



Public Works Committee
November 14, 2016
Item 7.1



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Sewer Lateral Cross Connection Program Update

Sewer Lateral Cross Connection Program

Agenda:

- What is a Sewer Lateral Cross Connection
- A Brief History of the Program
- Identifying and Correcting Sewer Lateral Cross Connections
- Program Results
- Challenges & Next Steps
- Recommendations
- Questions



- Community
- People
- Processes
- Finance

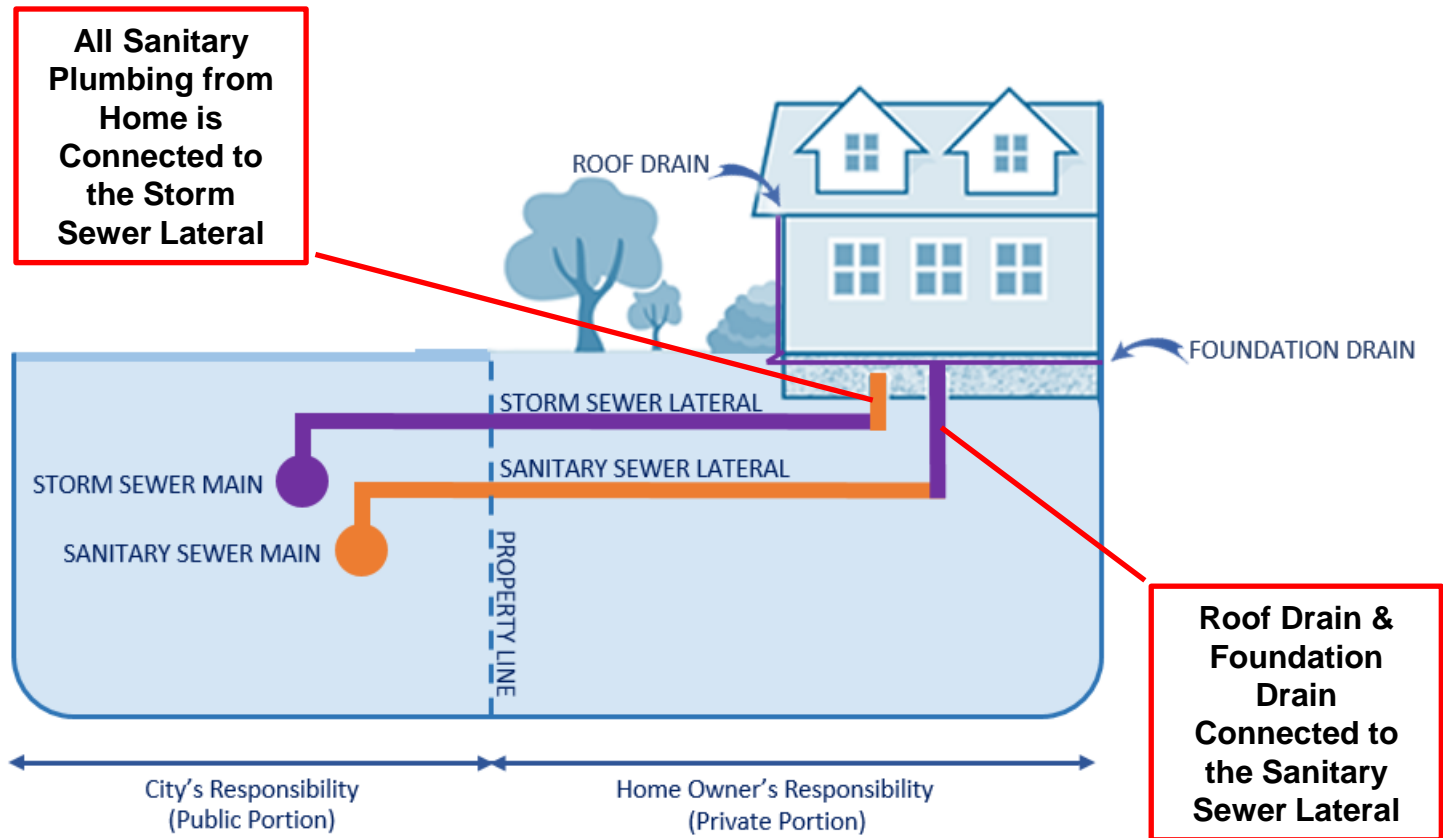


What is a Sewer Lateral Cross Connection?

