City of Hamilton
PUBLIC WORKS COMMITTEE
AGENDA

Meeting #:	23-009
Date:	June 12, 2023
Time:	1:30 p.m.
Location:	Council Chambers Hamilton City Hall 71 Main Street West

Carrie McIntosh, Legislative Coordinator (905) 546-2424 ext. 2729

Pages

1. CEREMONIAL ACTIVITIES

   1.1 City of Hamilton Recognized as a Leader in Waste Education

2. APPROVAL OF AGENDA

   (Added Items, if applicable, will be noted with *)

3. DECLARATIONS OF INTEREST

4. APPROVAL OF MINUTES OF PREVIOUS MEETING

   4.1 May 29, 2023 — 5

5. COMMUNICATIONS

6. DELEGATION REQUESTS

7. DELEGATIONS

8. STAFF PRESENTATIONS

9. CONSENT ITEMS

a. Free-Floating Carshare Pilot Program

Item on OBL: ABW
Current Due Date: August 16, 2023
Proposed New Due Date: September 8, 2023

b. Security Report on Theft and Vandalism Prevention in City-Owned Spaces - Results of 2-Year Pilot Program

Item on OBL: ADC
Current Due Date: May 29, 2023
Proposed New Due Date: July 12, 2023

c. Winterizing Public Washrooms

Item on OBL: ABV
Current Due Date: July 12, 2023
Proposed New Due Date: August 16, 2023

d. Traffic Calming Management Policy

Item on OBL: N/A

Current Due Date: Q3 2023

Proposed New Due Date: Q4 2023

e. Management of the Aviary at 85 Oak Knoll Drive

Item on OBL: AAY
Current Due Date: Q2 2023
Proposed New Due Date: September 18, 2023

f. Bayfront Park – Transit Service Extension

Item on OBL: ADA
Current Due Date: Q4 2023
Proposed New Due Date: December 4, 2023

b. Items to be Removed:

a. Enhanced Safety and Security Measures at John Rebecca Park, 76 John Street North, Hamilton (Beasley Neighbourhood) (Ward 2)

Item on OBL: ADD

15. PRIVATE AND CONFIDENTIAL

16. ADJOURNMENT

PUBLIC WORKS COMMITTEE
MINUTES 23-008
1:30 p.m.
Monday, May 29, 2023
Council Chambers
Hamilton City Hall
71 Main Street West

Present: Councillors N. Nann (Chair), E. Pauls (Vice-Chair), J. Beattie, C. Cassar, J. P. Danko, M. Francis, T. Jackson, C. Kroetsch, T. McMeekin, M. Spadafora, M. Tadeson, A. Wilson and M. Wilson

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THE FOLLOWING ITEMS WERE REFERRED TO COUNCIL FOR CONSIDERATION:

1. In-Service Road Safety Review of the Intersections of Main Street West and King Street West at Dundurn Street South and Main Street East at King Street East (Delta) (PW23033) (Wards 1 and 3) (Outstanding Business List Item) (Item 9.1)

(M. Wilson/Nann)
That Report PW23033, respecting In-Service Road Safety Review of the Intersections of Main Street West and King Street West at Dundurn Street South and Main Street East at King Street East (Delta), be received.

Result: **MOTION, CARRIED by a vote of 12 to 0, as follows**:

Yes – Ward 1 Councillor Maureen Wilson
Yes – Ward 2 Councillor Cameron Kroetsch
Yes – Ward 3 Councillor Nrinder Nann
Yes – Ward 5 Councillor Matt Francis
Yes – Ward 6 Councillor Tom Jackson
Not Present – Ward 7 Councillor Esther Pauls
Yes – Ward 8 Councillor J. P. Danko
Yes – Ward 10 Councillor Jeff Beattie
Yes – Ward 11 Councillor M. Tadeson
Yes – Ward 12 Councillor Craig Cassar
Yes – Ward 13 Councillor Alex Wilson
Yes – Ward 14 Councillor Mike Spadafora
Yes – Ward 15 Councillor Ted McMeekin

2. Improving Truck Route Detouring During Construction Closures (PW23035) (City Wide) (Outstanding Business List Item) (Item 9.2)

(Spadafora/Tadeson)
That Report PW23035, respecting Improving Truck Route Detouring During Construction Closures (City Wide) (Outstanding Business List Item), be received.

Result: **MOTION, CARRIED by a vote of 11 to 0, as follows**:

Yes – Ward 1 Councillor Maureen Wilson
Yes – Ward 2 Councillor Cameron Kroetsch
Yes – Ward 3 Councillor Nrinder Nann
Yes – Ward 5 Councillor Matt Francis
Yes – Ward 6 Councillor Tom Jackson
Not Present – Ward 7 Councillor Esther Pauls
Yes – Ward 8 Councillor J. P. Danko
Yes – Ward 10 Councillor Jeff Beattie
Yes – Ward 11 Councillor M. Tadeson
Yes – Ward 12 Councillor Craig Cassar
Yes – Ward 13 Councillor Alex Wilson
Yes – Ward 14 Councillor Mike Spadafora
Not Present – Ward 15 Councillor Ted McMeekin

3. Construction Agreement with Town of Milton for the Rehabilitation of Milburough Line (PW23034) (Ward 15) (Item 11.1)

(A. Wilson/Spadafora)
That Council provide approval for the General Manager of Public Works, or designate, to execute the Construction Agreement between the City of Hamilton and the Corporation of the Town of Milton (hereinafter referred to as the “Town of Milton”), attached as Appendix “A” to Report PW23034, and all amendments and ancillary documents, respecting the cost shared Milburough Line capital road improvement project.

Result: **MOTION, CARRIED by a vote of 11 to 0, as follows**:

Yes – Ward 1 Councillor Maureen Wilson
Yes – Ward 2 Councillor Cameron Kroetsch
Yes – Ward 3 Councillor Nrinder Nann
Yes – Ward 5 Councillor Matt Francis
Yes – Ward 6 Councillor Tom Jackson
Not Present – Ward 7 Councillor Esther Pauls
Yes – Ward 8 Councillor J. P. Danko
Yes – Ward 10 Councillor Jeff Beattie
Yes – Ward 11 Councillor M. Tadeson

Yes – Ward 12 Councillor Craig Cassar
Yes – Ward 13 Councillor Alex Wilson
Yes – Ward 14 Councillor Mike Spadafora
Not Present – Ward 15 Councillor Ted McMeekin

4. Expansion of Pollinator Beds and Addition of Murals at York Boulevard Parkette 2, Hamilton (Ward 1) (Item 12.1)

(M. Wilson/Cassar)
WHEREAS, York Boulevard is a gateway into the City of Hamilton and currently includes several pollinator patches in the parkettes and medians;

WHEREAS, the Hamilton Naturalist's club has been actively creating and maintaining garden beds and promoting pollinator education at York Boulevard Parkette 2;

WHEREAS, the City of Hamilton has achieved Bee City status and is committed to upkeep the Bee City Vision through the protection and support of pollinators and habitat creation; and

WHEREAS, the planting of perennials and native plants contributes to biodiversity across the City and community murals help to celebrate and inform residents about nature and pollinator habitat.

THEREFORE, BE IT RESOLVED:

(a) That funding in the amount of $30,000 to the Hamilton Naturalist's club for the expansion of garden beds and addition of murals at York Boulevard Parkette 2 in order to contribute to pollinator habitat and community education, to be funded from the Ward 1 Special Capital Re- Investment Discretionary Fund (#3302109100) be approved;

(b) That the Mayor and City Clerk be authorized and directed to approve and execute all required agreements and ancillary documents, with such terms and conditions in a form satisfactory to the City Solicitor.

Result: **MOTION, CARRIED by a vote of 11 to 0, as follows**:

Yes – Ward 1 Councillor Maureen Wilson
Yes – Ward 2 Councillor Cameron Kroetsch
Yes – Ward 3 Councillor Nrinder Nann
Yes – Ward 5 Councillor Matt Francis
Yes – Ward 6 Councillor Tom Jackson
Not Present – Ward 7 Councillor Esther Pauls
Yes – Ward 8 Councillor J. P. Danko

Yes – Ward 10 Councillor Jeff Beattie
Yes – Ward 11 Councillor M. Tadeson
Yes – Ward 12 Councillor Craig Cassar
Yes – Ward 13 Councillor Alex Wilson
Yes – Ward 14 Councillor Mike Spadafora
Not Present – Ward 15 Councillor Ted McMeekin

5. Active and Sustainable School Travel Project (Ward 9) (Item 12.2)

(Beattie/Francis)
WHEREAS, the Active and Sustainable School Travel (ASST) program has been operating in Hamilton schools for 20 years and throughout this time, Transportation Planning – Sustainable Mobility and Public Health have been the partners in leading this work for the City in partnership with School Boards as guided by the Active and Safe School Travel Charter;

WHEREAS, many partners have participated in the ASST initiative including McMaster University, Mohawk College, Civic Plan, LURA, Hamilton Police Services, Bike for Mike and the Daily School Route (DSR), and each has contributed to implementation, research and partnerships that have evolved the program over time;

WHEREAS, the City and its partners are at a point where it is appropriate to re-confirm and extend partnerships and programs to better serve our school communities and have full alignment in meeting future goals and milestones, while further testing the school travel approach on a larger scale;

WHEREAS, the DSR, a part of the Bike for Mike not-for-profit organization, has developed a structured and robust approach to school travel that creates active transportation systems for kids with the aspiration of 100% of students walking/wheeling to/from school daily, which has been tested in multiple schools and has involved the City, School Boards and Civic Plan as partners;

WHEREAS, Ward 9 has ten elementary schools located in areas with a variety of land-use and transportation network characteristics, with many experiencing safety, traffic and parking challenges that could be addressed through active and safe school travel initiatives; and

WHEREAS, the DSR approach to active and safe school travel involving a comprehensive route strategy and safety review, has strong potential to address the school travel challenges in Ward 9 with a high potential for sustainable change.

THEREFORE, BE IT RESOLVED:

(a) That the General Manager of Planning and Economic Development be given the delegated authority to establish an agreement with Daily School Route (DSR), a part of the Bike For Mike not-for-profit organization, to deliver school engagement and behaviour change programs on behalf of the Active and Sustainable School Travel (ASST) program in partnership with Transportation Planning - Sustainable Mobility, the lead coordinating group, Public Health Services - Chronic Disease Prevention and Transportation Operations - Road Safety, in a form satisfactory to the City Solicitor;

(b) That Ward 9 be selected as an initial test case for the application of the Daily School Route (DSR) approach under the proposed agreement outlined in recommendation (a) between the City and the DSR;

(c) That the estimated cost of $85,000 to fund the Daily School Route (DSR) work to provide school travel planning services and tools for schools in Ward 9 be funded through S.C. Compensation Royalties (Terrapure Landfill) Reserve 117036; and

(d) That staff report back to Public Works Committee on the outcomes of the Ward 9 school travel planning initiatives undertaken by the City and the Daily School Route (DSR) following implementation.

Result: **MOTION, CARRIED by a vote of 13 to 0, as follows**:

Yes – Ward 1 Councillor Maureen Wilson
Yes – Ward 2 Councillor Cameron Kroetsch
Yes – Ward 3 Councillor Nrinder Nann
Yes – Ward 5 Councillor Matt Francis
Yes – Ward 6 Councillor Tom Jackson
Yes – Ward 7 Councillor Esther Pauls
Yes – Ward 8 Councillor J. P. Danko
Yes – Ward 10 Councillor Jeff Beattie
Yes – Ward 11 Councillor M. Tadeson
Yes – Ward 12 Councillor Craig Cassar
Yes – Ward 13 Councillor Alex Wilson
Yes – Ward 14 Councillor Mike Spadafora
Yes – Ward 15 Councillor Ted McMeekin

6. Non-Verbal Communication Panels in Parks (Ward 1) (Item 12.3)

(M. Wilson/Spadafora)
WHEREAS, a non-verbal communication panel is a board with images that assists non-verbal individuals to communicate more easily;

WHEREAS, these types of panels are being more widely integrated into playgrounds in the City and beyond;

WHEREAS, there are several community parks in Ward 1 that would benefit from this type of panel as part of the playground; and

WHEREAS, the addition of the panels supports enhanced inclusivity at playgrounds.

THEREFORE, BE IT RESOLVED:

(a) That the purchase and installation of Non-Verbal Communication Panels for Parks in Ward 1, to be funded from the Ward 1 Capital Discretionary Account #3302109100 at an upset limit, including contingency, not to exceed $21,000, be approved;

(b) That the Mayor and City Clerk be authorized and directed to execute any required agreement(s) and ancillary documents, with such terms and conditions in a form satisfactory to the City Solicitor.

Result: **MOTION, CARRIED by a vote of 13 to 0, as follows**:

Yes – Ward 1 Councillor Maureen Wilson
Yes – Ward 2 Councillor Cameron Kroetsch
Yes – Ward 3 Councillor Nrinder Nann
Yes – Ward 5 Councillor Matt Francis
Yes – Ward 6 Councillor Tom Jackson
Yes – Ward 7 Councillor Esther Pauls
Yes – Ward 8 Councillor J. P. Danko
Yes – Ward 10 Councillor Jeff Beattie
Yes – Ward 11 Councillor M. Tadeson
Yes – Ward 12 Councillor Craig Cassar
Yes – Ward 13 Councillor Alex Wilson
Yes – Ward 14 Councillor Mike Spadafora
Yes – Ward 15 Councillor Ted McMeekin

7. Dedication of the Sun Shelter in Honour of Dona Campbell and a Park Bench in Honour of Glen Campbell at Templemead Park, 30 Independence Drive (Ward 6) (Item 12.4)

(Jackson/Spadafora)
WHEREAS, the Environmental Services Division of Public Works offers a Commemorative Park Bench & Tree Program;

WHEREAS, the Commemorative Park Bench & Tree Program provides options to honour an individual or group by donating a bench or tree to a City park which allows for improvements to our parks and inspires community pride and a sense of place;

WHEREAS, the Commemorative Park Bench & Tree Program is operated at full cost recovery through the donations provided;

WHEREAS, Dona Campbell was the first Chairperson of the Templemead Community Council and in 1990 fulfilled the goal of a neighbourhood park in the Templemead Community complete with a play structure for children of all physical abilities and a sun shelter to protect families from the hot sun while at the park;

WHEREAS, Glen Campbell was the behind-the-scenes member of the building of the park, always at Dona's side and helping at all the fundraisers for Templemead Park;

WHEREAS, Glen Campbell passed away on February 2, 2019, and Dona Campbell passed away on January 23, 2021.

WHEREAS, a memorial will be dedicated to Dona Campbell and to Glen Campbell at Templemead Park in remembrance of their love of community and family; and

WHEREAS, a donation to the Commemorative Park Bench & Tree Program in Ward 6 requires funding approval.

THEREFORE, BE IT RESOLVED:

(a) That a contribution to the Commemorative Park Bench & Tree Program be funded from the Ward 6 Special Capital Re-Investment Discretionary Fund (# 3302209300) for the purchase of a Plaque at the Sun Shelter in honour of Dona Campbell and a Park Bench and Plaque in honour of Glen Campbell and Dona Campbell at Templemead Park, 30 Independence Drive, with an upset limit of $5,000, be approved; and

(b) That the Mayor and City Clerk be authorized and directed to approve and execute any and all required agreements and ancillary documents, with such terms and conditions in a form satisfactory to the City Solicitor.

Result: **MOTION, CARRIED by a vote of 13 to 0, as follows**:

Yes – Ward 1 Councillor Maureen Wilson
Yes – Ward 2 Councillor Cameron Kroetsch
Yes – Ward 3 Councillor Nrinder Nann

Yes – Ward 5 Councillor Matt Francis
Yes – Ward 6 Councillor Tom Jackson
Yes – Ward 7 Councillor Esther Pauls
Yes – Ward 8 Councillor J. P. Danko
Yes – Ward 10 Councillor Jeff Beattie
Yes – Ward 11 Councillor M. Tadeson
Yes – Ward 12 Councillor Craig Cassar
Yes – Ward 13 Councillor Alex Wilson
Yes – Ward 14 Councillor Mike Spadafora
Yes – Ward 15 Councillor Ted McMeekin

FOR INFORMATION:

(a) APPROVAL OF AGENDA (Item 2)

(Spadafora/M. Wilson)
That the Agenda for the May 29, 2023 Public Works Committee meeting be approved, as presented.

Result: **MOTION, CARRIED by a vote of 11 to 0, as follows**:

Yes – Ward 1 Councillor Maureen Wilson
Yes – Ward 2 Councillor Cameron Kroetsch
Yes – Ward 3 Councillor Nrinder Nann
Yes – Ward 5 Councillor Matt Francis
Yes – Ward 6 Councillor Tom Jackson
Not Present – Ward 7 Councillor Esther Pauls
Not Present – Ward 8 Councillor J. P. Danko
Yes – Ward 10 Councillor Jeff Beattie
Yes – Ward 11 Councillor M. Tadeson
Yes – Ward 12 Councillor Craig Cassar
Yes – Ward 13 Councillor Alex Wilson
Yes – Ward 14 Councillor Mike Spadafora
Yes – Ward 15 Councillor Ted McMeekin

(b) DECLARATIONS OF INTEREST (Item 3)

There were no declarations of interest.

(c) APPROVAL OF MINUTES OF PREVIOUS MEETING (Item 4)

(i) May 15, 2023 (Item 4.1)

(McMeekin/Francis)

That the Minutes of the May 15, 2023 meeting of the Public Works Committee be approved, as presented.

Result: **MOTION, CARRIED by a vote of 11 to 0, as follows**:

Yes – Ward 1 Councillor Maureen Wilson
Yes – Ward 2 Councillor Cameron Kroetsch
Yes – Ward 3 Councillor Nrinder Nann
Yes – Ward 5 Councillor Matt Francis
Yes – Ward 6 Councillor Tom Jackson
Not Present – Ward 7 Councillor Esther Pauls
Not Present – Ward 8 Councillor J. P. Danko
Yes – Ward 10 Councillor Jeff Beattie
Yes – Ward 11 Councillor M. Tadeson
Yes – Ward 12 Councillor Craig Cassar
Yes – Ward 13 Councillor Alex Wilson
Yes – Ward 14 Councillor Mike Spadafora
Yes – Ward 15 Councillor Ted McMeekin

(d) GENERAL INFORMATION / OTHER BUSINESS (Item 14)

(i) Amendments to the Outstanding Business List (Item 14.1)

(Spadafora/Pauls)
That the following amendments to the Public Works Committee's Outstanding Business List, be approved:

(1) Items Considered Complete and Needing to be Removed (Item 14.1(a)):

(i) Main Street East and King Street East (Delta) In-Service Road Safety Review (Item 14.1(a)(a))
Addressed as Item 9.1 (PW23033) (today's agenda)
Item on OBL: ACR

(ii) Main Street West at Dundurn Street South and King Street West at Dundurn Street South Intersection Road Safety Plan (Item 14.1(a)(b))
Addressed as Item 9.1 (PW23033) (today's agenda)
Item on OBL: ACS

(iii) Improving Truck Route Detouring during Construction Closures (Item 14.1(a)(c))
Addressed as Item 9.2 (PW23035) (today's agenda)
Item on OBL: ABY

(2) Items Requiring a New Due Date (Item 14.1(b)):

(i) Free-Floating Carshare Pilot Program (Item 14.1(b)(a))
Item on OBL: ABW
Current Due Date: June 12, 2023
Proposed New Due Date: August 16, 2023

(ii) Impact of On-Site and Excess Soils Management Regulation (O. Reg 406/19) and other pressures on Capital Program Costs (Item 14.1(b)(b))
Item on OBL: ACZ
Current Due Date: June 12, 2023
Proposed New Due Date: July 12, 2023

(3) Items to be Referred to the General Issues Committee (Item 14.1(c)):

(i) Redevelopment / Reuse of the former King George School Site, at 77 Gage Avenue North (Item 14.1(c)(a)
Item on OBL: V

(4) Items to be Removed (Item 14.1(d)):

(i) Correspondence from the Town of Fort Erie requesting support for their resolution in support of the Township of The Archipelago respecting Road Management Action on Invasive Phragmites (Item 14.1(d)(a))
Item on OBL: ABU

Result: **MOTION, CARRIED by a vote of 13 to 0, as follows**:

Yes – Ward 1 Councillor Maureen Wilson
Yes – Ward 2 Councillor Cameron Kroetsch
Yes – Ward 3 Councillor Nrinder Nann
Yes – Ward 5 Councillor Matt Francis
Yes – Ward 6 Councillor Tom Jackson
Yes – Ward 7 Councillor Esther Pauls
Yes – Ward 8 Councillor J. P. Danko
Yes – Ward 10 Councillor Jeff Beattie
Yes – Ward 11 Councillor M. Tadeson
Yes – Ward 12 Councillor Craig Cassar
Yes – Ward 13 Councillor Alex Wilson
Yes – Ward 14 Councillor Mike Spadafora
Yes – Ward 15 Councillor Ted McMeekin

(e) ADJOURNMENT (Item 16)

(Tadeson/Spadafora)
That there being no further business, the meeting adjourned at 2:47 p.m.

Result: **MOTION, CARRIED by a vote of 13 to 0, as follows**:

Yes – Ward 1 Councillor Maureen Wilson
Yes – Ward 2 Councillor Cameron Kroetsch
Yes – Ward 3 Councillor Nrinder Nann
Yes – Ward 5 Councillor Matt Francis
Yes – Ward 6 Councillor Tom Jackson
Yes – Ward 7 Councillor Esther Pauls
Yes – Ward 8 Councillor J. P. Danko
Yes – Ward 10 Councillor Jeff Beattie
Yes – Ward 11 Councillor M. Tadeson
Yes – Ward 12 Councillor Craig Cassar
Yes – Ward 13 Councillor Alex Wilson
Yes – Ward 14 Councillor Mike Spadafora
Yes – Ward 15 Councillor Ted McMeekin

Respectfully submitted,

Councillor N. Nann, Chair,
Public Works Committee

Carrie McIntosh
Legislative Coordinator
Office of the City Clerk

INFORMATION REPORT

TO:	Chair and Members Public Works Committee
COMMITTEE DATE:	June 12, 2023
SUBJECT/REPORT NO:	Accessible Transportation Services Performance Report (PW22079(c)) (City Wide)
WARD(S) AFFECTED:	City Wide
PREPARED BY:	Michelle Martin (905) 546-2424 Ext. 2765
SUBMITTED BY: **SIGNATURE:**	Maureen Cosyn Heath Director, Transit Public Works Department

COUNCIL DIRECTION

Public Works Committee, at its meeting of April 22, 2022, approved the following: "That staff be directed to report back to the Public Works Committee and the Advisory Committee for Persons with Disabilities on a quarterly basis respecting Accessible Transportation Services (ATS)." (PW Report 22-006, Item 3 (PW21055(a)).

INFORMATION

In 1998, an Ontario Human Rights Code complaint was filed and the subsequent settlement established, in part, that the City of Hamilton report on service-specific requirements, notably, a trip denial rate goal of 5%, an on-time performance goal of 95% or greater for DARTS trips, and an annual report to the City's Advisory Committee for Persons with Disabilities on: trip requests, trip denials, passenger refusals of trips, cancellations, no shows, missed trips, trips provided, complaints and on-time performance.

Accessible Transportation Services has presented performance indicators from 2019 up to Q2 2022 as described in PW22079. Performance indicators year to date Q3 2022 were presented as described in PW22079(a), and Q4 2022 performance indicators were presented as described in PW22079(b). Q1 2023 indicators were presented to the

Advisory Committee for Persons with Disabilities meeting 23-005 Agenda Item 8.1, and the report is attached as Appendix “A” to Report PW22079(c).

From the beginning to the end of 2022, there was an overall decrease in on-time performance of the contractor for specialized transit, DARTS, from 99.6% to 98.3%, and the downward trend continued for Q1 of 2023, with on-time performance sitting at 96.2%. Though still within the 95% guideline established by the 2004 Ontario Human Rights Commission settlement cited above, it is reflective of 4,726 late trips delivered in Q1: more than double the late trips delivered in any quarter in 2022, exceeding the 2022 late trip total by 139.

There has been a related increase in complaints largely driven by increased complaints about late trips. The count of all complaints received in Q1 2023 resulted in a count of 9.3 complaints per thousand trips: more than double the overall rate of complaints for 2022. The industry standard is 1.0 complaints/1000 trips, and the 2016 Canadian Urban Transit Association average was 2.1 complaints/1000 trips for large systems such as Hamilton (Canadian Urban Transit Association Specialized Transit Services Industry Practices Review, 2016).

At the request of the Advisory Committee for Persons with Disabilities following presentation of the 2022 Q4 totals, complaints per thousand trips have been broken down according to provider for Q1 2023; i.e., for DARTS and for each subcontractor. DARTS has the highest rate of complaints, which is not surprising, given they are solely responsible for reservations and scheduling, which capture the late trip complaints.

Also, again at the request of the Advisory Committee for Persons with Disabilities, DARTS call centre statistics have been included in the Q1 2023 report. Specifically, Advisory Committee for Persons with Disabilities members expressed concern about the rate of abandoned calls, given the increased call wait times reported by customers. Of 111,404 inbound calls, 30,230 (27.1%) were abandoned after more than 30 seconds.

The Q1 2023 trip denial rate for DARTS trips was 4.6%, within the 5% benchmark set in the 2004 Ontario Human Rights Commission settlement, but higher than the final 2022 rate of 1.7%.

While the Q2 2023 numbers were not finalized at the time of PW22079(c) writing, in April 2023, DARTS on-time performance shows some improvement at 98%; however, total complaints received sits at approximately 10.1 per thousand DARTS trips, again, largely driven by complaints about late trips. The April denial rate has dropped down to approximately 2.4%. These April numbers will be included in the 2023 Q2 report that will go to the Advisory Committee for Persons with Disabilities early in Q3.

The information presented meets the terms of the settlement and exceeds the frequency requirements.

APPENDICES AND SCHEDULES ATTACHED

Appendix “A” to Report PW22079(c) – Advisory Committee for Persons with Disabilities Meeting 23-005 8.1 – Accessible Transportation Services Performance Report Q1 2023

City of Hamilton
Accessible Transportation Services Performance Review
Q1 2023

Michelle Martin
Manager, Accessible Transportation Services
Transit Division
Public Works Department
May 9, 2023

This information report provides a summary of key statistical data and performance indicators for Q1 of 2023 (January to March). The City is obligated to provide statistical reports to the Advisory Committee for Persons with Disabilities (ACPD) to meet the terms of the City's 2004 settlement with the Ontario Human Rights Commission (OHRC) and complainants under the Code.

The report reflects the performance of specialized transportation offered by HSR Accessible Transportation Services (ATS) through its contractor for services, Disabled and Aged Regional Transportation System (DARTS) and their subcontractors, and through the ATS Taxi Scrip program. The data was obtained from DARTS performance report records, ATS contact reports, and ATS Taxi Scrip program data.

TRIPS REQUESTED AND PROVIDED

Table 1: System Requested and Delivered Passenger Q1 2023

DEMAND	Q1 2023
DARTS: Number of Total Trips Requested	192,077
DARTS: Number of Total Trips Delivered	125,547
TAXI SCRIP: Number of Total Trips Delivered	8,233
ATS: Number of Total Trips Requested, All Modes	200,310
ATS: Number of Total Trips Delivered, All Modes	133,780
ATS % Of Total Trips Delivered vs. Requested, All Modes	**67%**

Table 2: System Demand by Mode: DARTS vs. Taxi Scrip

DEMAND BY MODE	Q1 2023 %
DARTS	96%
TAXI SCRIP	4%
ATS: All Modes	100.0%

Demand for specialized trips on DARTS continues to be the main driver of trips requested and delivered. Taxi Scrip accounts for just 4% of system trips requested, and 96% of trips requested are for DARTS to date in 2023 (Table 2, above). The total number of requested trips includes client cancellations and no shows.

In Q1 2023, ATS delivered a total of 133,780 trips through both DARTS and the Taxi Scrip program; approximately 6% of total trips delivered were delivered through Taxi Scrip (see Table 1, above).

For Q1 of 2023, DARTS completed trip counts are at approximately 64% of 2019 numbers for the same period (pre-COVID), and at approximately 91% of budgeted service up to end of Q1.

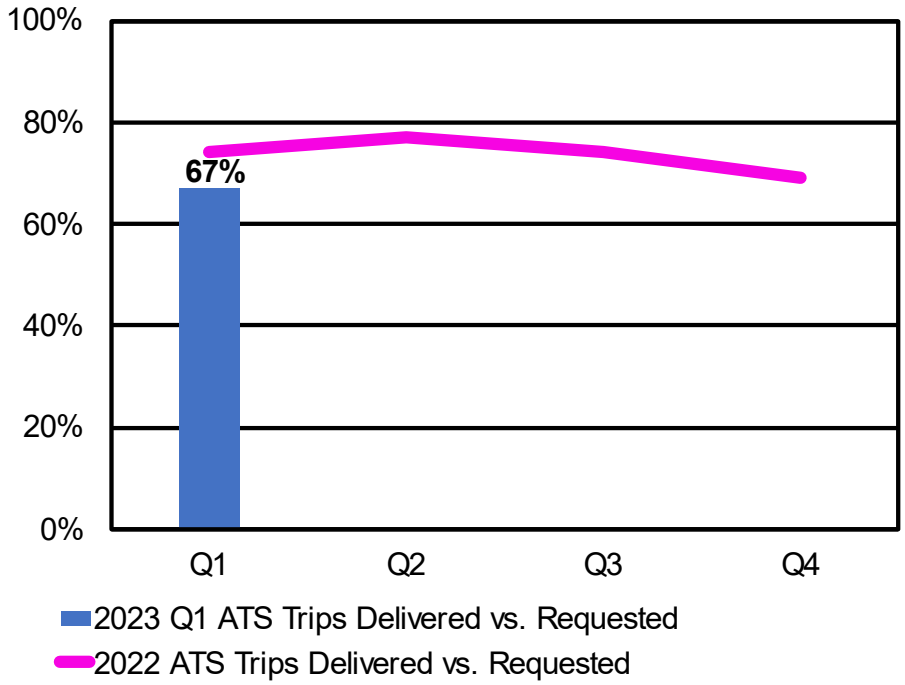


Figure 1: Demand: Count of ATS Trips Delivered versus Requested, All Modes

Alternate text for Figure 1: The graph in Figure 1 (above) compares total ATS trips requested to total number of ATS trips delivered for both DARTS and Taxi Scrip (i.e., all modes). The blue vertical column shows the percentage of trips provided out of the total number of trips requested for Q1 2023. The pink line graph above the column shows the trend across all of 2022. So far, at 67%, the percentage of requested trips delivered in Q1 2023 is lower than any quarter in 2022. The total number of requested trips also includes trips booked but not taken, i.e., cancelled trips and passenger no show trips (see also Table 1, above).

RATE OF DENIED SYSTEM TRIPS

Table 3: Rate of Denied Trips: ATS All Modes

Rate of Denied Trips: ATS All Modes	**Q1 2023**
ATS Total Number of Trips Requested	200,310
ATS Total Number of Trips Denied	8,754
% of Trips Denied	**4.4%**

System trip denial rates remain below the 5% goal established by the City's 2004 settlement with the OHRC, which includes Taxi Scrip trips for the purpose of calculating the trip denial rate. The industry best practice is 0% (Canadian Urban Transit Association (CUTA) Specialized Transit Services Industry Practices Review, 2016). Table 3 (above) shows that the while system denial rate remains

within the OHRC standard, the rate is more than double the overall denial rate for 2022 and is driven by increased trip denials by DARTS (see Table 4, below).

SPECIALIZED TRANSPORTATION TRIP DISPOSITION

Table 4: Contractor (DARTS) Trip Dispositions

Contractor Trip Dispositions	**Q1 2023**
Total Trips Requested	192,077
Total Trips Provided	125,547
Total Trips Denied	8,754
% of Total Trips Denied	**4.6%**

Contractor Denied Trip

A denied trip by the contractor occurs when the client's request, within the allowable booking windows, cannot be agreed to within one hour of the requested date and time of travel or acceptable alternative, according to the criteria listed in Appendix 1, below. Denial rates for service provided by our contractor, DARTS, currently sits at 4.6% year to date, end of Q1 (Table 4, above). This is an increase of more than double the rate for 2022. DARTS reports this figure to be due to circumstances beyond its control: increased employee absences including Operators, and in Reservations, Maintenance and Dispatch; and DARTS vehicles out of service awaiting parts for repair, due in part to supply chain issues.

Contractor Call Centre

Table 5: Contractor (DARTS) Call Centre Queue Productivity

Queue Productivity	**Q1 2023**
Inbound Calls	111,404
Calls Handled by Agents	76,284
Calls Abandoned by Clients	35,120
Transfer Rate	**68.5%**
Abandoned Rate	**31.5%**
Abandoned > 30 Seconds	30,230
Abandoned > 30 Seconds Rate	**27.1%**
Service Level	**48.94%**
Minimum Wait Time	00:00:00
Maximum Wait Time	04:50:18
Average Wait Time	00:07:08
Average Abandoned Wait Time	00:04:05

In response to ACPD feedback following the final 2022 ATS Performance Report, ATS requested DARTS provide call centre data (Table 5, above). The concern expressed by ACPD members was specifically around calls abandoned by clients who are attempting to book trips, which would not be captured in the trip denial rate in Table 3. The numbers above indicate that 27.1% of calls were abandoned after the 30 second mark. It should be noted that the above call centre data also indicates some clients may be having difficulty calling in to cancel trips in a timely manner (see Table 6, below). Call Centre terms are defined in Appendix 1.

Table 6: Client Trip Disposition - DARTS

Client Trip Disposition	Q1 2023
Total Trips Cancelled On Time	27,257
% of Total Trips Cancelled on Time	**14.2%**
Total Trips Cancelled Late	24,481
% of Total Trips Cancelled Late	**12.7%**
Total No Show/Cancelled at Door	5,900
% of Total No Show/Cancelled at Door	**3.1%**
Total Trips Refused	138
% of Total Trips Refused	**0.1%**

Client Trip Cancelled On Time

A trip cancelled on time has been cancelled by the client by 4:30 PM of the day prior to service. The industry best practice is an on-time cancellation rate of between 5-10% (CUTA Specialized Transit Services Industry Practices Review, 2016). Trips that are cancelled on time provide the opportunity to accommodate any outstanding trip requests or wait list trips in a timely manner.

Table 6 (above) on-time cancellations sit at 14.2% of trips requested on DARTS at the end of Q1 2023. The average on-time cancellation reported by CUTA in 2016 is 20.76% for large systems (agencies that serve a population higher than 150,000) (CUTA Specialized Transit Services Industry Practices Review, 2016).

Client Trip Cancelled Late

A late cancellation is one that is made after 4:30 p.m. of the day prior to service, and prior to vehicle arrival within the pickup window and/or within thirty minutes after the negotiated pickup time. Late cancellations rarely provide opportunity to accommodate any outstanding trip requests or wait list trips in a timely manner. Table 6 shows the late cancellation rate currently sits at 12.7% as of the end of Q1 2023.

Client No-Show/ Cancelled at Door

A No Show trip occurs when a client books a trip, does not cancel ahead of time, and is not available at the time that the vehicle arrives within the pickup window and/or within thirty minutes after the negotiated pickup time. This includes any occurrence of trips cancelled at door, where the client refuses a trip at the door that is within the pickup window and/ or within thirty minutes after the negotiated pickup time. No shows leave no opportunity to accommodate any outstanding trip request or wait list trips. Table 6 shows the no-show rate sits at 3.1% of DARTS trips requested at the end of Q1 2023. This is down slightly from 3.5% for 2022 and still lower than the 2016 average of 3.68% for larger systems reported by CUTA, but to exceeds the industry best practice of less than 1%. No shows result in both lost revenue and lost service efficiency (CUTA Specialized Transit Services Industry Practices Review, 2016).

HSR is currently working with the contractor for specialized transit, DARTS, and the software provider, Trapeze, to install an updated service infraction application to track late cancellations and no shows according to the points system outlined in PW21055(a). It should be noted, however, that

there were significant weather events in January, February, and March: for example, there were over 1,000 cancellations on January 25 alone—the date of an inclement weather event. This is an example of a circumstance in which ATS would not apply any penalty for a late cancellation or no show.

Client Refused Trip

A refused trip occurs when a client does not accept the travel times provided at the time of booking. The refused trip rate continues to be extremely low, at only 0.1% for Q1 of 2023.

DARTS ON-TIME PERFORMANCE

The City's 2004 settlement with the OHRC defines late trips as those where the contractor or subcontractor Operator does not arrive until 30 minutes or more after the scheduled arrival time and established an on-time performance goal of 95% or greater. The industry standard for on time performance is 95%-99% for large systems (agencies that serve a population higher than 150,000) (CUTA Specialized Transit Services Industry Practices Review, 2016).

In 2022, at 99%, on-time performance was consistently better than the target established in the OHRC settlement agreement and sits within the industry benchmark. As shown in Table 7 (below), in Q1 of 2023, on time performance has decreased to 96.2%—still within the 2004 OHRC guideline, but continuing a downward trend seen at the end of 2022. As noted above, DARTS has reported some causal factors to be beyond its control: increased employee absences including Operators, and in Reservations, Maintenance and Dispatch; and DARTS vehicles out of service awaiting parts for repair, due in part to supply chain issues.

Table 7: Contractor (DARTS) On-Time Performance

Service Metrics	Q1 2023
Total Trips Provided	125,547
Total Number of Late Trips	4,726
% of Trips Completed on Time	96.2%

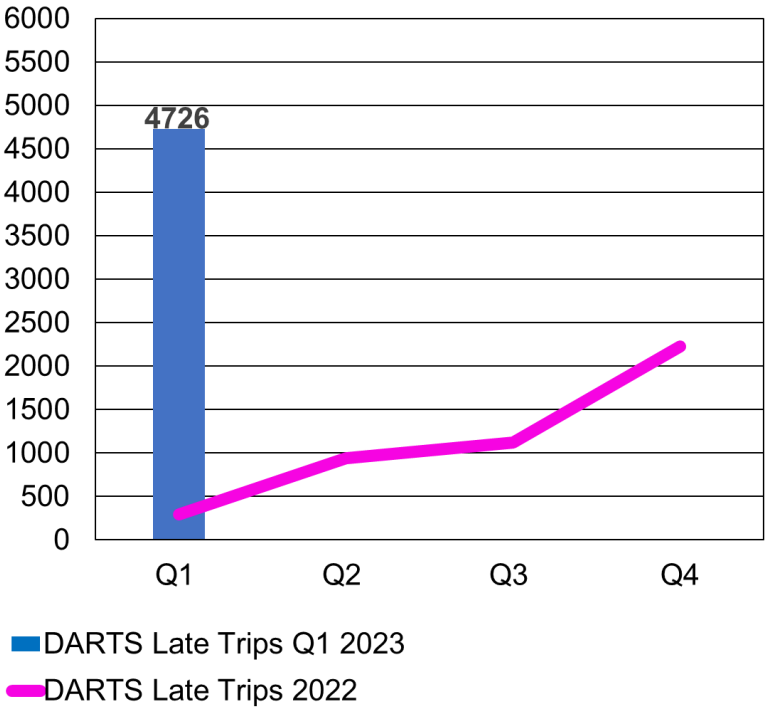


Figure 2: DARTS Late Trips

Alternate text for Figure 2: In Figure 2 (above), the vertical blue column shows the number of late trips in Q1 of 2023, compared to the trend across each quarter in 2022, illustrated by a pink line across the lower portion of the graph. At 4,726, the number of late trips is already more that double the late trips for any quarter last year, and higher than the 2022 total of 4,587 (see also Table 7, above).

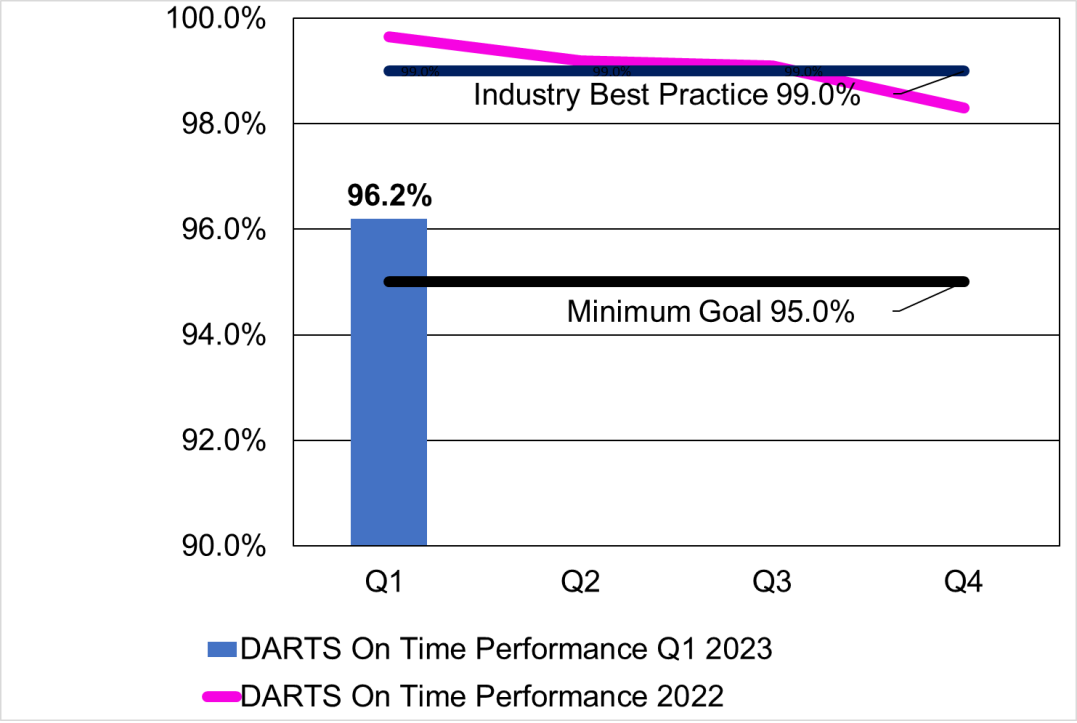


Figure 3: DARTS On Time Performance

Alternate text for Figure 3: Figure 3 (above) graphs DARTS on-time performance. The solid pink line shows the DARTS on-time performance trend across all quarters of 2022. The black line at the 99% level illustrates the industry best practice, and the black line at the 95% level shows the goal as directed by the OHRC in 2004. The graph shows a decrease in DARTS on-time performance from Q1 to Q4 of 2022 dropping to just over 98%. The vertical blue bar shows that at 96.2%, on-time performance in Q1 of 2023 has dropped below the lowest value for 2022, 1.2% above the OHRC goal of 95% but well below the industry standard of 99% (see also Table 7, above).

COMPLAINTS

Table 8: Complaints per Thousand Trips

Year	Complaints per Thousand ATS Trips, All Modes	ATS and DARTS Complaints per Thousand DARTS Trips
2023 Q1	8.8	9.3

Complaints are those customer contacts in which a customer submits an objection to the planning or provision of service. Complaints per thousand are shown in Table 8, above. The first column uses the total number of ATS trips provided (where complaints about Taxi Scrip have been included). In Q1 of 2023, there were 16 Taxi Scrip complaints. The second column uses the total number of DARTS trips provided (not including complaints about Taxi Scrip).

The industry best practice is 1.0 complaints per 1,000 trips. The 2016 CUTA average for large systems is 2.1 complaints per 1,000 trips. The Q1 2023 complaint level is almost nine times the industry best practice (1:1,000) and more than four times the 2016 CUTA average (CUTA Specialized Transit Services Industry Practices Review, 2016).

Table 9: Complaint Type

Complaint Type	Q1 2023
Service Performance	991
Staff Performance	125
Service Sufficiency	64
TOTAL	1180

Table 9 (above) breaks down the number of complaints based on three general categories:

- Service performance – categories of complaint where the service as performed did not meet expectations, including but not limited to complaints about pickup/ drop off outside of window; call return wait time; address, date or time errors; missed trip; or scheduled on board time. Most complaints are in this category.
- Staff performance – categories of complaint where staff conduct did not meet expectations, including but not limited to complaints about staff conduct or driving habits. This is the second most frequent category of complaint.
- Service sufficiency – categories of complaint where the service was insufficient to meet reported customer needs, including but not limited to complaints about subscription trips or waiting lists. Taxi Scrip complaints are captured in this category. This is the least frequent category of complaint.

The categories above have been in use internally many years. ATS is currently reviewing their use for better understanding of complaint drivers. In Table 9, total complaints include all complaints received, including non-validated complaints.

