



## STAFF REPORT ACTION REQUIRED

### Wet Weather Flow Master Plan and Basement Flooding Protection Program Update

<b>Date:</b>	August 12, 2011
<b>To:</b>	Public Works and Infrastructure Committee
<b>From:</b>	General Manager, Toronto Water
<b>Wards:</b>	City-wide
<b>Reference Number:</b>	P:\2011\Cluster B\TW\pw11012

#### SUMMARY

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The purpose of this report is to advise Council of the progress made since the adoption of the Wet Weather Flow Master Plan (WWFMP) in 2003, to set priorities for the next five years and seek approval in principle for the Don River and Central Waterfront Project. Subsequent to the adoption of the WWFMP, the rainstorm of August 2005 and the discovery of significant faults in the Coxwell Sanitary Trunk Sewer have profoundly influenced the implementation of the Plan. As a result, the main funding priorities should be: improving basement flooding protection during extreme storms; twinning of the Coxwell Sanitary Trunk Sewer; elimination of combined sewer overflows; and protection of infrastructure and property from imminent collapse due to stream erosion. All of these priorities are urgent, the solutions very complicated and each will involve several hundreds of millions of dollars to correct.

This report recommends that the Basement Flooding Protection Program, the Don River and Central Waterfront Project and the Stream Restoration Program be the main funding priorities for the WWFMP over the next five to ten years. Within those programs, it also recommends a method for prioritizing basement flooding projects and coordinating those projects with the rest of the Capital construction program and recommends a technical amendment to the low income subsidy for the Downspout Disconnection Program.

#### RECOMMENDATIONS

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The General Manager, Toronto Water recommends that:

1. City Council direct that the prioritization of Basement Flooding Protection Program projects be consistent with the principle that the greatest number of properties are

protected as soon as possible within approved funding envelopes and coordinated with other City capital programs.

2. City Council direct that projects identified through completed Environmental Assessments in the 32 identified Chronic Basement Flooding Study Areas, proceed to detailed design and construction, if the cost to benefiting property, as determined during the preliminary design phase, is less than or equal to \$32,000.
3. City Council direct the General Manager, Toronto Water to submit an updated five year list of projects, through the annual Capital Budget submission process, where Class Environmental Assessment studies have been completed, and the projects be prioritized in conformance with Recommendations 1 and 2, and where the first two years of projects will be identified for construction and the following three years of projects will be subject to confirmation for implementation through the preliminary design phases where cost estimates will be refined, and the project scheduling will be coordinated with Transportation Services and other utilities.
4. City Council approve the following changes to the coordination of Transportation Services' Program within Basement Flooding Study Areas:
  - a. Road resurfacing and reconstruction works that are not coincident with projects on the projected five year Basement Flooding Protection Program list, may proceed in accordance with Transportation Services' standard project prioritization process; and
  - b. Road resurfacing and reconstruction works that are coincident with projects on the projected five year list should be deferred.
5. City Council direct that existing sanitary and storm sewer design criteria continue to apply to road and sewer reconstruction projects outside of currently identified basement flooding study areas, but be consistent with the Wet Weather Flow Policy adopted by Council in 2003.
6. City Council request the General Manager, Toronto Water to finalize the Environmental Study Report for the Don River and Central Waterfront Class EA and submit it to the Ontario Ministry of the Environment for the obligatory 30 day public review period under the Municipal Class Environmental Assessment process.
7. City Council direct that subject to receiving approval of the Don River and Central Waterfront Project Environmental Assessment from the Ontario Ministry of the Environment, the General Manager, Toronto Water:
  - a. proceed to undertake the detailed design of the first phase of the Project, which represents the twinning of the Coxwell Sanitary Trunk Sewer and associated pumping station; and,
  - b. the Chief Financial Officer report back, through the 2013 Capital Budget process, on an implementation schedule and a long term funding model for the remaining elements of the plan.

8. City Council direct that the Eligibility Criteria: Financial Assistance for Low Income Property Owners previously approved under the Mandatory Downspout Disconnection Program be revised as outlined in Attachment No. 1 including, without limitation, the following revisions:
  - a. Eligibility limited to low-income disabled or senior citizen property owners;
  - b. The financial assistance available limited to a maximum upset limit of \$500, payable in the form of a cheque; and
  - c. Revised conditions for financial assistance and eligible work.
9. City Council authorize the General Manager of Toronto Water, in consultation with the City Solicitor, to prescribe any application form and other forms which the General Manager deems necessary to implement the financial assistance provisions set out in Recommendation 10 and to revise and amend those forms as the General Manager considers appropriate from time to time;.
10. City Council authorize the General Manager of Toronto Water to amend or revise the eligibility criteria with respect to low-income seniors and low-income disabled persons from time to time to reflect any future changes to the Municipal Code, Chapters 681 and 849.
11. City Council authorize the discontinuance, effective 2012, of the Community Program for Stormwater Management and the funds in the amount of \$250,000 be redirected to support the development and dissemination of public education and communication program to inform homeowners and contractors about:
  - a. climate change impacts, associated with intense storms, related to basement flooding;
  - b. the importance of downspout disconnection and “home isolation” consisting of the installation of sewer backwater valves and the capping off of storm sewer laterals with the installation of a sump pump to help prevent basement flooding;
  - c. the importance of other lot level controls (e.g. proper lot grading); and
  - d. the City’s Basement Flooding Protection Subsidy Program.
12. City Council request the General Manager, Toronto Water, in collaboration with the Toronto Region Conservation Authority, to report back in 2012 on the feasibility and costs of carrying out an Environmental Assessment for a Humber Bay Islands Land Form to improve water quality at Sunnyside Beach and protect the shoreline from erosion.

## FINANCIAL IMPACT

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The recommendations in this report are consistent with Toronto Water's approved 2011 Capital Budget, and 2012 to 2020 Capital Plan.

The budget allocations, as presented in Toronto Water's approved 2011 Capital Budget, and 2012 to 2020 Capital Plan, for the implementation of the Wet Weather Flow Master Plan projects detailed in this report are summarized in the following table. It is noted that the future year budget allocations are premised on the future water rate increases detailed in the 2011 Capital Budget submission. The implementation of the Don River and Central Water Project (which includes the twinning of the Coxwell Sanitary Trunk Sewer), as proposed in this report, will be considered in Toronto Water's forthcoming 2012 Capital Budget submission.

### Wet Weather Flow Master Plan Component Budget Allocations

Program Area	2011 \$1000s	2011-2015 \$1000s	2011-2020 \$1000s	Post 2020 \$1000s
Basement Flooding Protection Program	54,404	400,504	832,004	Ongoing
Don River and Central Waterfront Project	0	49,500	369,000	961,000
Stream Restoration	5,500	46,000	86,250	Ongoing
Projects under construction	7,711	7,711	7,711	0
WWFMP Implementation Projects	5,898	110,351	494,431	Ongoing
Land Acquisition & Erosion Control	6,000	16,000	22,500	0
<b>Total</b>	<b>79,512</b>	<b>630,065</b>	<b>1,811,895</b>	<b>&gt; 961,000</b>

The Deputy City Manager and Chief Financial Officer has reviewed this report and agrees with the financial impact information.

## DECISION HISTORY

City Council, at its meeting on September 22 – 25, 2003 adopted the “Wet Weather Flow Management Master Plan and Wet Weather Flow Management Policy”

<http://www.toronto.ca/legdocs/2003/agendas/council/cc030922/pof9rpt/cl042.pdf>

Further, as a result of major rainstorms and significant basement flooding, City Council, at its meeting on April 25 – 27, 2006 adopted a "Work Plan for the Engineering Review Addressing Basement Flooding" which identified a work plan focusing on 31 chronic basement flooding areas in the City and established performance criteria for managing drainage due to extreme storm events.

<http://www.toronto.ca/legdocs/2006/agendas/council/cc060425/wks2rpt/cl016.pdf>

City Council, at its meeting of November 19 and 20, 2007, adopted a report from the General Manager of Toronto Water titled "Implementing a Mandatory Downspout Disconnection Program", that amended the Municipal Code Chapter 681, Sewers to prohibit the connection of downspouts to combined or storm sewers in the combined

sewer area of the City; as well as to allow the General Manager of Toronto Water to authorize the exemption of properties from the bylaw requirements.

