	70
Residential – Semi-detached	70
Residential – Townhouse / Row housing	80
Industrial / Commercial	90

3.7.6 Depression Storage

3.7.6.1 Depression storage is defined as excess water which ponds on the land surface when the rainfall intensity exceeds the infiltration capacity of the soil during a storm event. The depression storage capacity of a drainage basin is usually expressed in terms of an equivalent average depth over the basin. Typical depression storage values are presented in **Table 3.7.6.1** below.

! Table 3.7.6.1 – Typical Depression Storage Depths

Land Cover	Storage Depth (mm)
Paved area	2.5
Flat roofs	2.5
Lawn	7.5
Wooded area	10.0
Open field	10.0

Given the flat topography in the region, depression storage may be an important model calibration parameter to adjust runoff volume. It would be reasonable to assume that some very flat areas within the region could store more than the typical values shown above.

3.7.7 Infiltration Losses

The ability for rainfall to infiltrate into the soil is a function of surface infiltration, soil porosity as well as the underlying soil percolation rate. Runoff occurs when either infiltration capacity or soil porosity is exceeded.

3.7.7.1 *Antecedent Moisture Conditions:* Infiltration parameters can vary depending on the type of antecedent moisture conditions (AMC). When performing continuous modelling, the infiltration parameters should be based on dry conditions given that the model will account for infiltration capacity loss during rainfall events and infiltration capacity recovery during inter-event periods. For single event modelling, infiltration parameters should be based on dry conditions for minor system design and normal antecedent conditions for major system design.

3.7.7.2 *Saturated Hydraulic Conductivity*: The Green-Ampt method's saturated hydraulic conductivity (Ks) parameter and the Horton method's minimum infiltration rate parameter (fmin) essentially represent the same value. There are numerous references and sometimes significant variability from one reference to the next.

For consistency, this manual provides recommended values according to Musgrave (1955), which provides an upper and lower range for each soil group. Depending on the texture of the soil, the value represents the upper, middle or lower value within the range.

3.7.7.3 *Green-Ampt Method:* The Green-Ampt method is a theoretical based method that approximates the physical nature of infiltration losses. Typical Green-Ampt infiltration parameters are presented in **Table 3.7.7.3** below. **Appendix A** includes a table showing all soil types in the region as well as the corresponding texture and hydrologic group.

! Table 3.7.7.3 – Typical Green-Ampt Infiltration Parameters

Parameter	Hydrologic Group			
	A	B	C	D
Su (mm)	100	300	250	180
Ks (mm/hr)				
clay	7.6	3.8	1.3	0.5
loam	9.5	5.7	2.5	1.0
sand	11.4	7.6	3.8	1.3
IMD, dry (fraction)	0.34	0.32	0.26	0.21
IMD, normal (fraction)	0.17	0.16	0.13	0.10

3.7.7.4 *NRCS (SCS) Curve Number Method:* The curve number method has limitations as explained in **Appendix A** and should be used only as deemed appropriate by an experienced practitioner with a sound understanding of the methodology and its noted limitations.

3.7.7.5 *Horton Method:* The Horton Equation is empirically based on an initial infiltration rate that gradually decreases (exponential decay) as soil becomes more saturated and converges to the soil's saturated hydraulic conductivity. Typical Horton infiltration parameters are presented in **Table 3.7.7.5** below. **Appendix A** includes a table showing all soil types in the region as well as the corresponding texture and hydrologic group.

! Table 3.7.7.5 – Typical Horton Infiltration Parameters

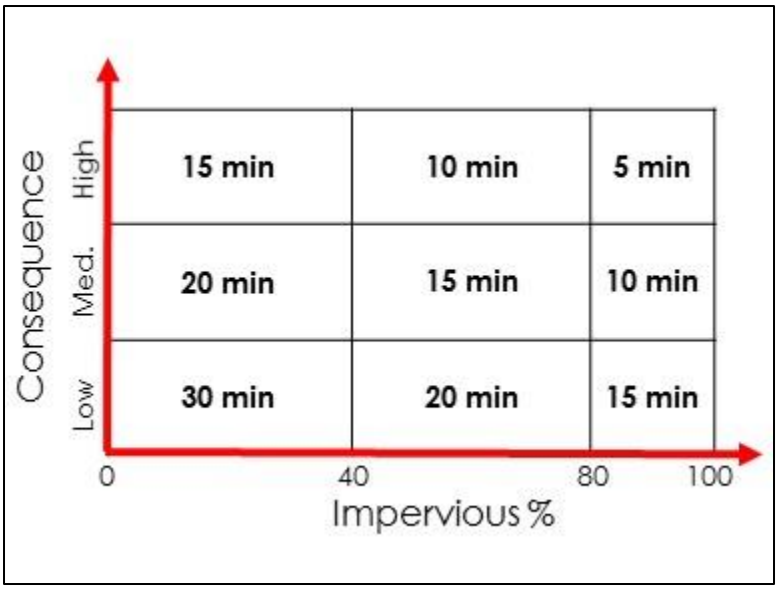
Parameter	Hydrologic Group			
	A	B	C	D
fmax, dry (mm/hr)	250	200	125	75
fmax, normal (mm/hr)	250	80	50	25
fmin (mm/hr)				
clay	7.6	3.8	1.3	0.5
loam	9.5	5.7	2.5	1.0
sand	11.4	7.6	3.8	1.3
k (1/hr)	4	4	4	4

3.7.8 Design Storm Distributions

Every storm has three Ds that are related to frequency. Depth, Duration and Distribution. Depth and Duration have well established frequency relationship (i.e. IDF curves). We do not have information on frequency of distributions. Hence, the selection of storm distribution must be made carefully and conservatively as this assumption can significantly affect the magnitude of the peak flow we are trying to estimate. For consistency in the region's approach, this manual recommends various design storms distributions, as provided in **Appendix B**, to evaluate both conveyance and storage requirements of a specific project.

3.7.8.1 *Conveyance Capacity:* To evaluate conveyance capacity of urban drainage systems, a Chicago 4-hour distribution shall be used. When using the Chicago 4-hour storm, the maximum timestep shall be based on **Graph 3.7.8.1** and dependant on impervious level and consequence of exceedance – as defined in Section 1.5.2). See **Appendix A** for supplemental information in reference to this section.

! Graph 3.7.8.1 – Maximum Timestep for Chicago 4-Hour Storm



The above graph is the same as Graph 3.2.2.6 – Maximum Inlet Times.

3.7.8.2 *Storage Requirements:* To evaluate stormwater storage facilities or pumped systems, both the Chicago 4-hour and SCS Type II 24-hour storm distributions shall be evaluated to determine the critical storage volume. See **Appendix A** for supplemental information in reference to this section.

3.7.8.3 *Climate Change Adaptation:* Stormwater infrastructure should be evaluated based on a **"stress test" event, herein defined as 150mm of rainfall** – representing a 39% increase compared to Windsor Airport's 100-year 24-hour rainfall of 108mm. Supporting discussion and rationale for the proposed increase is provided in section 3.9. The "stress test" storm shall be distributed as summarized below and specified in **Appendix B**:

- Rural Conditions: SCS Type II distribution
- Urban Conditions: Chicago 100-year 24-hour distribution with uniform distribution of the additional 42mm (i.e. additional 42mm spread evenly over the 24-hour period).

The "stress test" storm is intended to assess the resiliency and vulnerability of the designed (or pre-existing) system. However, in instances where identified vulnerability and risk is deemed unacceptable to the Municipality and/or the CA, the design will need to be adjusted to mitigate the unacceptable risk. For new

development, the stress test event shall be contained within the site and maintained below the lowest building opening elevation of the site.

3.7.8.4 *Watershed Drainage Studies*: For watershed scale drainage studies, the SCS Type II 24-hour storm distribution is recommended for rural conditions and the Chicago distribution for urbanized conditions. Both of these storm distributions have concentrated rainfall within the middle portion of the storm. For watersheds with both urban and rural conditions, it is recommended that both storms be evaluated. For larger watersheds with time of concentrations greater than 2 hours, it is also recommended that the lower intensity but more persistent AES 30% 12-hour storm be evaluated to assess the potential for superposition of subcatchment peak flows at the downstream reaches of the receiver. Where applicable, the evaluation of the Probable Maximum Storm may also be required. The latter two storms are defined in the MNRF River & Stream Systems: Flooding Hazard Limit Technical Guide dated 2002 (see **Appendix C** for reference).

3.7.8.5 *Allowable Release Rate:* Further to discussion in Section 3.3.1.4, when a hydrologic analysis is deemed appropriate to assess pre-development condition flow rates, the SCS Type II 24-hour storm shall be used.

3.7.9 Hydraulic Analysis

For certain applications, such as design of a small storm sewer system, the use of standard spreadsheet calculations using Manning's Equation and the Rational Method may suffice. However, hydraulic analysis of stormwater drainage systems will generally require modelling to evaluate the hydrodynamics of the system under the minor and major design storm events. The following section provides minimum requirements.

3.7.9.1 *Storm Sewer Hydraulic Grade Line (HGL):* Ideally, the hydraulic grade line would always be maintained below basement elevations, however this is impractical in most of the Windsor/Essex region due to limited gradient and the shallow sewer installations that are required to preserve fall. A typical acceptable level of service in this region requires that;

- the minor system HGL be maintained below ground elevations (i.e. no surface storage) and that;
- the major system HGL corresponds to;
    - a maximum surface ponding depth of 0.3 metres and;
    - a minimum 0.3 metres below building opening elevations.

More stringent HGL requirements may be required at the discretion of the Municipality and/or the CA based on known flooding issues or other site- specific conditions.

3.7.9.2 *Boundary Conditions:* Hydraulic grade line analysis must consider downstream boundary conditions of the downstream receiver. It is not acceptable to assume free outfall or normal flow depths condition without due consideration to the potential backwater conditions of the receiver. This is a particularly important design consideration in low lying areas near lakes and major watercourses as well as pumped systems where backwater conditions are most prominent and storm sewer surcharging is anticipated.

3.7.9.3 *SWM Facility Minor Storm HGL:* Where the downstream receiver is a SWM storage facility, the minor storm water level shall not exceed the inflow sewer obvert (i.e. shall not create a backwater condition on the minor storm system).

3.7.9.4 *Storm Sewer Manning's Coefficients:* Minimum roughness coefficient should follow Appendix C of the MTO Gravity Pipe Design Guidelines.

3.7.9.5 *Minor Losses:* Hydraulic analyses shall account for minor losses for inlet and outlet losses, bend losses and other appropriate losses.

3.8 LOW IMPACT DEVELOPMENT (LID) CONTROLS

3.8.1 MECP Guidance

The MECP (formerly MOECC) released Draft No.2 of its Low Impact Development (LID) Stormwater Management Guidance Manual dated November 27, 2017. The Draft document provides guidance on LID approaches as well as a comprehensive list of supporting resources related to LID from planning & design to construction and operation/maintenance.

The guidance describes the Runoff Volume Control Target (RVC_T), which is founded upon the principles of;

- *Maintaining the pre-development water balance and returning precipitation volume to the natural pathways of runoff, evapotranspiration and infiltration in proportions which are in keeping with the watershed conditions prior to development. The goal of maintaining the pre-development water balance shall be to ensure the ecosystem function and natural quality and hydrological characteristics of natural features, including aquatic habitat, baseflow, water quality, temperature, storage levels and capacity, and hydroperiods will be maintained and known impacts of urbanization are avoided.*

For the Windsor/Essex region, the specific RVC_T is 32mm. This volume control target is specific to the Windsor/Essex region based on the 90th percentile rainfall derived from an analysis of this region's historical hourly rainfall data. It supersedes and improves upon the previously used 25mm quality/erosion control volume, which represented the same 90 percent capture approach but more generally applied across the province.

3.8.1.1 To provide flexibility in the implementation of the RVC_T, a Control Hierarchy was developed as follows:

- Priority 1 (Retention): infiltration, evapotranspiration and or re-use. The control volume does not become runoff.
- Priority 2 (LID Volume Capture and Release): Utilize LID filtration. The control volume is filtered and released to the receiver at a reduced rate and volume (a portion may be lost via infiltration and/or evapotranspiration).
- Priority 3 (Other Volume Detention and Release): Other technologies which utilize filtration, hydrodynamic separation and/or sedimentation (to detain and treat runoff). The control volume is treated and released to the receiver at a reduced rate.

Refer to **Appendix A** or the MECP document itself for additional discussion regarding flexible treatment options for sites with restrictions (reference section 3.3.3.5 of the MECP guidance document).

3.8.2 Implementing LID in the Windsor/Essex Region

Retention of the specified 32mm of rainfall may prove challenging to implement for many parts of our region. While the approach certainly has merits, there remains concern that the shift to LID may prove impractical as a uniformly mandated approach to stormwater management in the Windsor/Essex region given the region's predominance of clay soils, lack of topographic relief, high groundwater and surface backwater conditions. The MECP acknowledges constraints and provides flexibility in control volume requirements, yet its Draft guidance implies that a significant effort and burden of proof (i.e. studies, monitoring, etc.) will be required to support the rationale that the priority 1 cannot be practically achieved. This manual proposes that the local Conservation Authorities, municipalities and practitioners have the best understanding of the region and are therefore best suited to determine the appropriate priority for the region.

This manual acknowledges the benefits of LID measures for peak flow attenuation, water quality and volume reduction and encourages its implementation **where it is expected to be beneficial**. In some instances, there is no significant benefit and potentially disadvantages to achieving the goal of maintaining the pre-development water balance. Refer to section 4.0 for further discussion related to a locally observed disadvantage to increasing infiltration.

It is well known in our region that many areas are not ideal for infiltration practices and cannot be relied upon to reduce conventional stormwater infrastructure costs. Moreover, with a non-infiltration LID measure such as rain harvesting, the designer cannot be assured that the homeowner will empty the collected rain before the next storm. Thus, the necessity for

redundancy leaves the region to implement retention at a premium. Notwithstanding, the implementation of such practices as supplemental measures to conventional stormwater measures could potentially yield some tangible benefits. For example, high-intensity thunderstorms that overwhelm urban storm sewer systems and result in basement flooding are more likely to occur in the summer months where it is also more likely that;

- groundwater levels would be lower
- warmer/dryer conditions could result in shrinking/cracking of clay soils – thereby creating pathways for improved infiltration capacity
- less frequent rainfall and greater infiltration/evapotranspiration losses would allow for full drawdown of infiltration storage (i.e. full storage volume would be available).
- Dryer conditions would encourage the use of harvested rain (i.e. full storage volume would be available).

The resulting benefit would be peak flow attenuation, reduced runoff and improved resiliency to the overall system, provided that the increased infiltration does not impact utilities or property.

3.8.3 LID Design Considerations

3.8.3.1 More infiltration could direct water into sewer trenches which could increase existing basement flooding risk. Refer to section 4.0 for further discussion.

3.8.3.2 LID facilities should generally include pre-treatment to capture oils, debris and suspended solids.

3.8.3.3 The inspection and maintenance of numerous small scattered facilities could easily overwhelm local government staff with increasing budgetary constraints and challenges to meet current operation and maintenance demands.

3.8.3.4 Public should be educated on source controls and encouraged to undertake measures on their properties. This will take time and poses challenges with regards to maintenance, ownership and restrictive covenants to ensure measures are secured in perpetuity from one property owner to the next.

3.8.3.5 LID controls require pre-treatment which can be challenging in right-of-ways. Space can be limited in ROW and avoidance of LID facilities by utilities could be challenging.

3.8.3.6 Consideration should be given to soil amendment with compost or other organic matter to enhance infiltration, capture runoff pollutants, and reduce the adverse effects of soil compaction associated with construction.

3.8.3.7 Development planning and building practices should be in sync with LID (i.e. land use density, roof disconnects, etc.)

3.8.3.8 LID measures could potentially be used as a storage redundancy over and above the prescribed 100-year design standard, which could also serve as a climate change adaptive measure.

3.8.3.9 Refer to the Credit Valley Conservation Authority and the Toronto Region Conservation Authorities guidance documents on LID. (https://cvc.ca/low-impact-development/low-impact-development-support/stormwater-management-lid-guidance-documents/)

3.9 CLIMATE CHANGE

There remains a lack of clear and consistent guidance with regards to climate change and what this means to the stormwater practitioner in the context of rainfall amounts and distributions used for stormwater designs. Recent extreme events in our region combined with Provincial Policy Statement 2014 as well as MECP policy and expectations impose a need to consider the resiliency and vulnerability of stormwater infrastructure under increasing rainfall conditions. As further study and science evolves, it is hoped that the results will lead to clear guidance on climate change and its impacts on stormwater design standards. Until then, the practitioner must continue on with the most reliable information available.

3.9.1 Practical Guidance for the SWM Practitioner

"Theory can leave questions unanswered, but practice has to come up with something." – Mason Cooley.

The evidence presented in **Appendix A** suggests that recent extreme rainfall experience in our region over the past few years has been related to prolonged rainfall and increased volume rather than increases to short-term intensities of 5 to 30 minutes. As such, the recommended approach to assess resiliency and vulnerability, at this time and based on the region's current understanding of rainfall, is to proceed slowly with an assumed 150mm rainfall amount as a defined "stress test" event. Refer to section 3.7.8.3 and **Appendix B** for storm distribution details.

Meanwhile, design standards should continue to rely upon the long-standing historical data provided by the Windsor Airport station. The foregoing value of 150mm is not arbitrary but is also not derived to any particular level of certainty or defined confidence limit. See **Appendix A** for a detailed discussion.

3.9.2 Beyond IDF Curves

IDF curves are an important tool for the stormwater practitioner. However, the complex problem of defining accurate IDF curves and adapting curves for climate change impacts is one of **many considerations** when designing resilient stormwater infrastructure or evaluating existing system vulnerabilities.

It is true that recent events exceeded 100-year rainfall and that the magnitude of rainfall led to flooding damage. However, it is **also the manner in which the rainfall is dealt with**, the limitations of our region and specified acceptable level of risk that contributes to flooding damage. It is important that these factors not be overlooked or substituted with the expectation that updated IDF curves and corresponding supersized infrastructure will solve all flooding problems. Perhaps more importantly, the cost of floodproof infrastructure is unlikely to be affordable or justified when compared to the expected cost of damages.

The objective of stormwater management from a flood control perspective is to **mitigate (not prevent) flooding damage** but to conversely and **most certainly prevent loss of life**. Surface flooding on a roadway or parking lot is typically not damaging at depths up to 0.3 metres. Road closures, while inconvenient, are also not typically damaging.

Of all the damage caused by recent extreme events in the region, basement flooding damage is the most significant as it not only carries an explicit repair cost but also results in significant emotional distress that is more difficult to quantify in terms of cost. This standard recognizes basement flooding as significantly damaging and dedicates a complete section (section 4.0) to the interaction between municipal infrastructure and private storm/sanitary systems. Mitigation measures at the lot level are believed to be the most practical approach to protect homes against flooding.

The region's flat topography significantly limits hydraulic gradient, particularly under high lake/river levels. Areas near waterbodies – lake, river or artificial pond for stormwater detention – are all subject to backwater conditions which limit stormwater conveyance capacity and/or necessitate pumping. Pumping stations are not typically designed to handle extreme events. Again, it is often not affordable or justified to do so when compared to the expected cost of damages, notwithstanding the large number of basement flooding damages due to vulnerable private drainage systems.

Most designs are based on a specified level of service, typically defined in the form of a return period (i.e. storm sewer designed to a 5-year event or a stormwater pond designed to a 100-year event). As discussed in section 1.5, the probability of exceedance (risk) over the design life of the infrastructure is more apt to define the reliability of the design.

Other design considerations include the impact of urbanization on stormwater **volumes**. This document evolves from the current **flow rate control** approach where post-development

stormwater has been historically restricted to pre-development flow rates measured at the lot level scale and without due regard for increased volume. The recommended approach considers the carrying capacity of the receiving watercourse(s) and prescribes a more holistic watershed management approach that considers the cumulative impacts of small, incremental changes to the hydrologic cycle.

It is important for municipalities and practitioners to bear in mind that extreme rainfall is only one of many other factors that contribute to flooding. The identification of other flooding causes and targeted mitigation measures that address the root cause of flooding is paramount. One interesting example is included in **Appendix A**.

3.9.3 Climate Adaptation and Mitigation

As referenced from the Engineer's Canada National Guideline: Principles of Climate Adaptation and Mitigation for Engineers, the need to incorporate climate change through adaptation and resiliency considerations into engineering works can be realized through the following actions:

1. Listing the climate change predictions and potential impacts for the area where the project is located;
2. Discussing the aspects of the project the engineer believes could be impacted;
3. Detailing what has been done in the design to reduce those impacts;
4. Discussing the climate-relevant national, provincial, and municipal level codes, policies and bylaws establishing the level of acceptable risk, and identifying the client's level of risk tolerance;
5. Detailing what additional/revised operations and maintenance (O&M) and inspection procedures are recommended within the service life cycle of the project; and
6. Outlining policies and procedures to restore interruptions to service, loss of functionality or repair damages from extreme weather events.

3.10 INFILL AND EXISTING DEVELOPMENT

3.10.1 Infill Development

The discussion below (in italics) is an excerpt of the MECP's (formerly MOE) 2003 SWM Guidelines;

Infill projects can range in size from a single lot to the complete redevelopment of significantly larger areas. Many forms of infill development can be more intensive than previous uses and have higher levels of imperviousness (e.g., more pavement), runoff rates, and contaminant loading per unit of area. In many cases, areas surrounding the new infill development were built before the need for stormwater controls was recognized and are already experiencing

stormwater management problems. ***Although the development of single, individual infill sites may not have significant impacts, the development of many individual sites can have cumulative effects and exacerbate or create problems at the subwatershed and watershed level including flooding, erosion, or water quality degradation.*** **[Emphasis Added]**

Applying stormwater management practices in developed areas can be a challenge. Land availability and cost often limit stormwater management options in infill situations. Stormwater controls in infill situations are frequently implemented on private property and owners are responsible for their maintenance. Municipalities can generally require owners to maintain these controls; however, the proliferation of numerous, small, scattered facilities may be undesirable from a management and operations perspective.

3.10.1.1 An Infill Development Plan or Subwatershed Rehabilitation Plan is the preferred approach to address stormwater management requirements, particularly where significant growth is expected.

3.10.1.2 On-site SWM is generally preferred. Where on-site facilities are impractical or ineffective, financial contribution can be collected in lieu to fund stormwater management measures located elsewhere within the same subwatershed.

3.10.1.3 Where additions or expansions are proposed, the overall site should be considered and retrofitted as required to meet the current SWM quality and quantity control standards of this manual.

3.10.1.4 Where reconstruction or rehabilitation projects do not alter the existing condition with regards to runoff peak flow and volume nor adversely impact the existing drainage system, the Municipality can, at their discretion, allow less than standard SWM measures to suit existing constraints. Such projects shall demonstrate a reasonable effort to implement practical SWM measures that will improve upon the existing condition.

3.10.2 Existing Development

3.10.2.1 The adoption of this manual may, in some instances, introduce more stringent SWM design criteria for future phases. Where existing developments of partial buildout are concerned, any proposed phases of development shall include an initial re-assessment of the existing SWM plan if applicable, an amendment to the SWM plan. It shall be acknowledged that amendments to the SWM plan may require retrofits to the existing stormwater facilities or construction of additional stormwater management measures to meet the new standards. Following the initial re-assessment, future phases should consist of a simple review to confirm that the future phases are meeting the new SWM plan.

3.10.2.2 SWM design for new development often includes assumed values for impervious level based on expected land use. Past practice has shown that residential development can significantly exceed assumed impervious level with the addition of sidewalks, driveways, patios, sheds, pools, etc. Actual impervious levels shall be measured as development progresses to verify/confirm that the assumed design values are being maintained. Conservative levels should be accounted for at the design stage to ensure that the actual levels do not exceed the assumed levels, thus mitigating costly retrofits to infrastructure. Storage facilities should account for additional storage, or at least allocate land for future expansion, to address deviations from assumed levels.

3.11 SUBMISSION REQUIREMENTS

The following items should be included and/or considered in typical SWM designs:

3.11.1 General

3.11.1.1 *Site Description:*

1) Location – nearest roads, watershed & subwatershed
2) Existing Conditions – land use on site & surrounding areas
3) Proposed Conditions
4) Drainage Area – for the site, tributary & watershed
5) Watercourses, Wetlands - present on site, and type (permanent or intermittent)
6) Drainage patterns and ultimate drainage location/outfall

3.11.1.2 *Background Information:*

1) Watershed Plans
2) Sub-Watershed Plans
3) Master Drainage Plans (MDPs)
4) Other Previous Reports and Relevant SWM Requirements
5) Existing Models
6) Geotechnical Report

3.11.1.3 *Figures:*

1) Location Plan
2) Legal Plan of Survey
3) Pre-Development Drainage Area Plan
4) Post-Development Drainage Area Plan
5) Proposed SWMF locations
6) Proposed Site Plan – grading, servicing and details
7) Erosion and Sediment Control Plan

3.11.2 Quality Control

3.11.2.1 *Design Criteria:*

1) Level of Protection
2) Drainage Area to Facility (ha)
3) Percentage Impervious
4) SWM Facility Monitoring and Maintenance Requirements
5) Customized Quality Objectives

3.11.2.2 *Oil-Grit Separators (OGS):*

1) Approved Manufacturer
2) Model Number
3) Sizing Calculations Included
4) TSS Removal (%)
5) Annual Runoff Treated (%)
6) Sediment Storage Capacity
7) Oil Storage Capacity
8) Total Storage Volume
9) Maximum Treatment Flow Rate
10) Particle Size Distribution and particle specific gravity used in sizing
11) Appropriate Lab Results and/or Field Study Results

3.11.2.3 *Wet Ponds/Wetlands/Hybrid:*

1) Permanent Pool Storage Requirements (m^3/ha)
2) Permanent Pool Storage Requirements (m^3)
3) Permanent Pool Volume Provided (m^3)
4) Extended Detention Storage Requirements (m^3/ha)
5) Extended Detention Storage Requirements (m^3)
6) Extended Detention Volume Provided (m^3)
7) Detention Time - minimum 24 hours
8) Inlet and Outlet Structure Details

3.11.3 Quantity Control

3.11.3.1 *Design Criteria:*

1) Runoff Coefficient or Impervious Calculations
2) Allowable release rate (m^3/s)
3) Design release rate (m^3/s)
4) SWMF Type
5) Stage vs Storage Table
6) Outlet Design
7) Total Active Storage Required (m^3)
8) Total Active Storage Provided (m^3)

3.11.4 Hydrologic & Hydraulic Modeling

3.11.4.1 *Hydrologic Modeling:*

1) Runoff method and parameters
2) Infiltration method and parameters
3) Other hydrologic routines (e.g. groundwater, etc., if applicable)

3.11.4.2 *Hydraulic Modeling:*

1) Type of Hydraulic Model – 1D, 1D dual drainage, 1D minor with 2D major system
2) Hydraulic routing method
3) Outfall parameters
4) Conduit parameters
5) Junction parameters
6) Pump parameters
7) Orifice parameters
8) Weir parameters
9) Storage unit parameters

3.11.5 Hydrogeology

1) Soils / Hydrogeology Report
2) Seasonal Groundwater Elevations
3) Pre & Post Development Water Budget
4) Special Construction Considerations and Recharge Measures

3.11.6 Construction Sediment Control

1) Sediment Control Plan
2) Sizing of Temporary Sediment Basins and details
3) Check dam locations and details
4) Silt fence location and details
5) Outlet location
6) 24-hour Extended Detention Calculations
7) Sequencing and Maintenance/Inspection schedule and notes

3.11.7 Other

1) Summary of model inputs and outputs
2) Schematic representation of pre and post development hydrologic models
3) Storm sewer design sheets
4) Storm sewer design drainage plan, showing areas and runoff coefficients
5) All final reports and plans signed and sealed
6) All drawings, calculations and model units shall be in **metric**.

4.0 PRIVATE DRAINAGE SYSTEMS

Given the limited land gradients that predominates the Windsor/Essex region, the function of both municipal and private drainage systems are often impacted by backwater conditions. This condition is not limited to areas near waterbodies – it is also common for most storm sewer systems in the region, which outlet to a pumped outfall, a stormwater management pond or an open channel with limited conveyance capacity.

Notwithstanding SWM efforts, recent rainfall events have revealed a potential shortcoming of the strategies that have been implemented in the region. Apart from the benefit of controlled peak runoff rates to downstream lands, ponds that are constructed in flatter areas such as the Windsor / Essex region, produce an undesirable effect that can potentially aggravate the flood risk to upstream lands – by elevating the hydraulic grade line in the upstream sewers and trench bedding. This phenomenon is particularly problematic in the Windsor / Essex region, due to the manner in which sewers have been traditionally installed, and the way that foundation and roof drainage has been provided in the region.

In the past 5 to 10 years, a potential incompatibility of urban SWM and building construction practices has become apparent to some engineers, particularly the developers of this manual. The following subsections address an unusual phenomenon that is believed to occur and recommend practices that are intended to mitigate a potentially unusual flood risk.

4.1 DISCUSSION OF LOCAL PHENOMENON

As noted, in most of the Windsor/Essex region, SWM systems that employ any type of pond inherently elevate upstream water levels. During infrequent events, when the rainfall duration and intensity is greatest, and water levels within the ponds approach the maximum design level, pond levels typically approach the grade of the surrounding lands. When this occurs, storm sewers typically surcharge to levels that greatly exceed the footing elevation of the buildings that line the streets. Moreover, sewer inverts are frequently installed above footing elevations.

A long-standing construction practice in the Windsor/Essex Region has been to bed new sewers in ‘sewer stone’ (graded clear stone). The use of sewer stone eliminates the need to compact the bedding and its ‘free-draining’ properties facilitates sewer construction in areas that exhibit a high groundwater table.

An undesirable characteristic of sewer stone is its ability to transmit groundwater efficiently. As a result of this property, and since the storm sewer system outlets directly to the SWM pond, the hydraulic grade line within the stone bedding of the storm sewers generally matches or exceeds the water level in the pond.

The fact that utility trenches typically cross within the road right-of-way compounds the problem. Since the bedding materials of each trench can and often do hydraulically interact, as the HGL

or 'groundwater level' of the storm sewer bedding becomes elevated, the HGL of the sanitary sewer and watermain bedding material also becomes elevated to a comparable level. The potential problem arises when the service connections that connect to the building are taken into consideration.

Each housing unit has multiple service trenches that extend from the road right-of-way to the building envelope – a storm connection, a sanitary connection, a water service, and a hydro trench (incl. bell and cable tv). These service trenches are normally bedded in similar 'sewer stone' or sand that can efficiently transmit water to the building foundation. Although measures can be taken to effectively 'cut-off' this groundwater supply, measures have not always been either prescribed and/or properly implemented to mitigate this condition. Taking into consideration the flat terrain that predominates the region, it becomes evident how building foundation drains in even modern developments can become overwhelmed by groundwater during heavier rainfall events.

4.2 NEED FOR BETTER COORDINATION OF MUNICIPAL AND PRIVATE DRAIN DESIGN

The foregoing highlights a flooding phenomenon that is somewhat unique to the Windsor/Essex region that has not been effectively addressed in the past. **Without better coordination of the municipal and private components of urban drainage systems, flooding will continue to occur in the region, regardless of what SWM measures are implemented on the municipality portion of the system.**

The following sets out recommendations for improving the effectiveness of urban drainage in the Windsor / Essex region where conditions are suitable for the afore-mentioned phenomenon to occur.

4.2.1.1 It is imperative that private drainage systems be constructed to handle the expected backflow pressure conditions of the stormwater system and that private connection trenches be hydraulically disconnected from the main sewer trench. Homebuilders should install impervious trench plugs on all utility trenches on the building side of the lot line to mitigate subsurface flow of groundwater through granular bedding materials to the building foundations. A suitable impervious material should be used such as bentonite, Class A bedding, or compacted clay. Consideration should be given to installing two trench plugs on each utility to provide some redundancy.

4.2.1.2 It is strongly recommended that all homes be equipped with backflow prevention and reliable/durable sump pump systems. A sump pump with backup power should also be considered to mitigate potential basement flooding in the event of a power outage. Consideration could also be given to overflow routing of foundation drainage to a separate structure located in the garage for ease of

access and emergency pumping via a backup sump pump or portable pump with generator.

4.2.1.3 Flooding issues commonly arise from deficient private drainage connections that re-introduce sump pump discharge back to the foundation drainage via cracks and pipe displacements. A secondary sump pump outlet to ground surface is recommended to ensure sump pump efforts are not lost.

4.2.1.4 All plumbing fixtures located in the basement level should be plumbed through a sewage ejector pump. The discharge piping should be installed such that the piping is raised above elevation of the ground outside of the structure before it exits the building. This measure will effectively prevent backflow of domestic sewage from the municipal sewer to the basement.

4.2.1.5 Stormwater can enter the sanitary system indirectly via loose joints, cracks in pipes and manholes, cleanouts or illicit drainage connections, causing sanitary sewer backup and flooding. The coincidence of backups with surface ponding can be indicative of significant inflow to the sanitary sewer via the manhole cover lift holes. Sealing manhole covers to mitigate inflow is recommended with due consideration to maintaining proper venting of the sanitary sewer system. New sanitary sewer design should endeavor to locate manholes away from low points.

4.2.1.6 High lake levels will naturally raise long-term groundwater levels in areas near waterbodies. Homeowners and homebuilders should be informed of this condition which should be carefully considered when deciding on backfill material surrounding the home, basement finish floor elevation and foundation design. Homeowners that choose to construct basement finish floor elevations below natural or stormwater management waterbody levels should expect frequent sump pump operation as well as sustained groundwater pressure on foundations which may require additional construction measures from both a structural and waterproofing perspective.

4.2.1.7 Consideration should be given to installing impervious trench plugs intermittently along the mainline sewers to mitigate the upstream piping of groundwater through the bedding material of the sewer.

4.2.1.8 Strapping of private drain pipes along the foundation walls should be prohibited. Private drain pipes should be installed away from the backfill zone.

5.0 IMPLEMENTATION/CONSTRUCTION

5.1 IMPLEMENTATION OF STORMWATER MANAGEMENT PLANS

There is often a disconnect between the approved SWM Plan outlined in a report and the construction drawings that are prepared to implement the SWM Plan. It is important to standardize a process in which recommendations of a SWM Plan are incorporated into the construction drawings.

5.1.1.1 All recommendations of a SWM Plan and design details of a SWM facility should be summarized on a SWM related construction drawing.

5.1.1.2 For phased development buildout, the individual phase construction drawings should be reviewed by the Municipality. Alternatively, the Municipality may request a letter of conformance from the Designer to confirm that the development is consistent with the SWM plan requirements.

5.1.1.3 Actual impervious levels for constructed phases should be reviewed to confirm that construction has proceeded in accordance with the design parameters used to size the stormwater facility. Should the actual impervious exceed design parameters, future buildout conditions or the stormwater management plan will need to be re-designed to suit. If the above retrofit measures are not feasible, the future development should not be allowed to proceed.

5.1.1.4 Whenever feasible, stormwater management facilities and green infrastructure should be established prior to development.

5.1.1.5 Upon completion of final grading of the facility, the Proponent shall complete a topographic survey of the facility. The survey shall be compared to the design SWM facility to verify that it has been constructed in accordance with the design. The Proponent shall provide the Municipality with a letter from the Professional Engineer(s) stating that it has been constructed in general conformance with the approved drawings. Record drawings and an electronic copy of the surveyed points data shall be enclosed with the letter.

5.2 EROSION AND SEDIMENT CONTROL (ESC) PLANS DURING CONSTRUCTION

The largest amount of sediments and pollutants will be coming off the site during construction. The construction will require control of significant amounts of sediment, not only during construction of buildings or municipal infrastructure but also during subsequent buildout of homes in a residential development. The quality control facilities that are designed as part of the completed stormwater management facility are designed for full build out with stabilized site conditions. These facilities are generally not capable of sufficiently addressing construction sediment and erosion controls.

5.2.1.1 Stormwater management submissions shall include an erosion and sediment control plan to mitigate construction sediment. The ESC plan is to be prepared by the Consultant and implemented by the Developer and Municipality. The plan should minimally include the following:

- Erosion and Sediment Control Plan during servicing construction **and home building.**
- Flow Management Plan
- Spill Control and Response Plan
- Landscaping Restoration Plan
- Dust Control
- Vehicle Tracking Control/Mud Mats
- Implementation and Quality Control of ESC Plan
- Inspection and Monitoring Plan

The Greater Golden Horseshoe Conservation Authorities (GGHCA) guideline titled "Erosion & Sediment Control Guidelines For Urban Construction" provides guidance for developing ESC plans.

6.0 OPERATION AND MAINTENANCE

It is important for owners to have a clear and concise operation and maintenance strategy to ensure that the intended design, performance and aesthetics of the stormwater management facility is implemented and maintained. This is often also required as a condition of an Environmental Compliance Approval (ECA). Operation and Maintenance procedures shall be provided by the Designer as a separate manual or drawing(s) for easy reference and implementation. These procedures shall be followed by the Developer during the maintenance period and by the Municipality upon final acceptance of the pond.

6.1 MINIMUM REQUIREMENTS

At a minimum, an operation and maintenance manual or drawing(s) shall include the following:

6.1.1 Facility Design Objectives and Functions

6.1.1.1 Summary of SWM objectives and functions: water quality, erosion and flood controls, process narrative to describe pond operation under various storm conditions (i.e. 25mm quality storm, minor storm and major storm), including stage/storage information.

6.1.1.2 Description of SWM features/structures and inspection requirements for same.

6.1.1.3 Facility design attributes: contributing area, impervious area, elevations/volumes for permanent pool, extended detention, active storage, release rates.

6.1.2 General Maintenance Activities

6.1.2.1 Periodic inspection is required to identify and schedule maintenance such as; debris and litter removal, sediment accumulation depth measurements, inlet/outlet repairs, pond bank and access road repairs, etc.

6.1.2.2 SWM ponds will generally require periodic vegetation maintenance. Grass cutting and weed control may be required to ensure that weeds and invasive species do not invade the pond banks. Site specific vegetation management measures shall be included as part of the manual or Landscaping Plan drawing. During the first two years of operation, inspections should be made after every significant storm (i.e. daily rainfall greater than 25mm) to ensure proper functioning. After this initial period, annual inspections may suffice unless site specific conditions warrant more frequent inspection.

6.1.2.3 Trash and debris shall be removed promptly to mitigate the potential for clogging of outlet pipes.

6.1.2.4 If oil/sheen is observed, it should be removed immediately by use of oil-absorbent pads or a professional with a vacuum truck. Special disposal requirements may apply.

6.1.2.5 Algal mats are prominent in stagnant conditions during summer months. If mats develop over 10% of the water surface, they should be removed using a rake and left to dry on the pond banks.

6.1.2.6 All SWM quality control measures require periodic maintenance for proper function.

6.1.3 Sediment Removal

6.1.3.1 Sediment removal frequency is dependent on many factors and can vary significantly. Removal shall be performed once the permanent pool volume equals the volume corresponding to a removal efficiency of 5% below the required treatment efficiency. SWM design calculations should identify the depth of sediment accumulation in the forebay that triggers the cleanout requirement.

6.1.3.2 Sediment accumulation rates are typically much larger during the construction period of a catchment area. Once a catchment area is fully developed and established, sediment accumulation rates tend to be significantly lower. For planning purposes only, the MECP provides typical annual sediment loading rates as outlined in Table 6.3 of their 2003 SWM manual.

6.1.3.3 Sediment to be properly handled and disposed of according to current regulations.

6.1.4 Monitoring and Reporting

6.1.4.1 Monitoring and reporting requirements as defined in the MECP's Environmental Compliance Approval (ECA) shall be included in the O&M manual.

6.2 ADDITIONAL REFERENCES

More detailed discussions regarding inspection and maintenance can be found in the MECP 2003 manual and TRCA Inspection and Maintenance Guide for Stormwater Management Ponds and Constructed Wetlands.

7.0 REFERENCES

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16. Ontario Ministry of Environment, Stormwater Management Planning and Design Manual, 2003.
17. Ontario Ministry of Natural Resources, River & Stream Systems: Flooding Hazard Limit Technical Guide, 2002.
18. Ontario Ministry of Transportation, MTO Drainage Management Manual, 1997.
19. Ontario Ministry of Transportation, Highway Drainage Design Standards, 2008.
20. Toronto and Region Conservation Authority, Stormwater Management Criteria, 2012.

APPENDIX A

Supplemental Information

A-3.2.1 Rainfall Intensity

A-3.2.1.1 *Understanding Rainfall versus Runoff Return Period:* As per OMAFRA drainage guidelines, "*the designer should understand the distinction between a storm with a 10-year return period and a flood with a 10-year return period, since a 10-year storm does not necessarily produce a 10-year flood. If a 10-year storm occurs when the ground is dry it will produce only a small flood. If the same size of storm occurs when the ground is wet it may produce double or triple the previous flood discharge. This is one of the difficulties in using the design storm concept. The true 10-year flood can only be determined by a frequency analysis of a large number of measured flood discharges in a watershed. Because such measurements are seldom available, the practice of estimating runoff from more readily available rainfall rates is widely used and accepted, and for this purpose it is often assumed that a 10-year storm will produce a 10-year flood*".

A-3.2.2 Storm Sewer (Minor) System

A-3.2.2.1 *Level of service:* Throughout the Essex Region, most municipalities specify the minor storm event as a 1 in 5 year (5-year) return period – a storm that has a 20% probability of occurring in any given year. These systems offer quick and efficient drainage of urbanized areas to limit the inconvenience of stormwater ponding.

Inconsistency: There has been inconsistency within the municipalities in the design intensities being used for sewer design, ranging from 2-year AES Windsor Airport to 5-year AES Windsor Airport to 5-year City of Windsor IDF curves. For a typical residential development with 20 min inlet time, the corresponding intensity varies from 52 mm/hr to 79 mm/hr. A standard approach to sewer design is preferred within the Windsor/Essex region.

A-3.2.2.3 *IDF curve fitting and impact on intensity equation:* The current AES Windsor Airport data is fitted to an IDF curve [i = a / (t+b)^c] where b is set to zero. When the actual b value is included the 5-year (20 min inlet time) intensity increases from 67.6 to 75.0 mm/hr – an 11% increase simply by providing a three-parameter curve fit to the rainfall data compared to the simplified two parameter curve fitting performed by AES.

A-3.2.2.7 A reduction in C value or impervious level, and subsequently in infrastructure sizing, should not be made on account of disconnected roofs. The rationale for this restriction is as follows:

Firstly, there is no guarantee that the roof leaders will be disconnected, particularly those that land onto paved areas and introduce liability to the municipality as well as risk of injury and inconvenience to the property owner.

Secondly, infiltration capacity in the region's predominantly clay soils is limited and should not be relied upon to infiltrate additional water from roofs. Under the design 5-year storm event, grassed areas are likely to be saturated, leaving roof water to flow overland into the storm sewer rather than infiltrate. It could be argued that roof water being directed to the surface introduces some lag and peak flow attenuation as compared to directly connected roofs. While this is true, current standard practice for storm sewer design already accounts for this attenuation via use of a 20 min. inlet time.

The above is not meant to discourage downspout disconnection. There are significant benefits to disconnecting roof leaders to reduce inflow to the private drainage system, maintain the natural hydrologic cycle and also promote stormwater infiltration / stormwater volume reduction on a long-term basis. Rather, the restriction is meant to promote that infrastructure be sized for the likely scenario that a 5-year design storm will completely saturate grass areas, which will no longer have capacity to infiltrate additional roof water.

A-3.3.1 Allowable Release Rate

A-3.3.1.4 It is generally acceptable to assume that a receiving open drain was designed to accommodate a 2-year undeveloped flow for the agricultural lands. However, in flat lands with average slope less than 0.5% and low hazard, municipal drains may only be designed to carry flows based on agricultural curves. These curves express discharge based on a Drainage Coefficient expressed in mm/day. Refer to OMAFRA Drainage Guide For Ontario Publication 29 for further details.

Individual versus holistic approach: The approach of treating individual development sites as an isolated catchment without consideration to the overall watershed hydrodynamics raises the following potential concerns:

1) On the surface, one might expect that individual developments restricted to a 2-year agricultural flow rate should sum up to equal the same 2-year agricultural flow for which the drain was designed. This is likely not the case. It is reasonable to expect that the hydrologic analysis of the drain design considered long lengths of overland flow across agricultural lands as compared to much shorter lengths across small individual properties. The result is shorter flow times and higher peak flows in the individual sites that sum up to a flow that exceeds the drain design.

2) Each designer may calculate pre-development flow rates using different methods with different hydrologic parameters and design storms, ultimately resulting in ambiguity, inconsistency and inequality in the calculated allowable release rate of individual sites.

3) From a hydrologic perspective, outflow from a developed site with a restricted 2-year pre-development flow rate is not the same as the pre-developed outflow. Although the peak outflow rate is designed to match under both pre and post-developed conditions, the shape of the outflow hydrograph can vary significantly. Development can significantly change the hydrology of the site (i.e. – quicker runoff response from sewer systems versus agricultural drainage, increase in runoff volume and subsequently a prolonged period of outflow from the site).

Example:

Pre-Developed

Area = 5 ha
Tc = 80 min.
C = 0.2
Q_{2yr} = 54 L/s
Q_{total} = 54 L/s

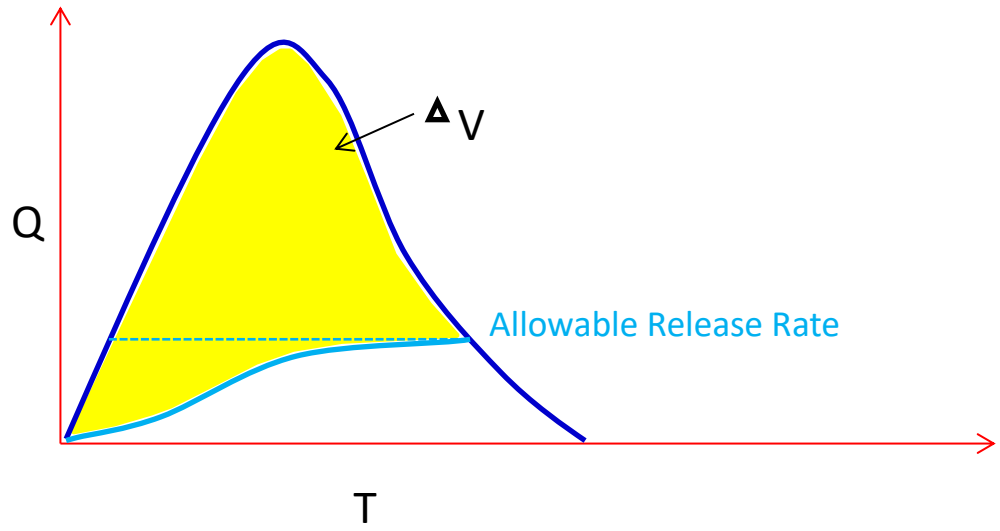
Developed with Flow Restriction

Area = 1 ha x 5
Tc = 40 min. for each site
C (allowable) = 0.2
Q_{2yr} = 18 L/s/site
Q_{total} = 89 L/s (165% of pre-developed flow)

A-3.3.2 Storage Requirements

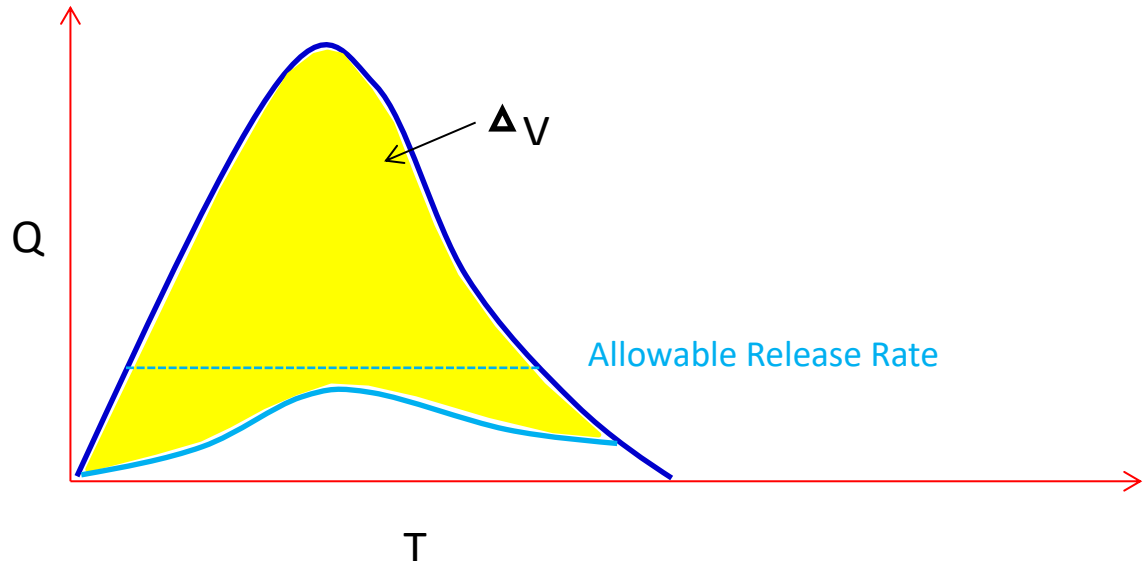
A-3.3.2.1 *Outflow from Storage Facility:* Gravity outflow from a storage facility is not constant and varies with storage levels.

Figure A-3.3.2.1a – Storage Volume for Gravity Outflow



Impact of Backwater Conditions: Gravity outflow from storage facility is reduced with decreasing head due to backwater conditions, resulting in additional storage required. The impact of backwater conditions can be impractical to analyze on a watershed scale and leave the practitioner without means of quantifying the reduced outflow from backwater conditions and resulting additional storage required. Where allowable release rates are small compared to the expected peak inflow to the facility, it can be reasonably conservative (i.e. not impractical) to assume a zero discharge.

Figure A-3.3.2.1b – Storage Volume for Gravity Outflow with Backwater Conditions



Development of Storage Equations: The standard storage equations were derived from PCSWMM modeling based on the following assumptions and input parameters:

- 100-year Rainfall (See Appendix B):
  - 108mm with SCS Type II 24-Hour Distribution
  - 81.6mm with Chicago 4-Hour Distribution
- Flow length: 40m
- Slope: 1%
- Depression Storage: 2.5mm impervious, 7.5mm pervious
- Manning's Roughness: 0.011 impervious; 0.24 pervious
- *Modified Green-Ampt Infiltration with following inputs;
  - Hyd. Group A: Su = 100, Ks = 9.5, IMD = 0.17
  - Hyd. Group B: Su = 300, Ks = 5.7, IMD = 0.16
  - Hyd. Group C: Su = 250, Ks = 1.3, IMD = 0.13
  - Hyd. Group D: Su = 180, Ks = 0.5, IMD = 0.10

*A Note on the Modified Green-Ampt Method used in PCSWMM:

The Modified Green-Ampt method changes the original Green-Ampt procedure by not depleting moisture deficit in the top surface layer of soil during initial periods of low rainfall as was done in the original method. This change can produce more realistic infiltration behavior for storms with long initial periods where the rainfall intensity is less than the soil's saturated hydraulic conductivity.

A-3.3.2.7 Hybrid Detention Approach: The hybrid approach of both regional and on-site storage reduces the size of storm sewers as compared to having no on-site controls. However, this approach must define the proper limit of on-site storage requirements that can be effectively and practically managed without forcing less economical storage costs onto the individual sites.

Individual sites can provide surface storage at relatively small cost. However, if underground storage is also required, it will typically be more costly than adding the same storage volume in a regional pond. **At a minimum, this standard recommends that at least 50% impervious be accounted for routing and regional storage design.** For example: an industrial site with 90% impervious would consider at least 50% impervious for routing and regional storage design and the remaining 40% impervious for on-site storage.

The recommended 50% impervious for routing and regional storage is derived assuming a maximum 50% lot coverage and minimum 10% landscaping (pervious) coverage, leaving 40% as potential parking lot coverage. Conservatively, we can assume that much of the landscaping area will be contributing runoff under the 100-year event, resulting in 50% (40% parking lot + 10% landscaping) of the 100-year rainfall or 54mm (50% x 108mm) to be stored on-site. Given that the first 32mm is required to be stored by stormwater practices other than parking lot surface storage (e.g. underground storage, surface swales/ponds, rain gardens, etc.), the remaining 22mm would be required to be stored on the parking surface. Assuming typical prismatic storage surfaces (i.e. Volume = Area / 3) with a maximum 0.3m storage depth at the catch basin, the required surface storage coverage is estimated to be 22% (i.e. 0.022m x 3 / 0.3m) or approximately half of the total parking lot area. Accounting for grading constraints which limit the full use of the parking area for storage, this is believed to be a reasonable assumption of parking lot surface storage capacity.