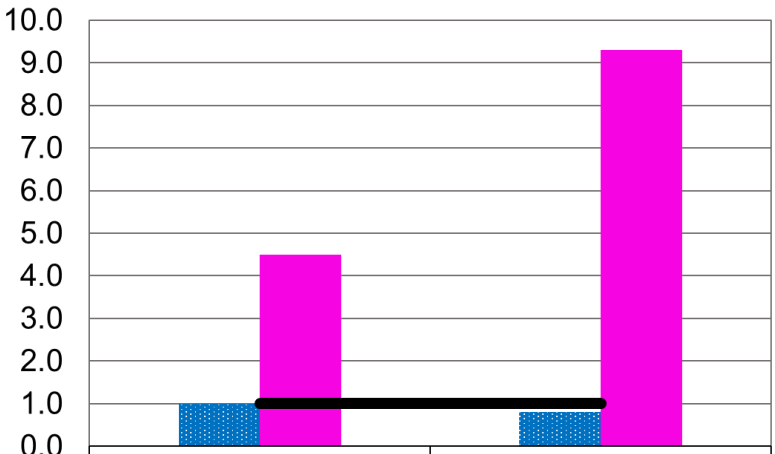
COMMENDATIONS

Table 10: Commendations per Thousand Trips

Year	Commendations per Thousand ATS Trips, All Modes	ATS and DARTS Commendations per Thousand DARTS Trips
Q1 2023	0.8	0.8

Table 10 (above) shows the number of commendations per thousand ATS system trips (including Taxi Scrip trips) and per thousand DARTS trips. It should be noted ATS does not typically receive commendations about Taxi Scrip service, and none were received to date as of Q1 in 2023.

The industry best practice is 1 commendation per 1,000 trips. The 2016 CUTA average for large system is 0.36 commendations per 1,000 trips. Commendations sit just slightly below the industry best practice of 1 commendation per thousand trips, but above the 2016 CUTA average (CUTA Specialized Transit Services Industry Practices Review, 2016).



	2022	2023 Q1
Commendations/ 1,000 DARTS trips	1.0	0.8
Complaints/ 1,000 DARTS trips	4.5	9.3
Industry Best Practice	1	1

Figure 4: ATS and DARTS Commendations and Complaints per Thousand DARTS Trips.

Alternate text for Figure 4: Figure 4 (above) graphs ATS and DARTS commendations and complaints per thousand trips, comparing the 2022 average with Q1 of 2023. The clustered vertical columns compare commendations to complaints. The vertical blue columns with white dots on the left side of each cluster show commendations per thousand trips, and the vertical pink columns on the right side of each cluster show complaints per thousand trips. The solid black line illustrates the industry best practice of less than one complaint per thousand trips and more than one commendation per thousand trips. The graph shows that the industry standard for complaints was not met for 2022 at 4.5 complaints per thousand trips; this more than doubled to 9.3 in Q1 of 2023. While the industry standard for commendations was met in 2022 at 1 commendation per thousand trips, it was not met in Q1 of 2023, dropping to 0.8. See also Tables 8 and 10, above.

VALIDATED COMPLAINTS FOR DARTS AND DARTS SUBCONTRACTORS

Table 11: Validated Complaints per Thousand Trips for DARTS and DARTS Subcontractors

Provider	Number of Trips Q1 2023	Number of Validated Complaints Q1 2023	**Validated Complaints per Thousand Trips Q1 2023**
DARTS	55,110	932	**16.9**
VETS	20,183	16	**0.8**
Hamilton Rising	29,915	38	**1.3**
City Marvel	19,769	53	**2.7**
Hamilton Cab	570	1	**1.8**
TOTAL	**125,547**	**1,040**	**8.3**

DARTS and subcontractor complaints are processed to DARTS for investigation. Where these complaints are deemed unfounded by DARTS, and if ATS concurs with this outcome, these complaints are not included in the count of validated complaints. Removing 9 complaints against ATS Customer Service and excluding unfounded complaints leaves an overall count of 8.3 complaints per thousand trips for the contractor and subcontractors, still more than eight times the industry best practice and just under 4 times the CUTA 2016 average (Table 11, above). Complaints against DARTS also include DARTS reservations, dispatch, scheduling, and on-street service, where complaints against subcontractors include on-street service only. In Q1 of 2023, 570 trips were delivered by demand taxi, where ATS client travel needs could be met with this service, to meet the service standard.

APPENDIX 1 - Definition of terms

Number of Total ATS Trips Requested, All Modes: the sum of DARTS Requested Trips [plus] Taxi Scrip Trips Delivered.

Taxi Scrip Trips Delivered: the total of all passengers reported by contracted brokers under the Taxi Scrip program.

Number of Total DARTS Trips Requested: the sum of Trips Delivered by DARTS, DARTS subcontractors, and meter taxi [plus] No Show Trips [plus] Cancelled Trips [plus] Trips Denied [plus] Trips Refused.

Trips Denied: a denied trip occurs when

- a casual trip request has been made as much as 7 days in advance up to 4:30 PM on the day prior to the required day of service, and a negotiated time cannot immediately be agreed to within one hour of the requested time or at a time otherwise suitable to the passenger, or cannot subsequently be agreed to through the use of the waiting list
- when a passenger requests a subscription trip which cannot immediately be fulfilled, this form of request is not recorded as a denial of service, however, each instance of a like casual trip request that cannot be accommodated as noted above is recorded as a trip denial
- when the passenger agrees to assignment to the waiting list, a trip denial will still occur if no trip can be found, or if an offered trip is not deemed by the passenger as either suitable or required
- when a passenger requests a trip after 4:30 PM of the day prior to the required day of service, or on the required day of service, and the trip request cannot be accommodated, such request will not be recorded as a denial of service.

Cancelled Trips: a cancelled trip is one that is cancelled by the passenger, or on the passenger's behalf, once a subscription or casual booking has been made

- an advance cancellation is one that is made by 4:30 p.m. of the day prior to service
- a late cancellation is one that is made after 4:30 p.m. of the day prior to service, and prior to vehicle arrival within the pickup window and/or within thirty minutes after the negotiated pick up time
- a program closure cancellation is one that is made for all passengers to a program with advance notification, including program shutdown periods and temporary program venue changes
- a service suspension cancellation is one that is made as a result of a weather or other emergency within the control of ATS and/ or DARTS.

No Show Trips: a no show occurs when a passenger books a trip, does not cancel ahead of time, and is not available at the time that the vehicle arrives within the pickup window and/or within thirty minutes after the negotiated pickup time. This includes any occurrence of trips cancelled at door, where the passenger refuses a trip at the door that is within the pickup window and/or within thirty minutes after the negotiated pickup time.

Number of Total DARTS Trips Delivered: the sum of all trips taken by passengers and their escorts and/or companions delivered by DARTS on DARTS, DARTS subcontractors, or metered taxi.

Late Trips: the sum of all trips that are more than 30 minutes late from that time negotiated with the passenger for the trip, as reported by drivers and as recorded by DARTS from driver manifests.

Complaints: those customer contacts under which a customer submits an objection to the planning or provision of service

Commendations: those customer contacts under which a customer submits praise for the planning or provision of service.

Validated complaint: complaint determined to be substantiated based on investigation by the contractor and ATS review/ agreement.

Rate of Denied Trips: Denied Trips expressed as a percentage of Number of Total ATS Trips Requested, All Modes.

Inbound calls: incoming calls entering call system queue.

Calls Handled by Agents: incoming calls transferred to an agent.

Calls Abandoned by Clients: calls for which the caller hung up.

Transfer Rate: rate of incoming calls transferred to an agent, as a percentage of calls queued.

Abandoned Rate: rate of calls abandoned, as a percentage of calls queued.

Minimum Wait Time: the shortest amount of time before call was transferred to an agent.

Maximum Wait Time: the longest amount of time before a call was transferred to an agent.

Service Level: calculated as [calls transferred within 5 minutes] / ([calls transferred] + [calls abandoned after 5 minutes]) * 100

Rate of Cancelled Trips: Cancelled Trips (by type) expressed as a percentage of Number of Total DARTS Trips Requested.

Rate of No-Show Trips: No Show Trips expressed as a percentage of Number of Total DARTS Trips Requested.

Rate of On-Time Performance: (DARTS Trips Delivered [minus] Late Trips) expressed as a percentage of (Number of Total DARTS Trips Delivered).

Refused Trips: A refused trip occurs when a client does not accept the travel times provided at the time of booking – see Trips Denied, above.

Complaints per 1,000 Trips: complaints per thousand trips (sum of Taxi Scrip Trips Delivered [plus] DARTS Trips Delivered).

Commendations per 1,000 Trips: commendations per thousand trips (sum of Taxi Scrip Trips Delivered [plus] DARTS Trips Delivered).

INFORMATION REPORT

TO:	Chair and Members Public Works Committee
COMMITTEE DATE:	June 12, 2023
SUBJECT/REPORT NO:	Surface Water Quality Program 2022 Annual Update (PW23040) (City Wide)
WARD(S) AFFECTED:	City Wide
PREPARED BY:	Susan Girt (905) 546-2424 Ext. 2671 Mike Spicer (905) 546-2424 Ext. 5826 Angie Evans (905) 546-2424 Ext. 6276 Terri Willert (905) 546-2424 Ext. 5874
SUBMITTED BY: **SIGNATURE:**	Nick Winters Director, Hamilton Water Public Works Department 

COUNCIL DIRECTION

N/A

INFORMATION

Report PW23040 serves to provide an update to Public Works Committee on the progress and successes of the Surface Water Quality Program (Program) for 2022, including stakeholder/partnership engagement and the overall framework for the Program.

On July 14, 2021, Public Works Committee received the Enhanced Inspection and Monitoring - Hamilton Water and Wastewater Report (PW21019). Within PW21019, Hamilton Water made a commitment to provide an annual Surface Water Quality Report outlining the status of the Program, as well as other general highlights.

With the completion of the internal and external review of the Program Framework in the second quarter of 2022, the framework was finalized. The first annual report was submitted to Council in July 2022.

On June 22, 2020, a Water Quality Technologist was hired by Hamilton Water, Environmental Monitoring and Enforcement Unit to support the development of the Program.

To date, the following actions have been completed:

2020

- Inventory of receiving water bodies/watercourses
- Inventory of Hamilton Water's stormwater and wastewater infrastructure assets with direct or indirect influence on Hamilton's surface water
- Review of key internal and external background water quality program data
- Identification and communication with key internal and external partners
- Four (4) locations were sampled by Hamilton Water at Chedoke Creek

2021

- Development of the Program Framework
- Internal and External engagement and review, which captured feedback and edits, of the Program Framework. Overall, the engagement and feedback received was positive; generating many discussions and questions that enhanced the Program for the City of Hamilton (City)
- In addition to the four (4) locations at Chedoke Creek, preliminary sampling for the Program began. The number of locations was increased to include an additional four (4) locations at Chedoke Creek and five (5) locations at Red Hill Valley Creek, two (2) locations at Battlefield Creek, and 10 locations within the Urban Core (Hamilton Harbour) area
- Launch of the Program website with data sharing, through Open Hamilton that describes the Program and enables the sharing of data with the public (https://www.hamilton.ca/surfacewaterquality)

Meetings were held with both internal staff and external partners in the development of the Program Framework and presented in Appendix "A" to Report PW22058, which included the following parties listed in Table 1.

Table 1 - Internal and External Surface Water Quality Program Partners

Internal	External
Hamilton Water including:	Hamilton Conservation Authority
Compliance and Regulations Section	Royal Botanical Gardens
Customer Service and Community Outreach Section	Bay Area Restoration Council
	Environment Hamilton
	Niagara Peninsula Conservation Authority

Internal	External
Environmental Monitoring and Enforcement Unit Plant Operations Section Water Distribution and Wastewater Collection Section Watershed Management Section Water/Wastewater Systems Planning Section Water Information Systems Unit Woodward Upgrades Program Healthy and Safe Communities Division, including: Food and Water Safety Section Indigenous Relations Section Environmental Services Division Parks and Cemeteries Section Waste Management Division Recycling and Waste Disposal Section	Conservation Halton
	Grand River Conservation Authority
	Ministry of Environment, Conservation and Parks
	Environment and Climate Change Canada
	Redeemer College
	Mohawk College
	McMaster University
	Ministry of Transportation
	Hamilton Harbour Remedial Action Plan which also includes Members from: • Cootes Paradise-Grindstone Water Quality Sub-committee • Halton Region • McMaster University • Hamilton Industrial Environmental Association, including Stelco and ArcelorMittal Dofasco • Hamilton Oshawa Port Authority • Fisheries and Oceans Canada
	Ministry of Natural Resources and Forestry
	Transport Canada
	Stewards of Cootes Watershed and Stewards of Red Hill
	Friends of Cootes to Escarpment EcoPark System

In Q2 2022, the Program Framework was finalized and is attached as Appendix “A” to Report PW23040. The Program Framework is a starting point for the City of Hamilton in gaining a holistic understanding of surface water quality and the potential impacts that various City assets may have on the natural environment. It highlights Hamilton’s major receiving water bodies, wastewater collection and treatment systems, internal and external partner engagement and a three-phased approach of Program implementation.

- Phase I establishes a monthly surface water monitoring plan, sampling 33 locations throughout the City

- Phase II focuses on assessing the initial sampling plan and making modifications as needed and expanding the coverage of the monitoring plan. This phase will take place between years 2-5.

- From the baseline information captured in Phases I and II, Phase III will focus on infrastructure investment needed to better protect the receiving waters, as well as prioritizing identified areas of interest/on-going water quality anomalies, or hot spots, for regular inspection and enforcement activities, as needed

As outlined in the Program, Hamilton's goal is to build a baseline understanding of ambient surface water conditions over time, develop open communication and transparency with various partners, and respond to and investigate any water quality anomalies that may be due to infrastructure malfunctions and standard operating conditions. The Program will also help to guide refinements of standard operating conditions and identify non-point source contaminates throughout Hamilton's Watersheds.

The Program Framework is a living document, that will be reviewed on an annual basis. A review of the 2022 Program Framework is in process and any decided changes to the Program will be captured in an amended document and shared with partners as appropriate. The Framework, along with any amendments, is a road map to ensure there is a clear oversight of Hamilton's assets and the corresponding receiving waters. An annual Program update will continue to be presented to Council outlining the successes, challenges, and other technical components of the Program. Any conditions that require immediate attention, will be addressed via the existing Hamilton Water Spill Response protocol.

Key parameters sampled for the Program from January 1 to December 31, 2022, are presented in table form, attached as Appendix "B" to Report PW23040. The tables show minimum, maximum, and average concentrations as analyzed in 2022. At this time, the data has not been separated into wet/dry weather events. This will be considered after sufficient data is gathered.

Key parameters presented are Dissolved Oxygen - Field (mg/L), Ammonia + Ammonium as N (mg/L), Bromide (mg/L), Carbonaceous Biochemical Oxygen Demand (cBOD) (mg/L), Chloride (mg/L), Escherichia coli (E. coli) bacteria (MPN/100mL), Nitrate as N (mg/L), Nitrite as N (mg/L), O-Phosphate as P (mg/L), Total Kjeldahl Nitrogen (TKN) (mg/L), Total Phosphorus (TP) (mg/L), Total Suspended Solids (TSS) (mg/L), Un-ionized Ammonia as NH3 at Field Temp. (ug/L), and Total Metals: Aluminum (mg/L), Copper (mg/L), Lead (mg/L), Zinc (mg/L). The full data set is available for download on the City's website (https://www.hamilton.ca/surfacewaterquality).

The Water Quality Technologist presented the Program Framework and collected water quality data to the Hamilton Harbour Remedial Action Plan for their 2022 Science Days. It is still too early within the Program to discuss surface water quality baseline trends; however, the collected data provides a great overview of preliminary data and potential hot spots that may require further examination. As more data is collected, staff will be able to identify seasonal trends and isolate water quality baselines for wet and dry weather events. Additional Program data, complemented by external partner surface water quality data, will help the City to identify specific areas or events that require further investigation. Trending the data will support meaningful communication with water quality partners, furthering the watershed approach to water quality discussions and actions.

Other key 2022 program tasks, included:

- Monthly grab sampling at the 33 Phase I sample locations, thus successfully completed the first year of Phase 1
- Semi-annual data was reviewed with senior leadership, attached as Appendix “C” to Report PW23040
- Finalized Memorandums of Understanding/Partnership Charters with partners that have external surface water monitoring and sampling programs. These agreements are for data sharing and City use of external surface water quality data

    - Partners with Memorandums of Understanding/Partnership Charters include:
        - Conservation Halton
        - Fisheries and Oceans Canada
        - Hamilton Conservation Authority
        - Niagara Peninsula Conservation Authority
        - Royal Botanical Gardens
        - Redeemer University

- Continued to integrate the Program into Hamilton Water’s Spill Response protocol
- Worked with internal and external parties to enhance the communication between the multiple individuals and groups that are involved with water quality and the watershed approach

Upcoming 2023 Program tasks, include:

- Continue sampling the 33 Phase I sample locations
- Semi-annual data trending review with senior leadership (January and July)

- Annual review of the operational components of the Program Framework
- Implement any amendments, once reviewed and approved internally and externally
- Continue to work with other City departments and external parties that have surface water quality influences and/or programs
- Draft water quality thresholds and identify 'hot spots' using statistical analysis that could trigger additional inspection and sampling
- Develop an intuitive approach to import external water quality data into the City's Program Website
- Finalize the Program Standard Operating Procedures
- Expansion into Phase II work is not anticipated for 2023

Council's investment to support the Program is providing better visibility in the field and is setting the groundwork for a watershed management approach. Continued development of the Program and watershed management approach may require additional investments in the future which will be discussed in the annual reports and included in Water, Wastewater and Storm Rate budget deliberations.

APPENDICES AND SCHEDULES ATTACHED

Appendix "A" to Report PW23040 - Surface Water Quality Program Framework

Appendix "B" to Report PW23040 - 2022 Surface Water Quality Program Locations and Water Quality Data

Appendix "C" to Report PW23040 - January 2023 Semi-Annual Review Outline

CITY OF HAMILTON

PUBLIC WORKS DEPARTMENT

SURFACE WATER QUALITY PROGRAM

A FRAMEWORK REPORT OUTLINING THE PROGRAM DETAILS

June 2022

Table of Contents

Executive Summary

In 2020, the City of Hamilton (City) set out to develop a framework for monitoring surface water quality (WQ) throughout Hamilton's Watersheds. This Surface Water Quality Program (SWQP) Framework is the starting point for the City in gaining a holistic understanding of its receiving waters and the potential impacts from various City assets within the storm and wastewater collection and treatment system.

The SWQP Framework highlights the following:

- The City's major receiving water bodies and wastewater collection & treatment systems
- Internal and external partner engagement
- Three-Phase approach of program implementation

The City endeavors to study how wastewater and stormwater discharges are influencing the quality of the receiving waters. With this Framework, Hamilton's goal is to build a baseline understanding of ambient surface water conditions over time, develop open communication and transparency with various partners, and respond to and investigate any water quality anomalies that may be due to infrastructure malfunctions and standard operating conditions. The SWQP will also help to guide refinements of standard operating conditions, and pin-point non-point source contaminates throughout Hamilton's Watersheds.

1. Historical Background

Positioned at the western end of Lake Ontario, the City of Hamilton (City) has been an important corridor for transportation and settlement for people for hundreds of years. With its Harbour and a rich natural and geophysical diversity that provides an abundance of resources, the City is an important centre of activity for Canada. The Port of Hamilton is among Canada's largest and busiest inland ports on the Great Lakes, which operates on an international scale receiving and sending material to North America and overseas.

Pollution-related problems in Hamilton Harbour were first formally identified in the early 1970s, although pollution issues date back much earlier. As Canada's industrial development advanced in the 20th century, its foundation for economic growth in the Great Lakes was developed. While the City has long benefitted from its strategic location for this growth and economic development, it has also resulted in the environmental degradation of Hamilton's natural ecosystem in and near Hamilton Harbour.

> *"For more than 100 years Hamilton has been exposed to industrial, population growth and urban development. Prior to modern pollution laws, waste was dumped into the Harbour… which today, continues to threaten public health, contaminate fish and wildlife, and restrict the use of the waterfront."*[1]

This environmental legacy culminated when Hamilton Harbour was identified as a Great Lakes Area of Concern (AOC) in 1987, under the Great Lakes Water Quality Agreement (GLWQA). Practices of the past and present continue to contribute to water quality (WQ) concerns like phosphorus loadings causing algal blooms, contaminated sediments, fish consumption advisories, beach closures, and degraded waterfront aesthetics.

The Hamilton Harbour Remedial Action Plan (HHRAP) program, under the GLWQA is a partnership-driven initiative to understand and remediate water quality issues within the AOC. Many programs involving local industry and the municipality have been coordinated with the help of the HHRAP; a process established to improve Hamilton Harbour through a watershed-focused, multi-partner approach, which identifies and measures 14 beneficial use impairments (BUIs). BUIs are used to assess the status of the Harbour by describing a human or ecological use that has been lost or impaired, as the result of environmental degradation. The cumulative successes of the HHRAP community initiatives, will aid in the future delisting of the Harbour as an AOC.

The City of Hamilton's efforts to improve water quality are focused on reducing pollutant loads to the natural environment. Such efforts include improved wastewater capture and treatment, the sewer lateral cross-connections program, Windermere Basin Wetland restoration, the beach E. coli monitoring program, and investigating poor water quality and potential hazards to the natural environment through the City's Environmental, Monitoring and Enforcement (EME) unit of Hamilton Water.

[1] Bay Area Restoration Council (BARC), 'Areas of Concern and Remedial Action Plans', *About the RAP*, https://hamiltonharbour.ca/about_the_rap, (accessed 06-04-2022).

To date, the HHRAP program has had most of its success in point-source identification and control. As a result of point-source reduction plans being implemented by local industries and municipalities, the focus has shifted to non-point source contributions and watershed efforts. A watershed approach to water quality through non-point source pollutants can provide the next stages and evolution of water quality and Harbour rehabilitation.

2. Receiving Water Bodies

Various types of overflow structures exist within the City's storm and wastewater infrastructure, both within the combined sewer system, and the separated sewer system. These designed overflow structures have the potential to discharge to the natural environment and include: storm relief pumping stations, combined sewer overflow tanks (CSOs), sewer pump stations (SPSs), sewer siphons and flow regulators.

Within the overall service area for the City's storm and wastewater collection and treatment system, five (5) major receiving water bodies exist. These are:

- Hamilton Harbour
- Cootes Paradise Marsh via Spencer & Chedoke Creeks
- Red Hill Creek
- Grindstone Marsh
- Lake Ontario

Headwater tributaries of the Grand River and Niagara Peninsula catchment areas also exist with the boundaries of the City of Hamilton. These headwater tributaries flow south into the Grand River towards Lake Erie, and east outside of City boundary, discharging into Lake Ontario.

a) Hamilton Harbour

Hamilton Harbour occupies an area of approximately 21.5 km^2 at the western end of Lake Ontario. The associated watershed supplying flow to the Harbour covers an area of approximately 500 km^2. The Harbour is connected to Lake Ontario by a narrow channel that cuts through the Burlington Beach Strip. It is also connected to Cootes Paradise on its western edge via a narrow channel that was excavated as part of the construction of the Desjardins Canal.

In the early 1980's, Hamilton Harbour was designated as an Environmentally Significant Area (ESA) in the former Region of Hamilton Wentworth Official Plan (Regional OP). It was later designated as an Area of Concern (AOC) under the Great Lakes Water Quality Agreement (1987). In Ontario, the responsibilities for RAP progress and AOC remediation are shared by the federal and provincial governments, through the Canada-Ontario Agreement (COA) Respecting the Great Lakes Basin Ecosystem. The oversight and hands-on implementation of the HHRAP includes a variety of departments at all levels of government, non-governmental organizations, academia, business

and industry, and the public. The local RAP team tracks environmental conditions, activities, and outcomes relevant to the RAP.[2]

The HHRAP was developed as a multi-stage and multi-partner effort to address a standardized list of 14 potential environmental, social, and economical BUI issues within the Harbour. The City is a committed partner of the HHRAP process, and its citizens are key partners in the efforts to return beneficial uses to the Harbour and delist it as an AOC. With the Woodward Wastewater Treatment Plant (WWTP) and numerous Combined Sewer Overflow (CSO) outfalls that either discharge directly into the Harbour or contribute pollutant loadings via tributary water bodies, the City's efforts to improve water quality are focused on reducing pollutant load through improved wastewater capture and treatment. Other key City efforts are outlined above.

It should also be noted that the Halton Regions' Skyway Wastewater Treatment Plant (WWTP) effluent is discharged in the north-east corner of Hamilton Harbour (Burlington Bay). Like the City of Hamilton, Halton's WWTP is subject to an MECP Environmental Compliance Approval (ECA) that outlines monitoring and other MECP requirements, based on their system. Halton's WWTP practices or information are outside the scope of this Framework.

b) Cootes Paradise Marsh

Cootes Paradise is an important coastal marsh area in western Lake Ontario and serves as a key sanctuary and habitat for a wide variety of fauna and flora, including rare or threatened species. Owned and managed by the Royal Botanical Gardens (RBG), it spreads over 8.4 km^2 including 2.5 km^2 of coastal wetland. Because it serves important ecological functions such as being a significant natural fish nursery and key migratory bird habitat, the Government of Ontario has listed Cootes Paradise as a Provincially Significant Class 1 Wetland, and as an Area of Natural and Scientific Interest (ANSI). Cootes Paradise is also a principle environmental protection area, protected under the Royal Botanical Gardens Act 1941. Like the Hamilton Harbour, Cootes Paradise was also designated as an ESA. Its primary tributaries, Chedoke, Westdale, Spencer, Borer's and Ancaster Creeks are also identified as being environmentally significant.

The Dundas WWTP effluent and a number of CSO sites discharge directly into Cootes Paradise or indirectly via its tributary streams. In addition, Cootes Paradise may receive overflows from two (2) Storm Relief Pumping Stations, multiple sewer pump stations (SPSs) with overflow structures, and multiple sewer siphons with overflow structures. The Dundas Equalization Tank may also discharge to Cootes Paradise under emergency conditions, though this is part of the separated sewer system and historically has not overflowed in normal conditions, including no overflows between 2015-2020. In order to improve the Cootes Paradise ecosystem, the City has a goal to control all the CSO discharges to Cootes Paradise to a maximum of one CSO event in an average year. The 'average' precipitation year is determined by the City's Pollution Prevention and Control Plan.

[2] Bay Area Restoration Council (BARC), 'Areas of Concern and Remedial Action Plans', *About the RAP*, https://hamiltonharbour.ca/about_the_rap, (accessed 06-04-2022).

c) Red Hill Creek

The second largest of the numerous streams that drain into Hamilton Harbour, the Red Hill Creek watershed is largely urban and covers an area of approximately 68 km^2, entirely inside the boundaries of the City. Tributaries flowing into Red Hill Creek include Hannon, Davis and Montgomery Creeks. At 7 km in length, Red Hill Creek is a major feature of the Red Hill Valley, which represents the largest open space within the watershed. Being located within an urban environment, the valley and creek have been affected by urbanization related water quality and habitat impacts.

The effluent from the Woodward WWTP, as well as the discharge from three (3) CSO outfalls during heavy precipitation/snow melt events, discharge into the Red Hill Creek upstream of Windermere Basin and Hamilton Harbour.

d) Grindstone Marsh

Grindstone Creek drains into Grindstone Marsh. Grindstone Marsh is a smaller version of Cootes Paradise Marsh and is an important coastal marsh area in western Lake Ontario and serves as a key sanctuary and habitat for a wide variety of fauna and flora, including rare or threatened species. Its primary tributary that flow through the City of Hamilton is Grindstone Creek via the Grindstone Creek Watershed.

e) Lake Ontario

Lake Ontario provides approximately 9 million people with drinking water[3], and is the last lake in the Great Lakes before flowing to the Atlantic Ocean. Most of the Lake Ontario watershed is dominated by agricultural and rural lands, with some major urban/industrialized centers along the coasts, including Hamilton and Toronto, and Rochester, N.Y.[4]

3. Hamilton's Wastewater Collection & Treatment Systems

The City's overall wastewater collection system collects both sanitary and combined sewage and includes 1,800 km of sewers; ~3,000 km if storm sewers are included. The overall service area is approximately 11,700 ha and has a population in the order of 569,353 people.[5]

Hamilton's wastewater collection system collects and conveys flows for treatment at the Woodward Avenue WWTP (Woodward WWTP), located at 700 Woodward Avenue in the City's east end, via three primary interceptor systems, namely the Western Sanitary Interceptor, the Red Hill Creek Sanitary Interceptor and the Eastern Sanitary Interceptor.

Sanitary sewage from Dundas and a portion of flow from Waterdown are conveyed to the Dundas WWTP for treatment. The Dundas WWTP also includes an Equalization Tank to capture excess

[3] Lake Ontario Waterkeeper, *Lake Ontario,* http://www.waterkeeper.ca/lake-ontario, (accessed 07-04-2022).
[4] Great Lakes Guide, 'Urban. Fragile. Deep. Populous. Integral: Lake Ontario', *Lake Ontario*, https://greatlakes.guide/watersheds/ontario (accessed 07-04-2022).
[5] Statistics Canada. 2022. (table). *Census Profile*. 2021 Census of Population. Statistics Canada Catalogue no. 98-316-X2021001. Ottawa. Released April 27, 2022. https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/index.cfm?Lang=E (accessed June 3, 2022)

flows. Flows captured in the Equalization Tank are pumped to the central combined sewer system for treatment at the Woodward WWTP.

Approximately half of the City of Hamilton's wastewater collection system area is serviced with over 570 km of combined sewers, representing a service area of approximately 5,180 ha that is located in the older parts of the City. It includes the lower portion of the City located between the Harbour and the Niagara Escarpment, and the upper portion of the City that extends from the Escarpment Brow to Mohawk Road. Select areas of the older parts of the City are serviced by separated sewer systems. The remaining portions of the City, including the South Mountain and Beach Boulevard, as well as Ancaster, Dundas, Glanbrook, Flamborough and Stoney Creek, are serviced by separate sanitary and storm sewer systems.

a) CSO Storage Facilities

There are nine (9) CSO storage tanks in the Combined Sewer System (CSS) network providing a total storage volume of approximately 314,000 m^3. This total storage volume is just over the daily average treatment capacity at Woodward WWTP. Storage tanks are located upstream of a CSO outfall and store combined sewage during wet weather events to reduce overflows to the natural environment, as the system was originally designed to do. The location and approximate storage volumes are provided in **Table 1** below.

The combined sewer overflow tanks were added to the system as a result of the recommendations from the City of Hamilton's Pollution Prevention and Control Plan (PPCP). The original PPCP was completed in 1991 and updated in 2003 to reflect current guidelines and regulations. The process of updating the PPCP commenced again in 2020.

The purpose of the tanks is to reduce the number of CSOs to the local receiving waters. These tanks capture and store excess combined sewage during rainstorms/snowmelt events and later send it to the Woodward WWTP where it can be treated after the storm/melt event subsides.

The configuration of the CSO storage tanks is generally similar, i.e. they are divided into two cells, the first of which is designed to retain the 'first flush' and wet weather flows for most of the annual wet weather and melt events. The second cell provides additional storage capacity used during major rainfall/melt events. Some storage tanks can drain by gravity, others require pumping for dewatering the facility, while the Main/King tank utilizes both.

Table 1: Existing CSO Storage Tanks

No.	Storage Tanks	City Asset ID	Location	Year of Construction	Approximate Volume(m^3)	Gravity or Pumping Drainage
1	Original Greenhill	HCS01	East of Greenhill Avenue & West of Red Hill Creek	1988	83,500	Gravity
2	Bayfront Park	HCS02	Hamilton's Bayfront Park & Strachan Street	1993	21,000	Pumping
3	James Street	HCS03	James Street & Guise Street	1993	1,400 + 1,800 (Downstream sewer)	Gravity
4	Main King	HCS04	Cathedral Park	1997	77,100	Gravity and Pumping
5	Eastwood Park	HCS05	Eastwood Park	1997	27,000	Pumping
6	New Greenhill	HCS06	East of Greenhill Avenue & East of Red Hill Creek	2004	66,800	Gravity
7	Red Hill Superpipe	HCS07	Parallel to Red Hill Creek Sanitary Interceptor	2011	14,400	Gravity
8	Royal/Stroud	HCS08	Near Royal Avenue & Stroud Road (Stroud Park)	2007	15,000	Pumping
9	McMaster (Ewen)	HCS09	Near W Park Avenue & Sanders Blvd	2012	6,000	Pumping

b) Flow Regulators

A flow regulator is a structure that controls and/or diverts flow within the Sewer System, either through automated, manual, or static operational control. Flow regulators have the potential to divert combined sewage to the natural environmental in the event the sewer system reaches capacity as a result of infrastructure malfunction and/or wet weather events.

c) Combined Sewer and Separated Sewer Overflow Outfalls

Overflows to the City's CSO and separated sewer overflow (SSOs) outfalls are controlled by various flow regulating structures within the Sewer System. These flow regulators divert combined sewage or sanitary wastewater to the local receiving waters to prevent basement flooding and to protect the WWTP and/or pumping stations from damage during large precipitation/melt events, or infrastructure malfunction.

There is forty-one (41) priority CSO and/or SSO outfalls throughout the City. Some locations consist of two distinct but parallel pipes, which are included in the count. These 41 locations include CSO tank outfalls, CSO/SSO outfalls, three (3) blocked outfalls on Red Hill Creek, and two (2) WWTP final effluent outfalls (FEOs). These priority outfalls have the potential to discharge wastewater directly to local receiving waters. Excluded from this count is Halton Region's Skyway WWTP outfall, located at the NE corner of Hamilton Harbour. A summary of the outfalls is provided in **Table 2**, below. Detailed maps of the priority outfalls, along with 2020 & 2021 CSO Deposit Summaries are provided in **Appendix A**.

Table 2: City of Hamilton Priority Combined and/or Separated sewer Outfalls

No.	Outfall Name/Location	Outfall Type	Receiving Water Body	ASSET ID	Location of Outfall
1	Dundas WWTP Plant Final Effluent Outfall (FEO) & Bypass	FEO / Bypass	Desjardins Canal (Cootes Paradise)	DI06OF02	West end of Desjardin Canal
2	Woodward WWTP Final Effluent Outfall (FEO) & Bypass	FEO& Bypass	Red Hill Creek	HP03OF03	Mouth of Red Hill Creek on the east side of Woodward Avenue
3	Bayfront Park CSO Tank (HCS02)	CSO	Hamilton Harbour	HG06OF01	Bayfront Park at the west end of Strachan Street
4a	Eastwood Park East (Ferguson) CSO Tank (HCS05)	CSO	Hamilton Harbour	HH04OF01	North end of Ferguson Avenue, north of Dock Service Road
4b	Eastwood Park West (Catharine) CSO Tank (HCS05)	CSO	Hamilton Harbour	HH04OF02	North end of Catharine Street, north of Dock Service Road
5	Greenhill CSO Tanks (HCS01 & HCS06)	CSO	Red Hill Creek	HO13OF02	East end of Greenhill Avenue, east of Rosseau Road
6	James CSO Tank (HCS03)	CSO	Hamilton Harbour	HH05OF01	North end of James Street at Guise Street
7a	Main King CSO Tank (HCS04)	CSO	Chedoke Creek (Cootes Paradise)	HE09OF01	West side of Highway 403 beneath the King Street overpass; Glen Rd.
7b	Glen				
7c	Tope				

No.	Outfall Name/Location	Outfall Type	Receiving Water Body	ASSET ID	Location of Outfall
8	McMaster/Ewen CSO Tank (HCS09)	CSO	Coldwater Creek (Cootes Paradise)	HB11OF01	Hydro right-of-way at north end of Ewen Road
9	Red Hill Superpipe CSO Tank (HCS07)	CSO	Red Hill Creek	HQ07OF03	North of Barton Street East, east of Red Hill Valley Parkway
10	Royal/Stroud CSO Tank (HCS08)	CSO	Chedoke Creek (Cootes Paradise)	HD12OF02	East end of Royal Avenue at Stroud Road
11	Aberdeen	CSO	Chedoke Creek (Cootes Paradise)	HE10OF03	Longwood Ave.
12	Birch	CSO	Hamilton Harbour	HJ05OF01	North side of Burlington Street, just west of Birch Avenue
13	Delbrook	CSO	Chedoke Creek (Cootes Paradise)	HC12OF03	Delbrook Court at Stroud Road
14	Dunn	CSO	Red Hill Creek	HP03OF02	Mouth of Red Hill Creek on the east side of Woodward Avenue
15	Hillyard	CSO	Hamilton Harbour	HJ04OF01	North end of Hillyard Street, north of Land Street
16a	Kenilworth East	CSO	Hamilton Harbour	HN04OF02	North end of Kenilworth Avenue, north of Burlington Street
16b	Kenilworth West	CSO	Hamilton Harbour	HN04OF01	North end of Kenilworth Avenue, north of Burlington Street
17	King Street West	SSO	Battlefield Creek	SD08OF03	Multiple flow regulators upstream on King Street West
18	Lawrence	CSO	Red Hill Creek	HP11OF06	East end of Lawrence Rd. at Red Hill Creek. Currently blocked.
19	Little John Rd.	SSO	Sulphur Creek (Cootes Paradise)	DI09OF02	Flow regulator/overflow in DI09A005.
20	42 Maplevale Drive	SSO	Ancaster Creek (Cootes Paradise)	AN11OF01	Flap gate in AM11A009 that would allow for overflow to AN11OF01
21	Melvin	CSO	Red Hill Creek	HQ08OF04	East end of Melvin Ave. at Red Hill Creek. Currently blocked.
22a	Ottawa East	CSO	Hamilton Harbour	HM05OF02	North end of Ottawa Street, north of Industrial Drive
22b	Ottawa West	CSO	Hamilton Harbour	HM05OF01	North end of Ottawa Street, north of Industrial Drive
23	Parkdale	CSO	Hamilton Harbour	HP04OF01	CSO outfall, north end of Parkdale Avenue. Parkdale Storm Relief Pump Station (HC001) discharges to same outfall.
24a	Plymouth East (Gage)	CSO	Hamilton Harbour	HL03OF01	North end of Plymouth/Depew St., north of Industrial Drive

No.	Outfall Name/Location	Outfall Type	Receiving Water Body	ASSET ID	Location of Outfall
24b	Plymouth West (Gage)	CSO	Hamilton Harbour	HL03OF02	North end of Plymouth/Depew St., north of Industrial Drive
25	Queenston	CSO	Red Hill Creek	HQ10OF04	East end of Queenston Rd. at Red Hill Creek. Currently blocked.
26	Rhodes Court	SSO	Sulphur Creek (Cootes Paradise)	DG11OF01	Flow regulator/overflow in DG11A042.
27	Sleepy Hollow Court	SSO	Lake Jojo (Cootes) Paradise	DI05OF03	Flow regulator/overflow in DI05A010.
28	Sterling	CSO	Cootes Paradise	HC10OF01	North side of Sterling Street, east of Forsyth Avenue
29a	Strathearne East (HCG04)	CSO	Hamilton Harbour	HO04OF02	North end of Strathearne Avenue, north of the CNR line
29b	Strathearne West (HCG04)	CSO	Hamilton Harbour	HO04OF01	North end of Strathearne Avenue, north of the CNR line
30	The Villa Syphon (Coldwater Creek)	SSO	Spring Creek (Cootes Paradise)	DH08OF14	Flow regulator in Dundas syphon DH08A026
31	Valley Drive	SSO	Battlefield Creek	SD07OF03	Flow regulator upstream on Valley Drive in SD07A041
32a	Wellington East (HCG14)	CSO	Hamilton Harbour	HI05OF01	North end of Wellington Street, north of Burlington Street
32b	Wellington West (HCG14)	CSO	Hamilton Harbour	HI05OF02	North end of Wellington Street, north of Burlington Street
33	Wentworth (HCG03)	CSO	Hamilton Harbour	HJ04OF02	North end of Wentworth Street, north of Land Street
34	Millen Rd./ Arvin Ave.	SSO	Lake Ontario	SG04OF01	MH SH08A125 - Hilts Drive, Stoney Creek
35	Edenbridge Crt.	SSO	Spring Creek (Cootes Paradise)	DG10OF01	Critical failure SPS overflow to natural environment for DC011.

d) Pump Stations and Emergency Overflows

Sewer pump stations (SPS) are needed when wastewater cannot be conveyed by gravity. They can be required at the end of a network due to pipe depth relative to an outlet or treatment facility as well as when there is a significant physical obstacle within the network (hill, river, etc.). Pumps can also be required to dewater storage facilities as well as provide surcharge relief by controlling the hydraulic grade line below a certain level.

Some SPSs within the City of Hamilton have an emergency overflow to the natural environment. In the event of an emergency, these are designed to overflow to the environment instead of backing up into homes. The City has rigorous procedures outlining roles and responsibilities in the event these emergencies were to occur.

There are seventy-three (73) SPSs throughout the City; twenty-two (22) of which have emergency overflows, three (3) of which are strictly storm relief pumping stations. The City actively inspects and maintains the existing SPSs within the system as part of the overall maintenance program. **Table 3** summarizes these 22 SPSs, throughout the City.

Table 3: Pump Stations (PS) with Emergency Overflows to the Natural Environment

No.	Lift Station Name	Type	Address	Receiving Water Body	Outfall ASSET ID	Location of Outfall
1	DC001	Sanitary	29 Sleepy Hollow Court	Lake Jojo (Cootes) Paradise	DI05OF03	Flow regulator/ overflow in DI05A010. DC001 is upstream. Outfall also considered an SSO.
2	DC006	Sanitary	Little John Rd	Sulphur Creek (Cootes Paradise)	DI09OF02	Flow regulator/ overflow in DI09A005. DC006 is upstream. Outfall also considered an SSO.
3	DC009	Sanitary	2 Rhodes Court	Sulphur Creek (Cootes Paradise)	DG11OF01	Flow regulator/ overflow in DG11A042. DC009 is upstream. Outfall also considered an SSO.
4a	DC011	Sanitary	Opposite 2 Edenbridge Crt., Dundas	Spring Creek (Cootes Paradise)	DG10OF01	9 Edenbridge Crt, Dundas. Also considered an SSO as a critical failsafe overflow for Storm Relief SPS wet well.
4b	DC011	Storm Relief	Opposite 2 Edenbridge Crt., Dundas	Spring Creek (Cootes Paradise)	DG09OF03	19 Glen Crt, Dundas
5	DC012	Storm Relief	Beside 27 Pleasant Ave, Dundas	Spring Creek (Cootes Paradise)	DH09OF01	59 Pimlico Dr, Dundas
6	DC013	Sanitary	Beside 150 Mill St. S at School St, Flamborough	Grindstone Creek 222 (Grindstone Marsh)	FN19OF03	Directly behind station
7	DC014	Sanitary	372 Dundas St E	Grindstone Creek 220 (Grindstone Marsh)	FN17OF02	Directly behind station

No.	Lift Station Name	Type	Address	Receiving Water Body	Outfall ASSET ID	Location of Outfall
8	DC015	Sanitary	84 Dundas St E, Flamborough	Grindstone Creek 228 (Grindstone Marsh)	FL23OF02	Directly behind station
9	DC017	Sanitary	241 Pleasant Ave, Dundas	Spring Creek (Cootes Paradise)	DF11OF01	224 Pleasant Ave.
10	FC001	Sanitary	Adjacent to 133 Elgin St, Flamborough on the road	Grindstone Creek 218 (Grindstone Marsh)	FM17OF05	Directly behind station
11	FC003	Sanitary	30 Carl Crescent	Grindstone Creek 228 (Grindstone Marsh)	FN20OF02	Behind 28 Carl Crescent
12	HC001	Storm Relief	Parkdale	Hamilton Harbour	HP04OF01	Storm Relief SPS Overflow & Parkdale CSO Outfall
13	HC002	Sanitary	56 West 31st St	Chedoke Creek (Cootes Paradise)	HD13OF01	600 Scenic Dr, Hamilton
14	HC007	Sanitary	In front of 166 St Margaret's Road, Ancaster	Ancaster Creek (Cootes Paradise)	AK11OF02	171 St Margaret's Rd, Ancaster
15	HC010	Sanitary	111 Sulphur Springs Rd., Ancaster	Sulphur Creek (Cootes Paradise)	AK08OF02	Directly behind station
16	HC011	Sanitary	170 Calvin St, Ancaster	Ancaster Creek (Cootes Paradise)	AL12OF05	Directly behind station
17	HC015	Sanitary	Aberdeen	Chedoke Creek (Cootes Paradise)	HE10OF03	Aberdeen CSO Outfall - Longwood Ave.
18	HC018	Sanitary	1980 Upper James St	Twenty Mile Creek	GD02OF01	Directly behind station

No.	Lift Station Name	Type	Address	Receiving Water Body	Outfall ASSET ID	Location of Outfall
19	HC020	Sanitary	130 Daffodil Cres	Chedoke Creek (Cootes Paradise)	AO04OF03	Directly behind station into SWMF 21B
20	HC060	Sanitary	193 King St E, Dundas	Desjardins Canal (Cootes Paradise)	DA10OF04	193 King St E. (Dundas Equalization/Diversion Tank)
21	HC061	Sanitary	42 Maplevale Drive	Ancaster Creek (Cootes Paradise)	AN11OF01	Flap gate in AM11A009 that would allow for overflow to AN11OF01. Also considered an SSO.
22	HC062	Sanitary	Pier 8	Hamilton Harbour	HH04OF007	Pier 8 – directly behind station

4. Hamilton's Stormwater Collection & Treatment Systems

Stormwater management is a core business provided by the City of Hamilton to manage water from precipitation and snowmelt that flows across the land before it is routed into drainage systems and then on to natural areas such as creeks, lakes and wetlands. The failure to do so would negatively impact the community by increasing stream erosion, to have and/or cause negative impacts to water quality, water temperature, increase baseflow, allow flooding, and destroy fisheries habitat and aquatic life.

