CITY OF WATERLOO

Water & Sanitary Sewer
Rate Design Study Final Report
& Financial Plan No. 112-301

April 1st 2016

DFA Infrastructure International Inc.

DFA Infrastructure International Inc.

33 Raymond Street St. Catharines Ontario Canada L2R 2T3
Telephone: (905) 938 -0965 Fax: (905) 937-6568

April 1, 2016

The Corporation of the City of Waterloo
100 Regina St. S.
PO Box 337, Station Waterloo
Waterloo, ON
N2J 4A8

Re: City of Waterloo
Water & Sanitary Sewer Rate Design Study Final Report
& Water Financial Plan No. 112-301

We are pleased to submit our final report entitled: "City of Waterloo Water & Sanitary Sewer Rate Design Study Final Report & Water Financial Plan No. 112-301". This report presents the full costs associated with managing the City of Waterloo's water and sanitary sewer systems, the options for cost recovery including a recommended option and the water system financial statements required under O.Reg 453/07.

Please do not hesitate to call if you have any questions.

Yours truly,

DFA Infrastructure International Inc.

Derek Ali, MBA, P.Eng.
President

Executive Summary

ES-1 Purpose of Report

The purpose of the rate study is to:

- Identify the full cost of services for the City's drinking water and sanitary sewer systems based on the most recent information. The period for this study is 24 years from 2016 to 2039 inclusive;
- Develop water and sanitary sewer rate structures that would not only recover the full cost of delivering these services but also provide sustainable financing over the long-term and address the issue of declining water consumption and revenue stability;
- Prepare an updated Water System Financial Plan (No.112-301) in accordance with the requirements of O.Reg. 453/07 for the renewal of the licence for the City's water distribution system. The existing licence expires on July 1, 2016 and submission of the financial plan as part of the licence renewal application process is due to the Ministry of the Environment (MOE) by June 1 2016; and
- Prepare a Sanitary Sewer System Financial Plan similar to that required for water under O.Reg 453/07.

ES-2 Background Information

The City of Waterloo (City) owns and operates a water distribution system (431 km) and a sanitary sewer (wastewater collection) system (407 km) that service approximately 131,000 residents but purchases water and wastewater treatment services from the Region of Waterloo (Region). The City is responsible for ensuring that management of these systems are financially sustainable over the long-term.

The Region's annual charges to the City for water and wastewater treatment services comprise a significant portion of the annual cost of service for each system. The City recovers its annual costs through monthly service charges for water based on meter size plus consumption charges based on the respective water and sanitary sewer uniform rate per cubic metre for the volume of water consumed.

The annual customer growth is projected to be approximately 246 new customers per year each with a demand of approximately 170 m3 per customer. This annual customer growth is consistent with 2013-2014 building permits issued and is conservative from an additional revenue generation perspective. The City's annual water and wastewater volumes projected to be treated by the Region and revenue volumes over the next 6 years are shown in the following table. Projections for the entire 24-year study period are provided in Appendix B.

ES-1: Water & Sanitary Sewage Volumes (m3)

Volumes	2016	2017	2018	2019	2020	2021
Water Volume to be Purchased from the Region (m^3)	12,285,662	12,274,432	12,268,381	12,318,894	12,368,688	12,426,243
Revenue Volume (m^3)	10,535,117	10,451,447	10,354,586	10,397,572	10,440,558	10,483,544
Non-Revenue Water (m^3)	1,750,545	1,822,985	1,913,795	1,921,323	1,928,130	1,942,700
City's Volume to be Treated by Region (m^3)	16,264,573	16,193,060	16,358,051	16,084,050	15,779,218	16,135,790
Sanitary Sewage Revenue Volume (m^3)	10,325,928	10,279,351	10,208,507	10,251,845	10,295,183	10,338,521

ES-3 Stakeholder Consultation

A Council Workshop was held on February 22, 2016 and a Public Open House on February 25, 2016 to obtain feedback on the rate structure design guiding principles, reserve strategies, capital financing and timing of implementation. Based on the feedback received the following guiding principles were used to develop the rate structure alternatives:

1. **Full Cost Recovery**. All costs are to be recovered through the utility rates;
2. **Revenue Stability.** Provide stable and adequate annual revenue to minimize the occurrence of annual deficits;
3. **User Pay.** Recover more revenue from those who use more water;
4. **Fairness and Equity.** Ensure to the extent possible that each customer class pays its fair share with minimal cross subsidization;
5. **Uniform Rate Structure.** Rate structure to remain a uniform volumetric (consumption) rate with no inclining or declining block (i.e. same consumption rate for all users). However a rate option based on an inclining block rate structure should be developed for further consideration;
6. **Water Conservation.** Water rate to be designed to facilitate ongoing water conservation;
7. **Capital Financing**. To be through a combination of reserve, rates, debt (in accordance with the City's debt policy);
8. **Ease of Administration**. Rate calculations are to be transparent and easily explainable to customers. Rate structure must be compatible with existing billing software capabilities and minimize costs due to rate structure changes;
9. **Affordability**. Customer affordability and assistance programs to be considered as part of the study.

The following were also confirmed:

- Use of debt financing for capital needs will be utilized for up to 30% of the estimated annual capital needs. Water and sanitary sewer projects are exempt from the City Debt Management Policy (FC-009). However a maximum debt funding limit of up to 30% of the annual capital funding needs was used for the purposes of this study and rate forecast as per the policy debt limits. This is seen as an acceptable debt level/strategy in accordance with the Council approved tax base debt policy.
- Targeting capital reserve balances of approximately 1% of the estimated asset replacement value as inflated each year according to the Construction Price Inflations Index.
- Targeting rate stabilization reserve balances of 5% of annual operating costs each year
- Implementing the new rate structure in 2019.

ES-4 Full Cost Assessment - Water

Table ES-2 is a summary of the projected costs related to the water system over the study period including the next 5 years. It shows that the average annual cost of managing the water system is approximately $30.6 million over the next 24 years compared to current (2016) annual costs of approximately $20.5 million. Debt repayment accounts for 3% of the annual costs. Operations cost are estimated to be approximately $7.6 million (25%) and the capital costs $3.9 million (13%). These are fixed costs that account for approximately 41% of the total annual costs. The purchase of water from the Region is estimated to be approximately $18.1 million (59%) of the overall net cost over the study period. These are variable costs because of the Region's rate structure for water treatment which is 100% volumetric. However most of the Region's water treatment costs are also fixed. Therefore if the Region were to change its current rate structure, then most of Region's cost would become a fixed cost to the City. The average annual full cost of service is approximately $22.0 million over the next 5 years.

