

Adopted by Council at its meeting held February 1, 2016 [CR71/2016]

/AC

Windsor, Ontario February 1, 2016

REPORT NO. 337 of the
ENVIRONMENT, TRANSPORTATION & PUBLIC SAFETY
STANDING COMMITTEE
of its meeting held January 20, 2016

Present: Councillor Fred Francis
Councillor Chris Holt
Councillor Bill Marra (Chair)
Councillor Hilary Payne
Councillor Paul Borrelli

That the following recommendations of the Environment, Transportation and Public Safety Standing Committee **BE APPROVED**:

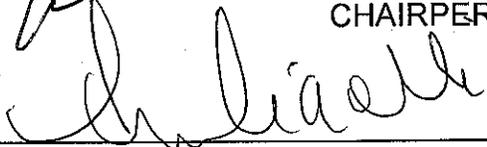
Moved by Councillor Holt, seconded by Councillor Francis,
That the report of the City Engineer dated December 4, 2015 entitled
"Update to Council on Basement Flooding Prevention Measures" **BE
RECEIVED** for information.
Carried.

⁶²
S 46/2015 ST2015

Clerk's Note: The report of the City Engineer dated December 4, 2015 entitled "Update to Council on Basement Flooding Prevention Measures" is **attached** as background information.

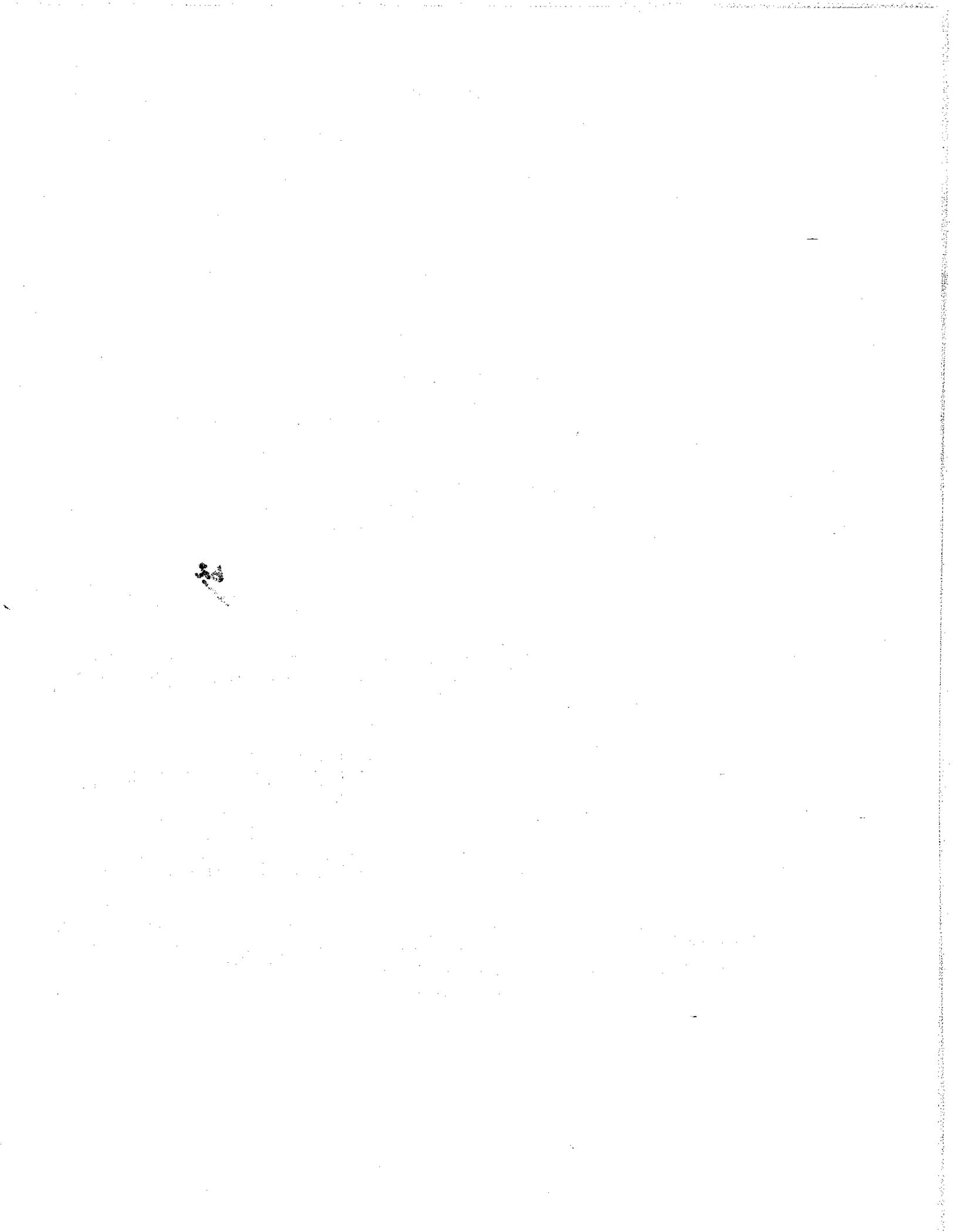


CHAIRPERSON



SUPERVISOR OF COUNCIL SERVICES

NOTIFICATION:	
NAME	CONTACT INFORMATION





MISSION STATEMENT

"Our City is built on relationships – between citizens and their government, businesses and public institutions, city and region – all interconnected, mutually supportive, and focused on the brightest future we can create together"

REPORT #: S 62/2015	Report Date: 12/4/2015
Author's Contact: Tiffany Pocock Engineer III 519-255-6257 ext. 6506 tpocock@citywindsor.ca	Date to Council: December 23, 2015
	Clerk's File #: SW2015

To: Mayor and Members of City Council

Subject: Update to Council on Basement Flooding Prevention Measures - Citywide

RECOMMENDATION:

To Council FOR INFORMATION

EXECUTIVE SUMMARY:

N/A

BACKGROUND:

In recent years, Windsor has experienced several significant rainfall events which have resulted in a number of flooded basements. In an effort to reduce instances of basement flooding, Administration brought a report to Council in May of 2012 (LiveLink Report #15652) which contained information on specific mitigating measures which could be undertaken to alleviate instances of basement flooding. The mitigating measures report included ways to:

- Improve performance of the existing sewer system;
- Assess the physical condition of the sewer system; and
- Develop and implement a system remediation/improvement plan.