The implementation of watershed stormwater strategies and construction of associated infrastructure allows for community development while balancing environmental, social, and economic needs to manage human activities within a watershed. Such initiatives include roadway salt management plans, as well as inspections and maintenance of stormwater management facilities (SWMF), oil and grit separator units, and Low Impact Development (LID) stormwater features. **Table 4** summarizes Hamilton's Stormwater Asset Inventory.

Table 4: Hamilton's Stormwater Asset inventory

Stormwater Asset Component	2005 Inventory	2009 Inventory	2016 Inventory	2019 Inventory	2020 Inventory	2022 Inventory
Storm Sewers	965 km	1,010 km	1,149 km	1,216 km	1,231 km	1263.49 km
Manholes	13,779	14,105	19,551	~21,000	25,503	21,408
Storm Pumping Stations	2	2	2	2	2	2

Watercourses	-	-	-	191 km	148 km	148km
Major Swales	15 km	-	190 km	-	-	-
Ditches	20 km	-	2,164 km	-	-	1,603.04km
Municipal Drains	-	-	-	57 km	57 km	57 km
Assumed SWMF (*City owned and maintained)	50	76	119	120	143	119
Un-assumed SWMF (*Contractor owned and maintained. After three years from construction date, City assumes SWMF)	-	N/A	36	39	57	63
Engineered Wetlands	-	-	-	7	Included in assumed SWMF count	9
Low Impact Development Features within the Right of Way	-	-	-	4	Included in assumed SWMF count	Included in assumed SWMF count
Inlet/Outlet Structures	1,000	845	977	~1,000	~1,000	1,432

5. Sewer Lateral Cross-Connections (known and potential)

Sanitary sewer lateral cross-connections (cross-connections) describe a condition whereby sanitary waste from homes and businesses discharge into the City's storm sewer systems and subsequently into downstream watercourses. Cross-connections are a relatively common problem for all municipalities and constitute a threat to the quality of receiving waters. The City of Hamilton first initiated a Cross-Connection Control program in 2001 within the separated sewer system and has been actively working to eliminate cross connections for the last 19 years.

The program involves a series of field investigations designed to locate and eliminate crossed sewer pipes that are discharging sewage into the City's storm sewer system. This includes the sampling of sewer outfalls, inspecting storm sewers, homeowner engagement, dye tests, engineering investigations, inspecting sewer laterals (the pipe connecting the sewer main to an individual home) and the uncrossing of a number of pipes. As the City works with homeowners

and business owners to correct a growing number of cross-connections, it will reduce the amount of untreated sewage being discharged into Hamilton's watercourses, including Hamilton Harbour, and thus help meet HHRAP water quality targets.

In addition to field investigations and repair, the City has also made changes to the building inspection program and created new bylaws to help prevent future cross-connections. By partnering with community academics, conducting a 2017 best practice industry review, and emphasizing continual improvement, Hamilton has set a high standard and established itself firmly as an industry leader throughout North America for the identification and elimination of cross-connections.

As of March 2022, the program has achieved the following:

- 352 km total of storm sewer surveyed.
- 700 sewer lateral dye tests performed.
- 435 complete cross-connections identified.
- 43 partial cross-connections identified.
- 425 cross-connection repairs; approximately 90 million litres of wastewater being diverted away from the natural environment and into the treatment system, annually.

6. Impacts of Wastewater and Stormwater Discharges

Specific to the City's wastewater and stormwater services and their impact on the quality of the receiving water bodies, the primary sources of polluted discharges include:

- Combined Sewer Overflows (CSOs)
- Separated Sewer Overflows (SSOs)
- Separated stormwater system discharges
- WWTP treated effluent discharge and bypasses
- Sanitary Sewer Cross-connections (direct and indirect)
- Sewage Pump Station (SPS) emergency overflows

As identified in the HHRAP, significant contributors to the recovery of Cootes Paradise, Red Hill Creek, and delisting Hamilton Harbour as a designated AOC, are the reduction of pollutant loadings from CSOs, and from the treated effluent discharge from both the Woodward & Dundas WWTPs.

Consequently, the City's Clean Harbour Program has many projects and programs that are related to the control and management of the CSO and WWTP discharges. These provide the greatest opportunity, in the relative short-term, to deliver water quality improvements to support the City's commitment to meeting the targets set by the HHRAP and protection of receiving natural water bodies. Other initiatives include on-going roadway salt management plans, inspections, and maintenance of stormwater management facilities (SWMF), oil and grit separator units, and Low Impact Development (LID) stormwater features.

The City of Hamilton and its Council are committed to providing our citizens with the highest quality water services that contribute to a healthy, safe, and prosperous community. We are

trusted by our customers to protect their health, the environment and our future through excellence, engagement, and innovation.

7. Surface Water Quality Program Introduction

Hamilton's City Council, at its November 27, 2019 meeting approved General Issues Committee (2020 Rate Budget) Report 19-025. Report 19-025 included a motion to add five (5) additional Full Time Equivalent Rate Supported staff to the Hamilton Water budget complement consisting of: four (4) staff to improve the routine physical inspection and preventative maintenance programs for Hamilton Water infrastructure including water and wastewater treatment plants, pumping stations, reservoirs, water towers, well systems and combined sewer overflow tanks; and, one (1) staff to sample and analyze water and wastewater quality, and equipment/process related data.

On June 22, 2020 a Water Quality Technologist (WQT) was hired to support the development of a Surface Water Quality Program (SWQP) for the watercourses within the City. The goal of this position is to implement a program to oversee the quality of receiving water bodies that receive discharges from City Infrastructure, including sampling, assessing, reporting and ongoing communication with internal and external partners. The position is based in the Environmental Monitoring and Enforcement unit (EME) of the Compliance & Regulations Section in Hamilton Water.

This SWQP Framework was developed using an all-encompassing systematic approach by collaborating with internal and external partners; avoiding duplication of efforts through communication and the transparency of various water quality program information.

The WQT identified gaps within the current water quality programs, focusing on City infrastructure that could potentially discharge wastewater into the natural environment.

The goal of this proposed long-term SWQP is to build baseline water quality data over time, develop communication strategies, ensure transparency, and respond to and investigate any water quality anomalies that may be due to infrastructure malfunctions, throughout the City of Hamilton's Watersheds.

8. Engagement

Since June 22, 2020, the WQT has reached out and introduced the proposed SWQP to internal and external partners, through email and virtual meetings, as listed in **Table 5**. Some of the partners listed have surface water quality programs throughout the City's Watersheds.

Table 5: Internal & External Engagement

Internal	External
Hamilton Water Division, including: Compliance & Regulations Section (C&R) Environmental Monitoring & Enforcement Unit (EME) Customer Service & Community Outreach Section (CS&CO) Water Information Systems Unit (WIS) Plant Operations Section (PO) Water Distribution & Wastewater Collection Section (WDWWC) Watershed Management Group (WM) Water/Wastewater Systems Planning Section (WWWSP) Woodward Upgrades Program (WUP) Healthy & Safe Communities Division, including: Food & Water Safety Section Indigenous Relations Section Environmental Services Division: Parks & Cemeteries Section Waste Management Division: Recycling & Waste Disposal Section	Hamilton Conservation Authority (HCA)
	Royal Botanical Gardens (RBG)
	Bay Area Restoration Council (BARC)
	Environment Hamilton
	Niagara Peninsula Conservation Authority (NPCA)
	Conservation Halton (CH)
	Grand River Conservation Authority (GRCA)
	Ministry of Environment, Conservation & Parks (MECP)
	Environment & Climate Change Canada (ECCC)
	Redeemer College
	Mohawk College
	McMaster University
	Ministry of Transportation (MTO)
	Hamilton Harbour Remedial Action Plan (HHRAP) which also includes Members from: - Cootes Paradise-Grindstone Water Quality Sub-committee - Halton Region - McMaster University -Hamilton Industrial Environmental Association (HIEA), including Stelco & ArcelorMittal Dofasco - Hamilton Oshawa Port Authority (HOPA) - Fisheries and Oceans Canada (DFO)
	Ministry of Natural Resources and Forestry (MNRF)
	Transport Canada (TC)
	Stewards of Cootes Watershed & Stewards of Red Hill
	Friends of Cootes to Escarpment EcoPark System

a) Key Partner Feedback

The feedback received from the partners is listed below:

- Interested in the City improving communications and overall WQ community involvement, including assigning a City WQ Liaison/point of contact person or group.
- Would like to be aware of and/or review any City water quality related policies or decisions, prior to going to council for approval.
- Willingness to provide their knowledge, input, and feedback during the review phase of the proposed City-wide SWQP.

- Continue in building relationships with the City of Hamilton and the WQT through aligning current WQ programs with transparency, communication, data sharing and trending.

The consensus of water quality programs throughout Hamilton is:

- sampling is generally completed mid-to down-stream within selected watersheds, or within the receiving waterbody;
- programs that do sample the headwaters of a watershed, only sample during select periods of the year: and,
- there's a lack of watershed-based studies, including achieving baseline ambient water quality data or known WQ thresholds to trigger additional inspections.
    - specifically, on the impacts of Hamilton Water Infrastructure during dry, wet or storm events.

Overall, the water quality concerns based on previous studies or known water quality 'gaps', that have been expressed are:

- large urban run-off during wet weather events causing an increase in erosion and first flush contaminants, and pollutants like:
    - rising Phosphorous levels;
    - Total Suspended Solids;
    - select Total Metals (i.e. Copper);
    - Chloride;
    - Petroleum Hydrocarbons, including Volatile Organic Compounds (VOCs); and,
    - E. coli (human and animal).
- Other pollutants of potential concern include perfluoroalkyl and polyfluoroalkyl substances (PFAS), polychlorinated biphenyls (PCBs), polychlorinated naphthalenes (PCNs), pharmaceutical residues and micro/nano plastics.

In addition to the above, both the internal and external partners have expressed their interest in an all-inclusive interactive data sharing map:

- Internal: combine all water quality features currently in separate GIS maps/layers, linking sample locations, data, reports, projects (short or long term) and contact info, etc.
- External: build onto the live Chedoke Creek Surface Water Quality Map, creating a centralized data sharing site that shows all internal and external program long-term sampling locations, with downloadable data for sharing, trending, research or reviewing purposes.
    - Many partners have openly expressed their willingness to share their data.

b) Other Water Quality Programs

The other partners that have on-going water quality sampling programs, of varying sample frequencies and parameters, within the City of Hamilton Watersheds are identified in **Table 6**. Refer to **Appendix B** for a table outlining additional Program details, and **Appendix C** for a PDF detailing current on-going Sampling Locations.

Table 6: Current & On-Going Water Quality Programs

Internal	Program	External	Program
Environmental Monitoring & Enforcement Unit (EME)	Chedoke Creek Program Four (4) Locations **Quarterly*	Conservation Halton (CH)	MECP PWQMN One (1) Location in Grindstone Marsh **8 months a year (Apr – Nov)*
Plant Operations Section (PO)	ECA Compliance Sampling (WWTPs, CSO Tank Effluent & Plant Bypass – various locations) Twelve (12) Locations (Five (5) of these sample locations are within the Woodward WWTP) ** Wet Weather Overflow Events*	Environment and Climate Change Canada (ECCC)	Central Station Water Quality Monitoring Hamilton Harbour Four (4) Locations **Monthly (weather permitting) January to March; bi-weekly April and May; weekly from June to September; bi-weekly October and November; Monthly (weather permitting) December*
Woodward Upgrades Program (WUP)	Red Hill Creek Monitoring Program Five (5) Locations **Six (6) times a year - two (2) wet & four (4) dry*	Fisheries and Oceans Canada (DFO)	Dissolved Oxygen and Temperature Monitoring Program for Fish Habitat Ten (10) consistent locations (5 in HH, 3 at CP and GS, 2 at Red Hill / Windermere). Loggers record at 15min intervals for the deployment period **6 months, year-round (less locations during ice on season. Additional locations are deployed based on monitoring needs* *Information is provided within Appendix B.*
Waste Management Division (Recycling & Waste Disposal Section), as per ECA agreements.	Ancaster Nine (9) Locations **1x annual* Binbrook Landfill Three (3) Locations **2x annual* Brampton Landfill Eight (8) Locations **2x annual* Edgewood Landfill Six (6) Locations **4x annual* Glanbrook Landfill	Hamilton Conservation Authority (HCA)	MECP PWQMN Six (6) Locations **8 months a year (Apr – Nov)* HHRAP Water Quality Monitoring Eleven (11) Locations **bi-weekly, year-round*

	Ten (10) Locations **3x annual* Rennie Landfill Five (5) Locations **2x annual* Stoney Creek Landfill Nine (9) Locations **3x annual* Upper Ottawa Landfill Three (3) Locations **2x annual* West Hamilton Landfill Six (6) Locations **3x annual*		
		Niagara Peninsula Conservation Authority (NPCA)	NPCA Surface Water Monitoring Eleven (11) Locations **Ice-free seasons (approx. 8-9 months a year)*
		The Ministry of the Environment, Conservation and Parks (MECP)	Great Lakes Index - Reference Station Monitoring One (1) location: Hamilton Harbour Centre Station (Station 258) **Multi-media sampling occurs 3 times a year (spring, summer, fall), every 3 years*
		Redeemer College	Chedoke Watershed Nine (9) Locations **bi-weekly in May/June and again in Oct/Nov* Red Hill Creek Watershed Eleven (11) Locations **bi-weekly ~ 2 months each summer*
		Royal Botanical Gardens (RBG)	RBG Water Quality for Cootes & Grindstone Six (6) Locations **bi-weekly, May-September*

9. Surface Water Quality Program Gap Analysis

The SWQP Framework and associated recommendations have been developed based on identified gaps through internal and external engagement, and the mapping of the City's wastewater and

stormwater assets and current internal and external water quality monitoring / sampling programs.

- 62 individual outfalls associated with the wastewater system were identified throughout Hamilton's watersheds. These include pump station (PS) emergency overflows, uncontrolled and controlled CSO and SSO Outfalls (with associated regulators, back-up overflow pipes, sluice gates, etc.), CSO tank outfalls and WWTP effluent outfalls.
- 932 storm sewer outfalls associated with the stormwater system were identified throughout Hamilton's watersheds. These include stormwater management pond outfalls. *Note: this is an estimate based on an inventory count, as of April 2022. The City is continuously adding new assets to the system.*
- 149 active sample locations were identified with ongoing / regular sampling programs shared between external and internal partners, including CSO tanks and WWTP effluent discharges to natural environment. These programs vary in scope, frequency, and parameter list.

In general, the following receiving water bodies / watercourses have some type of oversight as it relates to water quality monitoring:

- Hamilton Harbour
- Cootes Paradise
- Chedoke Creek
- Red Hill Creek
- Grindstone Creek & Marsh

Although the above water bodies / watercourses have some type of oversight, the review concluded there are variations in parameter lists and frequency, and there is limited visibility on how City infrastructure influences water quality within Hamilton's receiving water bodies and associated watercourses. Additional sample locations were determined to be necessary up-, mid- and down-stream respectively, especially up- and downstream to CSO related infrastructure.

10. Proposed Surface Water Quality Program Framework

Throughout the Framework development process, partners often asked, "what question(s) are you looking to answer with this Program?" Below are the primary questions driving the SWQP Framework forward.

- What is the ambient baseline water quality condition of the waterway?
- How does City Infrastructure influence water quality during seasonal fluctuations, wet/dry conditions, and wet weather events?
- Are there anomalies within the water quality data that the City should investigate (e.g. at any upstream infrastructure, or potential incoming non-point source contributions)?
- Are the right locations being sampled and for the correct parameters? Are the right questions being asked?

Based on feedback and the results of the gap analysis, along with the various projects that have been completed in support of the overall HHRAP objectives, and with limited water quality information available within the watersheds, the City is proposing a long-term multi-phased surface water quality monitoring program. This program is considered separate to other City sampling programs like the ones required under existing Environmental Compliance Approvals (ECA) and the Pollution Prevention Control Plan (PPCP), required by the MECP. Over time, as this program becomes established, further alignments with other programs may be considered.

The Hamilton Water Division (HW) will monitor and sample surface waters for a selected list of parameters, in various locations throughout the City; building consistency and baseline data, alongside the partners, beginning with Phase I.

HW will review the Framework on an annual basis to ensure the SWQP remains relevant.

11. PHASE I (1 to 2 Years)

Phase I of this multi-phase Framework focuses on establishing a surface water quality program (with monthly monitoring and sample collection) within the Watersheds that have been deemed priority.

Phase I sample location criteria used to rank priority Watersheds includes:

- CSO/SSO Outfalls and/or Sewer Pump Station (SPS) Emergency Overflows that can potentially discharge to the natural environment.
- Receiving Water Bodies classified as Sensitive Ecosystems (i.e. Cootes Paradise & Grindstone Marsh) & Hamilton Harbour (based on Area of Concern (AOC)).
    - Cootes Paradise is classified as an Environmentally Sensitive Area (ESA) as well as a Provincially Significant (Class 1) Wetland and an Area of Natural and Scientific Interest (ANSI).
- Ranking of surface water quality health based on the Conservation Authority Watershed Report Cards and Annual Reports.

The rationale used to select proposed Phase I sample locations within priority Watersheds, includes:

- up-, mid- and/or down-stream sample location(s) respectively, of known CSO/SSO Outfalls or SPS Emergency Overflow(s), with no current Internal/External WQ sample location.
- where there is a sample location already down-stream, an up- and/or mid-stream Watershed location is proposed, for water quality comparisons; the goal is to understand how infrastructure may be influencing the water quality.

a) Phase I Proposed Monitoring and Sampling Locations

The SWQP is proposing twenty-nine (29) new surface water monitoring and sampling locations to be introduced to the EME monitoring portfolio. These 29 locations do not include the current four (4) active Internal sample locations, within Chedoke Creek. The proposed 29 locations as well as the existing 4 locations, are to be monitored and sampled monthly, year-round by the WQT. The

proposed locations are outlined in **Table 8**. Refer to **Appendix D** for PDFs detailing Proposed Phase I Sampling Locations.

Table 7: Proposed Phase I Monitoring and Sampling Locations

Watershed	Sub-Watershed	Recommended Sample Location	Watershed Details
		Conservation Halton	
Grindstone Creek	Grindstone Creek Subwatershed 222 CH Grade: Poor	WQ Sample: Down-stream (Mill St S @ Smokey Hollow Park); GC222 SW1	Watershed Total: 82 Storm Outfalls (OFs) & five (5) Priority Outfalls Receiving water = Grindstone Marsh
		Hamilton Conservation Authority	
Spencer Creek	Spring Creek HCA Grade: Good	WQ Sample: Down-stream (Ogilvie Street); SprC SW1 WQ Sample: Up-stream (Ridgewood Blvd); SprC SW2	Watershed Total: 335 Storm OFs & 22 Priority Outfalls Receiving water = Cootes Paradise
	Ancaster Creek HCA Grade: Poor	WQ Sample: Mid-stream (Golf Links Rd); AC SW1 WQ Sample: Up-stream (Garner Rd E); AC SW4	
	Chedoke Creek HCA Grade: Insufficient Data	WQ Sample: Up/Mid-stream (Radial Rail Trail @Beddoe Drive); CC SW7 WQ Sample: Up/Mid-stream (Radial Rail Trail @Sanatorium); CC SW8 WQ Sample: Up/Mid-stream (Radial Rail Trail @Scenic Dr); CC SW9 WQ Sample: Up/Mid-stream (130 Daffodil Cres); CC SW10	
	Lower Spencer Creek HCA Grade: Fair	WQ Sample: Down-stream Dundas WWTP FEO (Desjardins Canal; east of Olympic Drive); LSC SW1 WQ Sample: Up-stream to Dundas WWTP FEO (Desjardins Canal; Centennial Park); LSC SW2 WQ Sample downstream to Sterling St CSO (Churchill Gardens/aviary); LSC SW3	
Red Hill Creek	Red Hill Valley HCA Grade: Poor	WQ Sample: Down-stream (Windemere Park); RHV SW1 WQ Sample: Mid-stream (Eastport Dr./Woodward Ave. Bridge; Down-stream to Woodward FEO); RHV SW2	Watershed Total: 161 Storm OFs and seven (7) Priority Outfalls Receiving water: Hamilton Harbour

		WQ Sample: Mid-stream (2245 Brampton Street); RHV SW3 WQ Sample: Mid-stream (Hixon Rd/Parkdale Ave S); RHV SW4	
	Upper Ottawa	WQ Sample: Up/Mid-stream (Mnt Brow Blvd @ Pedestrian Bridge at Albion Falls Park); UO SW1	
Stoney-Battlefield Creeks	Battlefield Creek HCA Grade: Poor	WQ Sample: Down-stream (Lake Ave N/Huckleberry Dr); BatC SW1 WQ Sample: Mid-stream (King Street W/Battlefield Museum); BatC SW2	Watershed Total: 49 Storm OFs & two (2) Priority Outfalls Receiving water: Hamilton Harbour
Urban Hamilton	Urban Core HCA Grade: Insufficient Data	WQ Sample: Down-stream (Bayfront Park); UC SW1 WQ Sample: Down-stream (Discovery Dr., SW corner); UC SW2 WQ Sample: Down-stream (Discovery Dr., NW corner); UC SW3 WQ Sample: Down-stream (Eastport - Catharine); UC SW4 WQ Sample: Down-stream (Wellington CSO); UC SW5 WQ Sample: Down-stream (Wentworth CSO); UC SW6 WQ Sample: Down-stream (Hillyard/Birch/ Sherman CSO); UC SW7 WQ Sample: Down-stream (Gage/Ottawa CSO); UC SW8 WQ Sample: Down-stream (Kenilworth CSO); UC SW9 WQ Sample: Down-stream (Strathearne CSO); UC SW10	Watershed Total: 20 Storm OFs and 19 Priority Outfalls Receiving water = Hamilton Harbour

b) Proposed Sampling Schedule

The City is proposing a long-term monthly SWQP. The monthly sampling event will record all field observations and parameters, and will sample for chemical parameters, as outlined below.

Once the Program is established and trends are being reviewed, the City will review the option to complete pre and post rain/wet weather event sampling and inspections, at select locations; resource dependent.

c) Surface Water Sampling Parameters Standardization

The following field and analytical parameters are being proposed as the standard list to develop baseline conditions. The list has been compiled by considering the City's current Wastewater ECA, WUP's current sampling program, existing Conservation Authority Programs, and potential contaminants of concern in our watersheds like O-Phosphate and Chloride, due to City use and aging infrastructure.

Field Parameters

Dissolved Oxygen (DO), pH, Conductivity, Temperature

Chemical Parameters

Ammonia as N, Carbonaceous Biochemical Oxygen Demand (cBOD), Chloride, Escherichia coli (E. coli) bacteria, Hardness, Nitrate, Nitrite, O-Phosphate, Total Kjeldahl Nitrogen (TKN), Total Phosphorus (TP), Total Suspended Solids (TSS), Un-ionized Ammonia, and Total Metals which include: Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Titanium, Tungsten, Uranium, Vanadium, Zinc, Zirconium.

Caffeine and/or Microbial Source Tracking (MST) will be added to the parameter list for sample locations, where further investigations are required.

d) Phase I Sample Method

In phase I, monthly grab samples will be taken at each location, for the parameters listed above. The main goal of this SWQP is to establish a baseline understanding of ambient surface water conditions. By sampling the ambient waterways and receiving waterbodies, the City is looking to understand the quality of water with our watersheds, up-, mid- and down-stream to any identified priority type City infrastructure.

e) Sample Characterization

The sample chain of custody and internal work orders will classify the sample as dry weather, wet weather, storm event, or snowmelt event, as well as document field parameters and observations (water colour, visible sheen, wind direction, weather, including a photo), for record keeping and trending purposes.

Classification of a dry, wet or storm event sample is determined by the amount of precipitation recorded at rain gauges throughout the City.

For Phase I, the WQT will review and record precipitation data from the two (2) ECCC precipitation gauges located at Royal Botanical Gardens and the Hamilton Airport, for trending purposes.

- A dry sample is classified as: < 4mm, of recorded precipitation within a 24-hour period, prior to sampling.

- A wet sample is classified as: ≥ 4mm, of recorded precipitation within a 24-hour period, prior to sampling.
- A storm precipitation event is classified as: ≥ 25mm, of recorded precipitation within a 24-hour period, prior to sampling.
- A snowmelt event is classified when there is a snowpack, and the temperature is above 0° Celsius.

f) Proposed Modifications to Existing City's Continuous Sampling Programs

EME's Chedoke Creek Quarterly Program

Current Program:

Four (4) sample locations; completed Quarterly. Parameters include: Field DO & Temperature, and E. coli

Proposed Modifications:

Increase sample frequency to monthly and ensure testing for the standard set of parameters, outlined above; absorb into this SWQP.

WUP's Red Hill Creek Monitoring Program

Current Program:

Sampling is completed every two (2) months (six (6) times per year).

As the SWQP evolves and as the WUP's monitoring program comes to completion in approximately 10 years, the City's SWQP will ensure monthly sampling at these locations are continued.

g) Proposed Modifications to Existing External Water Quality Programs

Phase I of the SWQP also includes suggested modifications to existing external WQ programs.

In 2022, discussions relating to the support of the Phase I proposed modifications of existing external programs, will be conducted by the City.

HCA's HHRAP WQ Monitoring Program

Current Program:

11 sample locations; completed bi-weekly, year-round. Parameters include: Ammonia, E. coli, Nitrate, Nitrite, TP, TSS, Volatile Suspended Solids (VSS) at 11/11 locations & O-phosphate at 5/11 locations

Proposed Modifications:

Hamilton Water currently supports this program by analysing the samples at the City's Environmental Laboratory. With Hamilton Water's support, the SWQP Framework is looking to increase the list of monitoring parameters to match the standard set of proposed parameters as outlined above.

Another opportunity would be to integrate HCA field data into the CHEL database (LIMS), that may allow enhanced trending and data analysis.

RBG's WQ for Cootes & Grindstone Program

Current Program:

Six (6) sample locations, completed bi-weekly, May to September; with one (1) sample location that was completed 4 times (CP-5 – West Pond) in 2020.

Hamilton Water currently supports this program by analysing the samples at the City's Environmental Laboratory. Parameters include: Ammonia (6 of 7 locations), E. coli (6 of 7 locations), nitrate/nitrite (2 of 7 locations), TP (all 7 locations), TSS (6 of 7 locations), VSS (6 of 7 locations) & Dissolved Organic Carbon (DOC) (2 of 7 locations) & Total Dissolved Phosphorus (TDP) (all 7 locations)

Proposed Modifications:

The SWQP Framework proposes the increase of the existing sampling period to bi-weekly from March 1 to November 30 (*water level, ice, weather & RBG resources dependent*) at all seven (7) locations.

Hamilton Water currently supports this program by analysing the samples at the City's Environmental Laboratory. With Hamilton Water's support, the SWQP Framework is looking to increase the list of monitoring parameters to match the standard set of proposed parameters as outlined above.

Another opportunity would be to integrate RBG field data into the CHEL database (LIMS), that may allow enhanced trending and data analysis.

h) Data Trending

Hamilton Water is in the process of building a trending dashboard technology that will integrate both internal and external data. Working with and along-side partners will be required to ensure compatibility for data storage and trending.

The data collected is reviewed against municipal, provincial, and federal regulations and guidelines for general baseline condition purposes only. The guiding documents provide water quality benchmarks, in order to monitor and measure water quality improvements, overtime.

The WQT will review water quality data, as it becomes available, against the Provincial Water Quality Objectives (PWQO), when available. In the absence of criteria of any parameter within the PWQO, the Canadian Water Quality Guidelines (CWQG) will be used. E. coli concentrations will be compared against the Canadian Health Guidelines, for primary and secondary contact recreational activities. The Hamilton's Public Health Services website will also be consulted, when required, to review E.coli data. Similar to the NPCA, the British Columbia Ambient Water Quality Guideline (BC, 2001) will also be reviewed in the absence of water quality criteria. The City of Hamilton's Sewer Use By-Law 14-090 will also be reviewed to ensure storm sewer compliance, when applicable. The

above guiding documents provide water quality benchmarks, in order to monitor and measure water quality improvements, over time.

As water quality data is collected over time, including utilizing current and historical watershed data, an average baseline, or a Water Quality Index, for select WQ parameters may be developed.

In 2022, discussions relating to developing WQ thresholds and triggers, for individual watersheds, will begin, working with our partners.

i) Spills Response Protocol

Review the EME Spills Response standard sampling list of water quality parameters to ensure it reflects the recommended SWQP standard parameter list.

Develop training material for EME's Environmental Enforcement Officers on location of standardize sampling locations to ensure data is being collected consistently.

Develop and implement standard operating procedures (SOPs) where the Surface Water Technologist will support extended sampling activities related to potential spill incidents. This includes any required additional sampling, data review, trending, and reporting.

a. Activation of City Reporting Spills Line

In the event there is an observed anomaly within the water quality (E. coli trend, abnormal field observations including floatables, low DO, etc.), and further investigation is required, the City's Spills Line will be called to report and initiate an inspection, as per the Level III SOP. If a water quality anomaly or observation cannot be determined through EME's spill investigation, the owner/operator of any suspected contributing infrastructure, will be contacted. It will be determined by the owner/operator of that infrastructure what manner of investigation (if any) would be beneficial.

Owners/operators of infrastructure could be the Water Distribution & Wastewater Collections Section, Plant Operations Section, Environmental Services Division, Waste Management Division, Transportation Operations & Maintenance Division, Energy Fleet & Facilities Division, Ministry of Transportation, Hamilton-Oshawa Port Authority, private property owners, and more.

In addition to the above, other partners with water quality programs will make visual observations and review their data with respect to long term averages, typical ranges, and trends. If water quality observations and field parameters are observed to be in poor condition, and/or the laboratory results are considered abnormally high, or abnormalities and/or significantly elevated concentrations are observed over several consecutive sampling dates, they are to report to the City Spills Line for further inspection.

In 2022, discussions relating to developing WQ thresholds and triggers, for individual watersheds, will begin, working with our partners.

j) Communications & Data Sharing

A monthly update within the Environmental Monitoring & Enforcement Unit, to discuss any completed sampling work, water quality data, and any issues identified in the field, will be established. An update to Senior Leadership will be scheduled on a 6-month interval, to discuss the status of the program and any identified trends associated with the water quality data. The Manager of C&R will communicate with the HW Leadership team as required. Any conditions that require immediate attention will be addressed via the existing Hamilton Water spill response protocol.

The City has begun the process of developing a Memorandum of Understanding (MOU) with all its partners.

Additional communications including involvement details will be developed to ensure scheduled update meetings, data transparency, communications, and long-term data sharing for both internal and external uses, such as downloadable data sharing for water quality trending purposes.

In Q1, 2021, a Surface Water Quality Webpage and Map, showing current SWQP sample locations, with associated analytical data, was launched on the City website. Looking ahead, this Water Quality Map will also include sample locations from all City partners.

k) Annual Report

Annually, the City will develop a surface water quality report outlining the successes, challenges, and other technical components of the Program. Any conditions that require immediate attention, will be addressed via the Hamilton Water spill response protocol.

As part of the annual review, the City will insure this SWQP Framework remains representative of its watershed needs and adjust as required.

Phase II (2 to 5 Years)

a) Phase II Proposed Monitoring and Sampling Locations

Phase II of the SWQP outlines additional surface water monitoring and sampling locations throughout the Watersheds. The additional locations throughout the Watersheds focus on:

- The remaining Watersheds not captured in Phase I
- Establishing an up-, mid- or down-stream water quality sampling location, respectively, to City infrastructure assets (including storm sewer outfalls) that discharge to the natural environment
    - An opportunity to gain a holistic view of how the City's assets, including road and storm run-off that discharge to the natural environment, influence water quality throughout the Watersheds.

The SWQP is proposing an additional ~46 surface water monitoring and sampling locations to be introduced to the monitoring portfolio. Refer to **Appendix E** for the Phase II Proposed sample locations. As the program evolves, Phase II locations may be moved, added, or removed.

b) Benthic Monitoring

Work with the partners who currently have benthic data and expand on the WUP, HCA, CH & NPCA Programs at select surface water quality monitoring and sampling locations throughout the City's watersheds.

c) Sediment sampling

Explore the opportunity to understand the sediment quality at select surface water monitoring and sampling locations throughout the City's watersheds.

d) Technology Implementation

Explore the opportunity to deploy technology to obtain real-time or in-stream water quality data, for long-term trending. This technology may enable early detection of water quality problems associated with City infrastructure (ex. pH, DO, Temperature, Flow, etc.).

e) Funding / Grants

Explore opportunities to apply for government funding or private sector grants aimed at increasing capability of the surface water monitoring program.

12. PHASE III (5 to 10 Years)

a) Decision Making / Capital Investing

The goal is to establish a robust water quality baseline that will enable decision makers to identify needed infrastructure investment to protect water quality, including a method to evaluate the impact of such investment.

As water quality data is collected over time, including utilizing current and historical WQ data, an average baseline for select WQ parameters may be developed.

Baseline variations may include:

- Seasonal, wet, dry, and storm over an:
  - Annual period;
  - 5-year period; and,
  - 10-year period.

Baseline may be developed by using the 75^{th} percentile of the sample result. This method should only be applied to background stations or stations located upstream of a City asset. By using the 75^{th} percentile, the City can then compare data from a downstream station, to see if it is elevated or not.

The City will also review the option to create a Water Quality Index (WQI), for each watershed or location. The SWQP may be modified to align with WQI objectives; customizing City urban creeks, with attainable improvement goals.

b) Strategic Sewer Use By-Law Enforcement

Prioritize areas of interest/on-going WQ areas of interest and provide input to Environmental Monitoring & Enforcement Unit to optimize areas in need of further inspection.

13. CONCLUSION

This Surface Water Quality Program Framework Report is the starting point for the City of Hamilton in gaining a holistic understanding of its receiving waters and the potential impacts from various assets within the storm and wastewater collection and treatment system. Hamilton endeavors to study how wastewater and stormwater discharges are influencing the quality of the receiving waters.

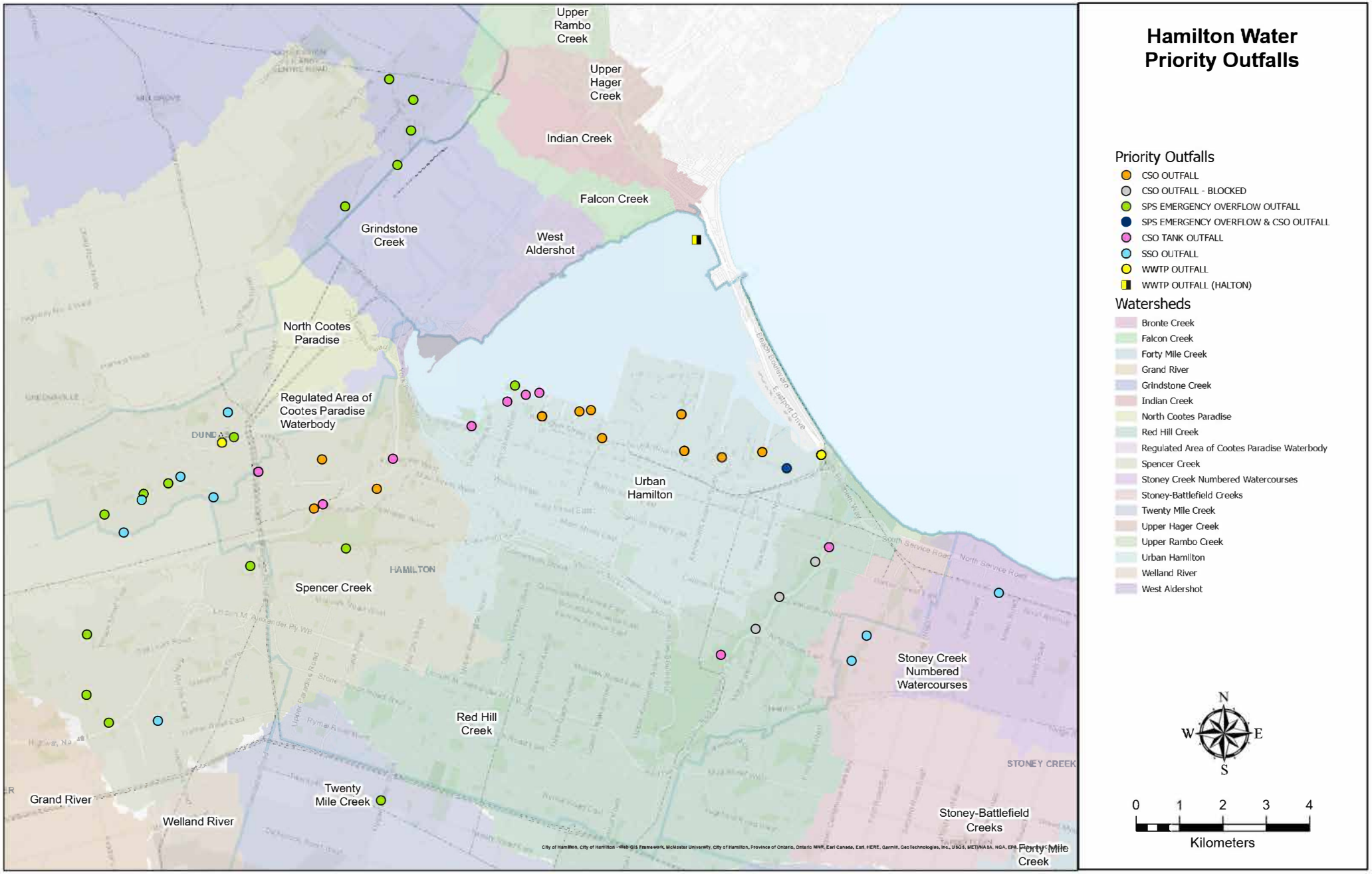
In this report, the major receiving water bodies were identified as well as the storm and wastewater collection and treatment systems. Key partners were engaged in 2020 to determine where the key gaps exist in the overall monitoring of Hamilton's surface waters. From this information, a phased approach was developed. Phase I establishes a monthly surface water monitoring plan.

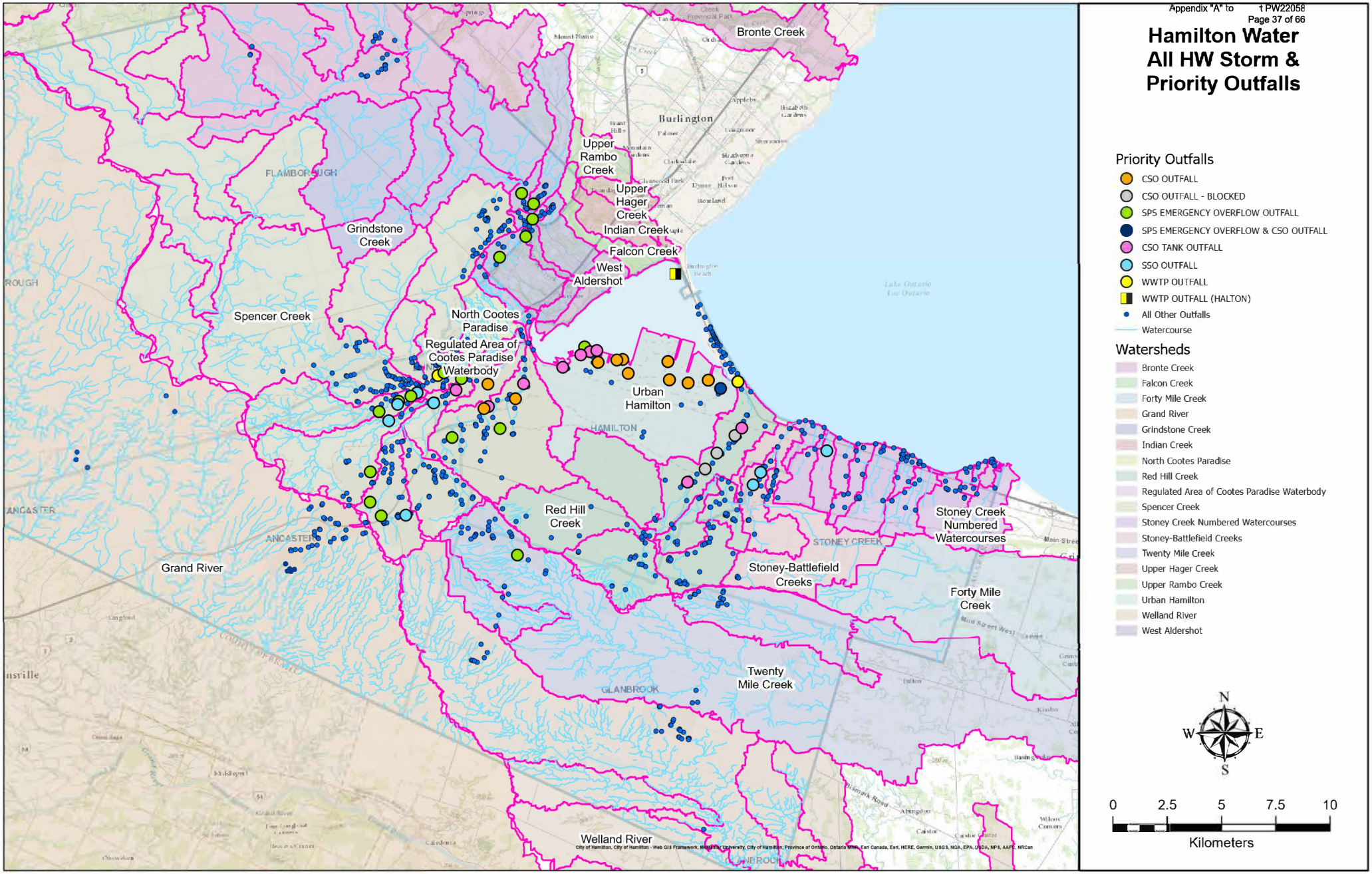
Phase II focuses on assessing the initial sampling plan and making modifications as needed and expanding the coverage of the monitoring plan. This phase will take place between years 2-5. From the baseline information captured in Phases I and II, Phase III will focus on infrastructure investment needed to better protect the receiving waters as well as prioritizing identified areas of interest/on-going WQ areas of interest for regular inspection and enforcement activities as needed.

This Framework is a living document and the road map in ensuring there is a clear oversight of Hamilton's assets and the corresponding receiving waters.

Appendix F gives a visual of the Framework's phased approach.