ES-2: Average Annual Full Cost of Water System

Cost Component (Water)	2016	2016 (%)	Average ($) (2016 2020)	Average (%) (2016 2020)	Average ($) (2016 2039)	Average (%) (2016 2039)
Capital Reserve Transfers	$ 2,777,481	14%	$ 3,100,679	14%	$ 3,962,470	13%
Regional Charges	$12,303,913	60%	$13,058,563	59%	$18,083,887	59%
Operating Expenses	$ 5,466,741	27%	$ 5,811,017	26%	$ 7,580,721	25%
Debt Repayment	$ -	0%	$ 11,417	0%	$ 972,520	3%
Total	**$20,548,135**		**$21,981,676**		**$ 30,599,598**	

The projected costs and net revenue requirements for each year over the next 24 years are used as the basis for developing the rates. The projected annual net full costs of managing the water system over the period are presented in Appendix F.

Table ES-3 is a summary of the projected costs for the sanitary sewer system over the study period. It shows that the average annual cost of managing the sanitary sewer system is approximately $38.3 million over the next 24 years compared to 2016 costs of approximately $24.5 million. The annual transfers to reserve are expected to decrease from approximately $3.2 million in 2016 to an average annual amount of approximately $2.9 million over the next 24 years as most of the sanitary sewer system needs are beyond 2035. There are currently no debt related costs based on the City's current capital needs. However, debt will play a future role in the long-term capital financing strategy for the sanitary sewer network and is estimated at approximately $0.52 million (1%) of annual costs. Operations cost are estimated to be approximately $5.9 million (15%) and the capital costs $2.9 million (8%). These are fixed costs that account for approximately 24% of the total annual costs. The treatment of wastewater by the Region is estimated to be approximately $29 million and accounts for 76% of the overall net cost. These are variable costs because the Region's current rate structure for wastewater treatment is 100% volumetric. However most of the treatment costs are fixed. Therefore if the Region were to change its current rate structure, then most of Region's cost would become a fixed cost to the City.

The projected costs and net revenue requirements for each year over the next 24 years are used as the basis for developing the rates. The projected annual net costs of managing the sanitary sewer system over the period are presented in Appendix F.

Table ES-3: Average Annual Full Cost of Sanitary Sewer System

Cost Component (Sanitary Sewer)	2016	2016 (%)	Average ($) (2016 2020)	Average (%) (2016 2020)	Average ($) (2016 2039)	Average (%) (2016 2039)
Capital Reserve Transfers	$ 3,227,783	13%	$ 2,954,049	11%	$ 2,895,828	8%
Regional Charges	$16,248,249	66%	$18,382,061	70%	$28,981,774	76%
Operating Expenses	$ 5,057,612	21%	$ 5,083,741	19%	$ 5,915,288	15%
Debt Repayment	$ -	0%	$ -	0%	$ 524,342	1%
Total	**$24,533,644**		**$26,419,851**		**$38,317,232**	

ES-5 Financing the System Costs

The existing rate structure plus two (2) alternative structures are considered for cost recovery based on the guiding principles and feedback received from the Council Workshop and Public Open House:

- *Option 1:* Continue using the existing rate structure and develop the rates required for full cost recovery. However, one of the main issues identified is the increased risk of not collecting sufficient rate revenues to fully offset the cost of service because 94% of the revenues depend on water consumption. This can result in annual deficits if not addressed.
- *Option 2*: A Sanitary Sewer Service Charge is introduced and 15% of the respective water and sanitary sewer system revenue requirements would be recovered from the respective service charges.
- *Option 3*: An inclining block rate structure is introduced. Under this option higher Water and Sanitary Sewer Rates would apply as consumption increases. The features of this structure include the following for both water and sanitary sewer:

    - *A Bi-Monthly Service Charge that includes consumption of 14 m^3* for no additional volumetric rate.

    - *A First Consumption Block (Block 1) for bi-monthly consumption greater than 14 m^3 but not to exceed 34 m^3.*

    - *A Second Consumption Block (Block 2) for bi-monthly consumption greater than 34 m^3.*

Table ES-4 shows the potential cost impacts of each option to the various customer types by moving from 2018 to 2019 rates and charges. *It is important to note that the change in cost in 2019 is a one-time adjustment to reflect the change in rate structure and full cost recovery*. Option 1 is projected to have a relatively consistent cost impact to all customer classes i.e. 7.00%-7.51% in 2019. Option 2 is projected to have a much greater cost impact on the residential sector (26.19% for residential small and 13.47 % for average residential customers) than on the non-residential sector. Large commercial and industrial customers would benefit from reductions of 3.75% to 5.98%. Option 3 is projected to result in reductions to the small and average residential customers (approximately 6.41% and 3.64% respectively) but would result in major increase to the other large customer classes ranging from approximately 20.87% to 32.48% for the Residential Small Apartments and Non-Residential Customers. These are significant increases that would require more specific consultation with the impacted customer classes prior to considering implementation. *Under all three (3) options the annual increases beyond 2019 would be approximately 3%-5% for all customer classes i.e. after the 2019 increase and rate structure changes are made and become the new baseline.*

Table ES-4: Annual 2019 vs. 2018 Costs to Customers

Description	2018	Option 1 (2019)	Option 2 (2019)	Option 3 (2019)
Small Residential - Single Family Homes Meter Size - 15 mm (Equivalency Unit - 1.00) Average Consumption - 120 m³/year				
Annual Increase to Total Bill (%)		7%	26%	-6%
Annual Increase to Total Bill ($)		$37.58	$140.59	-$34.43
Annual Bill ($)	$536.76	$574.34	$677.35	$502.33
Average Residential - Single Family Homes Meter Size - 15 mm (Equivalency Unit - 1.00) Average Consumption - 204 m³/year				
Annual Increase to Total Bill (%)		7%	13%	-4%
Annual Increase to Total Bill ($)		$63.82	$119.34	-$32.23
Annual Bill ($)	$886.20	$950.02	$1,005.54	$853.97
Residential - Small Apartments Meter Size - 25 mm (Equivalency Unit - 2.02) Average Consumption - 1060 m³/year				
Annual Increase to Total Bill (%)		7%	2%	23%
Annual Increase to Total Bill ($)		$331.25	$77.06	$1,026.87
Annual Bill ($)	$4,485.44	$4,816.69	$4,562.50	$5,512.31
Small Commercial and Industrial Meter Size - 40 mm (Equivalency Unit - 3.69) Average Consumption - 1215 m³/year				
Annual Increase to Total Bill (%)		7%	6%	32%
Annual Increase to Total Bill ($)		$379.83	$324.03	$1,686.48
Annual Bill ($)	$5,193.12	$5,572.95	$5,517.15	$6,879.60