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Complete Cross Connection



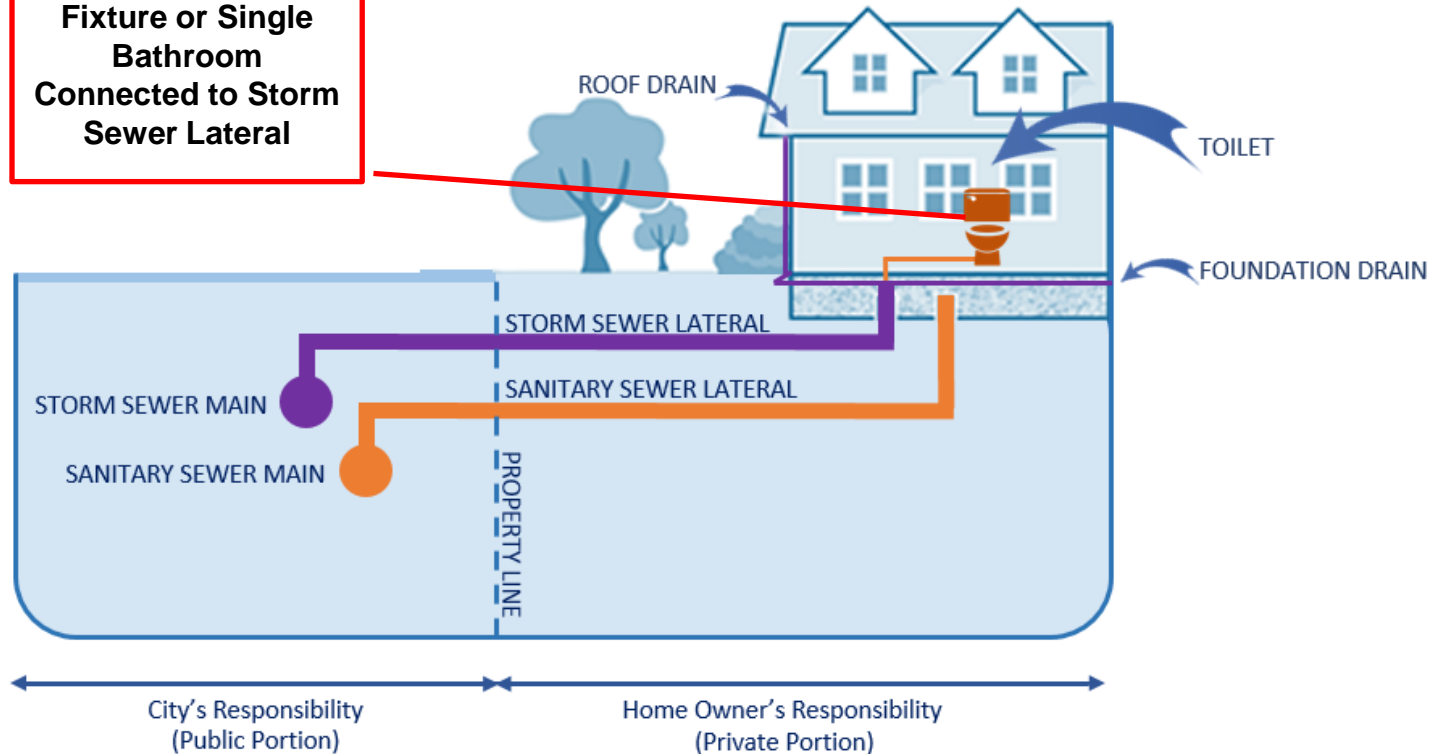
What is a Sewer Lateral Cross Connection?