The following report will provide Council with an update on the status of the various mitigating measures undertaken to alleviate instances of basement flooding as outlined and approved by CR128/2012 (attached as Appendix A).

DISCUSSION:

The measures outlined in CR 128/2012 to alleviate basement flooding represented a program approach to tackling basement flooding and were a balance of micro and macro methods; some short-term and some-long term. The measures included options for individual property owners to make improvements to their houses by disconnecting their downspouts and installing sump pumps and back water valves to minimize the incidents of flooding. It also made available the funding and approval for Administration to gather the required data in order to bring forward long term and citywide recommendations to improve the City's sewer infrastructure.

The status of these programs is as follows:

Downspout Disconnection Program

Downspout disconnection is an easy solution to reduce the amount of storm water directed into the city's combined and storm sewers during a rain event. Downspouts are disconnected and directed onto lawns and into landscaped areas, while those outletting onto a hard surface (driveway or sidewalk) remain connected to the sewer system due to possible risks (slip and fall, etc).

The program includes sending a mail out to all residential properties in the city to encourage voluntary, free, disconnection of downspouts with assistance. A sample letter is attached as Appendix B. The mail out letters have been sent to the majority of residences in the city however there are a couple of areas remaining. The final mail out of letters is tentatively scheduled for early spring of 2016. After these last mail outs have been completed, the entire city will have been contacted regarding the Downspout Disconnection Program. Only about 10% of the properties contacted through the mail outs typically contact the city for an inspection and potential disconnection. Since its inception, approximately 3000 homes have had their downspouts disconnected through this program at an approximate cost of \$300-\$500 per household, depending on site conditions. Administration reviewed the benefits and drawbacks of a citywide mandatory disconnection program in responding to CQ #61-2015, Livelink No. 18047 scheduled for December 21, 2015.