Description	2018	Option 1 (2019)	Option 2 (2019)	Option 3 (2019)
Large Commercial and Industrial Meter Size - 50 mm (Equivalency Unit - 4.62) Average Consumption - 8,227 m³/year				
Annual Increase to Total Bill (%)		7%	-4%	23%
Annual Increase to Total Bill ($)		$2,569.61	-$1,289.84	$8,032.85
Annual Bill ($)	$34,396.72	$36,966.34	$33,106.89	$42,429.57
Largest Commercial and Industrial Meter Size - 50 mm (Equivalency Unit - 4.62) Average Consumption - 192,000 m³/year				
Annual Increase to Total Bill (%)		8%	-6%	21%
Annual Increase to Total Bill ($)		$59,960.30	-$47,768.29	$166,689.39
Annual Bill ($)	$798,893.76	$858,854.06	$751,125.47	$965,583.15

ES-6 Conclusions and Recommendations

Based on the information reviewed and analyses completed, the following are the main conclusions:

1. The average annual full cost of managing the City's water system over the study period (next 24 years) is anticipated to be $30.6 million compared to current (2016) annual costs of approximately $20.5 million. Therefore water rate and service charge increases are necessary to ensure that the system costs are fully funded and financially sustainable over the long-term as required by O. Reg 453/07.
2. The Region's Charges estimated at $18.1 million (annual average cost) for water treatment represent the largest portion of system costs (59%) over the next 24 years. Contributions to the capital reserve account for $3.9 million (13%), O&M activities related to the City's operations account for $7.6 million (25%) and debt repayment accounts for $0.97 million (3%)
3. A water infrastructure funding gap of approximately $33 million over the next 20 years would continue to exist if rates and service charges are not adjusted to generate sufficient funding levels.
4. The financial statements for the water system prepared based on the results of the rate study analyses and projections, indicate the following:

- The accumulated surplus is projected to increase from approximately $72.6 million in 2016 to approximately $86.3 million by 2021.
- The operating surplus ratio is projected to decrease from 15% in 2016 to 12% by 2021.
- The cash position is projected to increase from $6.8 million in 2016 to $7.2 million in 2021.

These indicate that the financial outlook for the water system over the 6-year period 2016 to 2021 is good.

5. The average annual full cost of managing the City's sanitary sewer system over the study period (next 24 years) is anticipated to be $38.3 million compared to 2016 costs of approximately $24.5 million. Therefore sanitary sewer rate increases are necessary to ensure that the system costs are fully funded and financially sustainable over the long-term.
6. The Region's Charges estimated at $29 million (annual average cost) for wastewater treatment represent the largest portion of system costs (76%) over the next 24 years. Contributions to the capital reserve account for $2.9 million (8%), O&M activities related to the City's operations account for $5.9 million (15%) and debt repayment accounts for $0.5 million (1%)
7. The current funding levels are sufficient for meeting the projected needs over the next 20 years. However an infrastructure funding gap in excess of $72 million is projected beyond 2035 to 2065. Debt financing should be considered as part of the funding strategy to address this infrastructure funding gap which is projected to occur just beyond the study period
8. The financial statements for the sanitary sewer system prepared based on the results of the rate study analyses and projections, indicate the following:
    - The accumulated surplus is projected to increase from approximately $113.9 million in 2016 to approximately $126.5 million by 2021.
    - The operating surplus ratio is projected to decrease from 17% in 2016 to 4% by 2021.
    - The cash position is projected to increase from $13.7 million in 2016 to $18.2 million in 2021.

    These indicate that the financial outlook for the sanitary sewer system over the 6-year period 2016 to 2021 is good.
9. Based on a qualitative review, all options would provide the level of funding to be fully sustainable over the long-term. Although Option 3 is best from a water conservation and user pay guiding principle perspective, it has significant disadvantages including but not limited to:

- Revenue uncertainty resulting from conservation due to the higher Block 2 rate;
- Potentially high impacts (20.1% to 32.5% increases) to the non-residential customers that may affect the attraction and retention of business. These levels of increases are significant and would require further dialogue with the business community and volume data analysis prior to confirming the thresholds for each block and the factor to be used for setting the Block 2 rate; and
- The risk of shifting a much larger portion of costs to the residential sector should business customers relocate or discontinue operations.

Option 2 offers the most predictable revenues and would ensure that at least 15% of the annual water revenues would be guaranteed while providing sufficient incentive for customers to conserve.

Option 1 still offers a fair and reasonable rate structure because the amount paid varies almost directly with consumption due to the low fixed water charges (none for sanitary sewer). Under Option 1, from a high level equity perspective, the residential and non-residential sectors pay their fair share. Residential customers consume approximately 55% of the water and contribute 55% of the annual revenue, while the non-residential consumers account for the remaining 45% of consumption and revenues. The major disadvantage of the existing rate structure is the low level of revenue stability as only a marginal amount of the annual revenue is collected via fixed fees. This lack of revenue stability will be offset to some extent by the introduction of the rate stabilization reserves. Therefore Option 1 could be remain a viable option moving forward should Council not wish to proceed with Option 2 due to the large impact to the small and average residential customers.

1.1 Recommendations

The following are the primary recommendations for consideration by the City:

10. Implement the rate structure described as Option 2 in this report effective 2019 to achieve full cost recovery and ensure that 15% revenue recovery from the Water and Sanitary Sewer Service Charges. This would provide the best level of revenue stability compared to the other options. However, if the potential cost increases to the small and average residential customers under this option is of concern, then it would be reasonable to maintain the existing rate structure (Option 1) provided that the new rate stabilization reserve funds discussed in this report are established. The funds that would be available from these reserves would reduce the financial risks due to revenue volatility.
11. Increase transfers to the Water Capital Reserve Fund to the levels noted in Section 6.1.2 of this report and included in Appendix D, to meet the minimum target balance of 1% of asset value adjusted for annual inflation each year, subject to annual reviews of the water system's asset needs, to fully fund the capital requirements.

12. Maintain transfers to the Sanitary Sewer Capital Reserve Fund at the levels noted in Section 6.2.2 of this report and included in Appendix D, to meet the minimum target balance of 1% of asset value adjusted for annual inflation each year, subject to annual reviews of the sanitary sewer system's asset needs, to fully fund the capital requirements.
13. Utilize debt financing in the near term to help address the existing water capital shortfall and sanitary sewer capital shortfall projected in the longer term, in an effort to reduce the burden placed on the rates.
14. Establish a separate rate stabilization reserve fund for both water and sanitary sewer to be used for offsetting any deficits and stabilizing rates and service charges. These reserves to be phased-in at a rate of 1% of annual operating cost from 2019-2023 until the target balance of 5% of annual revenues is achieved.
15. Continue to take steps to identify and address the causes of non-revenue water and inflow and infiltration to the sanitary sewer system.
16. That the O.Reg. 453/07 Water System Financial Plan No. 112-301 including the Financial Statements contained herein be approved by Council and submitted to the Province of Ontario on or before June 1, 2016 in accordance with the Drinking Water System Licence renewal requirements and O. Reg. 453/07.