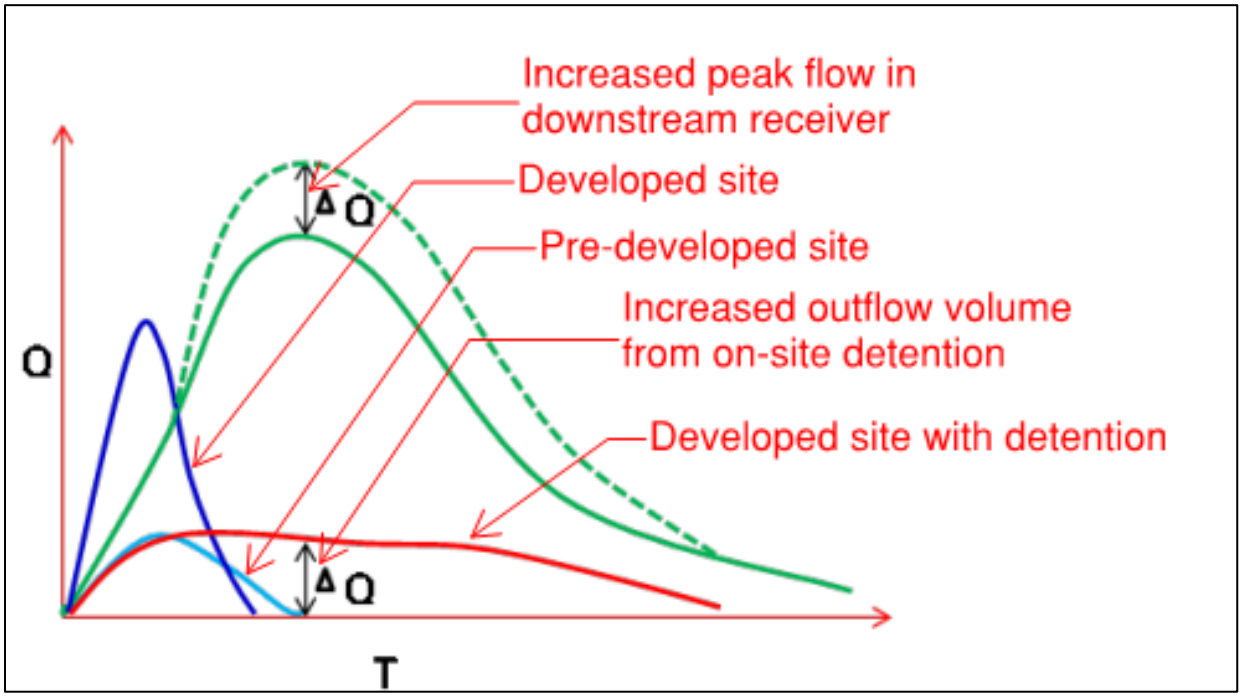
A-3.3.3 Peak Flow Timing Issues

A-3.3.3.1 While conservative, this approach is likely to be reasonable for many drains within the Windsor/Essex region. Given the flat topography in most of the region, conveyance capacity is limited. The limited hydraulic gradient often makes conveyance capacity improvements a non-viable option and thus, large detention facilities are the default stormwater approach. Large detention facilities and small release rates equals a long duration of outflow where any lag between subcatchments (say 1 to 2 hours) becomes insignificant when compared to several days of outflow. And while the

outflows from each detention facility will vary over time based on their stage-outflow relationship, it would be reasonable to expect that stormwater facilities may require pumped outflow to a shallow receiving drain and thus the outflow will be constant, prolonged and immediate.

A-3.3.3.2 An example to illustrate timing issues with future development is the following: A residential development is being proposed at the downstream reach of a large watershed which is largely agricultural lands. The downstream reach of the receiving drain outlets directly to the lake. Given the proximity of the development to the lake, it would be reasonable to allow the development to proceed without stormwater quantity control. As shown in **Figure A-3.3.3.2**, a hydraulic impact assessment would show that unrestricted flow from the proposed development will drain ahead of the watershed peak flow and thus will not increase the peak flow to the receiving drain.

Figure A-3.3.3.2 – Timing Effect of Stormwater Detention



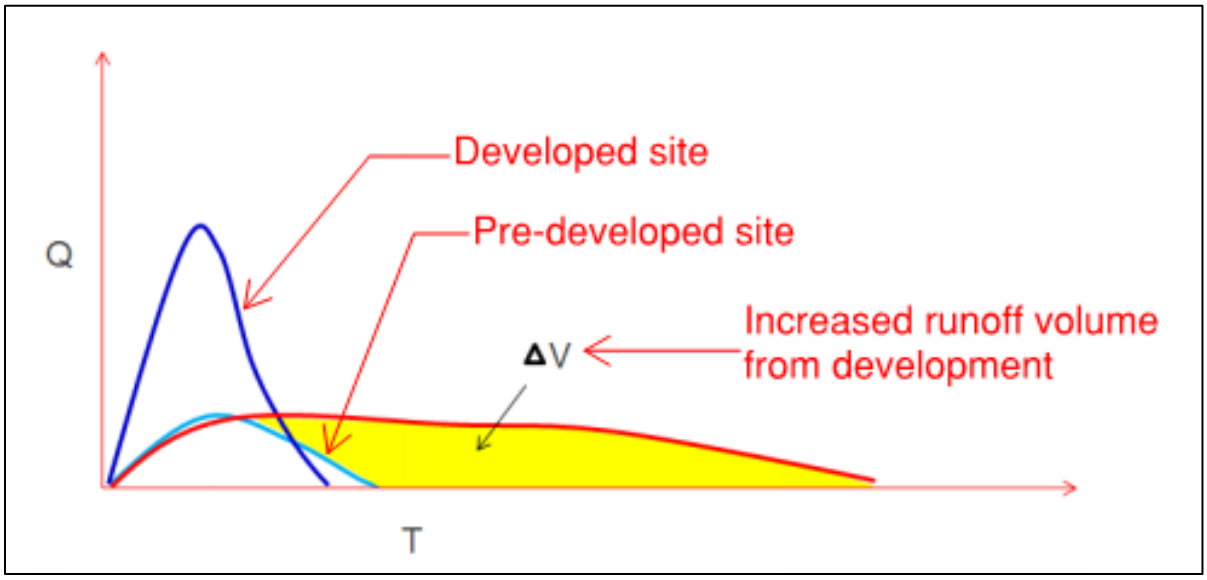
Conversely, the figure shows that adding stormwater detention to restrict flows to the pre-development condition will actually increase the overall peak flow to the drain given that the prolonged outflow, while no greater than the pre-development peak flow rate, will now increase the overall peak flow to the receiving drain. Initial Conclusion: the development should NOT have stormwater detention.

However, the foregoing conclusion is only valid under the condition that the largely agricultural lands remain undeveloped and the hydrologic response of the watershed does not change. What happens when the largely agricultural lands now begin to

slowly develop? After 10 years of upstream development, the watershed's hydrologic response (both volume and timing) has changed. Runoff reaches the drain much faster, even though these developments have detention facilities and restricted release rates. The unrestricted flow from the subject downstream development may now increase the overall peak flow in the downstream receiver. **Revised Conclusion: Stormwater planning at the watershed level is necessary to avoid adverse impacts from urbanization.**

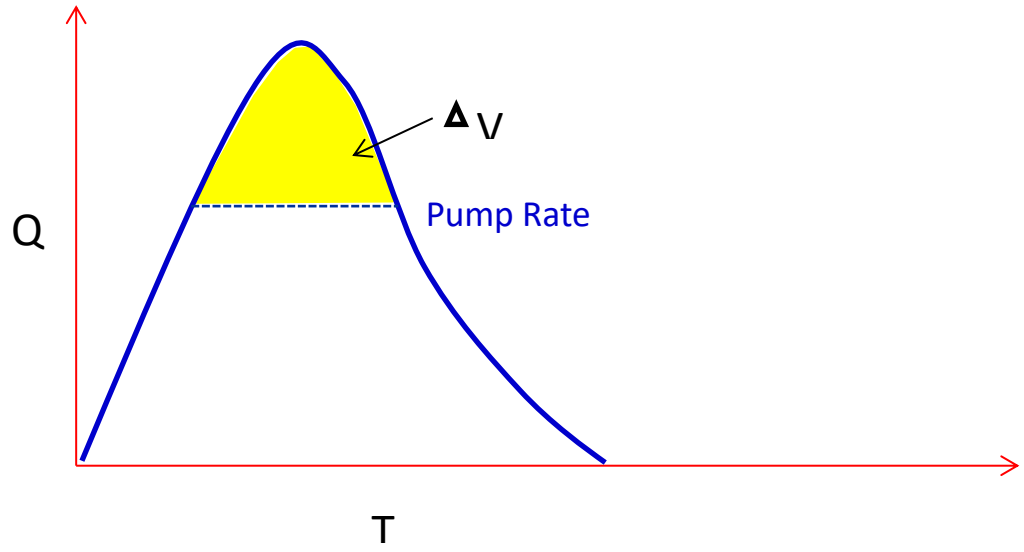
A-3.3.4 Volume Mitigation Issues

Figure A-3.3.4 – Increased Runoff Volume from Development



A-3.3.4.2 Pumped Drainage Systems: Pump design capacity varies depending on the specific requirements of a site. Often, the pump rate is designed to handle more frequent storm flows with the expectations that infrequent storms will produce peak flows that temporarily exceed the pump rate. When this occurs, temporary storage is required upstream of the pump.

Figure A-3.3.4.2 – Storage Volume for Pumped Outflow



A-3.4.1 Standard Quality Objectives

A-3.4.1.5 Current practice calculates OGS removal efficiencies based on a weighted calculation that accounts for rainfall intensity variation as a function of total annual rainfall volume. In other words, the historical hourly rainfall data at Windsor Airport suggests that 60.7% of the total rainfall volume occurs from rainfall intensities of 2 mm or less. Based on site characteristics, a 2 mm/hr rainfall is then converted to a corresponding flow rate and a removal efficiency is then calculated for said flow rate. Assuming a removal efficiency of 90% at the calculated flow rate, the relative efficiency is then 60.7% x 90% = 54.6% of the required 70% removal requirement for normal protection. The above process is repeated for various rainfall intensities ranging from 1 mm/hr to 25mm/hr and the relative efficiencies at each rainfall intensity are summed up to produce the overall removal efficiency.

Two concerns are apparent with the above methodology;

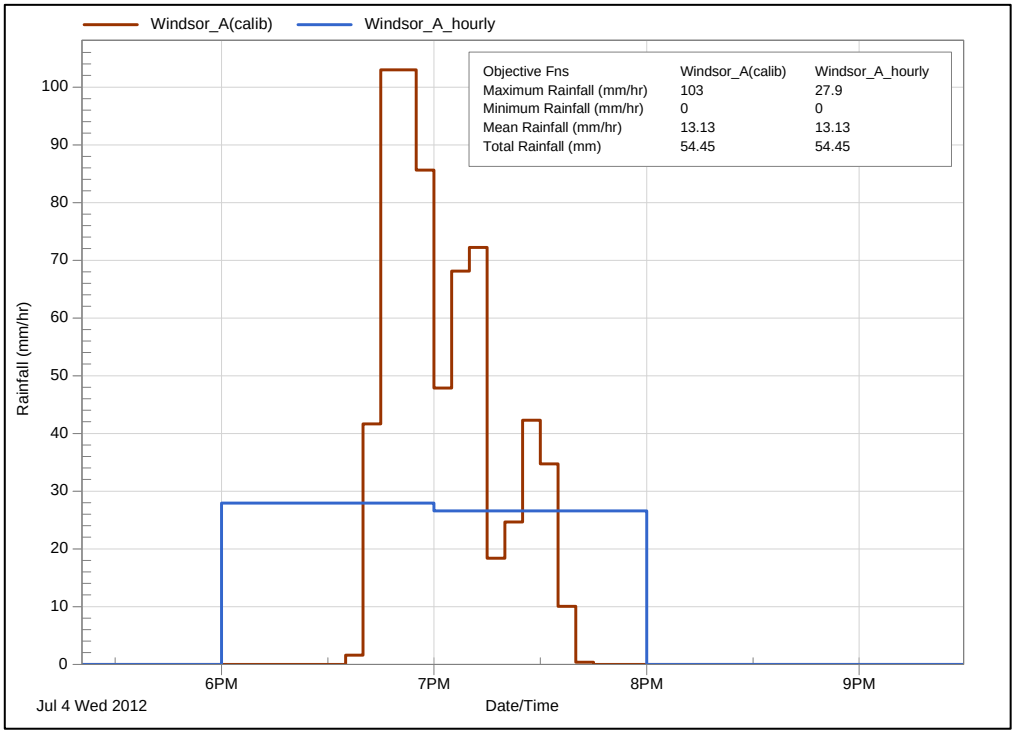
1. As illustrated in **Graph A-3.4.1.5** below, the hourly rainfall data dampens actual intensities experienced from short duration high intensity storm events and;

2. rainfall intensities of 2mm/hr are not likely to produce runoff and/or provide the energy required to washoff pollutant buildup.

To address the above concerns, this Manual recommends that the Windsor Airport Tipping Bucket rainfall data – data set available from 2008 to 2015 with no data available in 2009 and 2010 – be used to determine the rainfall intensity / rainfall volume relationship and that the rainfall intensities of 2mm/hr or less be excluded from

said rainfall analysis. *These adjustments yield **Table 3.4.1.5** to be used by OGS manufacturers to estimate TSS removal efficiencies.*

Graph A-3.4.1.5 – Hourly versus 5-minute Rainfall Intensity



A-3.7.2 Runoff Estimation Methods

A-3.7.2.1 The Rational Method can be useful and appropriate provided the user understands its underlying assumptions and limitations.

Assumptions:

- Runoff coefficient assumes a constant proportional rainfall loss throughout the storm
- The time of concentration should be taken as the hydraulically furthest point of the catchment – at which point the entire catchment is contributing runoff
- Uniform rainfall intensity for the duration of the storm – which is equal to the time of concentration or greater.

Limitations:

- The runoff coefficient (C) attempts to account for many variables that influence how much rainfall becomes runoff. Thus, selection of the C value relies heavily on

judgment and can be somewhat subjective. Moreover, the Rational Method assumes a constant C value whereas runoff volume can vary significantly based on antecedent moisture conditions as well as rainfall intensity and duration.

- The assumption that the storm intensity will be spatially and temporally uniform over a catchment area for the duration of the storm (equal or greater than time of concentration) should be limited to small catchments. It is recommended that the use of the Rational Method for sizing of conveyance systems be limited to smaller catchment areas as prescribed in section 3.2.2.3.

- The furthest point of a watershed may require a time concentration to be estimated across a large agricultural field which in turn will reduce the overall time of concentration at the downstream end. When this situation occurs, the user should verify that the smaller downstream developed area with smaller time of concentration does not produce a larger flow.

A-3.7.7 Infiltration Losses

Table A-3.7.7 – Soil Types in Essex County

Texture	Symbol	Name	Acreage	Hydrologic Group
Clay Soils	Bc	Brookston Clay	250,000	D
	Toc	Toledo Clay	17,500	D
	Cc	Clyde Clay	2,500	D
	Jc	Jeddo Clay	3,500	D
	Cac	Caistor Clay	13,500	C
	Pc	Perth Clay	9,000	C
Clay Loams	Pcl	Perth Clay Loam	8,000	C
	Cacl	Caistor Clay Loam	2,500	C
	Bcl	Brookston Clay Loam	30,000	D
Silt Loam	Tos	Toledo Silt Loam	1,000	D
Loams	Bg	Burford Loam	3,700	A
	Bg-s	Burford Loam Shallow Phase	5,300	A
	Hl	Harrow Loam	4,000	A
	Fl	Farmington Loam	2,000	B
	Pl	Parkhill Loam	5,000	C
	P-r	Parkhill Loam Red Sand Spot Phase	5,000	C

Texture	Symbol	Name	Acreage	Hydrologic Group
Fine Sandy Loams	Tfs	Tuscola Fine Sandy Loam	6,000	C
	Cdl	Colwood Fine Sandy Loam	7,000	C
Sandy Loams	Hs	Harrow Sandy Loam	3,500	A
	Fsl	Fox Sandy Loam	5,300	A
	Bel	Berrien Sandy Loam	16,000	C
	C-s	Caistor Sand Spot Phase	1,500	C
	B-s	Brookston Clay Sand Spot Phase	18,000	D
	Was	Wauseon Sandy loam	3,000	C
Sands	Gs	Granby Sand	1,000	C
	Bes	Berrien Sand	8,000	C
	Ps	Plainfield Sand	1,700	A
	Es	Eastport Sand	2,500	A
Misc. Soils	B.L.	Bottom Land	7,300	-
	Ma	Marsh	7,000	-
	Ml	Muck	1,700	-

A-3.7.7.4 The SCS Curve Number (CN) Method was originally intended to predict volume of runoff from daily rainfall. The rationale behind the method is that when infiltration depth is small compared to soil saturation, runoff is proportionally small compared to rainfall. Today, the method has been extended to perform more hydrologic analysis than it was originally intended for and with that comes several cautions:

- The method was based on average conditions and thus may not be accurate for historical events.
- The curve number is based on daily empirical data and was not intended to consider varying rainfall duration and intensity.
- The standard initial abstraction Ia = 0.2S is derived from agricultural watersheds and may overestimate losses for impervious areas and underestimate losses due to depression storage.
- Most importantly, the proportional nature of the equation translates to a proportional increase in infiltration as the rainfall intensity increases, thus applying the highest rate of infiltration during the highest peak rainfall intensity. This limitation can lead to significant over-estimation of infiltration and corresponding under-estimation of peak flow, particularly for analysis of high-intensity thunderstorms.

A-3.7.8 Design Storm Distributions

A-3.7.8.1 Typical models cannot be expected to mimic all of the complexity of a real-world conditions. For example, short-term minor detention from rear yard ponding would likely not be captured in a model of residential development. Thus, a very short-time step with corresponding very high intensity rainfall would produce higher model peak flows than actual conditions where dampening of short duration cloudbursts would be expected to occur. Moreover, where consequence of exceedance is lower, the additional effort to define the minutia of actual conditions in a model is not justified.

A-3.7.8.2 The Chicago 4-hour distribution represents a high intensity thunderstorm and is used to assess the conveyance capacity of an urban system as well as localized surface ponding. Conversely, the SCS Type II storm distributed at 2-hour intervals is used to evaluate volumetric capacity of storage elements and pumped systems. However, depending on the discharge rate of the storage element or pump, the Chicago storm can sometimes produce the critical storage volume requirements.

A-3.8 Low Impact Development (LID) Controls

This section presents the discussion provided in MECP's Draft No.2 of its Low Impact Development (LID) Stormwater Management Guidance Manual dated November 27, 2017 regarding flexible treatment options for sites with restrictions:

The RVC_T *acknowledges that retention (Control Hierarchy Priority 1) or Volume Capture and Release (Control Hierarchy Priority 2) may not be feasible for every site as a result of site-specific constraints. For all sites, regardless of perceived restrictions (i.e. constraints), the proponent should attempt to comply with the appropriate volume control alternative as described above. The Runoff Volume Control Target (*RVC_T*) acknowledges that volume control is achievable on these sites via re-use and evapotranspiration practices even when partial or no infiltration is possible.*

The constraints which may result in the application of alternatives to the above prescribed volume targets include:

a) Shallow bedrock† and Karst;

b) High groundwater† or areas where increased infiltration will result in elevated groundwater levels which can be shown to impact critical utilities or property;

c) Swelling clays or unstable sub-soils;

d) Contaminated soils (i.e. Brownfields);

e) High Risk Site Activities including spill prone areas;

f) Prohibitions and or restrictions per the approved Source Protection Plans and where impacts to private drinking water wells cannot be appropriately mitigated;

g) Flood risk prone areas or structures and/or areas of high inflow and infiltration (I/I) where wastewater systems (storm and sanitary) have been shown through technical studies to be sensitive to groundwater conditions that contribute to extraneous flow rates that cause property flooding / sewer back-ups and where LID BMPs have been found to be ineffective;

h) For existing Linear Developments where reconstruction is proposed and where available surface and subsurface areas is not available based on a site-specific assessment completed by a qualified person. Areas where private property is susceptible to flooding from high groundwater levels;

j) Surface water dominated or dependant features including but not limited to marshes and/or riparian forest wetlands which derive the all or a majority of their water from surface water, including streams, runoff, and overbank flooding. Surface water dominated or dependant features which are identified through approved site specific hydrologic or hydrogeologic studies, and/or Environmental Impact Statements (EIS) may be considered for a reduced volume control target. Pre-consultation with the MECP and local agencies is required;

k) Existing urban areas where risk to life, human health, property or infrastructure has been is identified and substantiated by a qualified person through an appropriate area specific study and where the risk cannot be reasonably mitigated per the relevant design guidelines;

l) Water reuse feasibility study has been completed to determine non-potable reuse of stormwater for onsite or shared use. Potable reuse may be considered on case specific basis.

† May limit infiltration capabilities if bedrock and groundwater is within 1m of the proposed facility invert per Table 3.4.1 of the LID Stormwater Planning and Design Guide (2010, V1.0 or most recent). Detailed assessment or studies are required to demonstrate infiltration effects and results may permit relaxation of the minimum 1m offset.

The two alternatives identified for sites with restrictions (i.e. constraints) are:

Alternative #1 – Reduced Runoff Volume Control Target

For site with restrictions, the proponent attempts to comply with the following conditions:

a) Achieve at least 75% volume control from all impervious surfaces for the runoff generated by the geographically specific 90th percentile rainfall event (Figure 3.1.2).

b) Options considered and presented should examine the merits of relocating project elements to address, varying soil conditions and other constraints across the site.

c) Not applicable for sites which directly discharge to a watercourse (See Section 3.3.3.6)

Alternative #2 – Maximum Extent Possible (MEP)

a) For site with restrictions, the proponent attempts to comply with the following conditions: Achieve volume control to the maximum extent possible (MEP). In regards to Alternative #2, the maximum extent possible (MEP) is defined as the maximum achievable volume control, using all known, available and reasonable approaches, including the methods as described within this manual, given the site restrictions. The specific scope of MEP may be negotiated between the relevant parties and / or subject to the jurisdiction of the relevant municipality, local or provincial agency.

b) Options considered and presented should examine the merits of relocating project elements to address, varying soil conditions and other constraints across the site.

c) Not applicable for sites which directly discharge to a watercourse. (See Section 3.3.3.6)

A-3.9 Climate Change

The discussion below (in italics) is an excerpt of the MECP's Policy Review of Municipal Stormwater Management in the Light of Climate Change, published April 5, 2016 (Updated April 6, 2016):

Overall, the municipalities need better tools to manage stormwater and to build municipal stormwater systems that are resilient and adaptive to climate change to better protect the environment. Currently no province-wide inventory is available for municipal stormwater systems to gauge the size of the problem or to compare any achieved progress on system condition or vulnerability to climate change.

Resilient systems for municipal stormwater management are systems that strengthen the treatment train approach already established in the SWM Manual by building in resiliency to climate change. This would be accomplished by developing technical guidance for source control such as under the SWM Manual, but also by developing a MOE policy framework that could clarify and encourage municipalities and others to plan and act on resiliency for climate change.

A MOE policy vision for resilient systems for municipal stormwater management may include, for example, the following considerations:

- *Include both source control (lot, neighbourhood) and conventional stormwater management.*
- *Reduce the generation of stormwater by building communities that interfere less with the natural water cycle.*
- *Reuse stormwater and recognize stormwater as a resource (e.g. for flushing toilets, landscape watering).*

- *Recycle the municipal stormwater back into the natural water cycle, with careful regard for water quality and quantity cumulative impacts on watersheds and groundwater.*
- *Include data collection and vulnerability assessment for the existing conventional stormwater management systems to assist in adaptation decisions by municipalities.*
- *Include long term planning for municipal stormwater management including a systematic approach to adaptation and assessment of the cumulative impacts on the watershed.*
- *Include tracking the progress of climate change adaptation, in particular source control, across the province as part of public education.*

There would be environmental and possible fiscal benefits to municipalities through adopting this approach. Source control can be expected to reduce the volume of stormwater that will be directed from private properties to municipal stormwater management infrastructure. Source control can have water quality benefits related to stormwater by treating, managing or reusing stormwater on properties or nearby on road rights of way where rain falls.

Information is required on the inventory and status of conventional systems that extensively exist in many municipalities across Ontario today. Municipalities need to examine the vulnerability of their conventional stormwater management systems to climate change and how they can be improved to increase the resiliency and adaptation to the uncertainties and extremities of climate change.

While it may be possible in some cases for municipalities to manage much of the run-off from private properties (residential, businesses) by source control facilities on the road right of way, this may be very costly or not always possible to do so. Municipalities need the cooperation of the property owners in order to effectively manage stormwater at the source. The MOE believes that better results can be achieved for source control when individuals, businesses, ministries, agencies and others collaborate and cooperate. As such, policies, guidance, public education and incentives are preferred over prescriptive mandatory regulations and legislation.

- *A MOE policy framework is needed to support resilient municipal stormwater management systems and adaptation to climate change and other identified stressors for new and existing developments.*
- *Data collection and information management systems are necessary to track the inventory, condition and performance of stormwater systems in order to assess Ontario's vulnerability to climate change and aid adaptive decision-making for infrastructure renewal.*

Resilient systems for municipal stormwater management can be accomplished in Ontario through MOE collaboration with municipalities and industry in developing policy, technical guidance, and municipal tools, all of which will assist municipalities to make informed decisions about climate change adaptation for their stormwater management systems.

A-3.9.1 Practical Guidance for the SWM Practitioner

Again, the recommended 150mm rainfall amount as a "stress test" is not derived from a theoretical basis, nor is it derived to any level of certainty or defined confidence limit. Rather, it is based on a pragmatic observation that the recent extreme events have relatively large areas (greater than 25 square kilometres) with approximated rainfall amounts between 125mm and 150mm (refer to radar rainfall maps in Appendix C). While both storms measured larger amounts in localized areas, it is deemed impractical and currently unjustified to increase rainfall amounts by 100% to match said isolated areas that measured extreme rainfalls over 200mm. A rainfall of 150mm appears to encapsulate a significant spatial extent (greater than 25 square kilometres) from the recent events as well as match 2090 projections from both the MTO IDF Tool (148.8mm) and Regional IDF Study (147.1mm). These studies, as well as the recent extreme events are further discussed in the remainder of this section.

For perspective, the recommended 150mm rainfall over 24 hours translates to a 1:2,620 year storm based on Windsor Airport's historical data. Perhaps more clearly expressed as risk over a design life of 100 years, the 108mm rainfall has a 63% chance of occurring whereas the 150mm rainfall has a 4% chance of occurring.

Regional IDF Study – A Comparison of Future IDF Curves for Southern Ontario

Study Objectives

Extreme rainfall statistics in the form of intensity-duration-frequency (IDF) curves are used extensively in the design of water management infrastructure and policies. The IDF study and technical report prepared by Dr. Coulibaly et al (July 2015) aimed to understand the limitations and applicability of different techniques for updating IDF statistics in light of climate change.

Study Conclusions

The study highlighted the complexity of the development of future IDF projections and the various sources of uncertainty involved. Ultimately, based on the study results, it was recommended that further study is needed before major change in infrastructure design standards. Further study is recommended to include the analysis of nonstationarity of extreme rainfall and development of regional IDF statistics.

Given the uncertainly in future IDF curves, it was also recommended that weight-of-evidence approaches be used. IDF curves may form part of the evidence based approach for

adaptation to extreme precipitation risk as well as historical extremes and information on the resiliency (i.e. thresholds and vulnerabilities) of stormwater systems.

The trend analysis results indicated that there is no significant trend with a slight apparent decreasing trend for short duration storms. The study recommended that trend results should be taken with caution in part because there is no objective way to discriminate trends among climatic trends, anthropogenic caused changes and sampling variability.

Windsor Airport IDF Curves

Standard practice in the region has generally relied upon Windsor Airport curves for design – whether it be Rational Method sewer design or creating storm distributions for hydrologic modeling. The Windsor Airport offers the most robust historical dataset (61 years from 1946-2007) as compared to the Harrow station (28 years from 1966-1989 & 2001-2007) and Point Pelee station (22 years from 1975-1993 & 2002-2004).

Table A-3.9.1a showing Windsor Airport extreme rainfall trends from 1995-2007 illustrates a decreasing trend from 1995 to 2007 across almost all durations and return periods.

Table A-3.9.1a – Windsor Airport Extreme Rainfall Trends 1995-2007

Duration	% Change in Rainfall					
	2 Year	*5 Year*	*10 Year*	*25 Year*	*50 Year*	*100 Year*
5 min	*-2.0%*	*-2.2%*	*-2.3%*	*-2.4%*	*-2.4%*	*-2.4%*
10 min	*-1.7%*	*-2.3%*	*-2.6%*	*-2.8%*	*-3.0%*	*-3.1%*
15 min	*-2.0%*	*-2.5%*	*-2.8%*	*-3.0%*	*-3.1%*	*-3.2%*
30 min	*-3.7%*	*-3.7%*	*-3.7%*	*-3.7%*	*-3.7%*	*-3.7%*
1 hour	*-4.9%*	*-3.2%*	*-2.5%*	*-1.9%*	*-1.5%*	*-1.2%*
2 hour	*-4.9%*	*-2.7%*	*-1.7%*	*-0.8%*	*-0.2%*	*0.2%*
6 hour	*-4.0%*	*-3.3%*	*-3.1%*	*-2.8%*	*-2.6%*	*-2.5%*
12 hour	*-3.4%*	*-1.8%*	*-1.1%*	*-0.4%*	*-0.1%*	*0.3%*
24 hour	*-2.2%*	*-1.5%*	*-1.2%*	*-0.9%*	*-0.7%*	*-0.5%*

Table A-3.9.1b showing Windsor Airport extreme rainfall trends from 1995 to 2015 continues to illustrate a decreasing trend for short-duration events from 5min to 30min duration for nearly all return periods. The trends illustrate an increasing trend in 1 hour, 2 hour, 12 hour and to a lesser extent the 24 hour durations.

Table A-3.9.1b – Windsor Airport Extreme Rainfall Trends 1995-2015[1]

Duration	% Change in Rainfall					
	2 Year	*5 Year*	*10 Year*	*25 Year*	*50 Year*	*100 Year*
5 min	*-1.7%*	*-2.7%*	*-3.1%*	*-3.6%*	*-3.8%*	*-4.0%*
10 min	*0.2%*	*-0.9%*	*-1.3%*	*-1.8%*	*-2.1%*	*-2.3%*
15 min	*0.3%*	*-0.5%*	*-0.9%*	*-1.2%*	*-1.4%*	*-1.6%*
30 min	*-0.1%*	*-0.1%*	*-0.1%*	*-0.1%*	*-0.1%*	*-0.1%*
1 hour	*-1.2%*	*0.7%*	*1.6%*	*2.4%*	*2.8%*	*3.2%*
2 hour	*-1.8%*	*0.5%*	*1.6%*	*2.6%*	*3.2%*	*3.6%*
6 hour	*-0.8%*	*-0.5%*	*-0.4%*	*-0.3%*	*-0.2%*	*-0.1%*
12 hour	*-0.4%*	*0.8%*	*1.3%*	*1.8%*	*2.1%*	*2.4%*
24 hour	*0.2%*	*0.3%*	*0.4%*	*0.5%*	*0.5%*	*0.5%*

Note 1: The extreme rainfall data for Windsor Airport is only available up to and including 2007. Data for subsequent years was derived from raw tipping bucket data that has not been verified to be accurate and that is missing most of the rainfall that occurred in 2009 and 2010.

Conclusion: Short-term durations events are slightly trending downwards, thus showing no evidence to increasing IDF curves for stormwater conveyance design. As mentioned in the regional study, trend results should be taken with caution in part because there is no objective way to discriminate trends among climatic trends, anthropogenic caused changes and sampling variability. Sampling variability in particular is demonstrated in section A-3.9.2.

MECP on Considering Climate Change

Dated October 2017, the MECP published a guide titled "Considering climate change in the environmental assessment process". Most pertinent to the Windsor/Essex Region SWM Standards Manual is *the Intensity Duration Frequency Curves* section under Appendix A and the referenced *Drainage Information* section under Appendix C. Said section provides a list of information about, and tools for, generating intensity duration frequency curves, which are available through:

- Ministry of the Environment and Climate Change
  AR4:A1B. Dynamically-downscaled climate projections with the PRECIS model under A1B emissions scenario, projected rainfall intensity-duration-frequency curves and daily and hourly time series data for climate change impact assessment. Climate projections are provided via the Ontario Climate Change Data Portal.

- Ministry of Transportation
  The IDF Curve Lookup is a web-based application provided by the Ontario Ministry of Transportation (MTO) for the purpose of retrieving intensity-duration-frequency curves.

MECP – Ontario Climate Change Data Portal

The technical report for the Ontario Climate Change Data Portal (CCDP) notes the following:

> *The projected IDF curves and the up-to-date project results as well as all associated data have been made publicly available at Ontario Climate Change Data Portal (Ontario CCDP): http://ontarioccdp.ca. The Ontario CCDP is developed with care and believed to be reliable, but mechanical or human errors remain a possibility. The IEESC [Institute for Energy, Environment and Sustainable Communities, University of Regina] accepts NO responsibility for any inaccuracies or omissions in the data, nor for any loss or damage directly or indirectly caused to any person or body by reason of, or arising out of, any use of Ontario CCDP. All IDF curves presented in the report and posted on this Portal at this time are calculated using the original model outputs of hourly precipitation. While all the revealed changes in the projected precipitation or IDF curves are possible from a physics or climate change science perspective, one should use these curves with extreme caution for practical applications. Further investigation is being undertaken to calibrate these IDF curves using historical data. These IDF curves will be updated once they are calibrated. Alternatively users can always download the hourly precipitation data and calculated their own IDF curves with appropriate corrections.*

Under the report acknowledgments the following is stated:

> *This project has received funding support from the Ontario Ministry of the Environment. Such support does not indicate endorsement by the Ministry of the contents of this material.*

Conclusion: The CCDP provides uncalibrated IDF curves to be used with extreme caution. Moreover, while the MECP references the CCDP under the guide titled "Considering climate change in the environmental assessment process", it does not endorse the contents of the material. This reference is deemed inappropriate to be used in our region at this time.

MTO IDF Curve Lookup System

The University of Waterloo was commissioned by the Design and Contract Standards Office of the Ministry of Transportation of Ontario (MTO) to update the intensity–duration–frequency (IDF) curves that are used to estimate design storms for drainage infrastructure.

The IDF Curve Lookup tool uses the Waterloo Multiple Physiographic Parameter Regression (WATMAPPR) model (Seglenieks 2009), which is based on the square grid technique (Solomon et al. 1968), to estimate the curve parameters. The square grid technique uses UTM 10 km grid squares as elementary subcatchments. The premise of the tool is that local and regional topography strongly influenced local climate. Thus, topographic parameters are useful interpolators of surface fields of interest, such as temperature, runoff and, in this case, IDF curve AB parameters.

Detailed information about the system notes the following:

> *This project does not address the spatial variability of time trends for extreme precipitation in Ontario. The analysis combines the datasets from all stations and determines their collective historical trend. The projections are extrapolations based on past trends and assume that the rate of change will stay constant. This serves two purposes. For now, the extrapolations provide a better projection of future precipitation extremes than a stationary model. In the future, the extrapolation will serve as a baseline for forecasts that incorporate both climatological factors and local variability.*

The tables below illustrate the minor variance in rainfall depth across the region as measured by the MTO IDF curve tool at 9 locations – Windsor Airport, LaSalle, Tecumseh, Belle River, ERCA office, Amherstburg, Harrow, Kingsville, Leamington. In summary, there is little variance across the region but there is a notable increase in rainfall amounts (e.g. 24 hr rainfall of 108mm at Windsor Airport versus 137mm for the region based on MTO IDF curves).

Table A-3.9.1c – Present Day (Ref. 2010) Rainfall Depths for 9 Locations Throughout the Region

	100 Year Rainfall Depths (mm)			
	10 min	15 min	30 min	24 hour
Average	30.8	34.8	42.8	137.3
Maximum	31.0	35.0	43.1	138.2
Minimum	30.6	34.5	42.5	136.4
Variance	0.4	0.5	0.6	1.8

Table A-3.9.1d – Projected 2090 Rainfall Depths for 9 Locations Throughout the Region

	100 Year Rainfall Depths (mm)			
	10 min	15 min	30min	24 hour
Average	31.7	35.9	44.4	148.3
Maximum	31.9	36.1	44.7	148.8
Minimum	31.5	35.6	44.1	146.4
Variance	0.4	0.5	0.6	2.4

Conclusion: The MTO IDF curve tool considers datasets from all stations within the region. It is difficult to ascertain how the tool is combining the datasets. Moreover, the assumption that future rate of change will remain constant to that of past trends somewhat contradicts the previously mentioned warning from the regional IDF study which noted that trend results should be taken with caution in part because there is no objective way to discriminate trends among climatic trends, anthropogenic caused changes and sampling variability. Put simply, the trend results may be related to climate change and/or may be a matter of spatial variability of

extreme events. A perfect example of sampling variability affected by spatial variation of extreme storm events is illustrated in section A-3.9.2.

Comparison of IDF Curves

From a SWM practitioner's perspective, there are generally two parameters of importance when considering climate change and its potential impacts to IDF curves. They are, the 5 min to 30 min rainfall timestep that will define peak rainfall intensity of the design storm rainfall hyetograph and the 24 hour rainfall depth that will define the design rainfall amount. The return periods of interest are generally limited to the minor and major storm events, typically 5-year and 100-year return periods, respectively. That being said, the following table summarizes rainfall intensities and amounts from the various sources discussed in this section. The Regional Study values are based on the 50% percentile curves.

Table A-3.9.1e – Windsor Airport Rainfall Comparison

Duration	5-year Rainfall Intensity (mm/hr)			100-year Rainfall Intensity (mm/hr)		
	EC 2007	MTO 2010	Regional IDF Study 2030	**EC 2007**	MTO 2010	Regional IDF Study 2030
5min	**143.2**	180.6	-	**227.1**	299.3	-
10min	**103.3**	111.3	-	**160.8**	184.4	-
15min	**87.9**	83.8	86.4	**142.5**	138.9	172.7
30min	**58.7**	51.6	56.9	**98.0**	85.6	101.1
Duration	5-year Rainfall Depth (mm)			100-year Rainfall Depth (mm)		
	EC 2007	MTO 2010	Regional IDF Study 2030	**EC 2007**	MTO 2010	Regional IDF Study 2030
24 hour	**68.0**	82.8	65.2	**107.9**	137.2	104.5

Table A-3.9.1f – Projected 2090 Windsor Airport Rainfall Comparison

Duration	5-year Rainfall Intensity (mm/hr)			100-year Rainfall Intensity (mm/hr)		
	EC 2007	MTO 2090	Regional IDF Study 2090	**EC 2007**	MTO 2090	Regional IDF Study 2090
5min	**143.2**	188.2	-	**227.1**	306.9	-
10min	**103.3**	116.7	-	**160.8**	189.8	-
15min	**87.9**	88.2	106.6	**142.5**	143.3	229.7
30min	**58.7**	54.8	68.6	**98.0**	88.7	141.3

Duration	5-year Rainfall Depth (mm)			100-year Rainfall Depth (mm)		
	EC 2007	MTO 2090	Regional IDF Study 2090	**EC 2007**	MTO 2090	Regional IDF Study 2090
24 hour	**68.0**	93.6	77.8	**107.9**	148.8	147.1

Conclusion: While the three sources display some consistencies, the overall impression from the above tables is that the IDF curves are variable and uncertain. To re-iterate one of the key regional IDF study recommendations, it was recommended that further study is needed before major change in infrastructure design standards. These standards recommend that, for now, the long-standing historical rainfall data from Windsor Airport continue to be used for design standards. Notwithstanding, the recent extreme events experienced in the region warrant some consideration with regards to assessing resiliency and vulnerabilities of existing stormwater systems and future designs under extreme rainfall events. This is discussed in the following section.

Historical Extremes

From our region's historical rainfall dataset (included in Appendix C – references), the Point Pelee and Harrow stations have combined for three occurences where 24 hour rainfalls exceeded Windsor Airport's 1:100 year rainfall of 108mm – Point Pelee station recorded 114mm (1989) and Harrow station recorded 121mm (1966) and 263mm (1989).

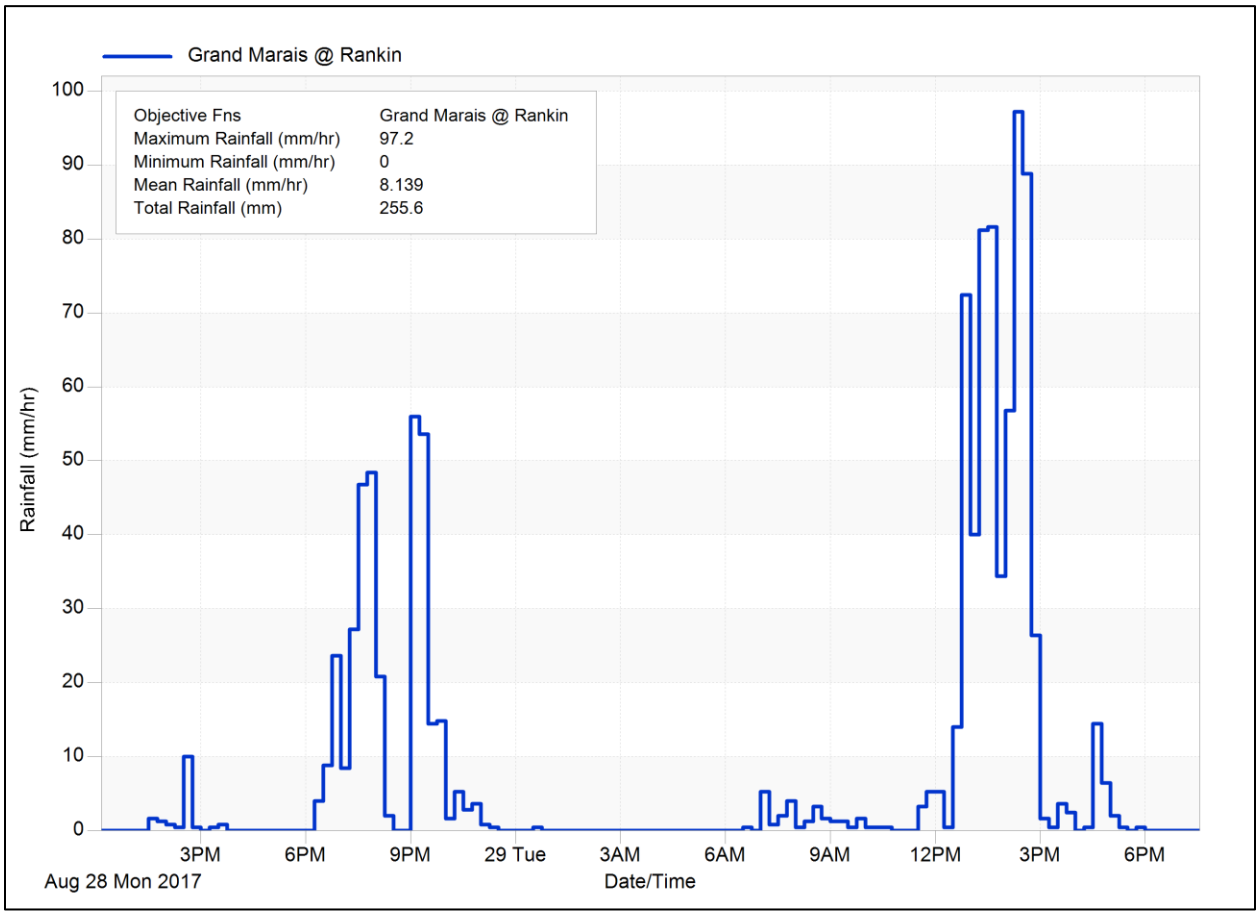
Recent rainfall data from flooding events in the Tecumseh, Lakeshore and Windsor areas suggest that northern areas of the region have also experienced greater than 108mm in 24 hours. Included in Appendix C are uncalibrated radar rainfall maps of these events with available rain gauge measured depths for comparison. While there is a level of uncertainty with radar estimates, and sometimes with rain gauge estimates, the maps are helpful for the purposes of assessing spatial variation of rainfall over the region. As illustrated in the maps, the core of these three storm events does not pass over the Windsor Airport climate station – a condition that demonstrates the spatial variability of the recent extreme events as well as the sampling variability of the historical rainfall record at Windsor Airport.

The maps also show 24 hour rainfall amounts between 125mm and 150mm over a significant aerial extent (i.e. the large rainfall amounts are not isolated micro-bursts of small spatial extent measured at one individual rain gauge).

Graph A-3.9.1a depicts the rainfall hyetograph for the August 2017 storm as recorded by ERCA's Grand Marais rain gauge @ Rankin (GMr Gauge as shown on rainfall maps). This location captured the eye of the storm and generally represents the most intense rainfall that was experienced. It is believed that this storm intensity exceeded all known historical records of

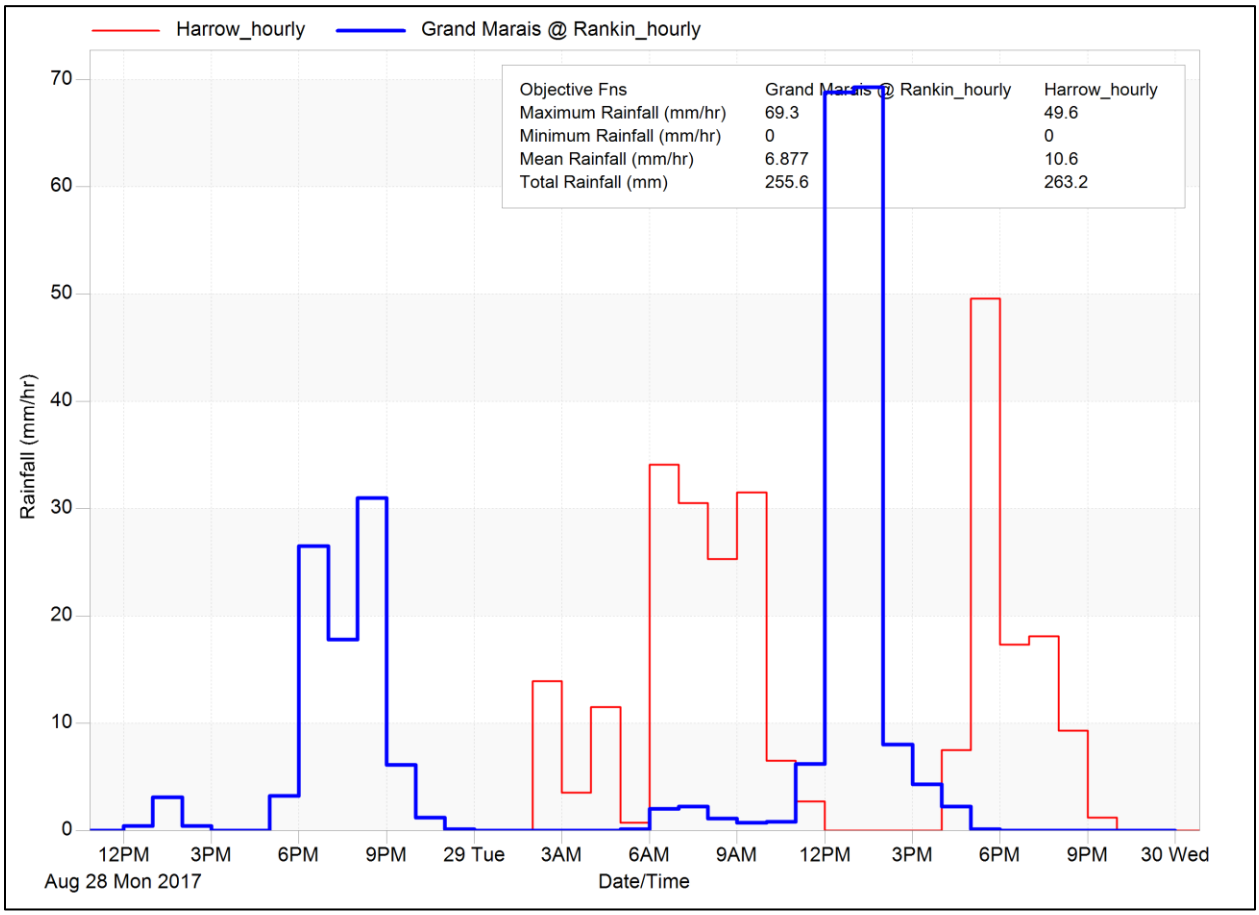
extreme events in the region, including the Harrow storm of 1989. While the storm significantly exceeded a 1:100 year return period for all durations from 1 hour to 24 hour, the 15 min rainfall was equivalent to a 1:8 year storm and the 30 min equivalent to a 1:68 year. Therefore, while the storm was severe, the short-term intensity of this extreme event did not exceed the current 1:100 year intensity as defined by Windsor Airport rainfall data.

Graph A-3.9.1a – August 2017 Storm Measured from Grand Marais Rain Gauge @ Rankin



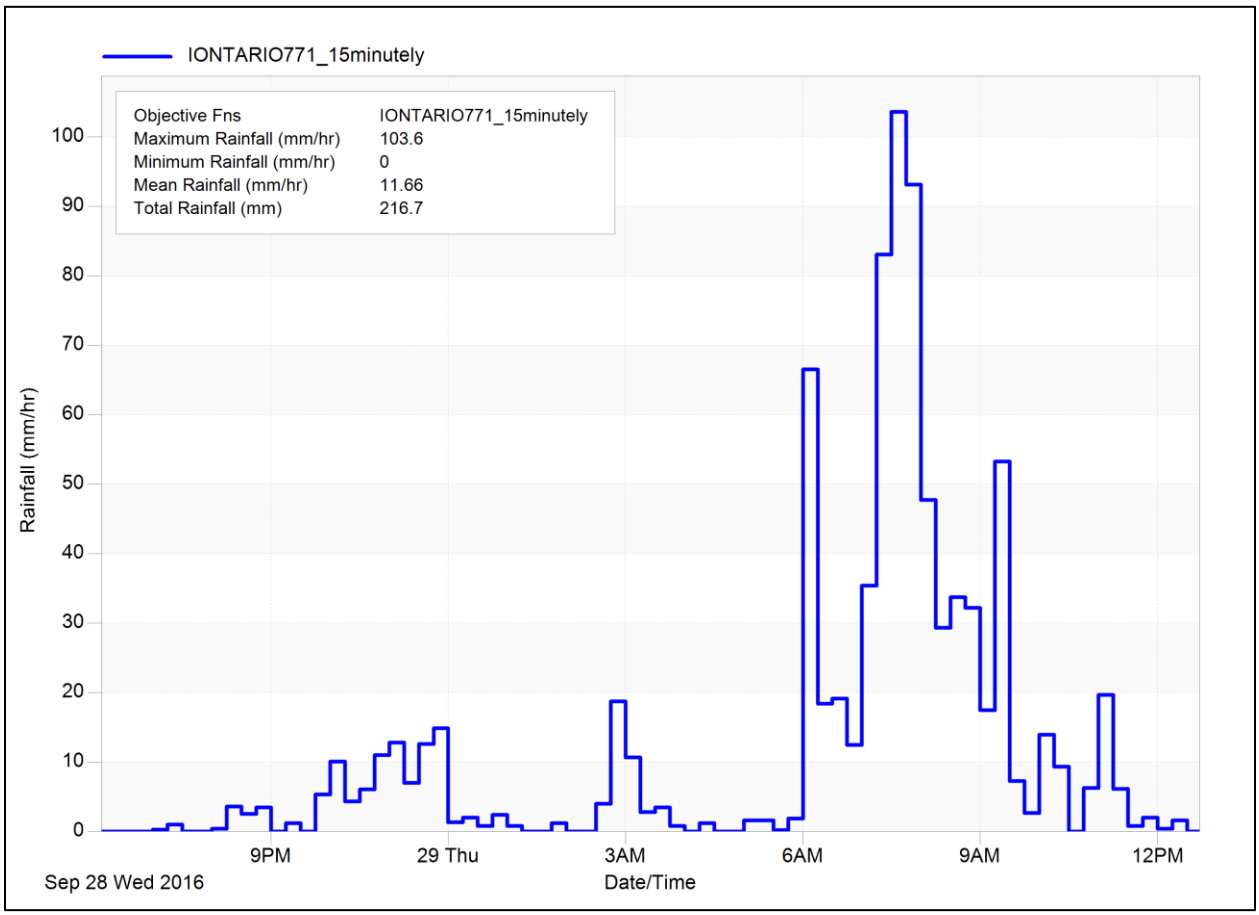
Graph A-3.9.1b depicts the rainfall hyetograph for August 2017 storm as recorded by ERCA's the Grand Marais rain gauge @ Rankin Graph compared to the July 1989 as recorded by Environment Canada's Harrow Station rain gauge. The Harrow storm has been transposed for comparison purposes.

Graph A-3.9.1b – August 2017 Storm Measured from Grand Marais Rain Gauge @ Rankin Compared to July 1989 Harrow Station Rain Gauge (Transposed for Comparison)



Graph A-3.9.1c depicts the rainfall hyetograph for the September 2016 storm as recorded a private gauge in the vicinity of Revland and St. Thomas – approximately 1,100 metres northwest of Manning and Tecumseh intersection. This storm also significantly exceeded a 1:100 year return period for all durations from 1 hour to 24 hour. The 15 min rainfall was equivalent to a 1:11 year storm and the 30 min equivalent to a 1:103 year. Again, while the storm was severe, the short-term intensity of this extreme event was less than or relatively equal to the current 1:100 year intensity as defined by Windsor Airport rainfall data.

Graph A-3.9.1c – September 2016 Storm Measured @ IONTARIO771 Rain Gauge Near Manning & Tecumseh



The extreme storms in September 2016 and August 2017 both appeared to stall over the Windsor, Tecumseh and Lakeshore regions. It is said that these extreme events may have been the result of two separate storms tracking from different directions and combining to create a phenomenon that seemingly dropped all of the storm's moisture over the region. The above commentary is speculative at this time. Further study from qualified experts in the field of both meteorology and climatology is recommended to provide guidance on how these extreme events fit within the context of stormwater design based on single station historical rainfall data.

Conclusion: As recommended in the regional IDF study discussed in section 3.9.2, further study is needed before major change in infrastructure design standards. Moreover, the suggested phenomenon that appeared to have stalled both extreme events in not well understood, at least not by the technical contributors of these standards. It would be a logical next step to attempt to better understand the conditions that led to these recent extreme events and the

probability of recurrence for similar conditions. Has this occurred previously? Did a similar phenomenon lead to the extreme rainfall of the 1989 Harrow Storm?