Basement Flooding Prevention Subsidy Program (BFPSP)

On May 3, 2011, City Council approved establishing the Basement Flooding Prevention Subsidy Program (BFPSP) with the intent to subsidize a portion of the costs incurred by owners of homes located in the City of Windsor for the supply and installation of a sump pump and/or back-water valve flood protection device. In 2012, funding towards defraying some of the subsidies paid by the City under the program for the disconnection of foundation drains from floor drains was received from ERCA. The program is in high demand by property owners and on October 1, 2014, eligible work

under the program was expanded to include 'installation of sump pump overflow to discharge outside to surface' for existing sump pumps. As of October 30, 2015, the following statistics are noted:

- 1579 subsidy payments totalling \$3,186,983 have been paid since the programs inception;
- Approximately \$157,950 has been transferred to the Building Department for Courtesy Inspections performed since the program was rolled out;
- 349 subsidy applications have been received year-to-date;

In order to gather the data for future recommendations to the overall sewer system, the following measures are underway.

Permanent Flow Monitoring

Flow monitoring devices installed in sewers assist in optimizing system capacity for the City's treatment plants during wet weather events. The devices provide real time information to plant operations allowing opportunity to monitor levels and flows. The 14 flow monitoring devices have been installed and operational since 2014. The ongoing monitoring will assist in evaluating the effectiveness of other programs along with identifying areas requiring further review and assessment.

Flow Monitoring & Hydraulic Modeling

With CR 76/2013, the City engaged Dillon Consulting to perform flow monitoring and develop a hydraulic model of the City's sewer system which is the first step toward developing a Master Plan for storm and sanitary sewers.

The consultant reviewed data for the physical parameters of the existing sewer system as provided by the Engineering Department, the Geomatics Division, and the Operations Department -Technical Support Division and supplemented this with field investigations in order to develop the computer model of the sewer system. The consultant installed 28 temporary flow monitoring devices in manholes and monitored them from August 2013 to November 2014 to gather the required data. This information was further supplemented by flow monitoring data from the City's permanent flow monitoring program, noted above. Using this information and rainfall data from the City's 14 precipitation gauge stations, the consultant developed a computer model of the sewer system and is in the process of calibrating and verifying the model using flows from real weather events. The computer model of the sewer system is scheduled to be submitted to the City by the end of 2015.

A Request for Proposal for Engineering Services will be issued in 2016 for the development of a storm water and sanitary sewer master plan. The hydraulic model of

the sewer system is a key building block for the master plan. Administration will refer recommended works identified in the master plan to future capital budgets.

Smoke & Dye Testing

Smoke and dye testing is a method to determine leaking and/or illegal connections (i.e. a storm connection to the sanitary sewer) to a sewer system. To date, there have been five contracts issued for smoke and dye testing that reviewed the following areas: Fountain Bleu, Forest Glade, Roseland, Southwood Lakes, and South Windsor.

When testing the sanitary sewers, fog was observed coming from missing or broken clean-out caps, washing machine drains, disconnected downspouts, vent stacks on the roof, the ground, etc. These observations resulted in issuing 602 work orders by the City to property owners. As of November 19, 2015, the number of work orders that have been completed was 398. The remaining 204 outstanding orders are related to broken and/or missing caps.

The testing also identified issues within the public right-of-way such as fog being seen coming from edge of sidewalks, outlet to municipal drains (possible overflow pipe) and catch basin or storm manhole. Administration is currently investigating to determine the possible sources and providing the appropriate corrective action.

There are two smoke testing contract tenders scheduled for 2016. Also, work has begun to undertake cleanout cap repairs found as a result of the testing in order to decrease infiltration into the sanitary sewer.

Rainfall IDF Curve

Administration has been working with ERCA to update the existing Rainfall Intensity Duration and Frequency (IDF) Curves. These curves are the tool that is used to design the capacity required for the storm sewers. Previously, simple statistical analysis of historical precipitation data was used to develop IDF curves. When looking to the future, the reality of climate change needs to be reflected in the updated IDF curves. A comprehensive inter-comparison of emerging techniques using the most recent climate model datasets was used.