The noted staff report can be viewed at:

<http://www.toronto.ca/legdocs/mmis/2007/pw/bgrd/backgroundfile-7842.pdf>

Further, at its meeting on September 24 and 25, 2008, City Council adopted an "Update on the Engineering Review Addressing Basement Flooding", which summarized the results of the engineering analysis, completed to date of the first four of 31 Basement Flooding Study Areas in accordance with the Basement Flooding Work Plan approved by Council in April 2006; and proposed an adaptive management strategy to help reduce the risk of basement flooding, on a City-wide basis. The report also amended the Municipal Code Chapter 681, Sewers to prohibit the connection of downspouts in the basement flooding study areas and all remaining parts of the City.

The noted staff report can be viewed at:

<http://www.toronto.ca/legdocs/mmis/2008/cc/decisions/2008-09-24-cc24-dd.pdf>

## **ISSUE BACKGROUND**

Lake Ontario plays an essential role in the health and well-being of Toronto's residents and provides them with a safe and abundant source of drinking water. It also provides a wide range of recreational opportunities, including swimming, boating, fishing, birding, cycling and hiking. To sustain these economic, social, cultural and environmental benefits, the water quality of Lake Ontario and its tributary watersheds must be protected and improved.

In 1987, however, the City of Toronto's waterfront was identified as one of 43 polluted "Areas of Concern" in the Great Lakes Basin by the International Joint Commission. The wet weather discharges from combined sewer overflows (which contain a mixture of untreated sewage and stormwater runoff) and separated storm sewers discharging along the waterfront, and within the six watersheds which cut across the City, were identified as the principal sources of pollution.

The City has undertaken a number of projects and initiatives to address these impacts and over time has realized significant improvements in water quality along the waterfront. Of particular note is that the City has achieved the international Blue Flag Designation at eight of our eleven waterfront beaches.

Another significant initiative was the development of the City's Wet Weather Flow Master Plan. The Plan and its 25 year implementation schedule were approved by Council in 2003. The Plan, considered the most comprehensive plan of its kind in Canada, addresses water quality (e.g. beaches) and flow impacts (e.g. basement flooding and stream erosion) associated with stormwater runoff and combined sewer overflows.

The goal of the Plan was to: *"Reduce and ultimately eliminate the adverse effects of Wet Weather Flow on the built and natural environment in a timely and sustainable manner, and achieve a measurable improvement in Ecosystem health of the Watersheds."*

Thirteen specific objectives were adopted and are contained in the Council approved Wet Weather Flow Policy which can be found at:

[http://www.toronto.ca/water/protecting\\_quality/wwfmmp\\_guidelines/pdf/wwfmmp\\_policy.pdf](http://www.toronto.ca/water/protecting_quality/wwfmmp_guidelines/pdf/wwfmmp_policy.pdf)

Key objectives are to:

- Contribute to achieving federal, provincial and municipal water quality objectives;
- Preserve and re-establish the natural hydrologic cycle;
- Reduce fish contamination due to urban runoff;
- Eliminate combined sewer overflows; and,
- Reduce basement flooding.

Unlike newer municipalities which are able to integrate current stormwater management best practices as they grow, the City of Toronto is fully urbanized and storm drainage and sewer systems, some dating back to the 1800s, were designed to old standards, which did not consider pollution impacts from wet weather or flooding impacts from extreme storms. The WWFMP therefore, represents a long term system-wide multi-pronged retrofit approach to stormwater management, which incorporates lot level controls (e.g. downspout disconnection, and onsite controls for new development), sewer system improvements, and end of pipe storage/treatment facilities (i.e. at the end of the sewer system before discharging to the lake or rivers).

The Plan was estimated to cost approximately \$1 billion over the 25 year implementation period, where projects were scheduled for implementation in five year blocks, with a first priority being the cleanup of the waterfront. In 2006, City Council significantly expanded the scope of the basement flooding remediation work identified in the WWFMP due to an extreme storm event which hit the City on August 19, 2005, and resulted in over 4,200 basement flooding complaints.

A summary of Phase One (2003-2008) of the WWFMP implementation is contained in a summary report titled *"Wet Weather Flow Master Plan, the Plan in Action, 5 Year Summary Report"* which can be found at:

[http://www.toronto.ca/water/protecting\\_quality/wwfmmp/annual.htm](http://www.toronto.ca/water/protecting_quality/wwfmmp/annual.htm)

The following briefly summarizes the status of key initiatives contained within the WWFMP.

### **(1) Mandatory Downspout Disconnection Program**

The Wet Weather Flow Master Plan identified lot level control measures to help reduce the impact of stormwater runoff. Key among them was the disconnection of roof downspouts. While every effort was made to help educate the public on the need to disconnect, and where the City provided funding for the voluntary disconnection of roof

downspouts, little uptake and progress was made in achieving the WWFMP's original downspout disconnection targets.

In recognition of the merits of downspout disconnection, City Council approved the Mandatory Downspout Disconnection Program for combined sewer service areas in 2007. In 2008, once the initial engineering assessments had been completed in the above-noted chronic basement flooding areas and where it was shown that downspout disconnection was an effective way to help reduce flows to the sewer systems City Council approved the expansion of the Mandatory Downspout Disconnection Program across the City in 2008, phased-in over an eight year period.

On November 20, 2011, the first phase of the By-Law will take effect, and the disconnection of downspouts will become mandatory in the combined sewer service of the City. However, exemptions will be considered in cases where the disconnection is not technically feasible or where a hazardous condition may be created.

While financial assistance is being provided, to fund the disconnection of downspouts for low income households, it is proposed that the funding be capped to an upset limit of \$500 per eligible household, and that the application for funding be simplified, as outlined in Attachment 1.

## **(2) The Toronto Green Standard and Wet Weather Flow Management Guidelines**

The Wet Weather Flow Master Plan also contained Wet Weather Flow Management Guidelines which were established to achieve measurable stormwater management controls for new and infill development. These guidelines were subsequently incorporated into the Toronto Green Standard released in 2007. As a result, the on-site stormwater management requirements are consistent across the City, and provide a foundation for the City's stormwater management retrofit.

## **(3) Community Program for Stormwater Management**

To support the Wet Weather Flow Master Plan, and help advance the goals and objectives of the WWFMP through community led stormwater management initiatives, the Community Program for Stormwater Management was initiated in 2004 to provide funding to a maximum of \$25,000 to non-profit groups and organizations to a total maximum annual Program funding of \$250,000, which is currently managed through the Toronto Environment Office. A summary of the Program deliverables for the period 2004 to 2009 are contained in 2010 staff report which can be viewed at:

<http://www.toronto.ca/legdocs/mmis/2010/pw/bgrd/backgroundfile-30708.pdf>

Given the budgetary pressures facing Toronto Water, and the need to better educate the public on measures they can implement to help guard against basement flooding and help reduce the overall impact stormwater runoff generated from individual properties, it is proposed, effective 2012, that the funding for the Community Program for Stormwater Management be redirected to support the development and dissemination of public education and communication material focussing on lot level controls.