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Partial Cross Connection

**Single Sanitary
Fixture or Single
Bathroom
Connected to Storm
Sewer Lateral**



History of the Cross Connection Program



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- **2001** – Ministry of the Environment Issues 4 Orders Regarding Discharge of Contaminants (E coli) to Red Hill Creek
- **2002 to 2004** – Investigation Completed & Storm Sewer Outfalls of Concern Identified
- **2005 to 2009** – Investigations Continued to Refine/Isolate Sources of Contamination
- **2009 to 2013** – Sewer Lateral Cross Connection Pilot Program
- **2014** – City Council Approved Accelerated Sewer Lateral Cross Connection Program and 2 Temporary FTEs
- **2016** – Provide Program Update to PW Committee

Identifying & Correcting Cross Connections

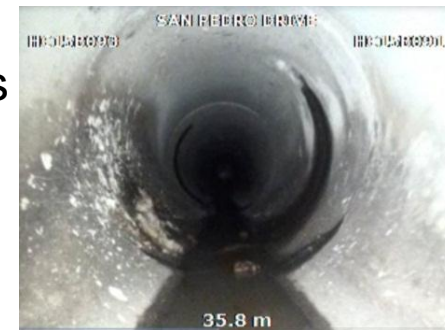
Step 1: Sampling of Outfalls and Upstream Storm Sewers

- Outfalls of concern are sampled for E coli and caffeine
- Sampling results are mapped out indicating where cross-connections are most likely to be found



Step 2: Storm Sewer CCTV Inspections

- All storm sewers within areas of concern are video inspected
- Signs of sanitary discharge from sewer laterals or staining of the sewer walls are indicators of cross connection



Identifying & Correcting Cross Connections

Step 3: Letters to Homeowners Requesting Participation

- Making contact and scheduling appointments takes time
- Can involve multiple letters and phone calls to explain the issue, what the City is asking of the homeowner and what risks exist
- Homeowners are advised of the following should a cross connection be confirmed:
 1. The City will not take any enforcement action against the homeowner at this time
 2. If a cross connection correction is possible on City property, this work will be completed at no cost to the homeowner



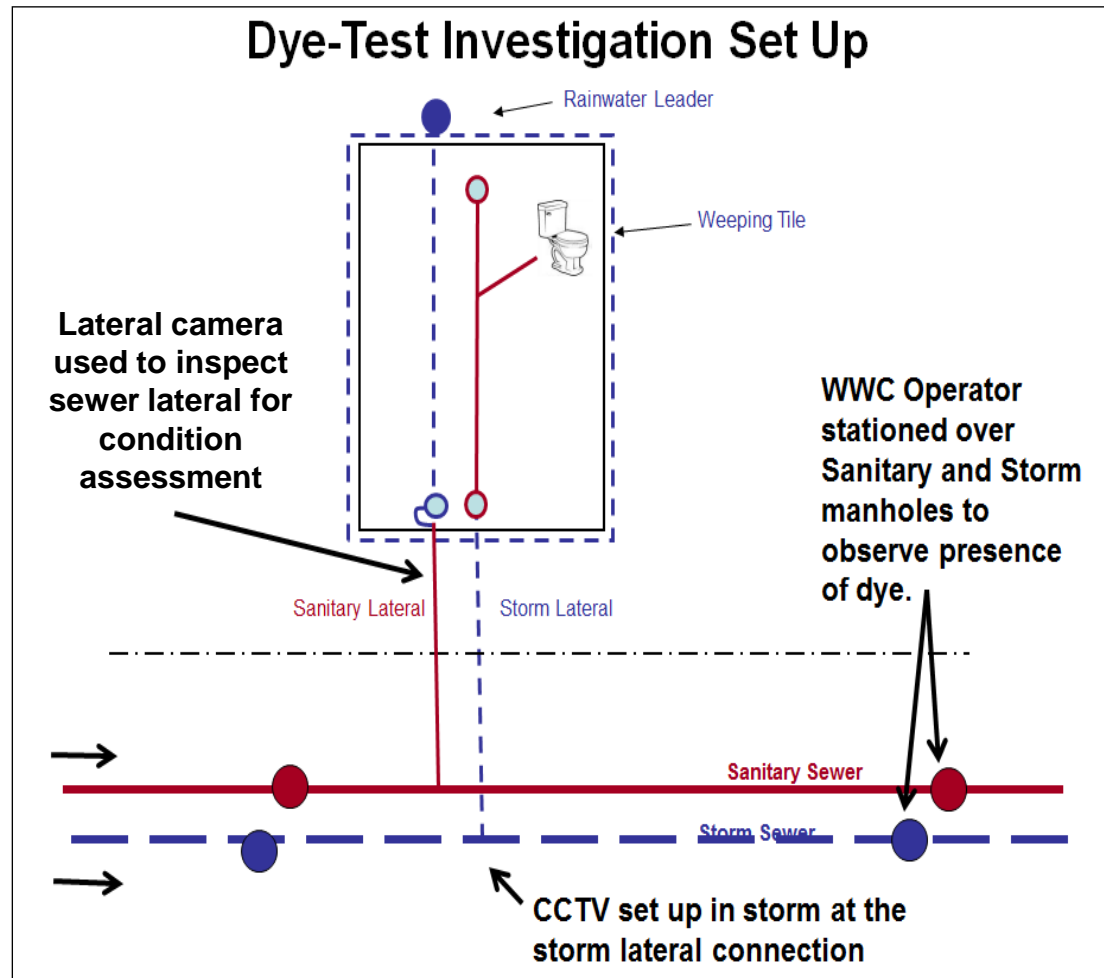
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Identifying & Correcting Cross Connections