On July 9, 2015 ERCA provided an initial update communicating that further study was required and IDF curve(s) will not be completed under this study. It was stated that the big question is "How new IDF curves would impact our system as it was design based on the old IDF curves and what design changes will be needed in the future?" ERCA has been asked to include the IDF curve range and the equations in the current study. The City will have to select an IDF curve within the range, based on the level of risk the City is willing to accept.

How the existing sewer system would function under a new IDF curve would have to be evaluated using the sewer model. This in turn may identify areas which require modification in order to meet the new standard.

RISK ANALYSIS:

The significant risk to the Corporation due to basement flooding is mitigated through the various measures discussed throughout this report. These mitigating measures are directed at helping to ensure optimal functionality of the sewer network by limiting and monitoring the flow during a storm event and installing barriers in an effort to further protect dwellings.

The efforts to date appear to be having positive results. Even though Windsor has experienced some record rainfall events in 2015¹, as of October 31, only 90 instances of flooding have been reported to 311. The chart below provides a summary of storm flooding calls received in previous years.

Calls to 311 re: Storm Flooding 2011 - 2015 (YTD)

	2011	2012	2013	2014	2015 YTD (Oct 31)
Storm Flooding	659	35	203	914	90

The City of Windsor is committed to continuing with these mitigating measures within its fiscal limits and available resources which will alleviate instances of basement flooding. Should the effort on the identified mitigating measures be reduced or eliminated, the risk of basement flooding will remain as could the severity of flooding should Windsor continue to experience isolated instances of severe rainfall/rapid melts or increased frequency of significant events due to climate change.

FINANCIAL MATTERS:

¹ June 2015 was the wettest the City has seen in 75 years with 197.8 mm falling (as of June 28). 272 mm of rain fell between May 30 and June 28 including 6 days with more than 20 mm of rain. During the combined months of May and June 2015, 349.2 mm of rain fell in Windsor. Source: "Monsoonal June: Windsor Shatters 75-year rainfall record" published June 28, 2015 (<http://windsorstar.com/news/monsoonal-june-windsor-shatters-75-year-rainfall-record>)

Funding for the above programs and measures were provided through CR 128/2012. In some cases additional funding has been approved through recent budgets and Council resolution due to the popularity of the programs and the need to obtain accurate data. The budgets for each program and the current financial positions, as of October 31st, are as follows:

	Budget to Date	Surplus / (Deficit)
Downspout Disconnection Program – Project 7069013	\$3,035,000	\$1,935,956
Basement Flooding Prevention Subsidy Program (BFPSP) – Project 7111013	\$2,967,837	(\$383,897)
Storm Water & Sanitary Master Plan – Project 7124000	\$1,650,000	\$847,372
Flow Monitoring Equipment – Project 7121029	\$300,000	\$71,175
Smoke and Dye Testing – Project 7131000	\$325,000	\$222,443
Basement Flooding Mitigation – Project 7125001	\$50,000	\$4,766

Council should be aware that, effective 2016, the Closed Caption Television (CCTV), Smoke and Dye Testing, Small Sewer Repairs, Basement Flooding Mitigation, and Basement Flooding Prevention Subsidy programs will all be combined into the Flooding Abatement Measures capital project.

CONSULTATIONS:

Engineering
 Finance
 Operations
 Pollution Control
 Rob Slater, Executive Initiatives Co-ordinator

CONCLUSION:

This report outlines the current status of the work that has been completed since the approval of CR 128/2012. In summary:

There has been significant progress in educating home owners on the merits of downspout disconnection and providing both the funding and expertise.

The Basement Flooding Prevention Subsidy Program has been well received by home owners wishing to install added protection, i.e. sump pumps and back water valves, into their houses to reduce the possibility of flooding.

On a macro level, Administration has moved forward with identifying weakness in the sewer systems through smoke and fog testing and is working to reduce or eliminate these weaknesses by corrective repairs. Also, permanent flow monitoring devices have been installed to assist plant operations to better understand how plant capacity corresponds with storm events.

With the expected completion of the hydraulic and flow modeling of the city's sewer infrastructure, the investment in the storm and sanitary master plans will benefit the long term planning and budgeting efforts to further mitigate possible flooding.