Appendix A: Priority Outfalls, and 2020 & 2021 CSO Deposit Summary


Upper Rambo Creek
Upper Hager Creek
Indian Creek
Falcon Creek
Grindstone Creek
West Aldershot
North Cootes Paradise
Regulated Area of Cootes Paradise Waterbody
Urban Hamilton
Spencer Creek
Red Hill Creek
Stoney Creek Numbered Watercourses
Twenty Mile Creek
Grand River
Welland River
Stoney-Battlefield Creeks
Forty Mile Creek
DUNDAS
HAMILTON
STONEY CREEK
Hamilton Water Priority Outfalls
Priority Outfalls
CSO OUTFALL
CSO OUTFALL - BLOCKED
SPS EMERGENCY OVERFLOW OUTFALL
SPS EMERGENCY OVERFLOW & CSO OUTFALL
CSO TANK OUTFALL
SSO OUTFALL
WWTP OUTFALL
WWTP OUTFALL (HALTON)
Watersheds
Bronte Creek
Falcon Creek
Forty Mile Creek
Grand River
Grindstone Creek
Indian Creek
North Cootes Paradise
Red Hill Creek
Regulated Area of Cootes Paradise Waterbody
Spencer Creek
Stoney Creek Numbered Watercourses
Stoney-Battlefield Creeks
Twenty Mile Creek
Upper Hager Creek
Upper Rambo Creek
Urban Hamilton
Welland River
West Aldershot
N
W
E
S
0
1
2
3
4
Kilometers


Appendix "A" to Report PW22058
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Hamilton Water
All HW Storm &
Priority Outfalls
Priority Outfalls
CSO OUTFALL
CSO OUTFALL - BLOCKED
SPS EMERGENCY OVERFLOW OUTFALL
SPS EMERGENCY OVERFLOW & CSO OUTFALL
CSO TANK OUTFALL
SSO OUTFALL
WWTP OUTFALL
WWTP OUTFALL (HALTON)
All Other Outfalls
Watercourse
Watersheds
Bronte Creek
Falcon Creek
Forty Mile Creek
Grand River
Grindstone Creek
Indian Creek
North Cootes Paradise
Red Hill Creek
Regulated Area of Cootes Paradise Waterbody
Spencer Creek
Stoney Creek Numbered Watercourses
Stoney-Battlefield Creeks
Twenty Mile Creek
Upper Hager Creek
Upper Rambo Creek
Urban Hamilton
Welland River
West Aldershot
N
W
E
S
0
2.5
5
7.5
10
Kilometers
Bronte Creek
Upper Rambo Creek
Upper Hager Creek
Indian Creek
Falcon Creek
West Aldershot
Grindstone Creek
Spencer Creek
North Cootes Paradise
Regulated Area of Cootes Paradise Waterbody
Urban Hamilton
Red Hill Creek
Stoney Creek Numbered Watercourses
Stoney-Battlefield Creeks
Forty Mile Creek
Twenty Mile Creek
Grand River
Welland River
Burlington
FLAMBOROUGH
HAMILTON
ANCASTER
STONEY CREEK
GLANBROOK

Hamilton Wastewater

Woodward WWTP Bypass and CSO Overflow Log
2020

SAC #	Event #	Start		Location	Stop		Duration	Volume	Disinfection	Reason	Sample Results						
											Bypass or CSO Sample					Final Effluent	
		Date yyyy-mm-dd	Time		Date yyyy-mm-dd	Time	Hours	ML	Yes / No	Code	TBOD mg/L	cBOD mg/L	TSS mg/L	TP mg/L	E.coli CFU/100ml	pH	Total Cl mg/L
903943	1	2020-01-11	00:27	HCG03	2020-01-12	20:47	37.81	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
903959	2	2020-01-11	11:21	S	2020-01-13	04:15	40.90	637.590	No	1,7	35	n/a	75.0	1.00	996,667	7.12	n/a
	3	2020-01-11	15:01	HCS04	2020-01-13	23:37	56.60	127.121	No	1,7	n/a	21	141	0.574	770,000	n/a	n/a
	4	2020-01-11	15:21	HCS01	2020-01-13	06:49	39.47	404.695	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		2020-01-13	13:05		2020-01-13	17:25	4.33	7.453									
	5	2020-01-11	14:01	DC011	2020-01-12	05:53	1.07	0.072	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	6	2020-01-12	1:20	HCS08	2020-01-12	06:00	4.67	5.341	No	1,7	n/a	8	220	0.287	40,000	n/a	n/a
	7	2020-01-11	10:35	HCS05	2020-01-13	02:15	39.67	50.204	No	1,7	n/a	19	57	0.916	883,333	n/a	n/a
	8	2020-01-12	02:20	DC012	2020-01-12	05:11	0.10	0.023	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	9	2020-01-11	17:21	HCS7C	2020-01-11	21:14	3.88	4.576	No	1,7	n/a	9	134	0.462	295,000	n/a	n/a
		2020-01-12	00:59		2020-01-12	07:38	6.65	10.754									
904069	10	2020-01-12	04:45	HCS09	2020-01-12	05:42	0.95	0.258	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904057	11	2020-01-12	07:19	HC060	2020-01-12	08:56	1.62	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904093	12	2020-01-24	17:40	HCG03	2020-01-25	13:43	19.70	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904096	13	2020-01-24	20:53	S	2020-01-25	22:51	25.97	206.690	No	1,7	50	n/a	70.0	1.33	1,022,500	6.98	n/a
	14	2020-01-25	02:17	HCS01	2020-01-26	10:45	32.47	180.441	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	15	2020-01-25	02:45	HCS04	2020-01-25	23:35	20.83	51.093	No	1,7	n/a	n/a*	n/a*	n/a*	340,000	n/a	n/a
	16	2020-01-25	00:00	HCS05	2020-01-25	21:05	21.08	1.394	No	1,7	n/a	25	55.0	0.92	430,000	n/a	n/a
904116	17	2020-01-26	18:43	HCG03	2020-01-26	23:27	2.53	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904122	18	2020-02-02	11:12	HCG03	2020-02-02	14:13	3.02	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904126	19	2020-02-10	11:45	HCG03	2020-02-10	14:07	2.37	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904129	20	2020-02-18	10:36	HCG03	2020-02-18	14:16	3.67	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904131	21	2020-02-26	12:34	HCG03	2020-02-26	12:56	0.37	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904135	22	2020-03-02	09:45	HCG03	2020-03-02	14:07	4.37	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904136	23	2020-03-02	12:51	S	2020-03-02	19:21	6.50	24.119	No	1,7	61	n/a	135	2.92	2,600,000	7.16	n/a
904141	24	2020-03-03	11:51	HCG03	2020-03-03	13:03	1.20	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		2020-03-03	14:16		2020-03-03	16:57	2.68										
		2020-03-03	17:31		2020-03-03	17:54	0.38										
904142	25	2020-03-03	14:52	S	2020-03-04	1:50	10.97	75.387	No	1,7	59	n/a	70.0	1.65	1,470,000	7.27	n/a
	26	2020-03-03	15:10	HCS01	2020-03-04	05:44	14.57	96.861	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	27	2020-03-04	01:00	HCS04	2020-03-04	02:51	1.85	2.001	No	1,7	n/a	n/a**	n/a**	n/a**	n/a**	n/a	n/a
904159	28	2020-03-06	06:56	HCG03	2020-03-06	07:14	0.30	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		2020-03-06	10:38		2020-03-06	15:54	5.27										
904163	29	2020-03-10	05:05	HCG03	2020-03-10	05:37	0.53	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		2020-03-10	05:55		2020-03-10	07:03	1.13										
		2020-03-10	07:29		2020-03-10	11:05	3.60										
904187	30	2020-03-13	04:21	HCG03	2020-03-13	05:51	1.50	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904194	31	2020-03-18	21:30	HCG03	2020-03-18	23:30	2.00	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904195	32	2020-03-20	01:56	HCG03	2020-03-20	02:32	0.60	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904210	33	2020-03-23	09:31	HCG03	2020-03-23	13:09	3.63	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		2020-03-23	14:34		2020-03-23	15:41	1.12										
	34	2020-03-25	13:12	DC012	2020-03-25	13:13	0.02	0.005	No	3	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904225	35	2020-03-28	10:19	HCG03	2020-03-28	11:08	0.82	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904232	36	2020-03-29	03:28	HCG03	2020-03-29	05:29	2.02	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		2020-03-29	06:37		2020-03-29	10:11	3.57										
904285	37	2020-04-07	21:56	HCG03	2020-04-07	22:09	0.22	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Hamilton Wastewater

Woodward WWTP Bypass and CSO Overflow Log
2020

SAC #	Event #	Start Date yyyy-mm-dd	Start Time	Location	Stop Date yyyy-mm-dd	Stop Time	Duration Hours	Volume ML	Disinfection Yes / No	Reason Code	Sample Results Bypass or CSO Sample TBOD mg/L	cBOD mg/L	TSS mg/L	TP mg/L	E.coli CFU/100ml	Final Effluent pH	Final Effluent Total Cl mg/L
904293	38	2020-04-09	01:25	HCG03	2020-04-09	05:48	4.38	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		2020-04-09	06:49		2020-04-09	07:55	1.10										
904298	39	2020-04-13	03:27	HCG03	2020-04-13	04:50	1.38	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		2020-04-13	05:23		2020-04-13	09:15	3.87										
904312	40	2020-04-19	11:27	HCG03	2020-04-19	12:03	0.60	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904313	41	2020-04-26	10:10	HCG03	2020-04-26	11:21	1.18	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904331	42	2020-04-30	07:53	HCG03	2020-04-30	08:36	0.72	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		2020-04-30	09:42		2020-04-30	10:22	0.67										
		2020-04-30	11:23		2020-04-30	12:31	1.13										
		2020-04-30	19:09		2020-04-30	19:48	0.65										
904376	43	2020-05-14	16:05	HCG03	2020-05-14	16:38	0.55	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		2020-05-14	17:49		2020-05-14	18:28	0.65										
904377	44	2020-05-15	08:37	HCG03	2020-05-15	09:54	1.28	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904382	45	2020-05-17	15:51	HCG03	2020-05-17	16:37	0.77	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		2020-05-17	17:14		2020-05-17	18:38	1.40										
		2020-05-17	21:38		2020-05-17	21:49	0.18										
		2020-05-17	22:02		2020-05-18	04:22	6.33										
		2020-05-18	06:56		2020-05-18	11:14	4.30										
		2020-05-18	14:55		2020-05-18	16:11	1.26										
		2020-05-18	20:46		2020-05-18	21:41	0.92										
904386	46	2020-05-18	09:28	S	2020-05-18	18:36	9.13	56.340	Yes	1,7	37	n/a	48.3	1.10	936,667	7.05	0.00
		2020-05-18	21:27		2020-05-19	00:16	2.82										
904399	47	2020-05-28	12:57	HCG03	2020-05-28	14:22	1.42	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		2020-05-28	15:44		2020-05-28	16:17	0.55										
904421	48	2020-05-29	10:14	HCG03	2020-05-29	11:30	1.27	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		2020-05-29	16:15		2020-05-29	16:55	0.67										
904429	49	2020-06-03	06:00	HCG03	2020-06-03	06:58	0.97	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904438	50	2020-06-10	05:17	HCG03	2020-06-10	06:10	0.88	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		2020-06-10	13:12		2020-06-10	13:15	0.05										
		2020-06-10	22:00		2020-06-11	01:06	3.10										
904450	51	2020-06-10	23:47	S	2020-06-11	02:40	2.88	26.510	Yes	1,7	77	n/a	97.0	1.67	1,990,000	6.90	0.00
904463	52	2020-06-22	19:50	HCG03	2020-06-22	20:50	1.00	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904464	53	2020-06-22	20:16	HCG14	2020-06-23	05:31	9.25	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		2020-06-23	13:40		2020-06-23	23:54	10.23										
904468	54	2020-06-23	13:28	HCG03	2020-06-23	14:22	0.90	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904504	56	2020-06-27	04:15	HCG03	2020-06-27	05:40	1.42	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904505	57	2020-06-27	05:09	HCG14	2020-06-27	05:19	0.17	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904531	58	2020-07-10	19:53	HCG03	2020-07-10	20:50	0.95	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		2020-07-10	20:40		2020-07-11	00:06	1.43										
904532	59	2020-07-10	20:06	HCG14	2020-07-10	21:59	1.88	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		2020-07-10	22:50		2020-07-11	01:17	2.45										
904540	60	2020-07-10	21:24	S	2020-07-11	02:25	5.02	43.010	Yes	1,7	65	n/a	88.4	1.94	540,000	7.05	0.00
904567	61	2020-07-16	15:20	HCG03	2020-07-16	15:30	0.17	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904578	62	2020-07-19	12:49	HCG03	2020-07-19	13:17	0.47	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Hamilton Wastewater

Woodward WWTP Bypass and CSO Overflow Log
2020

SAC #	Event #	Start Date yyyy-mm-dd	Start Time	Location	Stop Date yyyy-mm-dd	Stop Time	Duration Hours	Volume ML	Disinfection Yes / No	Reason Code	Sample Results Bypass or CSO Sample TBOD mg/L	cBOD mg/L	TSS mg/L	TP mg/L	E.coli CFU/100ml	Final Effluent pH	Final Effluent Total Cl mg/L
904580	63	2020-07-19	13:09	HCG14	2020-07-19	13:38	0.48	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904603	64	2020-08-02	00:35	HCG03	2020-08-02	01:01	0.43	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		2020-08-02	02:35		2020-08-02	02:57	0.37										
		2020-08-02	04:04		2020-08-02	04:36	0.53										
		2020-08-02	06:37		2020-08-02	07:16	0.65										
		2020-08-02	08:58		2020-08-02	09:45	0.78										
904611	65	2020-08-02	07:04	HCG14	2020-08-02	07:34	0.50	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		2020-08-02	09:06		2020-08-02	09:57	0.85										
904638	66	2020-08-03	16:47	HCG03	2020-08-03	17:45	0.97	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904639	67	2020-08-03	16:53	HCG14	2020-08-03	19:18	2.42	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		2020-08-03	22:40		2020-08-03	22:52	0.20										
904648	68	2020-08-04	18:58	HCG03	2020-08-04	20:22	1.40	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904650	69	2020-08-04	19:15	HCG14	2020-08-05	02:04	6.82	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904657	70	2020-08-04	19:16	HC015	2020-08-04	19:45	0.07	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904653	71	2020-08-04	19:30	HC001	2020-08-04	20:00	0.50	1.080	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904647	72	2020-08-04	19:54	S	2020-08-05	02:40	6.77	54.665	Yes	1,7	54	n/a	62.0	1.72	2,600,000	7.08	0.02
	73	2020-08-04	20:03	HCS08	2020-08-04	21:56	1.88	9.848	No	1,7	n/a	6	203	0.418	100,000	n/a	n/a
	74	2020-08-04	20:49	HCS04	2020-08-05	08:57	12.13	10.998	No	1,7	n/a	11	66.9	0.507	470,000	n/a	n/a
904687	75	2020-08-17	15:05	HCG03	2020-08-17	15:43	0.63	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		2020-08-17	21:22		2020-08-17	22:02	0.67										
904682	76	2020-08-17	15:16	HC001	2020-08-17	15:40	0.40	0.997	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904688	77	2020-08-17	15:14	HCG14	2020-08-17	16:34	1.33	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		2020-08-17	17:46		2020-08-17	22:42	4.93										
904690	78	2020-08-17	15:56	S	2020-08-18	01:09	9.22	65.268	Yes	1,7	64	n/a	61.5	1.87	6,745,000	7.17	0.00
904700	79	2020-08-25	01:08	HCG03	2020-08-25	01:52	0.73	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904701	80	2020-08-25	01:16	HCG14	2020-08-25	02:08	0.87	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904751	81	2020-09-07	04:22	HCG03	2020-09-07	05:49	1.45	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904752	82	2020-09-07	04:31	HCG14	2020-09-07	05:36	1.08	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904766	83	2020-09-13	03:46	HCG03	2020-09-13	03:52	0.10	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		2020-09-13	08:55		2020-09-13	10:04	1.15										
904769	84	2020-09-13	09:32	HCG14	2020-09-13	10:07	0.58	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904783	85	2020-09-28	20:07	HCG03	2020-09-28	20:17	0.17	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		2020-09-28	20:53		2020-09-28	21:13	0.33										
		2020-09-28	22:45		2020-09-28	23:41	0.93										
		2020-09-28	23:53		2020-09-29	00:58	1.08										
904785	86	2020-09-28	23:18	HCG14	2020-09-28	23:40	0.37	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		2020-09-29	00:14		2020-09-29	00:56	0.70										
904790	87	2020-09-30	15:56	HCG03	2020-09-30	17:00	1.07	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		2020-09-30	18:09		2020-09-20	18:21	0.20										
904791	88	2020-09-30	16:43	HCG14	2020-09-30	16:59	0.27	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904792	89	2020-10-01	17:50	HCG03	2020-10-01	19:08	1.30	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904793	90	2020-10-01	18:03	HCG14	2020-10-01	19:00	0.95	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904794	91	2020-10-02	14:40	HCG03	2020-10-02	15:00	0.33	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904795	92	2020-10-04	16:31	HCG03	2020-10-04	17:24	0.88	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Hamilton Wastewater

Woodward WWTP Bypass and CSO Overflow Log
2020

SAC #	Event #	Start Date yyyy-mm-dd	Start Time	Location	Stop Date yyyy-mm-dd	Stop Time	Duration Hours	Volume ML	Disinfection Yes / No	Reason Code	Sample Results Bypass or CSO Sample TBOD mg/L	cBOD mg/L	TSS mg/L	TP mg/L	E.coli CFU/100ml	Final Effluent pH	Final Effluent Total Cl mg/L
904797	93	2020-10-07	08:25	HCG03	2020-10-07	09:15	0.83	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904801	94	2020-10-13	02:51	HCG03	2020-10-13	03:36	0.75	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904802	95	2020-10-15	14:48	HCG03	2020-10-15	23:10	2.50	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904803	96	2020-10-15	22:36	HCG14	2020-10-16	11:15	12.65	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		2020-10-16	21:03		2020-10-17	09:20	12.28										
1377-BUFP4B	97	2020-10-16	13:41	HCG03	2020-10-16	13:46	0.08	n/a	No		n/a	n/a	n/a	n/a	n/a	n/a	n/a
		2020-10-16	18:34		2020-10-16	22:44	4.17										
904805	98	2020-10-19	21:55	HCG03	2020-10-20	00:10	2.25	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		2020-10-20	01:07		2020-10-20	04:13	3.10										
904806	99	2020-10-21	05:14	HCG03	2020-10-21	05:57	0.72	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904809	100	2020-10-22	06:15	HCG03	2020-10-22	06:56	0.68	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904828	101	2020-10-23	20:07	HCG03	2020-10-23	21:49	1.70	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904829	102	2020-10-23	20:08	HCG14	2020-10-26	15:14	67.10	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		2020-10-26	20:36		2020-10-27	10:26	13.83										
		2020-10-27	16:37		2020-10-28	06:44	14.11										
904803	103	2020-11-01	09:13	HCG03	2020-11-01	09:39	0.43	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904839	104	2020-11-15	09:07	HCG03	2020-11-15	10:26	1.32	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		2020-11-15	14:48		2020-11-15	15:22	0.57										
904847	105	2020-11-22	12:54	HCG03	2020-11-22	18:47	5.88	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904852	106	2020-11-26	02:32	HCG03	2020-11-26	02:58	0.43	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904855	107	2020-11-30	08:43	HCG03	2020-11-30	14:57	6.23	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904856	108	2020-11-30	11:32	HCG14	2020-11-30	12:19	0.78	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904857	109	2020-11-30	11:50	S	2020-12-01	03:08	15.30	125.225	No	1,7	82	n/a	130	2.55	1,450,000	6.99	0.00
201212-000001	110	2020-12-12	13:16	HCG03	2020-12-12	15:33	2.28	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
904867	111	2020-12-12	13:48	HCG14	2020-12-12	14:12	0.40	n/a	No	1,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		2020-12-12	14:24		2020-12-12	14:27	0.05										
		2020-12-12	14:28		2020-12-12	15:21	0.88										
201228-000000	113	2020-12-28	01:19	HCG03	2020-12-28	05:08	3.82	n/a	No	1,2,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		2020-12-28	05:50		2020-12-28	06:58	1.12										
201228-000001	112	2020-12-28	04:39	S	2020-12-28	11:41	7.03	44.188	No	1,2,7	32	n/a	70	1.33	930,000	7.10	0.00
201230-000000	115	2020-12-30	13:10	HCG03	2020-12-30	13:38	0.45	n/a	No	1,2,7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		2020-12-30	14:27		2020-12-30	15:30	1.05										
		2020-12-30	16:39		2020-12-30	18:23	1.75										
		2020-12-30	18:48		2020-12-30	19:47	0.98										
201230-000001	114	2020-12-30	18:43	S	2020-12-30	22:34	3.85	27.947	No	1,2,7	70	n/a	93	1.79	930,000	7.18	0.00
							791.80	**2352.154**									

Hamilton Wastewater

Woodward WWTP Bypass and CSO Overflow Log
2020

SAC #	Event #	Start Date yyyy-mm-dd	Start Time	Location	Stop Date yyyy-mm-dd	Stop Time	Duration Hours	Volume ML	Disinfection Yes / No	Reason Code	Sample Results Bypass or CSO Sample TBOD mg/L	cBOD mg/L	TSS mg/L	TP mg/L	E.coli CFU/100ml	Final Effluent pH	Final Effluent Total Cl mg/L

Legend / Notes

Bypass/Overflow Locations:

PH= Plant bypass
HW= Headworks bypass
PR= Primary bypass
S = Secondary bypass

HCS01 = Greenhill CSO
HCS02 = Strachan St CSO
HCS03 = James St CSO
HCS04 = Main/King CSO
HCS05 = Eastwood CSO
HCS7C = Red Hill CSO
HCS08 = Royal CSO
HCS09 = McMaster CSO

HCG03 = Wentworth CSO Outfall
HCG14 = Wellington CSO Outfall

Wastewater Pumping Stations: use station number

Treatment Levels:

Plant bypass (PH) - no treatment
Headworks bypass (HW) - receives preliminary treatment
Primary bypass (PR) - receives preliminary treatment
Secondary bypass (S) - receives preliminary and primary treatment
CSO tank overflows receive no treatment prior to discharge.

Notes:

* Insufficient sample collected to analyze all parameters
** Sample could not be collected due to autosampler failure

Sample Locations:

Plant: Headworks in front of the barscreens
Primary / Headworks: Inlet of the Primary Clarifiers
Secondary: Outlet of the Primary Clarifiers

Note: a Final Effluent Outfall sample must be collected for all bypass types

Volume Determination:

Bypass flow volumes at the Woodward WWTP are estimated.
CSO tank overflow volumes are measured.
Pumping stations overflow volumes are measured.

Reason Codes:

1. Heavy Precipitation
2. Snow Melt
3. Equipment Failure
4. Equipment Maintenance
5. Sewer Problems
6. Power Failure
7. Exceed Design
8. Other

Hamilton Wastewater

Woodward WWTP Bypass and CSO Overflow Log 2021

Event #	Location	Start Date yyyy-mm-dd	Start Time	Stop Date yyyy-mm-dd	Stop Time	Duration Hours	Volume ML	Disinfection Yes / No	Reason Code
1	HCG03	2021-01-02	00:17	2021-01-02	02:51	2.56	n/a	No	1,2,7
		2021-01-02	03:19	2021-01-02	04:37	1.30			
2	HCG14	2021-01-02	01:06	2021-01-02	02:20	1.23	n/a	No	1,2,7
3	S	2021-01-02	01:48	2021-01-02	08:36	6.80	50.877	No	1,2,7
		2021-01-02	12:17	2021-01-02	20:37	8.33			
4	HCG03	2021-02-27	06:46	2021-02-27	09:46	3.00	n/a	No	1,2,7
5	HCG14	2021-02-27	07:34	2021-02-27	08:00	0.44	n/a	No	1,2,7
		2021-02-27	08:58	2021-02-27	09:13	0.25			
6	S	2021-02-27	08:36	2021-02-27	12:52	4.25	36.996	No	1,2,7
7	HCG03	2021-02-28	12:46	2021-02-28	13:03	0.28	n/a	No	1,2,7
8	HCG03	2021-03-11	19:09	2021-03-11	19:38	0.48	n/a	No	1,2,7
9	HCG03	2021-03-26	03:14	2021-03-26	08:39	5.43	n/a	No	1,7
		2021-03-26	09:01	2021-03-26	09:59	0.98			
10	HCG14	2021-03-26	03:55	2021-03-26	05:59	2.07	n/a	No	1,7
		2021-03-26	06:41	2021-03-26	07:30	0.82			
11	S	2021-03-26	04:45	2021-03-26	11:46	7.02	41.994	No	1,7
12	HCG04	2021-03-26	07:29	2021-03-26	10:55	3.45	n/a	No	1,7
13	HCS04	2021-03-26	09:09	2021-03-26	13:48	4.65	11.934	No	1,7
14	HCS01	2021-03-26	10:32	2021-03-26	21:16	10.73	33.235	No	1,7
15	HCG03	2021-03-28	10:35	2021-03-28	11:14	0.66	n/a	No	1,7
		2021-03-28	11:30	2021-03-28	14:08	2.64			
16	HCG03	2021-04-05	17:28	2021-04-05	18:12	0.72	n/a	No	1,7
17	HCG03	2021-04-11	05:51	2021-04-11	06:20	0.48	n/a	No	1,7
		2021-04-11	06:56	2021-04-11	10:43	3.79			
18	HCG14	2021-04-11	07:49	2021-04-11	08:46	0.96	n/a	No	1,7
19	S	2021-04-11	09:03	2021-04-11	12:07	3.07	7.092	No	1,7
20	HCG03	2021-04-18	15:49	2021-04-18	16:54	1.08	n/a	No	1,7
21	HCG03	2021-04-29	18:26	2021-04-29	18:36	0.66	n/a	No	1,7
		2021-04-29	18:51	2021-04-29	19:30	0.16			
22	HCG03	2021-05-08	13:43	2021-05-08	14:07	0.40	n/a	No	1,7
23	HCG03	2021-05-26	19:01	2021-05-26	19:34	0.56	n/a	No	1,7
24	HCG14	2021-05-26	19:15	2021-05-26	19:33	0.29	n/a	No	1,7
25	HCG03	2021-05-28	12:01	2021-05-28	17:01	5.00	n/a	No	1,7

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Woodward WWTP Bypass and CSO Overflow Log 2021

Event #	Location	Start Date yyyy-mm-dd	Start Time	Stop Date yyyy-mm-dd	Stop Time	Duration Hours	Volume ML	Disinfection Yes / No	Reason Code
26	S	2021-05-28	16:20	2021-05-28	19:32	3.20	18.663	Yes	1,7
27	HCG03	2021-06-03	04:46	2021-06-03	05:20	0.56	n/a	No	1,7
28	HCG03	2021-06-08	05:17	2021-06-08	06:03	0.76	n/a	No	1,7
		2021-06-08	16:32	2021-06-08	17:33	1.01			
29	HCG14	2021-06-08	05:32	2021-06-08	06:04	0.52	n/a	No	1,7
		2021-06-08	16:38	2021-06-08	17:27	0.82			
30	HCG03	2021-06-14	09:02	2021-06-14	09:20	0.29	n/a	No	1,7
		2021-06-14	18:29	2021-06-14	19:11	0.71			
31	HCG14	2021-06-14	18:39	2021-06-14	19:03	0.40	n/a	No	1,7
32	HCG03	2021-06-18	12:55	2021-06-18	13:01	0.09	n/a	No	1,7
33	HCG03	2021-06-21	02:25	2021-06-21	03:15	0.83	n/a	No	1,7
34	HCG03	2021-06-25	22:09	2021-06-25	23:21	1.19	n/a	No	1,7
		2021-06-25	23:54	2021-06-26	01:27	1.56			
		2021-06-26	03:30	2021-06-26	05:58	2.47			
		2021-06-26	06:31	2021-06-26	07:29	0.96			
		2021-06-26	07:59	2021-06-26	08:33	0.57			
		2021-06-26	08:47	2021-06-26	09:05	0.30			
35	HCG14	2021-06-26	00:06	2021-06-26	01:28	1.36	n/a	No	1,7
		2021-06-26	03:44	2021-06-26	04:14	0.50			
		2021-06-26	04:37	2021-06-26	05:05	0.47			
		2021-06-26	05:34	2021-06-26	05:52	0.31			
		2021-06-26	06:47	2021-06-26	07:17	0.49			
36	S	2021-06-26	01:42	2021-06-26	03:07	1.42	35.636	Yes	1,7
		2021-06-26	06:01	2021-06-26	10:29	4.46			
37	HCS04	2021-06-26	08:17	2021-06-26	15:51	7.56	7.592	No	1,7
38	HCS01	2021-06-26	10:50	2021-06-26	12:50	2.00	1.945	No	1,7
39	HCG03	2021-06-29	18:06	2021-06-29	18:56	0.83	n/a	No	1,7
40	HCG14	2021-06-29	18:19	2021-06-29	19:03	0.74	n/a	No	1,7
41	HCG03	2021-07-01	17:04	2021-07-01	17:16	0.21	n/a	No	1,7
		2021-07-01	18:34	2021-07-01	19:39	1.08			
42	HCG14	2021-07-01	18:46	2021-07-01	19:37	0.86	n/a	No	1,7
43	HCG03	2021-07-02	16:05	2021-07-02	19:13	3.15	n/a	No	1,7

Hamilton Wastewater

Woodward WWTP Bypass and CSO Overflow Log 2021

Event #	Location	Start		Stop		Duration	Volume	Disinfection	Reason
		Date yyyy-mm-dd	Time	Date yyyy-mm-dd	Time	Hours	ML	Yes / No	Code
44	HCG14	2021-07-02	16:08	2021-07-02	17:06	0.97	n/a	No	1,7
		2021-07-02	17:17	2021-07-02	19:05	1.80			
46	HC001	2021-07-02	17:36	2021-07-02	18:43	1.10	1.567	No	1,7
45	S	2021-07-02	19:02	2021-07-02	20:45	1.72	15.607	Yes	1,7
46	HCG03	2021-07-07	20:39	2021-07-07	20:55	0.28	n/a	No	1,7
47	HCG03	2021-07-08	11:00	2021-07-08	13:00	2.01	n/a	No	1,7
		2021-07-08	14:12	2021-07-08	15:20	1.13			
48	HCG14	2021-07-08	12:05	2021-07-08	12:41	0.60	n/a	No	1,7
		2021-07-08	12:41	2021-07-08	12:42	0.01			
		2021-07-08	14:27	2021-07-08	14:45	0.30			
49	S	2021-07-08	12:43	2021-07-08	17:15	4.53	19.350	Yes	1,7
50	HCG03	2021-07-24	15:34	2021-07-24	15:51	0.28	n/a	No	1,7
		2021-07-24	23:35	2021-07-25	00:25	0.84			
51	HCG03	2021-07-27	11:10	2021-07-27	11:32	0.37	n/a	No	1,7
52	HCG03	2021-07-29	08:03	2021-07-29	09:53	1.83	n/a	No	1,7
53	HCG14	2021-07-29	08:23	2021-07-29	09:31	1.12	n/a	No	1,7
54	DC011	2021-08-01	17:17	2021-08-01	17:23	0.09	0.003	No	1,7
		2021-08-01	17:37	2021-08-07	17:38	0.02			
55	S	2021-08-07	16:26	2021-08-07	18:47	2.35	16.689	Yes	1,7
56	HCG03	2021-08-07	14:54	2021-08-07	16:17	1.38	n/a	No	1,7
57	DC011	2021-08-07	14:54	2021-08-07	14:55	0.01	0.006	No	1,7
		2021-08-07	14:56	2021-08-07	14:58	0.02			
		2021-08-07	14:58	2021-08-07	15:01	0.05			
58	HCG14	2021-08-07	14:57	2021-08-07	16:28	1.51	n/a	No	1,7
59	DC012	2021-08-07	14:58	2021-08-07	14:59	0.02	0.00011	No	1,7
		2021-08-07	19:35	2021-08-07	19:35	0.02			
60	HCS03	2021-08-07	15:22	2021-08-07	15:35	0.22	0.101	No	1,7
61	HCS09	2021-08-07	16:11	2021-08-07	18:30	2.31	0.053	No	1,7
62	HCG03	2021-08-11	05:13	2021-08-11	05:58	0.76	n/a	No	1,7
		2021-08-11	06:57	2021-08-11	07:21	0.40			
63	HCG14	2021-08-11	05:19	2021-08-11	06:04	0.76	n/a	No	1,7
64	HCG03	2021-08-17	13:24	2021-08-17	14:12	0.80	n/a	No	1,7
65	HCG14	2021-08-17	13:27	2021-08-17	14:08	0.68	n/a	No	1,7

Hamilton Wastewater

Woodward WWTP Bypass and CSO Overflow Log 2021

Event #	Location	Start Date yyyy-mm-dd	Start Time	Stop Date yyyy-mm-dd	Stop Time	Duration Hours	Volume ML	Disinfection Yes / No	Reason Code
66	HCG03	2021-08-26	19:01	2021-08-26	20:35	1.57	n/a	No	1,7
67	HCG14	2021-08-26	19:11	2021-08-26	20:44	1.54	n/a	No	1,7
68	S	2021-08-26	19:40	2021-08-26	23:51	4.18	65.926	Yes	1,7
69	HC001	2021-08-26	20:06	2021-08-26	20:29	0.38	0.940	No	1,7
70	HCS7C	2021-08-26	20:49	2021-08-26	23:42	2.88	2.695	No	1,7
71	HCG03	2021-08-29	13:56	2021-08-29	14:20	0.39	n/a	No	1,7
		2021-08-29	22:55	2021-08-29	23:42	0.79			
72	HCG14	2021-08-29	14:01	2021-08-29	14:18	0.29	n/a	No	1,7
		2021-08-29	23:09	2021-08-29	23:37	0.47			
73	HCG03	2021-09-05	00:36	2021-09-05	01:08	0.54	n/a	No	1,7
		2021-09-05	02:48	2021-09-05	03:38	0.83			
74	HCG14	2021-09-05	02:58	2021-09-05	03:37	0.65	n/a	No	1,7
75	HCG03	2021-09-07	19:38	2021-09-07	20:51	1.22	n/a	No	1,7
		2021-09-07	21:25	2021-09-08	01:01	3.60			
		2021-09-08	03:38	2021-09-08	05:09	1.51			
76	HCG14	2021-09-07	19:50	2021-09-07	20:27	0.60	n/a	No	1,7
		2021-09-07	21:35	2021-09-08	00:38	3.03			
		2021-09-08	03:45	2021-09-08	04:53	1.14			
77	S	2021-09-07	22:12	2021-09-08	16:24	18.19	213.360	Yes	1,7
78	HC001	2021-09-07	22:47	2021-09-08	00:32	1.75	3.755	No	1,7
79	HCG04	2021-09-07	23:02	2021-09-08	02:16	3.23	n/a	No	1,7
80	HCS04	2021-09-07	23:31	2021-09-08	15:53	16.36	54.750	No	1,7
81	HCS7C	2021-09-08	00:06	2021-09-08	02:35	2.49	4.211	No	1,7
82	HCS01	2021-09-08	00:17	2021-09-08	11:54	11.62	73.655	No	1,7
83	HCS08	2021-09-08	05:50	2021-09-08	09:58	4.14	0.002	No	1,7
84	HCG03	2021-09-09	14:18	2021-09-09	14:41	0.38	n/a	No	1,7
85	HCG03	2021-09-12	19:11	2021-09-12	19:49	0.64	n/a	No	1,7
		2021-09-12	23:28	2021-09-13	00:38	1.17			
86	HCG14	2021-09-12	23:38	2021-09-13	00:16	0.63	n/a	No	1,7
87	HCG03	2021-09-13	21:15	2021-09-13	21:27	0.20	n/a	No	1,7
		2021-09-13	21:59	2021-09-13	23:19	1.33			
88	HCG14	2021-09-13	22:09	2021-09-13	23:14	1.07	n/a	No	1,7
89	S	2021-09-13	23:36	2021-09-14	02:39	3.05	24.033	Yes	1,7

Hamilton Wastewater

Woodward WWTP Bypass and CSO Overflow Log 2021

Event #	Location	Start		Stop		Duration	Volume	Disinfection	Reason
		Date yyyy-mm-dd	Time	Date yyyy-mm-dd	Time	Hours	ML	Yes / No	Code
90	HCG03	2021-09-15	00:06	2021-09-15	00:56	0.84	n/a	No	1,7
91	HCG14	2021-09-15	00:18	2021-09-15	00:57	0.66	n/a	No	1,7
92	HCG03	2021-09-22	05:17	2021-09-22	07:08	1.84	n/a	No	1,7
		2021-09-22	08:52	2021-09-22	13:14	4.35			
		2021-09-22	14:18	2021-09-22	16:14	1.94			
		2021-09-22	19:22	2021-09-23	01:36	6.23			
		2021-09-23	02:59	2021-09-23	03:40	0.69			
93	HCG14	2021-09-22	09:13	2021-09-22	10:10	0.96	n/a	No	1,7
		2021-09-22	19:45	2021-09-22	22:47	3.04			
		2021-09-22	22:47	2021-09-22	22:49	0.02			
94	S	2021-09-22	10:57	2021-09-23	10:44	23.78	272.260	Yes	1,7
95	HCS04	2021-09-22	15:24	2021-09-24	07:08	39.71	164.034	No	1,7
96	DC011	2021-09-22	20:23	2021-09-23	00:15	3.87	0.265	No	1,7
97	HCS01	2021-09-22	20:37	2021-09-23	19:36	22.99	148.260	No	1,7
98	HC001	2021-09-22	20:48	2021-09-23	01:56	5.13	4.095	No	1,7
99	DC012	2021-09-22	21:16	2021-09-22	22:51	1.58	0.044	No	1,7
100	HCS05	2021-09-22	21:47	2021-09-23	18:49	21.03	82.099	No	1,7
101	HW	2021-09-22	21:53	2021-09-23	01:35	3.70	39.140	No	1,7
102	HCS08	2021-09-22	22:04	2021-09-23	12:07	14.05	2.092	No	1,7
103	HCG04	2021-09-22	22:19	2021-09-23	02:01	3.69	n/a	No	1,7
104	HCS7C	2021-09-23	00:38	2021-09-23	01:39	1.03	0.123	No	1,7
105	HCG03	2021-09-25	15:03	2021-09-25	15:23	0.33	n/a	No	1,7
106	HCG03	2021-10-03	13:28	2021-10-03	14:15	0.78	n/a	No	1,7
		2021-10-03	20:19	2021-10-04	07:18	10.99			
		2021-10-04	09:29	2021-10-04	10:12	0.71			
107	HCG14	2021-10-03	20:26	2021-10-04	00:22	3.93	n/a	No	1,7
		2021-10-04	00:45	2021-10-04	02:21	1.60			
		2021-10-04	02:50	2021-10-04	03:26	0.58			
108	S	2021-10-03	21:32	2021-10-04	20:45	23.40	265.084	Yes	1,7
109	DC011	2021-10-03	21:42	2021-10-04	04:06	0.29	0.039	No	1,7
110	HCS04	2021-10-03	22:18	2021-10-04	22:30	24.20	104.529	No	1,7
111	HCG04	2021-10-03	22:41	2021-10-04	04:32	5.85	n/a	No	1,7
112	HCS08	2021-10-03	22:41	2021-10-04	21:14	22.55	4.434	No	1,7

Hamilton Wastewater

Woodward WWTP Bypass and CSO Overflow Log 2021

Event #	Location	Start Date yyyy-mm-dd	Start Time	Stop Date yyyy-mm-dd	Stop Time	Duration Hours	Volume ML	Disinfection Yes / No	Reason Code
113	PH	2021-10-03	22:36	2021-10-04	04:25	5.81	48.434	No	1,3,7
114	HCS7C	2021-10-03	23:14	2021-10-04	04:21	5.11	8.750	No	1,7
115	HCS01	2021-10-03	23:25	2021-10-05	04:29	29.07	228.682	No	1,7
116	HW	2021-10-04	03:00	2021-10-04	07:07	4.12	40.108	No	1,7
117	HCG03	2021-10-09	03:03	2021-10-09	03:21	0.31	n/a	No	1,7
		2021-10-09	03:26	2021-10-09	03:41	0.24			
		2021-10-09	04:16	2021-10-09	08:31	4.25			
		2021-10-09	11:08	2021-10-09	12:04	0.93			
118	HCG14	2021-10-09	04:24	2021-10-09	04:48	0.40	n/a	No	1,7
		2021-10-09	05:08	2021-10-09	07:02	1.89			
119	HC001	2021-10-09	06:01	2021-10-09	10:43	4.70	3.586	No	1,7
120	S	2021-10-09	06:11	2021-10-10	00:15	18.08	156.669	Yes	1,7
121	HCS01	2021-10-09	08:30	2021-10-09	22:49	14.32	59.654	No	1,7
122	HCG03	2021-10-15	19:20	2021-10-15	19:49	0.49	n/a	No	1,7
		2021-10-15	19:53	2021-10-15	21:55	2.03			
123	HCG14	2021-10-15	20:03	2021-10-15	21:10	1.13	n/a	No	1,7
124	HC001	2021-10-15	20:20	2021-10-15	21:07	0.78	1.653	No	1,7
125	S	2021-10-15	20:45	2021-10-16	12:09	15.40	114.737	Yes	1,7
126	HCG03	2021-10-21	19:39	2021-10-21	20:10	0.50	n/a	No	1,7
127	HCG03	2021-10-25	01:42	2021-10-25	03:11	1.49	n/a	No	1,7
		2021-10-25	05:31	2021-10-25	06:19	0.79			
		2021-10-25	08:04	2021-10-25	08:31	0.45			
		2021-10-25	10:04	2021-10-25	12:08	2.07			
		2021-10-25	12:53	2021-10-25	15:07	2.24			
		2021-10-25	16:02	2021-10-25	18:49	2.79			
		2021-10-26	01:03	2021-10-26	02:12	1.14			
		2021-10-26	02:57	2021-10-26	03:38	0.69			
		2021-10-26	04:20	2021-10-26	07:06	2.76			
128	S	2021-10-25	13:50	2021-10-27	05:26	39.61	453.663	No	1,7
129	HCS01	2021-10-25	16:40	2021-10-27	05:45	37.07	279.499	No	1,7
130	HCS04	2021-10-26	05:14	2021-10-27	01:54	20.67	40.147	No	1,7
131	HCS05	2021-10-26	11:18	2021-10-27	07:15	19.95	46.132	No	1,7

Hamilton Wastewater

Woodward WWTP Bypass and CSO Overflow Log 2021

Event #	Location	Start		Stop		Duration	Volume	Disinfection	Reason
		Date yyyy-mm-dd	Time	Date yyyy-mm-dd	Time	Hours	ML	Yes / No	Code
132	HCG03	2021-10-29	16:18	2021-10-29	21:10	4.87	n/a	No	1,7
		2021-10-29	23:42	2021-10-30	05:43	6.02			
133	HCG14	2021-10-29	17:03	2021-10-29	18:27	1.41	n/a	No	1,7
		2021-10-29	19:09	2021-10-29	19:29	0.33			
134	S	2021-10-29	18:06	2021-10-31	01:42	31.59	346.886	No	1,7
135	HCS01	2021-10-30	00:15	2021-10-31	05:16	29.01	211.499	No	1,7
		2021-10-31	15:40	2021-10-31	15:55	0.25			
136	HCS04	2021-10-30	01:24	2021-10-31	09:43	32.32	68.835	No	1,7
137	HCS08	2021-10-30	08:53	2021-10-30	17:03	8.16	0.666	No	1,7
138	HCG03	2021-10-30	20:58	2021-10-30	21:10	0.20	n/a	No	1,7
139	HCG03	2021-11-12	20:01	2021-11-12	20:44	0.72	n/a	No	1,7
140	HCG03	2021-12-05	20:47	2021-12-06	00:28	3.67	n/a	No	1,7
		2021-12-06	08:57	2021-12-06	09:19	0.36			
141	HCG14	2021-12-05	21:16	2021-12-05	21:16	0.01	n/a	No	1,7
		2021-12-05	21:17	2021-12-05	21:35	0.29			
		2021-12-05	21:35	2021-12-05	21:36	0.01			
		2021-12-05	22:13	2021-12-05	22:39	0.43			
		2021-12-05	22:39	2021-12-05	22:40	0.00			
142	S	2021-12-05	22:38	2021-12-06	05:12	6.56	55.288	No	1,7
143	HCG03	2021-12-11	01:54	2021-12-11	02:18	0.39	n/a	No	1,7
		2021-12-11	04:07	2021-12-11	06:25	2.29			
144	HCG14	2021-12-11	04:30	2021-12-11	06:10	1.68	n/a	No	1,7
145	DC011	2021-12-11	05:17	2021-12-11	06:42	1.42	0.106	No	1,7
146	DC012	2021-12-11	05:24	2021-12-11	06:04	0.67	0.038	No	1,7
147	S	2021-12-11	05:40	2021-12-11	14:03	8.38	65.643	No	1,7
148	HCG03	2021-12-25	13:24	2021-12-25	14:14	0.83	n/a	No	1,7
		2021-12-25	15:11	2021-12-25	15:26	0.25			
						888.11	**4059.840**		

Legend / Notes

Bypass/Overflow Locations:

PH= Plant bypass
HW= Headworks bypass
PR= Primary bypass
S = Secondary bypass
HCS01 = Greenhill CSO Tank
HCS02 = Strachan St CSO Tank
HCS03 = James St CSO Tank
HCS04 = Main/King CSO Tank
HCS05 = Eastwood CSO Tank
HCS7C = Red Hill CSO Tank
HCS08 = Royal CSO Tank
HCS09 = McMaster CSO Tank
HCG03 = Wentworth CSO Outfall
HCG04 = Strathearne CSO Outfall
HCG14 = Wellington CSO Outfall
HC001 = Parkdale Pump Station
DC011 = Pleasant/Edenbridge Pump Station
DC012 = Pleasant/Sunrise Pump Station

Reason Codes:

1. Heavy Precipitation
2. Snow Melt
3. Equipment Failure
4. Equipment Maintenance
5. Sewer Problems
6. Power Failure
7. Exceed Design
8. Other

Volume Determination:

Bypass flow volumes at the Woodward WWTP are estimated.
CSO tank overflow volumes are measured.
Pumping stations overflow volumes are measured.

Bypass Treatment Levels:

Plant bypass (PH) - no treatment
Headworks bypass (HW) - receives preliminary treatment
Primary bypass (PR) - receives preliminary treatment
Secondary bypass (S) - receives preliminary and primary treatment
CSO tank overflows receive no treatment prior to discharge.