Step 4: Dye-Testing and Sewer Lateral CCTV Inspections



Identifying & Correcting Cross Connections

Step 5: Engineering Investigations for Corrective Action

- Sewer Lateral CCTV reports are reviewed to assess the structural condition of the entire sewer lateral
- Sewer as-built drawings are reviewed to determine whether depths of sanitary and storm sewers may permit reversal of both laterals
- The site is reviewed to confirm location of laterals in reference to driveways, landscaping and trees to determine if a correction of full lateral replacement is required
- Prior to initiating a correction staff advises the homeowner of the scope of work required to correct the cross-connection and makes recommendations if issues are found on the private portion of the lateral



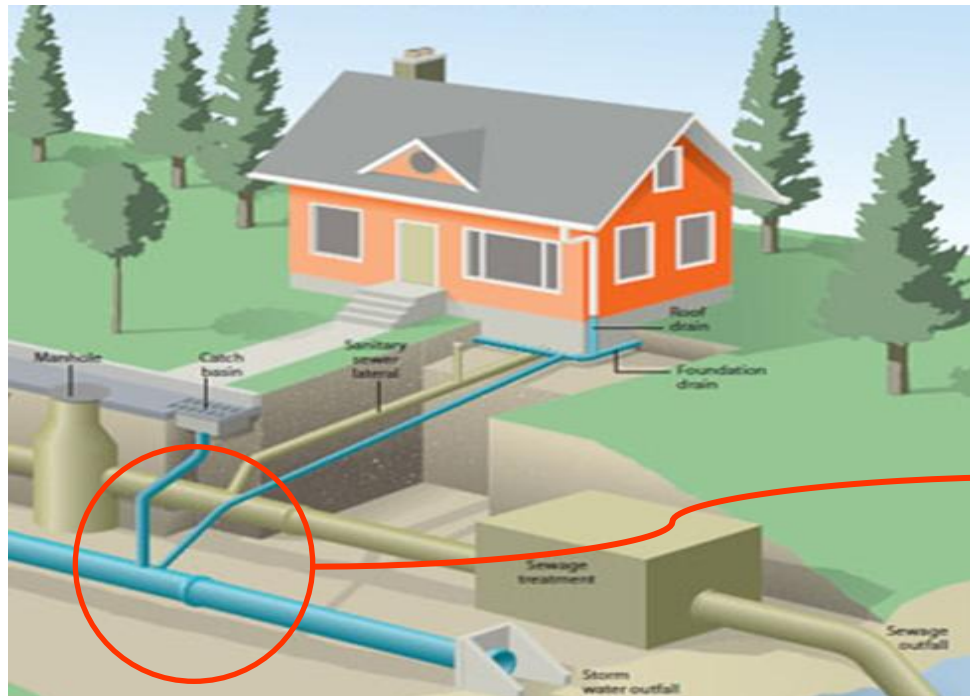
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Identifying & Correcting Cross Connections

Step 6: Sewer Lateral Cross Connection Corrections

- Sanitary and storm laterals are physically severed and reconnected so that they discharge to the correct sewer.