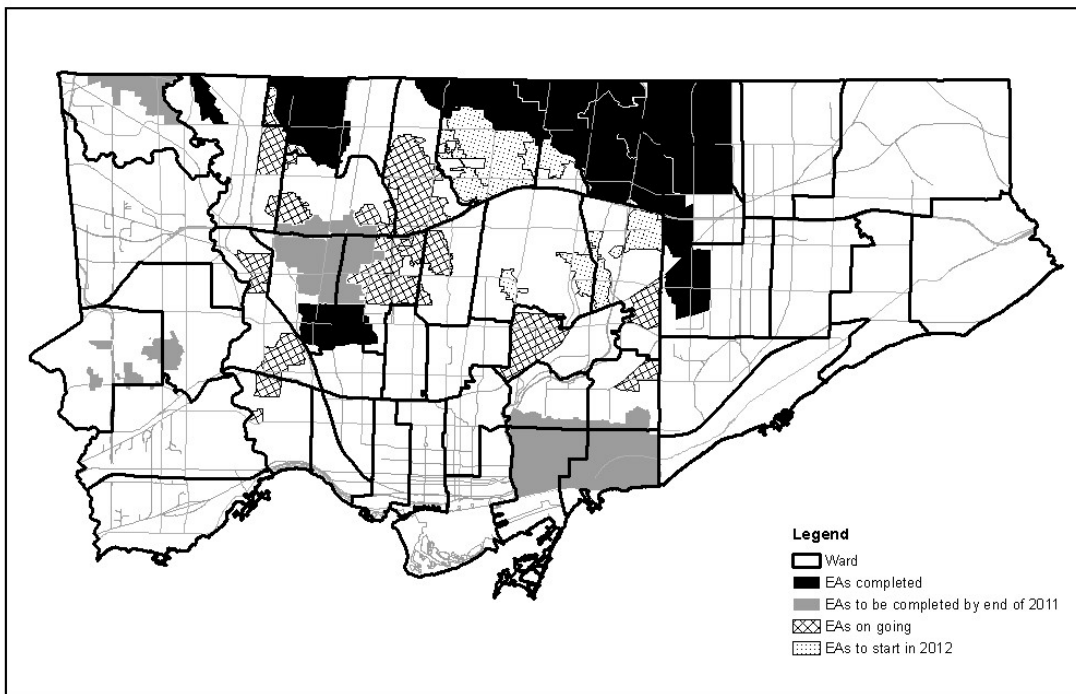
#### (4) Basement Flooding Protection

The status of the implementation of the Basement Flooding Protection work plan as approved by Council in 2006, is shown graphically in Figure 1. In accordance with the requirements of the Province of Ontario's Environmental Assessment Act, a Class Environmental Assessment study must be completed that includes the evaluation of alternative solutions and consultation with affected stakeholders before any work can be implemented in a given area.

At this time, 32 study areas have been identified, each representing a sanitary sewer drainage area serviced by underground sewer networks. A very detailed engineering assessment is required, typically over a two year period, to identify the most efficient and preferred solution. The solutions are neighbourhood specific and consider local factors such as the topography of the area, sewer system design and function, drainage associated with individual lots and the road network.

Construction of storm drainage and sewer improvement works began in 2009 and will continue for years to come. To date approximately \$32.8 million has been spent on 4.2 km of sewer upgrades. Based on computer simulation modelling, it has been estimated that this work will benefit an estimated 2,840 properties which had a high risk of flooding during extreme storm events.

**Figure 1 Status of Basement Flooding Environmental Assessment Studies**





### **(5) Stream Erosion Mitigation**

The storm of August 19, 2005 resulted in major stream erosion and significant damage to infrastructure, particularly in Highland Creek, with the washout of a section of the Highland Creek Sanitary Trunk Sewer (just south of Ellesmere Road), and major erosion of Birkdale Ravine. While these repairs were largely completed by 2006, given the extent of erosion damage from the August 19, 2005 storm, across the City, and the budget constraints, the stream erosion control projects identified in the Wet Weather Flow Master Plan's original implementation schedule, have been reprioritized with immediate repair work taking priority over longer-term restoration projects.

Major stream erosion control project sites planned for the next five years are highlighted in Attachment 2. Principally, these sites represent locations where infrastructure has been impacted or is vulnerable.

### **(6) End-of Pipe Projects**

The implementation of the WWFMP focussed on the cleanup of the waterfront and therefore a number of Class Environmental Assessment studies were initiated. The end of pipe facilities proposed through the WWFMP was typically stormwater ponds/wetlands where sufficient open public space was available or underground storage/treatment facilities where space was limited. The study areas, representing the drainage area tributary to the proposed facilities area shown in Attachment 2 and the status of the individual projects is summarized in Attachment 3.

## **COMMENTS**

### **Wet Weather Flow Master Plan Implementation Issues**

The Wet Weather Flow Master Plan was developed to be flexible enough to adapt to change. During the first five years of implementation, there were significant incidents that affected the implementation of the WWFMP. Projects and budgets have had to be reprioritized, but the objectives remain the same.

#### **(1) Climate Change and Basement Flooding**

When the WWFMP was adopted in 2003, it did not have explicit provisions for adapting to climate change. The August 19, 2005, rainstorm flooded many basements, caused severe stream erosion and caused significant damage to the City's infrastructure. The storm of 2005 exposed the need to be able to plan for, and respond effectively to the challenges of a changing climate. As a result, the original 25-Year Implementation Schedule, approved as part of the Wet Weather Flow Master Plan (WWFMP), has been updated to take new priorities into consideration.

Climate change adaptation priorities include:

- Improved property protection from extreme storms through improved service levels under the Basement Flooding Protection Program;
- Advanced the priority of Basement Flooding Protection projects;

- Legislating mandatory downspout disconnection in order to increase participation in this key measure; and,
- Adjustments to the Stream Restoration and Erosion Control Program to emphasize state-of-good repair projects.

## **(2) Priority Projects for the next five years**

Given the above challenges, implementation of the plan over the next five years, and possibly beyond, will focus on four priority issues that are addressed by three projects:

- Basement flooding is addressed by the Basement Flooding Protection Project;
- Two issues, twinning of the Coxwell Sanitary Trunk Sewer and the elimination of combined sewer overflows (CSOs) to the Don River and central waterfront, are addressed by the Don River and Central Waterfront Project; and,
- Protection of critical infrastructure in streams is addressed by the Stream Restoration Project.

Complementary to these three projects are ongoing programs that provide for monitoring and measuring progress, public education, land acquisition, review and approval of new development plans to ensure adherence to policies, and implementation of better drainage practices in transportation projects. Although these complementary programs do not, in themselves, require large sums of public money, they are critically important to the success of the priority projects.

### **Basement Flooding Program Implementation**

As mentioned above, construction of basement flooding related sewer works began in 2009. Not surprisingly for a program of this size, a number of implementation issues have affected the delivery of this Program and other City capital projects.

The greatest challenge is that the costs of improvement works identified far exceed the availability of funding, notwithstanding the year over year increases provided to this Program through Toronto Water's annual Capital Budget submissions. It should be emphasized that the analyses continue to show that the sewer systems in the affected areas are generally sound, however, were simply not designed to accommodate the significant increase in stormwater runoff generated from extreme storms which areas of the City are experiencing on a more frequent basis.

Consequently, while these improvement works represent service improvements which benefit only those affected areas, they compete for funding with other pressing issues facing Toronto Water, namely state of good repair projects addressing an infrastructure renewal backlog estimated at \$1.7 billion. For example, while most of the Basement Flooding Protection Program works represent improvements to storm drainage and sewer systems constructed in the 1950's to 1970's, these systems are well within their expected service life and, where all things being equal, should not have to be programmed for renewal for many decades to come.

In future, it may become necessary to examine alternate funding models for these types of works. Several municipalities across North America, including Halifax and

Edmonton, have developed stormwater utility charges that are lot specific and associated with the stormwater generated on a property, rather than water consumed. A stormwater utility charge, could be area specific, or in its simplest form, would be applied City-wide based on lot area and percentage hard surface. The revenues generated would be directed towards the implementation of works for wet weather flow control exclusively.

Toronto Water continues to educate, promote and financially support the implementation of some lot level measures which help guard against future incidences of flooding through the Basement Flooding Protection Subsidy Program (details of the program can be found at: <http://www.toronto.ca/water/sewers/pdf/brochure.pdf>). However, expectations by the public remain high for quick resolution and implementation of works despite the practical limitations and funding constraints.

Given the above, and the City-wide scope of the Basement Flooding Protection Program, a number of program changes are proposed to more equitably service the affected areas, within the given funding constraints, summarized in the following.

The key phases of the Program include;

- i) Completing Environmental Assessment studies and identifying the necessary upgrades
- ii) Capital Planning & Coordination (i.e. prioritizing works across the City and coordinating with other affected City divisions such as Transportation Services)
- iii) Preliminary Design
- iv) Detailed Design
- v) Construction

#### Prioritization of Basement Flooding Protection Program and Capital Planning

In the existing Basement Flooding Protection Program, and in accordance with the Council direction provided in 2008, projects are prioritized based on the number of properties receiving benefit from the project where the cost per benefiting property did not exceed \$25,000. Not all properties in a given neighbourhood benefit from infrastructure upgrades, as they may be located in an area of higher ground, away from the influence of overloaded sewer systems. Further, prioritization was given to those projects which benefited the largest number of properties, but where the cost per benefiting property did not exceed \$25,000 based on costing derived from the Environmental Assessment studies.

While this appeared to be fair and equitable, it has presented a few challenges where, in many cases, the project costs at the design and construction stages were far in excess of the original estimates. This was largely due to market conditions in the construction industry and buried utility conflicts or other physical constraints within the road allowance (e.g. large mature trees within the boulevards). A slightly modified approach is now proposed for the prioritization and scheduling of projects.