Finally, the updating of the IDF curves will ensure that future sewer design will be based on the current storms being experienced, thus allowing the sewer capacity and/or the storm water management plans to properly accommodate the more intense and frequent storm events.

The above noted mitigating measures have assisted the City in its efforts to reduce instances of basement flooding. In addition to continuing these measures, other ways to reduce instances of basement flooding will also be explored. Future measures may include implementing a mandatory downspout disconnection program along with having discussions with neighbouring municipalities with the goal of coordinating efforts to reduce instances of basement flooding.

APPENDICES:

1. CR 128/2012
2. Mail out letter including pamphlet attachment

Appendix A

CR128/2012

- I. THAT Council **RECEIVE** the 2012 Sewer Surcharge Budget Update report from the City Treasurer and;
- II. THAT the updated 5-Year Sewer Surcharge Forecasts (2012-2016) **BE RECEIVED** for information as presented in *Appendix A* of the report and;
- III. THAT, effective July 1, 2012, the Sewer Surcharge Rates **BE INCREASED** in accordance with Option 3 as detailed in this report and set at the following levels:
 - Residential Fixed Rate..... 66%
 - Residential Consumption Rate..... 487%
 - Commercial Rate..... 167%
- IV. That Council **APPROVE** (in principle, subject to annual Capital Budget approval) \$2,000,000 in 2013, \$400,000 in 2014, \$220,000 in 2015 and \$330,000 in 2016 as part of the respective Capital Budget for expansion of the downspout disconnection program to be funded from the Sewer Surcharge; and
- V. That Council **AUTHORIZE** Administration to retain contractors and/or temporary staffing (if required) to disconnect and document downspout disconnections in accordance to the downspout disconnection program; and
- VI. That the City Engineer **BE AUTHORIZED** to proceed to issue an RFP for a consultant or firm to perform flow monitoring and hydraulic modelling of the City's sewer system which will help in developing a Master Plan for storm and sanitary sewers; subject to meeting project specifications and being within the 2012 recommended budget of \$250,000 for capital project ECP 004-09 Stormwater and Sanitary Master Plan; and subject to the terms and conditions of the City's Purchasing By-law 400-2004 (as amended); and
- VII. That subject to the results of the hydraulic modelling and Master Plans that the City Engineer **REPORT** to Council, as part of a future Capital Budget deliberations, provide a report with recommendations for remedial works; and
- VIII. That Council **APPROVE** \$300,000 to be drawn from the Lou Romano Water Reclamation Plant Reserve (Fund 131) for the purpose of purchasing permanent flow monitoring equipment that will assist the City's treatment plants in making decisions which will optimize system capacity; and
- IX. That Council **PRE-COMMIT** \$200,000 in 2013, Capital Budget for smoke and dye testing to be used for assessing sewer conditions in targeted areas to be funded from Sewer Surcharge; and

- X. That Council **APPROVE** \$50,000 drawn from the Lou Romano Water Reclamation Plant Reserve (Fund 131) for the purpose of proceeding with updating the Rainfall Intensity Duration and Frequency (IDF) curves through the Essex Region Conservation Authority in partnership with interested local municipalities at a cost to the City not to exceed \$50,000; and
- XI. THAT the Chief Administrative Officer and City Clerk **BE AUTHORIZED** to sign any RFPs, RFTs, contracts or agreements arising out of recommendations V, VI, VII, VIII, IX and X approved as to technical content by the City Engineer, financial content by the City Treasurer and Chief Financial Officer, and as to legal content by the City Solicitor.



THE CORPORATION OF THE CITY OF WINDSOR
OFFICE OF THE CITY ENGINEER - ENGINEERING

Dear Resident / Property Owner:

Re: Downspout Disconnection Program

The City of Windsor is offering a free, voluntary program to disconnect your downspouts.

Downspouts drain stormwater from your roof away from the house. Disconnecting your downspouts has both environmental and economic benefits.

- Reduced neighbourhood basement flooding
- Reduced sewage treatment expenditures
- Added sewer capacity

The disconnection process will be completed with two visits to your home by City Staff. The first visit will be to review your downspouts and determine which ones, if any, are candidates for disconnection. The second visit will be to perform the actual disconnection(s).