As further studies and science evolves to provide clear guidance on stormwater design standards, the recurring extreme events of the last couple of years warrant that the current standards account for some level of rainfall increase to evaluate the resiliency and vulnerabilities of stormwater systems.

A-3.9.2 Beyond IDF Curves

Climate change may have had implications on the severity of the extreme events experienced in September 2016 and August 2017. However, there exists many other causes of flooding. One example of this is illustrated by the September 2016 storm event.

Graph A-3.9.2 depicts the rainfall hyetograph for the September 2016 storm as recorded a private gauge (IONTARIO771) in the vicinity of Revland and St. Thomas – approximately 1,100 metres northwest of Manning and Tecumseh intersection compared to the rainfall recorded by the City of Windsor's Wellington PS gauge. Recall, the rainfall at the private gauge exceeded the 1:100 year rainfall amounts for most durations.

The rainfall measured at the Wellington PS was much less intense with a 1:2 year return period across all duration except for the 12 hour and 24 hour where return periods were 1:4 year and 1:9 year, respectively. These two rainfall hyetographs at opposite ends of the City clearly demonstrate the spatial variation of the September 2016 storm. This spatial variation, combined with the information provided by another private gauge recording near the Wellington gauge, shines an important light on the perception that climate change is the culprit for all recent flooding.

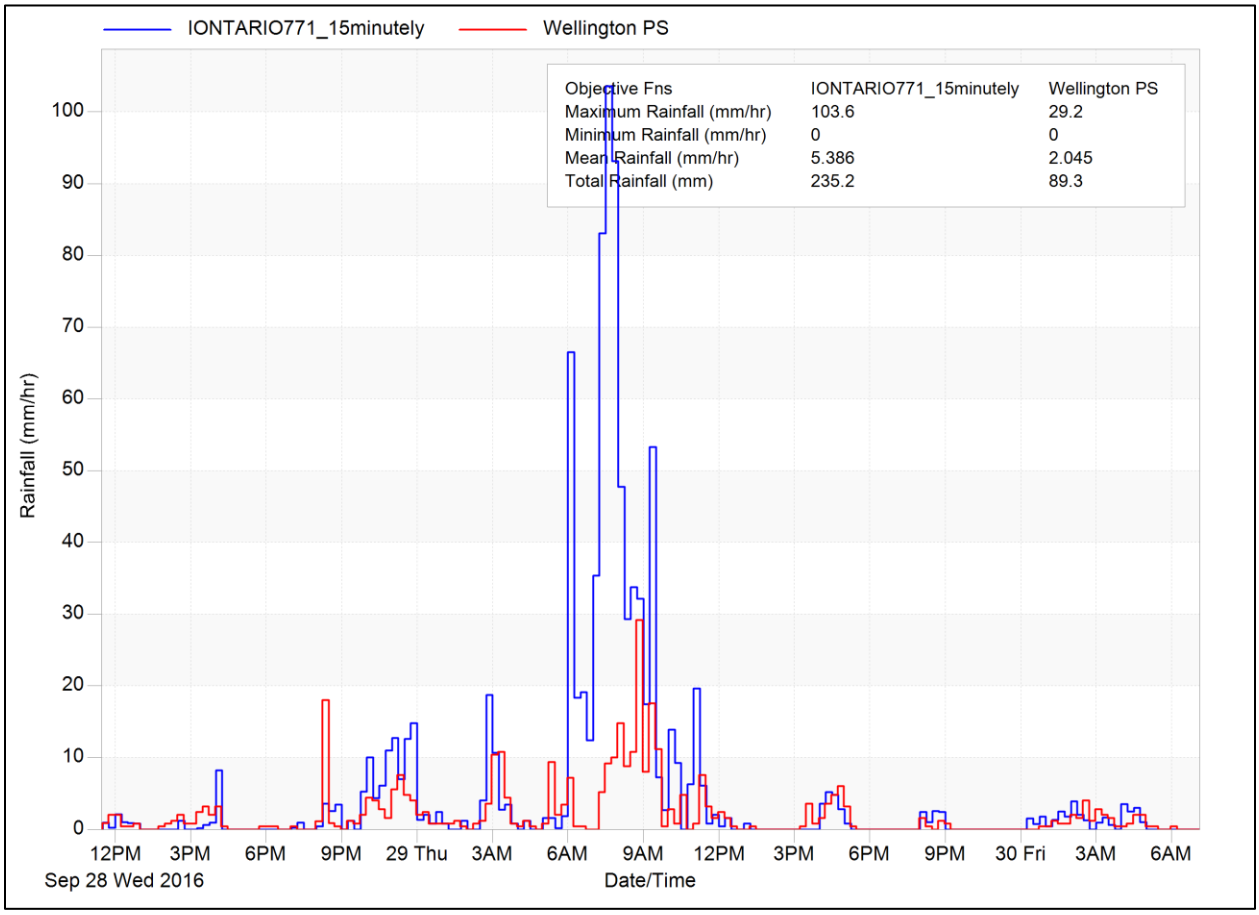
The private gauge recording is located near Randolph and Totten, approximately 1.2 kms away from the Wellington gauge. From 12pm on September 28th to 7am on September 30th the Wellington gauge measured 89mm whereas the private (CoCoRaHS) gauge measured 86mm in that time.

CoCoRaHS stands for **Co**mmunity **Co**llaborative **Ra**in, **H**ail and **S**now – a grassroots volunteer network of backyard weather observers of all ages and backgrounds working together to measure and map precipitation (rain, hail and snow) in their local communities.

The private CoCoRaHS gauge measures volume only and records daily amount at approximately 7am. At 7:21am on the 29th, the gauge measured 39.6mm and the observer noted that it was "pouring.." At 7:39am on the 30th, the gauge measured 46.5mm and noted the following; "State of Emergency in the Neighbourhood due to Flooding. Right now is a RainPause". Assuming a similar distribution between the two gauges – which can be reasonably assumed given the proximity of the gauges combined with the close match in rainfall volume –

the area of the private gauge experienced relatively low intensity storm which is not typically conducive of flooding.

Graph A-3.9.2 – IONTARIO771 Rain Gauge Near Manning & Tecumseh Compared to City of Windsor Wellington Gauge Near Crawford and Tecumseh



At a cursory level, the foregoing strongly suggests that flooding in the west side of the City was not related to extreme rainfall or climate change. It is speculated that residents experiencing flooding in the west side of the City may have equated their rain to the media reporting of the much more intense and noteworthy rainfall at the east side of Windsor and Town of Tecumseh. Thus, fueling the bias that climate change is the culprit of all recent flooding.

APPENDIX B

Design Storm Distributions

1. Water Quality Storm
2. Chicago 2-year 4-hour Storm
3. Chicago 5-year 4-hour Storm
4. Chicago 10-year 4-hour Storm
5. Chicago 25-year 4-hour Storm
6. Chicago 50-year 4-hour Storm
7. Chicago 100-year 4-hour Storm
8. SCS Type II 24-hour Storm
9. Urban Stress Test Storm

WATER QUALITY STORM

CHICAGO 2-YEAR 4-HOUR Adjusted Depth = 32.0 mm (90% percentile runoff volume control target)					
Time h:mm	**5min Rain mm/hr**	**Time h:mm**	**10min Rain mm/hr**	**Time h:mm**	**20min Rain mm/hr**
0:00	1.68	0:00	1.73	0:00	1.83
0:05	1.77	0:10	1.94	0:20	2.39
0:10	1.88	0:20	2.21	0:40	3.52
0:15	1.99	0:30	2.57	1:00	7.32
0:20	2.13	0:40	3.10	1:20	48.91
0:25	2.28	0:50	3.94	1:40	12.79
0:30	2.46	1:00	5.47	2:00	6.11
0:35	2.68	1:10	9.16	2:20	3.97
0:40	2.94	1:20	23.89	2:40	2.98
0:45	3.26	1:30	71.41	3:00	2.40
0:50	3.67	1:40	18.09	3:20	2.02
0:55	4.21	1:50	10.01	3:40	1.75
1:00	4.94	2:00	6.91	4:00	0.00
1:05	6.00	2:10	5.30		
1:10	7.67	2:20	4.31		
1:15	10.65	2:30	3.64	**Time h:mm**	**30min Rain mm/hr**
1:20	17.28	2:40	3.16		
1:25	40.48	2:50	2.80	0:00	1.96
1:30	94.95	3:00	2.51	0:30	3.21
1:35	37.90	3:10	2.29	1:00	8.21
1:40	21.47	3:20	2.10	1:30	37.80
1:45	14.71	3:30	1.94	2:00	5.51
1:50	11.11	3:40	1.81	2:30	3.20
1:55	8.91	3:50	1.69	3:00	2.30
2:00	7.44	4:00	0.00	3:30	1.81
2:05	6.39			4:00	0.00
2:10	5.60				
2:15	4.99	**Time h:mm**	**15min Rain mm/hr**		
2:20	4.50				
2:25	4.11	0:00	1.78		
2:30	3.78	0:15	2.13		
2:35	3.50	0:30	2.70		
2:40	3.26	0:45	3.72		
2:45	3.06	1:00	6.21		
2:50	2.88	1:15	16.41		
2:55	2.72	1:30	57.83		
3:00	2.58	1:45	11.58		
3:05	2.45	2:00	6.48		
3:10	2.34	2:15	4.53		
3:15	2.23	2:30	3.51		
3:20	2.14	2:45	2.88		
3:25	2.06	3:00	2.45		
3:30	1.98	3:15	2.14		
3:35	1.91	3:30	1.91		
3:40	1.84	3:45	1.72		
3:45	1.78	4:00	0.00		
3:50	1.72				
3:55	1.67				
4:00	0.00				

2-YEAR DESIGN STORMS

CHICAGO 4-HOUR Depth = 37.7 mm					
Time h:mm	**5min Rain mm/hr**	**Time h:mm**	**10min Rain mm/hr**	**Time h:mm**	**20min Rain mm/hr**
0:00	1.98	0:00	2.04	0:00	2.16
0:05	2.09	0:10	2.28	0:20	2.81
0:10	2.21	0:20	2.60	0:40	4.15
0:15	2.35	0:30	3.03	1:00	8.62
0:20	2.51	0:40	3.66	1:20	57.62
0:25	2.69	0:50	4.64	1:40	15.07
0:30	2.90	1:00	6.45	2:00	7.19
0:35	3.16	1:10	10.79	2:20	4.68
0:40	3.47	1:20	28.15	2:40	3.51
0:45	3.85	1:30	84.13	3:00	2.83
0:50	4.33	1:40	21.31	3:20	2.38
0:55	4.96	1:50	11.80	3:40	2.06
1:00	5.82	2:00	8.15	4:00	0.00
1:05	7.07	2:10	6.24		
1:10	9.04	2:20	5.07		
1:15	12.54	2:30	4.29	**Time h:mm**	**30min Rain mm/hr**
1:20	20.36	2:40	3.72		
1:25	47.69	2:50	3.30	0:00	2.31
1:30	111.86	3:00	2.96	0:30	3.78
1:35	44.65	3:10	2.69	1:00	9.68
1:40	25.30	3:20	2.47	1:30	44.53
1:45	17.33	3:30	2.29	2:00	6.49
1:50	13.09	3:40	2.13	2:30	3.77
1:55	10.50	3:50	2.00	3:00	2.71
2:00	8.77	4:00	0.00	3:30	2.14
2:05	7.53			4:00	0.00
2:10	6.60				
2:15	5.88	**Time h:mm**	**15min Rain mm/hr**		
2:20	5.31				
2:25	4.84	0:00	2.10		
2:30	4.45	0:15	2.52		
2:35	4.12	0:30	3.18		
2:40	3.84	0:45	4.38		
2:45	3.60	1:00	7.31		
2:50	3.39	1:15	19.33		
2:55	3.20	1:30	68.13		
3:00	3.04	1:45	13.64		
3:05	2.89	2:00	7.63		
3:10	2.75	2:15	5.34		
3:15	2.63	2:30	4.14		
3:20	2.52	2:45	3.40		
3:25	2.42	3:00	2.89		
3:30	2.33	3:15	2.53		
3:35	2.25	3:30	2.25		
3:40	2.17	3:45	2.03		
3:45	2.09	4:00	0.00		
3:50	2.03				
3:55	1.96				
4:00	0.00				

5-YEAR DESIGN STORMS

CHICAGO 4-HOUR
Depth = 49.5 mm

Time h:mm	5min Rain mm/hr
0:00	2.44
0:05	2.58
0:10	2.73
0:15	2.91
0:20	3.12
0:25	3.36
0:30	3.65
0:35	3.99
0:40	4.41
0:45	4.92
0:50	5.59
0:55	6.46
1:00	7.66
1:05	9.42
1:10	12.20
1:15	17.18
1:20	28.20
1:25	64.52
1:30	139.58
1:35	60.83
1:40	35.06
1:45	23.95
1:50	17.96
1:55	14.28
2:00	11.81
2:05	10.06
2:10	8.75
2:15	7.74
2:20	6.94
2:25	6.29
2:30	5.76
2:35	5.30
2:40	4.92
2:45	4.59
2:50	4.30
2:55	4.05
3:00	3.83
3:05	3.63
3:10	3.45
3:15	3.29
3:20	3.14
3:25	3.01
3:30	2.89
3:35	2.78
3:40	2.67
3:45	2.58
3:50	2.49
3:55	2.41
4:00	0.00

Time h:mm	10min Rain mm/hr
0:00	2.51
0:10	2.82
0:20	3.24
0:30	3.82
0:40	4.67
0:50	6.02
1:00	8.54
1:10	14.69
1:20	38.85
1:30	107.72
1:40	29.51
1:50	16.12
2:00	10.93
2:10	8.25
2:20	6.62
2:30	5.53
2:40	4.76
2:50	4.18
3:00	3.73
3:10	3.37
3:20	3.08
3:30	2.83
3:40	2.63
3:50	2.45
4:00	0.00

Time h:mm	15min Rain mm/hr
0:00	2.58
0:15	3.13
0:30	4.02
0:45	5.66
1:00	9.76
1:15	26.72
1:30	88.40
1:45	18.73
2:00	10.21
2:15	6.99
2:30	5.33
2:45	4.31
3:00	3.64
3:15	3.15
3:30	2.78
3:45	2.49
4:00	0.00

Time h:mm	20min Rain mm/hr
0:00	2.66
0:20	3.53
0:40	5.34
1:00	11.61
1:20	75.35
1:40	20.75
2:00	9.59
2:20	6.07
2:40	4.47
3:00	3.55
3:20	2.95
3:40	2.54
4:00	0.00

Time h:mm	30min Rain mm/hr
0:00	2.86
0:30	4.84
1:00	13.11
1:30	58.69
2:00	8.60
2:30	4.82
3:00	3.39
3:30	2.64
4:00	0.00

10-YEAR DESIGN STORMS

CHICAGO 4-HOUR
Depth = 57.0 mm

Time h:mm	5min Rain mm/hr
0:00	2.74
0:05	2.90
0:10	3.09
0:15	3.29
0:20	3.53
0:25	3.81
0:30	4.15
0:35	4.54
0:40	5.03
0:45	5.63
0:50	6.41
0:55	7.43
1:00	8.85
1:05	10.92
1:10	14.21
1:15	20.11
1:20	33.09
1:25	74.91
1:30	157.73
1:35	70.81
1:40	41.12
1:45	28.10
1:50	21.03
1:55	16.68
2:00	13.76
2:05	11.68
2:10	10.14
2:15	8.94
2:20	8.00
2:25	7.24
2:30	6.61
2:35	6.08
2:40	5.63
2:45	5.24
2:50	4.91
2:55	4.61
3:00	4.35
3:05	4.12
3:10	3.91
3:15	3.73
3:20	3.56
3:25	3.40
3:30	3.26
3:35	3.14
3:40	3.02
3:45	2.91
3:50	2.81
3:55	2.71
4:00	0.00

Time h:mm	10min Rain mm/hr
0:00	2.82
0:10	3.19
0:20	3.67
0:30	4.34
0:40	5.33
0:50	6.92
1:00	9.89
1:10	17.16
1:20	45.47
1:30	122.80
1:40	34.61
1:50	18.86
2:00	12.72
2:10	9.54
2:20	7.62
2:30	6.34
2:40	5.44
2:50	4.76
3:00	4.24
3:10	3.82
3:20	3.48
3:30	3.20
3:40	2.96
3:50	2.76
4:00	0.00

Time h:mm	15min Rain mm/hr
0:00	2.91
0:15	3.55
0:30	4.57
0:45	6.49
1:00	11.33
1:15	31.33
1:30	101.26
1:45	21.94
2:00	11.86
2:15	8.06
2:30	6.11
2:45	4.92
3:00	4.13
3:15	3.56
3:30	3.14
3:45	2.81
4:00	0.00

Time h:mm	20min Rain mm/hr
0:00	3.01
0:20	4.01
0:40	6.13
1:00	13.52
1:20	86.55
1:40	24.32
2:00	11.13
2:20	6.98
2:40	5.10
3:00	4.03
3:20	3.34
3:40	2.86
4:00	0.00

Time h:mm	30min Rain mm/hr
0:00	3.23
0:30	5.53
1:00	15.30
1:30	67.63
2:00	9.96
2:30	5.51
3:00	3.85
3:30	2.97
4:00	0.00

25-YEAR DESIGN STORMS

CHICAGO 4-HOUR Depth = 67.0 mm					
Time h:mm	**5min Rain mm/hr**	**Time h:mm**	**10min Rain mm/hr**	**Time h:mm**	**20min Rain mm/hr**
0:00	3.15	0:00	3.24	0:00	3.46
0:05	3.34	0:10	3.68	0:20	4.65
0:10	3.55	0:20	4.25	0:40	7.17
0:15	3.80	0:30	5.04	1:00	16.07
0:20	4.08	0:40	6.22	1:20	101.49
0:25	4.41	0:50	8.12	1:40	29.07
0:30	4.81	1:00	11.69	2:00	13.18
0:35	5.28	1:10	20.45	2:20	8.19
0:40	5.86	1:20	54.26	2:40	5.94
0:45	6.58	1:30	142.97	3:00	4.67
0:50	7.50	1:40	41.39	3:20	3.85
0:55	8.73	1:50	22.50	3:40	3.29
1:00	10.44	2:00	15.10	4:00	0.00
1:05	12.93	2:10	11.27		
1:10	16.90	2:20	8.96		
1:15	24.01	2:30	7.43	**Time h:mm**	**30min Rain mm/hr**
1:20	39.58	2:40	6.34		
1:25	88.69	2:50	5.54	0:00	3.72
1:30	182.17	3:00	4.92	0:30	6.46
1:35	84.02	3:10	4.42	1:00	18.21
1:40	49.16	3:20	4.02	1:30	79.54
1:45	33.62	3:30	3.69	2:00	11.77
1:50	25.13	3:40	3.41	2:30	6.44
1:55	19.87	3:50	3.17	3:00	4.45
2:00	16.35	4:00	0.00	3:30	3.42
2:05	13.84			4:00	0.00
2:10	11.98				
2:15	10.55	**Time h:mm**	**15min Rain mm/hr**		
2:20	9.42				
2:25	8.50	0:00	3.35		
2:30	7.74	0:15	4.10		
2:35	7.11	0:30	5.31		
2:40	6.57	0:45	7.61		
2:45	6.11	1:00	13.42		
2:50	5.71	1:15	37.46		
2:55	5.36	1:30	118.42		
3:00	5.05	1:45	26.21		
3:05	4.78	2:00	14.06		
3:10	4.53	2:15	9.49		
3:15	4.31	2:30	7.14		
3:20	4.11	2:45	5.73		
3:25	3.93	3:00	4.79		
3:30	3.76	3:15	4.12		
3:35	3.61	3:30	3.62		
3:40	3.47	3:45	3.23		
3:45	3.34	4:00	0.00		
3:50	3.22				
3:55	3.11				
4:00	0.00				

50-YEAR DESIGN STORMS

CHICAGO 4-HOUR
Depth = 73.9 mm

Time h:mm	5min Rain mm/hr
0:00	3.39
0:05	3.60
0:10	3.83
0:15	4.10
0:20	4.42
0:25	4.78
0:30	5.22
0:35	5.74
0:40	6.38
0:45	7.18
0:50	8.21
0:55	9.58
1:00	11.48
1:05	14.27
1:10	18.71
1:15	26.68
1:20	44.13
1:25	98.55
1:30	200.17
1:35	93.46
1:40	54.82
1:45	37.46
1:50	27.94
1:55	22.05
2:00	18.10
2:05	15.29
2:10	13.21
2:15	11.60
2:20	10.34
2:25	9.31
2:30	8.47
2:35	7.77
2:40	7.17
2:45	6.66
2:50	6.22
2:55	5.83
3:00	5.49
3:05	5.18
3:10	4.91
3:15	4.67
3:20	4.45
3:25	4.25
3:30	4.07
3:35	3.90
3:40	3.75
3:45	3.61
3:50	3.47
3:55	3.35
4:00	0.00

Time h:mm	10min Rain mm/hr
0:00	3.50
0:10	3.97
0:20	4.60
0:30	5.48
0:40	6.78
0:50	8.89
1:00	12.87
1:10	22.70
1:20	60.47
1:30	157.69
1:40	46.14
1:50	24.99
2:00	16.69
2:10	12.40
2:20	9.83
2:30	8.12
2:40	6.92
2:50	6.02
3:00	5.34
3:10	4.79
3:20	4.35
3:30	3.98
3:40	3.68
3:50	3.41
4:00	0.00

Time h:mm	15min Rain mm/hr
0:00	3.61
0:15	4.43
0:30	5.78
0:45	8.32
1:00	14.82
1:15	41.74
1:30	130.87
1:45	29.15
2:00	15.53
2:15	10.42
2:30	7.80
2:45	6.24
3:00	5.19
3:15	4.46
3:30	3.90
3:45	3.48
4:00	0.00

Time h:mm	20min Rain mm/hr
0:00	3.73
0:20	5.04
0:40	7.84
1:00	17.79
1:20	112.29
1:40	32.35
2:00	14.55
2:20	8.97
2:40	6.47
3:00	5.06
3:20	4.17
3:40	3.55
4:00	0.00

Time h:mm	30min Rain mm/hr
0:00	4.02
0:30	7.05
1:00	20.19
1:30	88.10
2:00	12.97
2:30	7.02
3:00	4.82
3:30	3.69
4:00	0.00

100-YEAR DESIGN STORMS

CHICAGO 4-HOUR Depth = 81.6 mm					
Time h:mm	**5min Rain mm/hr**	**Time h:mm**	**10min Rain mm/hr**	**Time h:mm**	**20min Rain mm/hr**
0:00	3.71	0:00	3.83	0:00	4.09
0:05	3.94	0:10	4.35	0:20	5.54
0:10	4.20	0:20	5.05	0:40	8.65
0:15	4.50	0:30	6.02	1:00	19.77
0:20	4.85	0:40	7.47	1:20	123.48
0:25	5.25	0:50	9.83	1:40	36.02
0:30	5.73	1:00	14.28	2:00	16.15
0:35	6.31	1:10	25.26	2:20	9.92
0:40	7.03	1:20	67.16	2:40	7.13
0:45	7.92	1:30	172.68	3:00	5.56
0:50	9.07	1:40	51.34	3:20	4.57
0:55	10.59	1:50	27.82	3:40	3.88
1:00	12.72	2:00	18.55	4:00	0.00
1:05	15.84	2:10	13.75		
1:10	20.81	2:20	10.87		
1:15	29.71	2:30	8.97	**Time h:mm**	**30min Rain mm/hr**
1:20	49.12	2:40	7.63		
1:25	108.91	2:50	6.63	0:00	4.41
1:30	218.23	3:00	5.87	0:30	7.78
1:35	103.42	3:10	5.26	1:00	22.45
1:40	60.97	3:20	4.77	1:30	97.06
1:45	41.72	3:30	4.37	2:00	14.39
1:50	31.11	3:40	4.03	2:30	7.74
1:55	24.53	3:50	3.74	3:00	5.30
2:00	20.12	4:00	0.00	3:30	4.04
2:05	16.98			4:00	0.00
2:10	14.65				
2:15	12.86	**Time h:mm**	**15min Rain mm/hr**		
2:20	11.44				
2:25	10.30	0:00	3.95		
2:30	9.36	0:15	4.87		
2:35	8.58	0:30	6.36		
2:40	7.91	0:45	9.19		
2:45	7.34	1:00	16.45		
2:50	6.85	1:15	46.45		
2:55	6.42	1:30	143.67		
3:00	6.04	1:45	32.45		
3:05	5.70	2:00	17.25		
3:10	5.40	2:15	11.53		
3:15	5.13	2:30	8.62		
3:20	4.88	2:45	6.87		
3:25	4.66	3:00	5.71		
3:30	4.46	3:15	4.89		
3:35	4.27	3:30	4.28		
3:40	4.10	3:45	3.81		
3:45	3.95	4:00	0.00		
3:50	3.80				
3:55	3.67				
4:00	0.00				

SCS TYPE II 24-HOUR DESIGN STORMS

		Unit Rainfall Depth = 1 mm	100-Year Depth = 108 mm	Rural Stress Test Depth = 150 mm	5-Year Depth = 68.0 mm
Time h:mm	Rain %	2hour Rain mm/hr	2hour Rain mm/hr	2hour Rain mm/hr	2hour Rain mm/hr
0:00	0	0.000	0.00	0.00	0.00
2:00	2	0.010	1.08	1.50	0.68
4:00	3	0.015	1.62	2.25	1.02
6:00	3	0.015	1.62	2.25	1.02
8:00	4	0.020	2.16	3.00	1.36
10:00	6	0.030	3.24	4.50	2.04
12:00	48	0.240	25.92	36.00	16.32
14:00	16	0.080	8.64	12.00	5.44
16:00	4	0.030	3.24	4.50	2.04
18:00	3	0.020	2.16	3.00	1.36
20:00	3	0.015	1.62	2.25	1.02
22:00	2	0.015	1.62	2.25	1.02
0:00	0	0.010	1.08	1.50	0.68

URBAN STRESS TEST STORM

CHICAGO 100-YEAR 24-HOUR (108 mm) + UNIFORM DISTRIBUTION OF ADDITIONAL 42 mm Depth = 108 mm + 42 mm = 150 mm			
Time h:mm	**15min Rain mm/hr**	**Time h:mm**	**15min Rain mm/hr**
0:00	2.41	12:15	4.49
0:15	2.43	12:30	4.29
0:30	2.45	12:45	4.12
0:45	2.46	13:00	3.98
1:00	2.48	13:15	3.85
1:15	2.51	13:30	3.74
1:30	2.53	13:45	3.63
1:45	2.55	14:00	3.54
2:00	2.58	14:15	3.46
2:15	2.61	14:30	3.39
2:30	2.64	14:45	3.32
2:45	2.67	15:00	3.26
3:00	2.71	15:15	3.20
3:15	2.74	15:30	3.15
3:30	2.79	15:45	3.10
3:45	2.83	16:00	3.05
4:00	2.88	16:15	3.01
4:15	2.94	16:30	2.97
4:30	3.00	16:45	2.93
4:45	3.07	17:00	2.90
5:00	3.15	17:15	2.87
5:15	3.23	17:30	2.84
5:30	3.33	17:45	2.81
5:45	3.45	18:00	2.78
6:00	3.59	18:15	2.76
6:15	3.75	18:30	2.73
6:30	3.94	18:45	2.71
6:45	4.18	19:00	2.69
7:00	4.49	19:15	2.67
7:15	4.89	19:30	2.65
7:30	5.43	19:45	2.63
7:45	6.20	20:00	2.61
8:00	7.41	20:15	2.59
8:15	9.56	20:30	2.57
8:30	14.29	20:45	2.56
8:45	32.01	21:00	2.54
9:00	145.13	21:15	2.53
9:15	48.51	21:30	2.51
9:30	23.13	21:45	2.50
9:45	15.08	22:00	2.49
10:00	11.35	22:15	2.47
10:15	9.23	22:30	2.46
10:30	7.88	22:45	2.45
10:45	6.94	23:00	2.44
11:00	6.25	23:15	2.43
11:15	5.73	23:30	2.42
11:30	5.32	23:45	2.41
11:45	4.99	0:00	0.00
12:00	4.72		

APPENDIX C

Reference Material

1. Agricultural Drain Components: *OMAFRA Design and Construction Guidelines, June 1986 – Page 14*
2. MNRF River & Stream Systems: Flooding Hazard Limit Technical Guide dated 2002 – Page 42: Rainfall Distributions (Table D-6)
3. MTO Road Surface Drainage Systems: *MTO Drainage Design Standards, January 2008 – SD-1*
4. MTO Bridge and Culvert Crossings: *MTO Drainage Design Standards, January 2008 – WC1*
5. Temporary Works during Construction: *MTO Drainage Design Standards, January 2008 – TW-1*
6. City of Pickering Drawing P-1007 – Stormwater Management Pond Warning Sign
7. Radar Rainfall Maps: Figures 1 & 2
8. Environment Canada IDF Data: Windsor A, Harrow CDA & Point Pelee CS Stations
9. MNRF River & Stream Systems: Flooding Hazard Limit Technical Guide dated 2002 – Page 27a: Flood Plain Stability Charts (Figure 6-2)

Table 1. Recommended Criteria for the Design of Agricultural Drain Components.

Component	Recommended Design Criteria	Method
Open Channel - Low hazard, flooding could wash out culverts, erode field corners, cause minor damage or interruption to farm operations.	2 year storm	In flat lands, average slope less than 0.5% use Agricultural curves. In rolling lands average slope more than 0.5% use Rational Method or SCS peak flow method.
Field culverts - low hazard, flooding could erode driving surface	2 year storm	Rational Method[b].
Residence or major agricultural culverts - low hazard, flooding could wash out culvert, isolate farm residence or farm commercial operation	5-10 year storm	Rational Method[b].
Township road culvert - replacement[a]	5-10 year storm	Rational Method[b].
County Road culvert replacement[a]	10-25 year storm	Rational Method[b].
MTC highway culvert - replacement[a]	see Table 2	Rational Method[b]. If area exceeds 25 km^2 use MTC Index Flood Method or hydrologic model.

[a] Obtain Road Authority's current criteria prior to design.
[b] Other hydrologic design methods may be used where appropriate.

TABLE D-6
RAINFALL DISTRIBUTIONS (PERCENT)

Type	Reference	Storm Duration	HOURS											
			1	2	3	4	5	6	7	8	9	10	11	12
Probable Maximum Storm	Small Dams	6 Hour	8	9	11	49	15	8	-	-	-	-	-	-
HAZEL	Ministry of Natural Resources	12 Hour	3	2	3	6	8	6	11	6	6	25	18	6
TIMMINS	Ministry of Natural Resources	12 Hour	8	10	6	1	3	10	23	10	12	6	7	4
Return Period Storms	SCS II	24 Hour 2 Hour Increment	2	3	3	4	6	48	16	6	4	3	3	2
	AES, 30% Southern Ontario	12 Hour	15	25	22	14	12	8	9	1	0	0	0	0
	AES, 30% Northern Ontario	12 hour	8	17	15	14	18	14	6	3	3	1	1	0
	AES, 70% Southern Ontario	12 hour	3	5	7	10	14	10	12	11	9	9	5	5
	AES, 70% Northern Ontario	12 Hour	3	5	7	10	13	12	8	10	11	11	5	5

Note: A.E.S. 30% distributions represent 70% of all storms for which the accumulated hourly rainfall was equal or less than shown. Consequently, only 30% of the storms had higher accumulated rainfall.

SD –1 Design Flows for Surface Drainage Systems

SCOPE

This standard identifies the minimum Design Flows that shall be used for the sizing of road surface drainage systems. The selected Design Flow shall be applied to size the minor and major drainage systems (piped and surface flow) for various MTO road types. This standard provides the hydrologic basis for all Surface Drainage Standards (SD-2 to SD-13).

DESIGN REFERENCES

MTO Drainage Management Manual (1997), Chapter 3.

1. HYDROLOGY

1.1 Design Flows

Design Flows for the Minor and Major highway drainage systems are as follows:

Design Flow for Minor System and Major System		
Functional Road Classifications	**Drainage System Type**	**Design Flow**
Freeway Arterial (Urban)	Minor System	10-Year
	Major System	100- Year
Arterial (Rural) Collector (Urban and Rural)	Minor System	10-Year
	Major System	100-Year
Local Road (Urban and Rural)	Minor System	5-Year
	Major System	-
Depressed Roadways (see SD-7)	Minor System	25-Year
	Major System	100-Year

1.2 Local External Catchment Areas Draining to the Highway Right-of-Way (Proposed Highway)

1.2.1 Either an overland flow route (swale, ditch or realigned watercourse) or a storm sewer system shall convey the external runoff from the point of interception to the receiving watercourse.

1.2.2 For a proposed highway, the capacity of the conveyance system shall be sufficient to convey the Major System Design Flow.

1.2.3 For an existing highway subject to modification, the capacity of the conveyance system shall be sufficient to ensure the following:

- No increase in flood risk to properties, adjacent to the highway right-of-way including significant natural areas/habitats; and
- The design of the overland flow route adheres to the requirements for the design of Roadside Ditches (Standard SD-9).

2. HYDRAULICS

The hydraulic standards are addressed in Standards SD-2 to SD-13.

3. PHYSICAL CHARACTERISTICS

There are no Physical Characteristics specific to this Standard.

4. COMMENTARY

As part of the design process the following shall be addressed:

- Include downstream capacity constraints in the design of the Minor System and the Major System. The analysis should extend as far downstream as the change in flow may have an impact on downstream erosion potential or flood risk.
- Allow for future road widening when sizing the Minor System and the Major System.
- Include interception of groundwater as a component of the conveyed flows.
- Ensure that the drainage system accommodates conveyance of the Major System Design Flow.

WC-1 Design Flows (Bridges and Culverts)

SCOPE

This standard identifies the minimum Design Flows for the sizing of bridges and culverts for flow conveyance on Regulated and non-Regulated Watercourses. It also identifies the requirement for accommodating the Regulatory Flow on Regulated Watercourses, and for determining the maximum allowable increase in flood elevations upstream of a bridge or culvert. This standard provides the hydrologic basis for all water crossing standards, WC-1 to WC-13.

DESIGN REFERENCES

Canadian Highway Bridge Design Code (CHBDC, 2000).
Exceptions to the Canadian Highway Bridge Design Code, CAN/CSA-S6-00 For Ontario, June 2002

1. HYDROLOGY

This standard addresses the Design Flow requirements for standard road classifications and low volume roads.

1.1 Standard Road Classifications

1.1.1 As a minimum, bridges and culverts of Provincial Highways shall be designed to the criteria shown in the following table, except as outlined in Section 1.1.2 to Section 1.1.4 of this standard:

Design Flow Return Period for Bridges and Culverts - Standard Road Classifications

Functional Road Classification	Return Period of Design Flows (Years) [1,2,3]		Check Flow for Scour
	Total Span less than or equal to 6.0 m	Total Span greater than 6.0 m	
Freeway, Urban Arterial	50	100	130% of 100 year
Rural Arterial, Collector Road	25	50	115% of 100 year
Local Road	10	25	100% of 100 year

Note:
1. The listed design flows apply to roads under the jurisdiction of the Ministry of Transportation.
2. The Fish Passage Design Flow for culverts is defined in Standard WC-12 Fish Passage Requirements Through Culverts
3. Sometimes referred to as Normal Design Flow

1.1.2 On Regulated Watercourses the Regulatory Flow shall be calculated in all cases where Floodline Mapping is available, where there is a potential risk to public safety, or where there is potential damage to adjacent properties, as applied in Section 2.3 of this standard.

1.1.3 The criteria may be modified in exceptional cases, such as for unusually large structures, or for vital routes which must remain useable during Regulatory Flow conditions. Use of Regulatory Flow criteria in the latter case shall be justified by a cost-benefit analysis.

1.1.4 If the road classification is likely to be upgraded or downgraded within 5 years of construction, the Return Period shall be based on the future classification.

1.2 Low Volume Roads

Design Flow Return Periods for Bridges on Low Volume Roads were developed to achieve economies without compromising safety. These requirements apply only to bridges. Culverts shall be designed in accordance with Section 1.1 of this standard.

1.2.1 As a minimum, bridges shall be designed to accommodate the Design Flow without damage to the structure or approaches. Relief Flow over the road shall be in accordance with Standard WC-13 Relief Flow (Bridges and Culverts). Drainage facilities for Low Volume Roads shall be designed to the criteria shown in the following table, except as provided in Section 1.2.2 to 1.2.5 of this standard:

Design Flow Return Period for Bridges on Low Volume Roads

		Return Period of Design Flow (Years)[1,2]	
Road Function	**Vulnerability**	**Total Span less than or equal to 6.0 m**	**Total Span greater than 6.0 m**
Collector and Arterial	High	25	50
	Low	25	50
Local	High	10	25
	Low	10	25
Resource Access	High	5	10
	Low	5	10
Recreation	High	5	10
	Low	2	2

Notes:
[1] The listed design storms apply to roads under the jurisdiction of the Ministry of Transportation.
[2] Sometimes referred to as Normal Design Flow

1.2.2 The Check Flow need not be considered.

1.2.3 On Regulated Watercourses the Regulatory Flow shall be calculated in all cases where Floodline Mapping is available, where there is a potential risk to public safety, or where there is potential damage to adjacent properties, as applied in Section 2.3 of this standard.

1.2.4 Low water crossings, which accommodate the Design Flow but overtop during more severe flooding, may be considered as an alternative, but not for Collector or Arterial Roads.

1.2.5 The Return Period should be determined by the owner in order to establish the acceptable length of time the structure is impassable. Where required, approval shall be sought from other agencies having jurisdiction.

1.2.6 The hydrology criteria may be modified in exceptional cases, such as for unusually large structures or for vital routes which must remain useable during more severe storm conditions. Use of a more severe design storm in the latter case shall be justified by a cost-benefit analysis.

1.3 Channel Realignment or Diversion

Channel realignment or channel restoration upstream or downstream of a water crossing that will alter the storage or discharge characteristics upstream of the crossing, shall be designed to meet the design standards of the crossing. As a minimum the combined capacity of the watercourse and floodplain shall convey the 25-year Design Flow. The main channel is to be designed to a lower Design Flow such that a stable channel is maintained.

2. HYDRAULICS

2.1 Design Flow and Upstream Water Surface Elevations

The existing and proposed upstream water surface elevations shall be calculated for Design Flow identified in Sections 1.1.1 and 1.2.1 of this standard and shall be used for the design of the Water Crossing.

2.2 Range of Flows and Upstream Water Surface Elevations

The existing and proposed upstream water surface elevations shall be calculated for Design Flows with Return Periods ranging from 5 years to 100 years, where the estimated water surface elevations will be used for assessing impacts on Rating Curves upstream of the water crossing.

2.3 Regulatory Flow and Upstream Water Surface Elevations

The existing and proposed upstream water surface elevations shall also be calculated for Regulated Watercourses where the Regulatory Flow estimate is required.

2.4 Check Flow

The Return Period for the Check Flow is identified in Section 1.1.1 of this standard. The Check Flow shall be used for scour analysis to assess structural integrity where required.

2.5 Winter Flow Condition

The Winter Flow Depth shall be used to evaluate icing conditions where required.

3. PHYSICAL CHARACTERISTICS

There are no physical characteristic standards applicable to Design Flows (Bridges and Culverts).

4. COMMENTARY

- The decision whether there would be any risk to public safety or potential damage to adjacent properties as a result of change in flood elevations shall be determined in consultation with the Municipality, Conservation Authority or the Ministry of the Natural Resources given their responsibilities under the Conservation Authorities Act and Lakes and Rivers Improvement Act.
- In the case where a drainage system that is not subject to regulations for conveyance or flood protection (e.g. municipal drain) is being conveyed under the highway, the design approach shall be followed for the protection of the highway.

- Where, through consultation with the Conservation Authority and/or MNR, there is an increase in flood elevation on private land that will adversely impact the landowners, an agreement will be made with the affected landowners.
- Design Flows for water crossings shall normally be based on existing runoff conditions, but, at the request of the municipality concerned, and subject to the Ministry's cost sharing policies, may be based on runoff conditions anticipated 20 years from the time of design.
- Upstream water surface elevations are calculated for all design storms in recognition that any increase in flood elevation may represent an increase in flood risk.
- Assessment of the Check Flow is not normally required if the structure is designed to the larger Regulatory Flow criteria.
- Performance of culverts on fish migration routes shall be checked with the Standard WC-12, Fish Passage through Culverts.
- The calculation of upstream elevations for a range of Design Flows under existing and proposed conditions is to be used to evaluate the impact of the structure on the upstream Rating Curve. If there is a negative impact, based upon the effect on private property or drainage systems, it may be necessary to change the proposed opening size to mitigate potential impacts.

TW-1 - Return Period of Design Storms for Temporary Works

SCOPE

This standard identifies the return periods for the sizing of temporary drainage facilities (e.g. bridges, culverts, diversion channels and diversion pipes) during construction. It also includes the return period associated with the design of temporary erosion control basins.

DESIGN REFERENCES

MTO Drainage Management Manual (1997), Chapter 6

1. HYDROLOGY

The Return Period for the design of drainage measures required during construction shall be assessed independently for each project. The contributing factors affecting the choice of a Return Period depend on the length of the construction period and include the potential consequences in terms of public safety, traffic delays, property damage due to flooding, and environmental impacts.

1.1 Consequence of Failure or Capacity Exceedance Definitions

The following definitions apply to assessing the consequence of failure or capacity exceedance from the perspective of Public Safety, Traffic Delays, Damage due to Flooding, and Natural Habitat Impacts.

- Low:
  - Public Safety – failure or capacity exceedance is not a significant risk to public safety
  - Traffic Delays – there would be no significant traffic delays as there are alternative routes
  - Damage due to Flooding –flooding would be local or would be limited to unimproved rural lands that would not be adversely affected by the flooding
  - Natural Habitat Impacts – any impacts will be temporary (i.e. fish habitat not permanently affected and vegetation damage will generally recover within two growing seasons)
- Medium:
  - Public Safety – failure or capacity exceedance is not a greater risk to public safety
  - Traffic Delays – there may be road closure causing delay or detouring (nuisance)
  - Damage due to Flooding – land uses such as croplands or parking will be flooded
  - Natural Habitat Impacts – temporary impacts anticipated that may take more than two growing seasons to recover
- High:
  - Public Safety –failure or capacity exceedance represents a significant risk to public safety
  - Traffic Delays – road closure causing significant impact on traffic or emergency vehicles
  - Damage due to Flooding – buildings will be flooded
  - Natural Habitat Impacts – permanent damage anticipated, requiring mitigation and/or habitat compensation

For each type of measure (e.g. culvert, by-pass channel) the consequence of failure or capacity exceedance shall be determined for each of the four categories (Public Safety, Traffic Delays, Damage due to Flooding, Natural Habitat Impacts). The worst case impact (low, medium, high) from the four categories shall be used for selecting the Return Period that shall guide design.

1.2 Return Period for Bridges Culverts, Diversion Channels and Diversion Pipes

The minimum Return Period for temporary drainage works shall be as follows.

Minimum Minor Return Period For Temporary Drainage Works			
Duration of Construction	**Return Period (Years)**		
	Consequence:		
	Low	**Medium**	**High**
Less than 2 months	2	2	2
Up to 4 months	2	5	5
Up to 8 months	5	5	10
Up to 12 months	5	5	20
Up to 18 months	5	10	25
Greater than 18 months	10	10	25

1.3 Return Period for Temporary Erosion Control Basins

A 25 mm design storm with a duration of three hours shall be used to size temporary erosion control basins.

2. HYDRAULICS

There are no standards specific to Hydraulics.

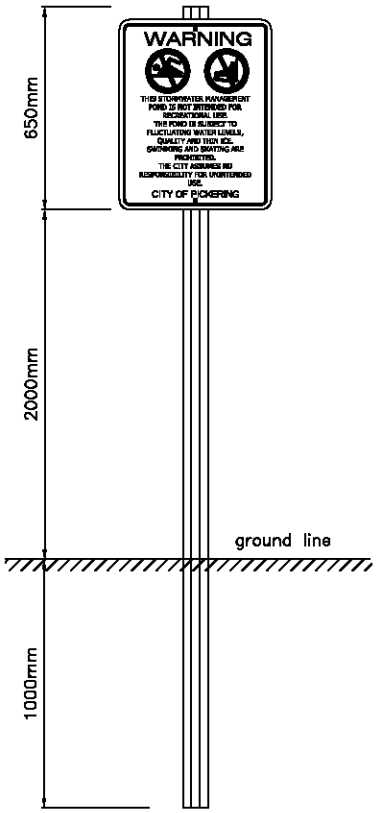
3. PHYSICAL CHARACTERISTICS

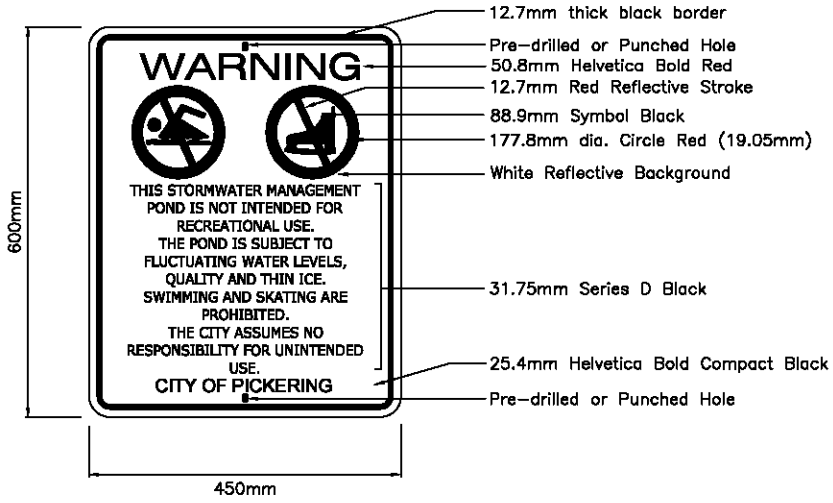
Temporary Erosion Control Basins shall be sized to include both a Permanent Pool and Live Storage. The Permanent Pool shall have a capacity of 125 cubic metres per hectare of upstream catchment area, while the Live Storage shall be large enough to contain the runoff generated by the 25 mm design storm noted in Standard TW-1 (1.3).

4. COMMENTARY

- This standard does not apply where dam and pump methodologies are used to divert streamflow from a construction site.
- The following table illustrates the method of determining the consequence of failure or capacity exceedance. The Worst Case from Column 1 to 4 will be used for establishing the Return Period for temporary drainage works.

Typical Measures	Consequences				
	Public Safety (1)	**Traffic Delays (2)**	**Damage due to Flooding (3)**	**Natural Habitat Impacts (4)**	**Worst Case from Column 1 to 4**
Temporary Culvert/Bridge	LOW	MEDIUM	LOW	LOW	MEDIUM
Diversion Channel	LOW	LOW	HIGH	MEDIUM	HIGH
Note: The above ratings are for illustrative purposes only.					





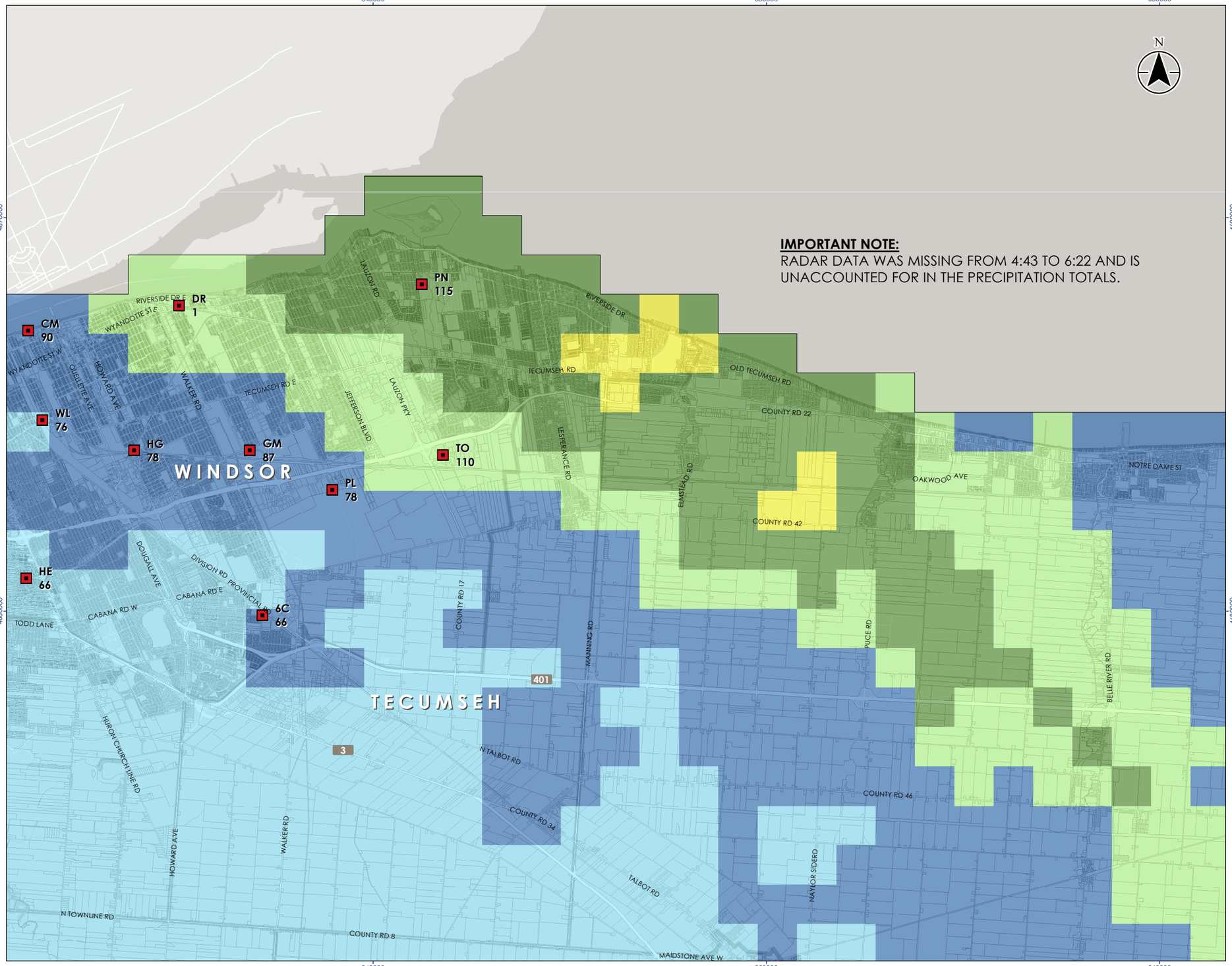
SIGN REQUIREMENTS
SIGN(S) MUST BE PLACED AT ALL POND ENTRANCES.

SIGNAGE FACE
SIGN(S) TO BE MANUFACTURED USING REFLECTIVE FINISH (ENGINEER GRADE)
1/8" THICK ALUMINUM PANEL (2" RADIUS CORNERS), WITH TOP AND BOTTOM MOUNT HOLES.

MOUNTING
SIGN(S) TO BE MOUNTED TO 3.65m U–CHANNEL GALVANIZED STEEL POST.

All dimensions are in millimetres unless otherwise noted.

City of Pickering	Planning & Development Department	
DRAWN P. HELGESEN	STORMWATER MANAGEMENT POND WARNING SIGN	REVISION NO.
APPROVED		DATE
DATE JANUARY 2012		P–1007



Stantec

Legend

- Analysis Area
- Rain Gauge and Observed Precipitation Amount (mm)

Precipitation (mm)

- 175 - 206
- 150 - 175
- 125 - 150
- 100 - 125
- 75 - 100
- 50 - 75
- 25 - 50

< 25 mm not shown

Rain Gauge Key

6C	6th Concession PS
AM	Ambassador PS
CM	CMH Woods PS
DR	Drouillard PS
GM	Grand Marais PS
GMr	Grand Marais @ Rankin
HE	Huron Estates PS
HG	Howard Grade Separation PS
LE	Leffler PS
LR	Lou Romano WRP
PL	Pillette PS
PN	Pontiac PS
TO	Twin Oaks PS
WL	Wellington PS

0 2 4 km

1:100,000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2016.
3. Rainfall amounts shown are estimated from uncalibrated radar rainfall data and may not accurately represent the actual amount of rainfall that occurred. Radar data was obtained from the National Centers for Environmental Information (NCEI), NEXRAD Level-III Digital Precipitation Rate (DPR) product, Detroit, Michigan radar station (Station ID: KDTX).