In recognition that Environmental Assessment studies are in varying stages of completion and in some cases yet to be initiated, it is proposed that in a given year, in advance of

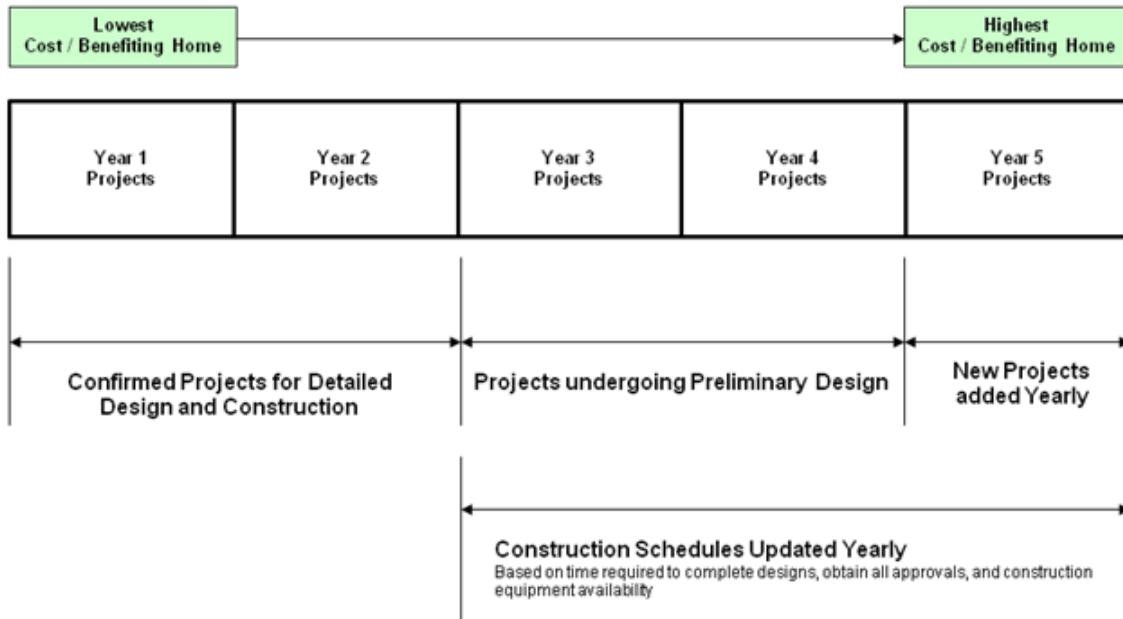
Toronto Water's Capital Budget submission, the following process (also shown schematically in Attachment 4 be followed:

- a) Basement Flooding Protection Capital Program, where total project costs are within the budget envelope identified in the previously submitted 5 year capital plan, be developed, as shown schematically in Figure 2, to contain the following:
  - i) Years 1 & 2: Projects confirmed for detailed design and construction;
  - ii) Years 3 to 5: Projects undergoing preliminary design, coordination and revised cost estimation; where two years worth of projects were already identified in the previous year and the new program now contains an additional year's worth of projects;
- b) A new cost per benefiting property be established or reconfirmed;
- c) A city-wide project prioritization list be refreshed to account for new projects identified through recently completed Environmental Assessment studies, and cost estimates revised as may be necessary due to changing market conditions; and the projects be ranked in ascending order based on cost per benefiting property, where the highest priority for implementation would be given to the lowest cost per benefiting property;
- d) An additional year's worth of projects be identified, where the cost per benefiting property is less than or equal to that determined in b), working down the list (from lowest to highest cost per benefiting property), for inclusion in the Capital Program for the preliminary design phase; and
- e) Any project previously on the preliminary design list, for which preliminary design has been completed through the past year, but where the cost per benefiting property has now been estimated to exceed the predefined threshold cost per benefiting property in b), is "kicked out" of consideration for detailed design and construction, and re-prioritized on the original city-wide project prioritization list.

Based on recently completed Environmental Assessment studies, it is expected that projects whose cost meet the original \$25,000 per benefiting household will all have been implemented by 2015, and a threshold of \$32,000 per benefiting household threshold is being recommended to develop a five year program, extending to 2016, at budget levels as envisioned in the 2012-2020 Capital Plan submitted by Toronto Water with its approved 2011 Capital Budget.

At some point in the future, we can expect that this new threshold will again have to be raised once the lower cost per benefiting property projects has been exhausted. Further, Council will, at some later date, have to determine an upset limit for the cost per benefiting property in light of competing infrastructure renewal priorities.

**Figure 2**  
**Schematic of Basement Flooding Protection Program**  
**5 Year Capital Planning of Projects**



Storm Drainage Design Standards Outside of Basement Flooding Study Areas

It is proposed that the current storm drainage design standards continue to be used for the design of road storms and grading of roads for areas outside of Basement Flooding Study Areas when these systems are being renewed. Once the analyses for the 32 Study Areas has been completed, it is Toronto Water’s intention to undertake similar analyses across the City so that future Capital Programs for sewer system renewals will incorporate the needs to provide this higher level of protection from extreme storms, as part of the City’s Climate Change Adaptation Strategy.

**Don River and Central Waterfront Project**

**Introduction**

In 2008, Toronto Water initiated the "Cleaning Up Our Waterways: The Don River & Central Waterfront Project" to carry forward the recommendations of the Wet Weather Flow Master Plan (WWFMP) to control polluted stormwater and combined sewer overflow (CSO) discharges along the Inner Harbour and lower reaches of the Don River, including Taylor Massey Creek.

This Project addresses two critical issues:

- 1) Polluted Stormwater and Combined Sewer Overflow Discharges - there are 50 CSO outfalls along the Don River and Central Waterfront from which combined sewer

overflows (containing a mixture of polluted stormwater and untreated sewage) are released 42 times on average in a typical season (April to October). CSO discharges contain harmful bacteria, pathogens, heavy metals, oils, pesticides, as well as nutrients (phosphorous and nitrogen) that cause excessive algae growth and degrade the health of the City's waterways. The City is required to meet provincial requirements for the control of CSOs.

- 2) Sanitary Trunk Sewer Capacity and Operational Security – There is an urgent need to "twin" the Coxwell Sanitary Trunk Sewer (Coxwell STS) which is the City's most critical trunk sewer servicing about 30 percent of Toronto (approximately 750,000 residents). Currently, the City has no ability to reroute sewage flows in the event of an emergency such as structural failure or to allow for periodic maintenance. In light of forecasted population growth identified in the City's Official Plan, there is also a need to provide upgrades to the Don Sanitary Trunk Sewer to ensure the system has capacity to effectively service future and provide safety and security of operation.

As per the requirements of the Province of Ontario's Environmental Assessment Act, a Class Environmental Assessment (Class EA) study for the Don River and Central Waterfront Project was initiated in 2008. Throughout the Class EA process, extensive research, analysis and planning have been undertaken, as well as consultation with the public, external agencies and other stakeholders.

An innovative "systems integration" approach was taken to develop a solution which addresses both the sanitary trunk sewer servicing needs within the Don Sanitary Trunk Sewer System (which includes the critical Coxwell Sanitary Trunk Sewer) and the wet weather flow controls dealing with most of the remaining combined sewer overflow discharges in the City in one complete system.

### **Benefits of the Project**

The implementation of this project will achieve the following outcomes:

- Twinning of the Coxwell Sanitary Trunk Sewer (STS) to allow for periodic maintenance and ensure safety of operation;
- Upgrading the City's critical Don Sanitary Trunk Sewer system to ensure the system has capacity to effectively service future population growth in the City;
- Virtually eliminating untreated sewage (from CSOs) from entering the Don River and Central Waterfront, which will lead to improvements in water quality, enhance recreational opportunities, improve aquatic habitat, support economic revitalization efforts for Toronto's waterfront and ultimately move us closer to delisting the City of Toronto as a polluted Area of Concern in the Great Lakes Basin;
- Ensuring the City meets Provincial requirements for the control of combined sewer overflows, and support commitments made by Federal and Provincial Governments, for the cleanup of the Areas of Concern through the Canada-Ontario Agreement and Federal Government's commitment through the Bi-National Great Lakes Water Quality Agreement; and

- Addressing the projected trunk sanitary servicing needs with the wet weather flow control requirements as a complete and integrated system, thereby reducing costs and implementation schedule.