Before Correction



After Correction

Cross Connection Program Results



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Effective January 2016 New Subdivision Agreements Require a Dye Test to Confirm that Private Sewer Laterals are Connected Correctly

Sanitary Sewer Dye Test

5.12 Prior to occupancy inspection the Owner of a Lot or Block within the Land shall:

- a) dye test all sanitary drains in newly constructed dwellings in order to ensure that they have been properly connected to the sanitary sewer system; and,
- b) provide the Director of Building Division and the Senior Director of Growth Management with a certificate prepared by a professional engineer confirming that all sanitary drains for each dwelling unit have been dye tested and are properly connected to the City's sanitary sewer system.

Cross Connection Program Results

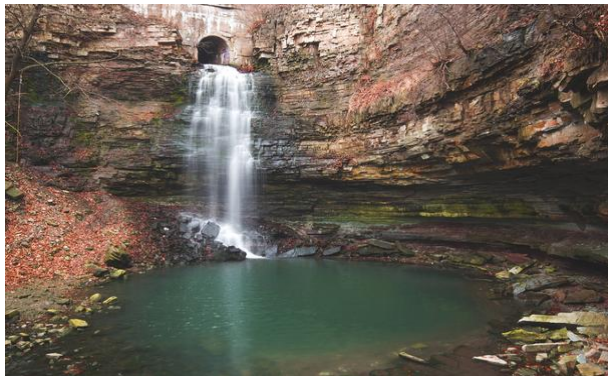


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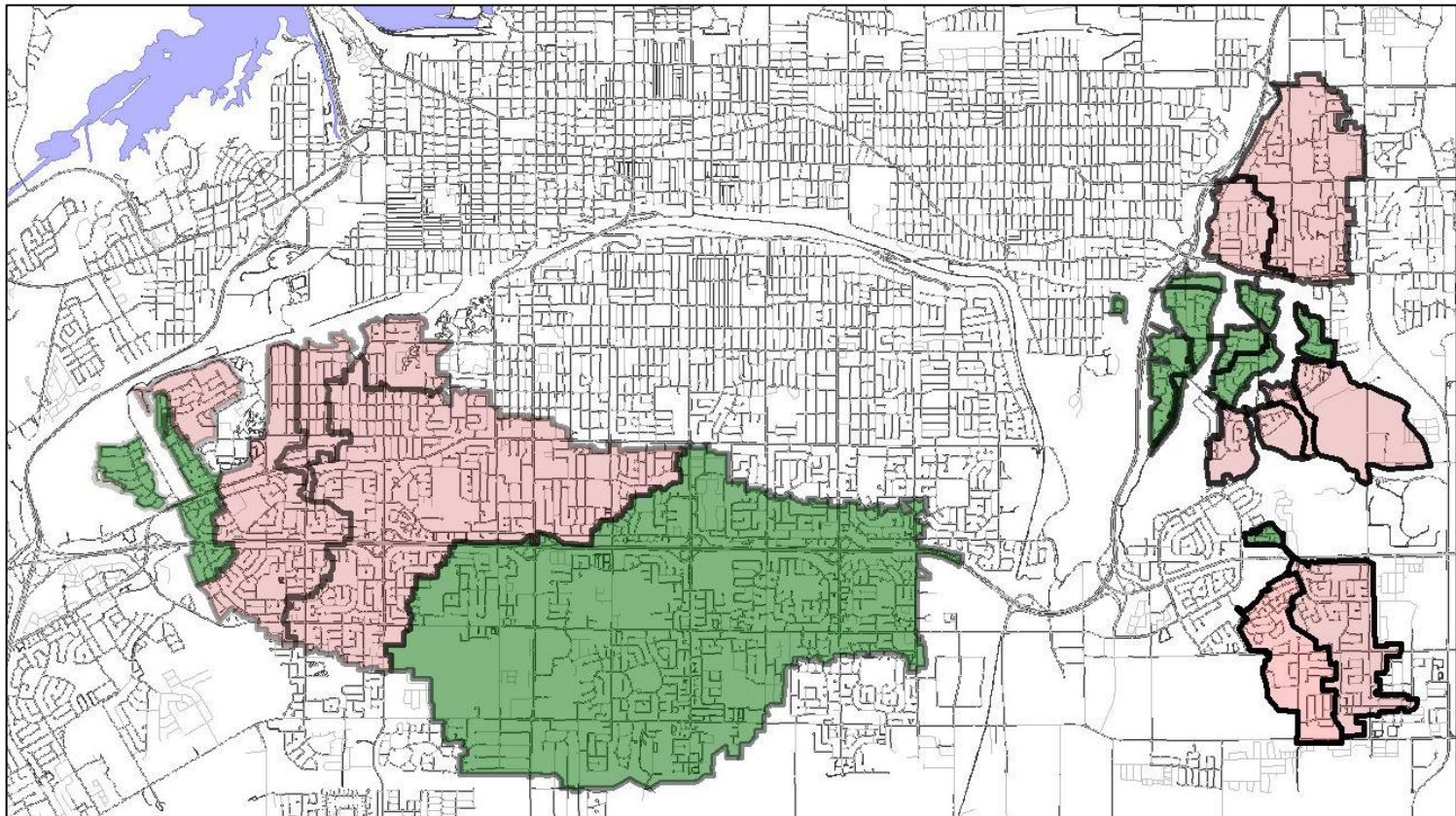
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- 40.1 Million Litres of sanitary sewage annually diverted away from watercourses, or **16.4 Olympic Swimming pools**
- Cross connections identified and corrected in Wards 5, 6, 7, 8, 9, 10, 13 and 15
- 1 cross connection found for every 500m of sewer inspected
- To date the program has inspected only 10% of the entire separated storm system
- Industry scan completed to learn from others and identify strategies to improve the program