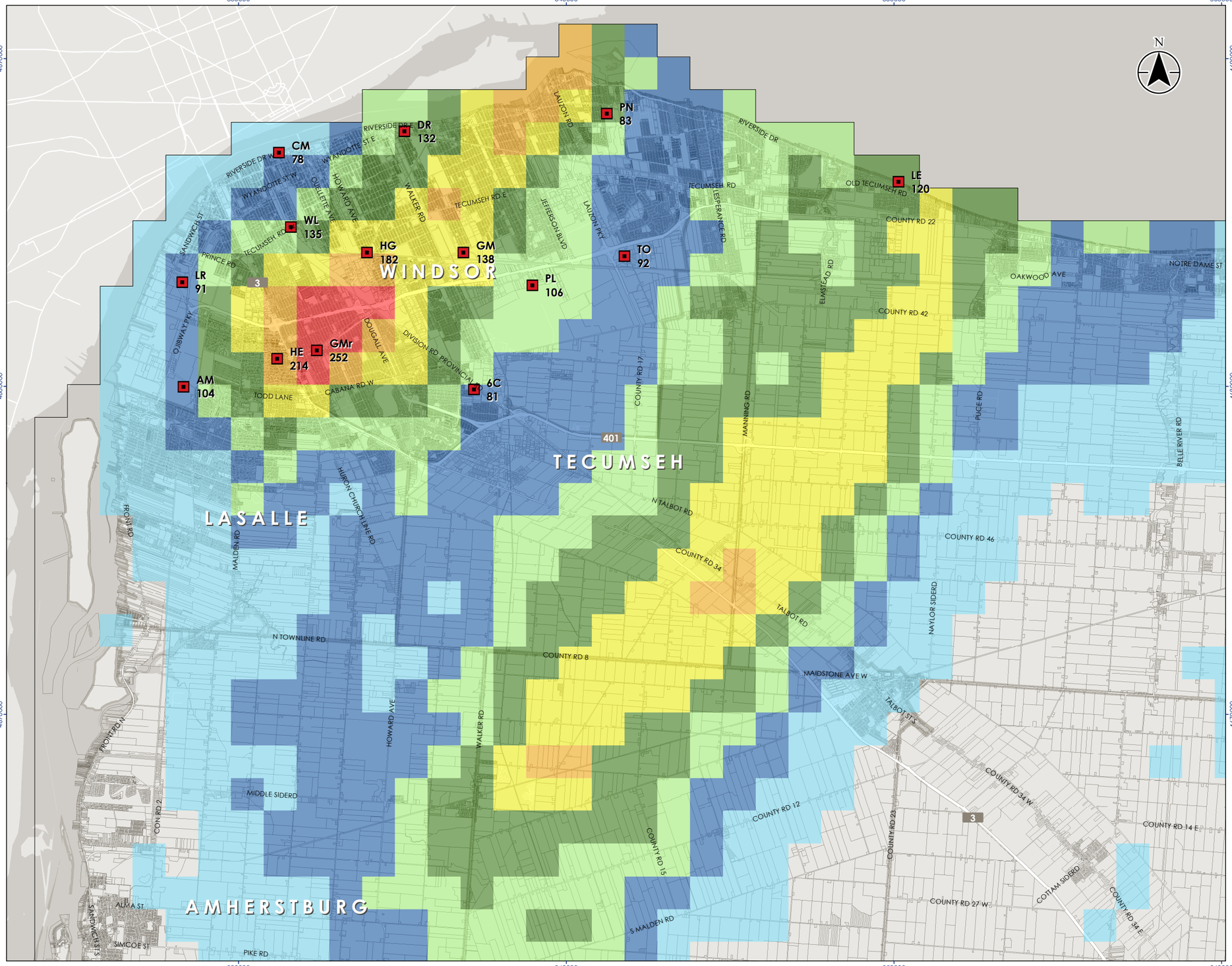
Project Location
Essex County

Prepared by KDB on 2017-10-10

Project
UNCALIBRATED RADAR ANALYSIS

Figure No.
1

Title
24-Hour Rainfall Amounts
Sept. 28 & Sept. 29, 2016; 18:00 to 18:00



Stantec

Legend

- Analysis Area
- Rain Gauge and Observed Precipitation Amount (mm)

Precipitation (mm)

- 175 - 206
- 150 - 175
- 125 - 150
- 100 - 125
- 75 - 100
- 50 - 75
- 25 - 50

< 25 mm not shown

Rain Gauge Key

6C	6th Concession PS
AM	Ambassador PS
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GMr	Grand Marais @ Rankin
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HG	Howard Grade Separation PS
LE	Leffler PS
LR	Lou Romano WRP
PL	Pillette PS
PN	Pontiac PS
TO	Twin Oaks PS
WL	Wellington PS

0 2 4 km

1:120,000 (At original document size of 11x17)

Notes

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Project Location
Essex County

Prepared by KDB on 2017-10-10

Project
UNCALIBRATED RADAR ANALYSIS

Figure No.
2

Title
24-Hour Rainfall Amounts
Aug. 28 & Aug. 29, 2017; 17:30 to 17:30

idf_v2-2_2012_02_09_613_ON_6139525_WINDSOR_A.txt
Environment Canada/Environnement Canada

Short Duration Rainfall Intensity-Duration-Frequency Data
Données sur l'intensité, la durée et la fréquence des chutes de pluie de courte durée

Gumbel - Method of moments/Méthode des moments

2012/02/09

==========

WINDSOR A ON 6139525

Latitude: 42 17'N Longitude: 82 58'W Elevation/Altitude: 189 m

Years/Années : 1946 - 2007 # Years/Années : 60

==========

****

Table 1 : Annual Maximum (mm)/Maximum annuel (mm)

****

Year / Année	5 min	10 min	15 min	30 min	1 h	2 h	6 h	12 h	24 h
1946	10.7	14.2	15.0	22.6	29.0	42.7	46.2	49.3	54.9
1947	9.7	18.8	23.4	27.9	37.8	38.1	54.4	61.0	71.4
1948	7.1	7.9	9.9	11.7	15.0	16.0	30.7	40.1	44.2
1949	11.9	19.3	22.4	29.0	47.0	51.8	54.1	57.9	71.6
1951	5.8	8.9	13.2	18.5	26.9	34.3	38.1	44.7	53.8
1952	7.4	13.2	15.0	19.0	30.7	37.1	43.9	46.7	47.0
1953	20.1	20.8	21.1	32.5	40.6	51.1	52.3	54.9	55.1
1954	8.9	13.7	16.0	20.6	24.6	27.4	52.1	66.3	67.3
1955	8.4	9.4	12.4	18.8	21.3	34.0	41.7	41.9	60.2
1956	8.4	11.7	12.2	15.5	23.4	30.7	35.6	39.9	44.2
1957	10.9	19.8	26.7	46.5	52.8	57.4	96.8	100.3	100.3
1958	7.9	11.7	11.9	15.0	23.1	29.5	35.1	38.9	40.4
1959	11.7	16.3	17.5	21.3	21.6	34.0	40.6	60.5	65.5
1960	7.6	10.7	12.4	16.8	29.5	34.5	36.6	43.9	54.4
1961	11.7	17.3	22.6	35.8	38.1	43.2	43.2	43.2	45.7
1962	14.0	21.8	24.4	34.0	54.6	64.3	64.8	64.8	64.8
1963	13.0	20.1	27.2	40.9	43.9	45.0	45.0	45.0	56.9
1964	13.2	17.5	22.4	27.2	27.2	28.7	33.5	36.6	39.4
1965	7.9	12.7	13.7	15.7	22.6	27.2	32.8	55.1	58.9
1966	14.5	18.8	23.1	32.5	33.0	47.0	57.1	64.5	67.3
1967	13.7	20.1	21.8	24.9	26.4	26.4	41.1	62.2	72.6
1968	10.2	15.2	17.5	25.9	36.8	38.1	60.2	77.2	78.2
1969	11.2	19.0	20.8	27.7	27.7	36.1	57.1	57.1	57.1

1970	9.4	12.2	16.5	17.0	22.6	29.5	29.7	36.6	39.6
1971	9.4	17.8	25.7	35.1	35.1	35.1	43.9	43.9	43.9
1972	9.9	12.2	14.5	19.6	25.9	28.7	31.0	31.2	39.1
1973	12.7	18.0	22.6	27.9	30.0	30.2	33.5	37.8	40.4
1974	15.0	26.2	39.4	41.1	45.0	49.5	49.8	49.8	49.8
1975	8.4	14.2	21.1	24.9	25.1	31.7	40.6	44.7	52.8
1976	9.1	13.2	14.0	16.5	22.9	27.4	34.3	35.3	40.4
1977	7.1	10.9	14.0	16.5	25.4	29.2	29.2	31.7	41.4
1978	8.8	10.5	11.8	20.4	21.1	21.1	22.5	28.6	31.0
1979	10.4	16.6	24.9	32.0	48.3	52.6	55.3	60.8	61.2
1980	14.1	17.2	25.0	35.6	45.3	45.6	46.3	79.8	80.0
1981	-99.9	16.7	23.3	26.0	32.0	45.6	77.3	81.7	92.3
1982	7.7	10.7	13.2	18.9	27.3	28.3	28.3	40.4	49.9
1983	15.0	16.5	22.1	32.3	38.7	45.4	62.1	62.1	82.0
1984	6.0	8.8	11.3	17.5	17.7	21.0	32.6	34.9	37.2
1985	11.2	13.3	13.9	18.7	24.6	39.6	58.4	59.2	59.2
1986	8.0	12.7	18.0	19.4	20.7	32.0	37.7	47.7	88.6
1987	11.9	16.5	19.8	24.5	29.9	36.1	39.1	41.6	52.8
1988	7.0	8.8	12.5	12.7	12.9	14.4	28.0	32.3	33.0
1989	7.4	11.9	17.5	21.2	27.0	36.3	48.3	61.7	71.8
1990	11.4	16.0	18.8	20.5	22.4	26.4	41.9	52.2	70.6
1991	5.6	9.6	12.9	25.7	37.2	40.5	40.5	40.7	43.2
1992	6.5	9.8	12.0	16.9	25.7	29.8	34.4	34.4	45.8
1993	7.0	9.6	10.5	11.2	17.2	23.9	28.7	30.6	44.7
1994	8.3	11.3	14.6	23.8	30.0	43.2	51.3	51.5	80.7
1995	9.7	17.2	24.3	40.5	56.7	58.9	63.0	63.0	63.6
1996	13.5	15.4	16.8	18.7	18.7	19.1	40.2	40.4	46.3
1997	7.9	11.5	15.6	17.5	21.8	30.6	38.2	39.9	41.7
1998	7.3	12.7	13.9	15.7	16.4	26.8	31.4	36.2	57.4
1999	9.3	13.3	16.5	20.8	21.0	22.2	23.4	24.8	29.8
2000	7.6	11.2	13.1	20.4	26.4	31.0	51.8	89.0	94.6
2001	6.1	10.2	12.2	12.8	14.3	17.2	24.1	38.1	48.4
2002	6.9	9.1	10.8	14.4	17.2	17.4	29.6	31.7	43.2
2003	7.2	10.0	12.2	14.4	14.8	14.8	22.7	33.5	34.6
2004	13.3	15.7	18.6	20.4	22.1	33.2	35.8	37.3	53.7
2005	10.5	16.9	24.0	25.8	26.0	26.0	29.8	30.6	41.2
2006	10.6	18.3	23.6	26.6	35.7	51.3	53.1	53.3	66.9
2007	8.0	15.1	18.7	30.9	48.6	48.8	50.4	55.8	57.6
# Yrs. Années	60	61	61	61	61	61	61	61	61
Mean Moyenne	9.9	14.4	17.9	23.5	29.2	34.7	42.8	48.8	56.1
Std. Dev. Écart-type	2.9	4.0	5.6	8.1	10.6	11.4	13.8	15.7	16.5
Skew. Dissymétrie	0.96	0.47	0.99	0.81	0.85	0.42	1.23	1.07	0.74
Kurtosis	4.27	2.90	4.84	3.21	3.19	2.88	5.84	4.28	3.13

*-99.9 Indicates Missing Data/Données manquantes

Warning: annual maximum amount greater than 100-yr return period amount
Avertissement : la quantité maximale annuelle excède la quantité pour une période de retour de 100 ans

Year/Année	Duration/Durée	Data/Données	100-yr/ans
1953	5 min	20.1	18.9
1957	6 h	96.8	86.2
1957	12 h	100.3	98.0
1974	15 min	39.4	35.6

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Table 2a : Return Period Rainfall Amounts (mm)
Quantité de pluie (mm) par période de retour

****

Duration/Durée	2 yr/ans	5 yr/ans	10 yr/ans	25 yr/ans	50 yr/ans	100 yr/ans	#Years Années
5 min	9.4	11.9	13.6	15.8	17.4	18.9	60
10 min	13.7	17.2	19.5	22.5	24.6	26.8	61
15 min	17.0	22.0	25.3	29.5	32.5	35.6	61
30 min	22.2	29.4	34.1	40.1	44.6	49.0	61
1 h	27.5	36.9	43.1	50.9	56.7	62.5	61
2 h	32.8	42.9	49.6	58.1	64.3	70.6	61
6 h	40.5	52.8	60.8	71.1	78.6	86.2	61
12 h	46.2	60.1	69.2	80.8	89.4	98.0	61
24 h	53.4	68.0	77.6	89.8	98.9	107.9	61

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Table 2b :

Return Period Rainfall Rates (mm/h) - 95% Confidence limits
Intensité de la pluie (mm/h) par période de retour - Limites de confiance de 95%

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Duration/Durée	2 yr/ans	5 yr/ans	10 yr/ans	25 yr/ans	50 yr/ans	100 yr/ans	#Years Années
5 min	112.5	143.2	163.5	189.2	208.2	227.1	60
	+/- 8.1	+/- 13.6	+/- 18.3	+/- 24.7	+/- 29.6	+/- 34.5	60
10 min	82.3	103.3	117.3	134.8	147.9	160.8	61
	+/- 5.5	+/- 9.2	+/- 12.5	+/- 16.8	+/- 20.1	+/- 23.4	61
15 min	68.0	87.9	101.1	117.8	130.2	142.5	61
	+/- 5.2	+/- 8.8	+/- 11.8	+/- 16.0	+/- 19.1	+/- 22.2	61
30 min	44.4	58.7	68.2	80.2	89.1	98.0	61
	+/- 3.7	+/- 6.3	+/- 8.5	+/- 11.5	+/- 13.7	+/- 16.0	61
1 h	27.5	36.9	43.1	50.9	56.7	62.5	61
	+/- 2.4	+/- 4.1	+/- 5.6	+/- 7.5	+/- 9.0	+/- 10.4	61
2 h	16.4	21.5	24.8	29.0	32.2	35.3	61
	+/- 1.3	+/- 2.2	+/- 3.0	+/- 4.0	+/- 4.8	+/- 5.6	61

6 h	6.8	8.8	10.1	11.8	13.1	14.4	61
	+/- 0.5	+/- 0.9	+/- 1.2	+/- 1.6	+/- 1.9	+/- 2.3	61
12 h	3.9	5.0	5.8	6.7	7.5	8.2	61
	+/- 0.3	+/- 0.5	+/- 0.7	+/- 0.9	+/- 1.1	+/- 1.3	61
24 h	2.2	2.8	3.2	3.7	4.1	4.5	61
	+/- 0.2	+/- 0.3	+/- 0.4	+/- 0.5	+/- 0.6	+/- 0.7	61

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Table 3 : Interpolation Equation / Équation d'interpolation: R = A*T^B

R = Interpolated Rainfall rate (mm/h)/Intensité interpolée de la pluie (mm/h)
RR = Rainfall rate (mm/h) / Intensité de la pluie (mm/h)
T = Rainfall duration (h) / Durée de la pluie (h)

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Statistics/Statistiques	2 yr/ans	5 yr/ans	10 yr/ans	25 yr/ans	50 yr/ans	100 yr/ans
Mean of RR/Moyenne de RR	40.4	52.0	59.7	69.4	76.6	83.7
Std. Dev. /Écart-type (RR)	39.4	49.9	56.9	65.8	72.3	78.9
Std. Error/Erreur-type	10.8	15.0	17.8	21.3	24.0	26.6
Coefficient (A)	24.0	31.0	35.7	41.7	46.0	50.4
Exponent/Exposant (B)	-0.710	-0.709	-0.708	-0.707	-0.707	-0.706
Mean % Error/% erreur moyenne	9.9	11.4	12.0	12.6	13.0	13.3

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Environment Canada/Environnement Canada

Short Duration Rainfall Intensity-Duration-Frequency Data
Données sur l'intensité, la durée et la fréquence des chutes
de pluie de courte durée

Gumbel - Method of moments/Méthode des moments

2012/02/09

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HARROW CDA AUTO ON 6133362
(composite)
Latitude: 42 2'N Longitude: 82 54'W Elevation/Altitude: 191 m

Years/Années : 1966 - 2007 # Years/Années : 28

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Table 1 : Annual Maximum (mm)/Maximum annuel (mm)

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Year / Année	5 min	10 min	15 min	30 min	1 h	2 h	6 h	12 h	24 h
1966	11.9	18.3	20.3	32.0	33.0	39.4	74.7	114.0	121.4
1967	9.7	15.0	19.3	26.2	26.7	29.5	45.2	46.7	48.5
1969	13.5	21.1	25.4	49.0	58.4	61.5	61.5	66.3	68.8
1970	8.4	10.7	15.2	27.2	31.7	33.5	38.9	47.2	50.0
1971	10.2	10.9	14.2	21.6	27.4	28.4	29.7	29.7	33.8
1972	6.6	9.1	10.9	16.5	21.6	25.4	32.8	50.3	64.3
1973	5.1	6.3	8.6	14.5	27.7	35.8	50.8	56.4	56.9
1974	6.3	7.6	8.4	9.4	12.7	16.5	25.9	34.3	35.1
1976	4.6	6.3	8.1	9.9	15.5	15.7	32.0	37.6	38.9
1977	8.1	13.7	17.8	19.8	22.9	23.9	31.0	35.8	59.4
1978	6.0	12.0	15.6	21.2	21.3	21.3	26.7	33.3	35.2
1979	6.0	12.0	14.2	15.8	16.6	16.6	29.5	38.5	38.5
1980	13.0	19.4	23.3	29.9	37.2	39.7	39.8	48.5	56.8
1981	17.8	19.0	21.6	22.3	24.0	24.7	27.1	34.8	51.4
1982	10.8	16.8	23.7	26.0	29.0	29.0	29.0	37.2	37.2
1984	10.2	14.3	17.7	26.1	28.7	35.5	36.2	36.6	36.6
1985	10.2	17.2	20.8	26.7	26.8	26.9	28.6	30.8	53.2
1986	12.0	20.7	25.2	34.6	39.4	44.7	50.5	50.5	54.1
1987	8.5	12.8	16.9	20.2	31.3	38.6	60.6	82.7	89.6
1988	11.7	19.0	25.0	37.2	53.1	53.2	53.2	54.2	54.2
1989	8.7	17.2	24.7	37.6	49.6	80.0	133.6	187.7	263.2
2001	5.6	7.8	9.4	13.2	18.4	23.2	28.6	41.2	41.2
2002	6.4	10.8	12.6	14.2	16.0	16.2	28.8	37.4	38.8

2003	7.4	11.8	14.2	18.0	21.2	25.0	36.6	38.2	39.4
2004	8.4	11.8	12.8	22.2	29.4	39.6	42.4	42.4	42.4
2005	10.4	13.0	14.0	15.4	16.4	18.4	24.6	29.0	44.4
2006	10.0	14.8	20.0	27.0	33.2	33.4	33.8	34.0	45.8
2007	7.4	11.6	12.6	16.2	19.2	21.4	44.0	45.6	45.8
# Yrs. Années	28	28	28	28	28	28	28	28	28
Mean Moyenne	9.1	13.6	16.9	23.2	28.2	32.0	42.0	50.7	58.7
Std. Dev. Écart-type	3.0	4.3	5.5	9.2	11.3	14.6	21.9	32.2	44.1
Skew. Dissymétrie	0.83	0.07	0.06	0.84	1.15	1.60	2.99	3.34	4.05
Kurtosis	4.35	2.40	2.15	4.09	4.41	6.45	14.03	15.40	20.86

*-99.9 Indicates Missing Data/Données manquantes

Warning: annual maximum amount greater than 100-yr return period amount
Avertissement : la quantité maximale annuelle excède la quantité pour une période de retour de 100 ans

Year/Année	Duration/Durée	Data/Données	100-yr/ans
1989	2 h	80.0	77.9
1989	6 h	133.6	110.7
1989	12 h	187.7	151.7
1989	24 h	263.2	197.1

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Table 2a : Return Period Rainfall Amounts (mm)
Quantité de pluie (mm) par période de retour

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Duration/Durée	2 yr/ans	5 yr/ans	10 yr/ans	25 yr/ans	50 yr/ans	100 yr/ans	#Years Années
5 min	8.6	11.2	13.0	15.2	16.8	18.5	28
10 min	12.9	16.7	19.2	22.4	24.7	27.1	28
15 min	16.0	20.8	24.1	28.1	31.2	34.2	28
30 min	21.7	29.8	35.2	42.0	47.0	52.0	28
1 h	26.3	36.3	42.9	51.3	57.5	63.7	28
2 h	29.6	42.6	51.1	61.9	70.0	77.9	28
6 h	38.4	57.8	70.6	86.8	98.8	110.7	28
12 h	45.5	73.9	92.7	116.5	134.2	151.7	28
24 h	51.5	90.5	116.3	148.9	173.1	197.1	28

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Table 2b :

Return Period Rainfall Rates (mm/h) - 95% Confidence limits

Intensité de la pluie (mm/h) par période de retour - Limites de confiance de 95%

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Duration/Durée	2 yr/ans	5 yr/ans	10 yr/ans	25 yr/ans	50 yr/ans	100 yr/ans	#Years Années
5 min	103.4	135.0	155.9	182.4	202.0	221.5	28
	+/- 12.2	+/- 20.5	+/- 27.7	+/- 37.3	+/- 44.6	+/- 52.0	28
10 min	77.4	100.2	115.2	134.3	148.4	162.4	28
	+/- 8.8	+/- 14.7	+/- 19.9	+/- 26.9	+/- 32.1	+/- 37.4	28
15 min	63.9	83.4	96.3	112.6	124.6	136.6	28
	+/- 7.5	+/- 12.6	+/- 17.0	+/- 23.0	+/- 27.5	+/- 32.0	28
30 min	43.4	59.6	70.4	84.0	94.1	104.1	28
	+/- 6.2	+/- 10.5	+/- 14.2	+/- 19.2	+/- 22.9	+/- 26.7	28
1 h	26.3	36.3	42.9	51.3	57.5	63.7	28
	+/- 3.8	+/- 6.5	+/- 8.8	+/- 11.8	+/- 14.1	+/- 16.5	28
2 h	14.8	21.3	25.6	31.0	35.0	39.0	28
	+/- 2.5	+/- 4.2	+/- 5.7	+/- 7.6	+/- 9.1	+/- 10.6	28
6 h	6.4	9.6	11.8	14.5	16.5	18.5	28
	+/- 1.2	+/- 2.1	+/- 2.8	+/- 3.8	+/- 4.6	+/- 5.3	28
12 h	3.8	6.2	7.7	9.7	11.2	12.6	28
	+/- 0.9	+/- 1.5	+/- 2.1	+/- 2.8	+/- 3.3	+/- 3.9	28
24 h	2.1	3.8	4.8	6.2	7.2	8.2	28
	+/- 0.6	+/- 1.1	+/- 1.4	+/- 1.9	+/- 2.3	+/- 2.7	28

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Table 3 : Interpolation Equation / Équation d'interpolation: R = A*T^B

R = Interpolated Rainfall rate (mm/h)/Intensité interpolée de la pluie (mm/h)
RR = Rainfall rate (mm/h) / Intensité de la pluie (mm/h)
T = Rainfall duration (h) / Durée de la pluie (h)

****

Statistics/Statistiques	2 yr/ans	5 yr/ans	10 yr/ans	25 yr/ans	50 yr/ans	100 yr/ans
Mean of RR/Moyenne de RR	37.9	50.6	59.0	69.5	77.4	85.2
Std. Dev. /Écart-type (RR)	36.5	47.0	53.9	62.7	69.2	75.6
Std. Error/Erreur-type	10.8	11.4	12.2	13.4	14.3	15.3
Coefficient (A)	22.7	32.2	38.4	46.2	52.0	57.7
Exponent/Exposant (B)	-0.704	-0.653	-0.633	-0.617	-0.608	-0.601
Mean % Error/% erreur moyenne	9.7	8.2	7.7	7.4	7.2	7.1

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Environment Canada/Environnement Canada

Short Duration Rainfall Intensity-Duration-Frequency Data
Données sur l'intensité, la durée et la fréquence des chutes de pluie de courte durée

Gumbel - Method of moments/Méthode des moments

2012/02/09

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POINT PELEE CS ON 613P001
(composite)
Latitude: 41 57'N Longitude: 82 31'W Elevation/Altitude: 176 m

Years/Années : 1975 - 2004 # Years/Années : 22

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Table 1 : Annual Maximum (mm)/Maximum annuel (mm)

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Year / Année	5 min	10 min	15 min	30 min	1 h	2 h	6 h	12 h	24 h
1975	7.9	14.0	14.7	15.5	31.0	34.3	34.3	34.3	45.5
1976	9.1	13.2	17.0	20.8	22.4	32.3	37.8	48.3	49.3
1977	10.2	17.3	22.9	34.5	51.6	51.6	53.6	53.6	53.6
1978	4.6	9.1	11.4	16.0	16.0	21.2	23.9	34.5	37.0
1979	8.1	12.1	15.2	16.6	16.8	16.8	26.1	49.2	58.6
1980	11.7	17.8	18.8	25.7	35.0	37.3	41.6	41.8	70.9
1981	8.6	13.8	15.8	18.8	22.1	22.7	29.8	34.4	50.9
1982	13.4	18.8	24.9	33.8	34.7	35.9	35.9	36.4	36.4
1983	8.5	11.3	15.0	21.6	28.1	32.5	37.5	44.6	54.8
1984	12.5	17.2	18.7	19.9	22.2	25.7	29.4	33.0	33.0
1985	9.9	12.4	17.0	19.9	19.9	21.7	29.6	29.8	29.9
1986	7.4	9.9	13.3	21.9	24.0	37.7	48.2	48.4	51.0
1987	10.5	15.2	18.8	18.8	29.6	38.0	73.1	81.1	91.4
1988	7.7	9.6	10.6	13.4	15.6	18.8	29.5	37.0	40.0
1989	14.3	20.4	30.6	51.0	63.2	85.8	102.5	110.5	113.6
1990	12.2	14.1	16.7	23.3	36.7	50.5	77.9	106.3	106.4
1991	8.6	14.9	15.4	18.0	21.2	26.4	40.1	57.0	58.8
1992	6.9	9.4	12.5	22.2	36.5	55.0	75.7	83.4	85.8
1993	14.3	20.4	21.0	21.2	21.2	24.3	26.1	31.4	38.2
2002	17.6	22.4	23.2	23.4	23.4	30.2	41.8	49.0	51.6
2003	7.6	8.6	9.6	12.6	15.6	20.8	49.4	56.0	56.0
2004	13.0	19.2	23.6	41.8	61.0	63.4	65.4	65.4	72.6

# Yrs. Années	22	22	22	22	22	22	22	22	22
Mean Moyenne	10.2	14.6	17.6	23.2	29.4	35.6	45.9	53.0	58.4
Std. Dev. Écart-type	3.1	4.1	5.2	9.3	13.7	16.8	20.8	23.2	23.0
Skew. Dissymétrie	0.56	0.22	0.70	1.73	1.38	1.51	1.29	1.40	1.12
Kurtosis	3.39	2.34	3.75	6.19	4.59	5.76	4.43	4.56	3.93

*-99.9 Indicates Missing Data/Données manquantes

****

Table 2a : Return Period Rainfall Amounts (mm)
Quantité de pluie (mm) par période de retour

****

Duration/Durée	2 yr/ans	5 yr/ans	10 yr/ans	25 yr/ans	50 yr/ans	100 yr/ans	#Years Années
5 min	9.7	12.4	14.2	16.5	18.2	19.9	22
10 min	13.9	17.6	20.0	23.0	25.3	27.5	22
15 min	16.7	21.3	24.3	28.1	31.0	33.8	22
30 min	21.7	29.9	35.4	42.3	47.4	52.5	22
1 h	27.2	39.3	47.4	57.5	65.1	72.5	22
2 h	32.8	47.7	57.5	70.0	79.2	88.4	22
6 h	42.5	60.8	73.0	88.4	99.8	111.1	22
12 h	49.2	69.7	83.2	100.3	113.1	125.7	22
24 h	54.6	75.0	88.5	105.5	118.1	130.7	22

****

Table 2b :

Return Period Rainfall Rates (mm/h) - 95% Confidence limits
Intensité de la pluie (mm/h) par période de retour - Limites de confiance de 95%

****

Duration/Durée	2 yr/ans	5 yr/ans	10 yr/ans	25 yr/ans	50 yr/ans	100 yr/ans	#Years Années
5 min	116.4	149.2	170.8	198.2	218.6	238.7	22
	+/- 14.2	+/- 23.9	+/- 32.3	+/- 43.6	+/- 52.2	+/- 60.8	22
10 min	83.5	105.4	119.9	138.2	151.7	165.2	22
	+/- 9.5	+/- 16.0	+/- 21.6	+/- 29.1	+/- 34.8	+/- 40.6	22
15 min	66.9	85.2	97.3	112.5	123.8	135.1	22
	+/- 7.9	+/- 13.3	+/- 18.0	+/- 24.3	+/- 29.1	+/- 33.9	22
30 min	43.4	59.9	70.8	84.6	94.8	105.0	22
	+/- 7.2	+/- 12.1	+/- 16.3	+/- 22.0	+/- 26.3	+/- 30.6	22

1 h	27.2	39.3	47.4	57.5	65.1	72.5	22
	+/- 5.3	+/- 8.9	+/- 12.0	+/- 16.2	+/- 19.3	+/- 22.5	22
2 h	16.4	23.8	28.8	35.0	39.6	44.2	22
	+/- 3.2	+/- 5.4	+/- 7.3	+/- 9.9	+/- 11.8	+/- 13.8	22
6 h	7.1	10.1	12.2	14.7	16.6	18.5	22
	+/- 1.3	+/- 2.2	+/- 3.0	+/- 4.1	+/- 4.9	+/- 5.7	22
12 h	4.1	5.8	6.9	8.4	9.4	10.5	22
	+/- 0.7	+/- 1.2	+/- 1.7	+/- 2.3	+/- 2.7	+/- 3.2	22
24 h	2.3	3.1	3.7	4.4	4.9	5.4	22
	+/- 0.4	+/- 0.6	+/- 0.8	+/- 1.1	+/- 1.4	+/- 1.6	22

****

Table 3 : Interpolation Equation / Équation d'interpolation: R = A*T^B

R = Interpolated Rainfall rate (mm/h)/Intensité interpolée de la pluie (mm/h)
RR = Rainfall rate (mm/h) / Intensité de la pluie (mm/h)
T = Rainfall duration (h) / Durée de la pluie (h)

****

Statistics/Statistiques	2 yr/ans	5 yr/ans	10 yr/ans	25 yr/ans	50 yr/ans	100 yr/ans
Mean of RR/Moyenne de RR	40.8	53.5	62.0	72.6	80.5	88.4
Std. Dev. /Écart-type (RR)	40.3	50.8	57.8	66.7	73.3	79.8
Std. Error/Erreur-type	9.0	12.8	15.4	18.7	21.1	23.6
Coefficient (A)	24.3	33.1	38.8	46.1	51.5	56.8
Exponent/Exposant (B)	-0.704	-0.684	-0.675	-0.667	-0.663	-0.660
Mean % Error/% erreur moyenne	8.3	10.9	12.3	13.6	14.3	14.9

FIGURE 6-1: FLOOD PLAIN STABILITY CHART FOR HUMANS – 1

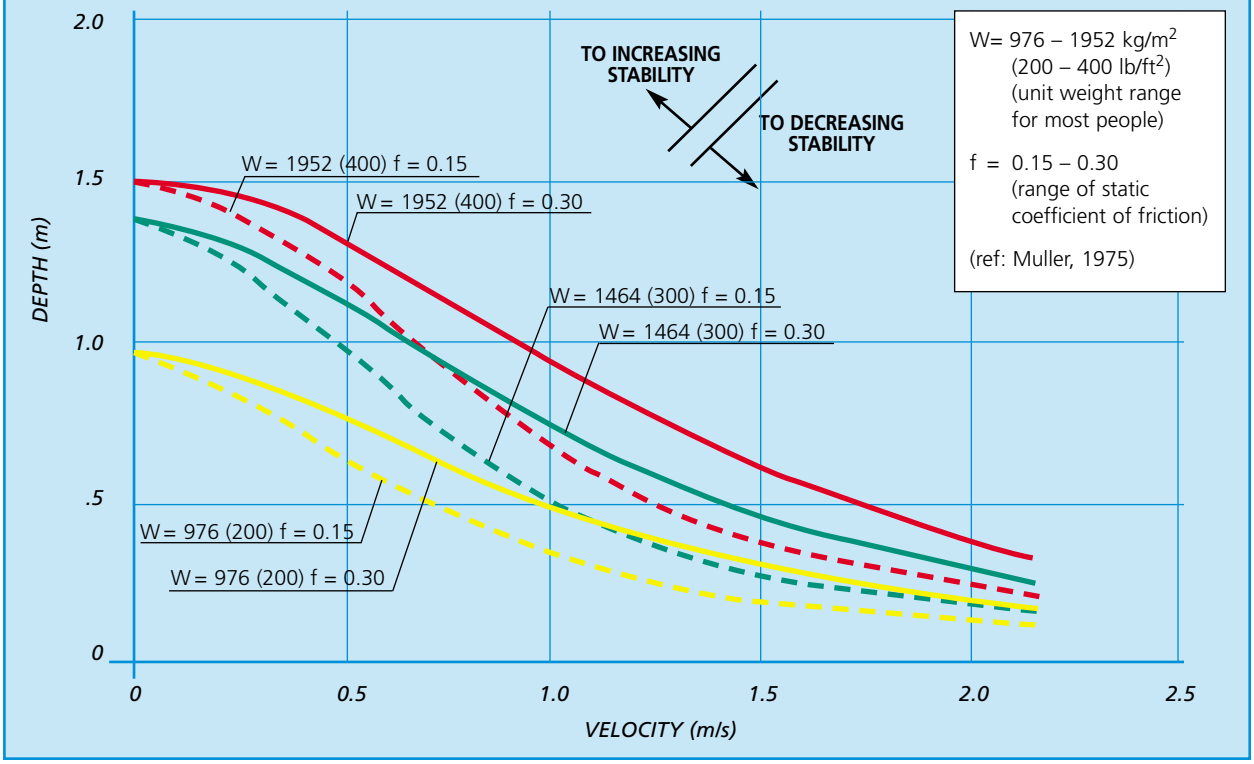
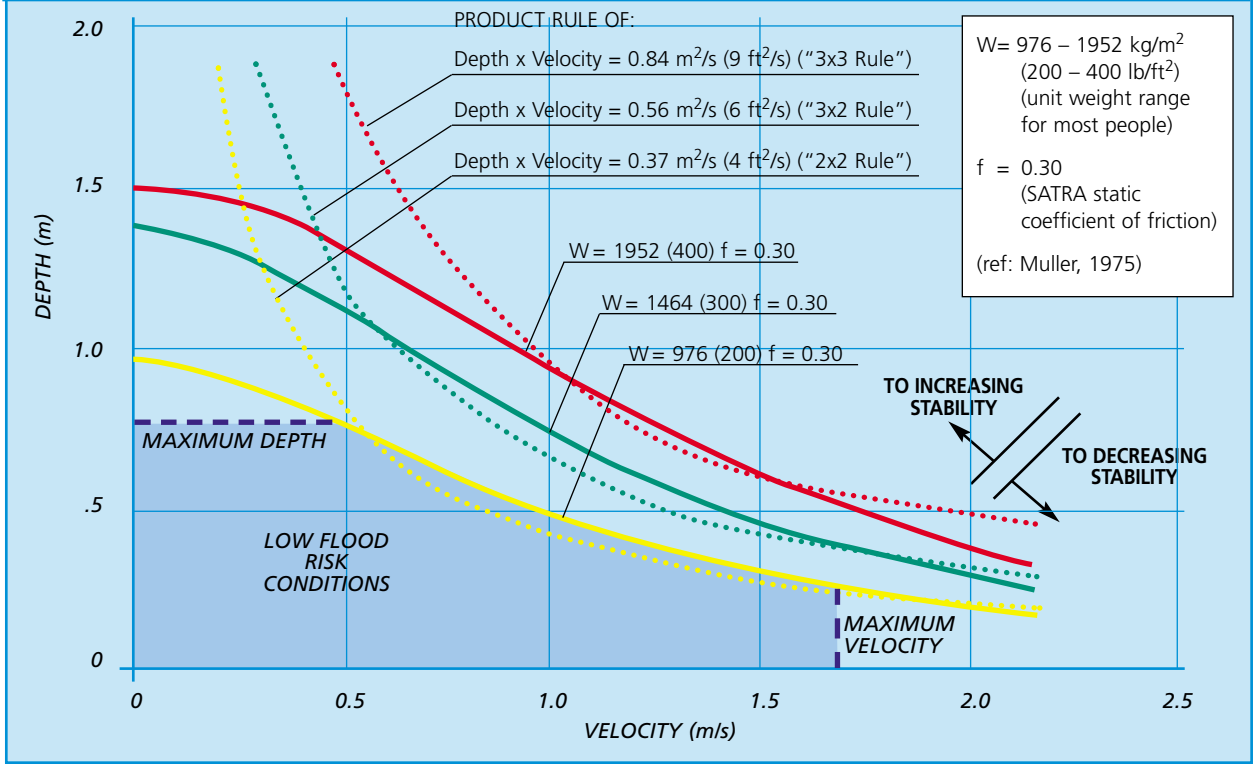


FIGURE 6-2: FLOOD PLAIN STABILITY CHART FOR HUMANS – 2



Report to Council

Department:	Infrastructure Services
Division:	Drainage
Date:	April 20, 2020
Prepared by:	Lindsay Dean, Drainage Superintendent
Report Number:	Drainage-2020-03
Subject:	Appointment of an Engineer under Section 78 of the Drainage Act to install a new culvert over the North Rear Road Drain South Side
Number of Pages:	3

Recommendation(s)

That Drainage-2020-03 entitled Appointment of an Engineer under Section 78 of the Drainage Act to install a new culvert over the North Rear Road Drain South Side prepared by Lindsay Dean, Drainage Superintendent dated April 20, 2020 be received, and

That Council appoint Rood Engineering Incorporated under Section 78 of the Drainage Act to install a new culvert over the North Rear Road Drain South Side.

Purpose

The Town of Essex has received a request to install a new culvert for Gerald Grondin over the North Read Road Drain South Side.

Background and Discussion

The North Rear Road Drain South Side runs along the south side of North Malden Road from Brush Road to Lot 6, North Malden Concession where it crosses under North Malden Road in a northwesterly direction to its outlet into the King Creek Drain.

Under Section 78 of the Drainage Act, Council may appoint an engineer to make repairs or improvements to existing municipal drains that have been passed under municipal by-law. The North Rear Road Drain South Side is a municipal drain that has been adopted by municipal by-law and any new culverts added to this municipal drain would qualify under this section of the act.

Prior to the appointment of an engineer, notice must be sent to the Conservation Authority and after 30 days an engineer may be appointed to this project. An engineer appointment under Section 78 of the Drainage Act, gives the engineer authority to review the drainage works and prepare a report outlining their recommendations.

The procedures and appeals under Section 78 are followed in the same manner as Petition Drains, Section 4 of the Drainage Act. The general procedure is as follows:

- Council appointment of an engineer to prepare a report;
- Conduct an on-site meeting with affected landowners;
- Meeting to consider the report and passing of the provisional by-law;
- Court of Revision;
- 3rd and Final Reading of the by-law;
- Construction of drainage works.

Schedule

Should Council approve to proceed with the report and appoint an Engineer, the estimated schedule will be as follows:

- Council approval and appointment of Engineer –May 2020
- On Site Meeting – June 2020

- Preparation of the Report – September 2020
- Submission of Report and notification period –October 2020
- Consideration of the Report by the Drainage Board –October 2020
- Provisional By-law and Adoption by Council – October 2020
- Court of Revision –November 2020
- 3rd and Final Reading of the By-law – December 2020
- Construction (dependent on weather and agency approvals)- Early 2021

Financial Impact

The landowner receiving the culvert will be responsible for all costs associated with the construction, engineering and incidental costs.

Link to Strategic Priorities

☒ Manage, invest and plan for sustainable municipal infrastructure which meets current and future needs of the municipality and its citizens.

☐ Create a safe, friendly and inclusive community which encourages healthy, active living for people of all ages and abilities.

☐ Provide a fiscal stewardship and value for tax dollars to ensure long-term financial health to the municipality.

☐ Manage responsible and viable growth while preserving and enhancing the unique rural and small town character of the community.

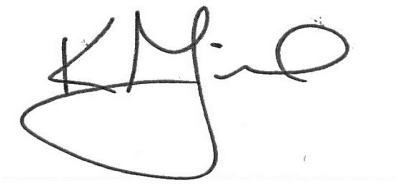
☐ Improve the experiences of individuals, as both citizens and customers, in their interactions with the Town of Essex.

Report Approval Details

Document Title:	Appointment of Engineer for North Rear Road Drain South Side New Culvert Installation.docx
Attachments:	
Final Approval Date:	Apr 14, 2020

This report and all of its attachments were approved and signed as outlined below:

Norm Nussio, Manager Operations and Drainage - Apr 14, 2020 - 12:13 PM



Kevin Girard, Director, Infrastructure Services - Apr 14, 2020 - 1:06 PM

Chris Nepszy, Chief Administrative Officer - Apr 14, 2020 - 2:28 PM

Report to Council

Department:	Corporate Services
Division:	Corporate Services
Date:	April 20, 2020
Prepared by:	Jeffrey R. Morrison, CGA, CPA, Director, Corporate Services
Report Number:	Corporate Services-2020-01
Subject:	Town of Essex Shoreline Assistance Loan Program
Number of Pages:	38

Recommendation(s)

That Corporate Services Report 2020-01 entitled Town of Essex Shoreline Assistance Loan Program prepared by Jeffrey R. Morrison, Director, Corporate Services dated April 20, 2020 be received,

That Council authorize the implementation of the Town of Essex Shoreline Assistance Loan Program (the "Program") and to further delegate to and authorize Administration to negotiate and enter into all Property Owner Agreements and to take such steps to give effect to same pursuant to the Program in substantially the same form and manner as the proposed or draft Property Owner Agreement attached hereto

That Council accordingly give three readings to By-law 1908, being a By-law to authorize the Town of Essex Shoreline Assistance Loan Program and the undertaking of flood and shoreline control/mitigation works on private residential property as Local improvements; and

That Administration come back to council with by-law(s) pertaining to Section 36 of Ontario Regulation 586/06 to authorize the imposition of said local improvement works as a "special

charge" on participating properties in accordance with the Program and the Property Owner Agreements.

Purpose

Council approval is required to initiate and enter into a local improvement program. As outlined under Section 1(3) of Ontario Regulation 586/06, if a Municipality undertakes work as a local improvement, a special charge imposed by local improvement by-law with respect to the work has priority lien status in respect to the subject property.

Background and Discussion

The complete background and discussion is contained in the following (attached) documents:

- Appendix 'A' - Corporate Services Report 2019-05
- Appendix 'B' - Shoreline Assistance Loan Program Property Owner Agreement (Draft)

Financial Impact

All costs associated with the administration of the program will be recoverable.

Consultations

Edwin C. Hooker – Barrister & Solicitor - Wolf Hooker Professional Corporation

Link to Strategic Priorities

☒ Manage, invest and plan for sustainable municipal infrastructure which meets current and future needs of the municipality and its citizens.

☐ Create a safe, friendly and inclusive community which encourages healthy, active living for people of all ages and abilities.

☒ Provide a fiscal stewardship and value for tax dollars to ensure long-term financial health to the municipality.

☒ Manage responsible and viable growth while preserving and enhancing the unique rural and small town character of the community.

☒ Improve the experiences of individuals, as both citizens and customers, in their interactions with the Town of Essex.

Report to Council

Department:	Corporate Services
Date:	September 16, 2019
Prepared by:	Jeffrey R. Morrison, CPA, CGA Director, Corporate Services
Submitted by:	Jeffrey R. Morrison, CPA, CGA Director, Corporate Services
Report Number:	Corporate Services Report 2019-05
Subject:	Shoreline Assistance Loan Program
Number of Pages:	5

Recommendation(s)/Conclusion(s)

The following are provided for Council's consideration:

1. That Corporate Services Report 2019-05 entitled "Shoreline Assistance Loan Program" be received; and
2. That Council approve Administration to move forward with finalizing a Shoreline Assistance Loan Program using the structure identified under Scenario 1 of the report (local improvement) to replace the Shoreline Assistance Loan Program that was discontinued by the Provincial government effective April 1, 2010.

Purpose

Council approval is required for revenue allocations or expenditures that fall outside of the annual budget process.

Background

On April 1, 2010 the Province of Ontario discontinued the Shoreline Assistance Loan Program administered by the Ministry of Municipal Affairs and Housing.

The Program provided loans to private owners of shoreline properties to repair or construct protective works, or repair, raise or relocate buildings or structures damaged by high-water levels under the authority of the Shoreline Property Assistance Act, RSO 1990.

The program was discontinued in 2010 due to minimal uptake as a result of lower lake levels and economic conditions which allowed financial institutions competitive or better interest rates on personal loans than those offered through the program.

The period, number of loans, and total value per year across the entire province is summarized below.

Period	Number of Loans	Total Principal Value
2001-02	2	$96,600
2002-03	2	$18,300
2003-04	0	$0
2004-05	2	$30,700
2005-06	0	$0
2007-08	0	$0
2008-09	1	$12,200
2009-10	0	$0
2010-11	Program cancelled as of April 1, 2010	
Total 2001 to 10	7	$157,800

It has also been identified that the majority if not all of the debentures were issued by municipalities in either Essex County or Chatham-Kent.

During the first quarter and last quarter of 2018 the Town received two requests for information as it pertains to the former program. At this point Administration began to research the program, only to identify that it had been cancelled in April 2010. Conversations were also initiated with the Ministry of Municipal Affairs and Housing to see if the program would be relaunched; the answer was no.

The Shoreline Property Assistance Act, RSO 1990 remains in place, however through conversation with our Municipal Advisor at the Ministry of Municipal Affairs and Housing the act will be repealed in the near future; although no definitive date has been provided.

In April 2019 Administration began the process to more thoroughly investigate the Act and the former loan program. At this point it was determined that the municipality may be in a position to offer replacement of the program aimed at properties where the need for repair or construction of protective works to protect existing development from high water levels is identified.

Feasibility

A working group including: Town of Essex, ERCA, Legal, and a Local Financial Institution, was created to ensure that all facets of the program were reviewed and to determine whether the program would be feasible if Council support were to be received. It's been determined that the program can effectively operate with the support of our partners.

The goal of the program would be to provide residents and/or property owners another tool in their fight to protect and maintain their investment along Lake Erie.

Intent

Through consultation with the Essex Region Conservation Authority (ERCA), it has been determined that the program should be limited to existing development and/or property and

their current use. Participation in the program, or improvements made to shoreline infrastructure does not guarantee future development or construction on site. Any future activities would need to comply with all current municipal, agency and Ministry regulations.

One of the underlying goals in developing the program was affordability. When the Province eliminated the Shoreline Assistance Loan Program in 2010 the interest rate was approximately 6.5%. Through partnerships with a local lender the interest rate under the proposed program would be comparable to the current residential posted mortgage rate at the time of the loan (September 2019 approximately 2.99%).

Scenarios

Another underlying goal of the program was to structure in such a way that the loans would: be collected like tax (on the final two property tax installments annually), be secured for the lender, and the loans would not impact the municipality's debt level.

With benefit of legal counsel it's been identified that there are two scenarios that would be feasible for the program:

1) the Town would loan the funds for repairs and/or improvements directly to the property owner, with the Town having borrowed the funds for the loan from a financial institution; or
2) the property owner would borrow the funds directly from the financial institution with the Town providing a guarantee of said loan to ensure a preferential rate of interest on the loan.

Scenario 1 mimics the structure under the cancelled Provincial program, and would be collected by way of local improvement through property tax. This is the preferable and recommended scenario as it is collected as tax, secured, and does not impact the municipality's debt level. The Owner and the Town may under section 36.1 of Part III of O.Reg 586/06: Local Improvement Charges – Priority Lien Status enter into an agreement for the undertaking of private work (i.e. work owned privately or undertaken on private property).

Section 1(2.1) of the Act and 1(2) of O. Reg. 586/06 further identifies that a special charge can be imposed as a local improvement and added to the property owner's tax roll.

Scenario 2 would require the Town to act as the 'guarantor' for the property owner's loan obtained from a financial institution. Although this scenario would allow the municipality to collect as tax and provide a secured loan, it may impact the municipality's debt level if the guarantor provisions were exercised in the event of a default on the underlying loan. Additionally the ability to collect as tax under scenario 2 doesn't necessarily provide priority lien status to the loan in case of default and eventual tax registration/sale.

Next Steps

Upon adoption of this Report and its recommendations, Administration will work with the Town's strategic partners to finalize the steps involved in the application, approval, and completion of the process to finalize a program that can be brought to market. A communication and marketing campaign will be developed once adopted.

Financial Impact

All costs associated with the administration of the program will be recoverable.

Link to Strategic Priorities

This report is linked to the Strategic Priority: "Manage the Town's finances and human resources in a responsible manner".

Reviewed by:	Chris Nepszy, Chief Administrative Officer	concur
	Doug Sweet, Director, Community Services / Deputy CAO	concur
	Lori Chadwick, Director, Development Services	concur
	Robert Auger, Legislative Services / Clerk	concur
	Heather MacDonald, Manager, Finance and Business Services	concur

Shore Line Improvement Property Owner Agreement

As provided in the Expression of Interest in Appendix D, *Property Owners (hereinafter, collectively, the "Property Owner)":* *1.* *Property Identifying Information (hereinafter, the "Property"):* *1. Address –* *2. Assessment Roll –*	*Certified as sufficient, in accordance with O.Reg. 586/06. On the date of:* _____ *Robert Auger, L.L.B.* *Town Solicitor / Clerk*

THIS PROPERTY OWNER AGREEMENT ("POA")**,** made in duplicate as of this ____ day of _____ 20__ ("Effective Date").

B E T W E E N:

INSERT PROPERTY OWNER
(hereinafter called the "Property Owner")

Of The First Part

- and -

THE CORPORATION OF THE TOWN OF ESSEX
(hereinafter called the "Town" and, together with the Property Owner, the "Parties")

Of The Second Part

WHEREAS:

1. Essex Town Council ("Council") at its meeting(s) of _____, 2020 adopted Resolution R120-00-000 to authorize the undertaking of specific works and the entering into of a Shoreline Assistance Loan Program Property Owner Agreement (POA) with respect to such works and Resolution R120-00-000 to give notice of the Towns intention to pass a Bylaw authorizing such works as a local improvement, respectively (the "Decisions"), and at its meeting of _____, 2020 did enact By-law _____, **as amended from time to time** (the "By-law"), pursuant to Section 36.5 and 36.6 of Ontario Regulation 586/06 to authorize the undertaking of flood

prevention and control works on private residential property as local improvements under the Shoreline Assistance Loan Program set out in the By-law (the "Program").

2. Among other things, the Decision authorizes the Clerk and Treasurer to negotiate and enter into POAs with consenting property owners on the terms and conditions set out in the Decision which are incorporated, as appropriate, into this POA.

3. The Property Owner owns the Property.

4. The Property Owner has submitted a complete Expression of Interest and complete Funding Request for the Property to participate in the Program.

5. The Town has reviewed the Expression of Interest and Funding Request and has approved the participation of the Property in the Program;

In consideration of the mutual covenants herein contained, the Parties agree as follows:

1. Definitions

In addition to the terms defined in the various sections of this POA, the following terms have the following meanings unless inconsistent with the subject matter or context:

"Actual Cost" means the invoiced cost of completion of the Actual Improvements as set out in Appendices A2 and G;

"Actual Improvements" means the Eligible Improvements undertaken to the Property under the Program as indicated in Appendices A2 and G;

"Administrative Charge" means a one-time charge of $2,000, representing each Property's share of the Town's cost of administering the Program;

"Applicable Laws and Requirements" means:

(1) any statute or proclamation or any delegated or subordinate legislation, including regulations and municipal by-laws;

(2) any lawful requirement of a Governmental Authority, including but not limited to those lawful requirements contained in POAs with the Governmental Authority or in approvals, certificates, permits and/or other authorizations issued by the Governmental Authority; or

(3) any applicable judgment of a relevant court of law, board, arbitrator or administrative agency of competent jurisdiction,

each of which is binding and in force in the Province of Ontario;

"Approved Final Cost" has the meaning given to it in section 9, and as set out in Appendix A2;

"Assignment, Novation, and Release" means an agreement to assign this POA to a new owner of the Property and to release the Property Owner from his or her obligations under this POA, in the form attached as Appendix C;

"Business Day" means Monday to Friday inclusive, excluding statutory and other holidays, namely; New Year's Day; Good Friday; Easter Monday; Victoria Day; Canada Day; Civic Holiday; Labour Day; Thanksgiving Day; Christmas Day; Boxing Day and any other day which the Town has elected to be closed for business;

"Business Hours" means the hours between 8:30 am and 4:30 pm (Eastern time zone);

"Town" means the The Corporation of the Town of Essex;

"Town-Provided Material" means any written documentation or other material that the Town makes available generally to the public or specifically to the Property Owner in connection with the Program or this POA;

"Cost of Borrowing" means the Town's actual or notional cost of borrowing to fund the Program (with notional cost being set at the rate of foregone investment income to the Town) charged to the Property by applying the Program Interest Rate to the Funding Amount over the Special Charge Term;

"Completion Date" means the date indicated in Appendix E by which the Work shall be completed, as that date may be extended pursuant to section 7 of this POA;

"Contractor" means an insured person retained by the Property Owner to complete the Work;

"Council" means Essex Town Council;

"Current Value Assessment" means the current value assessment of the Property as shown on the last returned assessment roll at the time of submitting the Expression of Interest to the Town;

"Eligible Improvements" means the flood control/mitigation measures as recommended for the Property by the Essex Region Conservation Authority (ERCA) as identified in the Shoreline Assessment Report set out in Attachment 3 to Appendix E;

"**Estimated Cost"** means the estimated cost of completion of the Intended Improvements as set out in Appendix A1;

"Estimated Lifetime" means the estimated useful life of the Intended Improvements, as set out in Appendix A1;

"Expression of Interest" means an application in the Town's prescribed form that the Property Owner completed and submitted to the Town's satisfaction and that confirmed the Property's eligibility to participate in the Program, which completed form is attached as Appendix D to this POA;

"Final Disbursement" means the disbursement of the remaining portion of the Funding Amount not already disbursed as the Initial Disbursement by the Town to the Property Owner, as calculated pursuant to Section 10 and set out in Appendix A2;.