### **The Recommended Solution and Design**

Based on the extensive research and analysis, input from the public, agencies and other stakeholders, the preferred solution and design for the Project has been finalized and is shown on Figure 3. The integrated solution addresses wet weather flow controls and sanitary servicing needs in one complete system. The recommended solution and design includes the following components:

#### Sanitary Trunk Sewer System

- The Lower Don/Coxwell Bypass Tunnel will be used on a contingency basis as a bypass to the existing Coxwell Sanitary Trunk Sewer allowing for periodic maintenance and any necessary repairs of the Coxwell STS;
- Four underground storage tanks for offline storage of peak sanitary flows where additional capacity is needed; and
- Upgrades to the North Toronto Treatment Plant (NTTP).

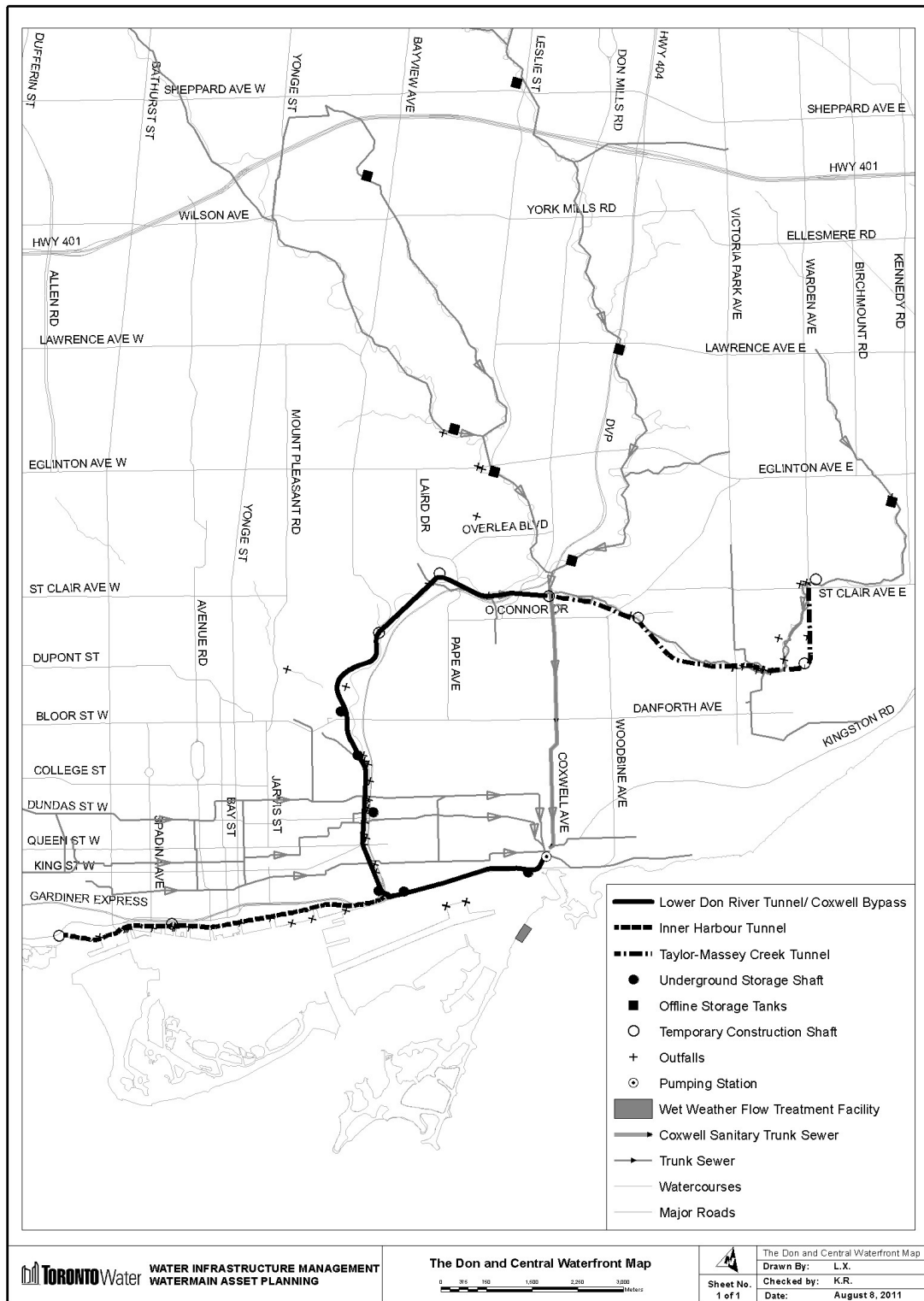
#### Wet Weather Flow Collection and Storage System

- Three integrated tunnels connected to 15 underground vertical storage shafts (30 metres in diameter) will collect and store combined sewer overflows and convey these flows to a new wet weather flow treatment facility;
- Three tunnels include the Lower Don Tunnel/Coxwell Bypass (10.9 km); Taylor Massey Creek Tunnel (5.9 km); and Inner Harbour Tunnel (5.6 km); and.
- Three underground storage tanks for offline storage of combined sewer overflows from 4 remote outfall locations.

#### Treatment of Collected Wet Weather Flow

- A new wet weather treatment facility will provide high-rate treatment of wet weather flows and will be located on future lakefill in the waterlot south of the Ashbridges Bay Treatment Plant;
- A new pumping station in Ashbridges Grove Park with forcemains connecting to the new wet weather flow treatment facility; and
- Upgrade of an existing CSO tank at the North Toronto Treatment Plant.

**Figure 3 Don River and Central Waterfront Project Preferred Solution**





## **Stakeholder Consultation**

Throughout the study process, extensive consultation has taken place with the public, residents' associations, environmental groups, and other stakeholders. Meetings and briefings have also been held with City Councillors, City Agencies, Boards and Commissions and Divisions including Parks, Forestry & Recreation, Transportation, City Planning, the Toronto and Region Conservation Authority (TRCA), TTC, Public Health, and Waterfront Toronto, among others. Meetings with external review agencies such as the Ministry of the Environment, Ministry of Natural Resources, Department of Fisheries & Oceans, and Environment Canada have also taken place. Finally, First Nations have been engaged through correspondence and meetings at various phases of the study.

Consultation and communications activities have included:

- Four rounds of Public Information Centres (9 open houses in total from 2008 to 2011) and other consultation events (e.g., workshop and public forum in 2010) were held at various stages of the EA study process to receive input on the problem/opportunity, the preferred solution, and the preferred design;
- Individual meetings and briefings with community groups, ratepayers associations, etc.;
- Project display booths at various locations and events, e.g., local malls, Lake Ontario Evenings hosted by the TRCA, etc.; and,
- Project postcards and newsletters, as well as a project video and website - [www.toronto.ca/involved/projects/cleanwaterways](http://www.toronto.ca/involved/projects/cleanwaterways) to raise awareness and provide information to the public.

## **Addressing Key Issues**

While the Project and its objectives of cleaning up the Don River and Central Waterfront has received strong support from a broad range of stakeholders throughout the consultation process, some issues/concerns have been raised about the preferred solution and recommended siting of specific components of the Project. The Project Team has taken into consideration the input received from the public, other stakeholders and agencies throughout the consultation process, and this input has played a significant role in finalizing the preferred solution and design for the Project.

### Comments about the Preferred Solution

The preferred solution identified in the Don River and Central Waterfront Class EA study confirms the approach to addressing CSOs in the Don watershed that was recommended in the Wet Weather Flow Master Plan and adopted by City Council in 2003 – namely a system of tunnels, storage elements and treatment to capture and treat CSOs. However, some stakeholders have advocated for the elimination of CSOs by completely separating the existing combined sewer system (i.e. by constructing road storm sewers separating this stormwater flow from the sanitary flow) rather than implementing a tunnel storage and treatment system to capture and treat the CSOs.

Sewer separation is an approach that has been examined by the City and has not been recommended due to technical and cost considerations, in addition to the fact that it does not achieve the water quality benefits and solve the environmental problems caused by polluted stormwater entering our waterways. In short, it does not provide an effective solution to the problem.