No one will need to enter your home, and all work will be confined to the exterior of your house. **Currently, this program is focused on residential properties only** and may become mandatory. Funding may not be available in the future, at which time the cost of disconnection will become the property owners' responsibility.

Please take a moment to review the *attached* information, which may answer some questions you may have. Should you have any further questions about the program, please call 519-255-6257, extension 6336.

TO BOOK AN APPOINTMENT:

Call **311** or **519-255-2489** and tell them you are interested in registering for the Downspout Disconnection Program. Appointments should be booked by February 26, 2016.

Sincerely,

Wes Hicks, P.Eng.

Senior Manager, Infrastructure & Geomatics/Deputy City Engineer

SC/mb
Attachment

Frequently Asked Questions – Downspout Disconnection Program

1. What are the advantages of taking part in this program?

Downspouts drain stormwater from your roof away from your home. Some of the benefits of disconnecting include reduced neighbourhood basement flooding, reduced sewage treatment, and added sewer capacity.

2. How does the program work?

After registering and booking an appointment by calling 311 or 519-255-2489, the process would be completed with two visits to your home by City staff. The first visit would be to review your downspouts to determine which ones, if any, can be safely disconnected. The second visit would be to perform the actual disconnection(s).

3. I'm not sure if my home qualifies for this program?

If you're not sure you qualify for this program, we encourage you to register for the program anyway by calling 311 or 519-255-2489. The initial assessment visit will only determine if we can or can't disconnect any downspouts and the visit will be noted and filed.

4. Is this a mandatory program?

No. This program is not mandatory and you are under no obligation to register at this time if you are not interested.

5. Are there any costs to the homeowner?

This program is completely free. All costs associated with this program are funded through the City of Windsor.

6. Do I need to be home during any of the two appointments?

You do not need to be home during the appointments. Access to the perimeter of your home, including the backyard is required in order to perform a thorough and accurate assessment. Any work is confined to the exterior of the home only.

7. What happens after the initial assessment visit?

After the initial assessment visit, a City representative will leave a notice in your mailbox or attached to your front door. This notice will tell you if your home is a candidate for disconnection and who to contact for the final appointment.

8. Wouldn't a disconnected downspout cause water to seep back into my home?

Downspouts should only be disconnected if there is sufficient lawn or landscaped area where the water can be directed. The City will not disconnect any downspout(s) if determined to cause a tripping hazard.

9. Who performs the work?

City staff and/or a qualified contractor hired by the City will carry out all work.

10. Will the City provide me the materials to complete the work myself?

The City will not provide materials to the homeowner. All work must be completed by the City.

11. Will the City fix my downspout if I have already disconnected it?

The City will not correct any downspouts disconnected by the homeowner.

12. How do I register?

Dial 311 or 519-255-2489 and ask to register for the Downspout Disconnection Program.

Downspout Disconnection

Program

How Does it Work?

• 23cm is measured from where the downspout enters the sewer connection.



• The downspout is cut.

• The sewer standpipe is capped, preventing water from going in.



• The downspout is inserted INTO the elbow (if the elbow is put into the downspout it will leak).



• A downspout pipe extension is attached. A splash board may be used to prevent erosion.





Downspouts, or roof leaders, are contributors to the pollution of Windsor's watercourses. We're letting clean water go down the drain, and it's forcing dirty water out into the Detroit River and potentially into our homes.

Along the Detroit River, combined sewer overflows (CSOs) exist where excess diluted sewage is spilled into the river once capacity is reached. If downspouts are disconnected in key areas, the frequency of CSOs could be reduced dramatically.

Here's what Windsor would accomplish by removing clean rainwater from the sewage:

- Reduced basement flooding
- Reduced sewage treatment expenditures
- Added sewer capacity
- Reduced need for costly trunk sewer projects

The City of Windsor provides a Downspout Disconnection Service to its residents free of charge. Simply book an appointment and an inspector will discuss the disconnection work that will occur at your home.

Under By-Law 26-2008, parts of the City may require mandatory disconnection. Non-compliance with a disconnection order may be subject to a fine under the By-Law.

To book an appointment to disconnect, please dial 311 or for more information on this program, please contact the Engineering Department at (519) 255-6257.