    That a copy of this document entitled: "*Water and Sanitary Sewer Rate Design Final Report & Water Financial Plan No. 112-301"* be posted on the City's website (http://www.waterloo.ca/ratereview/) and made available to the public at no charge.
17. That the Sanitary Sewer System Financial Plan including the Financial Statements contained herein be received by Council
18. The City should actively pursue Grant funding opportunities based on recent Federal Budget announcements to increase funding to municipalities for infrastructure and 'green' projects.

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1 Introduction

1.1 Background

The City of Waterloo (City) owns and operates a water distribution system and a sanitary sewage (wastewater) collection system that service approximately 131,000 residents. The City is responsible for ensuring that these systems are financially sustainable over the long-term. The delivery of water and sanitary sewage collection services in the Waterloo Region is a two-tier structure whereby the Region of Waterloo (the Region) is responsible for water treatment and transmission and wastewater treatment. The Area Municipalities purchase water and wastewater treatment services from the Region and are responsible for the water distribution services to and sanitary sewage collection from their respective customers.

The Region's annual charges to the City for water and wastewater treatment services are based on actual water volume supplied to the City and the wastewater volume treated. These are calculated by applying the respective Regional water and wastewater volumetric rates to the water and wastewater volumes as measured by the Region. The Region is the "wholesaler" and the City is the "retailer" of water and wastewater services in the City of Waterloo. Therefore, the Region's charges are a major part of the City's annual service delivery costs. The Region's charges are more fully explained in Section 66.1 Cost Components Service.

The total cost of the City's water distribution and sanitary sewage collection services, including payments made to the Region, are recovered from daily operating (non-rate) revenues (e.g. administrative fees, etc.) and through direct billing to customers (rate revenues). The City's water bill to customers is comprised of monthly service charges based on meter size for water plus consumption charges based on the respective water and sanitary sewage uniform rate per cubic metre for volume of water consumed. The sanitary sewer portion of the bill does not include monthly service charges. These revenues are required to cover the full costs of the managing the water and wastewater systems including annual operating and capital costs and long-term asset renewal costs, net of any non-rate revenues. However, there is an increasing risk to revenue recovery because consumption is volatile while many of the system costs are fixed. Consumption in recent years has been trending downwards despite continued growth. Therefore a more stable rate structure is required to improve the level of revenue recovery over the long-term. Accordingly, there is a need for the City to update its rate structures and rates to ensure that it remains on course to sustainable system financing. The City is also required to prepare and submit an updated Water System Financial Plan (No. 112-301) to meet the requirements of the Drinking Water Quality Management System as defined under O.Reg. 453/07 for renewal of its water distribution system licence.

1.2 Purpose

The purpose of the rate study is to:

- Identify the full cost of services for the City's drinking water and sanitary sewer systems based on the most recent information;
- Develop water and sanitary sewer rate structures that would not only recover the full cost of delivering these services but also provide sustainable financing over the long-term and address the issue of declining water consumption and revenue stability;
- Prepare an updated Water System Financial Plan (No.112-301) in accordance with the requirements of O.Reg. 453/07 for the renewal of the licence for the City's water distribution system. The existing licence expires on July 1, 2016 and submission of the financial plan as part of the licence renewal application to the Ministry of the Environment (MOE) is required by June 1 2016; and
- Prepare a Sanitary Sewer System Financial Plan similar to that required for water under O.Reg 453/07.

2 Regulatory Requirements

2.1 Provincial Regulations

The primary Provincial legislation governing drinking water and sanitary sewer services include the following:

- The Environmental Assessment (EA) Act, 1990;
- The Environmental Protection (EP) Act, 1990;
- The Safe Drinking Water Act, 2002;
- The Municipal Act, 2001;
- The Development Charges Act, 1997;
- The Sustainable Water & Sewer Systems Act, 2002; and
- The Water Opportunities & Conservation Act, 2010.

The first two (2) set out the technical requirements related to service delivery. The EA Act applies to expansion of existing facilities and establishment of new capacity such as the installation of new pipes. The EP Act establishes the minimum requirements for the operations of water and sanitary systems in terms of the potential environmental impacts.

The Safe Drinking Water Act, 2002 (SDWA) has significant implications to the daily water system operations as it sets out the water sampling and other requirements (in O.Reg. 170/03) for ensuring that the water delivered to consumers is high quality and safe for consumption. This Act has been a major influence over the past decade in terms of adjustments to operational practices and quality expectations regarding both the Region and the City operations. In addition, there is also a requirement under this Act (O.Reg 188/07) for drinking water providers

to establish a Drinking Water Quality Management System (DWQMS) and obtain a licence for their respective water systems. As part of this DWQMS, and as required under O. Reg. 453/07 (Financial Plans Regulation), operating authorities must submit a financial plan in order to renew their drinking water system licences. These requirements are further described in Section 8 - O.Reg 453/07 Water System Financial Plan No. 112-301. There are also many other regulations and guidelines that deal with design and operation standards that mandate certain activities be undertaken as part of service delivery.

The Municipal Act also sets out the financial requirements for managing the water and sanitary sewer systems including the assessment and recovery of full costs. The Municipal Act, Part VII, Section 293 requires municipalities to establish reserves for dealing with long-term liabilities. This applies directly to the pipe networks and the future liabilities associated with their age and condition. The Municipal Act also permits the City to establish fees for cost recovery and requires public input prior to any fee adjustments. The Development Charges Act and regulations establishes the requirements for the recovery of portions of future growth related capital expenditures to be incurred by the City.

The Sustainable Water & Sewer Systems Act, 2002 (SWSSA)

The Sustainable Water and Wastewater Systems Act, 2002 (SWSSA) was established based on the recommendations made by Justice O'Connor on improvements to the management and operation of water and wastewater systems. Under the SWSSA municipalities are required to submit reports on the full cost of service and method of cost recovery to the Province of Ontario as follows:

- A report prepared by a Professional Engineer, identifying the full cost of water and sanitary sewer services;
- A report identifying a sustainable method by which the full cost would be recovered;
- The comments made by the City's Auditor following a review of both reports; and
- Copies of Council resolutions accepting the recommendation of reports;

Regulations under the SWSSA are still pending. However, these requirements have evolved over the years into best practice approaches taken by municipalities for sustainable water and sanitary sewer financial planning.