Cross Connection Program Results

- Sewer Lateral Cross Connection Area 2009 – 2016 (pink)
- Next phase of Inspections (green)



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Cross Connection Program Results



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	2009 - 2013	2014	2015	2016 (January to August 31st)	Total	% Increase ²
# Identified ¹	131	0	38	70	239	267%
# Corrected ¹	113	12	35	69	229	305%
km of Sewer Main Inspected	59.5	8	20.5	34	122	286%
# of Samples Collected	251	0	0	147	398	293%
# of Individual Property Investigations	266	7	75	81	429	152%
Cost for CCTV	\$215,892	\$25,000	\$37,000	\$100,498	\$378,390	
Cost for Investigation	\$118,527	\$3,113	\$59,500	\$92,584	\$273,724	
Cost for Corrections	\$558,552	\$79,043	\$230,720	\$426,651	\$1,294,966	
# of Staff Dedicated to Program	0.5	0	1.5	2.5		

¹Complete Cross Connections Only (Excludes Partial Cross Connections)

²2016 YTD Totals vs. 2009 - 2013 Yearly Average

Challenges & Next Steps

Cross Connection Program Challenges

- Investigative Process is Effective & Cost Efficient, but Multiple Reinvestigations will be Required.
- Currently No Effective Strategy to Eliminate Partial Cross Connections.
- E Coli Counts from Samples Are Not Reflective of the Success of the Program, or the Scope of the Problem.
- Prevalence of Cross Connections & Time/Resources Required to Investigate the Entire Separated Storm Sewer System.