"Funding Amount" means the total funds provided to the Property Owner by the Town under this POA, and calculated pursuant to Section 9 and set out in Appendix A2;

"Funding Request " means a request in the Town's prescribed form that the Property Owner has completed and submitted to the Town's satisfaction for funding for the Work, which completed request is attached as Appendix E to this POA;

"Governmental Authority" means any federal, provincial or municipal government, parliament, legislature, or any regulatory authority, agency, ministry, department, commission or board or other representative thereof, or any political subdivision thereof, or any court or (without limitation to the foregoing) any other law, regulation or rule-making entity, having jurisdiction over the relevant circumstances, or any person acting under the authority of any of the foregoing (including, without limitation, any arbitrator);

"Initial Disbursement" means disbursement to the Property Owner of the portion of the Funding Amount requested in the Funding Request of up to ten percent (10%) of the Estimated Cost in advance of completion of the Work, in accordance with Section 5;

"Intended Improvements" means the Eligible Improvements intended to be undertaken to the Property under the Program as set out in Appendix E;

"Lifetime" means the effective useful life of the Work, as set out in Appendix A2;

"Local Improvement Roll" means the local improvement roll for the Property setting out the Special Charge (Actual), as prepared and corrected by the Town and certified by the Town Treasurer in accordance with the Regulation;

"MFIPPA" means the *Municipal Freedom of Information and Protection of Privacy Act* R.S.O. 1990, Chapter M.56, as amended;

"Payment Term" means the time period over which the Property Owner will pay the Special Charge (Actual) commencing on the earlier of the date of first payment of the Special Charge (Actual) and the first payment due date for the Special Charge (Actual,) and ending upon full payment of the Special Charge (Actual);

"Pre-Authorized Property Tax Payment Program" means the Town's payment program in which the Property Owner authorizes automatic withdrawals from his or her bank account to the Town to pay property taxes and other charges collected through the tax bill as they become due and owing, such withdrawals to be made eleven times per calendar year;

"Program Documents" shall mean the documents comprising the Property Owners' request to participate in the Program and to obtain the requested funding, consisting of the:

(1) Expression of Interest, attached as Appendix D;

(2) Funding Request, attached as Appendix E; and

(3) Project Completion Report, attached as Appendix F;

"Program Interest Rate" means the following annual interest rates corresponding to each of the following Special Charge Terms, which interest rate will be fixed for the duration of the Special Charge Term:

Special Charge Term	Effective Interest Rate (Annual)
Up to 10 years	Set by Financial Institution at time of borrowing

"Project Completion Report" means a report, in the Town's prescribed form (inclusive of any requisite attachments), that the Property Owner will prepare and submit to the Town's satisfaction following completion of the Work, for determination by the Town, in accordance with this POA, of any Final Disbursement for which the Property qualifies, which completed report will be attached as Appendix F to this POA. It is anticipated that a letter from the Essex Region Conservation Authority (herein "ERCA") evidencing final inspection of any permits obtained from ERCA will be a requisite attachment;

"Property" means the property defined on Appendix A3;

"Property Owner-Provided Material" means any written documentation or other material that the Property Owner provides to the Town, including but not limited to the Program Documents;

"Regulation " means Ontario Regulation 586/06, *Local Improvement Charges-Priority Lien Status* regulation made pursuant to the *Municipal Act, 2001, S.O. 2001, c. 25*, as amended from time to time;

"Special Charge" means a charge imposed by the Town on the property pursuant to the Regulation;

"Special Charge (Actual)" means the final Special Charge for the Property based on the Actual Improvements, as set out in Appendix B2, that Town Council will impose on the Property;

"Special Charge (Estimated)" means the estimated Special Charge for the Property based on the Intended Improvements, as set out in Appendix B1;

"Special Charge Term" means the time period of five, ten, fifteen or twenty years, as selected by the Property Owner on Appendix E (Funding Request), commencing from the first payment due date for the Special Charge (Actual), which term cannot exceed the Lifetime of the Work;

"Substantially Performed" shall mean when the Work is ready for use or is being used for the purposes intended;

"Term" shall have the meaning ascribed to it in Section 2; and

"Work" means the Actual Improvements, collectively.

2. Term

This POA commences on the Effective Date and terminates at the end of the Payment Term.

As provided by Section 22, the Term continues even if ownership of the Property transfers but, upon such transfer, the prior Property Owner may become eligible for a Release (subject to applicable penalties as identified by the lending institution).

3. Interpretation

Each of the following Appendices to this POA are incorporated by reference into this POA as if they were fully stated herein:

Appendix A1 – Work – Intended
Appendix A2 – Work – Actuals
Appendix A3 – Property
Appendix B1 – Special Charge – Estimated
Appendix B2 – Special Charge – Actual
Appendix C – Form of Assignment, Novation and Release
Appendix D– Expression of Interest
Appendix E– Funding Request
Appendix F– Project Completion Report
Appendix G– POA Withdrawl Form
Appendix H– Pre-Authorized Property Tax Payment Program Application

Where there is a conflict between the language in any of the Appendices and this POA, the language of this POA shall prevail. The Property Owner authorizes the Treasurer for the Town to:

a) Attach a completed Appendix H upon signing the Agreement; and

b) Complete and attach Appendices A2, B2, and F upon the earlier of termination fo the Agreement or completion of the Work and provide copies of same to the Property Owner.

4. Property Owner's Initial Covenants:

The Property Owner covenants that the Property Owner:

(1) is the lawful owner of the Property, and that if more than one person owns the Property, all Property Owners are parties to and have signed this POA;

(2) is responsible for and will ensure that the Property Owner complies with all obligations it may have to any financing institutions or other lenders who may have a mortgage interest in the Property;

(3) understands and agrees that:

(a) the Special Charge (Estimated) as set out Appendix B1 is only an estimate of the Special Charge amount based on the Estimated Cost set out in Appendix A1;

(b) the Town shall provide the Property Owner from time to time with updated versions of Appendices A2 and B2 (as new information set forth in Appendices A2 and B2 becomes known) to which the Property Owner will then be bound except as otherwise provided in this POA;

(c) the maximum Special Charge (Actual) eligible for the Property to be the lesser of thirty percent of the Current Value Assessment or $250,000; and

(d) the Town will advise the Property Owner of the Special Charge (Actual) pursuant to Section 16.

(4) understands and agrees that by entering into this POA, completing and returning to the Town the Pre-Authorized Property Tax Payment Program Form attached as Appendix H, and providing a void blank cheque, the Town will automatically enroll the Property Owner in the Pre-Authorized Property Tax Payment Program, which payment program will apply to payment of the Special Charge (Actual), the property taxes payable on the Property, and any other charges that are payable through the Property's tax bill.

5. Initial Disbursement

Prior to completion of the Work, the Town will pay the Initial Disbursement indicated in Appendix A1 to the Property Owner.

6. Property Owner's Responsibility

The Property Owner understands and agrees that it is the Property Owner's sole responsibility to complete the Work by retaining a Contractor and to ensure that the Work is completed by the Completion Date.

The Town takes no responsibility for and has no involvement in retaining a Contractor or any other person to complete the Work. The Town also takes no responsibility for and has no involvement in the completion of the Work or in ensuring its completion, and the Property Owner is solely responsible for any action that may impede or adversely affect the Contractor and the Contractor's ability to complete the Work in a timely manner. The Property Owner further understands and agrees that the Town has no responsibility or liability to the Contractor or to the Property Owner for the completion of the Work including, without limitation, any delays, errors, or defects in the completion of the Work, any negligence of the Contractor in the completion of the Work, the Contractor's failure to complete the Work, any payment or failure to make payment to the Contractor or any other person in respect of completion of the Work, and the discharge of any liens on the Property.

7. The Property Owner is not an agent of the Town

The Property Owner understands and agrees that it is the Property Owner's sole responsibility to make payments for the completion of the Work, and that the Town will make payments to the Property Owner in accordance with this POA only if all requirements for such payment have been met.

The Town is not responsible for, and will not provide funding under the Program for, costs incurred by the Property Owner in retaining any subsequent contractor to maintain or repair the Work or consultant required to inspect the Work.

The Town is not liable for any failure of the Work to achieve the expected mitigation measures against flooding. The Property Owner further understands and agrees that the maximum Funding Amount under the Program is the lesser of the amounts set out in section 9 of this POA, and that the Property Owner may not receive payment from the Town of all, or any, costs incurred by the Property Owner to complete the Work.

8. Completion Date

Provided that the Property Owner notifies the Town in writing by at least 4:00 pm on the business day that is at least 10 business days before the Completion Date that the Property Owner is unable to Substantially Perform the Work by the Completion Date, and provided further that the Property Owner indicates the reasons for the delay and makes available whatever additional written or verbal information the Town requires, then the Town retains the right in its discretion on a case by case basis to extend the Completion Date to a later date.

9. Approved Final Cost

Within 30 days of the earlier of (a) the Work being Substantially Performed or (b) the Completion Date, the Property Owner shall provide the Town with the Project Completion Report.

The Town shall then verify the completeness and accuracy of the Project Completion Report, and will disqualify the Property from any funding under this POA if the Project Completion Report is incomplete or, in the Town's sole opinion, provides inadequate information to qualify for funding under this POA.

The Town may, in its sole discretion, make any reasonable adjustments to the Actual Cost as evidenced on the Project Completion Report, and may, at Property Owner expense, inspect or cause the inspection of the Work in accordance with Section 25 of this POA.

The Actual Cost as verified and adjusted by the Town in its sole discretion will constitute the Approved Final Cost.

10. Funding Amount

The Funding Amount shall be the amount that is the lesser of:

1) the Approved Final Cost;

2) the Estimated Cost plus Five (5) per cent of the Estimated Cost; and

3) the highest dollar amount that does not cause the Special Charge (Actual) to exceed the lesser of either 30 percent of Current Value Assessment for the property or $250,000, when the Town calculates the Special Charge (Actual) as set forth in Section 11(1) of this POA.

11. Final Disbursement

The Final Disbursement shall be the Funding Amount as determined under Section 9 of this POA, less the Initial Disbursement.

The Town will pay to the Property Owner the Final Disbursement within a reasonable period of time following receipt of the Project Completion Report, as determined by the Town. Any Town payment will be made by cheque payable to the Property Owner.

12. Special Charge

(1) **Calculating the Special Charge**

After the Final Disbursement Amount is paid to the Property Owner, the Town will calculate the Special Charge (Actual) for the Property.

The Special Charge (Actual) shall equal the sum of (a) the Funding Amount, (b) the Cost of Borrowing, and (c) the Administrative Charge.

(2) **Notice of the Special Charge**

The Town will advise the Property Owner of the proposed Special Charge (Actual) pursuant to Section 16.

(3) **Consent to Levy of the Special Charge**

The Property Owner consents to the Special Charge (Actual) being levied by the Town on the Property pursuant to the Regulation, and agrees to pay (together with the annual property taxes assessed against the Property) the Special Charge (Actual) in equal annual amounts over the Special Charge Term, by making 12 monthly payments per year under the Pre-authorized Property Tax Payment Plan. The Property Owner understands that such monthly payments will be in an equal amounts, except for the final payment which may be greater or lower to address any remainder amounts.

(4) **Apportioning the Special Charge**

The Town apportions the Special Charge (Actual) on the basis of one Special Charge per property.

13. Property Owner's Additional Obligations:

The Property Owner shall:

(1) Complete the Work by the Completion Date;

(2) Remain enrolled and in good standing in the Town's Pre-authorized Property Tax Payment Program for the duration of the Payment Term;

(3) If the Property Owner does not complete the Work or otherwise does not put the Property in a position where the Town can impose the Special Charge on the Property, repay in its entirety all funds received from the Town pursuant to this POA or under the

Program (the "funds") within ten business days of receipt of a demand for payment from the Town and if upon the expiry of said ten business days the funds have not been paid in its entirety then such funds shall constitute a charge imposed by the Town and a debt of the Property Owner to the Town and such charge may be added to the tax roll and collected in the same manner as municipal taxes pursuant to the provisions of Sections 391 and 398 of the *Municipal Act, 2001, S.O. 2001, c. 25*; and

(4) Notify any party to whom the Property Owner plans to transfer the Property, whether a buyer or otherwise, in advance of such transfer that the Special Charge (Actual) has been, or will be imposed on the Property pursuant to the Program and the Regulation.

(5) The Town is hereby authorized to: a) register notice of this agreement on title to the Property at the expense of the Property Owner; and b) otherwise notify anyone enquiring at the Town for a Tax Certificate in respect of the Property as to the existence of this POA and any payment required any party to whom the Property Owner plans to transfer the Property, whether a buyer or otherwise, in advance of such transfer that the Special Charge (Actual) has been, or will be imposed on the Property pursuant to the Program and the Regulation hereunder.

14. Withdrawal

The Property Owner may withdraw from this POA by completing the withdrawal form in Appendix G and submitting to the Town Clerk by mail or in person so long as such submission arrives date-stamped no later than eight Business Days from the date the Property Owner submitted the signed POA to the Town by mail or in person. Unless withdrawn in accordance with this section, this POA shall be final and binding after eight Business Days from the date the property owner submitted the signed POA by mail or in person and upon certification by the Town Clerk.

15. Certified POA

Once certified by the Town Clerk, this POA is final and binding.

16. Notice of Local Improvement Roll

The Town shall give notice to the Property Owner of the proposed Local Improvement Roll before the Special Charge (Actual) is imposed. The proposed Local Improvement Roll shall set out the proposed Special Charge (Actual) to be levied on the Property in respect of the undertaking of the Work on the Property under this POA and under the Program.

Upon receipt of notice of the proposed Local Improvement Roll, the Property Owner has 21 days to provide to the Town written objections or proposed revisions to the proposed Local Improvement Roll.

The Town's Treasurer shall consider any objections and proposed revisions to the proposed Local Improvement Roll as may be made by the Property Owner, and may make any corrections to the proposed Local Improvement Roll which the Treasurer considers fair and equitable as a result of such objections and proposed revisions. Once any such corrections are made, the Treasurer shall certify the Local Improvement Roll.

The certified Local Improvement Roll and the Special Charge (Actual) set out in it shall be final and binding on the Property, and the Work is conclusively deemed to have been lawfully undertaken in accordance with the Regulation.

17. Special Charges added to the Tax Roll

Pursuant to the *Municipal Act, 2001, S.O. 2001, c. 25* and the Regulation, once levied, the Special Charge (Actual) can be added by the Town to the tax roll for the Property. Once added to the tax roll the Special Charge (Actual) has the same priority to all other liens as property taxes, and will become an obligation of all subsequent owners of the Property.

The Town will note the full amount of the Special Charge (Actual) on the tax roll, and this amount will appear on any tax certificates requested for the Property.

The Special Charge (Actual) will be collected through the tax bill for the Property, and payment will be due and payable at the same time as property tax payments for the Property.

The portion of the Special Charge (Actual) annually payable will be added to the tax roll for the Property and will form a priority lien on the property if not paid when due.

18. Severed Lands

Where the Property Owner seeks to sever the Property, the Special Charge (Actual) shall be:

Reapportioned among the new lots in any manner the Town considers just and equitable, having regard to the relative degree of benefit received by each of the new lot, and a new special charge will be imposed on each of the new lots in the amount apportioned to each lot;

19. Corrections to Special Charges and to the Local Improvement Roll

(1) The Town may correct the Special Charge (Actual) pursuant to the Regulation, if the Town Treasurer determines that the Special Charge (Actual) is incorrect due to a gross or manifest error.

(2) The Town Treasurer will make any amendments and corrections to the Local Improvement Roll to reflect any correction to the Special Charge (Actual) made pursuant to subsection (1), and any apportionment of a Special Charge (Actual) pursuant to Section 18, and shall certify the corrected Local Improvement Roll.

20. Late Payment Penalties and Events of Default

(1) If the Property Owner fails to make any payment owing to the Town under this POA on the date it becomes due, the payment is subject to the following late payment penalties (as may be amended by regulation from time to time):

(a) a fee for non-sufficient funds (per the Town's schedule of fees) being in the Property Owner's account under the Pre-authorized Property Tax Payment Program;

(b) a one-time penalty of 1.25% of the unpaid amount on the first day of default; and
(c) an additional 1.25% of the unpaid amount on the first day of each month thereafter that the amount remains outstanding.

(2) The Town may declare that an event of default has occurred (an "Event of Default") if the Property Owner:

(a) fails to meet any of its obligations under this POA, including without limitation

(i) failure to make any payment to the Town as it becomes due;

(ii) failure to reimburse the Town all portions of the Funding Amount that the Town has provided to the Property Owner in accordance with Section 10 and Section 5 in the event that the Property Owner has not completed the Work or otherwise has not put the Property in a position for the Town to apply a Special Charge; or

(iii) failure to adhere to its confidentiality obligations under this POA; or

(b) makes false or misleading representations or submits false or misleading information to the Town.

(3) In the event that the Town has declared that an Event of Default has occurred, the Town may immediately, in its sole discretion, exercise one or more of the following remedies:

(a) terminate its obligations under this POA and, if applicable, demand repayment of all monies provided under this POA to the Property Owner to date;

(b) pursue a court action to recover all damages and/or demand specific performance; and

(c) add to the property tax roll for the Property the Initial Disbursement and/or any other monies paid by the Town to the Property Owner , as a fee/charge, as provided for Section 391 and 398 of the Municipal Act owed to the Town pursuant to this POA.

(d) be entitled to refuse building permits with respect to the Eligible Improvements and/or shall be entitled to refuse building and/or occupancy permits with respect to any buildings, and/or shall be entitled to issue stop work orders with respect to any matters in respect of which a permit has been issued and/or may refuse to grant to the Owner any permissions, permits, certificates, approvals or authorities of any kind or nature which the Owner would have been entitled to receive had the Owner otherwise complied with the Town's requirements in this agreement, and/or shall be entitled to refuse to issue releases, all of which may be done until such time as the default has been cured in a manner satisfactory to the Town.

(e) the owner acknowledges that this agreement is entered into pursuant to section 36.2, Part III of O. Reg. 586/06, provided for under subsection 400(j) of The Municipal Act, S.O.

2001, c.25 (herein "the Act") and amendments thereto, and that a bylaw has been passed by the Town approving the entering into of this Agreement by the Town and incorporating the terms of this Agreement into that bylaw, and further that section 446 of The Municipal Act, S.O. 2001, c.25 and amendments thereto, applies to all requirements of this Agreement. If the Owner neglects to undertake any matter or thing required to be done by this Agreement and such default continues after SEVEN (7) days of the Owner being given written notice by the Town of such default, in addition to other remedies available to the Town, the Town may direct that such matter or thing shall be done at the expense of the Owner, and the Town may recover the costs incurred in doing it, by action or by adding such costs to the tax role and collecting them in the same manner as taxes; the Owner hereby authorises the Town (including, without limiting the generality of the foregoing, its employees, agents and servants) to enter upon the Lands to do any such matter or thing.

21. Sale and Release

The Property Owner shall have the unfettered right to sell, transfer, charge, and mortgage, encumber or otherwise deal with the Property without the prior consent of the Town.

In the event the Property is transferred to a new owner, the Property Owner shall continue to be liable to the Town for all Property Owner obligations and liabilities under this POA until the Town signs the Assignment, Novation and Release, thereby releasing the Property Owner from obligations and liabilities under this POA.

The Town shall not sign the Assignment, Novation and Release until all of the following conditions are met to the satisfaction of the Town:

(1) the Property Owner provides the Town with a registered copy of the Transfer of the Property from the Property Owner to a new owner;

(2) the Special Charge (Actual) and other amounts due and owing under this POA for the portion of the Payment Term during which the Property Owner owned the Property are fully paid; and

(3) the Property Owner provides the Town with an original Assignment, Novation and Release in the form attached as Appendix C, executed by the Property Owner and the new owner.

The Property Owner acknowledges that nothing in this POA interferes with the Town's rights, benefits and powers under the Regulation and *Municipal Act, 2001, S.O. 2001, c. 25* with respect to the Property or the Special Charge (Actual), and that the Town shall not be prevented from or prejudiced in carrying out its statutory rights and responsibilities thereunder.

22. Ownership, Disclosure, and Confidentiality of Written Material

(1) **Ownership and Compelled Disclosure of Property Owner-Provided Material**

Once in the possession and/or under the control of the Town, any Property Owner-Provided Material becomes the property of the Town and, consequently, subject to the Municipal Freedom

of Information and Protection of Privacy Act ("MFIPPA"). Pursuant to MFIPPA, the public has a right to seek access to these documents, in whole or in part, which the Town must then disclose in accordance with the provisions of MFIPPA. Please note that those provisions safeguard against disclosure of personal information but exceptions to such safeguards do apply.

Moreover, the Town may be required to disclose these documents pursuant to other Applicable Laws and Requirements regarding disclosure of information and production of documents, including (but not limited to) the Federal Courts Rules, the Ontario Rules of Civil Procedure, the Criminal Code of Canada, subpoenas and summonses to witness, court orders, and any other federal, provincial or municipal statutory power that compels the Town to disclose such information and documents.

The Town reserves the right to make all final disclosure decisions including those pursuant to MFIPPA.

(2) **MFIPPA Designation of Property Owner-Provided Material**

If the Property Owner finds that any of the Property Owner-Provided Material, in whole or in part, contains information exempt from disclosure under MFIPPA (pursuant to Section 10 of MFIPPA or any other section) or the other disclosure obligations discussed above, then the Property Owner should clearly identify the exempted information to the Town. Doing so will more easily enable the Town to notify the Property Owner in advance of any disclosure the Town may be compelled to undertake.

The Town shall assume no liability that may arise from a Property Owner failing to identify information to which any of these disclosure obligations stated above applies and to provide the necessary information in support thereof.

(3) **Ownership and Confidentiality of Town-Provided Materials**

All Town-Provided Material in connection with, or arising out of, the Program or this POA:

(a) is and shall remain the property of the Town;

(b) must be treated by the Property Owner as confidential and not disclosed to anyone other than the Property Owner or Town staff (which does not include Town Council Members) without written consent from the Town unless such Town-Provided Material was obtained in a manner available generally to the public (such as from the Town's website); and

(c) other than in connection with the Program, must not be used or disseminated by the Property Owner for any purpose on this or related matters without the express written permission of the Town.

This provision survives the termination of the POA for five (5) years, beginning with the date on which the POA terminates.

23. Audit

The Town may audit this POA and related records. The Property Owner shall at all times during the term of the POA, keep and maintain records of the Work performed pursuant to this POA. This shall include proper records of invoices, Incentives/Rebates, timesheets, and other documents that

support actions taken by the Property Owner. The Property Owner shall at its own expense make such records available for inspection and audit by the Town at all reasonable times.

24. Inspection

Until the date that the Work is completed as verified in writing by and following a satisfactory final inspection conducted by the Essex Region Conservation Authority (ERCA) respecting any related permit issued by ERCA, the Town reserves the right, upon 14 days written notice to the Property Owner, to have a Town Official or third party contractor retained by the Town inspect the Work. Such inspection is solely for the purpose of verifying the Work stated in the Project Completion Report. By conducting such inspection, the Town is not making any representations or warranties with respect to the Work and is not liable for any aspect of the Work.

25. Indemnities

The Property Owner indemnifies and saves harmless the Town, its Mayor, Deputy Mayor, Members of Council, officers, employees, and agents from and against any losses, liens, charges, claims, demands, suits, proceedings, recoveries and judgements (including legal fees and costs) arising from or related to this POA and the Property Owner's performance or nonperformance of its obligations, including breach of any confidentiality obligations under the POA.

Upon assuming the defence of any action covered under this section the Property Owner shall keep the Town reasonably informed of the status of the matter, and the Property Owner shall make no admission of liability or fault on the Town's part without the Town's written permission.

26. Posting Security

Unless security has otherwise been posted to the Town though a parallel permitting process under the Building Code Act , 1992, S.O. 1992, c. 23 or similar legislation, the Town my require and the Property Owner agrees, so as to assure the performance by the Property Owner of each of the terms and conditions of this Agreement pending completion of the Work to the satisfaction of ERCA and the Town, upon execution of this Agreement, to forthwith deposit with the Town, security in an amount which is equal to $_____ . For greater certainty, the amount of said security shall be subject to approval by the Town's Clerk and Solicitor.

Said security shall be either by way of

a) cash, or

b) a Standby Letter of Credit pursuant to UCP500 only, issued by a chartered bank of Canada in form satisfactory to the Town's Clerk and Solicitor. (not a Letter of Guarantee or Bond)

Provided that in no event shall the Town be required to pay interest on this security.

26.1. Release of Security

The Town agrees to return the said security to the Property Owner upon the completion and final approval of the works specified in this Agreement which approval is at the Town's sole discretion.

27. Survival

In addition to any obligations set forth in this POA that by their nature survive the completion of the Work or termination of this POA or otherwise expressly survive, those obligations set forth in Sections 23 (Ownership and Confidentiality of Town-Provided Material), 24 (Audit), and 26 (Indemnities) shall continue to bind the Property Owner notwithstanding the completion of the Payment Term, the release by the Town of the Property Owner of its obligations under this POA, or the termination of this POA.

28. Severability

If any provision of this POA or the application thereof to any person or circumstances is found to be invalid, unenforceable or void by any court or tribunal of competent jurisdiction, such provision shall be deemed severable and all other provisions of this POA shall be deemed to be separate and independent therefrom and continue in full force and effect.

29. Further Assurances

The Property Owner agrees that it will do all such acts and execute all such further documents, conveyances, deeds, assignments, transfers and the like, and will cause the doing of all such acts and the execution of all such further documents (including waivers of moral rights) as are within its power to cause the doing or execution of, as the Town may from time to time reasonably request, in writing, and as may be necessary or desirable to give full effect to this POA.

30. Notices

Any demand or notice to be given pursuant to this POA shall be duly and properly made and given if made in writing and either delivered to the party for whom it is intended to the address as set out below or sent by prepaid registered mail addressed to such party as follows:

in the case of the Town:

The Corporation of the Town of Essex
33 Talbot Street South, Essex, ON N8M 1A8
Attention: Director, Corporate Services / Treasurer

and in the case of the Property Owner:

to the Primary Contact indicated in the Expression of Interest or to such other addresses as the Parties may from time to time notify in writing,

and any demand or notice so made or given shall be deemed to have been duly and properly made or given and received on the day on which it shall have been so delivered or, if mailed, then, in the absence of any interruption in postal service in the Town of Essex affecting the delivery or handling thereof, on the day following three business days following the date of mailing.

31. Successors and Assigns

The POA shall endure to the benefit of and be binding upon the Parties hereto and their respective heirs, executors, administrators, successors and assigns.

32. Appendices

The Appendices to this POA shall constitute an integral part of this POA and all expressions defined in this POA shall have the same meanings in such attachments. In the case of a conflict between the body of this POA and any attachment, the provisions of the body of this POA shall take precedence.

33. Governing Law

This POA shall be governed by the laws of the Province of Ontario. Any dispute arising out of this POA will be determined by a court of competent jurisdiction in the Province of Ontario.

34. Entire POA

The POA forms the entire agreement between the Parties. In the event of conflict or inconsistency between the POA and any other agreement between the Parties, the POA shall prevail.

35. Amendments

The Parties can mutually agree to amend this POA.

36. Headings, subheadings, index numbers, reference numbers

All headings, subheadings, index and reference numbers in POA and attachments are given for the convenience of the Parties and as such must be taken only as a general guide to the items referred to and not relied upon. It must not be assumed that such numbering is the only reference to each item, but the POA as a whole must be fully read in detail for each item.

37. Contra Proferentum

It is agreed and acknowledged that both parties, directly or through their agents, principals, representatives and/or solicitors, have participated in the preparation and/or negotiation of the provisions of this agreement.

Should any provision of this agreement require judicial interpretation, mediation or arbitration, it is agreed that the court, mediator or arbitrator interpreting or construing the same shall not apply a presumption that the terms thereof shall be more strictly construed against one party or so as to disadvantage any party on the basis that such party and/or its solicitor or agent:

a. Prepared this agreement or any part of it; or

b. Seeks to rely on this agreement or any part of it.

38. Independent Legal Advice

To the extent that the solicitors of Wolf Hooker Professional Corporation has been involved in the preparation of this agreement, such solicitors act solely as solicitors for the Town and with regard to the interests of the Town and not for any other party to this agreement. It is strongly recommended that all other parties to this agreement obtain independent legal advice prior to signing this agreement. Each such party acknowledges:

1) having obtained independent legal advice from his, her, or its' own solicitor with respect to the terms of this Agreement prior to its execution or having otherwise been given a reasonable opportunity to obtain such advice and declined to so;
2) that he or she or it understands the terms, and his or her rights and obligations, under this Agreement.

Signature page follows

IN WITNESS WHEREOF the Parties have executed this POA as of the Effective Date.

SIGNED AND DELIVERED

Authorized by Resolution_____ as adopted by Town of Essex Council on _____2019 and by Resolution _____ as adopted by Town of Essex Council on _____, 2019, and enacted by **Bylaw** _____ as amended from time to time, pursuant to Section 36.5 and 36.6 of Ontario Regulation 586/06.

_____
Town Clerk

_____

(print name of witness above)

THE CORPORATION OF THE TOWN OF ESSEX

_____
Jeffrey R. Morrison, CPA, CGA
Director, Corporate Services / Treasurer

_____
Robert Auger, L.L.B.
Town Solicitor / Clerk

PROPERTY OWNER

_____
Name:

APPENDIX A1

Improvements -- Intended

Intended Improvements	Estimated Cost	Estimated Lifetime (years)
	$XXXXXX	XXXXXXX
(as per ERCA Permit)		
	TOTAL =	**AVERAGE =**

1. Completion Date

The Property Owner will complete the above Intended Improvements by the Completion Date.

APPENDIX A2

Improvements – Actual

Actual Improvements	Actual Cost	Expected Lifetime
	TOTAL =	**AVERAGE =**

1. Funding Amount

In accordance with Section 9 of the POA, the Funding Amount is [AMOUNT] which is the lesser of:

(i) The Approved Final Cost which is [AMOUNT];

(ii) The Estimated Cost plus five percent of the Estimated Cost which is [AMOUNT]; and

(iii) the highest dollar amount that does not cause the Special Charge (Actual) to exceed the lesser of 30 percent of Current Value Assessment for the property up to a maximum of $250,000 when the Town calculates the Special Charge (Actual) which is [AMOUNT].

2. Final Disbursement

The Final Disbursement is [AMOUNT] which is equal to the Funding Amount ([AMOUNT]) minus any Initial Disbursement ([AMOUNT)].

APPENDIX A3

"Property" means those lands:

Municipally known as: _____within the boundaries of the Town of Essex, Province of Ontario

Bearing Roll No.: _____

Legally Described as:

APPENDIX B1

Special Charge -- Estimated

The Special Charge (Estimated)[1] is [AMOUNT].

The Special Charge (Estimated) was calculated as follows:

Special Charge Term (years)	
Program Interest Rate (%)	
Actual Funding Amount	$
Cost of Borrowing	$
Administrative Charge	$
Special Charge (Estimate)	$

The monthly payment amount of the Special Charge (Estimated) is [AMOUNT]. This amount is payable 12 times per year.

[1] As per Section 16 of the POA, the Town will notify the Property Owner of the Special Charge (Actual) prior to certification of the charge and adoption of the by-law to impose the charge on the Property.

APPENDIX B2

Special Charge - Actual

The Special Charge (Actual) is [AMOUNT].

The Special Charge (Actual) was calculated as follows:

Special Charge Term (years)	
Program Interest Rate (%)	
Actual Funding Amount	$
Cost of Borrowing	$
Administrative Charge	$
Special Charge (Actual)	$

The monthly payment amount of the Special Charge (Estimated) is [AMOUNT]. This amount is payable 12 times per year.

APPENDIX C

Form of Assignment, Novation, and Release

(The current Property Owner of the Property can reproduce and use this form to satisfy the requirements in Section 22 (Sale and Release). Please inquire with Town staff if an electronic version is needed.)

THIS AGREEMENT made as of the __ day of _____, 20__.

AMONG:

_____

(the "**Assignor**")

- and -

_____

(the "**Assignee**")

- and -

The Coporation of the Town of Essex
(the "**Town**")

WHEREAS:

A. Pursuant to Town of Essex Bylaw _____, the Assignor applied to participate in the The Corporation of the Town of Essex's Program and consequently, entered into a Property Owner Agreement with The Corporation of the Town of Essex on _____ (the "POA"), a copy of which is attached as Schedule A, to obtain funding for energy efficiency and water conservation improvements at the Property (the "Funding Amount");

B. The Corporation of the Town of Essex adopted Bylaw _____ (the "Bylaw") to impose on the Property a Special Charge (Actual) in the amount of that requires the owner of the Property to repay the Funding Amount, together with the Cost of Borrowing and the Administrative Charge;

C. The POA includes additional obligations that are separate and apart from the obligation to repay the Special Charge (Actual) that the Bylaw has imposed on the Property

NOW THEREFORE in consideration of the transfer of the Property from the Assignor to the Assignee, the Town's release of the Assignor, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties covenant and agree as follows:

1. **Definitions**. Unless otherwise defined herein, all capitalized terms used in this POA shall have the respective meanings ascribed to them in the POA.

2. Assignment of POA. The Assignor does hereby absolutely and unconditionally assign, novate, transfer, set over and convey unto the Assignee, for its sole use and benefit, all of the Assignor's right, title, interest, obligations and liabilities in, to and under the POA from and after the date hereof.

3. Assumption of POA. The Assignee hereby accepts this assignment contained in Section 2 hereof and covenants and agrees with the Assignor that, from and after the date hereof, the Assignee assumes and is responsible for and will perform, observe, satisfy, discharge and pay as and when due the obligations and liabilities of the Assignor under the POA arising from and after the date hereof.

4. Consent of Town. The Town (in its capacity as an existing party under the POA), effective from and after the date hereof, hereby consents to the assignment of all the Assignor's right, interest, obligations and liabilities in, to and under the POA, and accepts in full satisfaction the Assignee as a party to the POA in substitution for the Assignor.

5. Agreement between the Town and Assignee. The Assignee covenants with the Town that the Assignee will perform, observe, satisfy, discharge and pay as a when due the obligations and liabilities of the Property Owner under the POA arising from and after the date hereof. Among other things, the Assignee will provide information necessary for automatic enrolment in the Pre-Authorized Property Tax Payment Program as discussed further in the POA.

6. Release of the Assignor. In accordance with Section 22 of the POA, the Town hereby releases and discharges the Assignor of and from the observance and performance of the covenants, agreements and obligations under the POA, effective from and after the date hereof.

7. Joint and Several Liability. The liability of each entity comprising the Assignee hereunder shall be joint and several.

8. Successors and Assigns. This Assignment, Novation and Release shall ensure to the benefit of and shall be binding upon the Parties hereto and their respective heirs, executors, administrators, successors and assigns.

9. Governing Law. This Assignment, Novation and Release shall be construed and enforced in accordance with the laws of the Province of Ontario and the laws of Canada applicable therein and shall be treated in all respects as an Ontario contract.

10. Counterparts. This Assignment, Novation and Release may be executed in several counterparts and by facsimile transmission of an originally executed document, each of which shall be deemed to be an original, and such counterparts shall constitute one and the same instrument.

11. Further Assurances. Each of the Parties hereto shall from time to time hereafter and upon any reasonable request of the other, execute and deliver, make or cause to be made all such further acts, deeds, assurances and things as may be required or necessary

to more effectually implement and carry out the true intent and meaning of this Assignment, Novation and Release.

12. **Headings, Extended Meanings.** The headings in this Assignment, Novation and Release are inserted for convenience of reference only and shall not constitute a part hereof and are not to be considered in the interpretation hereof. In this Assignment, Novation and Release, words importing the singular include the plural and *vice versa*; words importing the masculine gender include the feminine gender and vice versa; and words importing persons include firms or corporations and *vice versa*.

IN WITNESS WHEREOF the Parties hereto have executed this Assignment, Novation and Release as of the date first above-written.

ASSIGNOR In the presence of:

By:
Name: Witness name:

ASSIGNEE

By:
Name: Witness name:

TOWN OF ESSEX

By: _____
Name:

Attach copy of the POA and mark it Schedule "A"

APPENDIX D

Expression of Interest

I, _____ formally request the Town of Essex to review my property for consideration under the Shoreline Assistance Loan Program.

My property is located in the Town of Essex, and I confirm that I am the owner. Property details are as follows.

_____ Municipal Address

_____ Roll Number

I have obtained the following, which are attached:

____ ERCA Permits

____ Engineering Documents (if required by ERCA)

____ Contractor Quote(s)

____ Other

Signed,

_____ Property Owner

_____ Date

APPENDIX E

Funding Request

To be finalized.

APPENDIX F

Project Completion Report

To be finalized.

APPENDIX G

POA Withdrawal Form

(as permitted pursuant to subsection 36.4(4) of Ontario Regulation 586/06)

IF YOU INTEND TO WITHDRAW FROM THE POA, THIS FORM MUST BE COMPLETED AND SUBMITTED NO LATER THAN 8 BUSINESS DAYS AFTER YOU SUBMIT YOUR SIGNED POA TO THE TOWN

I/we, as signator(ies) to a Property Owner Agreement with the Corporation of The Town of Essex,

Dated, concerning my/our property identified as [insert Effective Date]

_____(the "POA"), withdraw my/our
[insert Assessment Roll Number]

signature(s) from the POA.

Property Owner 1	Title (if auth. rep. of corp. owner)	Date
Property Owner 2, if applicable	Title (if auth. rep. of corp. owner)	Date
Property Owner 3, if applicable	Title (if auth. rep. of corp. owner)	Date
Property Owner 4, if applicable	Title (if auth. rep. of corp. owner)	Date
Property Owner 5, if applicable	Title (if auth. rep. of corp. owner)	Date

Send completed form to:
Town Clerk, 33 Talbot Street South, Essex, ON N8M 1A8

APPENDIX H

Pre-Authorized Property Tax Payment Program Application

Application

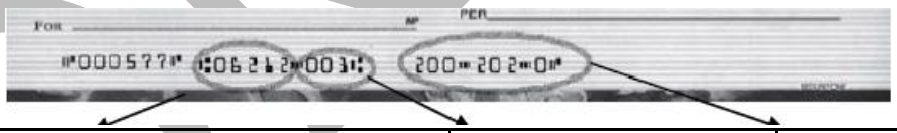
Essex **Pre- Authorized Tax Payment**

Applicant Information

Instalment Plan: ❑ 2-Instalment ❑ 6-Instalment I 12-Instalment If an option is not selected, you will be enrolled in the 12-Instalment Plan	
Assessment Roll Number (21 digits):	
Property Address:	
Property Owner(s):	
Signature*:	Signature*:
My/our application is for ❑ Personal or ❑ Business PAD service * By signing this form you agree to the terms and conditions listed on page 2. Please provide additional signatures, if more than one signature is required on cheques issued against the account. Please review, print, sign, and return your application form.	
Date (YYYY/MM/DD):	Date (YYYY/MM/DD):
Telephone (Day):	Telephone (Day):

Financial Institution Information

Please attach a void cheque or have your bank/financial institution complete the following.



Financial Institution (FI) Transit Number:	Fl Number:	Account Number:
Fl Name:		
Fl Address:		
Name of Fl Officer:		
Fl Officer Title:		
Signature of Fl Officer:	Fl Officer Phone Number:	

3 3

The Corporation of the Town of Essex

By-Law Number 1908

Being a by-law to Authorize the Town of Essex Shoreline Assistance Loan Program and the undertaking of flood and shoreline control/mitigation works on private residential property as Local improvements.

Whereas Part III of Ontario Regulation 586/06 authorizes Council to pass a by-law to undertake works on private residential property as local improvements for the purpose of raising all or part of the cost of the work by imposing special charges on lots upon which all or some part of the local improvement is or will be located; and

Whereas such a by-law may authorize the undertaking of works which satisfy the requirements of a Town program; and

Whereas at its meeting of September 16, 2019, Town Council authorized Administration to move forward with the finalization of a Shoreline Assistance Loan Program pursuant to the authority of Ontario Regulation 586/06;

Now therefore, the Council of The Corporation of the Town of Essex enacts as follows:

1. That Council authorize the undertaking of flood/shoreline control/mitigation works on private property as local improvements on private property by agreement pursuant to the provisions of the Shoreline Assistance Loan Program, as set out in Appendix A to this By-law, for the purpose of raising all or part of the cost of the work by imposing special charges on lots upon which all or some part of the local improvement is or will be located; and
2. That the Mayor and Clerk of the Town may execute Property Owner Agreements with eligible property owners of such properties substantially in the form shown as Appendix B to this By-law subject to such amendments from time to time as may be recommended by administration of the Town acting on the advice of the Town's solicitor.
3. That this by-law comes into force and effect upon passage.

Read a first, a second and a third time and finally passed on April 20, 2020.

_____

Mayor

_____

Clerk

Appendix A

Shoreline Assistance Loan Program Design

I. Outline of Program

1.0. Overview

The Shoreline Assistance Loan Program is designed to extend municipal funding to consenting property owners for the installation of qualifying flood control/mitigation improvements and related designs and permits and then to secure payment by imposing a local improvement charge on the private residential property, as authorized by the Ontario Regulation 596/06 ("the Regulation").

Unless otherwise described herein, capitalized terms shall carry the meaning outlined in the Shoreline Assistance Loan Program (POA) attached hereto as Appendix A to this outline.

1.1. Program Eligibility

Shoreline properties located within the Town of Essex abutting Lake Erie.

The property must have a property tax account with the Town of Essex.

Participation is voluntary, owner-initiated and subject to the following conditions:

- All registered owner(s) of the property must consent to participating in the Program;
- Property tax, utility bills and all other payment obligations to the Town for the past two years must be in good standing;
- Consent from all mortgage lenders, if the property is subject to one or more mortgages; and
- Compliance with all other terms and conditions of this Program and the Property Owner Agreement.

1.2. Expression of Interest

Property owners initiate the process by providing an application in the Town's prescribed form (or otherwise contains sufficient information) that the Property Owner completes and submits to the Town's satisfaction that confirms the Property's eligibility to participate in the Program.

1.3. Permits and quotation

This program works in a manner that compliments and necessitates compliance with the permitting requirements within the Town (where applicable) and with the Essex Region Conservation Authority (herein "ERCA"). The property owner must obtain all necessary permits from ERCA and the information on the permit will assist in detailing the intended improvements. The property owner will also be required to provide, to the satisfaction of the Town, information on the estimated lifetime of the improvements.

In addition, the property owner must provide a quotation from a contractor, to the satisfaction of the Town, to assist in the determination of the estimated cost of the improvement.

1.4. Funding under the Program

An initial disbursement of up to 20% of the pre-qualified project costs can be accessed prior to completion of the work, once the above information is provided, together with a signed copy of the Shoreline Assistance Loan Program Property Owner Agreement (POA) prepared by the Town together with any other attachments required under this agreement.

Within 30 days of the earlier of (a) the Work being Substantially Performed or (b) the Completion Date, the Property Owner shall provide the Town with the Project Completion Report.

The Town shall then verify the completeness and accuracy of the Project Completion Report, and will disqualify the Property from any funding under this POA if the Project Completion Report is incomplete or, in the Town's sole opinion, provides inadequate information to qualify for funding under this POA.

The Town may, in its sole discretion, make any reasonable adjustments to the Actual Cost as evidenced on the Project Completion Report, and may, at the Property Owner expense, inspect or cause the inspection of the Work in accordance with Section 25 of this POA.

The Actual Cost as verified and adjusted by the Town in its sole discretion will constitute the Approved Final Cost.

The Funding Amount shall be the amount, that is the lesser of:

(1) the Approved Final Cost;
(2) the Estimated Cost plus Five (5) per cent of the Estimated Cost; and
(3) the highest dollar amount that does not cause the Special Charge (Actual) to exceed the lesser of either 30 percent of Current Value Assessment for the

property or $250,000, when the Town calculates the Special Charge (Actual) as set forth in Section 11(1) of the POA.

1.5. Completing the Works through Contractor Engagement

The Town will provide funding to Property Owners for eligible improvements covered by the Program that have been approved and signed off by ERCA, verified by the Town and installed by contractors hired by the property owner. The Town will not pre-qualify contractors or procure contractors to perform or install Works on behalf of Property Owners in connection with this Program. The Property Owner will use the funds disbursed by the Town to pay contractors directly.

The Town is not responsible for the work quality of any contractors hired in connection with this Program and assumes no liability for the works undertaken. All improvements and Works must adhere to local codes and by-laws. The Property Owner is responsible for ensuring that hired contractors are licensed, bonded, and insured. Any issues that may arise relating to the quality of workmanship or post-installation performance of flood mitigation measures, for example, should be dealt with by the Property Owner and contractor.

1.6. Application Process

The steps below outline the process and requirements Property Owners need to follow as part of the Program. Town staff will periodically review this process to ensure effective Program implementation and, where deemed appropriate, the Town may make changes in its sole discretion.

Step 1: Pre-qualification

Property Owners submit an Expression of Interest that includes, but is not limited to, the following information:

- Property address to confirm location is within eligible area of the Town;
- Property assessment roll number to confirm no outstanding payments owed to the Town in the last two years; and
- Evidence of mortgage lender consent (where applicable).
  If a Property Owner has one or more outstanding mortgage(s) associated with the property, then the Property Owner must obtain (at his or her own expense) consent from the mortgage lender(s) through a form that the Town will provide. Property owners will advise their mortgage lender(s) of their intention to participate in the Program and receive permission from the lender(s) (perhaps up to only a specific dollar amount) as a requirement of the Program.

Once the property owner has been prequalified by Town staff, based on the above criteria, the Town will provide Notice to Proceed to the Property Owner.

Step 2: Design of Works and Funding Request Form

1. *Details of Improvements and ERCA approval.* Where not already provided in the Expression of Interest, the Property Owner shall supply sufficient design details describing the nature of the improvements and demonstrating how these works will impact or mitigate flooding and shoreline erosion. In addition, the estimated cost of the works can be included in the report or separately indicated on the Funding Request Form.

2. Funding Request Form

The Property Owner also will need to submit a Funding Request Form that:

- identifies the improvements that the property owner intends to install based on the permit obtained by the Property Owner from ERCA;
- identifies the cost for each improvement (including equipment, materials and labour costs); and
- the amount of prepayment (up to a maximum of 20% of the estimated cost of the work) being requested from the Town upon signing the POA.

Following receipt of the Funding Request Form, the Town will:

- confirm the eligibility of the works (e.g. items affixed to property);
- verify the reasonableness of retrofit costs and labour costs by consulting manufacturer pricing and prevailing labour rates;
- calculate the administrative costs using a formula that apportions the cost to the Town to operate this program per individual property. (*n.b.* the "cost to the Town" includes recurring costs and any non-recurring costs not covered by the grant funding, if any, that the Town has obtained for the Program).

The above steps will enable the Town to derive the funding amount up to the maximum of either 30 percent of Current Value Assessment for the property or $250,000 to include in the Property Owner Agreement.

Step 3: Property Owner Agreement

After the Town has confirmed the acceptability of the details of the improvements, estimated costs, permit obtained from ERCA, and the Funding Request Form, the Town will prepare a property owner agreement ("POA"), in accordance with Appendix B (as amended from time to time at the discretion of the Town acting on the advice of its solicitor) for the Property Owner to review and sign.

Step 4: Completing Improvements

1. Initial Funding Disbursement

Following execution of the POA, the Town will provide the Property Owner with the initial disbursement agreed upon in the POA to a maximum of 20 percent of the estimated cost of the work that can be used by the Property Owner to pay contractors or suppliers (i.e. security deposit). The property owner will be contractually obligated to repay this initial disbursement to the Town if the property owner does not complete the improvements.

The property owner can proceed with hiring contractor(s) and performing the approved improvements to the property. The improvements must be completed within a reasonable timeframe, as stipulated in the POA, to be determined by the Town in its sole discretion.

2. Final Funding Disbursement

As will be detailed in the POA, the Town will provide the final disbursement only after the Property Owner provides a Project Completion Report that:

- includes a Certificate of Completion that attests the approved shoreline improvement measures having been installed and provides a written verification from ERCA that its permit has been finalized to its satisfaction; and
- indicates the actual costs and useful life for all the works.

The Town shall then verify the completeness and accuracy of the Project Completion Report, can disqualify the Property from any funding if the Project Completion Report is incomplete or provides inadequate information to qualify for funding.

The Town may, in its sole discretion, make any reasonable adjustments to the Actual Cost as evidenced on the Project Completion Report, and may, at Property Owner expense, inspect or cause the inspection of the Work in accordance with Section 25 of the POA.

The Actual Cost as verified and adjusted by the Town in its sole discretion will constitute the Approved Final Cost.

Step 5: LIC Repayment

Following the Town Treasurer's periodic certification of the local improvement roll, (which occurs after the improvements on a given set of properties are complete and the final amounts of funding are confirmed), the administration will submit a corresponding bill for Council to adopt a by-law pursuant to Section 36.14 of O.Reg 586/06 to impose the special charges on the participating properties. For each property included in the by-law, the Treasurer will then add to the Town's tax roll for that property each year that

portion of the imposed special charge that is due in that year. These collective steps will provide priority lien status for the annual amount that the Treasurer adds to the tax roll and will ensure that any subsequent property owner who was not a party to the POA is bound to pay that amount.

To facilitate repayment of the annual special charge, the POA will require Property Owners to sign-up for the pre-authorized payment plan option of 11 monthly instalments similar to the existing Program for property tax payments. At any time, a Property Owner can make advance payments, including a one-time payment of the total outstanding amount owing to clear the property of the LIC charge. Failure to make payments is treated with the same remedy as uncollected property taxes which may include penalties and interest charges.

1.7. LIC Disclosure

As indicated above, the subsequent owner of a property on which the Town has imposed a special charge is required to pay the Town the annual LIC amount even though that subsequent owner was not a party to the original POA. In addition to notice that the Town will be giving in accordance with the provisions of O.Reg 586/06, the Town also will take the following steps to ensure even greater transparency of the LIC to interested parties by:

i) posting on the City's website notice of the special charge by-law to impose the charge on the property in advance of its introduction and after its adoption; and

ii) updating the Tax Certificate to include the full LIC amount, amount payable in the current year, outstanding amounts owing and a note to reference the by-law pursuant to which the special charge was imposed.

1.8. Quality Control

As a means of additional oversight to confirm that the funded improvements were completed, the POA will indicate that the Town reserves the right to have a Town official or third party contractor arrange with the property owner for an inspection until such time that ERCA has issued a final approval of the Works and to audit the related documentation which must be retained by the Property Owner and be available for inspection..

Report to Council

Department:	Office of the CAO
Division:	Legal and Legislative Services
Date:	April 20, 2020
Prepared by:	Robert W. Auger, Town Solicitor/Clerk
Report Number:	Legal and Legislative Services-2020-05
Subject:	Court of Revision for the Bayliss Drain (Bridge Replacements and Maintenance Schedule), Geographic Township of Colchester South, Project REI2016D024, Town of Essex, County of Essex
Number of Pages:	4

Recommendation(s)

That the following three (3) members of the Drainage Board: Kirk Carter, Percy Dufour and Luke Martin be appointed to sit as members of the Court of Revision to be convened for the Bayliss Drain (Bridge Replacements for Maintenance Schedule) Geographic Township of Colchester South, Project REI2016D024, pursuant to the Report prepared by Gerard Rood, Professional Engineer, Rood Engineering Limited, and dated February 18, 2020 (hereinafter the "Report"), such Court of Revision to be scheduled for 4:30 pm on May 21, 2020, via electronic meeting, and

That By-Law 1904 being a by-law to provide for the Bayliss Drain (Bridge Replacements and Maintenance Schedule), be read a first and second time and be provisionally adopted on May 21, 2020.

Purpose

A Court of Revision is required in accordance with Section 46 of the Drainage Act, R.S.O. 1990, Chapter D. 17, as amended 2010 (hereinafter the "Drainage Act").

Background and Discussion

Rood Engineering was instructed by the Town of Essex on or about May 4, 2016 to prepare a report for the above Bayliss Drain: Bridge Replacements and Maintenance Schedule, pursuant to Section 78 of the Drainage Act.

On February 18, 2020 the Report was prepared by Rood Engineering Inc. to provide the details, estimates and assessments therein.

A Consideration Meeting for this Report was held on March 16, 2020. At this meeting the Drainage Board received public correspondence/delegations and heard the various concerns or comments made by those who attended. At this meeting the Drainage Board resolved and recommended that the said Report be adopted and that a provisional By-Law be prepared for Council's consideration (see Drainage Board minutes from the March 16, 2020 consideration meeting, which minutes are included under Item 12 of the April 20, 2020 Regular Council Meeting Agenda).

Appointment of Court of Revision Members:

The Court of Revision is to be comprised of three (3) members of the Drainage Board and so accordingly it is recommended that Court of Revision members when required to be convened shall be appointed on a rotating, alphabetical order basis. If an appointed member is not available then that appointed member shall be replaced by the next available member of the Drainage Board (based on the aforementioned rotating, alphabetical order basis).

It is therefore recommended that Kirk Carter, Percy Dufour and Luke Martin be selected and appointed to sit as the Town of Essex members of the Bayliss Drain: Bridge Replacements and Maintenance Schedule.