The Water Opportunities and Conservation Act, 2010 (WOA)

The WOA was enacted in November 2010. This legislation promotes water conservation and requires municipalities to prepare the following reports:

- Water conservation plans;
- Sustainability plans for water, sanitary sewage & stormwater management; and

- Asset management plans.

Financial plans are required as a component of the water and sanitary sewer sustainability and asset management plans. Therefore more municipalities are now preparing sanitary sewer financial plans as a best practise. These financial plans that are similar to those required for water systems in accordance with O.Reg. 453/07.

2.2 City of Waterloo By-laws

By-Law 2016-001 establishes the City's 2016 to 2018 water and sanitary sewer rates and charges to its customers. The rates and charges will be updated in 2019 through an update of By-Law 2016-001. Excerpts of the by-law related to the drinking water and sanitary sewer rates and charges are included in Appendix A.

3 Methodology

This section outlines the study methodology which considers the feedback received from City Council and customers as further described in Section 4.

3.1 Guiding Principles

The water and sanitary sewer rate structure design is based on the guiding principles noted below. These reflect the feedback received from Council and customers described in Section 4.

1. **Full Cost Recovery**. All costs are to be recovered through the utility rates;
2. **Revenue Stability.** Provide stable and adequate annual revenue to minimize the occurrence of annual deficits;
3. **User Pay.** Recover more revenue from those who use more water;
4. **Fairness and Equity.** Ensure to the extent possible that each customer class pays its fair share with minimal cross subsidization;
5. **Uniform Rate Structure.** Rate structure to remain a uniform volumetric (consumption) rate with no inclining or declining block (i.e. same consumption rate for all users). However a rate option based on an inclining block rate structure should be developed for further consideration;
6. **Water Conservation.** Water rate to be designed to facilitate ongoing water conservation;
7. **Capital Financing**. To be through a combination of reserve, rates, debt (in accordance with the City's debt policy);
8. **Ease of Administration**. Rate calculations are to be transparent and easily explainable to customers. Rate structure must be compatible with existing billing software capabilities and minimize costs due to rate structure changes;
9. **Affordability**. Customer affordability and assistance programs to be considered as part of the study.

3.2 Study Components

This study consists of three (3) main parts:

- *Full Cost of Service*. This identifies the full costs (net of non-rate revenues) associated with managing the water and sanitary sewer systems over a twenty-four (24) year study period from 2016 to 2039;
- *Rate Structure Alternatives (i.e. Full Cost Recovery)*. This identifies the rate structure alternatives and the preferred option for recovery of costs (i.e. a revenue plan) through proposed new rate structures and rates and charges to customers; and
- *O.Reg.453/07 Financial Plans.* Section 8 presents the Water System Financial Plan (No. 076-301) financial statements and other information required to meet the requirements of O.Reg. 453/07. The financial statements are based on the information developed as part of the full cost and revenue analyses completed for the rate study. Similar financial statements are also presented for the sanitary sewer system in Section 9.

Full Cost Methodology

Calculation of the City's full cost of managing the water and wastewater systems is based on estimating and projecting the respective annual costs related to each system over the study period. These include:

- Annual operations and maintenance (O&M) costs related to water distribution and sanitary sewage collection;
- Regional charges for water supply and wastewater treatment;
- Watermain and sewer replacement costs over the twenty four (24) year period based on the renewal needs according to life expectancy as identified in the City's Asset Inventory;
- Capital funding for growth related projects over and above funding available through the Development Charges Reserve Fund and direct contributions by developers, as presented in the City's Capital Budget Forecast;
- Funding required for studies and non-growth operational improvement projects as presented in the City's Capital Budget Forecast;
- Annual contributions to a capital reserve fund for financing capital projects; with a minimum target of 1% of asset replacement value.
- Annual contributions to a rate stabilization reserve fund to offset major peaks and valleys in rate requirements due to annual fluctuations in consumption as a result of unpredictable weather patterns; with a target of 5% phased in at a rate of 1% per year beginning in 2019 over a 5-year period such that the 5% target is achieved by 2023; and
- Repayment of existing and proposed future debt. Debt will be utilized to address the water network capital backlog and sanitary sewer system needs in accordance with the City's debt policy (maximum 30% of project cost to be funded by debt).

The assumptions made with respect to these cost items are presented in Table 6-1. The annual costs are calculated in 2015 dollars and inflated over the study period.

Cost Recovery Methodology

The fundamental components of the City's current rate structure i.e. a fixed monthly charge according to the customer's meter size plus a consumption rate per cubic metre is maintained as the basis for the water and sanitary sewer rate structures. However, options for improved revenue security are provided and assessed against the guiding principles to identify a preferred option. Prior to completing this part of the study, feedback from Council and customers was obtained and incorporated into development of the options. The base option is the City's 2015 rate structure with annual increases to the respective rates for full cost recovery. Two (2) additional options include adjusting the rate structure such that approximately 15% of the annual revenue would be generated by the fixed charges, and an inclining block structure to promote conservation. The current rate structure and rates for 2016 to 2018 as approved by Council under By-Law 2016-001 would continue to apply. Therefore the implementation year for the preferred rate structure option is 2019. The respective water and sanitary rates over the study period and potential impacts to customers under each option are modeled using DFA's Financial Planning Model. A more detailed description of the City's current rate structure and the rate options for cost recovery are presented in Section 7.

Data Sources

The primary sources of data used to prepare this rate study are listed in Table 3-1. In addition, information was also developed from discussions with and input from the City's staff, as required.

Table 3-1: Rate Study Data Sources

Item	Data Source
Asset Life Expectancy	• The City's Water & Wastewater Asset Inventory
Asset Replacement Cost	• The City's Water & Wastewater Asset Inventory • Unit Prices Provided by the City • City's 2016 Capital Budget and 10-Year Capital Forecast
Net Book Value (2014), Depreciation, Historical Cost, etc.	• The City's PSAB 3150 Data for Water & Wastewater
Customer Growth	• City's 2013-2014 record of Building Permit Activity & actual development • Development Charges Study • People and Jobs Forecast 2015 to 2029 • The revenues noted in the 2016 to 2018 annual operating budgets

Item	Data Source
O&M Costs	• City's 2016 Budget • Region's 2016 Projected Rates & Charges
Non-Rate Revenues	• City's 2016 Budget Operating
Non TCA Capital Projections	• City's 2016 Budget Operating • City's 2016 Capital Budget and 10-Year Capital Forecast
Water & Wastewater Treatment Volumes	• City's Historical Records • City's Water Supply Master Plan
Water Volume Sold to Customers	• City's 2016 Operating Budget Data
Existing Debt	• There is no existing water or wastewater debt

4 Stakeholder Feedback

The study process included obtaining feedback from members of Council and customers through the following:

- A workshop session held on February 22, 2016 with members of Council (Committee of the Whole)
- A Public Open House held on February 25, 2016 in conjunction with the Asset Management Plan and Water Master Plan public meeting requirements.