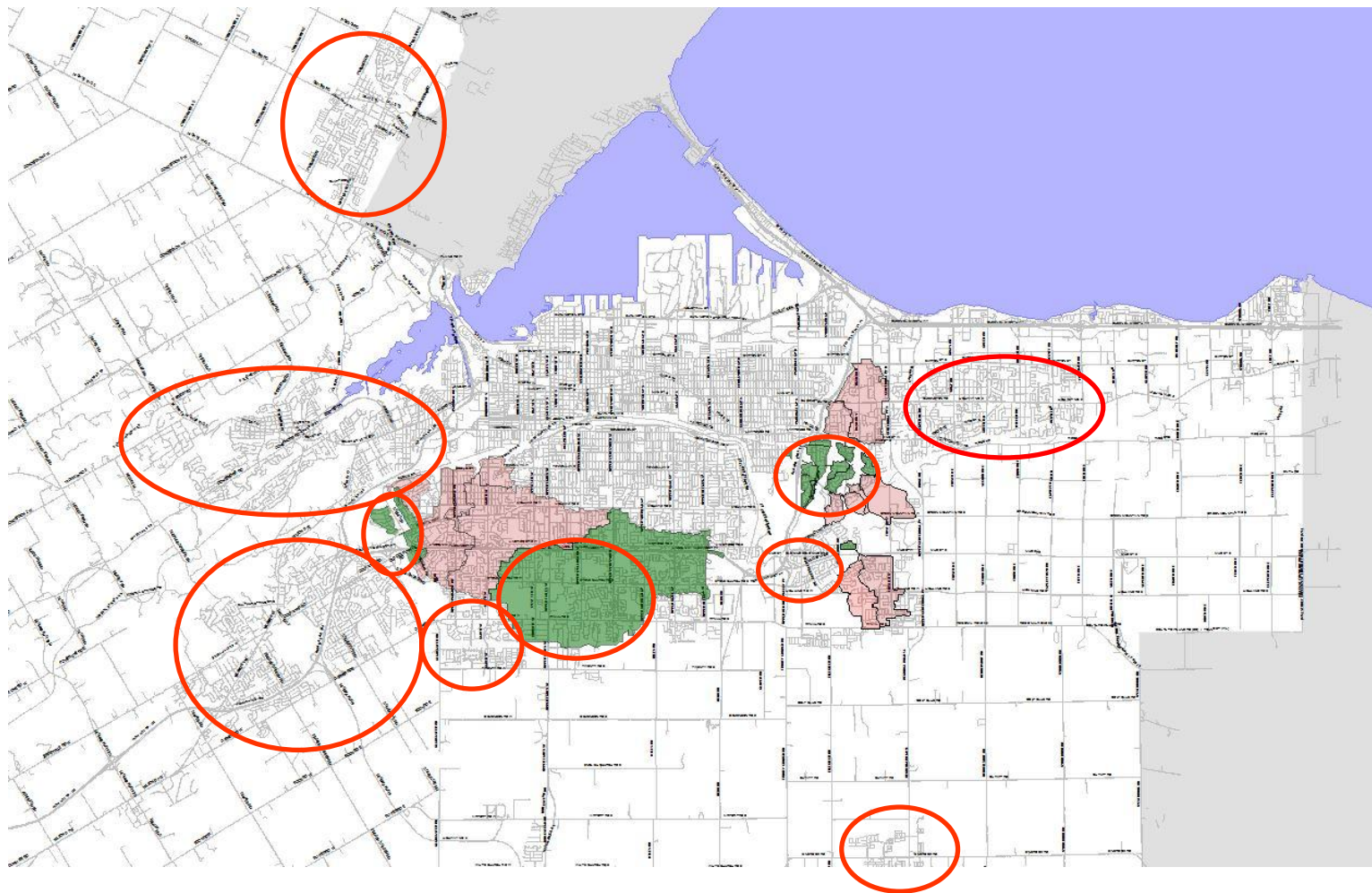
Challenges & Next Steps

Future Areas of Study

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Recommendations

- a) That approval be given for a permanent Sewer lateral Cross Connection Program; and,
- b) That the two temporary (24 month) staff approved for the pilot program in Report PW14028 be made permanent to provide for the administration and management of the Sewer Lateral Cross Connection Program and be referred to the 2017 Water and Wastewater/Storm Rate Budget.



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Sewer Lateral Cross Connection Program



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Questions?