It is further recommended that By-law 1904 adopting the recommendations in the Rood Engineering Report dated February 18, 2020 be provisionally adopted so that said Report can proceed to the Court of Revision specified in this report.

The Court of Revision is the next step in the process in accordance with Section 46 of the Drainage Act, R.S.O. 1990, Chapter D. 17, as amended 2010.

Financial Impact

There is no financial impact.

Consultations

Link to Strategic Priorities

☒ Manage, invest and plan for sustainable municipal infrastructure which meets current and future needs of the municipality and its citizens.

☐ Create a safe, friendly and inclusive community which encourages healthy, active living for people of all ages and abilities.

☒ Provide a fiscal stewardship and value for tax dollars to ensure long-term financial health to the municipality.

☐ Manage responsible and viable growth while preserving and enhancing the unique rural and small town character of the community.

☐ Improve the experiences of individuals, as both citizens and customers, in their interactions with the Town of Essex.

The Corporation of the Town of Essex

By-Law Number 1904

Being a by-law to provide for Bayliss Drain (Bridge Replacements and Maintenance Schedule), Geographic Township of Colchester South, Project REI2016D024, Town of Essex, County of Essex

Whereas the Town of Essex Drainage Department recommended that Council appoint a Drainage Engineer to prepare a drainage report for the for Bayliss Drain (Bridge Replacements and Maintenance Schedule), Geographic Township of Colchester South, Project REI2016D024, Town of Essex, County of Essex;

And Whereas Section 78 of the Drainage Act, R.S.O. 1990, Chapter D. 17, as amended 2010, states that the Council of any municipality whose duty it is to maintain and repair the drainage works or any part thereof, may on the report of an Engineer appointed by it, complete the drainage works as set forth in such report;

And Whereas an Engineers Drainage report dated February 18, 2020 and considered by the Drainage Board at its March 16, 2020 Consideration of Report meeting, has been procured and made by Gerard Rood, Professional Engineer, Rood Engineering Inc. and that the said report is attached hereto and forms part of this by-law;

And Whereas the Council of The Corporation of the Town of Essex is of the opinion that the said drainage works and/or improvements are warranted and desirable;

Now therefore the Council of The Corporation of the Town of Essex pursuant to the Drainage Act enacts as follows:

1. That the considered report dated February 18, 2020 and attached hereto as Schedule A to this By-law is hereby adopted and the said drainage works and/or improvements as therein indicated and set forth is hereby authorized and shall be completed in accordance therewith.

2. That the Corporation of the Town of Essex may borrow on the credit of the Corporation the amount of $126,500.00, the amount necessary for the construction of the said drainage works.

3. That the Corporation may issue debentures for the amount borrowed less the total amount of:
    - Grants received under Section 85 of the Drainage Act, R.S.O. 1990, Chapter D. 17, as amended, 2010;
    - Commuted payments made in respect of lands and roads assessed within the Municipality;
    - Money paid under Section 61(3) of the Drainage Act, R.S.O. 1990, Chapter D. 17, as amended 2010;

    and such debentures shall be made payable: a) in the case of assessments in value of between $500.00 and $9,999.99 within (5) five years from the date of the debenture and shall bear interest at a rate not higher than the lending rates published by Infrastructure Ontario for municipalities; or b) in the case of assessments in value of $10,000.00 and greater, within (10) ten years from the date of the debenture and shall bear interest at a rate not higher than the lending rates published by Infrastructure Ontario for municipalities

4. That a special equal annual rate sufficient to redeem the principal and interest on the debentures shall be levied upon the lands and roads as set forth in the Schedule, to be collected in the same manner as other taxes collected in each year for (5) five or (10) ten years (as applicable) after the passing of this by-law.

5. For paying the amount assessed upon the lands and roads belonging to or controlled by the Municipality, a special rate sufficient to pay the amount assessed plus interest thereon, shall be levied upon the whole rateable property in the Town of Essex, in each year for five years after the passing of this by-law to be collected in the same manner and at the same time as other taxes are collected.

6. All assessments of $499.99 or less are payable in the first year in which the assessment is imposed.

7. The by-law comes into force on the passing thereof and may be cited as "Bayliss Drain: Bridge Replacements and Maintenance Schedule".

Read a first and a second time and provisionally adopted on April 20, 2020.

_____
Mayor

_____
Clerk

Read a third time and finally passed on

_____
Mayor

_____
Clerk

Report to Council

Department:	Infrastructure Services
Division:	Operations
Date:	April 20, 2020
Prepared by:	Jackson Tang, Assistant Manager, Business Services
Report Number:	Operations-2020-01
Subject:	Results of Request for Tender for the Supply of Tandem Drum Asphalt Compactor
Number of Pages:	3

Recommendation(s)

That Operations 2020-01 entitled Results of Request for Tender for the Supply of Tandem Drum Asphalt Compactor prepared by Jackson Tang, Assistant Manager, Business Services dated April 20, 2020 be received, and

That Council award the Request for Tender for the Supply of Tandem Drum Asphalt Compactor to Kucera Group Tecumseh in the amount of $52,406.40 including non-refundable harmonized sales tax; and

That Council approve the additional funding of $2,406.40 above the allocated 2020 Supply of Tandem Drum Asphalt Compactor capital budget of $50,000.00 (Project Code: PW-20-0032) through transferring from the Development Charges Reserve.

Purpose

Council approval is required to award the request for tender for the Supply of Tandem Drum Asphalt Compactor to Kucera Group Tecumseh and that the additional funds for the project be approved as per recommendation above.

Background and Discussion

In 2020, Council approved in the Capital Budget for a Tandem Drum Asphalt Compactor to be utilized by the Operations Department at the amount of $50,000.

A Request for Tender following the guidelines as set out in the Town's Procurement By-Law Number 1043 for the Supply of Tandem Drum Asphalt Compactor was posted both on the Town's website and Merx, and closed on April 01, 2020 at 3:00:00 PM.

Administration reviewed the Tender submissions for specification compliance and found it to be complete. The results of the submitted tender prices are noted in Table below:

Name of Tenderer	Total Tender price including non-refundable Harmonized Sales Tax (1.76%)
Kucera Group Tecumseh	$52,406.40
Toromont CAT	$63,373.08
Enduraquip Inc	$53,927.71

Based on the pricing provided in the submissions, it is recommended that the lowest tender submitted by Kucera Group Tecumseh be accepted.

Financial Impact

As per the 2020 Capital budget, $50,000 (Project Code: PW-20-0032) was approved for the purchase of the subject Tandem Drum Asphalt Compactor which is not sufficient to cover the

lowest total tender price. Additional funds of $2,406.40 are required to be transferred from Development Charges Reserve to cover this shortage.

Link to Strategic Priorities

☒ Manage, invest and plan for sustainable municipal infrastructure which meets current and future needs of the municipality and its citizens.

☐ Create a safe, friendly and inclusive community which encourages healthy, active living for people of all ages and abilities.

☐ Provide a fiscal stewardship and value for tax dollars to ensure long-term financial health to the municipality.

☐ Manage responsible and viable growth while preserving and enhancing the unique rural and small town character of the community.

☐ Improve the experiences of individuals, as both citizens and customers, in their interactions with the Town of Essex.

Report to Council

Department:	Infrastructure Services
Division:	Capital Works and Infrastructure
Date:	April 20, 2020
Prepared by:	Jackson Tang, Assistant Manager, Business Services
Report Number:	Capital Works and Infrastructure-2020-03
Subject:	Results of Request for Tender - Supply of Three Pick-up Trucks 2020
Number of Pages:	3

Recommendation(s)

That Capital Works and Infrastructure 2020-03 entitled Results of Request for Tender - Supply of Three Pick-up Trucks 2020 prepared by Jackson Tang, Assistant Manager, Business Services dated April 20, 2020 be received, and

That Council award the Request for Tender - Supply of Three Pick-up Trucks 2020 to Ken Knapp Ford in the amount of $117,652.87 including trade in value and non-refundable harmonized sales tax.

Purpose

In accordance with the Town Procurement By-Law Number 1043, Council approval is required for purchases in excess of $100,000. This report is to seek Council's approval to appoint a qualified supplier to provide the Town with three different pick-up trucks.

Background and Discussion

The Town of Essex is updating and adding to its vehicle fleet. As a result, the Town has to purchase three different pick-up trucks to be utilized by Community Services, Building Services and Environmental Services Departments respectively.

A Request for Tender, following the guidelines as set out in the Town's Procurement By-Law Number 1043 was posted both on the Town's website and Merx, and closed on April 01, 2020 at 3:00:00 pm.

Upon Closing, only one tender from Ken Knapp Ford was received. Administration reviewed the tender submissions for specification compliance and found the pick-up truck quoted for Community Services (Project Code: CS-20-0019) as an F-350 with a capacity of one ton which is heavier than the capacity of three-quarter ton specified by the Town. After clarification, Ken Knapp Ford submitted another model, an F-250 with the capacity of three-quarter ton. The price of the F-250 is $982.00 higher but has a fuel consumption of at least one-third less than the F-350. The three used pick-up trucks that the tendered vehicles are replacing have also been included in the Request for Tender for trade in. The results of the submitted tender prices including non-refundable harmonized sales tax for different trucks are noted in the table below:

Project Code	Item Description	Approved Budget 2020	Total Tender price including non-refundable Harmonized Sales Tax (1.76%)	Total Tender price including Trade in Value and non-refundable Harmonized Sales Tax (1.76%)
CS-20-0019	¾ Ton Crew Cab Pick-up Truck	$65,000.00	$49,194.85	$45,887.65
BD-20-0001	½ Ton 4 x 4 Pick-up Truck	$42,500.00	$38,502.93	$35,195.73
WW-20-0009	½ Ton 4 x 4 Pick-up Truck	$45,000.00	$39,113.49	$36,569.49

Total	$152,500.00	$126,811.27	$117,652.87

Financial Impact

As per the 2020 approval capital budget, a combined total of $152,500 has been allocated towards these projects. The total for the purchase of all three pick-up trucks is $117,652.87 including the trade in value of $9,158.40 and non-refundable Harmonized Sales Tax (1.76%) applicable to the Town of Essex which is within the approved 2020 capital budget. The Trade in value of $9,158.40 will be transferred back to the respective Project Codes under the Land & Equipment Sales General Ledger Account.

Link to Strategic Priorities

☒ Manage, invest and plan for sustainable municipal infrastructure which meets current and future needs of the municipality and its citizens.

☐ Create a safe, friendly and inclusive community which encourages healthy, active living for people of all ages and abilities.

☐ Provide a fiscal stewardship and value for tax dollars to ensure long-term financial health to the municipality.

☐ Manage responsible and viable growth while preserving and enhancing the unique rural and small town character of the community.

☐ Improve the experiences of individuals, as both citizens and customers, in their interactions with the Town of Essex.

Report to Council

Department:	Development Services
Division:	Planning
Date:	April 20, 2020
Prepared by:	Niharika Bandaru, Climate Change Analyst
Report Number:	Planning-2020-06
Subject:	Climate Change Adaptation Plan – Progress Report 1
Number of Pages:	3

Recommendation(s)

That Planning 2020-06 Report, entitled "Climate Change Adaptation Plan – Progress Report 1" prepared by "Niharika Bandaru, Climate Change Analyst" dated "April 20, 2020" be received.

Purpose

To provide Council with updates regarding the progress on the climate change adaptation planning process.

Background and Discussion

At its regular meeting of November 18, 2019, Council gave direction to Administration to implement the process leading to the creation of a proposed Climate Change Adaptation Plan. The process includes 4 phases:

- Phase 1: Assessing Climate Impacts

- Phase 2: Adaptation Planning
- Phase 3: Approval and Funding; and,
- Phase 4: Implementation

Phase 1 is currently in progress and includes engaging internal and external community stakeholders through the internal and external climate adaptation teams (ICAT and ECAT) to draw on expertise to advise on solutions to various risks posed by climate impacts to the Town of Essex. At the regular meeting of November 18, 2019, Council requested regular updates on the progress of the Climate Change Adaptation Planning process. The following report is with reference to this request.

Internal Climate Adaptation Team (ICAT)

An Internal Climate Adaptation Team (ICAT) was created consisting of representatives from the following departments of the Town of Essex:

- Infrastructure Services:
  - Operations/Drainage
  - Capital Works & Asset Management
  - Environmental Services
- Community Services:
  - Recreation & Culture
  - Parks & Facilities
  - Fire
- Development Services:
  - Planning Services
  - Building Services
  - Economic Development
- Corporate Services
  - Finance & Business Services

    - Human Resources
    - Information Technology
- Strategic Communications
- Legal and Legislative Services

The Kick-Off meeting was conducted on February 28, 2020. During this meeting, members were introduced to the purpose of the ICAT, Climate Projections, and the Adaptation Planning Timeline. Members also engaged in a group exercise where they were asked to discuss how the operations, services, and assets of their individual divisions would be affected by the climate projections for the region.

For example:

- Extreme flooding, rain/storm events, and high lake levels can increase the number of hazard zones and increase costs associated with moving essential infrastructure out of hazard zones (Affected divisions: Environmental Services, Operations/Drainage)
- More days above 30˚C will result in reduced attendance of outdoor recreational programs and an increased cancellation of outdoor programming (Affected divisions: Parks & Facilities, Recreation & Culture, Strategic Communications, Human Resources, Finance)
- Higher heat waves will lead to more fires resulting in exhaustion and decreased mental health in firefighters (Affected divisions: Fire, Human Resources, Finance)
- Increased average temperatures will lead to greater number of power outages and increased cost of battery backups for traffic signals (Affected divisions: Public Works, Finance)
- Increased rain events may lead to increased costs by investment in back-up generators/power sources for vulnerable areas (Affected divisions: Parks & Facilities)

Essex Climate Adaptation Team (ECAT)

The fourteen (14) ECAT members, including Councillor Kim Verbeek, met on March 5, 2020 at the Essex Sports Complex to formally kick off discussions. ECAT Members were introduced to the Committee's purpose, Climate Projections, and the Adaptation Planning Timeline. An intensive Impact Identification workshop was conducted whereby members highlighted the various ways their individual sectors, as well as the community as a whole, would be impacted by climate change in the region.

For example:

- More frequent/severe extreme weather events (ex: windstorms, thunderstorms, tornadoes etc.) will cause increased damage to communication infrastructure which will result in a break in telecommunication and emergency services. (Affected sectors: Emergency Management, Health, Infrastructure)
- Increase in lake level fluctuation will increase damage to septic systems creating greater issues for private land owners along the shoreline. (Drainage, Land Management, Health)
- Increased annual precipitation will increase sediment loads in drainage system leading to bank failures and damage to bridges and culverts. (Infrastructure, Transportation, Land Management)
- Increased precipitation will lead to an increase in mold growth leading to crop failures. (Agriculture, Economy, Health)
- Hotter days will result in increased need for cooling for agricultural livestock leading to an increased energy demand (Agriculture, Economy, Energy)

Data Analysis and Future Meetings

The data collected from the ICAT and the ECAT is currently being compiled to produce impact statements for the Town of Essex. Impact statements identify the effects of existing or forecasted changes in climate on built, natural, and community systems. By examining these statements, the effect on Town operations, services, and capital assets will be better understood. The impact statements will inform the Vulnerability and Risk Assessment process that will be conducted with the members of both the ICAT and ECAT in upcoming meetings (currently subject to COVID-19 related procedural changes).

A Vulnerability Assessment (VA) is conducted to understand the susceptibility of a certain Town division or a service area to climate change impacts. A Risk Assessment follows a VA, and is conducted to understand the likelihood of a projected impact as well as the severity of its damage to Town divisions and service areas. This process will result in determining the high and medium priority impacts to various operations at the Town of Essex, as well as community stakeholders.

In order to accommodate changes to operations due to the COVID-19 pandemic, the follow-up ICAT and ECAT meetings have been postponed to May from their intended scheduled dates in early April. Currently, plans to organize these meetings electronically and virtually are underway. Despite meeting date changes, COVID-19 has not impacted overall project timelines or budgets. Efforts are being taken to ensure that the planned milestones are met in a timely manner, with minimal impacts from the ongoing pandemic.

Financial Impact

None.

Consultations

Rita Jabbour, Manager, Planning Services

Link to Strategic Priorities

☒ Manage, invest and plan for sustainable municipal infrastructure which meets current and future needs of the municipality and its citizens.

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☐ Provide a fiscal stewardship and value for tax dollars to ensure long-term financial health to the municipality.

☐ Manage responsible and viable growth while preserving and enhancing the unique rural and small town character of the community.

☒ Improve the experiences of individuals, as both citizens and customers, in their interactions with the Town of Essex.

Report Approval Details

Document Title:	Climate Change Adaptation Plan - Progress Report 1 - Planning-2020-05.docx
Attachments:	
Final Approval Date:	Apr 15, 2020

This report and all of its attachments were approved and signed as outlined below:

Rita Jabbour, Manager, Planning Services - Apr 15, 2020 - 3:18 PM

Lori Chadwick, Director, Development Services - Apr 15, 2020 - 3:19 PM

Chris Nepszy, Chief Administrative Officer - Apr 15, 2020 - 3:33 PM

Attorney General
McMurtry-Scott Building
720 Bay Street
11th Floor
Toronto ON M7A 2S9
Tel: 416-326-4000
Fax: 416-326-4007

Procureur général
Édifice McMurtry-Scott
720, rue Bay
11e étage
Toronto ON M7A 2S9
Tél.: 416-326-4000
Téléc.: 416-326-4007

Ontario

Our Reference #: M-2020-3888

April 9, 2020

I am writing to let you know that the Ontario government is revising one element of a previous emergency order, O. Reg. 73/20 made under the *Emergency Management and Civil Protection Act*, which suspended limitation periods and procedural time periods retroactive to March 16, 2020.

The previous order was made to help Ontarians who are having difficulty meeting those time requirements as a result of the COVID-19 outbreak.

The emergency order has been amended to lift the suspension of limitation periods and procedural time periods under the *Construction Act*. This will allow for the release of holdback payments to contractors and subcontractors in the normal course, helping to resolve a potentially significant cash flow problem as a result of the order for the construction industry.

The suspension will be lifted on April 16, 2020, to give the industry time to prepare for these changes. Once lifted, parties will have the same amount of time to meet a deadline that had been remaining before the suspension began on March 16, 2020.

The amendments to the order also address the *Niagara Escarpment Planning and Development Act*. The amendments to O. Reg. 73/20 will be posted on e-Laws at: https://www.ontario.ca/laws/regulation/200073.

Please note that at the time you receive this email, e-Laws may not yet be updated to reflect the amendments.

Sincerely,

Doug Downey

Doug Downey
Attorney General

Information for Snow Birds: Operation of Seasonal Trailer Parks and Recreational Campgrounds

Published on April 5, 2020

Ontario "snow birds" where their only Canadian residence is in a Seasonal Trailer Park, or Recreational Campground are permitted to continue their occupancy.

Recreational use of these properties are not permitted and subject to a provincial fine.

> "We recognize Ontario "snowbirds" are returning to Canada earlier than they normally would. In some instances, seasonal trailer parks and campgrounds may have been opened earlier than usual to permit individuals to take up temporary accommodation in their mobile homes, recreational vehicles or trailers. For Ontarians whose only Canadian residence is at one of these seasonal trailer parks or campgrounds, they are permitted to continue their occupancy and complete their mandatory isolation order made by the federal government under the Quarantine Act which took effect on March 25, 2020."

Please see below for the full release from the Ministry of Municipal Affairs and Solicitor General.

Ministry of Municipal Affairs and Housing

Office of the Minister

777 Bay Street, 17th Floor
Toronto ON M7A 2J3
Tel.: 416 585-7000

Solicitor General

Office of the Solicitor General

25 Grosvenor Street, 18th Floor
Toronto ON M7A 1Y6
Tel.: 416 325-0408
MCSCS.Feedback@Ontario.ca

Ministère des Affaires municipales et du Logement

Bureau du ministre

777, rue Bay, 17e étage
Toronto ON M7A 2J3
Tél.: 416 585-7000

Solliciteur général

Bureau de la solliciteure générale

25, rue Grosvenor, 18e étage
Toronto ON M7A 1Y6
Tél.: 416 325-0408
MCSCS.Feedback@Ontario.ca

Ontario

April 4, 2020

Dear Head of Council:

Subject: Operation of Seasonal Trailer Parks and Recreational Campgrounds – Amended Essential Business Order as of April 3, 2020

Nothing is more important than protecting the health and well-being of Ontarians. Since first learning of COVID-19, Ontario has taken decisive action to contain the spread of this new virus.

Based on the advice of the Chief Medical Officer of Health, the province has declared an emergency so that we can take immediate action to stop the spread of COVID-19 and protect the public. On Tuesday, March 24th, the province ordered the mandatory closure of all non-essential workplaces pursuant to Ontario Regulation 82/20 under the *Emergency Management and Civil Protection Act*. On April 3, 2020 the province released an amended list of essential workplaces and ordered all businesses not covered by the amended emergency order to close their physical locations effective as of Saturday, April 4, 2020 at 11:59 p.m.

Seasonal trailer parks and recreational campgrounds are not listed as essential businesses and, as such, are required to be closed as of 11:59 p.m. today.

We recognize Ontario “snowbirds” are returning to Canada earlier than they normally would. In some instances, seasonal trailer parks and campgrounds may have been opened earlier than usual to permit individuals to take up temporary accommodation in their mobile homes, recreational vehicles or trailers. For Ontarians whose only Canadian residence is at one of these seasonal trailer parks or campgrounds, they are permitted to continue their occupancy and complete their mandatory self-isolation as required by the mandatory isolation order made by the federal government under the *Quarantine Act* which took effect on March 25, 2020.

…/2

Everyone has a role to play in stopping the spread of COVID-19 and we are asking that our enforcement partners assist in this effort. We encourage you to assist in enforcement efforts to ensure that seasonal trailer parks and/or campgrounds are not being used for recreational purposes. We encourage you to work with park operators and local public health officials in this regard, including to take into consideration the continued need for accommodation of those individuals outlined above.

Officers are encouraged to undertake a graduated approach to enforcement of the emergency orders, which may include educational messaging to businesses around the emergency order, specific warnings, the issuance of a ticket under Part I of the Provincial Offences Act (POA) or a summons under Part III of the POA. Officers are also encouraged to review the applicable provincial and federal emergency orders, and to continue to monitor ontario.ca/alert for any updates or changes to provincial orders.

By staying home and avoiding contact with others we can stop the spread of COVID-19.

Thank you for your continued cooperation on this matter.

Sincerely,

Steve Clark
Minister of Municipal Affairs
and Housing

Sylvia Jones
Solicitor General

Contact us

Queen's Park
Room 370 Main Legislative Building

Community Office
316 Talbot St. N
Essex, ON N8M 2E1

Toronto, ON M7A 1A5

Phone: 416-325-0714
Fax: 416-325-0873
Email: tnatyshak-qp@ndp.on.ca

Tel: 519-776-6420
Toll Free: 1-800-265-3909
Fax: 519-776-6980
Email: tnatyshak-co@ndp.on.ca

Community Office Hours

Monday : 9:30AM – 4:00PM
Tuesday: 9:30AM – 4:00PM
Wednesday: Closed (Case Work). Appointment only.
Thursday: 9:30AM – 4:00PM
Friday: 9:30AM – 4:00PM

The office is closed from noon to 1pm daily for lunch.

From: Denonville, Alex
Sent: Wednesday, April 8, 2020 1:32 PM
To: CouncilMembers <CouncilMembers@essex.ca>
Subject: Community Update, April 8: Town of Essex By-law Officer to conduct enforcement of provincial orders

Media Release
April 8, 2020

Update on COVID-19 Response

Town By-law Officers to conduct enforcement of provincial orders

Essex- Town of Essex By-law Officers are working with the Ontario Provincial Police to conduct regular patrols to ensure members of the public follow the provincial orders made under the Emergency Management and Civil Protection Act.

The emergency orders prohibit organized public events and social gatherings of more than five, as well as restrict the use of recreational amenities in public spaces. The orders also call for the closure of all non-essential businesses.

"We expect and hope that all of our residents take these orders seriously to help stop the spread of the virus in our community," said Mayor Larry Snively. "However, it is clear that some are not getting the message to stay home, if you can, and avoid gathering. For these cases, enforcement is the next step to ensure the health and safety of everyone in our community."

During regular business hours, the Town's by-law enforcement team will conduct regular patrols and follow up on complaints from the public. When enforcing the orders, individuals may be required to provide their name, date of birth, and address. Failure to comply with an emergency order can carry fines for individuals between $750 to $100,000, and up to one year imprisonment. For more details on the enforcement of provincial orders, visit the Ministry of the Solicitor General's news update.

During regular business hours, residents with concerns about large groups or non-essential businesses continuing to operate can contact the Town's By-law Enforcement Team at bylaw@essex.ca or 519-776-7336 ext 1400. Alternatively, residents can contact the Ontario Provincial Police non-emergency line at 1-888 310-1122, which is available 24 hours per day, 7 days per week.

For guidance on what individuals can do to reduce their risk of contracting the virus, or what to do if they display symptoms, please visit the Ontario Ministry of Health's COVID-19 resource page. For local updates, please visit Windsor Essex County Health Unit's Novel Coronavirus page.

Media Contact
Alex Denonville
Manager, Communications
adenonville@essex.ca
519-990-7546

April 11, 2020

AMO COVID-19 Update – New Emergency Orders

Extension of All Ontario Emergency Orders until April 23

Today, the Province has extended all emergency orders under s.7.0.2 (4) of the *Emergency Management and Civil Protection Act* (Ontario Takes Further Action to Stop the Spread of COVID-19) until April 23, 2020, including the closure of outdoor amenities in parks and recreational areas, non-essential workplaces, public places and bars and restaurants, along with restrictions on social gatherings. This extension is to help stop the spread of COVID-19 and protect the health and safety of Ontarians.

In addition, new measures have been introduced to address surge capacity in retirement homes, restrict recreational camping on Crown land, and allow the repurposing of existing buildings and temporary structures.

Temporary Health Care Structures for COVID-19

On April 9th, an emergency order (Order under Subsection 7.0.2 (4) of the Act - Temporary Health or Residential Facilities) under the *Emergency Management and Civil Protection Act*, provides relief from the Building Code to temporary health care structures being built for COVID-19 purposes. These structures are not designed to meet the normal requirements for health care facilities (such as HVAC or oxygen gas lines). However, they are needed as hospitals require new beds to care for those suffering from the pandemic as well as the other patients.

Specifically, the structures will:

- not be subject to the Building Code,
- no building permit will be required,
- no zoning or site plans will be required.

These structures would need to be designed by architects and approved by engineers. Both these professions would have to sign off on the structures. The Chief Building Official (CBO) will need to deem the building safe and regularly inspect for structural sufficiency in keeping with the original design. We understand that

CBOs have requested this approach and have been consulted by the Province in advance of this order.

Discussion about the orderly dismantling of these structures during the recovery period is taking place and will unfold as the epidemic starts to subside.

The Ministry of Municipal Affairs and Housing will be setting up webinars soon to take building officials and municipal staff though the order and answer questions. More MMAH information about those sessions will be coming next week.

Construction Act Payment Suspension Revision

The Province has revised one *Construction Act* section of a previous emergency order, O. Reg. 73/20 made under the *Emergency Management and Civil Protection Act*, which suspended limitation periods and procedural time periods retroactive to March 16, 2020. At the time of this update, O. Reg. 73/20 has not been revised to include this revision on the provincial e-Laws site.

This emergency order has been amended to lift the suspension of limitation periods and procedural time periods under the *Construction Act*. This will allow for the release of holdback payments to contractors and subcontractors in the normal course, helping to resolve a potentially significant cash flow problem as a result of the order for the construction industry.

The suspension will be lifted on April 16, 2020, to give the industry time to prepare for these changes. Once lifted, parties will have the same amount of time to meet a deadline that had been remaining before the suspension began on March 16, 2020.

Child Care Operators prevented from Charging Fees while Closed

During the COVID-19 outbreak, the Ontario government is temporarily preventing child care centres from collecting payments from parents, while also ensuring that their child care spaces are protected. Child care centres, with the exception of those accommodating health care and other frontline workers, were ordered closed to help prevent the spread of the virus and keep the children and child care staff safe.

An emergency order (Ontario Protects Parents during COVID-19) has been issued, and immediately prevents any child care operator from charging parent fees where care is not being provided. The order also means that parents cannot lose their child care space because they are not paying fees during this period. This order will affect closed municipal child care centres.

AMO's COVID-19 Resources page is being updated continually so you can find critical information in one place. Please send any of your municipally related pandemic questions to covid19@amo.on.ca.

April 14, 2020

AMO COVID-19 Update: Bill 189, *Coronavirus Support and Protection Act, 2020* Receives Royal Assent

Today, the Province extended the Declaration of Emergency under the *Emergency Management and Civil Protection Act* for a further 28 days, to May 12, 2020. This extension was made to help stop the spread of COVID-19 and protect the health and safety of Ontarians.

The extension of the provincial declaration of emergency allows Ontario to continue to enforce current emergency orders. A full list of emergency orders can be found on the e-Laws website under the *Emergency Management and Civil Protection Act*.

Bill 189 Receives Royal Assent

Today Bill 189 was introduced and passed by the Ontario Legislature. Of municipal significance, the Act amends the *Planning Act,* the *Development Charges Act*, and the *Police Services Act*. This new legislation was intended to demonstrate that the government is actively listening to the concerns of education and municipal stakeholders during this COVID-19 emergency.

At the time of writing this update, the legislation has not been posted but the Province has released a backgrounder with a summary of these changes. While AMO staff will provide further Bill 189 analysis if required, here are the municipal implications that we understand Bill 189 will have:

Planning

We understand that Bill 189 temporarily suspends specified timelines for applications for development and land use planning matters. This relief may be applied retroactively to the date that an emergency was declared. This legislation allows those municipalities who want to proceed with planning applications to do so while allowing those that are not in a position to proceed to redirect efforts to dealing with the COVID emergency without fearing appeals for missing deadlines. The timelines would return to normal once the emergency ends.

We appreciate the efforts of Minister Clark to bring about these extensions to development approvals timelines. AMO will continue to press for similar suspension to all statutory timelines that municipal governments are currently required to follow. As well, AMO is requesting that when timelines are restarted there should be a reasonable recovery period to properly manage any backlog.

Development Charges

The changes to the Act governing development charges ensures that municipal governments can continue to use their existing development charge bylaws. Preserving these existing bylaws allows municipalities to continue collecting development charges without having to replace expiring bylaws. AMO understands municipalities will have six months from the end of the declared emergency to develop new development charge bylaws.

In addition, education related development charges may still be collected.

Police Services Act

Municipalities had previously been mandated to complete Community Safety and Wellbeing Plans by January 1, 2021. This due date will no longer apply. The Solicitor General will establish a new deadline, by regulation, at a future date.

The above changes will allow municipal governments and their staff to continue to focus on responding to the public health emergency in the months ahead.

AMO's COVID-19 Resources page is being updated continually so you can find critical information in one place. Please send any of your municipally related pandemic questions to covid19@amo.on.ca.

The Corporation of the Town of Midland

575 Dominion Avenue
Midland, ON L4R 1R2
Phone: 705-526-4275
Fax: 705-526-9971
www.midland.ca

March 23, 2020

By Fax to: 613.941.6900 & Twitter @CanadianPM, @JustinTrudeau

The Right Honourable Justin Trudeau
Prime Minister of Canada
Langevin Block,
Ottawa, Ontario, K1A 0A2

Dear Prime Minister:

Re: Direct Payment of Federal Funds to Municipalities to Waive Property Taxes for the Year 2020 - Financial help to alleviate the suffering from COVID-19 Pandemic

It is trite to repeat the human and financial toll of the COVID-19 Pandemic. Similarly, the commitment of the federal, provincial and municipal governments toward alleviating the suffering of Canadians does not require repeating.

We, at the Town of Midland, in the Province of Ontario, are proposing what we believe to be a simple but effective solution to facilitate the delivery of our common and shared commitment to the financial and psychological well-being of all Canadians.

Proposal:

1. **Residential Properties (primary residence only)**

    a. Waive 100% of the 2020 property taxes for all residential properties currently assessed at or below $ 500,000.00 by each governing provincial property assessment body; and
    b. Waive 50% of the 2020 property taxes for all residential properties currently assessed below $ 1,000,000.00; and
    c. Waive 25% of the 2020 property taxes for all residential properties currently assessed above $1,000,000,00.

2. **Industrial, Commercial and Farm Properties**

    a. Waive 100% of the 2020 property taxes for all; industrial, commercial and farm properties currently assessed at under $ 10,000,000.00; and
    b. Waive 50% of the property taxes for the year 2020 for all industrial, commercial and farm properties currently assessed between $10,000,000.00 and $ 50,000,000.00; and
    c. Waive 25% of the property taxes for the year 2020 for all industrial, commercial and farm properties assessed above $50,000,000.00.

3. **Federal Transfer Payment to Canadian Municipalities**

    a. In lieu of the annual municipal property taxes, the Federal Government transfers funds to municipalities across Canada, as a one-time grant.

Advantages of the Proposal:

1. Quick and timely relief;
2. Direct relief to all Canadian homeowners and the business community;
3. Directly protects Canadians who although may be solvent, are unable to easily meet the financial pressures beyond their personal capacity due to COVID-19;
4. No additional resources required to assess individual need and delivery of the relief;
5. Negligible overhead costs for the disbursement of the relief. In fact, it may cut-down on some of the work for municipal staff; and
6. The financial stimulus received from the federal government will come into circulation immediately and will stay in the community.

There are a multitude of other direct and indirect financial and non-financial benefits that will result from the implementation of this proposal. The biggest non-financial impact is that Canadians will see an immediate financial relief respecting the pressures to make their property tax payments and be better positioned to address other essential needs. In turn, removing this added stress will provide some relief to the already strained financial and health systems.

As you are aware, Canadians are entering this time of crisis with a very high amount of house-hold debt and a great deal of financial fragility. Taking this simple step should alleviate some of those pressures. At the same time, it will keep your municipal governments, and school boards primed for continued productivity and forward momentum to address the fallout from COVID-19.

Thanking you in anticipation of a favourable response.

Sincerely,
The Corporation of the Town of Midland

Stewart Strathearn,
Mayor
sstrathearn@midland.ca

A. Sidhu

Amanpreet Singh Sidhu,
Chief Administrative Officer
asidhu@midland.ca

c: Town of Midland Council
Association of Municipalities of Ontario
Province of Ontario

Ministry of Municipal Affairs and Housing

Office of the Minister

777 Bay Street, 17th Floor
Toronto ON M7A 2J3
Tel.: 416 585-7000

Ministère des Affaires municipales et du Logement

Bureau du ministre

777, rue Bay, 17e étage
Toronto ON M7A 2J3
Tél.: 416 585-7000

Ontario

234-2020-902

Dear Heads of Council / Clerks and CAOs:

Nothing is more important than protecting the health and well-being of all Ontarians. Since first learning of COVID-19, Ontario has taken decisive action to stop the spread of the virus.

Our government knows that an increasing number of municipalities are responding to the COVID-19 outbreak by diverting resources to essential services, instructing non-essential staff to work from home and suspending in-person meetings. We appreciate that the current situation is not “business as usual,” and that meeting statutory timelines associated with decisions on planning applications can be difficult, if not impossible.

In response to requests from municipalities and the Association of Municipalities of Ontario, our government intends to introduce legislation in the coming weeks to allow for the suspension of specified timelines associated with land use planning matters that could be applied retroactively to the date that an emergency was declared. If passed, these changes would provide authority for the Minister of Municipal Affairs and Housing to give municipalities time to focus on the COVID-19 outbreak.

If approved, municipalities and planning boards would still be able to make decisions on land use planning matters during this time if they so desired and can consider using electronic and virtual channels as appropriate to engage and solicit feedback from the public on land use planning matters. It is vital for the economy that we move the administrative process along to the best of our collective ability in order to continue the important job of creating housing and keeping infrastructure projects moving.

Municipalities that instead wish to pause their consideration of planning applications and direct their resources and attention to more immediate priorities would be permitted to do so without the threat of appeal.

We know that such a change could have a significant effect on your municipality’s land use planning matters, but it is necessary to ensure we can all offer our full support to help our health care sector to stop the spread of COVID-19.

…/2

Our government also supports growth paying for growth and ensuring municipalities have the tools to ensure complete communities are built. Therefore, we will also be proposing amendments to the *Development Charges Act* to ensure these important principles would continue during the COVID-19 outbreak.

If passed, our proposed changes would allow municipalities to continue to use their existing development charge bylaw during the COVID-19 outbreak and for a short period thereafter. We know that if a municipality's development charge bylaw is scheduled to expire in the coming months it would be difficult to replace given the current situation. We are taking this measure to ensure municipalities can continue to count on this vital source of revenue for local infrastructure and services.

We have also extended the current Environmental Registry of Ontario posting related to community benefits charges until April 20, 2020. The extension of the Environmental Registry of Ontario posting along with the proposed development charge changes will allow municipalities more time to consider the alignment of future development charge bylaws with the new community benefits tool to support local growth.

Let me assure you that our government is working to support you, our municipal partners, and will continue to work collaboratively to keep all Ontarians safe.

Further details and information will be provided once the legislation is introduced.

Sincerely,

Steve Clark
Minister

c. Association of Municipalities of Ontario

UNION WATER SUPPLY SYSTEM

JOINT BOARD OF MANAGEMENT

Wednesday, April 15, 2020
9:15AM
Virtual Meeting via Zoom

AGENDA

A. Call to Order:

B. Disclosures of Pecuniary Interest:

C. Approval of Minutes:

Minutes of the meeting of the Union Water Supply System Joint Board of Management Meeting held Wednesday, February 19, 2020
Pages 2 - 6

D. Business Arising Out of the Minutes

E. Items for Consideration:

1. UW/11/20 dated April 10, 2020 re: Status Update of UWSS Operations & Maintenance Activities and Capital Works to April 10, 2020
   Pages 7 - 10

2. UW/12/20 dated April 7, 2020 re: UWSS 2019 Financial Report
   Pages 11 - 30

3. UW/13/20 dated April 10, 2020 re: Payments from February 14 to April 10, 2020
   Pages 31 - 40

F. New Business:

G. Adjournment:

H. Date of Next Meeting: May 20, 2020, 9:00 am location TBD

/kmj

JOINT BOARD OF MANAGEMENT

Wednesday, February 19, 2020
9:00 AM
Ruthven Water Treatment Plant
1615 Union Avenue,
Ruthven

MINUTES

Members Present:	Mayor MacDonald (Chair); Deputy Mayor Verbeke, Councillors Hammond, Wilkinson – Leamington Deputy Mayor Queen, Councillors DeYong, Neufeld, Patterson, Gaffan (alternate) – Kingsville Councillor VanderDoelen – Essex
Members Absent:	Mayor Nelson Santos (Vice Chair) – Kingsville Councillors Dunn and Jacobs – Leamington Councillor Walstedt - Lakeshore
UWSS Staff Present:	Rodney Bouchard, Manager UWSS Khristine Johnson, UWSS Recording Secretary
Municipal Staff Present:	Andy Graf – Essex Shaun Martinho – Kingsville Kevin Girard – Lakeshore
OCWA Staff Present:	Susan Budden Dale Dillen, Ken Penney

Call to Order: 9:01 am

Disclosures of Pecuniary Interest: none

Adoption of Board Minutes:

No. UW-10-20

Moved by: Councillor DeYong

Seconded by: Councillor Patterson

That Minutes of the UWSS Joint Board of Management meeting of January 15, 2020 be approved.

Carried

Business Arising Out of the Minutes:

There was none.

Report UW/05/20 dated February 14, 2020 re: Status Update of the UWSS Operations & Maintenance Activities and Capital Works to February 14, 2020

The Manager reviews his report with board members. He explains that the filters #5 and #7 are in the process of being cleaned and disinfected, while flow meters are being installed. Maintenance on filters #1 and #3 will start shortly.

Clarifier #3 has been put back into service after being on shut down for the winter season. The operations staff will then work on starting up Clarifier #2. Once that is completed Clarifier #1 will be shut down for the installation of an 18 inch butterfly valve and flow meter.

The Manager informs the board members that the work on Filters #2 and #4 filter inlet gate valves has been postponed until the fall to allow for lower flows. At that time new inlet valves will be installed in conjunction with the filter #4 rehabilitation project.

The Manager then informs board members that the Harrow/Colchester WTP is in need of doing some upgrades. While these upgrades are taking place the UWSS will supply water to the area in question through interconnects. Billing flows for both Kingsville and Essex will be monitored during this time.

The Manager provides updates on several ongoing projects around the WTP. He notes that the SCADA project is entering the final stages with the final FAT testing to take place the first week of March. This final step had been delayed due to vacations and scheduling conflicts. The CO2 pH Adjustment project is also nearing completion. The actual system has been commissioned and is operational. There are a few minor technical deficiencies that the team is working on.

Peralta Engineering has been retained to design and install a sewage force main for UWSS thus eliminating the existing septic system. This will allow UWSS to expand the parking lot at the front of the Ruthven Water Treatment Plant building. The Manager feels that this project will have engineering completed by April or May. The Board asks if this is a new sewer line. The Manager notes that the connection is just north on Union Avenue.

Phasor Industrial has been retained by the UWSS to complete electrical upgrades to the Low Lift. Phasor provided the best quote for the work, which includes a new transformer, new transfer switch gear and other electrical work.

The Manager notes that OCWA Engineering Services has been retained to act at project coordinator for the Kingsville Water Project (KWT). He indicates that a number of safety issues have been discovered and the interior coating has damage from ice. A new circulating pump will be installed during the rehabilitation. It should also be noted that the exterior paint testing does indicate the presence of lead paint. Therefore, this project will require full encapsulation in order to ensure safety of the surrounding area. He anticipates that the work will commence in April 2020, depending on the weather and the ground

conditions. He is also working with the Town of Kingsville, as a small building to house some mechanical equipment will be built on site. The Manager explains that Kingsville will have to opportunity to determine which logos are placed on the sides. The same opportunities where provided to Leamington and Essex during the recent refurbishment of those water towers. There is some concern regarding the antennas and other communication equipment on top of the tower in regards to income for leased space. The Manager assures the board that income structure is all documented in agreements. The Manager also assures board members that there will be communication with the neighbours in the location of construction. However, it should be noted there will be noise while the project is ongoing, but the site will be kept as tidy as possible and there is adherence to noise by-laws.

The Manager then explains that he is working with Eramosa for retrofitting multiple hydrants throughout the system with sensor and telemetry equipment, which will help measure flow, temperature and other parameters. This information will be collected in real time and sent back to the water treatment operators. This will allow operations staff to monitor any pressure drop and determine water age. This project will also assist with determining which areas should be flushed more often. Board members ask for clarification on a few points regarding this project. The Manager then explains that the monitoring device is inside the hydrant and the hydrants will remain operational.

The Manager informs the board that quotes have been received to start on the new lab, but he is waiting for a third quote. The quotes were coming from local vendors. Once the new lab is constructed the old lab will be removed to make way for new washrooms.

The Manager confirms that the monitoring buoys project mentioned a few months ago is proceeding. The team is looking to obtain a grant of $1 million. He will keep the Board updated as to the progress of this project.

Finally, the Manager notes that the flows are up quite a bit over last year and the four (4) year average. He believes this will be the trend over the next year.

No. UW-11-20

Moved by: Councillor Patterson

Seconded by: Councillor Neufeld

That report UW/05/20 dated February14, 2020 re: Status Update of the UWSS Operations & Maintenance Activities and Capital Works to February 14, 2020 is received.

Carried (UW/05/20)

Report UW/06/20 dated February 14, 2020 Engineering and Design – Dissolved Air Flotation (DAF)

The Manager reviews his report with members of the Board. He notes that the UWSS is made up of up flow clarifiers, which require a steady, constant flow. He further explains that UWSS would like to retrofit one of the clarifiers with a dissolved air flotation (DAF) system. This will allow to maintain some of the components of the current system and address the materials that want to sink and the materials that want to float.

Based on the DAF design he feels that there is potential to have 2x the throughput of water. DAF systems are a little more robust and can handle the changes and will not take as long to start up. Currently the clarifiers take a long time to get a blanket going and this wastes a great deal of water.

He explains he has been working with Associated Engineering (AE) over the last several years and are very knowledgeable of the systems. The intent is to design two (2) clarifier DAFs at this time, therefore the costs will be higher at beginning of this project but lower.

No. UW-12-20

Moved by: Deputy Mayor Verbeke

Seconded by: Councillor Neufeld

That the Union Water Supply Joint Board of Management (UWSS Board) receives this report for information; and further,

That the UWSS Board authorizes the UWSS General Manager to award a contract in the amount of $384,200 to Associated Engineering for Conceptual & Detailed Design and Engineering services and project management for the retrofit of Clarifier #2 with a Dissolved Air Flotation clarification system.

Carried (UW/06/20)

Report UW/07/20 dated February 11, 2020, 2019 Annual Report under the Safe Drinking Water Act and Ontario Regulation 170/03

The Manager explains that this report is a requirement under Regulation 170/03 and should be made available to the public. He confirms that it is posted on the UWSS website. He notes that the UWSS had only one AWQI in 2019, however it was mistakenly recorded under the Kingsville Distribution number.

There is a general discussion about our settling pond, lead testing and the raw water.

No. UW-13-20

Moved by: Deputy Mayor Queen

Seconded by: Councillor Wilkinson

That the UWSS Joint Board of Management receive the 2019 Annual Report under the Safe Drinking Water act 2002 and under Regulation 170/03.

Carried (UW/07/20)

Report UW/08/20 dated February 11, 2020, 2019 Summary Report for Municipalities under Regulation 170/03 made under the Safe Drinking Water Act

The Manager again explains that the Summary Report is a requirement under the Safe Drinking Water Act (SDWA) and is prepared each year. This report demonstrates all of

the municipalities served by UWSS and mentions any issues that have been noted in 2019. It also provides the flows for each of the municipalities. He further explains that the UWSS met all the regulatory requirements in 2019.

No. UW-14-20

Moved by: Councillor DeYong

Seconded by: Councillor Hammond

That the UWSS Joint Board of Management receive the 2019 Summary Report, which fulfills the requirement of Schedule 22 of the Ontario Regulation 170/03; and

That the Summary Report for 2019 is forwarded to the four (4) participating municipalities namely the Town of Essex, The Town of Kingsville, the Town of Lakeshore and the Municipality of Leamington.

Carried (UW/08/20)

Report UW/09/20 dated February 14, 2020 re: Payments from January 10 to February 14, 2020

No. UW-15-20

Moved by: Councillor Patterson

Seconded by: Councillor Gaffan

That report UW/23/20 dated July 26, 2020 re: Payments from June 14 to July 26, 2020 is received.

Carried (UW/09/20)

New Business

There were no new items to discuss.

Adjournment

No. UW-16-20

Moved by: Deputy Mayor Verbeke

Seconded by: Councillor Hammond

That the meeting adjourn at 9:44 am

Carried

Date of Next Meeting: Wednesday, April 15, 2020 9:00 am – Virtual Meeting.

/kmj

UW/11/20

To: Chair and Members of the Union Water Supply System Joint Board of Management

From: Rodney Bouchard, UWSS General Manager

Date: April 10, 2020

Re: Status Update of UWSS Operations & Maintenance Activities and Capital Works to April 10, 2020

Aim:

To inform the UWSS Board about operational and maintenance activities and capital works projects for the Union Water Supply System since the last Board meeting on.

Discussion:

The UWSS Manager conducts regular meeting with OCWA Operations staff in regards to on-going operations and maintenance programs for the UWSS facilities. The following provides an update on UWSS operations, regular maintenance and major maintenance and Capital Works at UWSS facilities:

1. Regular Maintenance on all process equipment and analyzers continue to be completed through OCWA's Workplace Maintenance Management System.

2. It should be noted that all non-essential staff at the UWSS facilities, including UWSS and OCWA staff, are currently working remotely as much as possible to reduce the potential impact of COVID-19 on essential drinking water treatment operators. Maintenance staff including electricians and SCADA specialists are also working remotely on a rotational schedule to ensure that maintenance issues for the UWSS systems are addressed. Necessary physical distancing, handwashing, sanitizing and protective equipment protocols are implemented as needed when staff need to work in proximity to each other. Regulatory sampling for the distribution system is being completed as required. A contingency plan has been developed and is currently in place for Operations and Maintenance staff at UWSS facilities.

3. Clarifier #2 went into service on February 25th, 2020. Clarifier #1 had been taken out of service the week of February 24th, 2020 for the installation of a new control valve and flow meter. However, this work has been postponed due to the COVID-19 pandemic; as such Clarifier #1 was put back into service on April 6th, 2020. The retained contractor, Nevtro, will complete the work in the fall once flows drop enough to accommodate the shutdown.

4. Low Lift pump #5 was pulled for rehabilitation. Parts have been ordered and the retained contractor, Nevtro, will return to install as soon as it is complete.

5. Earlier this year, the UWSS was requested by the Town of Essex to supply water to the Harrow/Colchester area due to a proposed maintenance shutdown

of the Harrow/Colchester Water Treatment Plant. This proposed shut down has been postponed due to the COVID-19 outbreak.

6. In February, High Lift pump #4 was observed to have an electrical short in the motor. The motor was removed and sent to Phasor Electric for evaluation and repair. The motor has been repaired by Phasor and is in storage at the plant. Installation of the motor has been delayed due to the COVID-19 outbreak.

7. Flow meters for raw water line #1 and #2 have recently been noted to be erratic. Accurate flow numbers are needed for optimal operation of the CO2 pH control system and for chemical dosing. Operations staff are trying alternate flow measuring devices to ensure accurate and steady readings. An additional magnetic flow meter will be purchased for #2 raw water line and installed later in the year at the same time as the recently purchased #1 raw water line flow meter.

8. SCADA Upgrade Project Update: The final SCADA system Factory Acceptance Testing (FAT) was completed on March 3-5, 2020 at the contractor's offices (SUMMA Engineering) in Etobicoke. However, on-site work for the new SCADA system integration was put on hold on March 16, 2020 due to the COVID-19 outbreak. The SCADA system integrator, SUMMA Engineering is completing work that can be done remotely, such as training and operation & maintenance manuals. Filters #1 and #3, the CO2 system and the chlorine gas disinfection system are currently operating on the new SCADA system. The water treatment operators are learning and evaluating the new system for additional improvements once the SCADA integrators return to site for implementation of the remainder of the new SCADA system.

9. CO2 pH Adjustment/ Chlorine System Improvements Project Update – Substantial Completion for this project was issued on March 31st, 2020. All the essential components of the project have been completed. The remaining items of this project, including landscaping and minor deficiencies, are currently on hold due to the COVID-19 outbreak. Work will resume once non-essential construction services can resume as per Province of Ontario direction.

10. OCWA Engineering Services (OCWA ES) has been retained by UWSS to provide engineering, project management and contract management services for the Kingsville Water Tower recoating and rehabilitation project. This work also includes the construction of a small utility building on-site to house existing electrical and telecom equipment and a new chlorine analyzer. The design of the utility building has been completed by The Municipal Infrastructure Group (TMIG), a subcontracted design engineering firm retained through OCWA ES. This design was received by UWSS on April 9th, 2020 and is currently under review.

    OCWA ES is currently preparing engineering specs and tender package for the water tower recoating, safety upgrades, and building construction work.

However, the tendering and completion of this work may need to be postponed due to the COVID-19 outbreak.

11. Eramosa Engineering of Guelph, ON has been retained to provide design/engineering consulting services for the provision and retrofit of 12 hydrants in the larger UWSS distribution system to include real time smart metering capabilities. These "smart hydrant" retrofits will include continual pressure and temperature monitoring capabilities. Eramosa has completed the construction of the monitoring equipment for the 12 hydrant retrofits. However, the actual retrofit work is on-hold due to the COVID-19 outbreak.

12. UWSS requested quotes from regional access control security system providers. Empire communications has been retained to supply and install an access control security system for UWSS facilities. This will include an upgrade to the video camera security system currently in-place. The work is currently on-hold due to the COVID-19 outbreak.

13. NJ Peralta Engineering of Kingsville has been retained for engineering services for the installation of a sewage force main for the UWSS Ruthven Water Treatment Plant and for the new parking area proposed at the Treatment Plant. The design work is currently underway. However, the on-site work may be delayed to the later part of the year due to the COVID-19 outbreak.

The first chart shows comparative flows for 2016 through 2020 in Mega Litres (ML) and the second chart shows Millions of Imperial Gallons (MIG) for the period January 1st to April 9th, 2020.

	2016	2017	2018	2019	2020
Flow to Date (ML)	2,920.11	3,005.13	3,277.85	3,457.09	3,710.33
Max Day (ML)	41.30	45.64	45.61	52.22	55.87
Min Day (ML)	19.49	20.72	23.56	20.13	25.44
Average Day (ML)	29.20	30.36	33.11	34.92	37.10
No of Days	100	99	99	99	100

	2016	2017	2018	2019	2020
Flow to Date (MG)	642.35	661.10	721.04	760.47	816.18
Max Day (MGD)	9.09	10.04	10.03	11.49	12.29
Min Day (MGD)	4.29	4.56	5.18	4.43	5.60
Average Day (MGD)	6.42	6.68	7.28	7.68	8.16
No of Days	100	99	99	99	100

Flows to date are up 253.24 ML (55.71 MIG) or 7.33% from last year. The 2020 flows to date are up 17.22% over the previous 4 year average.

Recommendation:

That this report be received by the UWSS Board for information purposes.