Bypass Sample Locations:

Plant: Headworks in front of the barscreens
Primary / Headworks: Inlet of the Primary Clarifiers
Secondary: Outlet of the Primary Clarifiers

Note: a Final Effluent Outfall sample must be collected for all bypass types

Appendix B: Active/on-going Sample Program Details

Current Internal and External Water Quality Monitoring & Sampling Programs Throughout the City of Hamilton

STAKEHOLDER	Conservation Authority	Watershed	Sub-watershed	PROGRAM	PRIVATE Site ID	CITY ID (IPS)	Sample Method (Grab or Composite)	Sample Frequency	Duration	Parameters	Status (Active/Inactive)	Permission for Data Sharing through LIMS	UTM Easting (Zone 17)	UTM Northing (Zone 17)	Latitude	Longitude	Road Access	Other Description
EXTERNAL - CA SITE	Niagara Peninsula Conservation Authority	Welland River	Buckhorn Creek	NPCA Surface Water Monitoring	BU001		Grab	Monthly	Ice free seasons (approx. 8-9 months)	general chemistry, nutrients, metals and bacteria	Active	Not on LIMS; data will be sent by Stakeholder via email , when data is requested.	598136.9	4768694.7	43.064612	-79.794732	Haldibrook Road	
EXTERNAL - CA SITE	Niagara Peninsula Conservation Authority	Twenty Mile Creek	Twenty Mile Creek	NPCA Surface Water Monitoring	TN001		Grab	Monthly	Ice free seasons (approx. 8-9 months)	general chemistry, nutrients, metals and bacteria	Active		589469.125	4782649.375	43.19132	-79.898914	Twenty Road	
EXTERNAL - CA SITE	Niagara Peninsula Conservation Authority	Twenty Mile Creek	Three Mile Creek	NPCA Surface Water Monitoring	TN002		Grab	Monthly	Ice free seasons (approx. 8-9 months)	general chemistry, nutrients, metals and bacteria	Active		590516.325	4779498.675	43.162829	-79.886544	English Church Road	
EXTERNAL - CA SITE	Niagara Peninsula Conservation Authority	Twenty Mile Creek	Twenty Mile Creek	NPCA Surface Water Monitoring	TN003		Grab	Monthly	Ice free seasons (approx. 8-9 months)	general chemistry, nutrients, metals and bacteria	Active		602041.9302	4776483.683	43.134219	-79.745352	Woodburn Road	
EXTERNAL - CA SITE	Niagara Peninsula Conservation Authority	Welland River	Welland River West	NPCA Surface Water Monitoring	WR000		Grab	Monthly	Ice free seasons (approx. 8-9 months)	general chemistry, nutrients, metals and bacteria	Active		585551.9684	4780318.682	43.17079	-79.947474	Butter Road	
EXTERNAL - CA SITE	Niagara Peninsula Conservation Authority	Welland River	Welland River West	NPCA Surface Water Monitoring	WR001		Grab	Monthly	Ice free seasons (approx. 8-9 months)	general chemistry, nutrients, metals and bacteria	Active		586431.475	4779277.825	43.161319	-79.936818	Airport Road	
EXTERNAL - CA SITE	Niagara Peninsula Conservation Authority	Welland River	Welland River West	NPCA Surface Water Monitoring	WR002		Grab	Monthly	Ice free seasons (approx. 8-9 months)	general chemistry, nutrients, metals and bacteria	Active		586882.275	4779149.375	43.160111	-79.931294	Airport Road	
EXTERNAL - CA SITE	Niagara Peninsula Conservation Authority	Welland River	Welland River West	NPCA Surface Water Monitoring	WR003		Grab	Monthly	Ice free seasons (approx. 8-9 months)	general chemistry, nutrients, metals and bacteria	Active		591002.125	4773783.525	43.111317	-79.881507	Tyneside Road	
EXTERNAL - CA SITE	Niagara Peninsula Conservation Authority	Welland River	Welland River West	NPCA Surface Water Monitoring	WR00A		Grab	Monthly	Ice free seasons (approx. 8-9 months)	general chemistry, nutrients, metals and bacteria	Active		584533.72	4782159.98	43.187482	-79.959718	Book St.	
EXTERNAL - CA SITE	Niagara Peninsula Conservation Authority	Welland River	Welland River West	NPCA Surface Water Monitoring	WR004		Grab	Monthly	Ice free seasons (approx. 8-9 months)	general chemistry, nutrients, metals and bacteria	Active		595536.26	4772538.05	43.099545	-79.826005	Harrison Road	
EXTERNAL - CA SITE	Niagara Peninsula Conservation Authority	Welland River	Welland River West	NPCA Surface Water Monitoring	WR020		Grab	Monthly	Ice free seasons (approx. 8-9 months)	general chemistry, nutrients, metals and bacteria	Active		587464.93	4776185.81	43.133362	-79.924596	Highway 6	
EXTERNAL - CA SITE	Hamilton Conservation Authority	Spencer Creek	Upper Spencer Creek	PWQMN	9000800702		Grab	Monthly	8 Months/Year (April - November)	Chloride, TSS, nitrogen, phosphorus, E.coli, metals	Active	E.coli data is shared through LIMS; remaining parameters (analyses through MECP Lab) to be shared by HCA via email, when data is requested.	574723	4800433	43.353038	-80.077953	Safari Rd. & Spencer Creek	Westover
EXTERNAL - CA SITE	Hamilton Conservation Authority	Spencer Creek	Middle Spencer Creek	PWQMN	9000800602		Grab	Monthly	8 Months/Year (April - November)	Chloride, TSS, nitrogen, phosphorus, E.coli, metals	Active		576826	4792678	43.283004	-80.053092	Highway 5 & Spencer Creek	Highway 5
EXTERNAL - CA SITE	Hamilton Conservation Authority	Spencer Creek	Middle Spencer Creek	PWQMN	9000800502		Grab	Monthly	8 Months/Year (April - November)	Chloride, TSS, nitrogen, phosphorus, E.coli, metals	Active		584060	4790786	43.265198	-79.964232	Mill St. & Market St. S.	Dundas
EXTERNAL - CA SITE	Hamilton Conservation Authority	Red Hill Creek	Upper Ottawa	PWQMN	9000100402		Grab	Monthly	8 Months/Year (April - November)	Chloride, TSS, nitrogen, phosphorus, E.coli, metals	Active		595856	4783739	43.200347	-79.820138	Arbour Rd. & Albion Falls Parking Lot	Mt Albion
EXTERNAL - CA SITE	Hamilton Conservation Authority	Red Hill Creek	Red Hill Valley	PWQMN	9000100502		Grab	Monthly	8 Months/Year (April - November)	Chloride, TSS, nitrogen, phosphorus, E.coli, metals	Active		598679	4787347	43.232465	-79.784753	Queenston Rd. & Red Hill Creek	Red Hill Queenston
EXTERNAL - CA SITE	Hamilton Conservation Authority	Stoney-Battlefield Creeks	Stoney Creek	PWQMN	6005000202		Grab	Monthly	8 Months/Year (April - November)	Chloride, TSS, nitrogen, phosphorus, E.coli, metals	Active		601411	4786566	43.225071	-79.751259	Queenston Rd. & Stoney Creek	Stoney Creek
EXTERNAL - CA SITE	Conservation Halton	Grindstone Creek	Grindstone Creek Subwatershed 230	PWQMN	9000902402 / GRN-5		Grab	Monthly	8 Months/Year (April - November)	general chemistry, nutrients, metals	Active	Not on LIMS; data will be sent by Stakeholder via email , when data is requested.	591735.950	4794723.503	43.30138	-79.86883	Unsworth Avenue north of Plains Road West	~200m downstream of Unsworth Avenue within RBG lands
EXTERNAL - CA SITE	Hamilton Conservation Authority	Spencer Creek	Chedoke Creek	HHRAP	CC-3		Grab	Bi-weekly	Year Round	Ammonia, E.coli, nitrate, nitrite, o-phosphate, TP, TSS, VSS	Active	Yes, data is shared through LIMS	589391.05	4789899.19	43.2566	-79.8987	Frid St.	
EXTERNAL - CA SITE	Hamilton Conservation Authority	Spencer Creek	Chedoke Creek	HHRAP	CC-5		Grab	Bi-weekly	Year Round	Ammonia, E.coli, nitrate, nitrite, o-phosphate, TP, TSS, VSS	Active		588153.63	4789538.67	43.2535	-79.914	Stroud Rd. & Stroud Park	
EXTERNAL - CA SITE	Hamilton Conservation Authority	Spencer Creek	Chedoke Creek	HHRAP	CC-7		Grab	Bi-weekly	Year Round	Ammonia, E.coli, nitrate, nitrite, o-phosphate, TP, TSS, VSS	Active		586873.92	4788666.91	43.2458	-79.9299	Scenic Dr. & Chedoke Radial Trailhead	
EXTERNAL - CA SITE	Hamilton Conservation Authority	Spencer Creek	Chedoke Creek	HHRAP	CC-9		Grab	Bi-weekly	Year Round	Ammonia, E.coli, nitrate, nitrite, o-phosphate, TP, TSS, VSS	Active		589253.04	4788664.45	43.2455	-79.9006	Chedoke Ave. & Hillcrest Ct.	
EXTERNAL - CA SITE	Hamilton Conservation Authority	Spencer Creek	Lower Spencer Creek	HHRAP	CP-7		Grab	Bi-weekly	Year Round	Ammonia, E.coli, nitrate, nitrite, TP, TSS, VSS	Active		586988.87	4791100.88	43.2677	-79.9281	Cootes Dr. & Spencer Creek Trail	
EXTERNAL - CA SITE	Hamilton Conservation Authority	Spencer Creek	Chedoke Creek	HHRAP	CP-11		Grab	Bi-weekly	Year Round	Ammonia, E.coli, nitrate, nitrite, o-phosphate, TP, TSS, VSS	Active		589810.4	4791337.58	43.2695	-79.8933	Macklin St. N & Kay Drage Park Bridge	
EXTERNAL - CA SITE	Hamilton Conservation Authority	Spencer Creek	Borers Creek	HHRAP	CP-18		Grab	Bi-weekly	Year Round	Ammonia, E.coli, nitrate, nitrite, TP, TSS, VSS	Active		586744.43	4791808.61	43.2741	-79.931	Olympic Dr. & Olympic Ice Surface Arena	
EXTERNAL - CA SITE	Hamilton Conservation Authority	Spencer Creek	Ancaster Creek	HHRAP	AC-1		Grab	Bi-weekly	Year Round	Ammonia, E.coli, nitrate, nitrite, TP, TSS, VSS	Active		586928.64	4750733.56	43.2644	-79.9289	Westaway Rd. & McMaster Parking Lot P	
EXTERNAL - CA SITE	Hamilton Conservation Authority	Spencer Creek	Ancaster Creek	HHRAP	AC-2		Grab	Bi-weekly	Year Round	Ammonia, E.coli, nitrate, nitrite, TP, TSS, VSS	Active		585791.21	4789530.61	43.2537	-79.9431	Lynden Ave. & Little John Rd.	
EXTERNAL - CA SITE	Hamilton Conservation Authority	Spencer Creek	Ancaster Creek	HHRAP	AC-3		Grab	Bi-weekly	Year Round	Ammonia, E.coli, nitrate, nitrite, TP, TSS, VSS	Active		585799.46	4789519.61	43.2536	-79.943	Lynden Ave. & Little John Rd.	
EXTERNAL - CA SITE	Hamilton Conservation Authority	Spencer Creek	Ancaster Creek	HHRAP	AC-5		Grab	Bi-weekly	Year Round	Ammonia, E.coli, nitrate, nitrite, TP, TSS, VSS	Active		583337.98	4787000.95	43.2312	-79.9737	Rosseaux St. & Wilson St. E.	
CITY SURFACE WATER MONITORING SITE	Hamilton Conservation Authority	Spencer Creek	Chedoke Creek	EME Surface Water Monitoring Program		CC_SW1	Grab	Quarterly	Year Round	E. Coli, Field: DO, Field: Temp	Active	Yes, data is shared through LIMS			43.2735	-79.89351		
CITY SURFACE WATER MONITORING SITE	Hamilton Conservation Authority	Spencer Creek	Chedoke Creek	EME Surface Water Monitoring Program		CC_SW2	Grab	Quarterly	Year Round	E. Coli, Field: DO, Field: Temp	Active				43.26862	-79.89334		
CITY SURFACE WATER MONITORING SITE	Hamilton Conservation Authority	Spencer Creek	Chedoke Creek	EME Surface Water Monitoring Program		CC_SW3	Grab	Quarterly	Year Round	E. Coli, Field: DO, Field: Temp	Active				43.26271	-79.89408		

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CITY SURFACE WATER MONITORING SITE	Hamilton Conservation Authority	Spencer Creek	Chedoke Creek	EME Surface Water Monitoring Program		CC_SW5	Grab	Quarterly	Year Round	E. Coli, Field: DO, Field: Temp	Active				43.25647	-79.89878		
EXTERNAL - RBG SITE	Hamilton Conservation Authority	Cootes Paradise	Cootes Paradise	RBG Water Quality Cootes Paradise	CP1		Grab	Bi-weekly	May 13 - Sept 30	Ammonia, E.coli, TDP., TP. TSS. VSS	Active		589465.5763	4792411.434	43.279209	-79.897374		East End
EXTERNAL - RBG SITE	Hamilton Conservation Authority	Spencer Creek	Lower Spencer Creek	RBG Water Quality Cootes Paradise	CP16		Grab	Bi-weekly	May 13 - Sept 30	Ammonia, E.coli, TDP., TP. TSS. VSS	Active		588904.7709	4791447.326	43.270595	-79.90444		Westdale Inlet
EXTERNAL - RBG SITE	Hamilton Conservation Authority	Cootes Paradise	Cootes Paradise	RBG Water Quality Cootes Paradise	CP2		Grab	Bi-weekly	May 13- Sept 30	Ammonia, DOC, Nitrite/Nitrate, E.coli, TDP. TP. TSS. VSS.	Active		588711.0898	4791911.194	43.274795	-79.906751		Mid Marsh
EXTERNAL - RBG SITE	Hamilton Conservation Authority	Cootes Paradise	Cootes Paradise	RBG Water Quality Cootes Paradise	CP5		Grab	Bi-weekly	August- Sept 30	Ammonia, E.coli, Nitrate/Nitrite, TDP, TP, TSS. VSS	Active		586805.3287	4791414.472	43.270545	-79.930312		West Pond
EXTERNAL - RBG SITE	Halton Region Conservation Authority	Hamilton Harbour	Grindstone Creek Watershed	RBG Water Quality Grindstone Marsh	GC1		Grab	Bi-weekly	May 13- Sept 30	Ammonia, DOC, Nitrite/Nitrate, E.coli, TDP. TP. TSS. VSS	Active		590280.3252	4793468.216	43.288626	-79.887161		Carolls Bay
EXTERNAL - RBG SITE	Halton Region Conservation Authority	Grindstone Creek	Grindstone Creek Subwatershed 232	RBG Water Quality Grindstone Marsh	GC5		Grab	Bi-weekly	May 13 - Sept 30	Ammonia, E.coli, TDP, TP, TSS. VSS	Active		590235.1509	4793853.098	43.292096	-79.887654		Long Pond
CITY CSO TANK EFFLUENT SITE	Hamilton Conservation Authority	Hamilton Harbour	Urban Hamilton	ECA Compliance Sampling Program		RS00001 EFFLUENT	Auto Sampler - Composite	Wet Weather Overflow Event	Year Round	as per ECA, BOD, Suspended Solids, Free	Active	Yes, data is shared through LIMS			43.27367	-79.85505		EASTWOOD PARK CSO TANK
CITY CSO TANK EFFLUENT SITE	Hamilton Conservation Authority	Spencer Creek	Ancaster Creek	ECA Compliance Sampling Program		RS00002 EFFLUENT	Auto Sampler - Composite	Wet Weather Overflow Event	Year Round	Ammonia as Nitrogen, TKN, Total Phosphorus, E.coli, Zinc, Lead, Copper	Active				43.26028	-79.93202		MCMASTER CSO TANK
CITY CSO TANK EFFLUENT SITE	Hamilton Conservation Authority	Red Hill Creek	Red Hill Valley	ECA Compliance Sampling Program		RS00003 EFFLUENT	Auto Sampler - Composite	Wet Weather Overflow Event	Year Round		Active				43.24316	-79.77061		RED HILL VALLEY CSO TANK
CITY CSO TANK EFFLUENT SITE	Hamilton Conservation Authority	Spencer Creek	Chedoke Creek	ECA Compliance Sampling Program		RS00004 EFFLUENT	Auto Sampler - Composite	Wet Weather Overflow Event	Year Round		Active				43.25299	-79.91528		ROYAL CSO TANK
CITY CSO TANK EFFLUENT SITE	Hamilton Conservation Authority	Hamilton Harbour	Urban Hamilton	ECA Compliance Sampling Program		RS00005 EFFLUENT	Auto Sampler - Composite	Wet Weather Overflow Event	Year Round		Active				43.26927	-79.86882		STRACHAN CSO TANK
CITY CSO TANK EFFLUENT SITE	Hamilton Conservation Authority	Spencer Creek	Chedoke Creek	ECA Compliance Sampling Program		RS00006 EFFLUENT	Auto Sampler - Composite	Wet Weather Overflow Event	Year Round		Active				43.26104	-79.89152		MAIN KING CSO TANK
CITY WWTP DISCHARGE	Hamilton Conservation Authority	Cootes Paradise	Cootes Paradise	ECA Compliance Sampling Program		RSZ0001 EFFLUENT	Auto Sampler - Composite	Wet Weather Overflow Event	Year Round		Active				43.26775	-79.94264		DUNDAS WWTP
CITY WWTP DISCHARGE	Hamilton Conservation Authority	Red Hill Creek	Red Hill Valley	ECA Compliance Sampling Program		WWTP WOODWARD FEO	Auto Sampler - Composite	Wet Weather Overflow Event	Year Round		Active				43.25589	-79.77255		WOODWARD WWTP
CITY WWTP DISCHARGE	Hamilton Conservation Authority	Red Hill Creek	Red Hill Valley	ECA Compliance Sampling Program		Secondary Bypass	Grab	Bypass Event	Year Round	as per ECA, BOD, Suspended Solids, Free	Active	Yes, data is shared through LIMS			43.252216	-79.77228		outlet of the primary clarifiers, just upstream of the Secondary Bypass Gate
CITY WWTP DISCHARGE	Hamilton Conservation Authority	Red Hill Creek	Red Hill Valley	ECA Compliance Sampling Program		Primary Bypass	Grab			Ammonia as Nitrogen, TKN, Total Phosphorus, E.coli, Zinc, Lead, Copper	Active				43.252444	-79.77335		inlet to the primary clarifiers, just upstream of the Primary Bypass Gate
CITY WWTP DISCHARGE	Hamilton Conservation Authority	Red Hill Creek	Red Hill Valley	ECA Compliance Sampling Program		Headworks Bypass	Grab				Active				43.252097	-79.774186		inlet to the primary clarifiers, just upstream of the Primary Bypass Gate
CITY WWTP DISCHARGE	Hamilton Conservation Authority	Red Hill Creek	Red Hill Valley	ECA Compliance Sampling Program		Plant Bypass	Grab				Active				43.252396	-79.773633		east influent channel, from hatch upstream of the East Influent Gate
Consultant - CITY WUP WWTP EXPANSION PROGRAM	Hamilton Conservation Authority	Red Hill Creek	Red Hill Valley	CITY WUP WWTP EXPANSION PROGRAM	WQ1		Grab	Six (6) times a year (2 wet/4 dry weather events)	March - December	Inorganics & Metals	Active	Yes, data is shared through LIMS			43.251977	-79.764867		
Consultant - CITY WUP WWTP EXPANSION PROGRAM	Hamilton Conservation Authority	Red Hill Creek	Red Hill Valley	CITY WUP WWTP EXPANSION PROGRAM	WQ2		Grab	Six (6) times a year (2 wet/4 dry weather events)	March - December		Active				43.254556	-79.76664		
Consultant - CITY WUP WWTP EXPANSION PROGRAM	Hamilton Conservation Authority	Red Hill Creek	Red Hill Valley	CITY WUP WWTP EXPANSION PROGRAM	WQ3		Grab	Six (6) times a year (2 wet/4 dry weather events)	March - December		Active				43.257836	-79.769725		
Consultant - CITY WUP WWTP EXPANSION PROGRAM	Hamilton Conservation Authority	Red Hill Creek	Red Hill Valley	CITY WUP WWTP EXPANSION PROGRAM	WQ4		Grab	Six (6) times a year (2 wet/4 dry weather events)	March - December		Active				43.261441	-79.771637		
Consultant - CITY WUP WWTP EXPANSION PROGRAM	Hamilton Conservation Authority	Red Hill Creek	Red Hill Valley	CITY WUP WWTP EXPANSION PROGRAM	WQ5		Grab	Six (6) times a year (2 wet/4 dry weather events)	March - December		Active				43.263622	-79.773826		
EXTERNAL - ECCC SITE	Conservation Halton & Hamilton Conservation Authority	Hamilton Harbour	Hamilton Harbour	Central Station Monitoring	9031			Monthly (weather permitting) January to March; bi-weekly April and May; weekly from June to September; bi-weekly October and November; Monthly (weather permitting) December	Year Round	Phosphorus, oxygen, ammonia, nitrate+nitrite, chlorophyll, Secchi transparency, particulate organic carbon and nitrogen, dissolved organic and inorganic carbon, temperature/oxygen/conductivity profiles	Active	On Federal Open Portal website; D Depew has also indicated can send most recent sample results via email, if requested. ECCC open to discussing/ establishing an open data sharing agreement between the lab for trending and City Interactive Map.						
EXTERNAL - ECCC SITE	Conservation Halton & Hamilton Conservation Authority	Hamilton Harbour	Hamilton Harbour	Central Station Monitoring	1001			Monthly (weather permitting) January to March; bi-weekly April and May; weekly from June to September; bi-weekly October and November; Monthly (weather permitting) December	Year Round	Phosphorus, oxygen, ammonia, nitrate+nitrite, chlorophyll, Secchi transparency, particulate organic carbon and nitrogen, dissolved organic and inorganic carbon, temperature/oxygen/conductivity profiles	Active							
EXTERNAL - ECCC SITE	Conservation Halton & Hamilton Conservation Authority	Hamilton Harbour	Hamilton Harbour	Central Station Monitoring	9030			Monthly (weather permitting) January to March; bi-weekly April and May; weekly from June to September; bi-weekly October and November; Monthly (weather permitting) December	Year Round	Phosphorus, oxygen, ammonia, nitrate+nitrite, chlorophyll, Secchi transparency, particulate organic carbon and nitrogen, dissolved organic and inorganic carbon, temperature/oxygen/conductivity profiles	Active							
EXTERNAL - ECCC SITE	Conservation Halton & Hamilton Conservation Authority	Hamilton Harbour	Hamilton Harbour	Central Station Monitoring	9033			Monthly (weather permitting) January to March; bi-weekly April and May; weekly from June to September; bi-weekly October and November; Monthly (weather permitting) December	Year Round	Phosphorus, oxygen, ammonia, nitrate+nitrite, chlorophyll, Secchi transparency, particulate organic carbon and nitrogen, dissolved organic and inorganic carbon, temperature/oxygen/conductivity profiles	Active							

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EXTERNAL - REDEEMER UNIVERSITY	Hamilton Conservation Authority			Water Monitoring Project	Scenic Waterfall		Triplicate grab	every two weeks in May and June plus weekly for a 5-6 week stretch in Oct/Nov	Spring & Fall Semesters	nitrate, phosphate, TP, BOD5, chloride, E. coli and total coliform, (and with less frequency, microbial source tracking)	Active	Yes			43.2440075	-79.9346734		
EXTERNAL - REDEEMER UNIVERSITY	Hamilton Conservation Authority			Water Monitoring Project	Princess Falls		Triplicate grab				Active				43.2458048	-79.9298878		
EXTERNAL - REDEEMER UNIVERSITY	Hamilton Conservation Authority			Water Monitoring Project	Mountview Waterfall		Triplicate grab				Active				43.245625	-79.9214833		
EXTERNAL - REDEEMER UNIVERSITY	Hamilton Conservation Authority			Water Monitoring Project	Cliffview Falls		Triplicate grab				Active				43.245585	-79.9083939		
EXTERNAL - REDEEMER UNIVERSITY	Hamilton Conservation Authority			Water Monitoring Project	Westcliffe Falls		Triplicate grab				Active				43.2452308	-79.9087555		
EXTERNAL - REDEEMER UNIVERSITY	Hamilton Conservation Authority			Water Monitoring Project	Chedoke Falls		Triplicate grab				Active				43.2436553	-79.9000839		
EXTERNAL - REDEEMER UNIVERSITY	Hamilton Conservation Authority			Water Monitoring Project	Creek in Chedoke Golf Course		Triplicate grab				Active				43.2515745	-79.9104464		
EXTERNAL - REDEEMER UNIVERSITY	Hamilton Conservation Authority			Water Monitoring Project	Creek in Stroud Park		Triplicate grab				Active				43.2527987	-79.9161277		
EXTERNAL - REDEEMER UNIVERSITY	Hamilton Conservation Authority			Water Monitoring Project	Princess Point		Triplicate grab				Active				43.2732701	-79.8935819		
EXTERNAL - REDEEMER UNIVERSITY	Hamilton Conservation Authority			Water Monitoring Project	Upper Ottawa Creek		Triplicate grab	sample every two weeks in May-June			Active				43.2033045	-79.8364841		
EXTERNAL - REDEEMER UNIVERSITY	Hamilton Conservation Authority			Water Monitoring Project	Hannon Creek		Triplicate grab				Active				43.1955958	-79.8265171		
EXTERNAL - REDEEMER UNIVERSITY	Hamilton Conservation Authority			Water Monitoring Project	Upper Davis Creek (Felker's Creek)		Triplicate grab				Active				43.1963805	-79.7896142		
EXTERNAL - REDEEMER UNIVERSITY	Hamilton Conservation Authority			Water Monitoring Project	Upper Glendale Falls		Triplicate grab				Active				43.2021442	-79.8097958		
EXTERNAL - REDEEMER UNIVERSITY	Hamilton Conservation Authority			Water Monitoring Project	Lower Davis Creek (King and Quigley)		Triplicate grab				Active				43.222365	-79.7831875		
EXTERNAL - REDEEMER UNIVERSITY	Hamilton Conservation Authority			Water Monitoring Project	Red Hill Trail		Triplicate grab				Active				43.2257966	-79.79299		
EXTERNAL - REDEEMER UNIVERSITY	Hamilton Conservation Authority			Water Monitoring Project	Globe Park		Triplicate grab				Active				43.2484465	-79.7675357		
EXTERNAL - REDEEMER UNIVERSITY	Hamilton Conservation Authority			Water Monitoring Project	Buttermilk Falls		Triplicate grab				Active				43.2053967	-79.8198383		
EXTERNAL - REDEEMER UNIVERSITY	Hamilton Conservation Authority			Water Monitoring Project	Greenhill Park		Triplicate grab				Active				43.2110226	-79.7887561		
EXTERNAL - REDEEMER UNIVERSITY	Hamilton Conservation Authority			Water Monitoring Project	Red Hill at Woodward		Triplicate grab				Active				43.26241	-79.7723479		
EXTERNAL - REDEEMER UNIVERSITY	Hamilton Conservation Authority			Water Monitoring Project	Albion Falls		Triplicate grab				Active				43.2005	-79.8224		
EXTERNAL - MECP	Conservation Halton & Hamilton Conservation Authority	Hamilton Harbour	Hamilton Harbour	MECP GL Index and Reference Centre Station Monitoring	Station 258		Multi-media sampling	Water Qulaity sampling occurs approx. every 3 years .. Sediment sampling, every 6 years.	spring, summer, fall	Major ions, nutrient status, metals, PCB/OCs, PAHs, physical parameters Surface Water Samples: Turbidity, Chloride, Cations (Ca, Mg, Na, K), Chlorophyll, DOC and Silicate, Nitrates and Ammonium, Mercury, Suspended Solids, Total P and Kjeldahl-nitrogen, Alkalinity, Conductivity, Lab pH, Sulphate, Metals scan by ICP Sediment Samples:, chlorobenzenes, OC pesticides, PAHs, PCB-total, Chlorinated dioxins and furans, Dioxin-like PCB congers, mercury, arsenic, metals scan, Particle size, TOC, Total P & N	Active				43.288806,	-79.83625		Position: Lat. 43 17 19.7 Long. 79 50 10.5
EXTERNAL - DFO	Fisheries and Oceans Canada (DFO)	Hamilton Harbour & Red Hill Creek		Dissovled Oxygen and Temperature Monitoring Program for Fish Habitat			10 consistent locations (5 in HH, 3 at CP and GS, 2 at Redhill/Winderemer), loggers record at 15min intervals for the deployment period (6 months per season, or year-round. Additional locations are deployed based on monitoring needs. Comtcat DFO is you would like addional detials on their DO monitoring.											
CITY LANDFILL SITES				Ancaster		SW4	Grab	1x annual		General Chemistry Phenol Metal Turbidity	Active				43.2114552	-80.0204612		Close to Laurel Ct
CITY LANDFILL SITES				Ancaster		SW5	Grab	1x annual		General Chemistry Phenol Metal Turbidity	Active				43.2080888	-80.0234485		Close to the 403; on the side of the soccer fields
CITY LANDFILL SITES				Ancaster		SW6	Grab	1x annual		General Chemistry Phenol Metal Turbidity	Active				43.2118677	-80.0251463		Pond backing onto Griffiths property (PW1)

CITY LANDFILL SITES				Ancaster		SW7	Grab	1x annual		General Chemistry Phenol Metal Turbidity	Active				43.2099636	-80.0223354		Along the path past the second set of gates, at the other end of the soccer fields
CITY LANDFILL SITES				Ancaster		PW1	Grab	1x annual		General Chemistry Phenol Metal Turbidity VOCs PAHs	Active				43.2120495	-80.0258625		856 jerseyville road; Griffiths property
CITY LANDFILL SITES				Ancaster		MH1	Grab	1x annual		General Chemistry Phenol Metal Turbidity VOCs PAHs	Active				43.2116194	-80.0240332		next to panel; along driving path beside soccer fields
CITY LANDFILL SITES				Ancaster		SW11	Grab	1x annual		General Chemistry Phenol Metal Turbidity	Active				43.2079363	-80.0204766		in the ditch off of 403 on the opposite side of soccer fields
CITY LANDFILL SITES				Ancaster		SW14	Grab	1x annual		General Chemistry Phenol Metal Turbidity	Active				43.2065835	-80.0231588		on the east side of the driving path
CITY LANDFILL SITES				Ancaster		SW16	Grab	1x annual		General Chemistry Phenol Metal Turbidity	Active				43.2053049	-80.0251007		East of the driving path, furthest location out
CITY LANDFILL SITES				Binbrook		SW1	Grab	2x annual		General Chemistry Metals Phenols Turbidity	Active				43.1115104	-79.8342776		Closest to MW3 on outer boundary of landfill
CITY LANDFILL SITES				Binbrook		SW2	Grab	2x annual		General Chemistry Metals Phenols Turbidity	Active				43.112789	-79.8344707		Off of fletcher Road south of the landfill
CITY LANDFILL SITES				Binbrook		SW3	Grab	2x annual		General Chemistry Metals Phenols Turbidity	Active				43.1109602	-79.8335829		in the stream cutting through farm field
CITY LANDFILL SITES				Brampton		SW1	Grab	2X annual Reduced sampling in the fall (Gen chem and Phenol only)		General Chemistry Metals Phenols PCBs PAHs	Active				43.2484679	-79.7675718		Closest to Rennie Landfill
CITY LANDFILL SITES				Brampton		SSE	Grab	2X annual Reduced sampling in the fall (Gen chem and Phenol only)		General Chemistry Metals Phenols PCBs PAHs	Active				43.2483541	-79.7672573		A culvert directly across from SW1; across the river
CITY LANDFILL SITES				Brampton		SW2	Grab	2X annual Reduced sampling in the fall (Gen chem and Phenol only)		General Chemistry Metals Phenols PCBs PAHs	Active				43.2505241	-79.7655822		in the stream in between N4 and N5
CITY LANDFILL SITES				Brampton		SW3	Grab	2X annual Reduced sampling in the fall (Gen chem and Phenol only)		General Chemistry Metals Phenols PCBs PAHs	Active				43.252781	-79.7657539		past the redhill bridge past N7
CITY LANDFILL SITES				Brampton		SSN	Grab	2X annual Reduced sampling in the fall (Gen chem and Phenol only)		General Chemistry Metals Phenols PCBs PAHs	Active				43.2523864	-79.7674102		under construction currently
CITY LANDFILL SITES				Brampton		SSN-B	Grab	2X annual Reduced sampling in the fall (Gen chem and Phenol only)		General Chemistry Metals Phenols PCBs PAHs	Active				43.2528025	-79.7672251		under construction currently
CITY LANDFILL SITES				Brampton		SW4	Grab	2X annual Reduced sampling in the fall (Gen chem and Phenol only)		General Chemistry Metals Phenols PCBs PAHs	Active				43.253709	-79.7668107		unnaccesible due to construction
CITY LANDFILL SITES				Brampton		SW5	Grab	2X annual Reduced sampling in the fall (Gen chem and Phenol only)		General Chemistry Metals Phenols PCBs PAHs	Active				43.2547443	-79.7667664		unnaccesible due to construction
CITY LANDFILL SITES				Edgewood		SW1	Grab	4x annual		General Chemistry Metals	Active				43.3561426	-79.9952531		along edgewood road in the culvert close to BH3 and BH3A
CITY LANDFILL SITES				Edgewood		SW2	Grab	4x annual		General Chemistry Metals	Active				43.3538832	-79.9944967		along edgewood road in a culvert
CITY LANDFILL SITES				Edgewood		SW3	Grab	4x annual		General Chemistry Metals	Active				43.3580363	-79.9941668		across from the corn field in the phragmites
CITY LANDFILL SITES				Edgewood		SW4	Grab	4x annual		General Chemistry Metals	Active				43.3567735	-79.9989438		along the outside boundary of the landfill close to MW7
CITY LANDFILL SITES				Edgewood		SW5	Grab	4x annual		General Chemistry Metals	Active				43.3470607	-80.0010064		off of concession road 6 West in a culvert
CITY LANDFILL SITES				Edgewood		SW6	Grab	4x annual		General Chemistry Metals	Active				43.3584156	-79.996727		across from BH5 in a ditch on edgewood road; typically dry

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CITY LANDFILL SITES				Glanbrook		SW1	Grab	3x annual		General Chemistry Metals Phenols Turbidity	Active				43.0744367	-79.8076916		off of trimble road next to bridge
CITY LANDFILL SITES				Glanbrook		SW2	Grab	3x annual		General Chemistry Metals Phenols Turbidity	Active				43.0652568	-79.7965953		Off of haldibrook road near the culvert
CITY LANDFILL SITES				Glanbrook		SW3	Grab	3x annual		General Chemistry Metals Phenols Turbidity	Active				43.0646435	-79.7947365		off the bridge near the landfill entrance
CITY LANDFILL SITES				Glanbrook		SW4	Grab	3x annual		General Chemistry Metals Phenols Turbidity	Active				43.0614101	-79.7828436		Off of short road near the bridge, past BH102
CITY LANDFILL SITES				Glanbrook		SW5	Grab	3x annual		General Chemistry Metals Phenols Turbidity	Active				43.0711607	-79.8004979		past the gate near the compost pond, in the phragmites
CITY LANDFILL SITES				Glanbrook		SW6	Grab	3x annual		General Chemistry Metals Phenols Turbidity	Active				43.0727125	-79.7828436		Off the bridge off on Hall road just past GM 10A
CITY LANDFILL SITES				Glanbrook		SW7	Grab	3x annual		General Chemistry Metals Phenols Turbidity	Active				43.0689505	-79.7805691		Off the bridge on Woodburn Road
CITY LANDFILL SITES				Glanbrook		SW8	Grab	3x annual		General Chemistry Metals Phenols Turbidity	Active				43.0657056	-79.797188		In a ditch off of haldibrook road, across from SW2
CITY LANDFILL SITES				Glanbrook		SW10	Grab	3x annual		General Chemistry Metals Phenols Turbidity	Active				43.0662856	-79.792757		off the entrance road to glanbrook
CITY LANDFILL SITES				Glanbrook		FW99	Grab	3x annual		General Chemistry Metals Phenols Turbidity	Active				43.0649923	-79.7944307		Just past SW3 near the entrance
CITY LANDFILL SITES				Rennie		SW1	Grab	2x annual (Metals not sampled in spring)		General Chemistry Phenols Metals O&G Turbidity	Active				43.2482066	-79.7675912		in between SW5 and SW4
CITY LANDFILL SITES				Rennie		SW2	Grab	2x annual (Metals not sampled in spring)		General Chemistry Phenols Metals O&G Turbidity	Active				43.2454059	-79.7694111		Underneath the Redhill Nearest CP3
CITY LANDFILL SITES				Rennie		SW3	Grab	2x annual (Metals not sampled in spring)		General Chemistry Phenols Metals O&G Turbidity	Active				43.246543	-79.7680378		Underneath the Redhill across from MW6 52A/B
CITY LANDFILL SITES				Rennie		SW4	Grab	2x annual (Metals not sampled in spring)		General Chemistry Phenols Metals O&G Turbidity	Active				43.2479243	-79.7676972		In between SW1 and MW6-53A/B
CITY LANDFILL SITES				Rennie		SW5	Grab	2x annual (Metals not sampled in spring)		General Chemistry Phenols Metals O&G Turbidity	Active				43.2483033	-797675711		Closest to Brampton Landfill
CITY LANDFILL SITES				Stoney Creek		SW1	Grab	3x annual		General Chemistry Metals	Active				43.1918446	-79.6979061		West side of the landfill, near BH12 outside the boundary of the landfill
CITY LANDFILL SITES				Stoney Creek		SW2	Grab	3x annual		General Chemistry Metals	Active				43.1925095	-79.7016585		Closest to east entrance of landfill; outside the boundary of the landfill
CITY LANDFILL SITES				Stoney Creek		SW3	Grab	3x annual		General Chemistry Metals	Active				43.1933777	-79.7014815		in a ditch off the dofasco 2000 trail; outside the boundary of the landfill
CITY LANDFILL SITES				Stoney Creek		SW4	Grab	3x annual		General Chemistry Metals	Active				43.1926327	-79.6977371		In swampy area off the dofasco 2000 trail, near BH8; outside the boundary of the landfill
CITY LANDFILL SITES				Stoney Creek		SW10	Grab	3x annual		General Chemistry Metals	Active				43.1918818	-79.7006822		North side of the landfill, near BH19; outside the boundary of the landfill
CITY LANDFILL SITES				Stoney Creek		SW15	Grab	3x annual		General Chemistry Metals	Active				43.1924978	-79.697949		southwest corner of the landfill near BH7; outside the boundary of the landfill
CITY LANDFILL SITES				Stoney Creek		SW19	Grab	3x annual		General Chemistry Metals	Active				43.1881564	-79.7040564		In a ditch just off of 6th Road east
CITY LANDFILL SITES				Stoney Creek		SW30	Grab	3x annual		General Chemistry Metals	Active				43.1931783	-79.711926		in a culvert off of fifth road E
CITY LANDFILL SITES				Stoney Creek		SW31	Grab	3x annual		General Chemistry Metals	Active				43.1917547	-79.6794605		in a culvert off of 8th road E
CITY LANDFILL SITES				Upper Ottawa		SW1	Grab	2x annual		General Chemistry Metals Phenols	Active				43.2035413	-79.8364985		Near the dam
CITY LANDFILL SITES				Upper Ottawa		SW2	Grab	2x annual		General Chemistry Metals Phenols	Active				43.2025599	-79.8345888		Along the stream in between MH10 and MH11

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CITY LANDFILL SITES				Upper Ottawa		SW3	Grab	2x annual		General Chemistry Metals Phenols	Active				43.1988488	-79.8279503		In bridge underneath the off ramp of dartnall road
CITY LANDFILL SITES				West Hamilton		STN1	Grab	3 x annual		General Chemistry Metals Phenols PAHs	Active				43.2626906	-79.8940587		Near the Dam closest to Glen Road
CITY LANDFILL SITES				West Hamilton		STN3	Grab	3 x annual		General Chemistry Metals Phenols PAHs	Active				43.2651087	-79.8935008		Along the stream next to the Chedoke Expwy/403; in between STN1 and SWC2
CITY LANDFILL SITES				West Hamilton		STN4	Grab	3 x annual		General Chemistry Metals Phenols PAHs	Active				43.2666712	-79.8932916		Along the stream next to the chedoke expwy/403; in between SWC2 and HCL08
CITY LANDFILL SITES				West Hamilton		STN7	Grab	3 x annual		General Chemistry Metals Phenols PAHs	Active				43.2707296	-79.8931575		Off of Macklin St N. along the stream
CITY LANDFILL SITES				West Hamilton		STN9	Grab	3 x annual		General Chemistry Metals Phenols PAHs	Active				43.2734871	-79.8934874		Off of the bridge on desjardin recreation trail
CITY LANDFILL SITES				West Hamilton		SWC2	Grab	3 x annual		General Chemistry Metals Phenols PAHs	Active				43.2662473	-79.8933372		the stream next to chedoke expwy/403; in between STN4 and STN3

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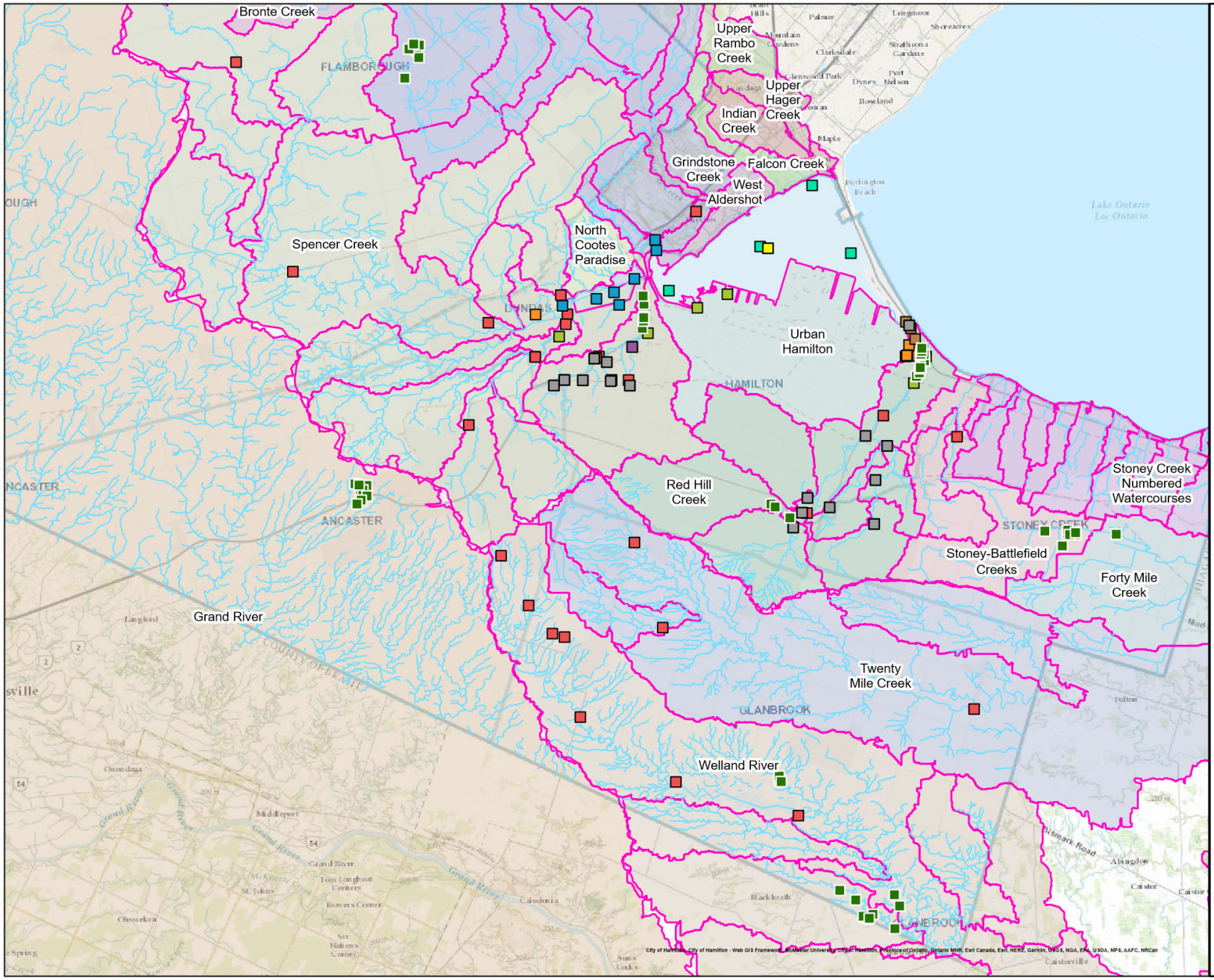
Appendix C: Active/on-going Sample Locations



Hamilton Water
Active Sample Locations

Active Sample Locations

- EXTERNAL - CA SITE
- EXTERNAL - RBG SITE
- CITY CSO TANK EFFLUENT SITE
- CITY SURFACE WATER MONITORING SITE
- CITY WWTP DISCHARGE
- CONSULTANT - CITY WUP WWTP EXPANSION PROGRAM
- EXTERNAL ECCC
- EXTERNAL - REDEEMER UNIVERSITY
- EXTERNAL - MECP
- CITY LANDFILL SITES
- Watercourse

Watersheds

- Bronte Creek
- Falcon Creek
- Forty Mile Creek
- Grand River
- Grindstone Creek
- Indian Creek
- North Cootes Paradise
- Red Hill Creek
- Regulated Area of Cootes Paradise Waterbody
- Spencer Creek
- Stoney Creek Numbered Watercourses
- Stoney-Battlefield Creeks
- Twenty Mile Creek
- Upper Hager Creek
- Upper Rambo Creek
- Urban Hamilton
- Welland River
- West Aldershot