The comments and feedback received was used to refine the guiding principles, reserve strategies and rate structure options for consideration.

4.1 Committee of the Whole (COW) Feedback

The workshop session involved a presentation to COW outlining background information on the water and sanitary sewer systems and the projected cost of service over the next 24 years. Survey questions were completed by members of Council during the workshop. An overview of the feedback is provided in Table 4-1.

Table 4-1: Council Feedback

Workshop Item	Feedback
Guiding Principles:	
Council was asked to rate the importance of each principle	• There was overall support for all principles • Consideration should be given to financing capital projects not only from the respective water and sanitary sewer capital reserve funds but also through the use of debt • Although there was general support for maintaining a uniform volumetric rate structure, the feedback suggested that an inclining block structure should also be examined to support water conservation and user pay.
• *Option 2*: 6% revenue recovery from the fixed charges; 94% from the volumetric charge. • *Option 3*: 20% revenue recovery from the fixed charges; 80% from the volumetric charge. • *Option 4*: 40% revenue recovery from the fixed charges; 60% from the volumetric charge.	• Options 2 and 3 were the most preferred • Options 1 and 4 were the least preferred.
Capital Reserve Strategies:	
Council was asked to rank four (4) potential capital reserve strategies: • *Option 1*:Target a minimum reserve balance of 1% of asset replacement value • *Option 2*: Target a minimum reserve balance of less than 1% of asset replacement value • *Option 3*: Target a reserve balance of 2% of asset replacement value • *Option 4*: Target a reserve balance of greater than 2% of asset replacement value	• Option 1 was the most preferred • Option 4 was the least preferred. • Preference for Options 2 and 3 were mixed

Workshop Item	Feedback
Rate Stabilization Reserve Strategies: Council was asked to rank four (4) potential capital reserve strategies: • *Option 1*:Target a minimum reserve balance of 5% of annual operating costs • *Option 2*: Target a minimum reserve balance of less than 5% of annual operating costs • *Option 3*: Target a reserve balance of 10% of annual operating costs • *Option 4*: Target a reserve balance of greater than 10% of annual operating costs	• Option 1 was the most preferred • Option 4 was the least preferred. • Preference for Options 2 and 3 were mixed
Implementation Strategies: Council was asked to indicate a preference for implementing the new rate structure: • As part of the Asset Management Plan Implementation (estimated to be 2019 for the purposes of this study) • As part of the next Water Services Utility rate report (2017)	• Implementation in 2019 to align with the Asset Management Plan Implementation was preferred.
Affordability Program: Council was asked to indicate a support for establishing a region wide affordability program for water and sanitary sewer.	• There was strong support for this initiative

The following were also confirmed:

- Use of debt financing for capital needs will be utilized for up to 30% of the estimated annual capital needs. Water and sanitary sewer projects are exempt from the City Debt Management Policy (FC-009). However a maximum debt funding limit of up to 30% of the annual capital funding needs was used for the purposes of this study and rate forecast as per the policy debt limits. This is seen as an acceptable debt level/strategy in accordance with the Council approved tax base debt policy.
- Targeting capital reserve balances to be minimum 1% of the estimated asset replacement value adjusted each year for inflation.
- Targeting rate stabilization reserve balances of 5% of annual operating costs each year
- Implementing the new rate structure in 2019.

4.1 Customer Feedback

A single combined Public Open House was hosted to obtain feedback on the rate design study, asset management plan and the master plan. Attendees had the opportunity to view information on display boards, indicate their preferences regarding the guiding principles and provide written feedback on comment sheets. There were approximately ten (10) attendees not including staff representing mainly the residential customers. There was general support for the guiding principles and the need for higher levels of revenue stability. Only one comment sheet was returned indicating a willingness to pay more for less future risk with respect to water and sanitary sewer assets.

5 Existing Systems

5.1 Water System

The water distribution system is operated by the City's operations staff with support from external contractors and consultants as needed. The City provides water directly to its customers through its water distribution system which is fed from the Region's water supply system. The distribution system generally consists of approximately 431 kilometres of watermain of various ages, materials and sizes, 30,050 water meters, 2,429 hydrants and 3,995 valves. Water use is metered for almost all customers.

5.2 Sanitary Sewer System

The sanitary sewer system is operated by the City's operations staff with support from external contractors and consultants as needed. The collection system consists of approximately 407 kilometres of sewer mains of various ages, 5,991 manholes and 6 pumping stations that are monitored by City staff using a Supervisory Control and Data Acquisition (SCADA) system.

5.3 Customer Growth

According to the City's billing records, the number of water and wastewater customers in 2016 is 30,182 and 29,906 respectively. The annual customer growth for both water and wastewater is estimated to be 246 residential customers for the study period beginning in 2019.This is consistent with 2013-2014 building permits issued and is conservative from an additional revenue generation perspective. Projections contained in the Development Charges Study and People and Jobs Forecast 2015-2029 are considered to be relatively high for the purposes of the rate study and would likely result in an over estimate of future revenues. Note that all growth is assigned to residential customers i.e. single family homes with a 15mm water meter to be conservative with the revenue projections. Growth for the period 2016 to 2018 is assumed to be zero to match the revenue projections contained in the City's annual budgets forecasted for this period. Annually any actual growth achieved will be captured by staff as part

of the annual consumption patterns update. Appendix B presents the customer growth projections over the study period.

5.4 Water Volumes

The City's historical and projected water volumes to be supplied annually by the Region and sold to customers over the study period are shown in Appendix B. The estimated water volumes to be purchased and sold each year over the next six (6) years are shown in Table 5-1.

The projected treatment volumes are based on a rolling 5-year average calculation which includes a 1% annual increase that accounts for additional demand due to growth. The annual volume of water to be purchased from the Region each year is projected to increase from approximately 12,285,662 m^3 in 2016 to 13,177,504 by 2039 based on the Region's Water Supply Master Plan. This includes water that is supplied by the City of Waterloo to the City of Kitchener and Bridgeport on a charge back basis, estimated to be approximately 14,400 m^3 in 2016.