Respectfully submitted,

Rodney Bouchard, Manager
Union Water Supply System Joint Board of Management
/kmj

Filename: t:\union wtr\reports to board\2020\uw11-20 uwss operations report for april 2020.docx

UW/12/20

To: Chair and Members of the Union Water Supply System Joint Board of Management

From: Laura Rauch, Director of Finance and Business Services, Municipality of Leamington

Date: April 7, 2020

Re: UWSS 2019 Financial Report

Aim:

To present the draft audited 2019 Financial Report for the Union Water Supply System (UWSS) to the Joint Board of Management for review and approval.

Background:

A UWSS Financial Report is prepared annually to comply with accounting and reporting requirements for government entities. The Financial Report enables the four municipal owners to report their share of UWSS on their municipal financial statements and returns.

The financial statements in the report have been prepared in accordance with Public Sector Accounting Board standards (PSAB), including PSAB section 3150 for tangible capital assets (TCAs).

Discussion:

The Draft 2019 Financial Report has been prepared by the Municipality of Leamington on behalf of the Joint Board of Management (Board) and audited by the external audit firm of Hicks, MacPherson, Iatonna and Driedger LLP. The Draft 2019 Financial Report is attached to this report and will become final upon approval by the Board, at which point the 2019 Statement of Financial Position will be submitted as final for signature by the Board Chair and Vice-Chair.

Highlights of the 2019 Financial Report in relation to prior year results and the 2019 Budget are as follows:

Statement of Financial Position

1. Financial Assets have increased by $1.7M primarily due to an increase in cash. Investment income has also increased marginally offset by a small decrease in accounts receivable. This is a result of timing of payments received, interest earned on the bank account and investment held, capital spending as well as increased operating revenues and decreased expenditures.

2. Financial Liabilities have increased by $1.2M as a result of increased amounts owing for related party transactions due to timing of transfers offset by the 2019 long-term debt annual repayments. Throughout the year there was no new debt issuance.
3. Non-Financial Assets have increased by $2.8M and represents capital additions of $4.1M less disposals and depreciation.
4. Capital asset purchases in 2019 include the following:
    - CO2 Water PH Adjustment System - $2.9M
    - SCADA system - $786k
    - Cottam Booster Station - $50k
    - Filter media replacements - $44k
    - Watermains - $40k
    - Clarifiers – $29k
    - Low Lift Stations - $27k
    - Water Quality/Level Instrumentation - $24k
    - Essex Water Tower - $19k

5. The 2019 ending balance of the accumulated surplus, under PSAB has increased by $3.2M.

Statement of Financial Activities

1. Wholesale billings were higher than budget expectations by approximately $725k (7.5%). Consumption increases explain this additional revenue.
2. Investment income is favourable to budget by $113k (25%) due to conservative estimates and a consistently strong cash position throughout the year. This investment income includes interest earned on the $10M GIC at 2.55% due April 2022.
3. Electricity was less than budget due to conservative budgeting by $35k (3%). The installation of LED lights as well as efficient equipment (i.e. pumps) has reduced the electricity demand within the plant.
4. As the CO2 Water PH Adjustment System project was not completed in 2019, the ongoing operational costs budgeted for purchase of carbon dioxide was not required creating a favourable variance of $175k.
5. Repairs and maintenance expense is $149k (52%) favourable to budget and fairly consistent with prior years. These expenses were budgeted appropriately due to the difficulty in predicting the timing of these watermain breaks and associated expenses.
6. Operational Programs and Studies were less than budget by $36k (20%). This is due certain studies that were not initiated in 2019 including the backup power generation/energy study and the new Ruthven reservoir #3 study.
7. Ontario Clean Water Agency (OCWA) operating contract costs were also under budget by $193k (6%) resulting from the timing of the new contract.
8. The loss recorded for the “sale of tangible assets” is a non-cash item that is the accounting difference between the historical cost of an asset and its associated depreciation. This is the residual net book value of the asset at the time of

disposal. The major asset disposed of was the original reservoir cover at the Cottam Booster station.

The UWSS's auditors have provided their opinion that the Draft 2019 Financial Report is a fair representation of the UWSS's financial position as at December 31, 2019.

Recommendation:

That the 2019 Financial Report for the Union Water Supply System Joint Board of Management be approved.

Respectfully submitted,

Laura Rauch, CPA, CMA
Director of Finance and Business Services and Treasurer
Municipality of Leamington

Encls.

Union Water Supply System

Financial Statements
December 31, 2019

Union Water Supply System

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INDEPENDENT AUDITOR'S REPORT

To the Owners of
Union Water Supply System

Report on the Audit of the Financial Statements

Opinion

We have audited the financial statements of Union Water Supply System, which comprise:

- the statement of financial position as at December 31, 2019
- the statement of financial activities for the year then ended
- the statement of cash flow for the year then ended
- the statement of change in net assets
- and notes to the financial statements including summary of accounting policies.

(Hereinafter referred to as the "financial statements").

In our opinion, the accompanying financial statements present fairly, in all material respects the financial position of Union Water Supply System as at December 31, 2019, and the results of its financial activities and cash flow for the year then ended in accordance with Canadian public sector accounting standards.

Basis for Opinion

We conducted our audit in accordance with Canadian generally accepted auditing standards. Our responsibilities under those standards are further described in the *Auditor's Responsibilities for the Audit of the Financial Statements* section of our report. We are independent of Union Water Supply System in accordance with the ethical requirements that are relevant to our audit of the financial statements in Canada, and we have fulfilled our ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

In connection with our audit of the financial statements, our responsibility is to read the other information, and in doing so, consider whether the other information is materially inconsistent with the financial statements or our knowledge obtained in the audit or otherwise appears to be materially misstated. If, based on the work we have performed, we conclude that there is a material misstatement of this other information, we are required to report that fact. We have nothing to report in this regard.

Responsibilities of Management and Those Charged with Governance for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with Canadian public sector accounting standards, and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, management is responsible for assessing Union Water Supply System's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate Union Water Supply System or to cease operations, or has no realistic alternative but to do so.

Those charged with governance are responsible for overseeing Union Water Supply System's financial reporting process.

Auditor's Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Canadian generally accepted auditing standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

As part of an audit in accordance with Canadian generally accepted auditing standards, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.

- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of Union Water Supply System's internal control.

- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.

- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on Union Water Supply System's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause Union Water Supply System to cease to continue as a going concern.

- Evaluate the overall presentation, structure, and content of the financial statements, including the disclosures, and whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

- Obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within Union Water Supply System to express an opinion on the financial statements. We are responsible for the direction, supervision and performance of Union Water Supply System's audit. We remain solely responsible for our audit opinion.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

HICKS MacPHERSON, IATONNA & DRIEDGER LLP

Leamington, Ontario
April 15, 2020

Chartered Professional Accountants
Licensed Public Accountants

Union Water Supply System

Statement of Financial Position
as at December 31

	2019	2018
Assets		
Financial		
Cash (note 3)	$ 10,060,725	$ 8,537,613
Long-term investment (note 4)	10,516,503	10,255,000
Accounts receivable (note 5)	1,181,861	1,269,254
	21,759,089	20,061,867
Liabilities		
Accounts payable and accrued liabilities (notes 5 and 11)	2,685,143	445,649
Long-term debt (note 6)	11,832,898	12,854,536
	14,518,041	13,300,185
Net Assets	7,241,048	6,761,682
Non Financial Assets		
Inventories (note 7)	4,038,375	369,958
Tangible capital assets (notes 2 and 7)	39,354,529	40,275,465
	43,392,904	40,645,423
Accumulated Surplus (note 10)	$ 50,633,952	$ 47,407,105

See accompanying notes to financial statements

Approved by the Board:

Chair _____

Vice Chair _____

Union Water Supply System

Statement of Financial Activities
for the years ended December 31

	2019 Budget (note 12)	2019 Actual	2018 Actual
Revenues			
Wholesale billings (notes 5 and 8)	$ 9,672,600	$ 10,397,971	$ 9,622,832
Investment income (note 9)	450,000	563,193	503,173
Other income	21,000	19,976	46,257
	10,143,600	10,981,140	10,172,262
Expenses			
Wages and benefits (note 11)	243,250	243,225	235,246
Rents and services	153,500	151,406	148,909
Administration fee (note 5)	30,000	30,000	30,000
Property taxes	147,500	148,569	146,283
Electricity and gas	1,250,000	1,215,129	1,104,324
Carbon dioxide	175,000	-	-
Repairs and maintenance	287,500	138,994	102,791
Operational programs and studies	180,000	143,600	167,981
Sundry expenses	250	-	-
Amortization (Schedule 1)	1,269,951	1,269,951	1,241,259
OCWA operating contract	3,265,000	3,072,099	2,757,009
Long-term interest expense	1,310,741	1,310,662	1,411,432
Loss on sale of tangible capital assets	-	30,658	-
	8,312,692	7,754,293	7,345,234
Annual Surplus	1,830,908	3,226,847	2,827,028
Accumulated Surplus, Beginning of Year	47,407,105	47,407,105	44,580,077
Accumulated Surplus, End of Year	$ 49,238,013	$ 50,633,952	$ 47,407,105

See accompanying notes to financial statements

Union Water Supply System

Statement of Cash Flow
for the years ended December 31

	2019	2018
Net Inflow (Outflow) of Cash Related to the Following Activities:		
Cash flow from operating activities		
Annual surplus	$ 3,226,847	$ 2,827,028
(Increase) Decrease in accounts receivable	87,393	(341,916)
Increase (Decrease) in accounts payable	2,239,494	(693,381)
	5,553,734	1,791,731
Cash flow from investing activities		
Items not involving cash:		
Amortization of tangible capital assets	1,269,951	1,241,259
Cash used to acquire tangible capital assets	(4,048,090)	(1,722,914)
Increase in long-term investment	(261,503)	(255,000)
Loss on sale of tangible capital assets	30,658	-
	(3,008,984)	(736,655)
Cash flow from financing activities		
Debt repayment (principal only)	(1,021,638)	(902,009)
Net Change in Cash for Year	1,523,112	153,067
Cash, Beginning of Year	8,537,613	8,384,546
Cash, End of Year	$ 10,060,725	$ 8,537,613

See accompanying notes to financial statements

Union Water Supply System

Statement of Change in Net Assets
for the years ended December 31

	2019 Budget (note 12)	2019 Actual	2018 Actual
Annual Surplus	$ 1,830,908	$ 3,226,847	$ 2,827,028
Amortization of tangible capital assets	1,269,951	1,269,951	1,241,259
Acquisition of tangible capital assets	(5,735,000)	(4,048,090)	(1,722,914)
Loss on sale of tangible capital assets	-	30,658	-
Change in Net Assets	(2,634,141)	479,366	2,345,373
Net Assets, Beginning of Year	6,761,682	6,761,682	4,416,309
Net Assets, End of Year	$ 4,127,541	$ 7,241,048	$ 6,761,682

See accompanying notes to financial statements

1. Description of Reporting Entity

The Union Water Supply System (UWSS) was created, effective January 8, 2001, by Order of the Minister of the Environment pursuant to the Municipal Water and Sewage Transfer Act, 1997. The Order transferred all assets, liabilities, rights and obligations of the Ontario Clean Water Agency in the municipal drinking water treatment and distribution system located in Ruthven to the municipalities of Leamington, Kingsville, Essex and Lakeshore ("member municipalities"). The Order provided for the establishment of a Joint Board of Management to govern the operation and management of the "System". Each owner's representation on the Board is based on its share of the total flows of the system with no municipality receiving more than fifty percent of the total number of members.

The interests of the Municipalities in the System shall be as tenants-in-common, each as to the undivided interest according to their proportional consumption of the total flows of the system. The ownership interests were reset on January 1, 2017 as Leamington - 50.55% (2013 - 56.11%), Kingsville - 40.33% (2013 - 34.83%), Essex - 5.97% (2013 - 6.04%) and Lakeshore - 3.15% (2013 - 3.02%). The ownership interest is to be updated every four years.

2. Summary of Accounting Policies

The financial statements of the Union Water Supply System are the representation of the Joint Board of Management prepared in accordance with Canadian public sector accounting standards for local governments, as recommended by the Public Sector Accounting Board of CPA Canada.

Basis of Accounting

Sources of financing and expenditures are reported on the accrual basis of accounting, with the exception of interest charges on long-term liabilities, which are charged against operations in the periods in which they are paid. The accrual basis of accounting recognizes revenues as they become available and measurable; expenditures are recognized, as they are incurred and measurable as a result of the receipt of goods or services and the creation of a legal obligation to pay.

Liabilities on the statement of financial position represent the outstanding principal portion of long-term liabilities, liabilities not yet due and other future expenses not yet raised by rates on the users.

Use of Estimates

The preparation of financial statements requires management to make estimates that affect the reported amount of assets and liabilities at the date of the financial statements, and the reported amounts of revenues and expenditures during the reporting period. Significant items subject to such estimates and assumptions include the valuation of accounts receivable, carrying value of tangible capital assets, accounts payable and accrued liabilities, including the valuation of post-employment benefits. Actual results could differ from those estimates.

2. Summary of Accounting Policies (Cont'd)

Tangible Capital Assets

Tangible capital assets are recorded at cost which includes all amounts that are directly attributed to acquisition, construction, development or betterment of the asset. The costs, less residual value, of the tangible capital assets are amortized on a straight-line basis over their estimated useful life as follows:

Land	Infinite
Land Improvements	15 years to infinite
Buildings	20 to 50 years
Machinery and Equipment	3 to 30 years
Linear Assets	10 to 90 years

One-half of the annual amortization is charged in the year of acquisition and in the year of disposal. Assets under construction are not amortized until the asset is available for productive use.

Contributions of Tangible Capital Assets

Tangible capital assets received as contributions are recorded at their fair value using the half year rule as though they have been received July 1.

Leases

Leases are classified as capital or operating leases. Leases which transfer substantially all the benefits and risks incidental to ownership of property are accounted for as capital leases. All other leases are accounted for as operating leases and the related lease payments are charged to expenses as incurred.

Inventories

Inventories consist of work-in-progress measured at cost.

Long-Term Investment

Investment is recorded at fair market value.

2. Summary of Accounting Policies (Cont'd)

Future Accounting Changes

Effective for fiscal periods beginning on or after April 1, 2021, all governments will be required to adopt PSAB Section 3450 Financial Instruments, Section 2601 Foreign Currency Translation, Section 3041 Portfolio Investments, Section 1201 Financial Statement Presentation, and Section 3280 Asset Retirement Obligations. These standards provide guidance on how to account for and present financial instruments, asset retirement obligations and foreign currency translation.

Effective for fiscal periods beginning on or after April 1, 2022, all governments will be required to adopt PSAB Section 3400 Revenue. This standard provides guidance on how to account for and present new categories of revenue.

Management is currently in the process of evaluating the potential impact of adopting these standards.

3. Cash

This balance represents a consolidation from the operating fund and the reserve fund as follows:

	2019	2018
Cash		
Operating Fund	$ 8,923,511	$ 7,437,411
Reserve Fund	1,137,214	1,100,202
	$ 10,060,725	$ 8,537,613

4. Long-Term Investment

Funds are invested in a guaranteed investment certificate (GIC) with an annual interest rate of 2.55%. The GIC has a five year term (matures April 2022).

5. Related Party Transactions

The related party balances on account of trade in the Statement of Financial Position are listed below:

	2019	2018
Accounts receivable	$ 864,964	$ 1,012,278
Accounts payable and accrued liabilities	2,102,171	257,614

The accounts receivable amount is the receivables from the four member municipalities for 2019 water flows that have not been received by year end. The accounts payable and accrued liabilities amount is the Due to Leamington balance that arises from Union Water Supply System 2019 purchases that have not been paid by year end.

5. Related Party Transactions (Cont'd)

The related party transactions on the Statement of Financial Activities are listed below:

	2019	2018
Wholesale billings revenue (note 8)	$ 10,397,971	$ 9,622,832
Administration fee	30,000	30,000

Wholesale billings revenue balance is 2019 sales of water flows to the four member municipalities and is detailed in Note 8. Administration fee is the fee paid to the Municipality of Leamington for annual bookkeeping services. These transactions are measured at exchange amounts, which are the amounts of consideration established and agreed to by the related parties.

6. Long-Term Debt

As beneficial owners, Leamington, Kingsville, Essex and Lakeshore (collectively "the Municipalities") had become indebted to OCWA for work performed by OCWA in developing the System. The Municipal Water and Sewage Transfer Act provided that the Municipalities to whom the System was transferred were liable for such indebtedness.

In anticipation of the pending transfer order, the Municipalities jointly refinanced the indebtedness to OCWA. A financing agreement for $18,492,167, dated March 8, 1999, with Sun Life Assurance ("Sun Life"), requires a monthly repayment based on projected flows of the facility for a term ending on December 31, 2026. The effective interest rate is 10.55% per annum.

The Union Water Supply System Joint Board of Management has assumed the responsibility for all payments pertaining to the obligation detailed above.

The balance of long-term debt reported on the Statement of Financial Position is:

	2019	2018
Outstanding principal at the end of the year for:		
Net long-term debt, end of year	$ 11,832,898	$ 12,854,536

The estimated future principal payments required in the next five years and thereafter are as follows:

2020	$ 1,154,638
2021	1,302,487
2022	1,466,829
2023	1,649,492
2024	1,852,503
Thereafter	4,406,949
	$ 11,832,898

7. Tangible Capital Assets/Inventories

	Net Book Value	
	2019	2018
Land	$ 133,634	$ 133,634
Buildings	16,529,422	17,032,794
Machinery and equipment	6,080,533	6,144,679
Linear assets	16,509,551	16,859,968
Land improvements	101,389	104,390
Total tangible capital assets	39,354,529	40,275,465
Inventories	4,038,375	369,958
	$ 43,392,904	$ 40,645,423

For additional information, see the Consolidated Schedule of Tangible Capital Assets (Schedule 1).

8. Wholesale Billings Revenue

The member municipalities are invoiced on a monthly basis for their recorded flows.

	Revenues		Flows	
	2019	2018	2019	2018
	$	$	Gals (000)	Gals (000)
Municipality of Leamington	$ 5,710,749	$ 5,080,831	2,032,078	1,906,998
Town of Kingsville	3,840,309	3,763,883	1,365,534	1,363,284
Town of Essex	503,487	485,452	179,248	175,952
Town of Lakeshore	343,426	292,666	122,240	106,077
	$ 10,397,971	$ 9,622,832	3,699,100	3,552,311

9. Investment Income

Investment income includes bank and GIC interest income as follows:

	2019	2018
Bank interest	$ 297,560	$ 243,648
Interest on long-term investment - GIC	265,633	259,525
	$ 563,193	$ 503,173

10. Accumulated Surplus

	2019	2018
Opening Fund Balance		
Funds:		
Operating fund	$ 8,256,491	$ 7,098,688
Capital financing reserve fund	11,359,727	11,074,166
Total Fund Balance	19,616,218	18,172,854
Long-term debt obligations	(12,854,536)	(13,756,545)
Tangible capital assets (including inventory)	40,645,423	40,163,768
Accumulated Surplus, beginning of year	47,407,105	44,580,077
Contributions to operating fund	(844,917)	1,157,803
Contributions to reserve fund	302,645	285,561
Tangible capital assets purchased	4,048,090	1,722,914
Loss on sale of tangible capital assets	(30,658)	-
Amortization of tangible capital assets	(1,269,951)	(1,241,259)
Debt repayment	1,021,638	902,009
Accumulated Surplus, end of year	$ 50,633,952	$ 47,407,105

11. Post Employment Benefits

Post employment benefits are future obligations of UWSS to its employees and retirees for benefits earned but not yet taken. Retiring full time employees hired prior to August 1, 2011 continue to receive paid health and dental benefits and life insurance coverage. All coverage continues for the lifetime of the retiree and spouse. In accordance with public sector accounting standards, the projected unit credit actuarial cost method has been used to determine the future cost of these benefits at the end of the year. The most recent actuarial valuation is dated March 23, 2018 and is effective December 31, 2017. Assumptions used are as follows:

(a) a discount factor of 3.40% was used;
(b) an increase of 5.9% for health in 2019 (2018 - 6.0%), linearly decreased to an ultimate rate of 4% in 2038, and an annual increase of 4% for dental benefits was used;
(c) an employee will retire when they meet the criteria for an unreduced pension from OMERS, abut not later than 65; and
(d) all employees will remain employed by UWSS until retirement.

The liability, based on the above assumptions, at year-end is $149,800 (2018 - $127,500) and is included in accounts payable and accrued liabilities. An additional expense of $22,300 (2018 - $21,500) is reported in the Statement of Financial Activities and is reflected in wages and benefits.

12. Budget Figures

The 2019 Budget approved by the UWSS Board on January 16, 2019 was prepared on a modified cash basis. This budget was revised on September 18, 2019. The budget has been restated and is reported on a full accrual basis, in accordance with PSAB reporting requirements, in relation to the actual results in these financial statements.

The following summary outlines adjustments made to the approved budget (modified cash basis) to derive the restated based budget (full accrual basis) as presented in the financial statements:

		2019
Financial Plan (Budget) surplus for the year	$	(3,655,841)
Add:		
Accumulated surplus, beginning of the year		47,407,105
Principal payments on long term debt		1,021,700
Capital expenditures reallocated to tangible capital assets		5,735,000
Less:		
Amortization expense on tangible capital assets		(1,269,951)
Budget Surplus per Statement of Financial Operations	$	49,238,013

13. Contingency - Liability Valuation

The Sun Life long-term debt obligation requires a monthly repayment based on projected flows of the facility over the term of the agreement ending on December 31, 2026. The annual valuation of the remaining obligation has been based on the present value of the remaining payment stream according to the cancellation provisions of the financing agreement.

In order to reflect the obligation in a manner similar to a traditional serial debt instrument, an amortization schedule allocating the required monthly payment stream between principal and interest has been created utilizing an effective monthly interest rate, as adopted in fiscal 2005 for the reporting of the remaining obligation.

Union Water Supply System

Schedule of Tangible Capital Assets - Schedule 1
as at December 31

	Infrastructure						Totals	
	Land	Land Improvements	Buildings	Machinery & Equipment	Linear Assets	Inventories	2019	2018
Cost								
Balance, beginning of year	$ 133,634	$ 120,022	$ 27,407,054	$ 10,791,625	$ 25,866,678	$ 369,958	$ 64,688,971	$ 62,966,057
Add: New acquisitions during the year	-	-	60,717	271,998	10,764	17,463	360,942	161,922
Add: Additions during the year	-	-	17,555	4,127	14,512	3,714,612	3,750,806	2,829,826
Less: Disposals during the year	-	-	(39,676)	(161,512)	-	(63,658)	(264,846)	(1,268,834)
Balance, end of year	133,634	120,022	27,445,650	10,906,238	25,891,954	4,038,375	68,535,873	64,688,971
Accumulated Amortization								
Balance, beginning of year	-	15,632	10,374,260	4,646,946	9,006,710	-	24,043,548	22,802,289
Add: Amortization	-	3,001	558,632	332,625	375,693	-	1,269,951	1,241,259
Less: Accumulated amortization on disposals	-	-	(16,664)	(153,866)	-	-	(170,530)	-
Balance, end of year	-	18,633	10,916,228	4,825,705	9,382,403	-	25,142,969	24,043,548
Net Book Value of Tangible Capital Assets Including Inventories	$ 133,634	$ 101,389	$ 16,529,422	$ 6,080,533	$ 16,509,551	$ 4,038,375	$ 43,392,904	$ 40,645,423

See accompanying notes to financial statements

UW/13/20

To: Chair and Members of the Union Water Supply System Joint Board of Management

From: Rodney Bouchard, Union Water Manager

Date: April 10, 2020

Re: Payments for the UWSS from February 14th to April 10th, 2020

Aim:

To provide the Board with a copy of payments made by the Union Water Supply System from February 14th to April 10th, 2020

Recommendation:

For information purposes.

Respectfully submitted,

Rodney Bouchard, Manager
Union Water Supply System Joint Board of Management
/kmj
Filename: t:\union wtr\reports to board\2020\uw13-20 payments from feb to april 2020.docx

Vendor : 0011450 To PT00000190
Batch : All
Department : All
Cheque Print Date : 20-Feb-2020 To 21-Feb-2020
Bank : 07 To 08
Class : All

Vendor / Invoice	Vendor Name / Description	CC1	CC2	CC3	GL Account Name	Batch	Invc Date	Invc Due Date	Amount
DEPARTMENT 0700	Union Water System								
010103	**ASSOCIATED ENGINEERING (ONT) LTD**								
527136	CO2 PH ADJUSTMENT SYSTEM					83	13-Feb-2020	20-Feb-2020	
70-7-0700-8745		700200			Treatment Plant				21,513.70
527138	SCADA UPGRADES - PROCESS NARRATIVE					83	13-Feb-2020	20-Feb-2020	
70-7-0700-8780					SCADA System				4,802.73
020120	**BELL MOBILITY CELLULAR**								
514877178-FEI	MONTHLY CELL PHONE CHARGES					95	01-Feb-2020	20-Feb-2020	
70-5-0700-7110		002070	002083		Telecommunications Usage				21.84
180325	**RICOH CANADA INC**								
SCO92695771	COPIER CONTRACT - DEC19-JAN30					83	31-Jan-2020	20-Feb-2020	
70-5-0700-7010		002070			Office Supplies				94.65
							Department Totals :		**26,432.92**

Vendor : 0011450 To PT00000190 EFT Paid Date : 20-Feb-2020 To 21-Feb-2020
Batch : All Bank : 07 To 08
Department : All Class : All

Vendor Code / Invoice No. / G.L. Account	Vendor Name / Description	CC1	CC2	CC3	GL Account Name	Batch	Invc Date	Invc Due Date	Amount
DEPARTMENT 0700	Union Water System								
050099	**ENBRIDGE GAS INC**								
1929770177678	1236.010M3 GAS - COTTAM BOOSTER STATION					84	11-Feb-2020	20-Feb-2020	
70-5-0700-7410			002073		Gas				369.41
080250	**HYDRO ONE NETWORKS INC**								
200141677460-,	JAN/20 HYDRO - RUTHVEN WATER TREATMENT					84	10-Feb-2020	20-Feb-2020	
70-5-0700-7420			002073		Electricity				46,319.20
200141680692-,	JAN/20 HYDRO - LOW LIFT					84	10-Feb-2020	20-Feb-2020	
70-5-0700-7420			002073		Electricity				-23.00
70-5-0700-7420			002073		Electricity				21,896.34
200141683019-,	JAN/20 HYDRO - METER#3					84	30-Jan-2020	20-Feb-2020	
70-5-0700-7420			002073		Electricity				-15.35
70-5-0700-7420			002073		Electricity				54.56
200152134969-,	JAN/20 HYDRO - METER#17					84	10-Feb-2020	20-Feb-2020	
70-5-0700-7420			002073		Electricity				-13.53
70-5-0700-7420			002073		Electricity				48.06
200208899066-I	FEB/20 HYDRO - METER#16					84	14-Feb-2020	20-Feb-2020	
70-5-0700-7420			002073		Electricity				-65.49
70-5-0700-7420			002073		Electricity				232.70
130620	**MONARCH OFFICE SUPPLY INC**								
193116 - 19283	PAPER, BINDERS, PENCILS					84	31-Jan-2020	20-Feb-2020	
70-5-0700-7010			002070		Office Supplies				101.30
190755	**SUN LIFE ASSURANCE COMPANY OF CANADA**								
FEB-20	FEB/20 UNION WATER LOAN 3724:1					84	01-Feb-2020	20-Feb-2020	
70-5-0700-6000			002020	006901	Debenture Principal				37,411.36
70-5-0700-6100			002010	006901	Debenture Interest				103,665.37
							Department Totals :		**209,980.93**

Vendor : 0011450 To PT00000190
Batch : All
Department : All
Cheque Print Date : 05-Mar-2020 To 13-Mar-2020
Bank : 07 To 08
Class : All

Vendor / Invoice	Vendor Name / Description	CC1	CC2	CC3	GL Account Name	Batch	Invc Date	Invc Due Date	Amount
DEPARTMENT 0700	Union Water System								
020120	**BELL MOBILITY CELLULAR**								
514877178-MA	MONTHLY CELL PHONE CHARGES					130	01-Mar-2020	12-Mar-2020	
70-5-0700-7110		002070	002083		Telecommunications Usage				21.82
030004	**C3 WATER INC**								
202002-288	WATER MODELLING UPDATES					135	29-Feb-2020	12-Mar-2020	
70-5-0700-7989		002075			Operational Programs & Studies				3,004.81
050003	**E.L.K. ENERGY INC**								
40010915-FEB	1738KWH - ESSEX WATER TOWER					119	01-Mar-2020	04-Mar-2020	
70-5-0700-7420		002073			Electricity				-93.41
70-5-0700-7420		002073			Electricity				331.93
40047150-FEB	1107KWH - METER#9					119	01-Mar-2020	04-Mar-2020	
70-5-0700-7420		002073			Electricity				-61.56
70-5-0700-7420		002073			Electricity				218.78
51976611-FEB	2844KWH - KINGSVILLE WATER TOWER					119	01-Mar-2020	04-Mar-2020	
70-5-0700-7420		002073			Electricity				-148.91
70-5-0700-7420		002073			Electricity				529.15
90006300-ADJ	BILLING ADJUSTMENT - FEB1					119	01-Feb-2020	04-Mar-2020	
70-5-0700-7420		002073			Electricity				-3,931.29
90006300-COF	13680KWH - COTTAM BOOSTER STATION					119	19-Feb-2020	04-Mar-2020	
70-5-0700-7420		002073			Electricity				-994.13
70-5-0700-7420		002073			Electricity				3,532.61
90006300-FEB	18240KWH - COTTAM BOOSTER STATION					119	24-Feb-2020	04-Mar-2020	
70-5-0700-7420		002073			Electricity				-1,101.42
70-5-0700-7420		002073			Electricity				3,913.86
90006300-MAF	16800KWH - COTTAM BOOSTER STATION					119	01-Mar-2020	04-Mar-2020	
70-5-0700-7420		002073			Electricity				-1,130.23
70-5-0700-7420		002073			Electricity				4,016.22
90006300-MIS	MISC BILLING ADJUSTMENT					119	01-Feb-2020	04-Mar-2020	
70-5-0700-7420		002073			Electricity				-3,525.42
190042	**SAMUEL STREET ADVISORY INC**								
133	RESTRUCTURING CONSULTANT - FINANCIAL					135	01-Mar-2020	12-Mar-2020	
70-5-0700-7950		002070			Professional Services				3,706.40
							Department Totals :		**8,289.21**

Vendor : 0011450 To PT00000190 EFT Paid Date : 05-Mar-2020 To 13-Mar-2020
Batch : All Bank : 07 To 08
Department : All Class : All

Vendor Code / Invoice No. / G.L. Account	Vendor Name / Description / CC1	CC2	CC3	GL Account Name	Batch	Invc Date	Invc Due Date	Amount
DEPARTMENT 0700	Union Water System							
030405	**COLLABRIA**							
130433	FUEL - MOE TRAINING - LONDON				106	24-Jan-2020	05-Mar-2020	
70-5-0700-7040		002070		Training				40.82
8B98Q3	CAR RENTAL - MOE TRAINING - LONDON				106	25-Jan-2020	05-Mar-2020	
70-5-0700-7040		002070		Training				156.25
CDN TIRE-JAN'	4PC MUG SET				106	14-Jan-2020	05-Mar-2020	
70-5-0700-7052		002070		Meeting Expenses				16.94
RCSS - JAN14	MEETING EXPENSES				106	14-Jan-2020	05-Mar-2020	
70-5-0700-7052		002070		Meeting Expenses				75.75
STAR-JAN20	STAR SUBSCRIPTION				106	13-Jan-2020	05-Mar-2020	
70-5-0700-7020		002070		Dues, Memberships and Subscriptions				16.94
WCWC 305004	UV TRAINING - FEB27				106	21-Jan-2020	05-Mar-2020	
70-5-0700-7040		002070		Training				406.80
080250	**HYDRO ONE NETWORKS INC**							
200141680894-I	FEB/20 HYDRO - LEAMINGTON WATER TOWER				140	02-Mar-2020	12-Mar-2020	
70-5-0700-7420		002073		Electricity				-156.13
70-5-0700-7420		002073		Electricity				554.80
200141681706-I	FEB/20 HYDRO - METER#2				140	28-Feb-2020	12-Mar-2020	
70-5-0700-7420		002073		Electricity				-16.99
70-5-0700-7420		002073		Electricity				60.37
200141682009-I	FEB/20 HYDRO - ALBUNA WATER TOWER				140	03-Mar-2020	12-Mar-2020	
70-5-0700-7420		002073		Electricity				-504.66
70-5-0700-7420		002073		Electricity				1,793.30
200141683019-I	FEB/20 HYDRO - METER#3				140	02-Mar-2020	12-Mar-2020	
70-5-0700-7420		002073		Electricity				-15.54
70-5-0700-7420		002073		Electricity				55.78
200141683120-I	FEB/20 HYDRO - METER#5				140	03-Mar-2020	12-Mar-2020	
70-5-0700-7420		002073		Electricity				-15.16
70-5-0700-7420		002073		Electricity				53.89
200141683423-I	FEB/20 HYDRO - METER#6				140	02-Mar-2020	12-Mar-2020	
70-5-0700-7420		002073		Electricity				-14.44
70-5-0700-7420		002073		Electricity				51.31
200141683524-I	FEB/20 HYDRO - METER#8				140	28-Feb-2020	12-Mar-2020	
70-5-0700-7420		002073		Electricity				-15.22
70-5-0700-7420		002073		Electricity				54.10
200141683726-I	FEB/20 HYDRO - METER#15				140	26-Feb-2020	12-Mar-2020	
70-5-0700-7420		002073		Electricity				-13.12
70-5-0700-7420		002073		Electricity				46.62
200141687362-I	FEB/20 HYDRO - METER#22				140	28-Feb-2020	12-Mar-2020	
70-5-0700-7420		002073		Electricity				-11.73
70-5-0700-7420		002073		Electricity				41.67
200141687766-I	FEB/20 HYDRO - METER#29				140	28-Feb-2020	12-Mar-2020	
70-5-0700-7420		002073		Electricity				-14.25
70-5-0700-7420		002073		Electricity				50.62
200141687867-I	FEB/20 HYDRO - METER#24				140	28-Feb-2020	12-Mar-2020	
70-5-0700-7420		002073		Electricity				-11.43
70-5-0700-7420		002073		Electricity				40.65
200141690190-I	FEB/20 HYDRO - METER#26				140	27-Feb-2020	12-Mar-2020	
70-5-0700-7420		002073		Electricity				-21.64
70-5-0700-7420		002073		Electricity				76.89
200220161473-I	FEB/20 HYDRO - METER#14				140	25-Feb-2020	12-Mar-2020	
70-5-0700-7420		002073		Electricity				-13.03

Vendor : 0011450 To PT00000190 EFT Paid Date : 05-Mar-2020 To 13-Mar-2020
Batch : All Bank : 07 To 08
Department : All Class : All

Vendor Code / Invoice No. / G.L. Account	Vendor Name / Description	CC1	CC2	CC3	GL Account Name	Batch	Invc Date	Invc Due Date	Amount
DEPARTMENT 0700	Union Water System								
70-5-0700-7420			002073		Electricity				46.30
130120	**MAPLE REINDERS CONSTRUCTORS LTD**								
PC#10 25056	PMT#10 CO2 INJ/CL2					140	31-Jan-2020	12-Mar-2020	
70-7-0700-8745			700200		Treatment Plant				54,656.00
70-7-0700-8745			700200		Treatment Plant				6,072.89
190185	**SGS CANADA INC. ENVIRONMENTAL SERVICES**								
11315051	WATER QUALITY STUDIES CORROSION-ESSEX					140	25-Feb-2020	12-Mar-2020	
70-5-0700-7989			002075		Operational Programs & Studies				98.31
11315118	WATER QUALITY STUDIES CORROSION-LAKESHORE					140	25-Feb-2020	12-Mar-2020	
70-5-0700-7989			002075		Operational Programs & Studies				98.31
11315202	WATER QUALITY STUDIES CORROSION-UWSS					140	25-Feb-2020	12-Mar-2020	
70-5-0700-7989			002075		Operational Programs & Studies				364.43
11315212	WATER QUALITY STUDIES CORROSION-KINGSVILLE					140	25-Feb-2020	12-Mar-2020	
70-5-0700-7989			002075		Operational Programs & Studies				98.31
11315215	WATER QUALITY STUDIES CORROSION-LEAMINGTON					140	25-Feb-2020	12-Mar-2020	
70-5-0700-7989			002075		Operational Programs & Studies				98.31
190635	**STANTEC CONSULTING LTD**								
1471892	COTTAM BOOSTER STN-RESERVOIR GRADING					140	24-Feb-2020	12-Mar-2020	
70-7-0700-8725			700030		Cottam Booster Station				1,618.86
190755	**SUN LIFE ASSURANCE COMPANY OF CANADA**								
MAR-20	MAR/20 UNION WATER LOAN 3724:1					140	01-Mar-2020	12-Mar-2020	
70-5-0700-6000			002020	006901	Debenture Principal				61,252.93
70-5-0700-6100			002010	006901	Debenture Interest				103,336.59
							Department Totals :		**230,511.40**

Vendor : 0011450 To PT00000190
Batch : All
Department : All
Cheque Print Date : 26-Mar-2020 To 27-Mar-2020
Bank : 07 To 08
Class : All

Vendor / Invoice	Vendor Name / Description	CC1	CC2	CC3	GL Account Name	Batch	Invc Date	Invc Due Date	Amount
DEPARTMENT 0700	Union Water System								
010103	**ASSOCIATED ENGINEERING (ONT) LTD**								
527259	SCADA - PROCESS NARRATIVE - MAR6					154	12-Mar-2020	26-Mar-2020	
70-7-0700-8780					SCADA System				7,992.83
527260	C02 PH ADJUSTMENT SYSTEM - MAR6					154	12-Mar-2020	26-Mar-2020	
70-7-0700-8745		700200			Treatment Plant				13,415.00
527261	DISSOLVED AIR FLOTATION (DAF) - MAR6					154	12-Mar-2020	26-Mar-2020	
70-7-0700-8745		700220			Treatment Plant				2,881.95
996694	**EMPIRE COMMUNICATIONS**								
30890	35% DEPOSIT FOR QUOTE #11054					154	16-Mar-2020	26-Mar-2020	
70-7-0700-8760					Security System				15,096.46
30892	35% DEPOSIT OF QUOTE #11055					154	16-Mar-2020	26-Mar-2020	
70-7-0700-8760					Security System				23,008.13
180325	**RICOH CANADA INC**								
SCO92734226	COPIER CONTRACT - JAN20-FEB28					154	28-Feb-2020	26-Mar-2020	
70-5-0700-7010		002070			Office Supplies				101.23
220158	**VERTICAL CONCEPTS INC**								
1484	BLINDS - OFFICES, HALLWAY					154	16-Mar-2020	26-Mar-2020	
70-7-0700-8035		309005			Furniture & Fixtures				5,401.40
							Department Totals :		**67,897.00**

Vendor : 0011450 To PT00000190 EFT Paid Date : 26-Mar-2020 To 27-Mar-2020
Batch : All Bank : 07 To 08
Department : All Class : All

Vendor Code / Invoice No. / G.L. Account	Vendor Name / Description	CC1	CC2	CC3	GL Account Name	Batch	Invc Date	Invc Due Date	Amount
DEPARTMENT 0700	Union Water System								
050070	**ELECTRICAL WHOLESALE SUPPLY**								
1302908	SCADA - UPS					155	20-Mar-2020	26-Mar-2020	
70-7-0700-8780					SCADA System				12,254.85
050099	**ENBRIDGE GAS INC**								
1929770177678	1189.048M3 GAS - COTTAM BOOSTER STATION					155	11-Mar-2020	26-Mar-2020	
70-5-0700-7410		002073			Gas				356.44
1929770208308	17929.418M3 GAS - RUTHVEN WTP					155	20-Mar-2020	26-Mar-2020	
70-5-0700-7410		002073			Gas				5,034.34
1929770217397	1841.231M3 GAS - LOW LIFT					155	24-Mar-2020	26-Mar-2020	
70-5-0700-7410		002073			Gas				536.73
080250	**HYDRO ONE NETWORKS INC**								
200141677460-I	FEB/20 HYDRO - RUTHVEN WATER TREATMENT PLANT					155	11-Mar-2020	26-Mar-2020	
70-5-0700-7420		002073			Electricity				52,210.18
200141680692-I	FEB/20 HYDRO - LOW LIFT					155	11-Mar-2020	26-Mar-2020	
70-5-0700-7420		002073			Electricity				-25.13
70-5-0700-7420		002073			Electricity				26,899.09
200152134969-I	FEB/20 HYDRO - METER#17					155	11-Mar-2020	26-Mar-2020	
70-5-0700-7420		002073			Electricity				-13.81
70-5-0700-7420		002073			Electricity				49.07
200208899066-I	MAR/20 HYDRO - METER#16					155	17-Mar-2020	26-Mar-2020	
70-5-0700-7420		002073			Electricity				-70.16
70-5-0700-7420		002073			Electricity				249.31
130120	**MAPLE REINDERS CONSTRUCTORS LTD**								
PC#11 25113	PMT#11 CO2 INJ/CL2					155	29-Feb-2020	26-Mar-2020	
70-7-0700-8745		700200			Treatment Plant				58,748.20
70-7-0700-8745		700200			Treatment Plant				6,527.58
150365	**ONTARIO CLEAN WATER AGENCY**								
INV0000000048	FEB/20 OPER&MTCE					155	29-Feb-2020	26-Mar-2020	
70-5-0700-6720		002071			OCWA Operating Contract				276,874.61
							Department Totals :		**439,631.30**

Vendor : 0011450 To PT00000190 EFT Paid Date : 02-Apr-2020 To 10-Apr-2020
Batch : All Bank : 07 To 08
Department : All Class : All

Vendor Code / Invoice No. / G.L. Account	Vendor Name / Description	CC1	CC2	CC3	GL Account Name	Batch	Invc Date	Invc Due Date	Amount
DEPARTMENT 0700	Union Water System								
030405	**COLLABRIA**								
ALL STAR TAXI-	TAXI - SCADA FAT WORKSHOP					170	04-Mar-2020	03-Apr-2020	
70-5-0700-7052		002070			Meeting Expenses				23.25
BEST WEST-20	ROOM - UV TRAINING LONDON					170	27-Feb-2020	03-Apr-2020	
70-5-0700-7040		002070			Training				157.59
ENTERPRISE-8	CAR RENTAL - UV TRAINING LONDON					170	28-Feb-2020	03-Apr-2020	
70-5-0700-7040		002070			Training				118.98
FOUR POINTS-	ROOM - MEETING WITH CONSULTANT					170	07-Mar-2020	03-Apr-2020	
70-5-0700-7052		002070			Meeting Expenses				193.52
FRESHCO-MAF	MEETING EXPENSES					170	13-Mar-2020	03-Apr-2020	
70-5-0700-7052		002070			Meeting Expenses				7.47
JACK ASTORS-	MEAL - SCADA FAT WORKSHOP					170	04-Mar-2020	03-Apr-2020	
70-5-0700-7052		002070			Meeting Expenses				48.77
ONROUTE-143	FUEL - UV TRAINING LONDON					170	27-Feb-2020	03-Apr-2020	
70-5-0700-7040		002070			Training				37.23
SANDMAN-365	ROOM - SCADA FAT WORKSHOP					170	05-Mar-2020	03-Apr-2020	
70-5-0700-7052		002070			Meeting Expenses				350.34
STAR-FEB20	STAR SUBSCRIPTION					170	13-Feb-2020	03-Apr-2020	
70-5-0700-7020		002070			Dues, Memberships and Subscriptions				16.94
050099	**ENBRIDGE GAS INC**								
1929770217397	1841.231M3 GAS - LOW LIFT					176	24-Mar-2020	02-Apr-2020	
70-5-0700-7410		002073			Gas				536.73
050195	**ESSEX POWERLINES CORPORATION**								
220651-MAR20	284KWH - METER#4					176	19-Mar-2020	02-Apr-2020	
70-5-0700-7420		002073			Electricity				-28.22
70-5-0700-7420		002073			Electricity				100.26
253800-MAR20	1KWH - METER#23					176	19-Mar-2020	02-Apr-2020	
70-5-0700-7420		002073			Electricity				-11.74
70-5-0700-7420		002073			Electricity				41.73
080250	**HYDRO ONE NETWORKS INC**								
200141680894-I	MAR/20 HYDRO - LEAMINGTON WATER TOWER					176	30-Mar-2020	02-Apr-2020	
70-5-0700-7420		002073			Electricity				-156.21
70-5-0700-7420		002073			Electricity				555.10
200141681706-I	MAR/20 HYDRO - METER#2					176	27-Mar-2020	02-Apr-2020	
70-5-0700-7420		002073			Electricity				-18.07
70-5-0700-7420		002073			Electricity				64.24
200141683019-I	MAR/20 HYDRO - METER#3					176	30-Mar-2020	02-Apr-2020	
70-5-0700-7420		002073			Electricity				-16.27
70-5-0700-7420		002073			Electricity				57.81
200141683423-I	MAR/20 HYDRO - METER#6					176	30-Mar-2020	02-Apr-2020	
70-5-0700-7420		002073			Electricity				-14.80
70-5-0700-7420		002073			Electricity				52.58
200141683524-I	MAR/20 HYDRO - METER#8					176	27-Mar-2020	02-Apr-2020	
70-5-0700-7420		002073			Electricity				-15.84
70-5-0700-7420		002073			Electricity				56.29
200141683726-I	MAR/20 HYDRO - METER#15					176	26-Mar-2020	02-Apr-2020	
70-5-0700-7420		002073			Electricity				-13.67
70-5-0700-7420		002073			Electricity				48.57
200141687362-I	MAR/20 HYDRO - METER#22					176	27-Mar-2020	02-Apr-2020	
70-5-0700-7420		002073			Electricity				-11.79
70-5-0700-7420		002073			Electricity				41.88

Vendor : 0011450 To PT00000190 EFT Paid Date : 02-Apr-2020 To 10-Apr-2020
Batch : All Bank : 07 To 08
Department : All Class : All

Vendor Code / Invoice No. / G.L. Account	Vendor Name / Description	CC1	CC2	CC3	GL Account Name	Batch	Invc Date	Invc Due Date	Amount
DEPARTMENT 0700	Union Water System								
200141687766-I	MAR/20 HYDRO - METER#29					176	27-Mar-2020	02-Apr-2020	
70-5-0700-7420			002073		Electricity				-14.43
70-5-0700-7420			002073		Electricity				51.28
200141687867-I	MAR/20 HYDRO - METER#24					176	27-Mar-2020	02-Apr-2020	
70-5-0700-7420			002073		Electricity				-11.37
70-5-0700-7420			002073		Electricity				40.39
200141690190-I	MAR/20 HYDRO - METER#26					176	27-Mar-2020	02-Apr-2020	
70-5-0700-7420			002073		Electricity				-22.82
70-5-0700-7420			002073		Electricity				81.10
200220161473-I	MAR/20 HYDRO - METER#14					176	25-Mar-2020	02-Apr-2020	
70-5-0700-7420			002073		Electricity				-12.41
70-5-0700-7420			002073		Electricity				44.12
190185	**SGS CANADA INC. ENVIRONMENTAL SERVICES**								
11321798	WATER QUALITY STUDIES CORROSION-UWSS					176	26-Mar-2020	02-Apr-2020	
70-5-0700-7989			002075		Operational Programs & Studies				593.25
11321899	WATER QUALITY STUDIES CORROSION-ESSEX					176	26-Mar-2020	02-Apr-2020	
70-5-0700-7989			002075		Operational Programs & Studies				98.31
11321914	WATER QUALITY STUDIES CORROSION-LAKESHORE					176	26-Mar-2020	02-Apr-2020	
70-5-0700-7989			002075		Operational Programs & Studies				98.31
11321916	WATER QUALITY STUDIES CORROSION-KINGSVILLE					176	26-Mar-2020	02-Apr-2020	
70-5-0700-7989			002075		Operational Programs & Studies				196.62
11321936	WATER QUALITY STUDIES CORROSION-LEAMINGTON					176	26-Mar-2020	02-Apr-2020	
70-5-0700-7989			002075		Operational Programs & Studies				98.31
190751	**SUMMA ENGINEERING LIMITED**								
PC#3 115045	PMT#3 SCADA - INSTALLATION					176	25-Mar-2020	02-Apr-2020	
70-7-0700-8780					SCADA System				8,298.61
70-7-0700-8780					SCADA System				922.07
PC#8 115048	PMT#8 SCADA UPGRADES					176	25-Mar-2020	02-Apr-2020	
70-7-0700-8780					SCADA System				75,760.29
							Department Totals :		**88,444.30**

UNION WATER SUPPLY SYSTEM

JOINT BOARD OF MANAGEMENT

Wednesday, April 15, 2020
9:00 AM
Virtual Meeting via Zoom

SPECIAL MEETING

AGENDA

A. Call to Order:

B. Disclosures of Pecuniary Interest:

C. Items for Consideration:

1. UW/10/20 dated April 3, 2020 re: Emergency Measures during an Emergency – Electronic Meetings and Electronic Preparation – Delegation of Authority
   Pages 2 - 4

D. Consideration of UWSS Policies

1. UW C01 – Electronic Meetings during and Emergency
   Under legal review – will be provided under separate cover

2. UW C01 – Delegation of Authority in Event of Loss of Quorum (COVID19)
   Under legal review – will be provided under separate cover

E. Adjournment:

/kmj

UW/10/20

To: Chair and Members of the Union Water Supply System Joint Board of Management

From: Rodney Bouchard, Union Water Manager

Date: April 3, 2020

Re: Emergency Measures during an Emergency
-Electronic Meetings and Electronic Participation
-Delegation of Authority

Recommendation:

It is recommended that:

1. The Union Water Supply System (UWSS) Joint Board of Management resolves to allow for electronic participation in meetings during an emergency as declared pursuant to the Emergency Management and Civil Protection Act; and
2. UWSS administration be directed to bring forward a policy delegating certain duties to the Manager of UWSS in order to ensure continuity for business purposes.

Background

The recent developments regarding COVID-19 both locally and internationally have resulted in numerous recommendations from public health authorities regarding social distancing and group gatherings. On March 17, 2020, the Province of Ontario declared an emergency pursuant to the Emergency Management and Civil Protection Act (EMCPA). The Province further approved Order in Council 519/2020 and 520/2020 ordering the closures of numerous types of establishments and prohibiting organized events of over fifty (50) people.

On March 19, 2020, the provincial legislature passed the Municipal Emergency Act, 2020, amending the Municipal Act, 2001 (the "Act") and the City of Toronto Act, 2006. The amending legislation provides enhanced means for members of municipal councils to meet electronically in situations where emergencies are declared pursuant to the EMCPA.

Discussion

Electronic Meetings and Electronic Participation

The Act requires that each municipality or local board have a procedural policy governing the calling, place and proceedings of meetings. In general, a meeting of the local board occurs where a quorum of local board is present and members advance the business or decision-making of the local board. The reference in the Act to a quorum of members

being present has always been understood to mean that members are to be physically present for a meeting.

Prior to March 19, 2020, the Act allowed for electronic participation in meetings where it was permitted by the municipality's procedure by-law or local board procedure policy. However, there were limitations to any such by-law/ policy, including:

- members participating electronically could not be counted for the purposes of determining a quorum. A quorum of members (7 is quorum for the UWSS Board) was still required to be physically present in order for the meeting to occur; and
- electronic participation was not allowed at a closed meeting.

The UWSS Board has never considered the use of electronic participation however, it should be considered at this time.

On March 19, 2020 the Act was amended removing the above limitations where an emergency has been declared pursuant to the EMCPA; however, a board is still required to include provisions authorizing such meeting methods in its procedural policy. This would generally require a meeting with physical attendances to approve the amendment of the procedural by-law prior to conducting electronic meetings; however, the Province added subsection 238(3.4) to address that issue. Subsection 238(3.4) permits a municipality/ local board to hold a special meeting electronically to amend its procedural policy to allow for electronic participation.

In light of the March 17, 2020 Ontario Emergency declaration in regards to electronic meetings and quorum requirements, the UWSS Manager sought a legal opinion from external legal counsel to ascertain if and how these emergency provisions applied to UWSS. The legal opinion indicates that UWSS appears to meet the definition of a local board and thus the provisions under Bill 187 under the Municipal Act, 2001 applies to UWSS.

The Manager is recommending that procedural policy be created to allow for electronic participation subject to the following requirements:

- an emergency has been declared by the Province or Manager under the Emergency Management and Civil Protection Act.
- members participating electronically shall be counted in determining quorum;
- members participating electronically in a closed meeting shall ensure that they are participating from a location that ensures the privacy and confidentiality of the closed meeting discussions;
- members participating electronically shall advise the office clerk of their intention to do so at least 24 hours prior to the meeting unless circumstances of the emergency to do not permit such notice;
- the Chair, in consultation with the Manager, shall rule on and determine the applicable meeting processes as required to be adapted for electronic participation which processes shall be consistent with the procedural policy and at all times in

compliance with the requirements of the Transfer Order 2001 and the Municipal Act, 2001.

A draft procedural policy for Electronic Meetings and Electronic Participation for UWSS Board meetings has been developed. This draft policy is currently under review by retained legal counsel to ensure that it meets the legal requirements under Bill 187 and/or the Municipal Act, 2001. This draft policy will be provided to Board members under separate cover before the April 15th, 2020 Special Meeting of the UWSS Board.

Delegation of Authority during an Emergency

A draft policy has been developed that contains a number of delegations to the Manager in order to ensure continuity of services and the business of the UWSS to continue in the event of loss of quorum of the Joint Board of Management. The draft policy is similar to the policy enacted during a lame duck period prior to an election. The draft policy is currently under review by retained external legal counsel and will be provided to Board members under separate cover before the April 15th, 2020 Special Meeting of the UWSS Board.

Financial Impact

There is no financial impact associated with this report.