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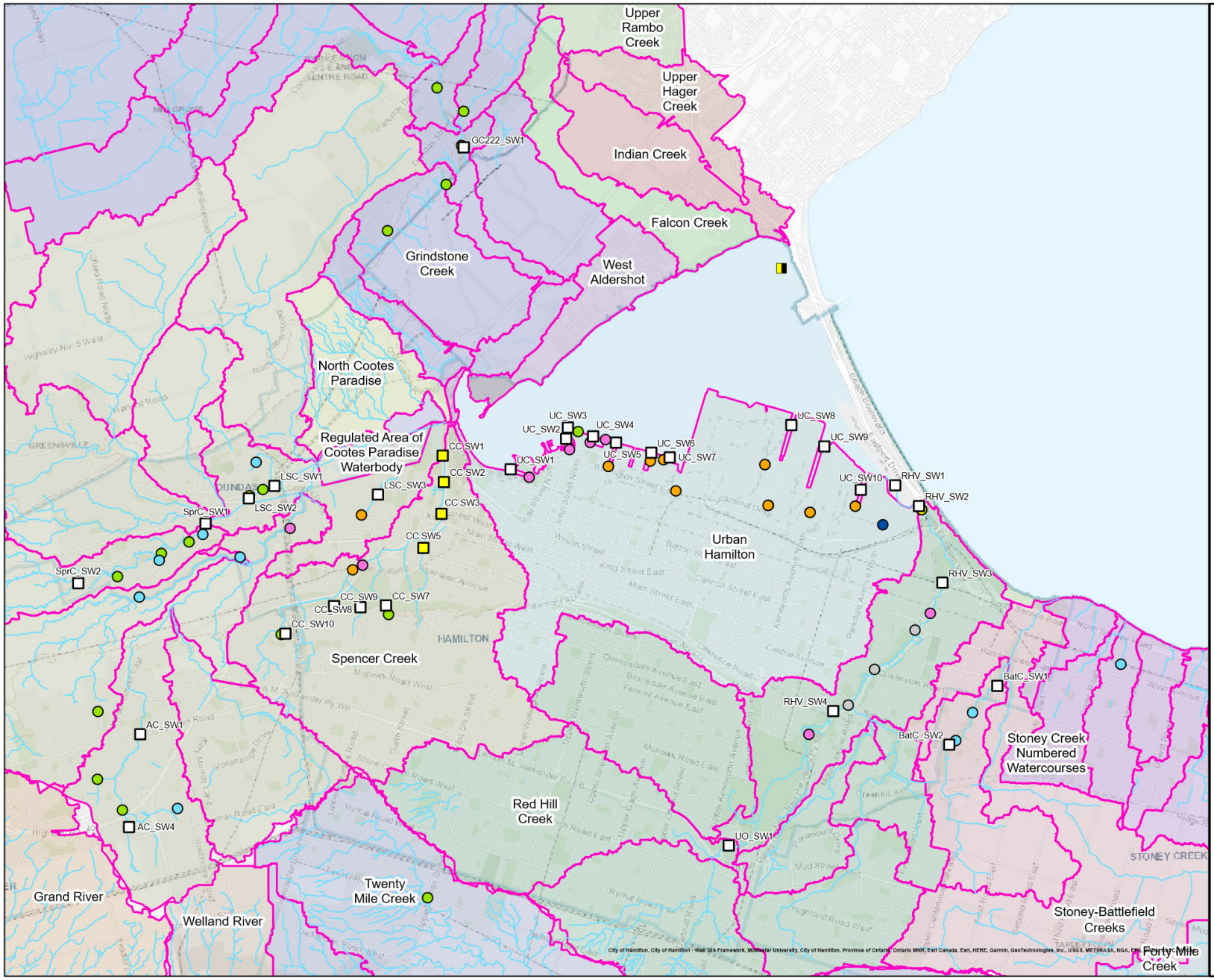
Appendix D: City of Hamilton's Phase I Sample Locations



Hamilton Water Priority Outfalls & Phase 1 Sample Locations

Chedoke Creek Active Sample Locations

Sample Locations

Phase 1

Priority Outfalls

- CSO OUTFALL
- CSO OUTFALL - BLOCKED
- SPS EMERGENCY OVERFLOW OUTFALL
- SPS EMERGENCY OVERFLOW & CSO OUTFALL
- CSO TANK OUTFALL
- SSO OUTFALL
- WWTP OUTFALL
- WWTP OUTFALL (HALTON)
- Watercourse

Watersheds

- Bronte Creek
- Falcon Creek
- Forty Mile Creek
- Grand River
- Grindstone Creek
- Indian Creek
- North Cootes Paradise
- Red Hill Creek
- Regulated Area of Cootes Paradise Waterbody
- Spencer Creek
- Stoney Creek Numbered Watercourses
- Stoney-Battlefield Creeks
- Twenty Mile Creek
- Upper Hager Creek
- Upper Rambo Creek
- Urban Hamilton
- Welland River
- West Aldershot

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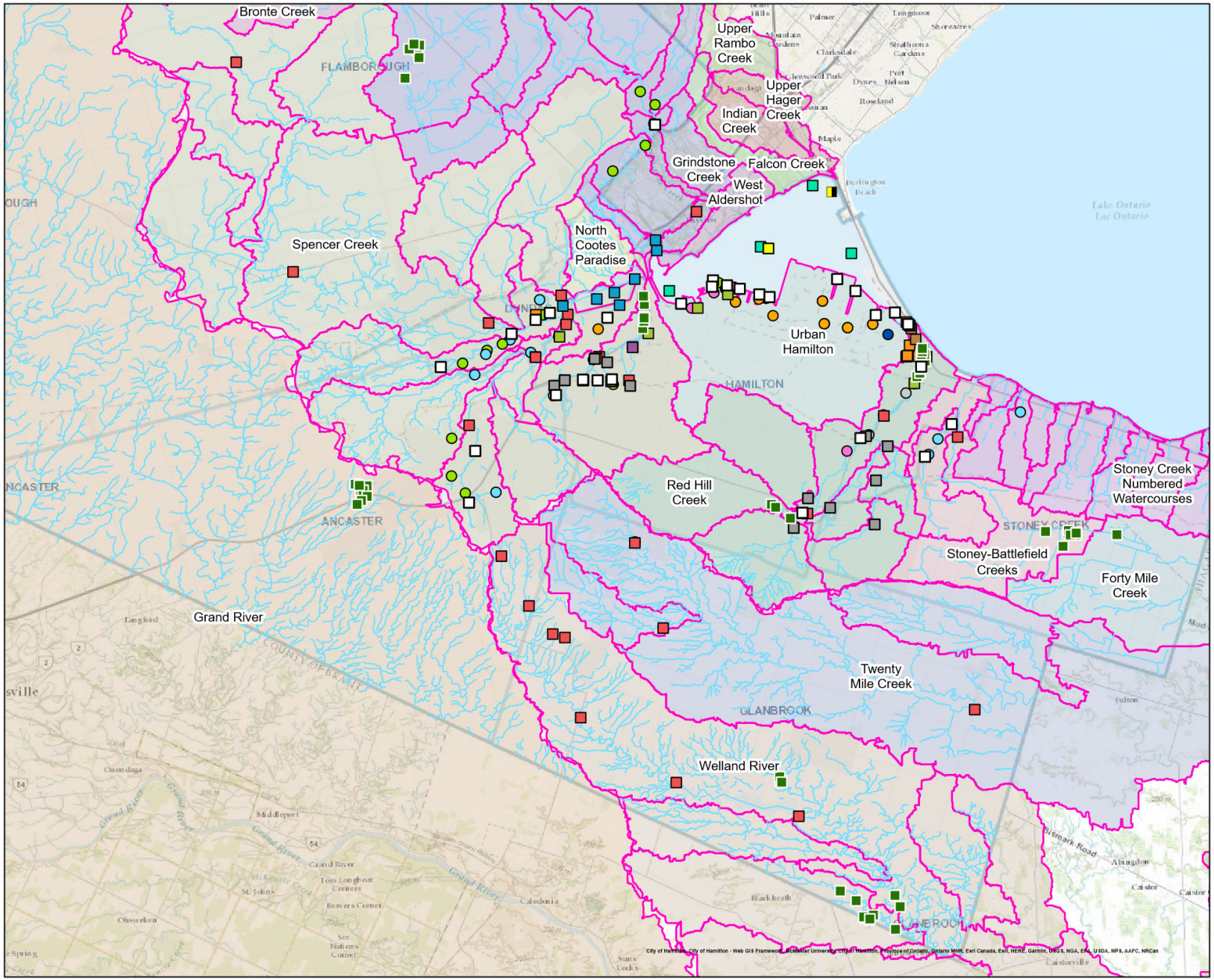

Hamilton Water Priority Outfalls, Active Sample Locations & Phase 1 Sample Locations

Sample Locations
- Phase 1

Active Sample Locations
- EXTERNAL - CA SITE
- EXTERNAL - RBG SITE
- CITY CSO TANK EFFLUENT SITE
- CITY SURFACE WATER MONITORING SITE
- CITY WWTP DISCHARGE
- CONSULTANT - CITY WUP WWTP EXPANSION PROGRAM
- EXTERNAL ECCC
- EXTERNAL - REDEEMER UNIVERSITY
- EXTERNAL - MECP
- CITY LANDFILL SITES

Priority Outfalls
- CSO OUTFALL
- CSO OUTFALL - BLOCKED
- SPS EMERGENCY OVERFLOW OUTFALL
- SPS EMERGENCY OVERFLOW & CSO OUTFALL
- CSO TANK OUTFALL
- SSO OUTFALL
- WWTP OUTFALL
- WWTP OUTFALL (HALTON)
- Watercourse

Watersheds
- Bronte Creek
- Falcon Creek
- Forty Mile Creek
- Grand River
- Grindstone Creek
- Indian Creek
- North Cootes Paradise
- Red Hill Creek
- Regulated Area of Cootes Paradise Waterbody
- Spencer Creek
- Stoney Creek Numbered Watercourses
- Stoney-Battlefield Creeks
- Twenty Mile Creek
- Upper Hager Creek
- Upper Rambo Creek
- Urban Hamilton
- Welland River
- West Aldershot

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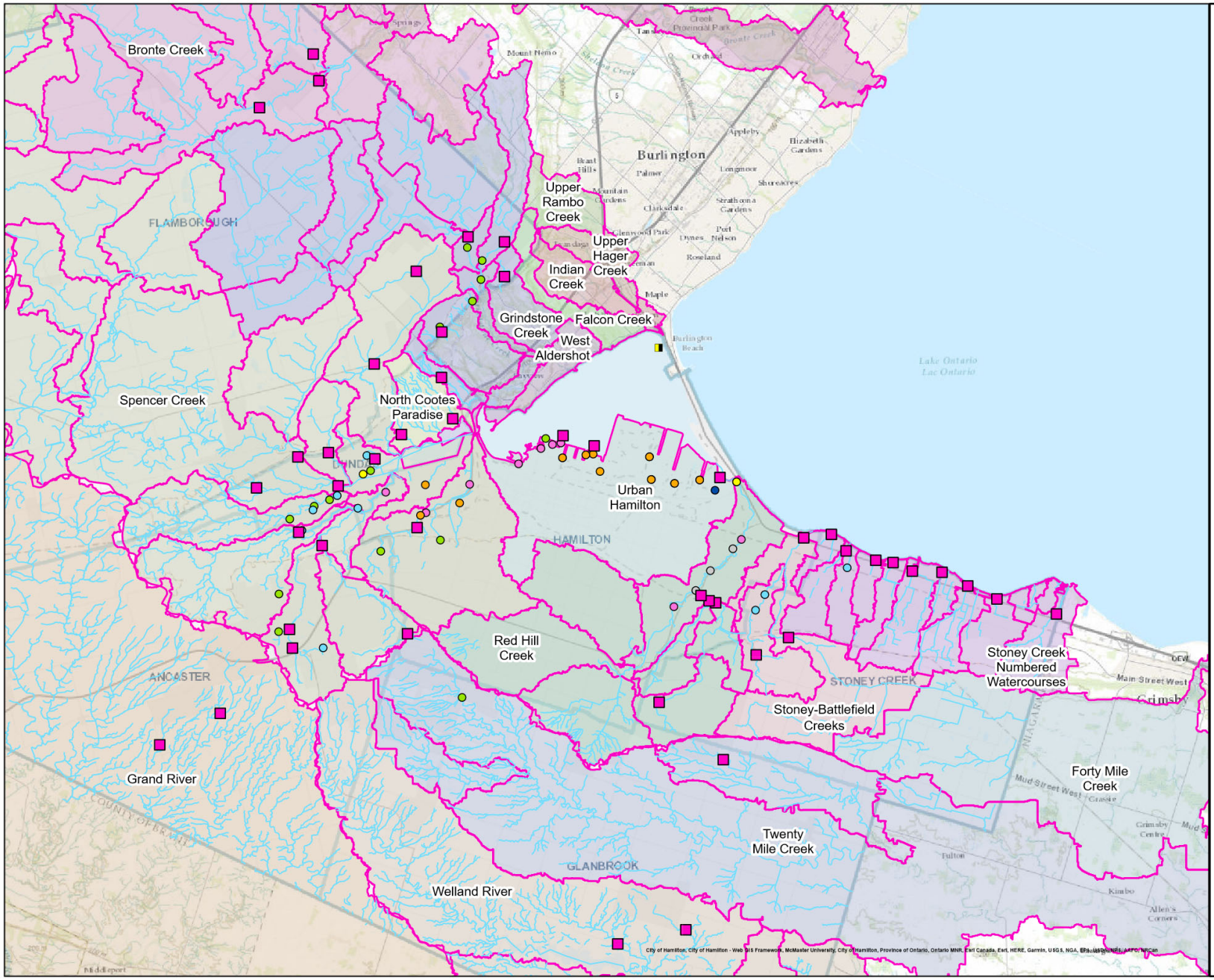
Appendix E: City of Hamilton Proposed Phase II Sample Locations



Hamilton Water Proposed Phase 2 Sample Locations

Proposed Sample Locations

Priority Outfalls

- CSO OUTFALL
- CSO OUTFALL - BLOCKED
- SPS EMERGENCY OVERFLOW OUTFALL
- SPS EMERGENCY OVERFLOW & CSO OUTFALL
- CSO TANK OUTFALL
- SSO OUTFALL
- WWTP OUTFALL
- WWTP OUTFALL (HALTON)
- Watercourse

Watersheds

- Bronte Creek
- Falcon Creek
- Forty Mile Creek
- Grand River
- Grindstone Creek
- Indian Creek
- North Cootes Paradise
- Red Hill Creek
- Regulated Area of Cootes Paradise Waterbody
- Spencer Creek
- Stoney Creek Numbered Watercourses
- Stoney-Battlefield Creeks
- Twenty Mile Creek
- Upper Hager Creek
- Upper Rambo Creek
- Urban Hamilton
- Welland River
- West Aldershot

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Appendix F: Visual – Framework's Phased Approach

Surface Water Quality Program Framework

Preparation

- Hiring WQT
- Background information review
- Stakeholder Engagement
- Sample Point Inventory
- Gap Analysis
- Sample name standardization
- EME Chedoke Creek sample conversion
- LIMS data standardization
- Mapping
- WQT Training
- Field equipment

Phase I (1-2 yrs)

- Sampling parameter standardization
- Proposed modification existing internal WQ programs
- New internal WQ monitoring locations
- Proposed modification external WQ programs
- Data trending
- Spills response protocol
- Stakeholder communications
- Annual report

Phase II (2-5 yrs)

- Additional enhancements to sample inventory
- Technology – real time monitoring
- Data sharing / Webpage
- Funding / Grants

Phase III (5-10 yrs)

- Decision making / Capital investing
- Benthic monitoring
- Strategic sewer use by-law enforcement

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Hamilton Water Priority Outfalls & Phase 1 Sample Locations

Chedoke Creek Active Sample Locations

Sample Locations

Phase 1

Priority Outfalls

- CSO OUTFALL
- CSO OUTFALL - BLOCKED
- SPS EMERGENCY OVERFLOW OUTFALL
- SPS EMERGENCY OVERFLOW & CSO OUTFALL
- CSO TANK OUTFALL
- SSO OUTFALL
- WWTP OUTFALL
- WWTP OUTFALL (HALTON)
- Watercourse

Watersheds

- Bronte Creek
- Falcon Creek
- Forty Mile Creek
- Grand River
- Grindstone Creek
- Indian Creek
- North Cootes Paradise
- Red Hill Creek
- Regulated Area of Cootes Paradise Waterbody
- Spencer Creek
- Stoney Creek Numbered Watercourses
- Stoney-Battlefield Creeks
- Twenty Mile Creek
- Upper Hager Creek
- Upper Rambo Creek
- Urban Hamilton
- Welland River
- West Aldershot

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Kilometers

Upper Rambo Creek
Upper Hager Creek
Indian Creek
Falcon Creek
Grindstone Creek
West Aldershot
North Cootes Paradise
Regulated Area of Cootes Paradise Waterbody
Urban Hamilton
Spencer Creek
Red Hill Creek
Twenty Mile Creek
Grand River
Welland River
Stoney Creek Numbered Watercourses
Stoney-Battlefield Creeks
Forty Mile Creek

GC222_SW1
UC_SW1
UC_SW2
UC_SW3
UC_SW4
UC_SW5
UC_SW6
UC_SW7
UC_SW8
UC_SW9
UC_SW10
RHV_SW1
RHV_SW2
RHV_SW3
RHV_SW4
CC_SW1
CC_SW2
CC_SW3
CC_SW5
CC_SW7
CC_SW8
CC_SW9
CC_SW10
LSC_SW1
LSC_SW2
LSC_SW3
SprC_SW1
SprC_SW2
AC_SW1
AC_SW4
BatC_SW1
BatC_SW2
UO_SW1

2022 SWQP LOCATIONS AND WATER QUALITY DATA

CHEDOKE CREEK

CHEDOKE CREEK - 2022	CC SW1		CC SW2		CC SW3	
	RANGE	AVERAGE	RANGE	AVERAGE	RANGE	AVERAGE
Dissolved Oxygen - Field (mg/L)	4.0 - 12.6	8.90	2.9 - 13.40	8.53	7.3 - 15.8	12.03
Ammonia + Ammonium as N (mg/L)	0.05 - 1.41	0.65	0.17 - 1.67	0.65	< 0.01 - 0.62	0.09
Bromide (mg/L)	< 1.0 - < 2.0	< 1.0	< 1.0 - < 2.0	< 1.0	< 1.0 - < 2.0	< 1.0
Carbonaceous Biochemical Oxygen Demand (mg/L)	< 2.0 - 10.0	4.0	< 2.0 - 18.0	5.0	< 2.0 - 7.0	3.0
Chloride (mg/L)	125 - 893	314	107 - 704	302	132 - 699	352
Escherichia coli (MPN/100mL)	3 - 280000	29842	38 - 133000	17540	148 - 27600	4552
Nitrate as N (mg/L)	0.52 - 2.99	1.68	1.27 - 3.17	2.19	1.64 - 3.45	2.62
Nitrite as N (mg/L)	< 0.05 - 0.10	0.06	< 0.05 - 0.10	0.06	< 0.05 - 0.10	0.06
O-Phosphate as P (mg/L)	< 0.05 - 0.30	0.16	< 0.05 - 0.45	0.24	0.15 - 0.47	0.31
Total Kjeldahl Nitrogen (mg/L)	0.8 - 1.9	1.30	0.5 - 3.3	1.30	< 0.20 - 1.90	0.47
Total Phosphorus (mg/L)	0.101 - 0.417	0.283	0.121 - 0.686	0.356	0.165 - 0.523	0.342
Total Suspended Solids (mg/L)	4.2 - 48.0	18.4	2.1 - 83.5	20.2	1.6 - 30.2	5.6
Un-ionized Ammonia as NH3 at Field Temp. (ug/L)	4.2 - 44.9	19.5	6.8 - 48.4	21.0	1.6 - 53.4	8.1
Aluminum (mg/L)	0.152 - 1.180	0.438	0.062 - 2.490	0.568	0.046 - 0.936	0.167
Copper (mg/L)	0.0022 - 0.0081	0.004	0.0022 - 0.0210	0.005	0.0024 - 0.0137	0.004
Lead (mg/L)	0.0007 - 0.0026	0.001	0.0002 - 0.0059	0.002	0.0002 - 0.0026	0.001
Zinc (mg/L)	0.010 - 0.067	0.032	0.014 - 0.118	0.038	0.011 - 0.076	0.031

CHEDOKE CREEK - 2022	CC SW5		CC SW7		CC SW8 (4 samples)	
	RANGE	AVERAGE	RANGE	AVERAGE	RANGE	AVERAGE
Dissolved Oxygen - Field (mg/L)	8.0 - 14.9	11.30	6.7 - 14.5	10.70	7.8 - 15.5	12.20
Ammonia + Ammonium as N (mg/L)	< 0.01 - 0.21	0.04	< 0.01 - 0.29	0.06	< 0.01 - 0.20	0.08
Bromide (mg/L)	< 1.0 - < 2.0	< 1.0	< 1.0 - < 2.0	< 1.0	< 1.0 - < 2.0	< 1.0
Carbonaceous Biochemical Oxygen Demand (mg/L)	< 2.0 - < 3.0	< 2.0	< 2.0 - < 3.0	< 2.0	< 2.0 - < 3.0	< 2.0
Chloride (mg/L)	125 - 579	293	186 - 1030	396	103 - 951	633
Escherichia coli (MPN/100mL)	220 - 5170	1422	470 - 8660	3186	109 - 7200	1928
Nitrate as N (mg/L)	0.29 - 3.39	2.44	1.95 - 4.10	2.71	1.05 - 1.56	1.31
Nitrite as N (mg/L)	< 0.05 - < 0.10	< 0.05	< 0.05 - 0.10	0.06	< 0.05 - < 0.05	< 0.05
O-Phosphate as P (mg/L)	0.13 - 0.45	0.28	0.11 - 0.47	0.25	< 0.05 - 0.06	0.05
Total Kjeldahl Nitrogen (mg/L)	< 0.20 - 0.60	0.30	< 0.2 - 0.6	0.30	0.2 - 0.8	0.50
Total Phosphorus (mg/L)	0.134 - 0.510	0.301	0.115 - 0.498	0.257	0.032 - 0.164	0.078
Total Suspended Solids (mg/L)	1.6 - 78.2	12.6	2.0 - 8.8	5.4	4.4 - 63.8	22.6
Un-ionized Ammonia as NH3 at Field Temp. (ug/L)	0.6 - 4.8	1.3	0.5 - 6.1	1.5	< 0.4 - 2.8	1.3
Aluminum (mg/L)	0.018 - 0.498	0.174	0.050 - 0.320	0.169	0.179 - 3.000	1.083
Copper (mg/L)	0.0019 - 0.0053	0.003	0.0030 - 0.0050	0.004	0.0020 - 0.0093	0.004
Lead (mg/L)	0.0002 - 0.0043	0.001	0.0001 - 0.0006	0.000	0.0004 - 0.0052	0.002
Zinc (mg/L)	0.018 - 0.042	0.030	0.010 - 0.039	0.020	0.014 - 0.070	0.039

CHEDOKE CREEK - 2022	CC SW9		CC SW10	
	RANGE	AVERAGE	RANGE	AVERAGE
Dissolved Oxygen - Field (mg/L)	7.1 - 14.1	9.90	1.4 - 14.4	7.90
Ammonia + Ammonium as N (mg/L)	0.01 - 0.94	0.38	0.01 - 0.55	0.14
Bromide (mg/L)	< 1.0 - < 2.0	< 1.0	< 1.0 - < 2.0	< 1.0
Carbonaceous Biochemical Oxygen Demand (mg/L)	< 2.0 - < 3.0	< 2.0	< 2.0 - < 3.0	< 2.0
Chloride (mg/L)	138 - 426	251	106 - 453	273
Escherichia coli (MPN/100mL)	2600 - 28000	12877	6 - 1050	213
Nitrate as N (mg/L)	2.73 - 7.83	5.58	0.15 - 0.94	0.41
Nitrite as N (mg/L)	< 0.05 - 0.40	0.19	< 0.05 - < 0.10	< 0.05
O-Phosphate as P (mg/L)	0.13 - 0.87	0.48	< 0.05 - 0.27	0.07
Total Kjeldahl Nitrogen (mg/L)	0.4 - 1.7	1.00	< 0.2 - 1.3	0.40
Total Phosphorus (mg/L)	0.130 - 0.913	0.515	0.017 - 0.388	0.085
Total Suspended Solids (mg/L)	1.0 - 21.4	5.1	0.8 - 39.0	5.3
Un-ionized Ammonia as NH3 at Field Temp. (ug/L)	0.4 - 22.7	10.1	0.1 - 2.2	0.9
Aluminum (mg/L)	0.017 - 0.447	0.102	0.006 - 0.165	0.037
Copper (mg/L)	0.0027 - 0.0075	0.004	0.0008 - 0.0099	0.002
Lead (mg/L)	0.0004 - 0.0023	0.001	< 0.0001 - 0.0015	0.000
Zinc (mg/L)	0.124 - 0.251	0.175	0.015 - 0.114	0.050

WEST HAMILTON

ANCASTER CREEK- 2022	AC SW1		AC SW4	
	RANGE	AVERAGE	RANGE	AVERAGE
Dissolved Oxygen - Field (mg/L)	7.7 - 12.1	10.3	2.9 - 13.1	8.6
Ammonia + Ammonium as N (mg/L)	0.03 - 0.09	0.06	0.03 - 0.13	0.08
Bromide (mg/L)	< 1.0 - < 2.0	< 1.0	< 1.0 - < 2.0	< 1.0
Carbonaceous Biochemical Oxygen Demand (mg/L)	< 1.0 - < 2.0	< 2.0	< 1.0 - < 2.0	< 2.0
Chloride (mg/L)	150 - 238	192	64.5 - 279	146.5
Escherichia coli (MPN/100mL)	34 - 17300	3540	50 - 620	210
Nitrate as N (mg/L)	0.57 - 1.10	0.80	0.26 - 0.94	0.63
Nitrite as N (mg/L)	< 0.05 - < 0.10	< 0.06	< 0.05 -< 0.10	< 0.06
O-Phosphate as P (mg/L)	0.05 - 0.08	0.06	0.05 - 0.08	0.06
Total Kjeldahl Nitrogen(mg/L)	0.2 - 1.4	0.50	0.40 - 1.10	0.56
Total Phosphorus (mg/L)	0.036 - 0.107	0.054	0.032 - 0.225	0.114
Total Suspended Solids (mg/L)	1.6 - 8.6	3.8	< 2.0 - 22.0	7.5
Un-ionized Ammonia as NH3 at Field Temp. (ug/L)	0.8 - 2.5	1.5	0.5 - 3.4	1.4
Aluminum (mg/L)	0.044 - 0.213	0.082	0.025 - 0.354	0.118
Copper (mg/L)	0.0005 - 0.0014	0.0009	0.0004 - 0.0028	0.0011
Lead (mg/L)	0.0001 - 0.0004	0.0002	< 0.0001 - 0.0010	0.0004
Zinc (mg/L)	0.003 - 0.006	0.005	0.003 - 0.030	0.012

SPRING CREEK - 2022	SprC SW1		SprC SW2	
	MIN - MAX	AVERAGE	MIN - MAX	AVERAGE
Dissolved Oxygen - Field (mg/L)	9.0 - 15.7	11.7	9.0 - 15.1	11.6
Ammonia + Ammonium as N (mg/L)	0.01 - 0.06	0.02	0.01 - 0.04	0.02
Bromide (mg/L)	< 1.0 - < 2.0	< 1.0	< 1.0 - < 2.0	< 1.0
Carbonaceous Biochemical Oxygen Demand (mg/L)	< 2.0	< 2.0	< 2.0	< 2.0
Chloride (mg/L)	62.8 - 96.7	74.6	45.7 - 76.7	58
Escherichia coli (MPN/100mL)	28 - 1200	467	7 - 461	195
Nitrate as N (mg/L)	0.10 - 0.69	0.24	0.10 - 0.73	0.22
Nitrite as N (mg/L)	< 0.05 - < 0.10	< 0.06	< 0.05 - < 0.10	< 0.06
O-Phosphate as P (mg/L)	< 0.05	< 0.05	< 0.05	< 0.05
Total Kjeldahl Nitrogen (mg/L)	0.14 - 0.50	0.25	0.11 - 0.40	0.26
Total Phosphorus (mg/L)	< 0.010 - 0.085	0.040	< 0.010 - 0.160	0.043
Total Suspended Solids (mg/L)	< 0.9 - 80.0	19.6	3.9 - 167.0	30.9
Un-ionized Ammonia as NH3 at Field Temp. (ug/L)	< 0.2 - 4.1	1.3	0.2 - 1.9	0.7
Aluminum (mg/L)	0.014 - 2.900	0.567	0.220 - 4.680	0.852
Copper (mg/L)	0.0006 - 0.0050	0.0020	0.0007 - 0.0076	0.0020
Lead (mg/L)	< 0.0001 - 0.0016	0.0005	0.0001 - 0.0027	0.0006
Zinc (mg/L)	0.001 - 0.012	0.004	0.001 - 0.015	0.003

LOWER SPENCER CREEK - 2022	LSC SW1		LSC SW2		LSC SW3	
	MIN - MAX	AVERAGE	MIN - MAX	AVERAGE	MIN - MAX	AVERAGE
Dissolved Oxygen - Field (mg/L)	7.8 - 17.2	11.0	3.5 - 17.1	9.42	5.8 - 13.1	8.6
Ammonia + Ammonium as N (mg/L)	0.03 - 0.26	0.15	0.04 - 0.34	0.15	0.01 - 0.07	0.04
Bromide (mg/L)	< 1.0 - < 2.0	< 1.0	< 1.0 - < 2.0	< 1.0	< 1.0 - < 2.0	< 1.0
Carbonaceous Biochemical Oxygen Demand (mg/L)	< 2.0 - 4.0	3.0	< 2.0 - 14.0	3.0	< 2.0	< 2.0
Chloride (mg/L)	149 - 300	198	151 - 389	219	566 - 618	597
Escherichia coli (MPN/100mL)	3 - 1730	386	7 - 2420	894	8 - 1990	335
Nitrate as N (mg/L)	14.4 - 21.4	17.1	7.76 - 21.50	16.21	0.29 - 0.53	0.43
Nitrite as N (mg/L)	< 0.05 - 0.10	0.08	< 0.05 - 0.10	0.07	< 0.05 - < 0.10	< 0.06
O-Phosphate as P (mg/L)	< 0.05 - 0.07	0.06	0.05 - 0.12	0.07	< 0.05	< 0.05
Total Kjeldahl Nitrogen (mg/L)	0.5 - 1.5	0.9	0.5 - 3.0	1.1	0.20 - 0.70	0.3
Total Phosphorus (mg/L)	0.059 - 0.193	0.107	0.084 - 0.435	0.161	0.014 - 0.142	0.039
Total Suspended Solids (mg/L)	3.4 - 13.8	7.9	1.4 - 199	32.8	1.0 - 145.0	17.2
Un-ionized Ammonia as NH3 at Field Temp. (ug/L)	0.5 - 6.8	3.2	0.3 - 9.0	2.9	< 0.1 - 1.5	0.8
Aluminum (mg/L)	0.045 - 0.138	0.093	0.024 - 0.760	0.133	0.006 - 0.374	0.057
Copper (mg/L)	0.0035 - 0.0064	0.0048	0.0025 - 0.0081	0.0053	0.0002 - 0.0019	0.0006
Lead (mg/L)	0.0003 - 0.0011	0.0007	0.0002 - 0.0051	0.0011	0.0001 - 0.0011	0.0002
Zinc (mg/L)	0.011 - 0.028	0.020	0.014 - 0.110	0.028	< 0.001 - 0.006	0.002

GRINDSTONE CREEK- 2022	GC222 SW1	
	MIN - MAX	AVERAGE
Dissolved Oxygen - Field (mg/L)	7.1 - 15.7	10.6
Ammonia + Ammonium as N (mg/L)	0.01 - 0.07	0.02
Bromide (mg/L)	< 1.0 - < 2.0	< 1.0
Carbonaceous Biochemical Oxygen Demand (mg/L)	< 2.0	< 2.0
Chloride (mg/L)	76.5 - 127	113.1
Escherichia coli (MPN/100mL)	51 - 9800	2195
Nitrate as N (mg/L)	0.99 - 4.63	2.19
Nitrite as N (mg/L)	< 0.05 - < 0.10	< 0.06
O-Phosphate as P (mg/L)	0.05 - 0.09	0.06
Total Kjeldahl Nitrogen (mg/L)	0.20 - 1.20	0.52
Total Phosphorus (mg/L)	0.019 - 0.103	0.061
Total Suspended Solids (mg/L)	< 0.9 - 10.9	5.2
Un-ionized Ammonia as NH3 at Field Temp. (ug/L)	< 0.4 - 2.3	0.9
Aluminum (mg/L)	0.009 - 0.361	0.117
Copper (mg/L)	0.0011 - 0.0035	0.0020
Lead (mg/L)	< 0.0001 - 0.0009	0.0003
Zinc (mg/L)	0.001 - 0.007	0.003

EAST HAMILTON

BATTLEFIELD CREEK - 2022	BatC SW1		BatC SW2	
	RANGE	AVERAGE	RANGE	AVERAGE
Dissolved Oxygen - Field (mg/L)	4.3 - 14.6	8.4	4.1 - 15.4	9.8
Ammonia + Ammonium as N (mg/L)	0.06 - 5.28	1.02	< 0.01 - 0.06	0.02
Bromide (mg/L)	<1.0 - < 2.0	< 1.0	<1.0 - < 2.0	< 1.0
Carbonaceous Biochemical Oxygen Demand (mg/L)	< 2.0 - 10.0	4.0	< 1.0 - 3.0	2.0
Chloride (mg/L)	59.6 - 8881	292.9	90.5 - 414	258.3
Escherichia coli (MPN/100mL)	300 - 517000	80475	4 - 31000	4457
Nitrate as N (mg/L)	0.41 - 1.51	0.99	0.15 - 2.64	0.76
Nitrite as N (mg/L)	< 0.05 - 0.18	0.1	< 0.05 - < 0.10	0.07
O-Phosphate as P (mg/L)	< 0.05 - 0.93	0.3	< 0.05 - 0.08	0.06
Total Kjeldahl Nitrogen (mg/L)	0.4 - 6.2	1.7	< 0.2 - 0.9	0.4
Total Phosphorus (mg/L)	0.059 - 1.060	0.389	< 0.010 - 0.175	0.066
Total Suspended Solids (mg/L)	2.0 - 129.2	18.2	1.8 - 52.8	12.1
Un-ionized Ammonia as NH3 at Field Temp. (ug/L)	1.3 - 122.0	20.7	< 0.2 - 1.1	0.5
Aluminum (mg/L)	0.026 - 2.560	0.472	0.026 - 2.200	0.51
Copper (mg/L)	0.0024 - 0.0141	0.0050	0.0019 - 0.0086	0.0033
Lead (mg/L)	0.0002 - 0.0094	0.0018	0.0001 - 0.0051	0.0013
Zinc (mg/L)	0.007 - 0.069	0.021	0.002 - 0.035	0.011

RED HILL VALLEY - 2022	RHV SW1		RHV SW2		RHV SW3	
	RANGE	AVERAGE	RANGE	AVERAGE	RANGE	AVERAGE
Dissolved Oxygen - Field (mg/L)	4.0 - 11.1	7.2	4.2 - 9.0	6.3	6.8 - 13.4	10.1
Ammonia + Ammonium as N (mg/L)	0.03 - 9.43	2.41	0.08 - 7.00	2.34	0.01 - 0.13	0.06
Bromide (mg/L)	<1.0 - < 2.0	< 1.0	<1.0 - < 2.0	< 1.0	<1.0 - < 2.0	< 1.0
Carbonaceous Biochemical Oxygen Demand (mg/L)	< 2.0 - 4.0	3.0	< 2.0 - 5.0	4.0	< 2.0 - 5.0	3.0
Chloride (mg/L)	95.7 - 308	193.3	132 - 404	240	44.9 - 468	286.1
Escherichia coli (MPN/100mL)	5.0 - 7700	2178	10 - 17300	3159	110 - 14100	3424
Nitrate as N (mg/L)	3.74 - 21.40	12.06	6.50 - 18.00	14.1	0.11 - 1.48	0.75
Nitrite as N (mg/L)	0.07 - 2.07	0.45	0.06 - 1.13	0.39	< 0.05 - < 0.10	0.07
O-Phosphate as P (mg/L)	< 0.05 - 0.47	0.17	0.06 - 0.41	0.18	< 0.05 - 0.10	0.06
Total Kjeldahl Nitrogen (mg/L)	1.0 - 10.2	3.1	1.0 - 9.0	3.4	0.4 - 1.0	0.6
Total Phosphorus (mg/L)	0.092 - 0.597	0.291	0.213 - 0.626	0.405	0.034 - 0.164	0.104
Total Suspended Solids (mg/L)	2.8 - 27.8	9.8	3.4 - 20.8	12.6	2.4 - 38.4	14.5
Un-ionized Ammonia as NH3 at Field Temp. (ug/L)	7.5 - 44.9	17.1	0.2 - 39.9	13.2	0.3 - 8.4	2.9
Aluminum (mg/L)	0.034 - 0.586	0.16	0.035 - 0.404	0.158	0.071 - 1.420	0.436
Copper (mg/L)	0.0020 - 0.0074	0.0038	0.0039 - 0.0061	0.0049	0.0021 - 0.0076	0.0037
Lead (mg/L)	0.0002 - 0.0024	0.0008	0.0030 - 0.0013	0.0007	0.0003 - 0.0034	0.0012
Zinc (mg/L)	0.006 - 0.046	0.022	0.025 - 0.040	0.031	0.010 - 0.076	0.032

RED HILL VALLEY - 2022	RHV SW4		UO SW1	
	RANGE	AVERAGE	RANGE	AVERAGE
Dissolved Oxygen - Field (mg/L)	8.2 - 15.4	11.3	7.1 - 13.9	11.3
Ammonia + Ammonium as N (mg/L)	< 0.01 - 0.13	0.04	0.03 - 0.38	0.13
Bromide (mg/L)	<1.0 - < 2.0	< 1.0	<1.0 - < 2.0	< 1.0
Carbonaceous Biochemical Oxygen Demand (mg/L)	< 2.0 - 5.0	2.0	< 2.0 - 7.0	3.0
Chloride (mg/L)	37.2 - 567	341.3	50.9 - 814	418.2
Escherichia coli (MPN/100mL)	100 - 9210	2613	100 - 36500	10072
Nitrate as N (mg/L)	0.10 - 1.64	0.85	0.49 - 1.69	1.22
Nitrite as N (mg/L)	< 0.05 - < 0.10	0.07	< 0.05 - < 0.10	0.07
O-Phosphate as P (mg/L)	0.05 - 0.06	0.05	0.05 - 0.15	0.07
Total Kjeldahl Nitrogen (mg/L)	< 0.2 - 1.4	0.4	0.3 - 0.9	0.5
Total Phosphorus (mg/L)	0.018 - 0.247	0.08	0.045 - 0.185	0.106
Total Suspended Solids (mg/L)	< 1.0 - 135.0	21.8	3.0 - 27.2	9.5
Un-ionized Ammonia as NH3 at Field Temp. (ug/L)	< 0.2 - 4.2	1.8	0.8 - 6.4	3.1
Aluminum (mg/L)	0.031 - 2.270	0.628	0.051 - 2.350	0.423
Copper (mg/L)	0.0014 - 0.0110	0.0039	0.0016 - 0.0116	0.0036
Lead (mg/L)	0.0002 - 0.0084	0.0017	0.0004 - 0.0033	0.0012
Zinc (mg/L)	0.008 - 0.164	0.05	0.049 - 0.242	0.145

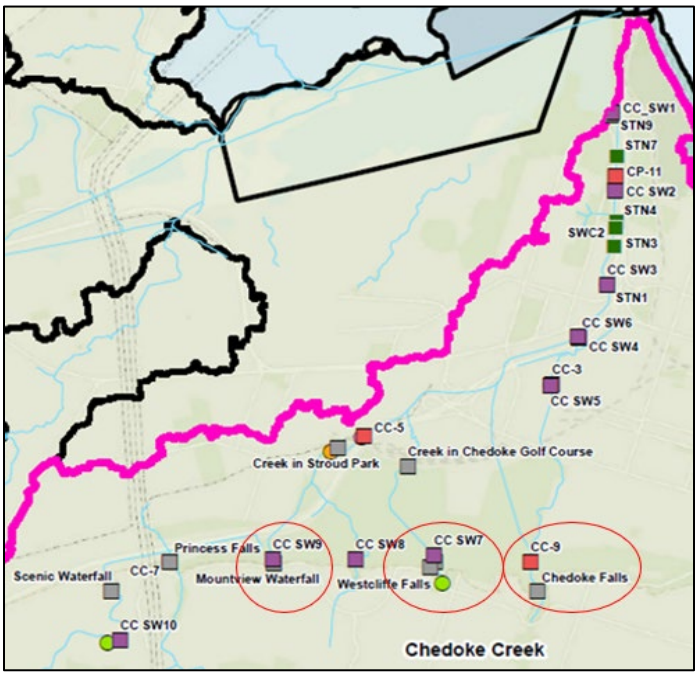
URBAN CORE (HAMILTON HARBOUR)

URBAN CORE (Hamilton Harbour)	UC SW1		UC SW2		UC SW3	
	RANGE	AVERAGE	RANGE	AVERAGE	RANGE	AVERAGE
Dissolved Oxygen - Field (mg/L)	7.4 - 14.2	10.2	7.9 - 13.8	10.4	7.7 - 14.0	10.2
Ammonia + Ammonium as N (mg/L)	0.02 - 0.35	0.12	< 0.01 - 0.39	0.12	< 0.01 - 0.40	0.13
Bromide (mg/L)	< 1.0 - < 2.0	< 1.0	< 1.0 - < 2.0	< 1.0	< 1.0 - < 2.0	< 1.0
Carbonaceous Biochemical Oxygen Demand (mg/L)	< 2.0 - 2.0	2.0	< 2.0 - 3.0	2.0	< 2.0 - 3.0	2.0
Chloride (mg/L)	68.3 - 124.0	95.1	67.6 - 124.0	95.3	67.6 - 125.0	95.4
Escherichia coli (MPN/100mL)	0 - 21	9.0	0 - 129	29	0 - 96	36
Nitrate as N (mg/L)	1.31 - 2.63	1.97	1.35 - 2.77	2.05	1.33 - 2.73	2.06
Nitrite as N (mg/L)	0.05 - 0.10	0.07	< 0.05 - 0.10	0.07	0.05 - 0.10	0.07
O-Phosphate as P (mg/L)	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total Kjeldahl Nitrogen (TKN) (mg/L)	0.5 - 0.9	0.6	0.4 - 0.9	0.7	0.5 - 0.8	0.6
Total Phosphorus (mg/L)	0.027 - 0.049	0.038	0.040 - 0.055	0.044	0.027 - 0.066	0.045
Total Suspended Solids (mg/L)	1.9 - 4.4	2.9	1.6 - 5.2	3.5	1.6 - 6.2	3.4
Un-ionized Ammonia as NH3 at Field Temp. (ug/L)	1.4 -11.4	5.3	< 2.0 - 11.1	5.6	< 2.0 - 11.7	7.0
Aluminum (mg/L)	0.022 - 0.090	0.04	0.014 - 0.088	0.036	0.013 - 0.094	0.039
Copper (mg/L)	0.0010 - 0.0019	0.0014	0.0010 - 0.0022	0.0016	0.0010 - 0.0022	0.0015
Lead (mg/L)	0.0001 - 0.0002	0.0001	0.0001 - 0.0002	0.0002	0.0001 - 0.0002	0.0002
Zinc (mg/L)	0.002 - 0.006	0.003	0.002 - 0.006	0.003	0.002 - 0.007	0.004

URBAN CORE (Hamilton Harbour)	UC SW4		UC SW5		UC SW6	
	RANGE	AVERAGE	RANGE	AVERAGE	RANGE	AVERAGE
Dissolved Oxygen - Field (mg/L)	8.2 - 14.0	10.4	6.9 - 13.3	9.6	7.9 - 13.9	10.4
Ammonia + Ammonium as N (mg/L)	< 0.01 - 0.41	0.13	0.06 - 0.40	0.16	0.02 - 0.44	0.15
Bromide (mg/L)	< 1.0 - < 2.0	< 1.0	< 1.0 - < 2.0	< 1.0	< 1.0 - < 2.0	< 1.0
Carbonaceous Biochemical Oxygen Demand (mg/L)	< 2.0 - 3.0	2.0	< 2.0	< 2.0	2.0 - 4.0	2.0
Chloride (mg/L)	67.4 - 125.0	95.7	72.2 - 126.0	94.2	68.7 - 126.0	96.2
Escherichia coli (MPN/100mL)	1 - 140	41	2 - 14200	2912	3 - 548	145
Nitrate as N (mg/L)	1.32 - 2.74	2.08	1.58 - 2.86	2.1	1.32 - 2.74	2.13
Nitrite as N (mg/L)	0.05 - 0.10	0.07	0.06 - 0.10	0.08	< 0.05 - 0.10	0.07
O-Phosphate as P (mg/L)	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total Kjeldahl Nitrogen (TKN) (mg/L)	0.4 - 0.8	0.6	0.5 - 0.8	0.6	0.5 - 1.0	0.7
Total Phosphorus (mg/L)	0.031 - 0.067	0.046	0.035 - 0.058	0.045	0.034 - 0.101	0.05
Total Suspended Solids (mg/L)	1.3 - 5.2	3.5	1.7 - 7.8	3.6	1.2 - 44.6	8.3
Un-ionized Ammonia as NH3 at Field Temp. (ug/L)	2.9 - 11.8	7.5	7.5 - 12.4	9.8	3.9 - 16.4	8.4
Aluminum (mg/L)	0.012 - 0.084	0.034	0.025 - 0.100	0.051	0.018 - 0.327	0.068
Copper (mg/L)	0.0013 - 0.0022	0.0017	0.0011 - 0.0019	0.0016	0.0012 - 0.0033	0.0020
Lead (mg/L)	0.0001 - 0.0002	0.0001	0.0002 - 0.0008	0.0004	0.0001 - 0.0025	0.0005
Zinc (mg/L)	0.002 - 0.005	0.003	0.003 - 0.006	0.005	0.002 - 0.018	0.006

URBAN CORE (Hamilton Harbour)	UC SW7		UC SW8		UC SW9		UC SW10	
	RANGE	AVERAGE	RANGE	AVERAGE	RANGE	AVERAGE	RANGE	AVERAGE
Dissolved Oxygen - Field (mg/L)	6.8 - 13.9	10.2	5.8 - 9.9	7.5	7.2 - 13.0	9.6	7.4 - 10.8	8.9
Ammonia + Ammonium as N (mg/L)	0.01 - 0.40	0.15	0.22 - 0.50	0.35	0.07 - 0.55	0.25	0.02 - 1.11	0.62
Bromide (mg/L)	< 1.0 - < 2.0	< 1.0	< 1.0 - < 2.0	< 1.0	< 1.0 - < 2.0	< 1.0	< 1.0 - < 2.0	< 1.0
Carbonaceous Biochemical Oxygen Demand (mg/L)	< 2.0 - 5.0	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0 - 3.0	2.0
Chloride (mg/L)	68.3 - 127.0	96.7	25.6 - 148.0	93.7	73.5 - 138.0	101.2	87.0 - 203.0	132.3
Escherichia coli (MPN/100mL)	0 - 210	45	12 - 20000	2586	3.0 - 47.0	24	1 - 1730	323
Nitrate as N (mg/L)	1.32 - 2.89	2.15	1.70 - 3.01	2.31	1.96 - 3.22	2.74	3.20 - 10.90	5.3
Nitrite as N (mg/L)	< 0.05 - 0.10	0.07	< 0.05 - 0.14	0.1	0.06 - 0.10	0.08	0.06 - 0.17	0.12
O-Phosphate as P (mg/L)	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05 - 0.10	0.06
Total Kjeldahl Nitrogen (TKN) (mg/L)	0.5 - 0.7	0.6	0.6 - 0.9	0.7	0.4 - 2.6	1.0	0.6 - 1.7	1.1
Total Phosphorus (mg/L)	0.028 - 0.055	0.041	0.040 - 0.067	0.055	0.043 - 0.081	0.057	0.067 - 0.181	0.114
Total Suspended Solids (mg/L)	1.8 - 14.1	4.5	1.6 - 5.8	3.2	2.2 - 7.3	3.8	2.6 - 6.8	4.3
Un-ionized Ammonia as NH3 at Field Temp. (ug/L)	2.1 - 12.6	8.1	12.9 - 55.3	24.1	6.9 - 30.5	15.6	4.8 - 44.2	16.0
Aluminum (mg/L)	0.014 - 0.047	0.028	0.043 - 0.064	0.052	0.038 - 0.121	0.063	0.031 - 0.119	0.076
Copper (mg/L)	0.0011 - 0.0021	0.0016	0.0024 - 0.0033	0.0030	0.0019 - 0.0037	0.0028	0.0019 - 0.0026	0.0022
Lead (mg/L)	0.0002 - 0.0003	0.0002	0.0004 - 0.0012	0.0006	0.0002 - 0.0006	0.0004	0.0002 - 0.0008	0.0006
Zinc (mg/L)	0.002 - 0.006	0.004	0.007 - 0.021	0.012	0.005 - 0.012	0.007	0.005 - 0.016	0.011

Chedoke Creek – Highlights



Areas of Interest (AOI)

Upper Chedoke

LOCATION	PARAMETER OF CONCERN	OTHER INFORMATION
SWQP CC SW9 Redeemer's Mountview Falls	Ammonia, E. coli, nitrates/nitrites, TKN, phosphorus (incl. ortho), zinc	
SWQP CC SW8	Total metals (Al, Cu, Pb, Zn)	No flow during dry weather – suggesting primarily road run off during snow melt/wet weather events
SWQP CC SW7 Redeemer's Westcliffe & Cliffview Falls	E. coli	
HCA CC-9 (Chedoke Falls) Redeemer's Chedoke Falls	E. coli, phosphorus	

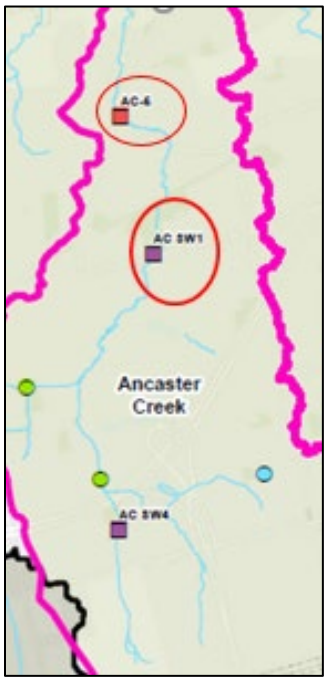
Lower Chedoke

LOCATION	PARAMETER OF CONCERN	OTHER INFORMATION
Multiple along lower Chedoke Creek Locations	Multiple Parameters	Dredging scheduled for 2023.
Kay Drage Park – Landfills:	NA	TC/TW in communication with Landfills. Requested additional information on the storm drainage pipes along Chedoke Creek. RC's Landfills group investigating storm drainage and leachate collection system.