The volumes projected to be sold to customers are based on a rolling 5-year average calculation which includes a 1% annual reduction until 2018. This accounts for ongoing conservation efforts and the overall downward trend in consumption despite annual customer growth. However, an increase in the volume sold is projected to begin in 2019 to account for growth. The annual increases due to annual growth are estimated to be approximately 43,050 m^3 per year based on annual growth of 246 new customers per year and an average consumption of 175 m^3 per customer projected for 2019. The annual volumes to be consumed by (i.e. sold to) customers are estimated to be approximately 10,354,586 m^3 in 2018 increasing to 11,257,292 m^3 by2039. These are the "revenue" volumes used to calculate the annual revenue from the metered consumption. The difference between the purchase volumes and the consumption volumes is the "unaccounted for" or non-revenue water volume.

Table 5-1: Water Volume Projections (2016-2021)

Water Volumes	2016	2017	2018	2019	2020	2021
Volume to be Purchased from the Region (m^3)	12,285,662	12,274,432	12,268,381	12,318,894	12,368,688	12,426,243
Revenue Volume (m^3)	10,535,117	10,451,447	10,354,586	10,397,572	10,440,558	10,483,544
Non-Revenue Water (m^3)	1,750,545	1,822,985	1,913,795	1,921,323	1,928,130	1,942,700

5.5 Wastewater Volumes

The sanitary sewage collected by the City is not measured at the source but is metered by the Region at the wastewater treatment plant. These volumes include sanitary sewage contributions from customers (as estimated based on metered water consumption) and inflow and infiltration (I&I) into the sanitary sewer system.

The historical and forecasted volumes of wastewater to be treated by the Region annually over the 24-year study period are also shown in Appendix B. These are based on the City's forecast for the period 2016 to 2018 which reflects the historical rolling 5-year average. The annual volume of wastewater to be treated by the Region each year is projected to increase from approximately 16,358,051 m^3 in 2018 to 16,063,727 by 2039. This includes I&I volumes and additional wastewater generation due to growth.

The revenue volumes for sanitary sewer billing are the metered water volumes for those customers that also have water services. This method of applying the sanitary sewer rates to the metered water consumption volumes for billing purposes is standard industry practise because sanitary sewage is typically not metered by municipalities. The annual revenue volumes, including new customer growth, are estimated to be approximately 10,208,507 m^3 in 2018 increasing to 11,118,605 m^3 by 2039. Note that there are customers that receive water services only. Therefore the revenue volumes for sanitary sewage are different from the revenue volumes for water because of the difference between the number water and sanitary sewer customers. The 2016 annual treatment volume is 16,264,573 m^3 compared to the estimated sanitary sewage volume generated by customers of 10,325,928 m^3 i.e. assuming that all water consumed by customers would be returned to the wastewater system.

The estimated volumes to be treated each year over the next six (6) years are shown in Table 5-2.

Table 5-2 Sanitary Sewage Volume Projections (2016-2021)

Wastewater Volumes	2016	2017	2018	2019	2020	2021
City's Volume to be Treated by Region (m^3)	16,264,573	16,193,060	16,358,051	16,084,050	15,779,218	16,135,790
Sanitary Sewage Revenue Volume (m^3)	10,325,928	10,279,351	10,208,507	10,251,845	10,295,183	10,338,521

6 Cost of Services

The respective full cost of managing the City's water and sanitary systems takes into account all factors that have a bearing on the level of effort and costs required to ensure a safe and reliable supply of potable water to customers and public health and environmental protection regarding sanitary sewage, over the long-term. These include both current and future considerations that would influence the cost of managing the systems throughout their respective lifetimes, which can be several decades for water and sanitary sewer systems. Examples include replacement and rehabilitation of the distribution pipe network and the sanitary sewer mains. The cost implications of some of these factors are more predictable and therefore more readily estimated than those of other factors e.g. the City's O&M cost for the distribution system is more predictable than the cost of purchasing water from the Region due to varying weather conditions and consumption patterns. Similarly the cost of sanitary sewage treatment tends to increase with wet weather but revenues may decline due to lower water consumption.

Higher costs are expected in the future as the water and sanitary sewage business environment changes. However, the impact can be mitigated by fully understanding, assessing and planning for future system costs. The following sections identify the main drivers of cost, the assumptions made in quantifying costs, and an estimate of the full cost of managing the water and sanitary sewer systems. The period used for this assessment is twenty-four (24) years (2016 to 2039).

The respective full cost of managing the water and sanitary sewer systems is the total operating and capital costs less non-rate revenues which are the revenues that are routinely generated each year through the daily operations. These include administrative revenues such as service fees for turn-off charges, lateral installations, etc. but do not include the revenues generated by the water and sanitary sewer rates (i.e. from the sale of water). Accordingly, the "net" full cost of service represents the amount to be recovered from customers through the water and sanitary sewer rates.

6.1 Cost Components

The costs components related to the ***water system*** include the following:

- *Operations and Maintenance (O&M) Costs of the Water Distribution Systems.* This includes the costs of administration, pipe repairs and maintenance, water meter maintenance, hydrant maintenance, water service installations and maintenance, sampling and testing and regulatory reporting,
- *Regional Charges for the Supply of Treated Water to the City.* The cost of water treatment and supply as billed by the Region is based on a uniform volumetric rate. This cost would vary depending on consumption and water loss within the City's system, and

is calculated as the product of the actual (metered) water volume purchased by the City and the Region's uniform water rate.

- *Capital Expenditures.* Capital expenditures are incurred primarily to replace and/ or rehabilitate existing water related infrastructure each year as part of the City's asset management program and increase system capacity to accommodate new growth. The costs associated with studies, design and construction are included in the capital expenditures. The capital costs associated with growth are normally recovered through developer contributions and financing from the Development Charges Reserve established by the City. However, depending on the project a portion of development related costs may be funded from the capital reserve. Annual contributions to the capital reserve are required to ensure that sufficient funds are available to finance projects as needed.
- *Debt Repayment.* This is an annual cost for the repayment of debentures issued to partially or fully fund capital projects. There are no existing water system related debts to be repaid. However the City does intends to finance up to 30% of the water capital backlog through debt, in accordance with its current debt management policy and discussions with staff.

The *sanitary sewer system* cost components are similar to those for water:

- *Operations and Maintenance (O&M) Costs of the Sanitary Sewer System.* This includes the costs of administration, pipe repairs and maintenance, manhole repairs and service lateral installations, maintenance & repairs;
- *Regional Charges for the Treatment of the City's Wastewater.* The cost of wastewater treatment as billed by the Region is based on a uniform volumetric rate. This cost would vary depending on the volume of wastewater, including inflow and infiltration, generated by the City. It is calculated as the product of the actual treated wastewater volume (as metered by the Region) and the Region's uniform wastewater rate. This cost tends to increase with wet weather due to the higher I&I volume.
- *Capital Expenditures.* Capital expenditures are incurred primarily to replace and/ or rehabilitate existing sanitary sewer related infrastructure each year as part of the City's asset management program and increase system capacity to accommodate new growth. The costs associated with studies, design and construction are included in the capital expenditures. Annual contributions to the capital reserve are required to ensure that sufficient funds are available to finance projects as needed.
- *Debt Repayment.* There is no existing sanitary sewer system related debt at this time However the City does intends to finance up to 30% of future capital projects (beyond 2025) through debt, in accordance with its current financial policy and discussions with staff.