Respectfully submitted,

Rodney Bouchard, Manager
Union Water Supply System Joint Board of Management
rb/kmj
Filename: t:\union wtr\reports to board\2020\uw10-20 emergency measures during an emergency.docx

From: "iagcodonotreply@agco.ca" <iagcodonotreply@agco.ca>
Date: April 10, 2020 at 6:31:15 AM EDT
To: Clerks <clerks@essex.ca>
Subject: iAGCO - Applications Undergoing Public Notice

iAGCO - Applications Undergoing Public Notice

Subscription details:

Email Address: clerks@essex.ca

Types of Applications: Liquor Sales Licence - Manufacturer's Tied House, Liquor Sales Licence, Cannabis Retail Store Authorization

Location: essex

The public notice offers the municipality and residents of the municipality in which the premises is located an opportunity to respond to the application within the time period identified on the posting and on the placard.

The following application(s) are now undergoing public notice:

Cannabis Applications

City	Premises	Deadline for Objections / Submissions	File Number	Application Type	Areas	
ESSEX	**Rural Cannabis Co.** 68 TALBOT ROAD NORTH ESSEX, ON N8M 1A4	2020-04-24	946746	**New Application** Cannabis Retail Store Authorization	Indoor Area	File Objection / Submission

To unsubscribe, click here.

Alcohol and Gaming Commission of Ontario
90 Sheppard Avenue East, Suite 200
Toronto ON M2N 0A4
Tel.: 416-326-8700
Toll free in Ontario: 1-800-522-2876
Inquiries: www.agco.ca/iagco

From: Denonville, Alex
Sent: Thursday, April 9, 2020 1:56 PM
To: Town of Essex All Staff <EssexAllStaff@essex.ca>
Subject: Town of Essex to Provide Sandbags for Residents

Media Release
April 9, 2020

Town of Essex to Provide Sandbags for Residents

Essex– With a long-term flood watch in place for the region, the Town of Essex will once again provide free sandbags to help residents protect their properties.

Residents are asked to call 519-776-7336 ext 1124 (during regular business hours) to request bags for their properties. Empty bags will be delivered to their property by Town of Essex staff. Residents are eligible to receive up to 100 sandbags per property, provided on a first-come, first-served basis. Residents who used the program in 2019 are asked to consider waiting to access new sandbags to ensure supply is available for those who need it most.

Sand is available at the Colchester Schoolhouse (195 Bagot Street, Colchester) and residents are required to bring their own shovels and fill their own bags.

All residents attending the Colchester Schoolhouse must adhere to physical distancing requirements and limitations on group sizes.

Media Contact
Alex Denonville
Manager, Communications
adenonville@essex.ca
519-990-7546

March 31, 2020

Mayor Tom Bain
Town of Lakeshore
419 Notre Dame Street
Belle River, ON N0R 1A0

Dear Mayor Bain:

RE: Town of Lakeshore's Correspondence regarding OPP Detachment Boards

I am writing in response to the letter dated January 30, 2020, sent by the Clerk for the Town of Lakeshore, Ms. Kristen Newman. It advised of Lakeshore Council's resolution of support (22-01-2020) for the Lakeshore Police Services Board's proposal of a 'two board system' for Essex County as its preferred option. Further, this has been recommended to the Solicitor General as input to the regulations for OPP detachment boards under development for the *Community Safety and Policing Act, 2019*.

This letter was considered by Tecumseh Town Council at its meeting of February 25, 2020, where it was referred to the Tecumseh Police Services Board. The Tecumseh PSB held its next meeting on March 4, 2020, at which the following resolution was passed (PSB 11/20):

> **Whereas** a consensus was reached at the joint meeting of Mayors, Police Services Board Chairs, and Chief Administrative Officers of the Towns of Essex, Kingsville, Lakeshore, Leamington and Tecumseh held on December 18, 2019 in Essex, ON, on the recommendations to the Solicitor General for a regional approach to the establishment of an OPP Detachment Board; and
>
> **Whereas** this consensus was recorded in the report by Foresight Management Consulting dated January 23, 2020 entitled "OPP Detachment Board Report" (Foresight Report); and
>
> **Whereas** no written objection to the contents of the Foresight Report was received by the Tecumseh Police Services Board;
>
> **Therefore be it Resolved that** the Tecumseh Police Services Board **recommend** to Tecumseh Town Council that the Mayor send a letter to the Town of Lakeshore, in response to their letter dated January 30, 2020, confirming support for the recommendations as set out in the Foresight Report, with a copy to be sent to the Solicitor General and the other OPP policed municipalities in Essex County.

.../2

Tecumseh Town Council accepted this recommendation at its March 24, 2020 meeting, and accordingly, I am writing to confirm our support for the recommendations as set out in the aforementioned Foresight Report. We have copied the Solicitor General and the municipalities in the Essex OPP Detachment.

Yours truly,

Gary McNamara
Mayor

c: Ministry of the Solicitor General
Town of Essex
Town of Kingsville
Municipality of Leamington

March 2020 Bank Payments Report

Contents Include

General Account Cheque Register

Pre-Authorized Payments

Payroll

essex

General Account Cheque Register for March 2020

Cheque Number	Vendor ID	Vendor Cheque Name	Cheque Date	Amount
51172	AON002	Aon Reed Stenhouse Inc.	March 10, 2020	$810.00
51173	ARE004	Arepel Contracting	March 10, 2020	$250.00
51174	BEU002	Beuglet, Tim	March 10, 2020	$500.00
51175	BOU017	Boussey, Juanelle	March 10, 2020	$500.00
51176	BYR009	Byrne, Andrew Steven	March 10, 2020	$1,000.00
51177	CCD001	Countryside Chrysler-Dodge Ltd	March 10, 2020	$180.29
51178	CIN001	Cintas Canada Limited	March 10, 2020	$105.36
51179	CLA019	Clark, Jerome	March 10, 2020	$250.00
51180	DAR006	Darocy, Paul	March 10, 2020	$250.00
51181	DAY002	Daytripping	March 10, 2020	$3,260.05
51182	DES027	Desjardins, Daryl	March 10, 2020	$1,000.00
51183	ELE009	Elegant Touch	March 10, 2020	$128.82
51184	ENT003	Entandem	March 10, 2020	$252.94
51185	ESS017	Essex Free Press	March 10, 2020	$78.15
51186	ESS048	ESSEX APPLIANCE CENTRE LTD	March 10, 2020	$755.97
51187	FOR026	Forthis Group	March 10, 2020	$4,000.00
51188	GAG001	Gagnon Demolition Inc	March 10, 2020	$500.00
51189	GAL009	Gallagher McDowall Associates	March 10, 2020	$10,297.13
51190	GEN010	Genn Construction	March 10, 2020	$500.00
51191	HAR001	The Harrow News & County Print	March 10, 2020	$1,830.60
51192	LEN002	Len Taylor & Sons Ltd	March 10, 2020	$1,706.93
51193	MAR070	Marks Supply Inc	March 10, 2020	$132.21
51194	MAR101	Martin, Robin	March 10, 2020	$250.00
51195	MAY008	Mayer, Steven Peter	March 10, 2020	$500.00
51196	MCT001	McTague Law Firm LLP	March 10, 2020	$91.53
51197	MER001	Merchants Paper Company Windso	March 10, 2020	$421.81
51198	MIN001	Minister of Finance	March 10, 2020	$274,818.00
51199	PET013	Peters, Frank	March 10, 2020	$300.00
51200	PIG003	Pigeon Bay Home Construction I	March 10, 2020	$1,000.00
51201	PRA001	Praxair Canada Inc	March 10, 2020	$803.11
51202	PRI028	Price, Glendon	March 10, 2020	$250.00
51203	RAI004	Rainforces LTD	March 10, 2020	$500.00
51204	RAN008	Randell, Lynn	March 10, 2020	$500.00
51205	REC001	Receiver General	March 10, 2020	$1,387.00
51206	REC003	Receiver General for Canada	March 10, 2020	$3,729.00
51207	SAL012	Salter, Charles	March 10, 2020	$500.00
51208	SID003	SIDDALL, ROBERT GEORGE	March 10, 2020	$250.00
51209	SKU001	Skulhala, Frank	March 10, 2020	$1,000.00
51210	SNG001	Stop N Go	March 10, 2020	$1,392.23
51211	STR017	Stryker Canada ULC	March 10, 2020	$1,515.11
51212	TAY011	Taylor, Leonard Christopher	March 10, 2020	$500.00
51213	TEC004	Technical Standards & Safety A	March 10, 2020	$544.00
51214	UNI027	Unique Homes (2003) Inc.	March 10, 2020	$1,000.00
51215	WAG002	Wagner, Rosemary	March 10, 2020	$250.00
51216	XER001	Xerox Canada	March 10, 2020	$4,993.36
51217	ACC009	Access County Community Suppor	March 17, 2020	$9,201.00
51218	AIR005	Airon Hvac & Control Ltd	March 17, 2020	$1,014.90
51219	AMH005	Amherstburg Animal Clinic	March 17, 2020	$150.00
51220	BOL006	Boultinghose, Bruce	March 17, 2020	$135.60
51221	BOS006	Bosse, Francis Mitchell	March 17, 2020	$100.00
51222	BRU012	J Brush Farms Ltd.	March 17, 2020	$120.00
51223	CAN032	Canadian Transportation Museum	March 17, 2020	$2,000.00
51224	CIN001	Cintas Canada Limited	March 17, 2020	$198.88
51225	COM035	ComTech Energy	March 17, 2020	$5,328.54
51226	CON002	Conseil scolaire catholique Pr	March 17, 2020	$62,662.58
51227	COT006	Cottam Radiator	March 17, 2020	$416.17
51228	DAM001	D'AMORE CONSTRUCTION	March 17, 2020	$156,066.56
51229	DAY002	Daytripping	March 17, 2020	$2,022.70
51230	DES026	DesRosiers, Dan	March 17, 2020	$1,000.00
51231	DOM003	Domino's Pizza	March 17, 2020	$433.55
51232	ESS017	Essex Free Press	March 17, 2020	$1,553.30
51233	ESS027	Essex Retirees' Social Club	March 17, 2020	$8,858.00
51234	HAR001	The Harrow News & County Print	March 17, 2020	$1,111.08
51235	HAR032	HARRIS TIME INC	March 17, 2020	$480.25
51236	HAR038	Harrow & Colchester South Cham	March 17, 2020	$1,000.00

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Cheque Number	Vendor ID	Vendor Cheque Name	Cheque Date	Amount
51237	HAR049	Harrow Kinsmen	March 17, 2020	$4,000.00
51238	HAR054	Harrow Early Immigrant Researc	March 17, 2020	$1,500.00
51239	HEW001	Jeffrey J. Hewitt, Lawyer	March 17, 2020	$2,683.75
51240	HOM006	Homenuik, Jeff	March 17, 2020	$221.46
51241	ING002	Ingenious Software	March 17, 2020	$2,461.59
51242	KIN003	Kingsville Essex Associated Ba	March 17, 2020	$5,000.00
51243	KOT002	Kotowich, Bruce	March 17, 2020	$150.00
51244	MOB002	Mobile Auto Glass Inc.	March 17, 2020	$367.25
51245	MUN012	Munger Plumbing & Electric	March 17, 2020	$2,760.02
51246	OLI005	Oliver Marketing	March 17, 2020	$84.75
51247	OTT002	Ottawa Brass Ltd.	March 17, 2020	$242.95
51248	PRA001	Praxair Canada Inc	March 17, 2020	$607.73
51249	RIV019	Rivard Animal Hospital	March 17, 2020	$150.00
51250	ROO007	Root, James	March 17, 2020	$690.51
51251	SAN018	Santos, Paul RGD	March 17, 2020	$565.00
51252	SEX001	SEXAUER LTD	March 17, 2020	$231.73
51253	SHE004	Shepley, Keith	March 17, 2020	$41,700.00
51254	SHR001	Shred-it International ULC	March 17, 2020	$321.62
51255	SOU001	South West Area Recreation Gui	March 17, 2020	$1,000.00
51256	TOW002	Town of Essex	March 17, 2020	$3,644.20
51257	TOW003	Municipality of Leamington	March 17, 2020	$125.00
51258	WIN055	Windsor-Essex Therapeutic Ridi	March 17, 2020	$800.00
51259	XER001	Xerox Canada	March 17, 2020	$290.05
51260	ZHA001	Zhao, Qingchou	March 17, 2020	$16,694.47
51261	LAC007	Lacasse Spg	March 18, 2020	$6,804.75
51262	LAC007	Lacasse Spg	March 18, 2020	$1,645.04
51263	LAC007	Lacasse Spg	March 18, 2020	$363.86
51264	407001	407 ETR	March 20, 2020	$41.94
51265	ABE001	Abell Pest Control	March 20, 2020	$73.45
51266	BEL017	Bell Canada-Public Access	March 20, 2020	$56.50
51267	BON005	BONNEAU, RICHARD	March 20, 2020	$40.00
51268	BUR021	Burkinshaw, Sean Robert	March 20, 2020	$500.00
51269	CAN001	K & S Windsor Salt Ltd	March 20, 2020	$13,669.23
51270	DAR002	Darem Hardware	March 20, 2020	$226.00
51271	DIS002	Disc'N Dat Audio Video	March 20, 2020	$4,663.60
51272	ESS044	Town of Essex	March 20, 2020	$529.60
51273	FRA015	Fraba, Harold Todd	March 20, 2020	$1,000.00
51274	GAG001	Gagnon Demolition Inc	March 20, 2020	$250.00
51275	KIN014	Kinnaird's Painting	March 20, 2020	$847.50
51276	MAL017	Malone, Michael Francis	March 20, 2020	$500.00
51277	MUL020	Mulder, Cara	March 20, 2020	$500.00
51278	MUN012	Munger Plumbing & Electric	March 20, 2020	$321.08
51279	REC003	Receiver General for Canada	March 20, 2020	$41.90
51280	ROW001	Rowden, Sarah Emily	March 20, 2020	$500.00
51281	SNA002	Snap-on Tools	March 20, 2020	$70.51
51282	TEC004	Technical Standards & Safety A	March 20, 2020	$203.00
51283	TOW002	Town of Essex	March 20, 2020	$141.80
51284	TRO013	Trotti, Raffaele Rino	March 20, 2020	$500.00
51285	WAR010	Warkentin Plumbing, Heating &	March 20, 2020	$134.19
51286	XER001	Xerox Canada	March 20, 2020	$71.14
51287	GLE003	Gledhill, Jon	March 24, 2020	$250.00
51288	ANI001	Anixter Power Solutions Canada	March 27, 2020	$9,887.50
51289	BRA029	Brandt	March 27, 2020	$534.11
51290	CAN001	K & S Windsor Salt Ltd	March 27, 2020	$50,892.08
51291	CAR030	Cardinal Couriers Ltd	March 27, 2020	$194.28
51292	CCD001	Countryside Chrysler-Dodge Ltd	March 27, 2020	$1,852.95
51293	CTR001	Canadian Tire #172	March 27, 2020	$595.82
51294	CUL001	Culligan Water	March 27, 2020	$31.58
51295	DAT002	Data Fix	March 27, 2020	$2,147.00
51296	DRA004	Drainage Superintendents Assoc	March 27, 2020	$525.00
51297	DRO012	Drouillard, Ross	March 27, 2020	$200.00
51298	DUP007	Dupuis, Daryl	March 27, 2020	$500.00
51299	ESS065	Essex County Locksmiths	March 27, 2020	$143.17
51300	GOO007	Goodwill Industries	March 27, 2020	$2,093.57
51301	GUA004	Guardian Fence	March 27, 2020	$3,032.92

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Cheque Number	Vendor ID	Vendor Cheque Name	Cheque Date	Amount
51302	JOH017	Johnson Controls #T6067	March 27, 2020	$3,745.95
51303	KSR001	K.S. Crowder Enterprises	March 27, 2020	$73.25
51304	LEN002	Len Taylor & Sons Ltd	March 27, 2020	$3,220.50
51305	LEW002	LEWIS INSULATIONS 2010 LIMITED	March 27, 2020	$673.63
51306	MAR078	Mar-Lin Dock & Door Sales & Se	March 27, 2020	$649.75
51307	MIC006	Michelin North America (Canada	March 27, 2020	$699.72
51308	MIN001	Minister of Finance	March 27, 2020	$251,559.42
51309	ONT005	Ontario Good Roads Association	March 27, 2020	$1,456.10
51310	PEA013	Pearse, Dale	March 27, 2020	$250.00
51311	PRA001	Praxair Canada Inc	March 27, 2020	$58.41
51312	ROS010	Rose City Electric Ltd.	March 27, 2020	$2,141.35
51313	SKI002	SKIP'S SAFETY SUPPLIES	March 27, 2020	$220.00
51314	SOC002	Society of St. Vincent de Paul	March 27, 2020	$3,012.78
51315	SOU033	South Howard Animal Clinic	March 27, 2020	$150.00
51316	STO004	Story Book Early Learning Cent	March 27, 2020	$511.33
51317	TOW002	Town of Essex	March 27, 2020	$12,643.81
51318	UND005	Underwood, Gregory John	March 27, 2020	$250.00
51319	WAL024	Walker Aggregates Inc.	March 27, 2020	$5,971.21
51320	WUR001	Wurth Canada Limited	March 27, 2020	$1,646.52
51321	XER001	Xerox Canada	March 27, 2020	$576.84
51322	SOC002	Society of St. Vincent de Paul	March 27, 2020	$1,000.00
EFT002157	ABB002	Abbott, Tom	March 6, 2020	$60.00
EFT002158	ACC004	Access Doors N More Inc	March 6, 2020	$2,220.45
EFT002159	AIR001	Air Liquide Canada Inc.	March 6, 2020	$20.67
EFT002160	ANC001	Anchem Sales	March 6, 2020	$475.73
EFT002161	AUT001	Auto Barn Parts	March 6, 2020	$22.05
EFT002162	BAK006	Baker, Glen	March 6, 2020	$72.00
EFT002163	BEZ001	Bezaire, Mike	March 6, 2020	$3,766.66
EFT002164	BLA011	Black & McDonald Limited	March 6, 2020	$445.74
EFT002165	CIM001	CIMCO Refrigeration	March 6, 2020	$818.78
EFT002166	CLS001	Canadian Linen and Uniform Ser	March 6, 2020	$122.25
EFT002167	COL001	Colenutt Signs Limited	March 6, 2020	$949.20
EFT002168	CTY002	County of Essex	March 6, 2020	$3,980.12
EFT002169	GRA040	Graybar Canada	March 6, 2020	$915.22
EFT002170	HDS001	HDS Canada Inc.	March 6, 2020	$703.63
EFT002171	HEA002	Heaton Sanitation	March 6, 2020	$1,582.00
EFT002172	HOL001	Holland Cleaning Solutions Ltd	March 6, 2020	$1,012.53
EFT002173	INL001	Inland Liferafts & Marine Limi	March 6, 2020	$106.17
EFT002174	JAN005	Janisse, Chris	March 6, 2020	$60.00
EFT002175	JUT001	Jutzi Water Technologies	March 6, 2020	$192.10
EFT002176	KEL015	Kelcom - Radio Division	March 6, 2020	$2,778.67
EFT002177	KLI003	Klie, Rodney	March 6, 2020	$48.00
EFT002178	KNI001	Knight, James	March 6, 2020	$72.00
EFT002179	LAN010	Landscape Effects Group	March 6, 2020	$9,193.68
EFT002180	LAS001	Laser Art Inc	March 6, 2020	$241.82
EFT002181	LEK001	Lekter Industrial Services Inc	March 6, 2020	$11,519.22
EFT002183	MCC027	McCoy, Matt	March 6, 2020	$36.00
EFT002184	MET004	Metcalfe, Heather	March 6, 2020	$95.93
EFT002185	MLS001	M & L Supply Fire & Safety	March 6, 2020	$24.01
EFT002186	MOO007	Moore, Scott	March 6, 2020	$48.00
EFT002187	OND001	Ondic, Dale	March 6, 2020	$60.00
EFT002188	PUR001	Purolator Inc.	March 6, 2020	$190.85
EFT002189	REG001	Reg Clark Truck Ltd	March 6, 2020	$9,505.28
EFT002190	RES002	Resurfice Corp.	March 6, 2020	$489.18
EFT002191	SCL001	Stantec	March 6, 2020	$3,190.74
EFT002192	SIL006	Silveira, Nelson	March 6, 2020	$124.46
EFT002193	SKY004	SkyMobile	March 6, 2020	$2,124.40
EFT002194	SOU007	Southwestern Sales Corporation	March 6, 2020	$509.53
EFT002195	STA030	Stationery & Stuff Inc.	March 6, 2020	$36.91
EFT002196	VAL009	Valvoline Express Care	March 6, 2020	$78.51
EFT002197	VIC007	Vickerd, Josh	March 6, 2020	$60.00
EFT002198	WOL004	Wolseley Canada Inc	March 6, 2020	$1,527.56
EFT002199	WOR010	Work Authority	March 6, 2020	$600.01
EFT002200	ACC004	Access Doors N More Inc	March 17, 2020	$3,648.77
EFT002201	ALD002	Aldridge, Austin	March 17, 2020	$254.24

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Cheque Number	Vendor ID	Vendor Cheque Name	Cheque Date	Amount
EFT002202	ANC001	Anchem Sales	March 17, 2020	$648.00
EFT002203	AUT001	Auto Barn Parts	March 17, 2020	$49.60
EFT002204	BEZ001	Bezaire, Mike	March 17, 2020	$6,173.56
EFT002205	BLA013	Blackburn Radio Inc.	March 17, 2020	$1,183.42
EFT002206	CCC002	Colonial Coffee Co. Ltd.	March 17, 2020	$78.53
EFT002207	CIM001	CIMCO Refrigeration	March 17, 2020	$2,158.30
EFT002208	COL001	Colenutt Signs Limited	March 17, 2020	$1,542.45
EFT002209	CON004	Conseil Scolaire Viamonde	March 17, 2020	$8,211.30
EFT002210	CTY002	County of Essex	March 17, 2020	$2,320,769.00
EFT002211	ESS019	Essex Home Hardware	March 17, 2020	$0.01
EFT002212	ESS084	Essex County K9 Services	March 17, 2020	$3,693.12
EFT002213	EVA001	Evans Utility & Municipal Prod	March 17, 2020	$12,785.39
EFT002214	FEE001	The Feed Store	March 17, 2020	$108.53
EFT002215	GAL005	Gallant, Tanner	March 17, 2020	$36.00
EFT002216	GEO001	Georgian Bay Fire & Safety Ltd	March 17, 2020	$1,100.67
EFT002217	GIR011	Aubin, Sarah	March 17, 2020	$186.44
EFT002218	GRA040	Graybar Canada	March 17, 2020	$1,361.38
EFT002219	GRE001	Great Lakes Safety Products	March 17, 2020	$139.13
EFT002220	GRE003	Greater Essex County District	March 17, 2020	$831,194.06
EFT002221	GRE005	Green Shield Canada	March 17, 2020	$52,304.84
EFT002222	HAM010	Hamilton, Nathan	March 17, 2020	$60.00
EFT002223	HOL001	Holland Cleaning Solutions Ltd	March 17, 2020	$1,023.22
EFT002224	JAC001	Jack's Auto Service	March 17, 2020	$1,166.23
EFT002225	LAS001	Laser Art Inc	March 17, 2020	$154.25
EFT002226	MAR060	Martynse, Bruce	March 17, 2020	$12.00
EFT002227	MOR009	Morassut, Jake	March 17, 2020	$150.00
EFT002228	NEV002	Neveu, Tom	March 17, 2020	$110.73
EFT002229	NUS001	Nussio, Norman	March 17, 2020	$282.00
EFT002230	PRE012	Preview Inspections & Consulti	March 17, 2020	$2,373.00
EFT002231	QUE001	Questica Inc.	March 17, 2020	$15,090.22
EFT002232	RCS001	RC Spencer Associates Inc.	March 17, 2020	$7,292.74
EFT002233	REN002	Larry Renaud Ford & RV Sales	March 17, 2020	$361.54
EFT002234	ROL005	Roles, Breanna	March 17, 2020	$78.95
EFT002235	ROO002	Rood Engineering	March 17, 2020	$1,080.28
EFT002236	SCL001	Stantec	March 17, 2020	$1,580.42
EFT002237	SIL006	Silveira, Nelson	March 17, 2020	$62.29
EFT002238	SUN002	Sun Life Assurance Company of	March 17, 2020	$14,456.04
EFT002239	SWE004	Sweet, Doug	March 17, 2020	$286.52
EFT002240	TRE004	Tremblar Building Supplies	March 17, 2020	$61.59
EFT002241	TWO001	Two Way Automotive	March 17, 2020	$294.02
EFT002242	VAL009	Valvoline Express Care	March 17, 2020	$117.76
EFT002243	VEH001	Vehicle Venture	March 17, 2020	$685.91
EFT002244	VER014	Verbeek, Kim	March 17, 2020	$201.00
EFT002245	VOL001	E.R. Vollans Ltd.	March 17, 2020	$131.19
EFT002246	WIN022	Windsor-Essex Catholic Distric	March 17, 2020	$291,912.89
EFT002247	WOL004	Wolseley Canada Inc	March 17, 2020	$912.20
EFT002248	MEL044	Meloche, Jeff	March 17, 2020	$152.54
EFT002249	TUR010	Turton, Richard	March 17, 2020	$137.59
EFT002250	120001	1206662 Ontario Ltd	March 20, 2020	$10,212.38
EFT002251	ABB002	Abbott, Tom	March 20, 2020	$36.00
EFT002252	AGR002	Agris Co-Operative Ltd.	March 20, 2020	$7,762.18
EFT002253	AQU001	Aquam Inc	March 20, 2020	$254.65
EFT002254	BLA013	Blackburn Radio Inc.	March 20, 2020	$2,250.11
EFT002255	CIN001	Cintas Canada Limited	March 20, 2020	$52.68
EFT002256	CLA007	Classic Displays	March 20, 2020	$1,258.82
EFT002257	CLS001	Canadian Linen and Uniform Ser	March 20, 2020	$419.69
EFT002258	COA003	Co-An Park	March 20, 2020	$21,284.69
EFT002259	COM030	Commercial Cleaning Services	March 20, 2020	$2,808.05
EFT002260	DEL013	Delta Power Equipment	March 20, 2020	$4,243.15
EFT002261	ELK001	E.L.K. Solutions Inc	March 20, 2020	$112,188.46
EFT002262	FEE001	The Feed Store	March 20, 2020	$81.19
EFT002263	HER005	Hernandez Sanitation Services	March 20, 2020	$678.00
EFT002264	HOL001	Holland Cleaning Solutions Ltd	March 20, 2020	$559.01
EFT002265	HUR007	Hurricane SMS Inc.	March 20, 2020	$1,695.00
EFT002266	JAC001	Jack's Auto Service	March 20, 2020	$1,349.52

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EFT002267	JAN005	Janisse, Chris	March 20, 2020	$36.00
EFT002268	JEF001	Jeff Shepley Excavating Ltd.	March 20, 2020	$8,248.09
EFT002269	JEF003	Jeffrey, Ed	March 20, 2020	$180.00
EFT002270	KNI001	Knight, James	March 20, 2020	$36.00
EFT002271	LAN010	Landscape Effects Group	March 20, 2020	$7,702.08
EFT002272	MAR053	Marchand, Shawn	March 20, 2020	$24.00
EFT002273	MCC027	McCoy, Matt	March 20, 2020	$36.00
EFT002274	MOO007	Moore, Scott	March 20, 2020	$24.00
EFT002275	NEL002	Nella Cutlery (Hamilton) Inc.	March 20, 2020	$316.40
EFT002276	NEX002	NEXGEN MUNICIPAL	March 20, 2020	$145.05
EFT002277	OND001	Ondic, Dale	March 20, 2020	$48.00
EFT002278	PUR001	Purolator Inc.	March 20, 2020	$89.29
EFT002279	REA016	Realtax Inc.	March 20, 2020	$723.20
EFT002280	REG001	Reg Clark Truck Ltd	March 20, 2020	$5,062.40
EFT002281	ROO002	Rood Engineering	March 20, 2020	$11,668.38
EFT002282	SEW003	The Sewing Shoppe	March 20, 2020	$412.45
EFT002283	STA030	Stationery & Stuff Inc.	March 20, 2020	$316.01
EFT002284	TWO001	Two Way Automotive	March 20, 2020	$74.14
EFT002285	VIC007	Vickerd, Josh	March 20, 2020	$24.00
EFT002286	WIN010	Windsor-Essex County Humane So	March 20, 2020	$100.00
EFT002287	WOL004	Wolseley Canada Inc	March 20, 2020	$6,456.37
EFT002288	MAR053	Marchand, Shawn	March 24, 2020	$48.00
EFT002289	120001	1206662 Ontario Ltd	March 27, 2020	$452.00
EFT002290	183943	1839431 Ontario Ltd	March 27, 2020	$21,802.79
EFT002291	AIR001	Air Liquide Canada Inc.	March 27, 2020	$19.33
EFT002292	AIR004	Airvoix Communciations Inc	March 27, 2020	$2,152.65
EFT002293	APP005	Applied Computer Solutions Inc	March 27, 2020	$864.34
EFT002294	AUT001	Auto Barn Parts	March 27, 2020	$4.51
EFT002295	CAR011	Carrier Centers	March 27, 2020	$6,199.83
EFT002296	CED003	Cedar Signs	March 27, 2020	$11,907.31
EFT002297	CHA036	Chadwick, Lori	March 27, 2020	$120.24
EFT002298	CHE003	Checker Industrial Ltd	March 27, 2020	$439.55
EFT002299	CIN001	Cintas Canada Limited	March 27, 2020	$261.64
EFT002300	CLS001	Canadian Linen and Uniform Ser	March 27, 2020	$980.68
EFT002301	COR004	Corporate Billing	March 27, 2020	$2,824.19
EFT002302	CUP001	Canadian Union of Public Emplo	March 27, 2020	$3,419.82
EFT002303	DUN008	Dunk & Associates	March 27, 2020	$28,250.00
EFT002304	EMP003	Empire Communications	March 27, 2020	$8,544.27
EFT002305	EMP006	Empire Business Continuity Con	March 27, 2020	$1,072.14
EFT002306	ERI001	Erie Sand & Gravel Ltd.	March 27, 2020	$79.34
EFT002307	ESS019	Essex Home Hardware	March 27, 2020	$1,000.30
EFT002308	GAR003	Garon, Joe	March 27, 2020	$147.64
EFT002309	GEO001	Georgian Bay Fire & Safety Ltd	March 27, 2020	$83.62
EFT002310	GIB008	Gibb, Rob	March 27, 2020	$12.00
EFT002311	GRE001	Great Lakes Safety Products	March 27, 2020	$52.64
EFT002312	GRE003	Greater Essex County District	March 27, 2020	$10,379.61
EFT002313	HHH001	Harrow Home Hardware	March 27, 2020	$862.51
EFT002314	HOL001	Holland Cleaning Solutions Ltd	March 27, 2020	$5,150.87
EFT002315	HUR007	Hurricane SMS Inc.	March 27, 2020	$1,582.00
EFT002316	INL001	Inland Liferafts & Marine Limi	March 27, 2020	$1,145.74
EFT002317	JEF001	Jeff Shepley Excavating Ltd.	March 27, 2020	$1,886.41
EFT002318	JUT001	Jutzi Water Technologies	March 27, 2020	$802.30
EFT002319	KEL011	Kelcom Wireless Ltd.	March 27, 2020	$110.15
EFT002320	KLI003	Klie, Rodney	March 27, 2020	$24.00
EFT002321	KRI004	KRIS KELLY SIGNS WINDSOR LTD	March 27, 2020	$1,830.60
EFT002322	LAN010	Landscape Effects Group	March 27, 2020	$11,162.14
EFT002323	LAS001	Laser Art Inc	March 27, 2020	$26.95
EFT002324	LEK001	Lekter Industrial Services Inc	March 27, 2020	$513.02
EFT002325	MAR070	Marks Supply Inc	March 27, 2020	$910.94
EFT002326	MLS001	M & L Supply Fire & Safety	March 27, 2020	$303.93
EFT002327	MON001	Monarch Office Supply Inc.	March 27, 2020	$2,651.24
EFT002328	NEL002	Nella Cutlery (Hamilton) Inc.	March 27, 2020	$79.10
EFT002329	OME001	OMERS	March 27, 2020	$116,141.36
EFT002330	ONT026	Ontario One Call Ltd	March 27, 2020	$218.91
EFT002331	RCS001	RC Spencer Associates Inc.	March 27, 2020	$3,571.51

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EFT002332	REA016	Realtax Inc.	March 27, 2020	$7,232.00
EFT002333	ROO002	Rood Engineering	March 27, 2020	$38,132.98
EFT002334	SAF002	Safedesign Apparel Ltd	March 27, 2020	$1,474.47
EFT002335	SEC002	Security One Alarm Systems Ltd	March 27, 2020	$356.56
EFT002336	SKY004	SkyMobile	March 27, 2020	$2,124.40
EFT002337	SOU007	Southwestern Sales Corporation	March 27, 2020	$1,561.55
EFT002338	STE004	Stewart Gilbert Limited	March 27, 2020	$141.25
EFT002339	VIK001	Viking Cives Ltd	March 27, 2020	$3,490.33
EFT002340	WIN010	Windsor-Essex County Humane So	March 27, 2020	$940.00
EFT002341	WIN058	WINDSOR TIRE INC	March 27, 2020	$567.24
EFT002342	WOL002	Wolf Hooker Professional Corpo	March 27, 2020	$2,879.77
EFT002343	ARC004	Architecttura	March 27, 2020	$11,194.06
EFT002344	GFL001	GFL Environmental Inc.	March 27, 2020	$303.87
EFT002345	WAD001	Waddick Fuels	March 27, 2020	$112.28
Total Cheques				**$5,239,406.67**

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Preauthorized Payments for March 2020

Date	Vendor	Description	Amount
March 2, 2020	API Alarm Monitoring	Miscellaneous Payment	$22.60
March 16, 2020	957590 Global Leasing	Bill Payment	$319.89
March 2, 2020	Allstream	Bill Payment	$61.64
March 2, 2020	Allstream	Bill Payment	$94.86
March 2, 2020	Allstream	Bill Payment	$206.44
March 19, 2020	Allstream	Bill Payment	$64.52
March 19, 2020	Allstream	Bill Payment	$64.52
March 19, 2020	Allstream	Bill Payment	$66.16
March 19, 2020	Allstream	Bill Payment	$117.80
March 23, 2020	Allstream	Bill Payment	$66.15
March 23, 2020	Allstream	Bill Payment	$73.63
March 23, 2020	Allstream	Bill Payment	$120.38
March 23, 2020	Allstream	Bill Payment	$172.74
March 24, 2020	Allstream	Bill Payment	$45.49
March 24, 2020	Allstream	Bill Payment	$65.81
March 24, 2020	Allstream	Bill Payment	$65.81
March 24, 2020	Allstream	Bill Payment	$74.85
March 24, 2020	Allstream	Bill Payment	$76.73
March 30, 2020	Allstream	Bill Payment	$66.56
March 30, 2020	Allstream	Bill Payment	$102.42
March 30, 2020	Allstream	Bill Payment	$225.16
March 16, 2020	BAM Fee	Lease Payment	$21.80
March 2, 2020	Bell Canada	Bill Payment	$385.86
March 13, 2020	Bell Canada	Bill Payment	$163.12
March 23, 2020	Bell Canada	Bill Payment	$102.54
March 23, 2020	Bell Canada	Bill Payment	$155.27
March 23, 2020	Bell Canada	Bill Payment	$164.92
March 23, 2020	Bell Canada	Bill Payment	$200.14
March 24, 2020	Bell Canada	Bill Payment	$226.96
March 25, 2020	Bell Canada	Bill Payment	$68.79
March 26, 2020	Bell Canada	Bill Payment	$246.64
March 2, 2020	Cogeco Connexion	Bill Payment	$124.24
March 3, 2020	Cogeco Connexion	Bill Payment	$152.86
March 9, 2020	Cogeco Connexion	Bill Payment	$101.64
March 9, 2020	Cogeco Connexion	Bill Payment	$112.21
March 9, 2020	Cogeco Connexion	Bill Payment	$169.44
March 11, 2020	Cogeco Connexion	Bill Payment	$137.74
March 23, 2020	Cogeco Connexion	Bill Payment	$90.80
March 30, 2020	Cogeco Connexion	Bill Payment	$124.24
March 2, 2020	Dell Finance	Lease Payment	$87.21
March 16, 2020	Dell Finance	Lease Payment	$463.05
March 26, 2020	Dell Finance	Lease Payment	$2,491.03
March 16, 2020	Dell Finance	Lease Payment	$699.44
March 30, 2020	Dell Finance	Lease Payment	$260.74
March 20, 2020	Dell Finance	Lease Payment	$2,407.93
March 6, 2020	Dell Finance	Lease Payment	$124.71
March 23, 2020	Dell Finance	Lease Payment	$164.77
March 20, 2020	ELK Energy	Bill Payment	$12.85
March 20, 2020	ELK Energy	Bill Payment	$14.66
March 20, 2020	ELK Energy	Bill Payment	$14.66
March 20, 2020	ELK Energy	Bill Payment	$14.66
March 20, 2020	ELK Energy	Bill Payment	$15.83
March 20, 2020	ELK Energy	Bill Payment	$19.69
March 20, 2020	ELK Energy	Bill Payment	$19.69
March 20, 2020	ELK Energy	Bill Payment	$19.69
March 20, 2020	ELK Energy	Bill Payment	$19.93
March 20, 2020	ELK Energy	Bill Payment	$19.97
March 20, 2020	ELK Energy	Bill Payment	$21.32
March 20, 2020	ELK Energy	Bill Payment	$21.57
March 20, 2020	ELK Energy	Bill Payment	$21.65

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Preauthorized Payments for March 2020

Date	Vendor	Description	Amount
March 20, 2020	ELK Energy	Bill Payment	$25.02
March 20, 2020	ELK Energy	Bill Payment	$28.30
March 20, 2020	ELK Energy	Bill Payment	$31.86
March 20, 2020	ELK Energy	Bill Payment	$32.17
March 20, 2020	ELK Energy	Bill Payment	$37.13
March 20, 2020	ELK Energy	Bill Payment	$39.19
March 20, 2020	ELK Energy	Bill Payment	$40.37
March 20, 2020	ELK Energy	Bill Payment	$43.59
March 20, 2020	ELK Energy	Bill Payment	$43.93
March 20, 2020	ELK Energy	Bill Payment	$45.18
March 20, 2020	ELK Energy	Bill Payment	$45.67
March 20, 2020	ELK Energy	Bill Payment	$58.58
March 20, 2020	ELK Energy	Bill Payment	$61.13
March 20, 2020	ELK Energy	Bill Payment	$62.89
March 20, 2020	ELK Energy	Bill Payment	$72.16
March 20, 2020	ELK Energy	Bill Payment	$82.00
March 20, 2020	ELK Energy	Bill Payment	$89.59
March 20, 2020	ELK Energy	Bill Payment	$92.19
March 20, 2020	ELK Energy	Bill Payment	$102.99
March 20, 2020	ELK Energy	Bill Payment	$103.22
March 20, 2020	ELK Energy	Bill Payment	$108.70
March 20, 2020	ELK Energy	Bill Payment	$125.88
March 20, 2020	ELK Energy	Bill Payment	$126.59
March 20, 2020	ELK Energy	Bill Payment	$131.34
March 20, 2020	ELK Energy	Bill Payment	$131.34
March 20, 2020	ELK Energy	Bill Payment	$158.02
March 20, 2020	ELK Energy	Bill Payment	$159.59
March 20, 2020	ELK Energy	Bill Payment	$186.63
March 20, 2020	ELK Energy	Bill Payment	$194.74
March 20, 2020	ELK Energy	Bill Payment	$218.49
March 20, 2020	ELK Energy	Bill Payment	$243.91
March 20, 2020	ELK Energy	Bill Payment	$248.75
March 20, 2020	ELK Energy	Bill Payment	$364.36
March 20, 2020	ELK Energy	Bill Payment	$517.12
March 20, 2020	ELK Energy	Bill Payment	$780.19
March 20, 2020	ELK Energy	Bill Payment	$794.96
March 20, 2020	ELK Energy	Bill Payment	$857.48
March 20, 2020	ELK Energy	Bill Payment	$921.99
March 20, 2020	ELK Energy	Bill Payment	$1,130.12
March 20, 2020	ELK Energy	Bill Payment	$1,556.93
March 20, 2020	ELK Energy	Bill Payment	$2,224.34
March 20, 2020	ELK Energy	Bill Payment	$2,236.58
March 20, 2020	ELK Energy	Bill Payment	$5,374.78
March 20, 2020	ELK Energy	Bill Payment	$9,033.24
March 20, 2020	ELK Energy	Bill Payment	$10,615.26
March 20, 2020	ELK Energy	Bill Payment	$11,775.10
March 20, 2020	ELK Energy	Bill Payment	$12,876.26
March 20, 2020	ELK Energy	Bill Payment	$33,303.23
March 2, 2020	Enbridge Gas Inc. (Union Gas)	Bill Payment	$208.10
March 2, 2020	Enbridge Gas Inc. (Union Gas)	Bill Payment	$371.22
March 2, 2020	Enbridge Gas Inc. (Union Gas)	Bill Payment	$752.99
March 3, 2020	Enbridge Gas Inc. (Union Gas)	Bill Payment	$893.50
March 4, 2020	Enbridge Gas Inc. (Union Gas)	Bill Payment	$83.57
March 4, 2020	Enbridge Gas Inc. (Union Gas)	Bill Payment	$103.43
March 4, 2020	Enbridge Gas Inc. (Union Gas)	Bill Payment	$594.49
March 4, 2020	Enbridge Gas Inc. (Union Gas)	Bill Payment	$1,239.34
March 4, 2020	Enbridge Gas Inc. (Union Gas)	Bill Payment	$1,912.35
March 5, 2020	Enbridge Gas Inc. (Union Gas)	Bill Payment	$208.08
March 5, 2020	Enbridge Gas Inc. (Union Gas)	Bill Payment	$1,055.87
March 10, 2020	Enbridge Gas Inc. (Union Gas)	Bill Payment	$1,334.12

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Preauthorized Payments for March 2020

Date	Vendor	Description	Amount
March 10, 2020	Enbridge Gas Inc. (Union Gas)	Bill Payment	$141.03
March 10, 2020	Enbridge Gas Inc. (Union Gas)	Bill Payment	$168.89
March 23, 2020	Enbridge Gas Inc. (Union Gas)	Bill Payment	$135.46
March 23, 2020	Enbridge Gas Inc. (Union Gas)	Bill Payment	$385.43
March 23, 2020	Enbridge Gas Inc. (Union Gas)	Bill Payment	$454.76
March 23, 2020	Enbridge Gas Inc. (Union Gas)	Bill Payment	$649.14
March 24, 2020	Enbridge Gas Inc. (Union Gas)	Bill Payment	$126.87
March 25, 2020	Enbridge Gas Inc. (Union Gas)	Bill Payment	$867.31
March 26, 2020	Enbridge Gas Inc. (Union Gas)	Bill Payment	$55.46
March 26, 2020	Enbridge Gas Inc. (Union Gas)	Bill Payment	$966.88
March 26, 2020	Enbridge Gas Inc. (Union Gas)	Bill Payment	$4,757.55
March 30, 2020	Enbridge Gas Inc. (Union Gas)	Bill Payment	$192.93
March 30, 2020	Enbridge Gas Inc. (Union Gas)	Bill Payment	$357.18
March 31, 2020	Enbridge Gas Inc. (Union Gas)	Bill Payment	$820.13
March 3, 2020	GFL (WDS)	Miscellaneous Payment	$201.50
March 3, 2020	GFL (WDS)	Miscellaneous Payment	$56,057.18
March 26, 2020	GFL (WDS)	Miscellaneous Payment	$185.41
March 26, 2020	GFL (WDS)	Miscellaneous Payment	$56,188.06
March 2, 2020	Hydro One	Bill Payment	$47.32
March 2, 2020	Hydro One	Bill Payment	$2,293.58
March 11, 2020	Hydro One	Bill Payment	$140.79
March 12, 2020	Hydro One	Bill Payment	$157.36
March 12, 2020	Hydro One	Bill Payment	$2,905.26
March 16, 2020	Hydro One	Bill Payment	$5.48
March 16, 2020	Hydro One	Bill Payment	$57.14
March 16, 2020	Hydro One	Bill Payment	$461.96
March 17, 2020	Hydro One	Bill Payment	$5,893.34
March 17, 2020	Hydro One	Bill Payment	$7,848.26
March 18, 2020	Hydro One	Bill Payment	$7,147.49
March 19, 2020	Hydro One	Bill Payment	$29.11
March 19, 2020	Hydro One	Bill Payment	$29.11
March 19, 2020	Hydro One	Bill Payment	$52.77
March 19, 2020	Hydro One	Bill Payment	$58.71
March 19, 2020	Hydro One	Bill Payment	$96.80
March 19, 2020	Hydro One	Bill Payment	$602.67
March 23, 2020	Hydro One	Bill Payment	$29.56
March 23, 2020	Hydro One	Bill Payment	$92.79
March 23, 2020	Hydro One	Bill Payment	$119.72
March 23, 2020	Hydro One	Bill Payment	$768.00
March 24, 2020	Hydro One	Bill Payment	$28.30
March 24, 2020	Hydro One	Bill Payment	$34.54
March 24, 2020	Hydro One	Bill Payment	$557.80
March 25, 2020	Hydro One	Bill Payment	$530.54
March 26, 2020	Hydro One	Bill Payment	$30.63
March 30, 2020	Hydro One	Bill Payment	$39.68
March 30, 2020	Hydro One	Bill Payment	$88.64
March 30, 2020	Hydro One	Bill Payment	$106.19
March 30, 2020	Hydro One	Bill Payment	$108.75
March 30, 2020	Hydro One	Bill Payment	$149.18
March 30, 2020	Hydro One	Bill Payment	$244.66
March 30, 2020	Hydro One	Bill Payment	$256.83
March 31, 2020	Hydro One	Bill Payment	$49.80
March 10, 2020	Ontario Clean Water	Miscellaneous Payment	$90,242.35
March 18, 2020	Reliance Comfort	Bill Payment	$33.90
March 24, 2020	Reliance Comfort	Bill Payment	$28.70
March 25, 2020	Reliance Comfort	Bill Payment	$22.60
March 27, 2020	Reliance Comfort	Bill Payment	$28.70
March 30, 2020	Reliance Comfort	Bill Payment	$16.95
March 30, 2020	Reliance Comfort	Bill Payment	$28.70
March 30, 2020	Reliance Comfort	Bill Payment	$135.10

Preauthorized Payments for March 2020

Date	Vendor	Description	Amount
March 20, 2020	Security One	Miscellaneous Payment	$338.86
March 26, 2020	Superpass	Bill Payment	$458.71
March 19, 2020	Telus Mobility	Bill Payment	$3,134.09
March 11, 2020	US Bank	Bill Payment	$26,743.45
March 6, 2020	Union Water WBP	Bill Payment	$38,963.05
Total Pre-Authorized Payments			**$430,923.65**

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Payroll for March 2020

Pay Week Ending	Pay Date	Amount
February 29, 2020	March 5, 2020	$94,512.03
March 7, 2020	March 12, 2020	$90,299.18
March 14, 2020	March 19, 2020	$90,465.55
March 21, 2020	March 26, 2020	$93,323.03
Council Remuneration	March 26, 2020	$13,164.88
Firefighter Pay	March 12, 2020	$75,763.88
Total		**$457,528.55**

The Corporation of the Town of Essex

By-Law Number 1906

Being a by-law to confirm the proceedings of the April 6, 2020, Regular Meeting of Council of The Corporation of the Town of Essex

Whereas pursuant to Section 5(1) of The Municipal Act, 2001, S.O. 2001, c.25 as amended, the powers of a municipality shall be exercised by its Council;

And whereas pursuant to Section 5(3) of The Municipal Act, 2001, S.O. 2001, c.25 as amended, a municipal power, including a municipality's capacity, rights, powers and privileges under Section 8 of the Municipal Act, 2001, S.O. 2001, c.25, as amended, shall be exercised by by-law unless the municipality is specifically authorized to do otherwise;

And whereas it is deemed expedient that a by-law be passed to authorize the execution of Agreements and other documents and that the proceedings of the Council of The Corporation of the Town of Essex at its meetings be confirmed and adopted by by-law.

Now therefore be it resolved that the Council of The Corporation of the Town of Essex enacts as follows:

1. That the actions of the Council of The Corporation of the Town of Essex in respect of all recommendations in reports and minutes of committees, all motions and resolutions and all other actions passed and taken by the Council of The Corporation of the Town of Essex, documents and transactions entered into during the April 6, 2020 meeting of Council, are hereby adopted and confirmed as if the same were expressly contained in this by-law.

2. That the Mayor and proper officials of The Corporation of the Town of Essex are hereby authorized and directed to do all the things necessary to give effect to the actions of the Council of The Corporation of the Town of Essex during the said April 6, 2020 meeting referred to in paragraph 1 of this by-law.

3. That the Mayor and the Clerk are hereby authorized and directed to execute all documents necessary to the actions taken by this Council as described in Section 1 of this by-law and to affix the Corporate Seal of The Corporation of the Town of Essex to all documents referred to in said paragraph 1.

Read a first and a second time and provisionally adopted on April 6, 2020.

_____
Mayor

_____
Clerk

Read a third time and finally adopted on April 20, 2020.

_____
Mayor

_____
Clerk

The Corporation of the Town of Essex

By-Law Number 1900

Being a by-law to authorize the borrowing of money to meet current expenditures of The Corporation of the Town of Essex

Whereas, in accordance with subsection 407(1) of the Municipal Act, 2001, 5.0. 2001, c.25 (the "Act"), the Corporation of the Town of Essex (the "Town") deems it necessary to pass and enact a by-law to authorize the temporary borrowing of monies, up to $4,000,000.00, to meet the current expenditures of the Town for the year 2020, until taxes are collected;

And whereas, pursuant to subsection 407(2) of the Act, the total amount borrowed pursuant to this By-Law together with the total of any similar borrowings is not to exceed the limits set forth in that subsection;

Now therefore the Council of The Corporation of the Town of Essex enacts as follows:

1. That the Mayor and the Treasurer are authorized on behalf of the Town to borrow from time to time by way of promissory note or bankers' acceptance from Canadian Imperial Bank of Commerce (CIBC) a sum or sums not exceeding in aggregate $4,000,000.00 to meet the current expenditures of the Town for the year (including the amounts required for the purposes mentioned in subsection 407 (1) of the Act), until taxes are collected, and to give to CIBC such promissory notes or bankers' acceptances, as the case may be, sealed with the corporate seal of the Town and signed by the Mayor and Treasurer for the sums borrowed plus interest at a rate to be agreed upon from time to time with CIBC.

2. All sums borrowed pursuant to this By-Law, as well as all other sums borrowed pursuant to the Act in this year and in previous years from CIBC for any purpose will, with interest thereon, be a charge upon the whole of the revenues of the Town for the current year and for all preceding years as and when this revenue is received.

3. The Treasurer is authorized to direct to apply in payment of all sums borrowed plus interest, all of the monies collected or received on account in respect of taxes levied for the current year and preceding years or from any other source which may lawfully be applied for this purpose.

4. The Treasurer is authorized to furnish to CIBC a statement showing the nature and amount of the estimated revenues of the Town not yet collected and also showing the total of any amounts borrowed that have not been repaid.

5. The Treasurer is authorized to annually rent a safety deposit box from CIBC on behalf of the Town.

6. By-Law Number 1703 is repealed and replaced by By-Law Number 1900 effective January 1, 2020.

Read a first, a second and a third time and finally passed on April 20, 2020.

_____

Mayor

_____

Clerk

The Corporation of the Town of Essex

By-Law Number 1909

Being a by-law to confirm the proceedings of the April 20, 2020, Regular Meeting of Council of The Corporation of the Town of Essex

Whereas pursuant to Section 5(1) of The Municipal Act, 2001, S.O. 2001, c.25 as amended, the powers of a municipality shall be exercised by its Council;

And whereas pursuant to Section 5(3) of The Municipal Act, 2001, S.O. 2001, c.25 as amended, a municipal power, including a municipality's capacity, rights, powers and privileges under Section 8 of the Municipal Act, 2001, S.O. 2001, c.25, as amended, shall be exercised by by-law unless the municipality is specifically authorized to do otherwise;

And whereas it is deemed expedient that a by-law be passed to authorize the execution of Agreements and other documents and that the proceedings of the Council of The Corporation of the Town of Essex at its meetings be confirmed and adopted by by-law.

Now therefore be it resolved that the Council of The Corporation of the Town of Essex enacts as follows:

1. That the actions of the Council of The Corporation of the Town of Essex in respect of all recommendations in reports and minutes of committees, all motions and resolutions and all other actions passed and taken by the Council of The Corporation of the Town of Essex, documents and transactions entered into during the April 20, 2020 meeting of Council, are hereby adopted and confirmed as if the same were expressly contained in this by-law.

2. That the Mayor and proper officials of The Corporation of the Town of Essex are hereby authorized and directed to do all the things necessary to give effect to the actions of the Council of The Corporation of the Town of Essex during the said April 20, 2020 meeting referred to in paragraph 1 of this by-law.

3. That the Mayor and the Clerk are hereby authorized and directed to execute all documents necessary to the actions taken by this Council as described in Section 1 of this by-law and to affix the Corporate Seal of The Corporation of the Town of Essex to all documents referred to in said paragraph 1.

Read a first and a second time and provisionally adopted on April 20, 2020.

_____
Mayor

_____
Clerk

Read a third time and finally adopted on May 4, 2020.

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Mayor

_____
Clerk