From a technical perspective, the City cannot completely separate stormwater flow from sanitary flow. The City can, at a significant cost, build new storm sewers parallel to existing combined sewers however this would not stop stormwater from entering into the combined sewer system because of direct connections from private properties (e.g. foundation drains). Even with mandatory downspout disconnection, it is not possible to remove all storm inflow from private drainage systems.

Most importantly, sewer separation, by itself, will not achieve the necessary water quality improvements as stormwater runoff contains high concentrations of pollutants, well in excess of Provincial Water Quality Objectives, and it is therefore necessary to capture and treat stormwater rather than have it released untreated into our waterways. This is consistent with stormwater management planning for new development across Ontario. This conclusion was reached in the original Remedial Action Plan reports of the 1990's and reconfirmed through the extensive analysis carried out for the WWFMP.

#### Comments about the Siting of Project Components

Many sites within the study area were considered for locating the various project elements, including underground vertical storage shafts, offline tanks and the wet weather flow treatment facility. The Study Team worked closely with Parks, Forestry and Recreation, Transportation, Planning, and the TRCA to evaluate the sites and identify preferred locations based on technical (e.g., constructability, hydraulics), social (e.g., land use and community disruption) and natural environment considerations (e.g., minimizing impacts to vegetation).

Based on the aforementioned criteria, the recommended study design has identified preferred siting locations for project components which are on City owned land, have as minimal impact on existing land uses as possible and are located primarily in open areas in the Don Valley or in passive parks or open green areas that do not directly abut residential homes.

Along the central waterfront, three locations were initially recommended for the siting of underground vertical storage shafts – Little Norway Park, a parking lot at Rees Street and Queens Quay and the York Street off-ramp site at Queens Quay. Based on feedback received during the June 2011 Public consultation concerning potential incompatibility with future land uses and community disruption to local residents and businesses, the preferred design was modified and the proposed underground vertical storage shafts in the harbourfront area were moved to the Keating Railyard near the mouth of the Don River. Only one temporary construction shaft (Rees Street parking lot at Queens Quay) is now proposed to facilitate the construction of the wet weather flow tunnel along the Inner Harbour.

For underground offline storage tanks that are recommended to be sited in passive parks or open green areas, closer to residential homes (e.g., Farlinger Park), Toronto Water will consult with local communities and PF&R during detailed design on the design of above ground features (e.g., venting units, access grates), as well as restoration and site enhancement opportunities at these locations.

Finally, mitigation measures will be taken at all sites to minimize construction impacts to the greatest extent possible.

### Implementation Timeframe and Costs

It is proposed that project implementation will be completed in phases, with the initial phase of implementation focused on twinning of the Coxwell Sanitary Trunk Sewer and meeting minimum Provincial requirements for CSO control. Over the proposed 25-year implementation timeframe for the Project, additional elements would be constructed to achieve the significant water quality improvements and environmental benefits. Table 1 presents the proposed implementation plan with associated costs.

**Table 1**  
**Don River and Central Waterfront Project**  
**Proposed Implementation Timeframe and Costs**

PROJECT PHASES	Implementation (Millions \$)					Total Cost
	1 - 5 Years	6 - 10 Years	11 – 15 Years	16 – 20 Years	21 – 25 Years	
PHASE I: Twinning of the Coxwell Sanitary Trunk Sewer						
a) Lower Don River/Coxwell Bypass Tunnel	\$ 81 M	\$ 97 M				\$ 178 M
b) Pumping Station at Ashbridges Grove Park,	\$ 30 M	\$ 36 M				\$ 66 M
						Sub-total: \$ 244 M
PHASE II: Meet Regulatory criteria for CSOs						
a) Taylor-Massey Creek Tunnel		\$ 81 M	\$ 86 M			\$ 167 M
b) Regulator Adjustments on the MTI		\$ 12 M				\$ 12 M
						Sub-total: \$ 179 M
PHASE III: Eliminate CSOs to achieve Water Quality Objectives						
a) Inner Harbour Tunnel			\$ 44 M	\$129 M	\$ 130 M	\$ 303 M
b) Wet Weather Flow Treatment Facility			\$40 M	\$118 M	\$119 M	\$ 277 M
c) Underground Vertical Storage Shafts			\$30 M	\$ 94 M	\$ 94 M	\$ 218 M
						Sub-total: \$ 798 M

PHASE IV: Independent Construction Elements a) 3 CSO Offline Storage Tanks b) 4 Sanitary Offline Storage Tanks			\$ 53 M \$ 56 M			\$ 53 M \$ 56 M  Sub-total: \$ 109 M
<b>Sub-Total:</b>	<b>\$ 111 M</b>	<b>\$ 226 M</b>	<b>\$ 309 M</b>	<b>\$ 341 M</b>	<b>\$ 343 M</b>	<b>\$ 1,330 M</b>

### Next Steps

The Consultant for the Class EA study is currently working on the finalization of the Environmental Study Report (ESR) which documents the findings and recommendations of the study. Upon finalization of the ESR, a Notice of Completion (to be advertised in local newspapers across the Study Area and sent to the Project contact list) and the ESR will be filed with the Ontario Ministry of the Environment for the required 30-day public review period.

Given the scope and importance of this Project, Toronto Water is seeking Council approval of the project, in principle, before filing the requisite Notice of Completion and the Environmental Study Report with the Ontario Ministry of Environment for the 30-day public review period. Subject to approval by the Ontario Ministry of the Environment, and funding approval, through Toronto Water's forthcoming 2012 Capital Budget, it is recommended that the design of Phase I, which addresses the critical twinning of the Coxwell Sanitary Trunk Sewer, begin in 2012.

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### SIGNATURE

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Lou Di Gironimo  
General Manager, Toronto Water

## **ATTACHMENTS**

1. "Eligibility Criteria – Financial Assistance Program for Low-Income Seniors and Low-Income Disabled Person"
2. Wet Weather Flow Master Plan Project Study Areas
3. Summary of Major Wet Weather Flow Master Plan Projects
4. Schematic of Basement Flooding Protection Project Prioritization and Scheduling Process

## ATTACHMENT 1

### Eligibility Criteria – Mandatory Downspout Disconnection Financial Assistance Program for Low-Income Seniors and Low-Income Disabled Person

#### 1. Definitions:

HOUSEHOLD INCOME — The combined gross income of all persons occupying the property in respect of which the application for financial assistance is made.

ELIGIBLE PROPERTY — Property classified as residential property on the annual assessment roll, or a portion of property classified as residential property, for the City of Toronto.

OWNER — A person assessed as the owner of residential real property, and includes an owner within the meaning of the *Condominium Act*.

ELIGIBLE PERSON — A low-income disabled person or a low-income senior who meets the qualifications set out in section 2 below.

LOW-INCOME DISABLED PERSON — A low-income property owner who meets all of the qualifications set out below:

- A. Who owns an eligible property; and
- B. Who has a household income of \$50,000 or less as shown on the most recent year's Notice of Income Tax Assessment; and
- C. Who is in receipt of one or more of the following:
  - (1) A disability pension under the *Canada Pension Plan Act (Canada)*; or
  - (2) Income support under the *Ontario Disability Support Program Act, 1997*; or
  - (3) Benefits under the *Workplace Safety and Insurance Act, 1997*; or
  - (4) Benefits for the interruption of earnings due to a prescribed illness, injury or quarantine under the *Employment Insurance Act (Canada)*; or
  - (5) Benefits under a contract of individual or group accident, sickness or disability insurance, or any other disability benefits arising from a contract of insurance, which contracts are consistent with the *Ontario Insurance Act* or any similar legislation governing contracts of insurance in another Canadian province.

LOW-INCOME SENIOR — A low-income property owner who meets all of the qualifications set out below:

- A. Who owns an eligible property; and
- B. Who has a household income of \$50,000 or less as shown on the most recent year's Notice of Income Tax Assessment; and
- C. Who is:
  - (i) 65 years of age or older; or
  - (ii) Between 60 and 64 years of age, and:
    - a. Is in receipt of the Guaranteed Income Supplement Allowance under the *Old Age Security Act (Canada)*; or
    - b. Is a widowed person receiving the spouse's allowance under the *Old Age Security Act (Canada)*; or
  - (iii) 50 years of age or older, and:
    - a. Is in receipt of a pension from a pension plan registered under the Income Tax Act (Canada); or
    - b. Is in receipt of a pension annuity resulting from a pension plan registered under the Income Tax Act (Canada); or

Any reference in this subsection 1C to the age of a person is reference to the age of the person as at the date of the application.