Ancaster Creek, Spencer Creek & Cootes Paradise

Areas of Interest (AOI)

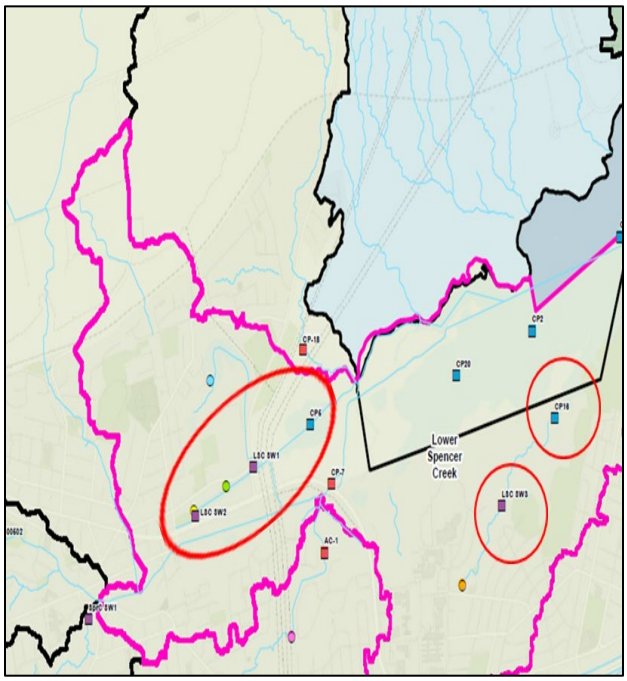
Ancaster Creek



LOCATION	PARAMETER OF CONCERN	OTHER INFORMATION
HCA's AC-5 (Wilson at Rousseaux)	E. coli, Nitrate	
SWQP AC SW1	E. coli, Nitrate	Evidence of possible cross-connection – TW has communicated this information with WDWWC team.

Spencer Creek (Spring Creek & Lower Spencer Creek) & Cootes Paradise

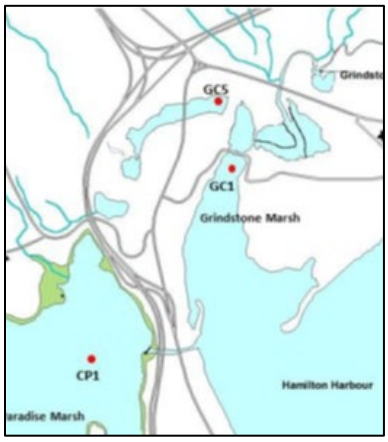
Areas of Interest (AOI)



LOCATION	PARAMETER OF CONCERN
SWQP LSC SW1 & SWQP LSC SW2	Ammonia, E. coli, Nitrate, TKN, Phosphate (including Ortho), Copper, Zinc
SWQP LSC SW3	Chloride
RBG's CP-5 (West Pond) Downstream to the Dundas WWTP	DO – extreme lows & highs, Phosphorus, Nitrates, Algae blooms
RBGs CP-16 (Westdale Inlet) downstream to Sterling CSO & City's LSC SW3	Phosphorus, TSS

Grindstone Creek – Highlights

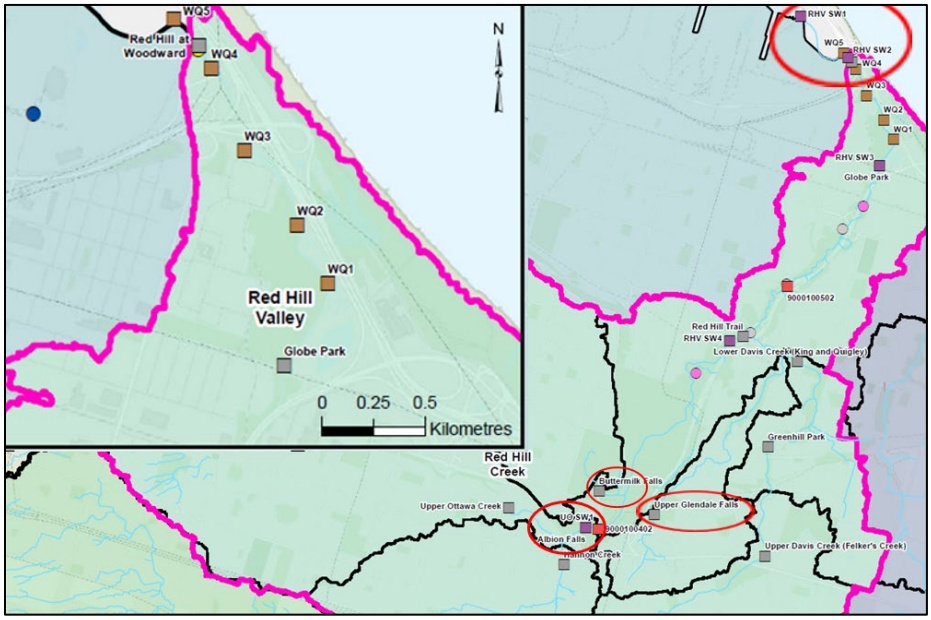
Areas of Interest (AOI)

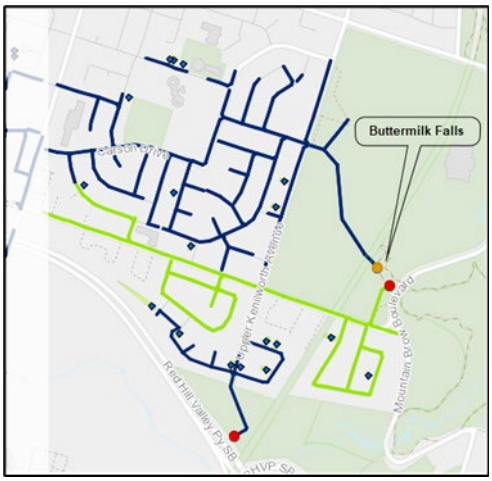


LOCATION	PARAMETER OF CONCERN
RBG's GC1 (lower Grindstone)	TP, TSS

Red Hill Valley Watershed Highlights

Areas of Interest (AOI)





Upper Red Hill

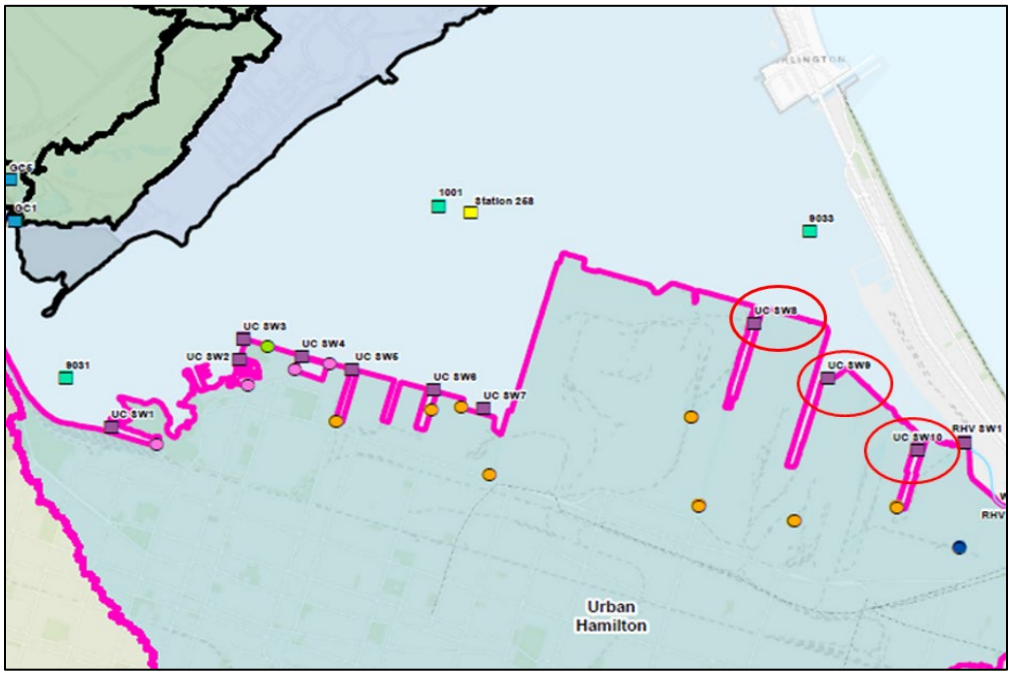
LOCATION	PARAMETER OF CONCERN
City's UO SW1 (HCA's Albion Falls)	E. coli, Zinc
Redeemer's Buttermilk Falls, including City Storm Outfall	E. Coli, Nitrate, total phosphorus, and Chloride

Lower Red Hill

LOCATION	PARAMETER OF CONCERN	OTHER INFORMATION
City's RHV SW1 & SW2	Lower DO & higher temperatures then mid-upper Red Hill Creek, Phosphorus (including Ortho), Ammonia (including Unionized), Nutrients	
WUP Locations		TW to review lower Red Hill/ WUP study in July 2023, when 2022 report is finalized.
DFO's DOT Program	DO & Temperature	As water flows downstream from Upper Red Hill Creek (City's SWQP RVH SW3 – Rennie Brampton), you can see that the natural cycle of dissolved oxygen disappears downstream of the HWWTP. Changes in DO could be the result of WWTP effluent disrupting the natural dynamics (changes in temperature and DO, as well as changes to water chemistry that affect stream biota, i.e. phytoplankton and bacterial communities that contribute to DO).

Urban Core (Hamilton Harbour)

Areas of Interest (AOI)

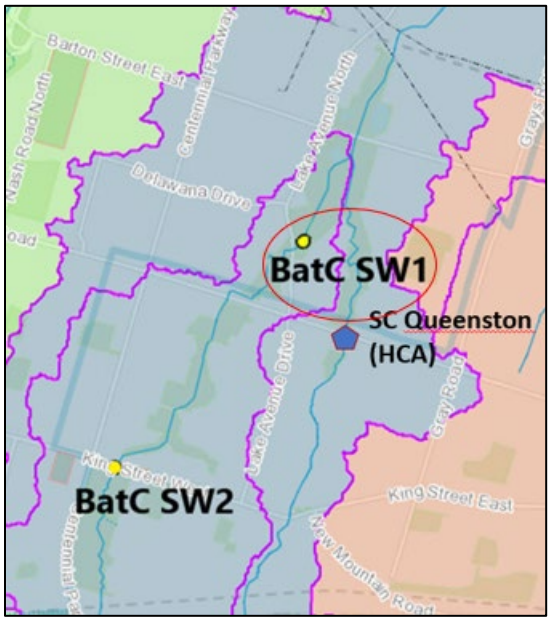


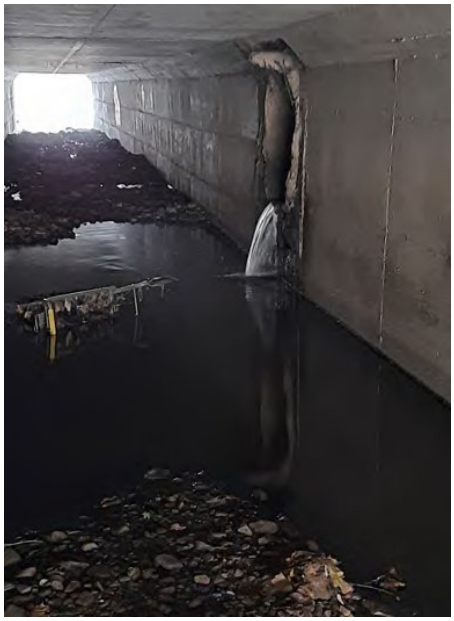
West Harbour

LOCATION	PARAMETER OF CONCERN	OTHER INFORMATION
City's SWQP UC SW8	Ammonia, E. coli, Nitrate/Nitrites, Phosphorus, Temperature (consistent ~5-10 degrees warmer than rest of Harbour locations), Total Metals (Al, Cu, Pb, Zn)	
City's SWQP UC SW9	Unionized ammonia, Phosphorus, Total Metals (Al, Cu, Pb, Zn)	
City's SWQP UC SW10	Ammonia (including unionized), Chloride, E. coli, Nitrate/Nitrites, Phosphorus (including Ortho), Total Metals (Al, Cu, Pb, Zn)	
DFO/MECP/ECCC:	DO, Temp, Nutrients	Hamilton Harbour faces significant periods of hypoxia, and even anoxia. DFO's work indicates that these periods are increasing during the summer. DO concentrations are becoming much more variable during the winter, and hypoxia is occurring earlier in the summer.

Stoney-Battlefield Creek

Areas of Interest (AOI)





LOCATION	PARAMETER OF CONCERN	OTHER INFORMATION
BatC SW1 (Lake Ave. Park)	Ammonia (including unionized), cBOD, E.coli, Phosphorus (including Ortho), Nitrate/Nitrites, TNK, Zinc.	There appears to be an observed trend of WQ degradation and/or changes in WQ Chemistry between the up- (BatC SW2) and down- (BatC SW1) stream location – both visual and chemical. Possible Cross Connection upstream to BatC SW1 at SD07OF01. Observed a plunge pool with a steady flow of water, SAN debris comprised of broken-down tissue, and heavy film on water just downstream. Algae/high nutrient evidence on the stream sediment. Notified WDWWC of the location.

Welland River, Buckhorn Creek & Twenty Mile Creek – NPCA

Watershed Fact Sheet: https://npca.ca/images/uploads/common/Water_Quality_Report_2021.pdf

2021 Annual Report:
https://npca.ca/images/uploads/common/Water_Quality_Monitoring_Program_Summary_Report_of_the_Year_2021_web.pdf

LOCATION	PARAMETER OF CONCERN
WR002 (downstream to Airport)	Chloride
General – Downstream to Airport	PFAS

Conclusion

Limitations of the SWQP WQ Trending:

- Minimal resources for second field staff, and/or WQT designate
- Minimal resources and/or funding for a WQ Trending Dashboard (BI Trending is supported by internal colleague, at a limited capacity)
- Not all WQ Partners/Agencies sample or trend same WQ parameters as the City's Water Quality Technologist (WQT)
- Plan required to assist expanding 3rd Party Parameter lists
- Request Parties to begin trending additional parameters in their own sampling program
- Develop SW Tributary Baselines & Thresholds; develop a WQ 'hot spot' type map
- Risks associated with small vessel use within Hamilton Harbour, for Harbour sampling

INFORMATION REPORT

TO:	Chair and Members Public Works Committee
COMMITTEE DATE:	June 12, 2023
SUBJECT/REPORT NO:	Sewer Use By-law Program 2022 Annual Update (PW23039) (City Wide)
WARD(S) AFFECTED:	City Wide
PREPARED BY:	Susan Girt (905) 546-2424 Ext. 2671 Mike Spicer (905) 546-2424 Ext. 5826 Rita Armenti (905) 546-2424 Ext.1626 Sherry Vanderheyden (905) 546-2424 Ext. 4437
SUBMITTED BY: **SIGNATURE:**	Nick Winters Director, Hamilton Water Public Works Department

COUNCIL DIRECTION

N/A

INFORMATION

This report serves to provide an update to Committee on the progress and successes of the Sewer Use By-law Program for 2022.

Public Works Committee at its meeting of April 7, 2014, received the new Sewer Use By-law Report (PW13061a), which was then subsequently enacted by Council and came into force on May 1, 2014. At the time, Hamilton Water made a commitment to provide an Information Report, outlining the status of the Sewer Discharge Permit Program, as well as other general Sewer Use By-law Program highlights, to the Public Works Committee on an annual basis.

The City of Hamilton's (City) Sewer Use By-law regulates discharges to the City's storm, sanitary, and combined sewers from industrial, commercial and institutional facilities, and residential units. It also regulates the conveyance and disposal of hauled sewage. It

establishes limits for common pollutants and prohibited substances, and details requirements that users need to meet to discharge to the City's sewer infrastructure.

The current Sewer Use By-law No.14-090 promotes clarity and ease of use as well as fair and consistent administration and enforcement. The environmental impacts would be significant without regulating dischargers to the sewer works through monitoring and enforcement of the By-law. Examples include:

- Clogged or damaged sewers and pipes;
- Risk of impairment of the sewage treatment processes;
- Wastewater collection system surcharges, basement flooding, and combined sewer overflows;
- High nutrients contributing to eutrophication of water bodies through algal blooms; and,
- Heavy metals and emerging contaminants that are toxic and can bioaccumulate in the food chain.

The mandate of the Environmental Monitoring and Enforcement Unit in the Hamilton Water Division of Public Works is to ensure a healthy environment and elevate trust and confidence in Hamilton Water's services through innovative risk assessment, mitigation, and compliance programs. The unit is responsible for the administration and enforcement of the Sewer Use By-law which is in place to protect the City's sewer infrastructure, wastewater treatment facilities, and the natural environment. This is achieved via the following activities and programs and an update for many of them are highlighted in this report:

- Sewer Discharge Permitting Program;
- 24/7 Spills Response Program;
- Wastewater Abatement Program;
- Industrial, Commercial and Institutional Inspection and Risk Assessments;
- Sampling and Monitoring;
- Enforcement Action;
- Hauled Sewage Monitoring Program; and,
- Sewer Use By-law Updates.

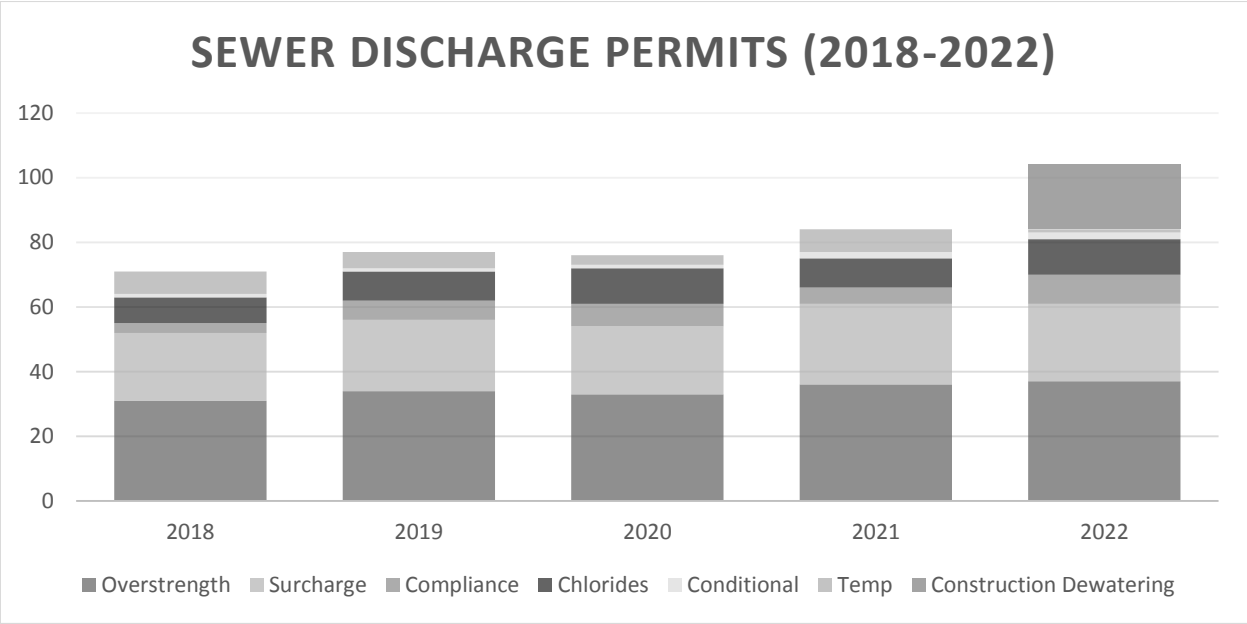
Since its inception, the Sewer Use By-law has been amended several times to accommodate changes to departmental structure and current industry practices and technologies. The most recent update was received by the Public Works Committee as Report PW19029(a), at its meeting of April 22, 2022, where amendments were proposed to update some parameter limits, introduce the Construction Dewatering Permit type and other minor administrative updates.

Staff administer various permit types by approving applications and processing quarterly invoices. Typically, permits are issued to Industrial, Commercial and Institutional facilities whose discharges do not meet the requirements of the Sewer Use By-law but can be treated effectively at one of the City's wastewater treatment plants and will not adversely affect the condition of the sewer system. In April 2022, Sewer Use By-law amendments introduced a new permit type (Construction Dewatering). Construction Dewatering is another type of activity where a permit may be issued to a constructor/developer.

Permits are a regulatory tool that allow the City to apply conditions and controls to discharges to the sewer works and recover costs associated with conveyance and treatment. After April 2022, there were seven (7) different types of Permits that can be issued by an Enforcement Officer, which are explained in detail below.

Some Sewer Discharge Permits require facilities to self-monitor discharges and submit data quarterly. All Permits include the requirement to report exceedances on internal monitoring samples which was not previously enforced. In 2022, the Environmental Monitoring & Enforcement Unit began identifying exceedances that were not reported, required facilities to submit plans to correct non-compliance and reinforced the Permit requirement to report. This resulted in more Spill reports and Compliance Program Permits in 2022.

Each discharger must apply to the City with specific details about the discharge which is assessed by Hamilton Water staff and only issued once all requirements are met. Except for Compliance and Temporary Permits, each permit is typically issued for a three (3) year period. Prior to the expiry date, if a permit is still required, the discharger must re-apply. In 2022, the Environmental Monitoring & Enforcement Unit managed one hundred and four (104) Permit files, which is up from 84 in 2021.



Overstrength Permit

If a discharger cannot meet the requirements of the Sewer Use By-law for treatable parameters (Carbonaceous Biochemical Oxygen demand, Total Suspended Solids, Phosphorus, Total Kjeldahl Nitrogen, and Oil and Grease (animal/vegetable)) they can opt to pay the City to treat their overstrength waste if they do not have real estate or expertise to install their own treatment system. In 2022, there were thirty-seven (37) Overstrength Permits versus thirty-six (36) in 2021.

Surcharge Permit

If water is discharged to the sewer that has not been purchased from the City's potable water system, a Surcharge Permit is required to recover the cost of conveying and treating that water. In 2022, there were twenty-four (24) Surcharge Permits versus twenty-five (25) in 2021.

Chlorides Permit

If a discharger cannot meet the requirements of the Sewer Use By-law for chlorides, a Chlorides Permit lays out the necessary conditions based on a sewer impact study that the discharger is required to conduct. Also, the study will determine the life span of the sewer and the discharger may be required to pay the City to replace the sewer if it does not reach its expected lifespan. In 2022, there were eleven (11) Chlorides Permits versus nine (9) in 2021.

Conditional Permit

A Conditional Permit controls and applies conditions to discharges from landfill leachate collection systems, or where a higher-level government authority is required. In 2022, there were two (2) Conditional Permits, which was the same in 2021.

Temporary Permit

A Temporary Permit controls and applies conditions for any of the above discharges that do not exceed a period of six (6) months - tank discharges, site excavations, etc. In 2022, there was one (1) Temporary Permits versus seven (7) in 2021. The decrease is due to some Temporary Permits being replaced with Construction Dewatering Permits in 2022.

Compliance Permit

A Compliance Permit provides a discharger with certain controlled exemptions to the Sewer Use By-law for a limited time, to plan and implement treatment works or pollution prevention activities that will bring their discharge into compliance. The business will set out activities to be undertaken that would result in the prevention or reduction and control of the discharge by the date specified in its permit.

This allows the business to continue to discharge to the City sewer works in excess of the Sewer Use By-law limits, (within certain parameters, conditions, and timelines prescribed in the permit) while taking the required corrective action to address and resolve the problem. As part of the permit conditions, the company may be required to perform sampling and is also required to provide progress reports regularly to the City. Failure to comply with any aspect of the compliance permit may result in its termination.

Once the permit expires, the discharger is continually monitored until it is verified that compliance was attained. In 2022, there were seven (7) active Compliance Permits, compared to five (5) in 2021.

Construction Dewatering Permit

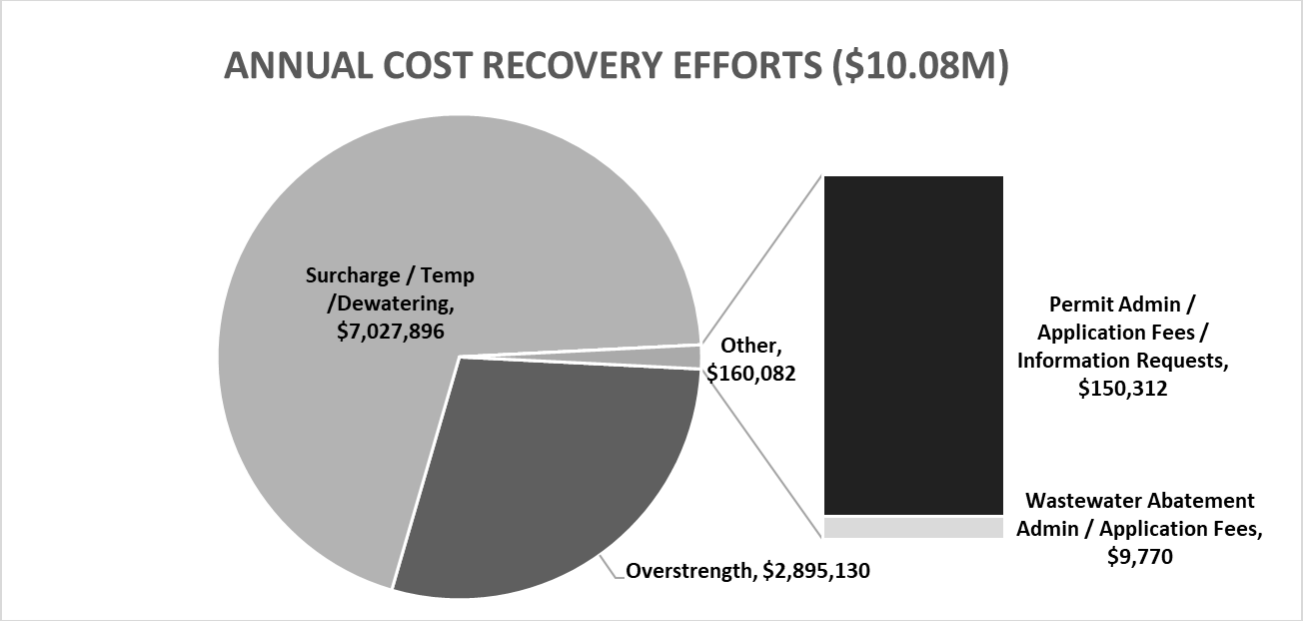
The new Construction Dewatering permitting program and the associated fees will provide additional revenue to support the expansion of the program. The Construction Dewatering program issued fourteen (14) Permits and processed five (5) Pre-Approvals in 2022. This program generated in $84,262 in revenue for 2022. One additional project received an approval for discharge prior to the 2022 Sewer Use By-law amendments that resulted in $17,404 in missed revenue.

Annual Revenue

In 2022, Sewer Discharge Permits generated approximately $10.08 million in annual revenue, which accounts for the recovery of costs associated with conveying and treating overstrength and surcharge wastewater. This includes approximately $150,000 for permit administration, application and information request fees being invoiced.

Also in 2022, a process was implemented to obtain updated water balance reports for all facilities with volume-based Permit fees as part of the renewal process to ensure accurate cost recovery. All Permit templates now require the submission of an updated Engineer's report with the Permit application. This new practice revealed four (4) previously undocumented discharges yielding retroactive cost recovery of $555,000, increased annual cost recovery of $300,000 and potential to free up sanitary sewer capacity by 54 litres/second.

The chart below shows a breakdown of the 2022 cost recovery efforts.

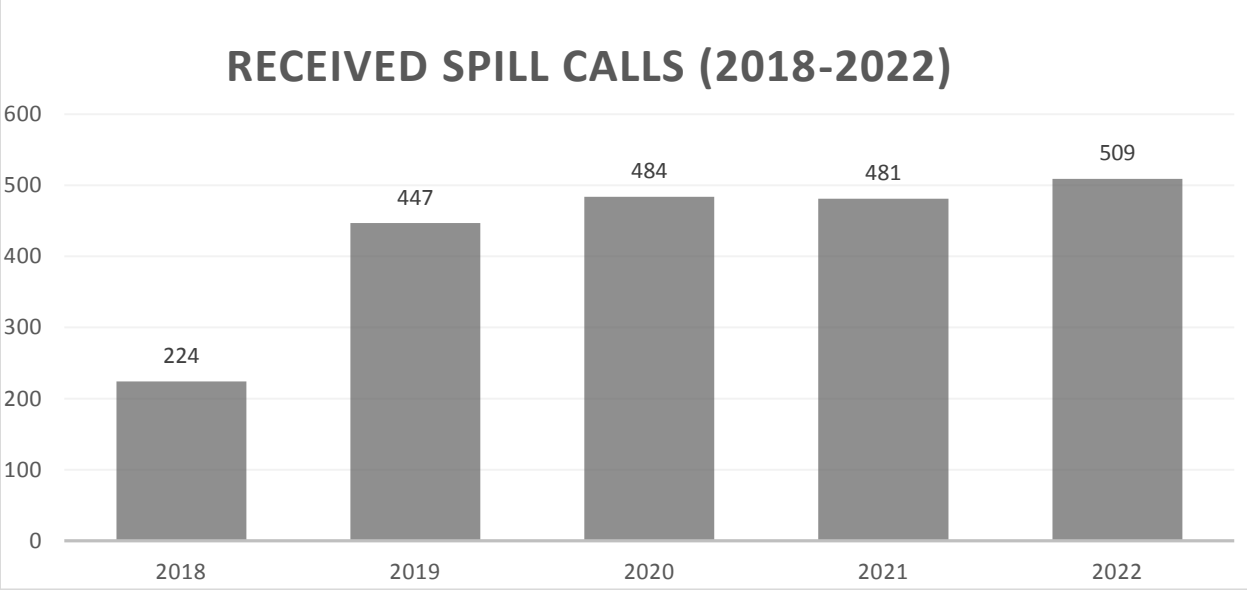


Spills Response Program

Environmental Monitoring & Enforcement staff respond to spills 24/7, mitigate impact, collect evidence, educate, hold responsible parties accountable for clean-up and evaluate potential enforcement and corrective actions to protect the integrity of the City's sewer works and Hamilton's water resources. In 2022, 509 spill notifications were handled by the Environmental Monitoring & Enforcement Unit. Environmental

Monitoring & Enforcement staff's experience and skillset are critical in dealing with a variety of situations of various magnitudes. A total of 67 spill samples were collected in 2022. The Environmental Monitoring & Enforcement Unit continues to build a relationship with the Ministry of the Environment, Conservation, and Parks and other City sections to ensure the interests of the community are protected. The responsibility and level of detail and care required to deal with these calls continues to increase and add additional pressures to Environmental Monitoring & Enforcement programming, competing for resources with other programs such as the inspection and sewer discharge permit program.

Support for work outside the Hamilton Water Division is also showing signs of impact to other work priorities. The Environmental Monitoring & Enforcement Unit continues to monitor portfolio performance via Key Performance Indicator/Metric monitoring. The Environmental Monitoring & Enforcement Unit worked with staff and senior leadership to support the creation of a Level 2 spills procedure, which was released in 2022, that provides additional guidance around coordination and execution of emergency spill response tasks consistently across the Public Works Department.



Staff endeavours to ensure that spills to the City's sewer infrastructure and natural environment are remediated. This includes having staff investigate the source of the spill and holding the responsible party accountable. In 2022, approximately 69% of the $177,465 spent on spill clean-up was recovered through Risk Management. This is a huge increase from previous years, with typical recoveries of 9%. Staff also supported other City departments on major spill related remediation work and associated cost recovery. Cost recovery efforts are continuous and, in some cases, yield results.

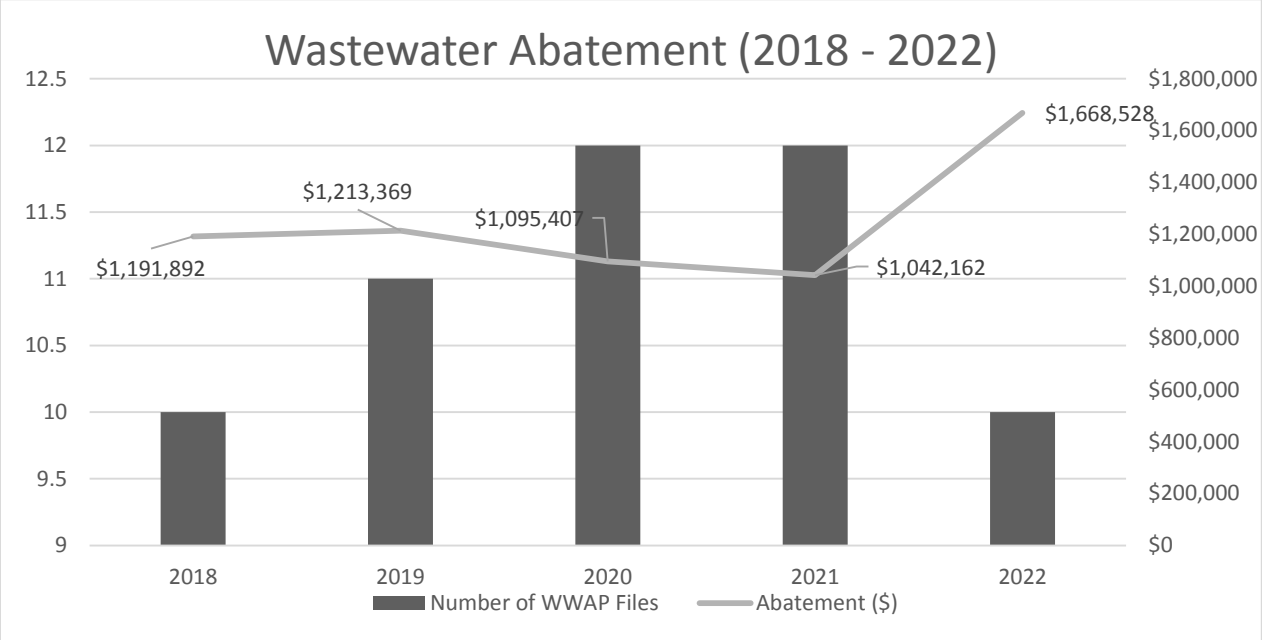
The corporate-wide Spills Contract is written with clear, specific terms and has been in use since 2017. The 5-year contract expired in October 2022 and the new contract was issued for tender in 2022 with the awarded vendor commencing work on November 1, 2022.

The spill clean-up and recovered costs associated with Hamilton Water operations are noted in the chart below.

Wastewater Abatement Program

The Wastewater Abatement program allows eligible commercial and industrial ratepayers to apply for an assessment of the flow differential between water use and sewage discharged to the City's sanitary sewer and combined sewer systems. Eligible commercial and industrial consumers include those that divert a minimum of 25% of their purchased potable water away from the sewer works.

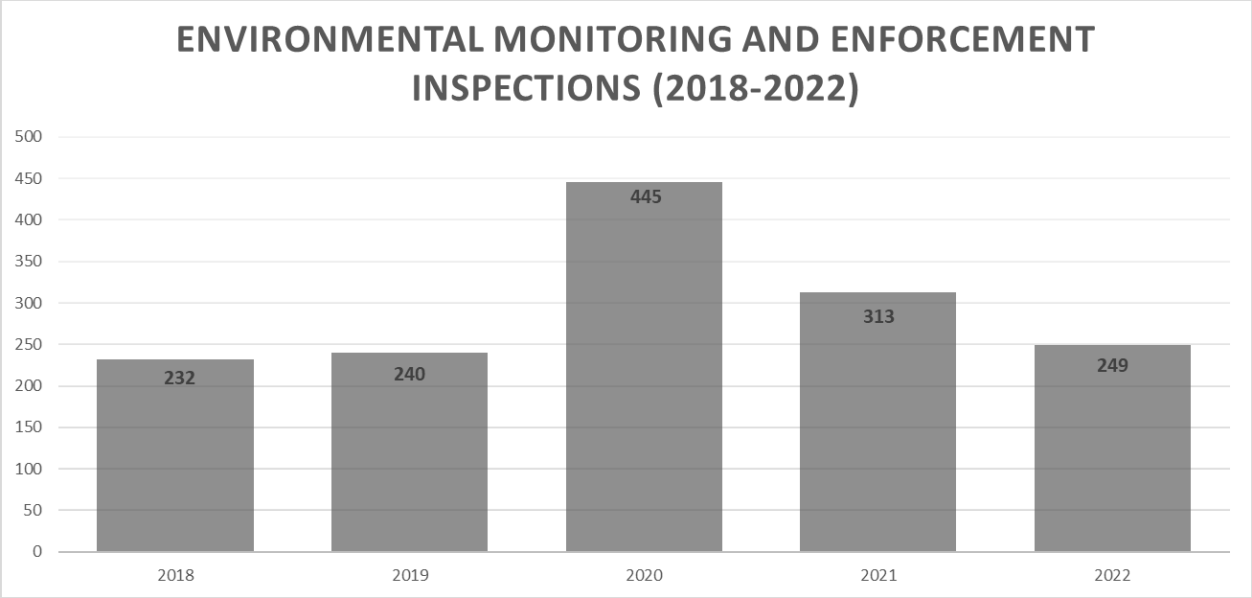
The chart below summarizes the program statistics over the past five (5) years. The application process is rigorous and expects the discharger to be in compliance with the Sewer Use By-law and maintain good financial standing with the City.



Industrial, Commercial & Institutional Inspection and Risk Assessments

In 2022, the Environmental Monitoring & Enforcement Unit completed 249 inspection work orders, which included the new Construction Dewatering field inspections. The Environmental Monitoring & Enforcement Unit started conducting field inspections based on a list of properties identified by the Hamilton Water Source Water Protection Unit using data from the development approvals process. 139 Construction Dewatering field inspections occurred in 2022. The other inspections included a combination of detailed and general site assessments.

The chart below shows the number of yearly inspection work orders (detailed and general site assessments) that have been completed.

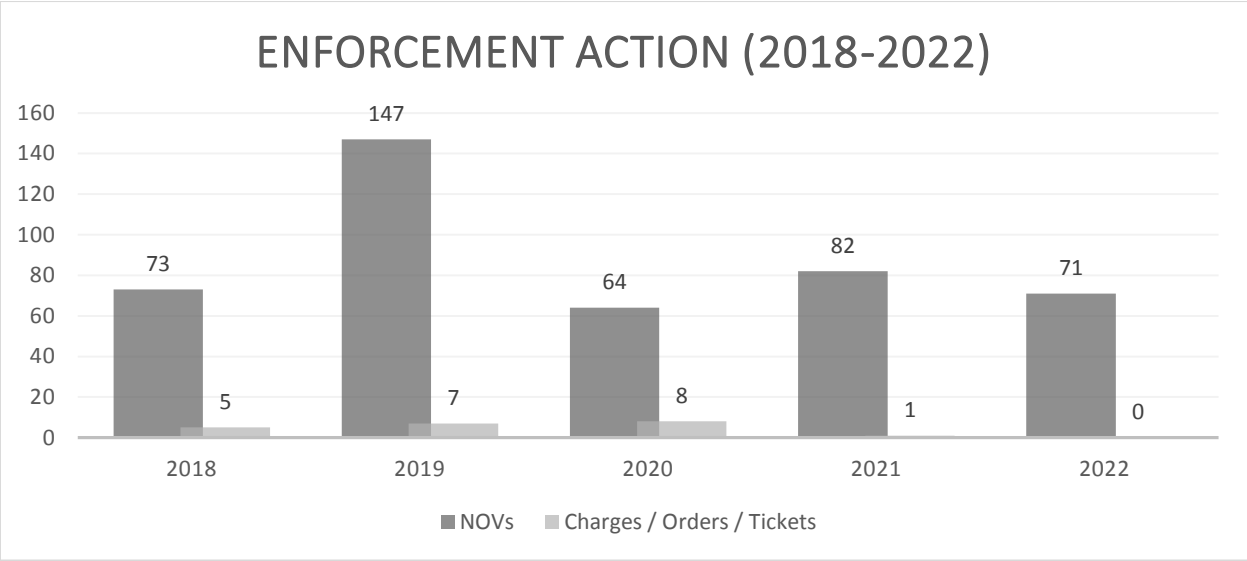


Enforcement Action

The Environmental Monitoring & Enforcement Unit generally issues Notices of Violation for offences under the Sewer Use By-law. Should compliance not be achieved following notification of offences using the Notice of Violation, then investigations may be conducted which may lead to prosecutions and potential convictions before the courts.