**2. Eligibility to receive financial assistance:**

- A. To be eligible to receive financial assistance, a person must:
  - (i) be a low-income senior or low-income disabled person;
  - (ii) occupy the residential property for which the application is made as his or her personal Principal residence;
  - (iii) make an application, together with his or her spouse (where applicable), for financial assistance in accordance with the provisions of Section 3; and
  - (iv) have paid in full all taxes and water charges and arrears payable for all previous years as well as taxes and charges due and owing for the current year in respect to the property for which the application is made and any other property owned within the City of Toronto;
- B. Where title to the eligible property is held by an eligible person and his or her spouse and no other owner, one of the joint owners must qualify as an eligible person, but where title to the eligible property is held jointly by an eligible person and a person or persons who are not his or her spouse or same sex spouse, all of the joint owners must qualify as an eligible person.

**3. Applications for financial assistance.**

- A. Applications for financial assistance must be legible, complete and accurate and in writing on a form prepared by the General Manager of Toronto Water for this purpose. An application must include documentation in support thereof in a form

satisfactory to the General Manager of Toronto Water, to establish that the applicant or, in the case of property held jointly in accordance with Section 2B, the applicant's spouse is an eligible person, that the residential real property with respect to which the application is made is eligible for such financial assistance.

- B. An application for financial assistance may be denied where the request for low-income financial assistance does not meet all terms and conditions on the application.

#### **4. Conditions of Financial Assistance.**

- A. Where eligible, the person shall submit to Toronto Water, a completed and compliant application form, together with all invoices and other supporting information substantiating the completion of the work and costs of same, within one year of the work being completed as a condition of the financial assistance. All applications are subject to the satisfaction of General Manager of Toronto Water and no reimbursement shall be made unless all terms and conditions of the application and these Eligibility Criteria are met.
- B. The disconnection work must be completed prior to making an application and in a manner satisfactory to the City.
- C. The applicant(s) shall assume all responsibilities, liabilities and risk whatsoever (whether financial or otherwise), save and except only for any eligible payment receivable by the applicant(s) under this financial assistance program, associated with or related to the downspout disconnection work including, without limitation, the manner and method of its conduct, installation, performance, workmanship, waste removal, maintenance, repair and its use and any acts or omissions related to such work.
- D. The financial assistance for eligible persons referred to in section 2 above shall be in the form of cost reimbursement, payable by cheque, for eligible works and limited to a maximum upset limit of \$500 for each eligible property and for each eligible applicant. No applicant shall receive financial assistance for more than one eligible property.
- E. There is no reimbursement for costs incurred by the applicant(s) related to property maintenance work, for example, rotting fascia board, roofing work, for upgraded specialty finishes, for example copper materials, for damaged goods, landscaping or for the restoration of property after the downspout disconnection work is completed. Reimbursement is only provided strictly for work directly related to the downspout disconnection and for standard aluminum eaves trough and downspout materials as a described below under section 5 – Eligible Works. Any interior work is not reimbursable.



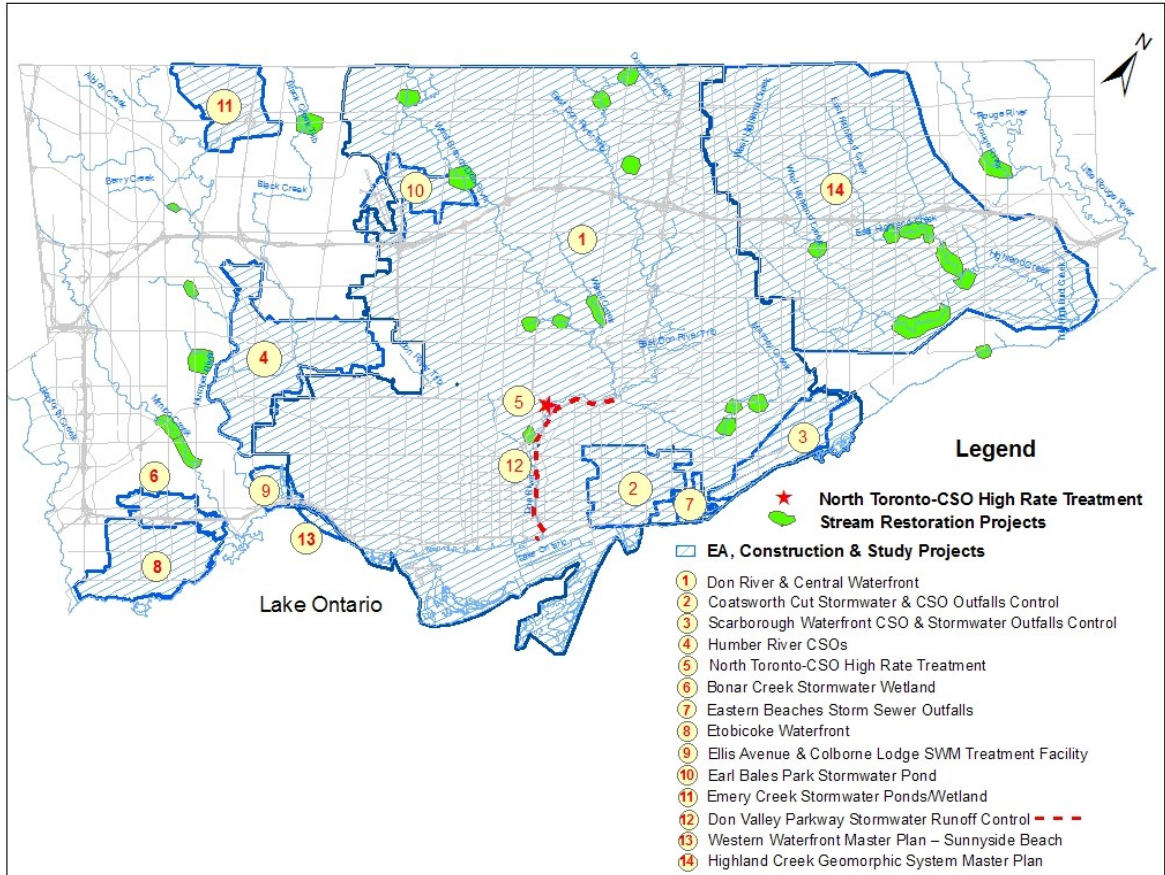
- F. Supporting documentation related to the disconnection work which must be included with this application include the following:
  - (i) before and after photographs of the disconnected downspout(s); and
  - (ii) dated and unaltered original invoice(s)/receipt(s) itemizing and detailing the location, work and materials related to the disconnection.
- G. The City may require an inspection to be conducted by a Toronto Water staff person after the eligible work is completed and prior to approval of an application or payment of financial assistance to verify the eligible work has been completed and all City requirements have been met.

### **5. Eligible Work.**

- A. The downspout(s) must be disconnected from the City sewage works and the drain, hole in the ground or other access point where the downspout originally accessed the City sewage works must be permanently sealed with concrete or some other similar permanent method.
- B. The water from the disconnected downspout must not create a hazardous condition to persons or property.
- C. The downspout disconnection shall be in compliance with all applicable City of Toronto By-laws including, without limitation, section 11 of Chapter 681, Sewers, and Chapter 629, Property Standards, of the City of Toronto Municipal Code (the “Municipal Code”), as amended from time to time.

## ATTACHMENT 2

### Wet Weather Flow Master Plan Project Study Areas



## ATTACHMENT 3

### Summary of Major Wet Weather Flow Master Plan Projects

	Project Type/Title/Description	Project Status
<b><i>Combined Sewer Overflow Projects</i></b>		
1	<p><b>Don River &amp; Central Waterfront</b></p> <ul style="list-style-type: none"> <li>• Most significant project underway - dealing with 50 CSOs along the Inner Harbour, Lower Don River and Taylor-Massey Creek</li> <li>• Outfalls currently average 42 combined sewer overflows per typical season (April to October)</li> <li>• Integrates "dry" weather servicing needs (i.e., servicing growth and security of operation for Coxwell STS) with wet weather flow controls in one complete project.</li> </ul>	<ul style="list-style-type: none"> <li>• EA initiated in 2008</li> <li>• Public consultation completed July 2011</li> <li>• Seeking authority to file EA Notice of Study Completion</li> <li>• <u>Project described in more detail below</u></li> </ul>
2	<p><b>Coatsworth Cut</b></p> <ul style="list-style-type: none"> <li>• Deals with 3 CSOs and 1 storm sewer outfall into Coatsworth Cut</li> <li>• EA study recommended:               <ul style="list-style-type: none"> <li>a) sewer system improvements to reduce frequency of overflows</li> <li>b) construction of a stormwater wetland south of the Ashbridges Bay Wastewater Treatment Plant</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• EA completed 2007</li> <li>• Sewer system improvements under construction in 2011</li> <li>• Design/construction of wetland on hold</li> <li>• Coordination with other projects in area</li> </ul>
3	<p><b>Scarborough Waterfront CSOs</b></p> <ul style="list-style-type: none"> <li>• Deals with 6 CSOs from Victoria Park Ave. to Brimley Road</li> <li>• Study incorporated basement flooding protection design considerations</li> <li>• Study showed sewer system already meets Provincial CSO control requirements</li> <li>• EA study recommended:               <ul style="list-style-type: none"> <li>a) continued separation of combined sewers to address basement flooding</li> <li>b) installation of bioretention strips/units (pilot project) along residential streets</li> <li>c) small underground storage tanks</li> <li>d) stormwater filtration system in Sandown Park</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• EA completed 2011</li> <li>• Detailed design for bioretention units on Aylesworth Ave. in 2011 and construction in 2012</li> <li>• Sewer separation on an opportunistic basis, in conjunction with sewer and road works</li> <li>• Construction of underground tanks on hold pending funding availability</li> </ul>

	<b>Project Type/Title/Description</b>	<b>Project Status</b>
4	<b>Humber River CSOs</b> <ul style="list-style-type: none"> <li>Deals with the City's remaining 11 CSOs discharging to Black Creek and the lower Humber River</li> <li>Study also incorporates basement flooding protection design consideration and includes Chronic Basement Flooding Study Areas Nos. 3, 4, 5 &amp; 6</li> </ul>	<ul style="list-style-type: none"> <li>EA for Study Area #3 completed in 2011</li> <li>EA for the remaining areas initiated in 2011 with expected completion in 2013</li> </ul>
5	<b>North Toronto – High Rate CSO Treatment</b> <ul style="list-style-type: none"> <li>Project represents a retrofit of an existing above ground CSO/Stormwater Tank at the North Toronto Wastewater Treatment Plant</li> <li>New technology, based on research work conducted in collaboration with MOE and Environment Canada</li> <li>Successful pilot testing demonstrated significant improvements in treatment efficiencies, which could significantly reduce construction costs for future facilities</li> </ul>	<ul style="list-style-type: none"> <li>Design and approvals completed in 2009</li> <li>Construction on hold pending completion of Coxwell STS emergency by-pass</li> </ul>
<b><i>Stormwater Treatment Projects</i></b>		
6	<b>Bonar Creek Stormwater Wetland</b> <ul style="list-style-type: none"> <li>Intercepts drainage from Gardiner Expwy (Kipling Ave. to Mimico Creek)</li> <li>Intercepts flow from Bonar Creek and 6 storm sewers entering Mimico Creek</li> <li>Accommodates future extension of Legion Road</li> <li>Stormwater pond/wetland proposed with volume of ~32,000 cubic metres, servicing 393 ha</li> </ul>	<ul style="list-style-type: none"> <li>EA completed in 2009</li> <li>Detailed design in 2012 with construction planned in 2013/2014 pending budget availability</li> </ul>
7	<b>Eastern Beaches Storm Sewer Outfalls</b> <ul style="list-style-type: none"> <li>Intercepts four remaining storm sewer outfalls along Eastern Beaches (Willow Ave and Nursewood Rd)</li> <li>Recommended solution involves construction of box culvert to carry flows to existing MacLean Eve. Storage Tank, and stormwater infiltration system north of Kingston Road</li> </ul>	<ul style="list-style-type: none"> <li>EA completed in 2009 and detailed design completed in 2010</li> <li>Construction on hold pending availability of funding</li> </ul>
8	<b>Etobicoke Waterfront</b> <ul style="list-style-type: none"> <li>Directed at 30 storm sewer outfalls along waterfront</li> </ul>	<ul style="list-style-type: none"> <li>EA to be completed in late 2011</li> </ul>

	<b>Project Type/Title/Description</b>	<b>Project Status</b>
	<ul style="list-style-type: none"> <li>• Study is exploring consolidation of existing outfalls to minimize number of end of pipe facilities</li> <li>• Recommends a tunnel interceptor sewer and large underground storage/treatment tank at Col. Sam Smith Park</li> </ul>	
9	<b>Ellis Avenue &amp; Colborne Lodge</b> <ul style="list-style-type: none"> <li>• Dealt with storm sewer discharges to the waterfront at Ellis Avenue and Colborne Lodge</li> <li>• Solution involved construction of a series stormwater ponds/wetlands in West Pond and Grenadier Pond in High Park; and Lake Shore Boulevard near Colborne Lodge and the Humber River</li> </ul>	<ul style="list-style-type: none"> <li>• Construction completed in 2007</li> </ul>
10	<b>Earl Bales Park Stormwater Pond</b> <ul style="list-style-type: none"> <li>• 3.2 hectare pond is largest facility of its kind in Ontario, servicing a 550 ha area</li> <li>• Innovation: reuse stormwater to support irrigation needs at Don Valley Golf Course; and snow making at Earl Bales Park Ski Hill</li> </ul>	<ul style="list-style-type: none"> <li>• EA completed in 2006 and design completed in 2009</li> <li>• Construction to be completed in 2011</li> </ul>
11	<b>Emery Creek Stormwater Ponds/Wetland</b> <ul style="list-style-type: none"> <li>• Pond identified as a need in 1986 "The Humber River Water Quality Management Plan"</li> <li>• Identified as the most significant water quality improvement project to improve water quality in the Humber River.</li> <li>• To serve large industrial/commercial catchment innovative design includes underground chemical spill containment</li> <li>• Project implementation held up by negotiations for land ownership and agreements</li> </ul>	<ul style="list-style-type: none"> <li>• Design completed in 2006</li> <li>• Construction on hold pending availability of funding</li> </ul>
12	<b>Don Valley Parkway Stormwater Runoff Control</b> <ul style="list-style-type: none"> <li>• Examined opportunities for treatment of stormwater runoff for area between East Don/Taylor-Massey Creek confluence to Gardiner Expwy</li> <li>• Recommended outfall and drainage improvements; and three wetlands</li> </ul>	<ul style="list-style-type: none"> <li>• EA completed 2009</li> <li>• Design and construction on hold pending availability of funding</li> </ul>
<b><i>Waterfront Shoreline Management</i></b>		
13	<b>Western Waterfront – Sunnyside Beach</b> <ul style="list-style-type: none"> <li>• EA led by Waterfront Secretariat, extended from</li> </ul>	<ul style="list-style-type: none"> <li>• New EA proposed to further assess the</li> </ul>

	<b>Project Type/Title/Description</b>	<b>Project Status</b>
	<p>Marilyn Bell Park to Humber River</p> <ul style="list-style-type: none"> <li>• Drew on WWFMP recommendations for Sunnyside Beach water quality improvement recommendations</li> <li>• Recommended pilot testing of UV beach enclosure, and if ineffective recommended advancing the WWFMP recommended landform in Humber Bay to deflect plume from the Humber River away from the Sunnyside Beach</li> </ul>	<p>feasibility and effectiveness of a new Humber Bay landform in collaboration with TRCA</p>
<b><i>Stream Erosion Control</i></b>		
14	<p><b>Highland Creek Geomorphic System Master Plan</b></p> <ul style="list-style-type: none"> <li>• Study identified stream channel and aquatic habitat based solutions to manage increased stormwater runoff flows, resulting from urbanization of the watershed</li> <li>• Recommendations include stream realignment projects to complete channel reconstruction</li> <li>• Given several exposed sections of sanitary trunk sewer, and previous washout of this critical infrastructure, implementation of projects noted is a priority</li> </ul>	<ul style="list-style-type: none"> <li>• EA completed in 2011</li> <li>• Design &amp; construction of works underway, priority given to those sections where infrastructure is at risk</li> </ul>

# ATTACHMENT 4

## Schematic of Basement Flooding Protection Project Prioritization and Scheduling Process