In circumstances which pose an immediate threat to public health, infrastructure or the environment, or otherwise require immediate action, Enforcement Officers may issue an order to comply or take other remedial actions. In certain cases, the circumstances may warrant charges under the Sewer Use By-law.

The chart below shows the enforcement action that has been taken over the past five (5) years, which includes Notices of Violation, tickets, charges and orders issued by the Environmental Monitoring & Enforcement Unit. Four (4) charges from 2019, 2020 and 2021 were successfully prosecuted in early 2022 prompting notable improvements in Sewer Use By-law compliance from these facilities.



Sewer Use By-law Updates

Public Works Committee at its meeting of April 22, 2022, approved the Sewer Use By-law Amendments Report (PW19029(a)). The purpose of the report was to address three (3) issues in the Sewer Use By-law:

1. Amendments to some of the parameter limits in the Sewer Use By-law; the rationale for which was outlined in Report PW19029 presented to Public Works Committee on April 1, 2019;
2. Amendments to implement Construction Dewatering provisions into the Sewer Use By-law; and;
3. Other administrative changes.

The Sewer Use By-law and its associated enforcement program are fully funded through fees and charges collected from users of the program.

Conclusion

The Environmental Monitoring and Enforcement Unit continues to be recognized as leaders in the Municipal Sewer Use Enforcement industry. Staffing resources have been optimized to ensure existing wastewater sampling service levels are met to support the Sewer Discharge Permit Program and provide sampling support to the Hamilton Water Division and others when required.

The strategic investments that City Council has made by adding resources to the Environmental Monitoring and Enforcement Unit, and support of ongoing changes to the

Sewer Use By-law has been instrumental to the success of this unit. This program continues to serve to protect Hamilton's sewer assets, wastewater treatment plants and the community's water resources.

APPENDICES AND SCHEDULES

N/A

INFORMATION REPORT

TO:	Chair and Members Public Works Committee
COMMITTEE DATE:	June 12, 2023
SUBJECT/REPORT NO:	Feasibility of Implementation of a Digital Automated Information System on the Lincoln Alexander Parkway and Red Hill Valley Parkway (PW23043) (City Wide) **(Outstanding Business List Item)**
WARD(S) AFFECTED:	City Wide
PREPARED BY:	Peter Locs (905) 546-2424 Ext. 6015
SUBMITTED BY: **SIGNATURE:**	Mike Field Acting Director, Transportation Division Public Works Department

COUNCIL DIRECTION

Public Works Committee at its meeting on January 13, 2020 provided the following direction:

That Transportation Operations and Maintenance staff be directed to undertake a feasibility study for the implementation of a digital automated information system that provides incident and travel time information to road users on the Lincoln Alexander Parkway and Red Hill Valley Parkway and report back to the Public Works Committee in September 2020 with a proposal for funding and implementation; and,

That staff be directed to consult with the Ministry of Transportation Ontario on coordinating incident management messaging as part of a digital automated information system.

INFORMATION

The City of Hamilton has initiated temporary installations of portable variable Messaging signs on both the Lincoln Alexander Parkway and the Red Hill Valley Parkway. The temporary installations are serving two purposes:

1. Safety Messaging – this initiative was the result of a consultant recommendation to utilize safety messaging to address driver behaviour issues that may be causing collisions to occur and was recommended as a safety measure through report PW15016.

2. Queue- End Warning – this initiative is a pilot to warn drivers of travel time and potential delays specifically near Highway 403 and Queen Elizabeth Way interchanges. The initiative was included in Report PW18008.

The two portable variable messaging signs installations, while serving separate purposes, appear the same to drivers and are considered the same (can be combined) as it pertains to studying the feasibility of a digital automated information system.

The City has retained a consultant to evaluate data collected to date by the two portable variable messaging signs installations with specific focus on the effectiveness of the queue-end warning system. The project has experienced delays primarily due to COVID-19 pandemic related traffic patterns impacts over the past three years.

Working with the consultant, City staff are reviewing the portable variable messaging signs installations to evaluate their effectiveness over the terms of their installations as well as evaluating technical considerations should the City wish to explore permanent installations. Some considerations include sign types, locations, operating parameters and integration with the City's advanced transportation management system.

The evaluation is expected to be completed in Q4 of 2023 with staff reporting back to the Public Works Committee in Q1 of 2024 with findings of the analysis work and recommendations for potentially converting the temporary portable variable messaging signs installations into a permanent digital automated information system.

APPENDICES AND SCHEDULES ATTACHED

N/A

INFORMATION REPORT

TO:	Chair and Members Public Works Committee
COMMITTEE DATE:	June 12, 2023
SUBJECT/REPORT NO:	Road Safety Review - 1415 Trinity Church Road (PW23042) (Ward 11)
WARD(S) AFFECTED:	Ward 11
PREPARED BY:	Josip Kafadar (905) 546-2424 Ext. 5781 Jamal Durrani (905) 546-2424 Ext. 5703
SUBMITTED BY: **SIGNATURE:**	Mike Field Acting Director, Transportation Division Public Works Department 

COUNCIL DIRECTION

Council at its meeting on February 22, 2023 provided the following direction:

That Item 8 of the Public Works Committee Report 23-002, a motion respecting Removal of the City-Owned Tree Located at 1415 Trinity Church Road, Hamilton (Ward 11) (Item 12.1), be referred to Public Works staff to prepare a report following a review of the traffic safety considerations related to 1415 Trinity Church Road as it relates to speed compliance matters and the placement of the driveway adjacent to a downhill portion of the roadway.

INFORMATION

The City of Hamilton approved the Vision Zero Action Plan in February 2019, which is a comprehensive road safety plan to eliminate collisions that involve serious injuries or fatalities. As part of this program, roadway safety improvements should be considered particularly in areas where there is a high volume of vulnerable road users.

The Transportation Division completed a review of Trinity Church Road between Dickenson Road East and Guyatt Road. The review included assessing the existing roadway condition in terms of signage, posted speed limit, and sightlines. Additionally, a

collision review was conducted and traffic study to measure traffic volumes and operating speeds.

Trinity Church Road is a two-way, two-lane rural collector roadway with a posted speed limit of 60 km/h. Trinity Church Road is identified as a Community Safety Zone between a point 500 metres south of Binbrook Road and Rymal Road. There are “Hidden Driveway” signs posted 195 metres north of the driveway, and 110 metres south of the driveway to 1415 Trinity Church Road.

Traffic studies were conducted March 27, 2023 to March 31, 2023, on Trinity Church Road, just north of house number 1415. Results are summarized below.

	Southbound Direction	**Northbound Direction**
85th Percentile Speed	79 km/h	79 km/h
Average Speed	72 km/h	72 km/h
Average Annual Daily Traffic	3546	4025

During a five-year period (2018-2022) there has been a total of five collisions, four being property damage only collisions and one non-fatal injury collision identified as a single motor vehicle collision. Of the four-property damage only collisions, two were rear-end, one was a single motor vehicle, and one was an angle collision.

Sightlines for the driveway to 1415 Trinity Church Road were reviewed in relation to the existing tree near the driveway in accordance to the Transportation Association of Canada guidelines. Based on the guidelines the line of sight is measured 4.4 meters back from the intersecting roadway. The tree on the property is located 5.4 metres back from the edge of the asphalt roadway. Since the tree is located beyond the line of sight and does not cause any obstructions when exiting the residential property, the necessity of removing the tree is not supported by the standards.

Sightlines were also reviewed in relation to the vertical alignment of the roadway north and south of the driveway. For a left turn from the driveway, the Transportation Association of Canada guidelines states that the stopped motorist should have 143.0 meters clear view of southbound traffic based on a design speed of 80 km/hr with a downgrade of 4%. For a right turn from the driveway the guideline is that the stopped motorist should have 130.0 meters clear view of northbound traffic based on a design speed of 80 km/hr with an approach grade of 3% or less.

The table below summarizes the results of the sightline assessment.

Movement	Approach Grade (%)	Speed Limit	Design Speed /85th Percentile Speed	Stopping Sight Distance Required (metres)	Measured Sight Distance (metres)
Right Turn from Stop	+3%	60 km/hr	80 km/hr	130	300+
Left Turn from Stop	-4%	60 km/hr	80 km/hr	143	70

Although the sightlines for the left turns from the driveway do not meet the Transportation Association of Canada guidelines, the existing conditions are not uncommon for rural roadways where vertical curves (elevation changes) are present. A "Hidden Driveway" sign is currently present 195 metres north of the driveway to 1415 Trinity Church Road for southbound traffic. The use of these signs is common practice in the City of Hamilton and other jurisdictions.

For the sightlines to be compliant at the driveway, one option would be to reconstruct the roadway to eliminate the vertical curve. This would be a complex construction project with a significant cost. Relocating the driveway would not meet the sightline requirements unless it was relocated to the south, beyond the property limits. This would require an agreement with the adjacent property owner(s) and is not recommended.

The City of Hamilton's policy for setting speed limits utilizes the methodology outlined within the Transportation Association of Canada Canadian Guideline for Establishing Posted Speed Limits. Trinity Church Road between Dickenson Road East and Guyatt Road was reviewed based on the guideline. When applying the roadway characteristics to the tool, the results recommends increasing the posted speed limit from 60 km/h to 70 km/h.

Although the guideline recommends increasing the seed limit to 70 km/h, it is recommend maintaining the existing 60 km/h posted speed limit as this roadway is identified as a Community Safety Zone and in respect to the limited sightlines.

In order to reduce the operating speeds on this roadway and calm traffic the Transportation Division will implement vertical centerline bollards and full lane transverse bars at strategic locations. Vertical Centre Line Bollards are used in order to give drivers a perception of lane narrowing and create a sense of constriction. Full lane transverse bars are a series of parallel pavement markings which extend across the majority of the travelled lane width. The markings are placed closer together with distance to create the illusion that a vehicle's speed is increasing to alert the driver of the need to reduce speed. These measures will be implemented on a trial basis and

evaluations will be conducted post implementation to determine their effectiveness in reducing operating speeds.

Further, the Transportation Division will seek support from Hamilton Police Services to increase enforcement on this section of road.

APPENDICES AND SCHEDULES ATTACHED

N/A

CITY OF HAMILTON
PUBLIC WORKS DEPARTMENT
Engineering Services Division

TO:	Chair and Members Public Works Committee
COMMITTEE DATE:	June 12, 2023
SUBJECT/REPORT NO:	Proposed Permanent Closure and Sale of Portion of Unassumed Alleyway Abutting 428 Main Street West, Hamilton (PW23037) (Ward 1)
WARD(S) AFFECTED:	Ward 1
PREPARED BY:	Cetina Farruggia (905) 546-2424 Ext. 5803
SUBMITTED BY: **SIGNATURE:**	Jackie Kennedy Director, Engineering Services Public Works Department

RECOMMENDATION

That the application of the owner of 428 Main Street West, Hamilton to permanently close and purchase a portion of the unassumed alleyway abutting 428 Main Street West, Hamilton, (“Subject Lands”), as shown on Appendix "A" and “B”, attached to Report PW23037, be approved, subject to the following conditions:

(i) That the applicant makes an application to the Ontario Superior Court of Justice, under Section 88 of the Registry Act, for an order to permanently close the Subject Lands, if required by the City, subject to:

(1) The General Manager of Public Works, or designate, signing the appropriate documentation to obtain any required court order; and

(2) The documentation regarding any required application to the Ontario Superior Court of Justice being prepared by the applicant, to the satisfaction of the City Solicitor;

(ii) That the applicant be fully responsible for the deposit of a reference plan in the proper land registry office, and that said plan be prepared by an Ontario Land Surveyor, to the satisfaction of the Manager, Geomatics and

Corridor Management Section, and that the applicant also deposit a reproducible copy of said plan with the Manager, Geomatics and Corridor Management Section;

(iii) That, subject to any required application to the Ontario Superior Court of Justice to permanently close the Subject Lands being approved:

(1) The City Solicitor be authorized and directed to prepare all necessary by-laws to permanently close and sell the alleyway, for enactment by Council;

(2) That the City Solicitor be authorized to amend and waive such terms as they consider reasonable to give effect to this authorization and direction;

(iv) The Corporate Real Estate Office of the Planning and Economic Development Department be authorized and directed to enter into any requisite easement agreements, right of way agreements, and/or other agreements deemed necessary to affect the orderly disposition of the Subject Lands and to proceed to sell the Subject Lands to the owners of 428 Main Street West, Hamilton, as described in Report PW23037, in accordance with the City of Hamilton Sale of Land Policy By-law 14-204;

(v) The City Solicitor be authorized to complete the transfer of the Subject Lands to the owners of 428 Main Street West, Hamilton, pursuant to an Agreement of Purchase and Sale or Offer to Purchase as negotiated by the Corporate Real Estate Office of the Planning and Economic Development Department;

(vi) The City Solicitor be authorized and directed to register a certified copy of the by-laws permanently closing and selling the alleyway in the proper land registry office;

(vii) The Public Works Department publish any required notice of the City's intention to pass the by-laws and/or permanently sell the closed alleyway pursuant to City of Hamilton Sale of Land Policy By-law 14-204;

(viii) That the applicant enter into a Maintenance Agreement with the City's Transportation Division for full maintenance and use of the southerly east-west leg and north-south leg of the alleyway as shown on Appendix "C" attached to Report PW23037, to the satisfaction of the Director, Transportation Division.

EXECUTIVE SUMMARY

The owner of 428 Main Street West, Hamilton, has applied to permanently close and purchase a portion of the public unassumed alleyway to support future development associated with planning application file DA-23-021.There were no objections from any City department, division, or public utilities. As the applicant is the only abutting landowner there is no impact to neighbouring residents. As such, staff support the closure and sale of the Subject Lands to the owners of 428 Main Street West, Hamilton.

Alternatives for Consideration – N/A

FINANCIAL – STAFFING – LEGAL IMPLICATIONS

Financial: The applicant has paid the Council approved user fee of $4868.50. The Subject Lands will be sold to the owners of 428 Main Street West, Hamilton at fair market value, as determined by the Corporate Real Estate Office of the Planning and Economic Development Department in accordance with the City of Hamilton Sale of Land Policy By-law 14-204.

Staffing: An agreement to purchase the Subject Lands will be negotiated by the Corporate Real Estate Office of the Planning and Economic Development Department.

Legal: Subject to any required application to the Ontario Superior Court of Justice to permanently close the Subject Lands being approved, the City Solicitor will prepare and negotiate the required Maintenance Agreement and prepare all necessary by-laws to permanently close and sell the Subject Lands and will register such by-laws in the Land Registry Office once Council has approved the by-law. The by-law does not take effect until the certified copy of the by-law is registered in the proper land registry office. The City Solicitor will complete the transfer of the Subject Lands to the owners of 428 Main Street West, Hamilton, pursuant to an agreement negotiated by the Corporate Real Estate Office of the Planning and Economic Development Department.

HISTORICAL BACKGROUND

The Subject Lands were created by Registered Plan 398 in 1907 and are public unassumed. On October 4, 2022 staff received an application from the owner of 428 Main Street West, Hamilton, to close and purchase the Subject Lands in order to support necessary land consolidation for comprehensive development. The applicant later submitted planning application file number DA-23-021. The applicant is proposing

to enhance and use at their own expense portions of the existing alleyway shown on Appendix "C" attached to Report PW23037, which is to remain in City ownership, but under a Maintenance Agreement with the City's Transportation Division.

POLICY IMPLICATIONS AND LEGISLATED REQUIREMENTS

The closure of the Subject Lands will be subject to any application required by the City. In addition, a by-law must be passed to permanently close the Subject Lands in accordance with the *Municipal Act, 2001.*

Alleyway Management Strategy - Classification System (Report PW17008(a)):
The Subject Lands are classified as Hierarchy Class "D": Alleyway is unassumed and could be used for any of the following:

- commercial parking;
- public/private waste collection;
- special consideration; and access to rear yards or overland flow routes.

RELEVANT CONSULTATION

The following public utilities, City departments and divisions were provided with a copy of the application and were invited to provide comments:

- Planning and Economic Development Department: Development Engineering, Building, Economic Development, Real Estate, and Planning
- Public Works Department: Engineering Services, Hamilton Water, Transportation, and Environmental Services
- Hamilton Emergency Services
- Corporate Services Department: Financial Planning, Administration and Policy
- Mayor and Ward Councillor
- Bell, Alectra Utilities, Hydro One, and Enbridge Gas

There were no objections received from any public utilities, City departments and divisions.

As the applicant is the only abutting landowner, there was no need for an external circulation.

ANALYSIS AND RATIONALE FOR RECOMMENDATION

As there were no objections received from any City department, division, or public utility, and the applicant is the only abutting landowner, staff are supportive of the closure and

sale of the Subject Lands to the owner of 428 Main Street West, Hamilton. The proposed Maintenance Agreement over the lands identified in Appendix "C" attached to Report PW23037 will allow for the applicant to make necessary enhancements to support the future development associated with planning application file DA-23-021 while also relieving the City of any future maintenance costs.

ALTERNATIVES FOR CONSIDERATION

N/A

ALIGNMENT TO THE 2016 – 2025 STRATEGIC PLAN

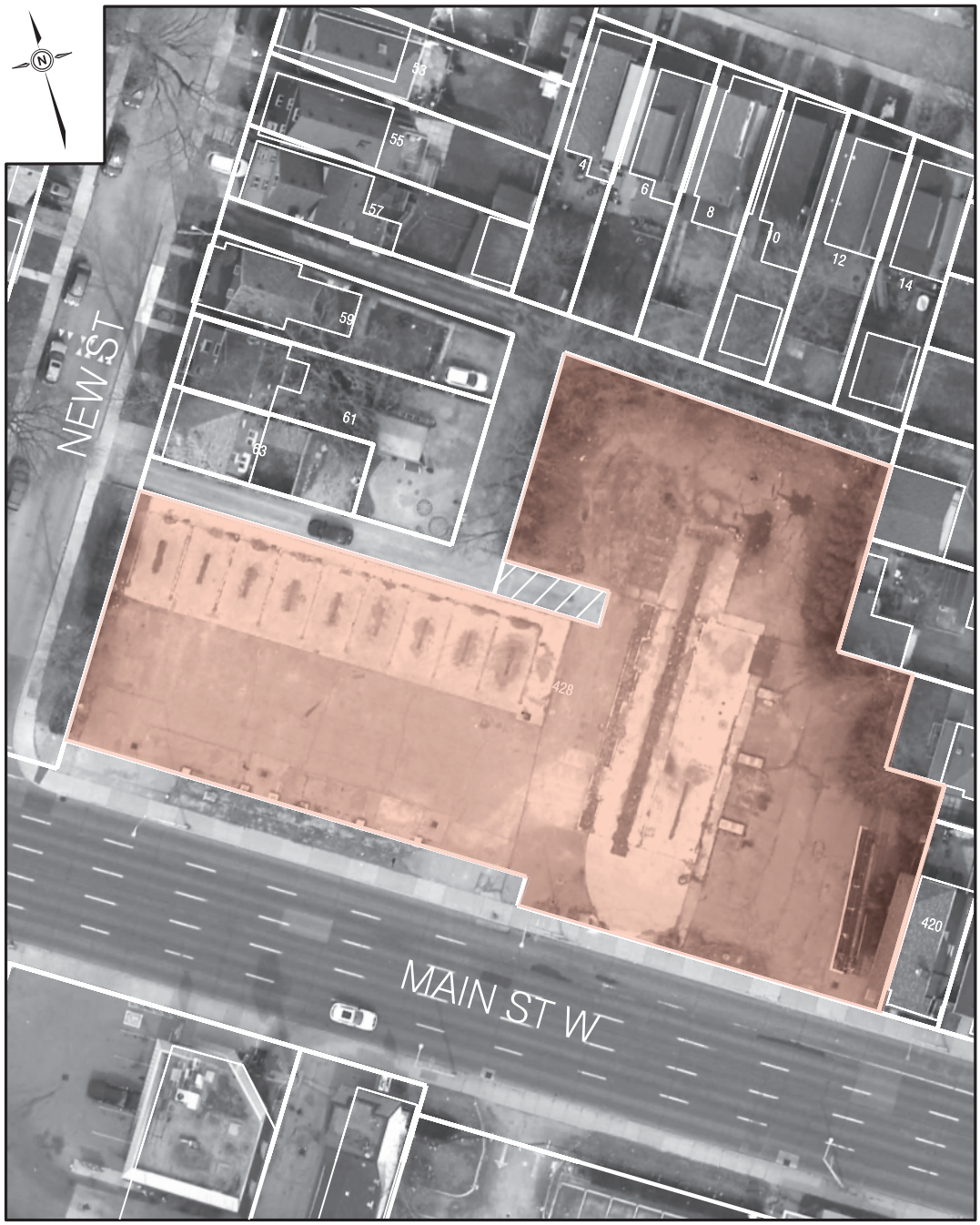
Built Environment and Infrastructure
Hamilton is supported by state-of-the-art infrastructure, transportation options, buildings and public spaces that create a dynamic City.

APPENDICES AND SCHEDULES ATTACHED

Appendix "A" to Report PW23037 – Aerial Drawing

Appendix "B" to Report PW23037 – Location Plan

Appendix "C" to Report PW23037 – Maintenance Agreement Lands



Hamilton

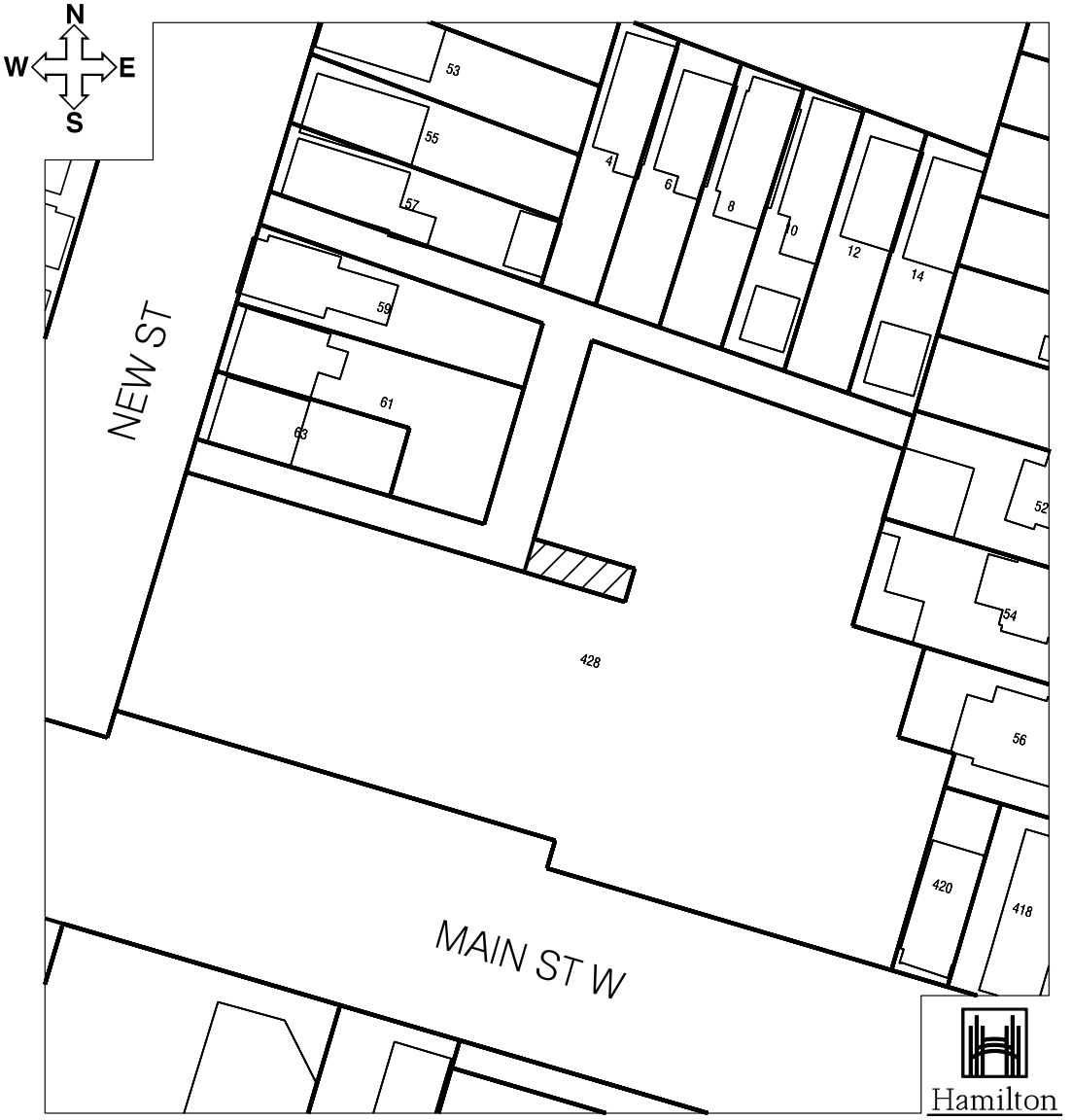
PROPOSED CLOSURE OF PORTION OF UNASSUMED ALLEY AT 428 MAIN STREET WEST, HAMILTON

Geomatics & Corridor Management Section
Public Works Department

LEGEND

Lands to be Closed

NTS | 08/12/2022 | Sketch By: CF



LOCATION PLAN

PROPOSED CLOSURE OF
UNASSUMED ALLEY AT

428 MAIN STREET WEST, HAMILTON

CITY OF HAMILTON
PUBLIC WORKS DEPARTMENT

LEGEND

SUBJECT LANDS

DATE: December 8, 2022 | Not to Scale | Sketch By: CF

REFERENCE FILE NO : PW22__

Hamilton

PROPOSED CLOSURE OF PORTION OF UNASSUMED ALLEY AT 428 MAIN STREET WEST, HAMILTON

Geomatics & Corridor Management Section
Public Works Department

LEGEND

Lands to be Closed

Maintenance Agreement Lands

NTS | 08/12/2022 | Sketch By: CF

CITY OF HAMILTON
PUBLIC WORKS DEPARTMENT
Environmental Services Division

TO:	Chair and Members Public Works Committee
COMMITTEE DATE:	June 12, 2023
SUBJECT/REPORT NO:	Bereavement Authority of Ontario Consumer Protection Fee (PW23036) (City Wide)
WARD(S) AFFECTED:	City Wide
PREPARED BY:	John Perrotta (905) 546-2424 Ext. 4402
SUBMITTED BY: **SIGNATURE:**	Cynthia Graham Director, Environmental Services Public Works Department 

RECOMMENDATIONS

(a) That the Cemetery License Fee as regulated by the Bereavement Authority of Ontario (BAO) be increase to $30.00 per burial effective July 1, 2023, from the current license fee of $13.63, as approved by Council on December 7, 2022; and

(b) That the Cemetery License Fee be renamed to the Bereavement Authority of Ontario Consumer Protection Fee on the user fee schedule and listed as a line item on the cemetery business service contracts with consumers and on the Cemetery Price List.

EXECUTIVE SUMMARY

The Bereavement Authority of Ontario (BAO) is a government delegated authority and not-for-profit corporation administering provisions of the *Funeral, Burial and Cremation Services Act, 2002* (FBCSA) on behalf of the Ministry of Public and Business Service Delivery. The Bereavement Authority of Ontario is responsible for protection of the public interest and regulates and supports licensed:

- Funeral establishment operators, directors and preplanners;
- Cemetery, crematorium and alternative disposition operators;
- Transfer service operators; and

- Bereavement sector sales representatives across Ontario.

The Bereavement Authority of Ontario is wholly funded by licensee fees that are paid by each cemetery operator, funeral establishment and crematorium operator in Ontario. The licensee fees also apply to personal licences for Funeral Directors and Sales Representatives in Transfer Services, Funeral, Cemetery and Crematoriums.

The City of Hamilton Municipal Cemeteries annually renew their Cemetery Operators license as required by the Bereavement Authority of Ontario by March 31st. Licence renewal fees for bereavement sector businesses are based on their prior 12 months of activity (number of deaths registered, cremations, hydrolysis, scatterings, or interments).

The license renewal is completed through the Bereavement Authority of Ontario's Annual Licensure Report (ALR) – Form 1. City Cemetery staff list the number of burials performed in all Municipal Cemeteries from January 1 to December 31 and pay the prescribed fee per burial as noted on the Form 1.

Alternatives for Consideration – See Page 4

FINANCIAL – STAFFING – LEGAL IMPLICATIONS

Financial: The Bereavement Authority of Ontario Consumer Protection Fee paid by the consumer per burial is transferred to account 45008 dept id 492095 (Provincial Licence Fees). These funds are used annually to renew the City of Hamilton's Cemetery Operating Licence. For the 2024 licensing year, the existing rate of $13.63 will be applied against activities conducted between January to June 2023, whereas the $30.00 rate will be applied against activities conducted between July and December 2023.

Staffing: N/A

Legal: N/A

HISTORICAL BACKGROUND

On February 6, 2023, The City of Hamilton received a Bereavement Authority of Ontario newsletter "Lifeline" advising all bereavement sector operators in Ontario of a proposed licensing fee increase. Subject to the approval of the Minister of Public and Business Service Delivery, the fee increase for the 2024 licensing year would become effective July 1, 2023**.**

The Bereavement Authority of Ontario advised the proposed new fee increase is needed to address:

- The highest 12-month rate of national inflation in four decades;
- Implementing their strategic plan and recommendations of the Office of the Auditor General (AG) of Ontario, as they grow their services and staffing level. The increase is needed to implement and sustain those improvements in regulating, providing guidance and supporting operators as professionals to facilitate compliance and elevate the profession; and
- A new and modern Bereavement Authority of Ontario database system to better organize and track licensee status.

On May 1, 2023, the Bereavement Authority of Ontario advised all bereavement sector operators that the proposed fee increase was approved by the Minister of Public and Business Service Delivery. Details of the approval are found in the below link: Notice to the Profession, as emailed to all bereavement operators.

Notice to the Profession - 60-day Notice: Licence fee increase begins on July 1, 2023 - Bereavement Authority of Ontario (thebao.ca)

POLICY IMPLICATIONS AND LEGISLATED REQUIREMENTS

The Funeral, Burial and Cremation Services Act, 2002, Part III Prohibitions and General Duties Re: Operation of Business, states:

Operating cemeteries

4 (1) No person shall operate a cemetery or hold themself out as the operator of a cemetery unless the person is licensed to do so. 2002, c. 33, s. 4 (1)

Duties in operating cemeteries
Owner's duties

5 (1) An owner of a cemetery shall;

(a) ensure that the cemetery is operated and maintained by a person who is licensed to operate the cemetery; and

(b) ensure that the cemetery operator complies with the requirements of this Act and the regulations. 2002, c. 33, s. 5 (1)

RELEVANT CONSULTATION

The following staff have reviewed and are supportive of the recommendations of this report: Finance and Corporate Services Department, Financial Planning Administration & Policy Division, Finance and Administration Section

ANALYSIS AND RATIONALE FOR RECOMMENDATION

The City of Hamilton Municipal Cemeteries are governed by the Funeral, Burial and Cremation Services Act, 2002 (FBCSA). The Bereavement Authority of Ontario is a government delegated authority administering provisions of the FBCSA on behalf of the Ministry of Public and Business Service Delivery. The BAO is responsible for protection of the public interest and regulates and supports licenced bereavement operations.

As per the FBCSA, Part III – General Provisions and Duties, the City of Hamilton Municipal Cemeteries must renew and maintain the cemetery operator's license (3275808-1) to perform burials and maintenance in accordance to the FBCSA. The renewal of the Cemetery Operating License is completed annually through the submission of the Bereavement Authority of Ontario 's Annual Licensure Report (ALR) – Form 1 and paying the applicable fee.

The renewal fee is calculated by the prescribed fee as approved by the Minister of Public and Business Service Delivery, multiplied by the number of burials conducted in January to December of each year. The cemetery operator's licence fee is passed on to the consumer and is currently included in the interment (burial fee). A portion of interment fee is transferred to account 45008 dept id 492095 (Provincial Licence Fees). These fees are not subsidized by the Municipality.

The Bereavement Authority of Ontario has advised that for transparency, a cemetery operator may now list the Bereavement Authority of Ontario Consumer Protection Fee as a line item in a business service contract with the consumer, paid by the consumer. This fee can also be listed on our user fee schedule, price list and website. Before this fee increase, the cemetery license fee was not permitted to be shown on a business service contract or cemetery price list. It was the responsibility of the cemetery operator to ensure there were sufficient funds to renew their operator's licence.

ALTERNATIVES FOR CONSIDERATION

If Council does not change the Bereavement Authority of Ontario Consumer Protection Fee to $30.00 per burial effective July 1, 2023, City Cemetery staff will list the 2023 approved cemetery license user fee of $13.63 on cemetery business service contracts with consumers and on the Cemetery Price List. The increase to $30.00 will be proposed on the 2024 user fee schedule for approval, becoming effective January 1, 2024. As the Bereavement Authority of Ontario Consumer Protection Fee will be required to renew the City of Hamilton's Cemetery Operating License, the cemetery

section will run an operating deficit as insufficient funds are collected to renew the Operator's licence in 2024.

Financial: If the fee increase is not supported, there will be a shortfall of approximately $12,133.80 which will be funded from the tax levy. The shortfall value represents the difference in the cost increase of $16.37, multiplied by 740 burials, which is the estimated average number of burials from July to December.

Staffing: N/A

Legal: Legislation states that the Bereavement Authority of Ontario Consumer Protection Fee must be paid to the Bereavement Authority of Ontario to renew the City of Hamilton's Cemetery Operating License. This is required whether or not the city charges customers the Bereavement Authority of Ontario Consumer Protection Fee.

ALIGNMENT TO THE 2016 – 2025 STRATEGIC PLAN

Economic Prosperity and Growth
Hamilton has a prosperous and diverse local economy where people have opportunities to grow and develop.

Our People and Performance
Hamiltonians have a high level of trust and confidence in their City government.

APPENDICES AND SCHEDULES ATTACHED

N/A

CITY OF HAMILTON
PUBLIC WORKS DEPARTMENT
Hamilton Water Division

TO:	Chair and Members Public Works Committee
COMMITTEE DATE:	June 12, 2023
SUBJECT/REPORT NO:	By-law Drainage Superintendent (PW23038) (City Wide)
WARD(S) AFFECTED:	City Wide
PREPARED BY:	Dave Alberton (905) 546-2424 Ext. 1090
SUBMITTED BY: **SIGNATURE:**	Shane McCauley Director, Water and Wastewater Operations Public Works Department

RECOMMENDATION

That By-law 22-126, being a By-law to appoint a Drainage Superintendent for the City of Hamilton, dated June 8, 2022, be repealed; and, that the draft By-law attached as Appendix "A" to Report PW23038, respecting the appointment of a Drainage Superintendent for the City of Hamilton which has been prepared in a form satisfactory to the City Solicitor, be approved and enacted.

EXECUTIVE SUMMARY

The attached By-law updates the City of Hamilton's (City) Drainage Superintendent appointed in accordance with the *Drainage Act R.S.O. 1990 (Drainage Act).* This is due to the hiring of a new Project Manager of Stormwater Operations and Maintenance within the Hamilton Water Division.

Alternatives for Consideration – See Page 3

FINANCIAL – STAFFING – LEGAL IMPLICATIONS

Financial: The appointment by By-law of a Drainage Superintendent will enable the City to obtain as much as 33 1/3% of assessment costs that are eligible for grants on maintenance and repair works and up to 50% of the costs incurred for the employment of a Drainage Superintendent when performing the duties of a Drainage Superintendent under the *Drainage Act.*

Staffing: N/A

Legal: N/A

HISTORICAL BACKGROUND

The Council of the City of Hamilton has appointed by By-law a Drainage Superintendent to carry out the duties of a Drainage Superintendent under the *Drainage Act*. As a result of staffing changes is it necessary to appoint a new Drainage Superintendent by By-law. The attached By-law reflects the current staffing change within the Hamilton Water Division and will replace the existing By-law 22-126.

POLICY IMPLICATIONS AND LEGISLATED REQUIREMENTS

N/A

RELEVANT CONSULTATION

Legal Services has been consulted.

ANALYSIS AND RATIONALE FOR RECOMMENDATION

The City is responsible for Municipal Drains as defined by the *Drainage Act*. For the City to be eligible for available grants, it is necessary to have an individual appointed by By-law, as the City's Drainage Superintendent. Hector Quintero is currently employed with the City as the Project Manager of Stormwater Operations and Maintenance. He is responsible for the operations and maintenance of stormwater and drainage assets, has successfully completed the required training, and is qualified to serve as the City's Drainage Superintendent.

ALTERNATIVES FOR CONSIDERATION

Council may choose not to designate a Drainage Superintendent. This is not recommended by staff as it would impede the creation, operation, and maintenance of municipal drains as a means of servicing non-riparian properties. It would also require the engagement of a consultant to administer Drainage Superintendent duties under the *Drainage Act*.

Financial: The City would not be eligible to receive any grant funds that would be available by having an appointed Drainage Superintendent under the *Drainage Act*.

Staffing: N/A

Legal: N/A

ALIGNMENT TO THE 2016 – 2025 STRATEGIC PLAN

Our People and Performance
Hamiltonians have a high level of trust and confidence in their City government.

APPENDICES AND SCHEDULES ATTACHED

Appendix “A” to Report PW23038 - To Appoint a Drainage Superintendent

Authority: Item X, Public Works Committee
Report XX-XXX (PW23038)
CM: DATE

Bill No. XXX

CITY OF HAMILTON

BY-LAW NO. XX-XXX

To Appoint a Drainage Superintendent

WHEREAS Section 93 of the Drainage Act, R.S.O. 1990 authorizes the council of a local municipality to appoint a Drainage Superintendent and provide for remuneration for services performed by the Drainage Superintendent in carrying out the provisions of this Act as set out therein;

AND WHEREAS Subsection 23 of the Municipal Act authorizes all municipalities to appoint such officers and servants as may be necessary for carrying into effect the provisions of any Act of the Legislature and to fix their remuneration and prescribe their duties;

NOW THEREFORE, the Council of the City of Hamilton enacts as follows:

1. Hector Quintero is appointed as Drainage Superintendent for the City of Hamilton:

2. The Drainage Superintendent shall carry out the duties imposed on this position pursuant to the Drainage Act, R.S.O. 1990 and shall submit such reports and carry out such other duties as may be required of them by Council from time to time:

3. City of Hamilton By-Law No. 22-126 is repealed; and

4. This By-Law comes into force on the day it is passed.

PASSED this X day of XXX 2023.

Hamilton

WASTE MANAGEMENT SUB-COMMITTEE

REPORT 23-001

Thursday, May 11, 2023
9:30 a.m.
Room 264, 2nd Floor
City Hall, Hamilton

Present: Councillor M. Francis (Chair)
Councillor A. Wilson (Vice Chair)
Councillor M. Tadeson
Kevin Hunt

THE WASTE MANAGEMET SUB-COMMITTEE PRESENTS REPORT 23-001 AND RESPECTFULLY RECOMMENDS:

1. APPOINTMENT OF CHAIR AND VICE CHAIR 2022 (Item 1)

(a) That Councillor M. Francis be appointed Chair of the Waste Management Sub-Committee for the balance of the 2022- 2026 term.

(b) That Councillor A. Wilson be appointed Vice-Chair of the Waste Management Sub-Committee for the balance of the 2022- 2026 term.

FOR INFORMATION:

(a) APPROVAL OF THE AGENDA (Item 2)

The Committee Clerk advised of the following changes to the agenda.

9. CONSENT ITEMS (Item 9)

9.1 Solid Waste Management Master Plan Update (no copy) ***Moved under Staff Presentations as Item 8.2***

The Agenda for the May 11, 2023 meeting of the Waste Management Sub-Committee was approved, as amended.

(b) DECLARATIONS OF INTEREST (Item 3)

No declarations of interest were made

(c) APPROVAL OF MINUTES OF PREVIOUS MEETING (Item 4)

(i) June 27, 2022 (Item 4.1)

The Minutes of the June 27, 2022 meeting of the Waste Management Sub-Committee were approved, as presented.

(d) STAFF PRESENTATIONS (Item 8)

(i) Overview of Waste Management Division and Services (Item 8.1)

Angela Storey, Director of Waste Management, addressed the Committee, respecting an Overview of Waste Management Division and Services, with the aid of a PowerPoint presentation.

The presentation from Angela Storey, Director of Waste Management, was received.

(ii) Hamilton Solid Waste Management Master Plan (Item 8.2)

Ryan Kent, Manager of Waste Policy and Planning, addressed the Committee, respecting the Hamilton Solid Waste Management Master Plan, with the aid of a PowerPoint presentation.

The presentation from Ryan Kent, Manager of Waste Policy and Planning, which includes the 2020 SWMMP Action Items (2021-2025 Progress), was received.

(iii) Blue Box Transition (Item 8.3)

Ryan Kent, Manager of Waste Policy and Planning, addressed the Committee, respecting the Blue Box Transition, with the aid of a PowerPoint presentation.

The presentation from Ryan Kent, Manager of Waste Policy and Planning, was received.

(iv) Organics Management Strategy (Item 8.4)

Ryan Kent, Manager of Waste Policy and Planning, addressed the Committee, respecting the Organics Management Strategy, with the aid of a PowerPoint presentation.

The presentation from Ryan Kent, Manager of Waste Policy and Planning, was received.

iv) Hamilton's Strategy to Reduce Single-Use Plastics and Federal Ban on Single-Use Plastics (Item 8.5)

Ryan Kent, Manager of Waste Policy and Planning, addressed the Committee, respecting Hamilton's Strategy to Reduce Single-Use Plastics and Federal Ban on Single-Use Plastics, with the aid of a PowerPoint presentation.

The presentation from Ryan Kent, Manager of Waste Policy and Planning, was received.

(e) DISCUSSION ITEMS (Item 10)

(i) Terms of Reference (Item 10.1)

The Terms of Reference for the Waste Management Sub-Committee, were received.

(f) ADJOURNMENT (Item 14)

There being no further business, the Waste Management Sub-Committee, adjourned at 10:26 a.m.

Respectfully submitted,

M. Francis, Chair
Waste Management Sub-Committee

Aleah Whalen
Legislative Assistant
Office of the City Clerk

12.1

CITY OF HAMILTON

MOTION

Public Works Committee: June 12, 2023

MOVED BY COUNCILLOR N. NANN………....…………..……………….........

SECONDED BY COUNCILLOR ……………………..……………………………

Drinking Fountain Installation as Part of the Zero Plastic Waste Initiative (Ward 3)

WHEREAS, the installation of water drinking fountains and bottle filling stations can help reduce the use of single-use plastic water bottles, having a measurable impact on Hamilton's ecosystems and public health;

WHEREAS, water drinking fountains and bottle filling stations encourage residents to take advantage of tap water rather than buying bottled water or other beverages; and

WHEREAS, water drinking fountains and bottle filling stations support residents staying hydrated in the heat and improve local health.

THEREFORE, BE IT RESOLVED:

(a) That a feasibility review and installation of water drinking fountains be added to the 2024 workplan, as part of a zero plastic waste initiative at the following parks and spaces, to be funded from the Ward 3 Capital Re-Investment Reserve #108053 at an upset limit, including contingency, not to exceed $285,000:

- (i) Belview Park - 205 Belmont Avenue
- (ii) Birch Avenue Park - 625 Wilson Street
- (iii) Birge Park - 167 Birge Avenue
- (iv) Bishops Park - 91 East Avenue South
- (v) Lifesavers Park - 100 Cumberland Avenue

(b) That the appropriate staff be authorized to choose the best suited location for such water drinking fountains based on best practices;

(c) That the annual operating impacts of $13,500 for the supply of water, maintenance, and winterization be included in the 2025 Public Works Department base operating budget submission; and,

(d) That the Mayor and City Clerk be authorized and directed to execute any required agreement(s) and ancillary documents, with such terms and conditions in a form satisfactory to the City Solicitor.

12.2

CITY OF HAMILTON

MOTION

Public Works Committee: June 12, 2023

MOVED BY COUNCILLOR E. PAULS …….....

SECONDED BY COUNCILLOR……...

Funding to Support Community Group with User Fee at T.B. McQuesten Park, 130 Southpark Avenue (Ward 7)

WHEREAS, the Wentworth District organization is coordinating a 3 vs. 3 basketball tournament fundraiser at T.B. McQuesten Park, 130 Southpark Avenue, to support child and youth mental health for to City of Hamilton residents;

WHEREAS, user fees are charged by the City of Hamilton to offset costs outside normal service levels, to support events and tournaments within Parks; and

WHEREAS, this group is seeking funding support to assist with these user fees for their event costs.

THEREFORE, BE IT RESOLVED:

(a) That $2,020.21, to support the user fee costs associated with the Wentworth District 3 vs.3 at T.B. McQuesten Park, 130 Southpark Avenue, to be funded from the Ward 7 Discretionary Fund, account 3302109700, be approved;

(b) That the Mayor and City Clerk be authorized and directed to approve and execute all required agreements and ancillary documents, with such terms and conditions in a form satisfactory to the City Solicitor.