The assumptions made with respect to these cost components are summarized in Table 6-1.

Table 6-1: Cost Related Assumptions

Applicable Factor	Assumptions Regarding Future Costs
Water System & Sanitary Sewer System Operations and Maintenance	• The current O&M costs are reflective of regulatory requirements. There would be no significant increase in the level of effort required to operate and maintain the water system in the future. The 2016 to 2018 O&M costs are the budget amounts already approved by the City for this period. However, an increase of 3% per year is allowed for inflation and any minor adjustments that may be required due to future regulatory changes from 2019 onward. • The City's annual contribution to capital and rate stabilization reserves is typically included in the annual O&M costs. However, these contributions would be adjusted to suit the capital requirements and target reserve levels and would vary as needed over the study period.
Region of Waterloo Water Supply Charges	• The Region's rate structure is 100% volumetric and would continue indefinitely. • The Region's Uniform Rate would increase in accordance with the rate projections provided by the Region - 2016 - 2017 - +3.9% - 2017 onward - +2.9% • The annual volume of water to be supplied by the Region would be as projected by the City (i.e. a 5-Year Historical Rolling Average less 1% per year until 2018 to account for the decline in consumption). • The Region's projected Uniform Rate is inclusive of annual amounts that may be required to fund any future rebate program for low income water customers. Discussions are ongoing with the Region.
Region of Waterloo Wastewater Treatment Charges	• The Region's rate structure is 100% volumetric and would continue indefinitely. • The Region's Uniform Rate would increase in accordance with the rate projections provided by the Region as follows up to 2025. Rates for 2026-2064 are currently outside the Region's 10 year forecast window but thought to be reasonable estimates based on the current wholesale trend: - 2016-2018 - +6.9% - 2019-2021 - +5.9% - 2022-2025 - +4.9% - 2026-2030 - +3.9% - 2031-2064 - +2.9% • The annual volume of wastewater to be treated by the Region would be as projected by the City (i.e. a 5-Year Historical Rolling Average). • The Region's projected Uniform Rate is inclusive of annual amounts that may be required to fund any future rebate program for low income sanitary customers.

Applicable Factor	Assumptions Regarding Future Costs
Water & Sanitary Sewer Revenue Volumes (Volume to be Sold to Customers)	• Volume of water used to calculate the City's annual water revenues and rates from 2016 to 2018 is based on the Region's Supply Master Plan. A 1% decline in consumption is applied to the previous five year average consumption to reflect conservation. • The revenue water volumes from 2019 onward would increase annually due to growth from **10,354,586 m^3** in 2018 based on the assumption that the decline would level off by 2018. • Because of the difference between the number of water and sanitary sewer customers, the volume of water used to calculate the City's annual sanitary sewer revenues and rates is based on the Region's Supply Master Plan. The historical rolling 5-year average treated volume is used to project volumes from 2016 to 2018.
Effective Date of Annual Regional & City Water Rates	• For the purposes of the study the annual Region and the City water rates are assumed to take effect on January 1st each year.
Annual Variations in Revenue Volumes (Volume Consumed) Due to Weather Conditions	• Annual variations in weather conditions are unpredictable. Therefore an annual allowance is required as contributions to separate rate stabilization reserves for water and sanitary sewer to account for potential fluctuations in revenue due to consumption variations. The target balance for each rate stabilization reserve would be equal to 5% of the City's annual operating cost for each system and be phased-in at a rate of 1% per year over the course of 2019-2023.
Water Consumption and Sanitary Sewage Increases Due to the Addition of New Customers	• There are approximately 30,360 water customers and 29,819 sanitary sewer customers in 2016. • No increase in customers is projected for 2016 to 2018 to match the revenue assumptions in the City's 2016 to 2018 budgets. • Approximately 246 new residential customers would be added annually from 2019 onward based realized growth from 2013 to 2014 (conservative assumption). • Residential customers would consume approximately 175 m^3 per customer based on the City's 2018 consumption projection. This is an additional 43,050 per year m^3. • There would be no Non-residential customer growth (conservative assumption).
New and Emerging Regulations and Guidelines Related to Water Quality and Sanitary Sewer Management	• The implications of the Safe Drinking Water Act and the Water Opportunities Act have already been realized for the most part. Any further cost implications of emerging regulations would be taken into account in the annual 3% increase for O&M costs.
Existing Asset Preservation and Renewal	• The timing of pipe and other asset replacement would be based on age and life expectancies contained in the City's Asset Inventory. • Capital expenditures would also be driven by the City's 10-year capital forecast for the period 2016 to 2025 • Water related asset backlog (i.e. replacements due as of 2015 or

Applicable Factor	Assumptions Regarding Future Costs
	earlier) is spread over a 21-year period starting in 2019 • Sanitary sewer related asset backlog is assumed to be already captured in the City's capital replacement plan.
New growth related infrastructure	• The growth related capital projects are based on the information contained in the City's 2016 – 2025 capital budget forecast • All project costs that are due to be funded directly by developer contributions and from DC Reserve Fund are not considered as direct cost to the City i.e. only the net cost to the City is considered in the future cost projections.
Inflation	• The Inflation index is estimated at 3% per annum for construction related costs
Capital Financing	• The City has no existing debt related to water and sanitary sewer. • Future capital financing for addressing the water backlog will be through a combination of capital reserves and debt financing as indicated through Council's feedback in accordance with the City's debt management policy as recommended by staff • Future capital financing for sanitary sewer projects would also be through a combination of capital reserves and debt (beyond 2025). • The City also plans to issue debentures to partially fund some growth related projects. • Third party funding is only considered where the funds are confirmed to be available.
Market Competition and Pricing	• All outsourced services will be secured through a competitive bid process thereby benefiting from market pricing and competition. Any market price increases would be covered of by the annual inflation assumption.

The factors described in Table 6-1 have different cost implications. Some are directly within the City's control, while others are not (e.g. Regional rates, water demand fluctuations due to weather variations), depending on the factor. For example, there is flexibility with capital expenditures, as upgrades can be planned and timed to suit a particular budget strategy. Lost revenues due to unaccounted for water and costs related to demand fluctuations are more difficult to control. It is also assumed that expansion of the water and sanitary sewer systems will be limited to within the existing approved service areas.

6.1 Full Cost Assessment – Water System

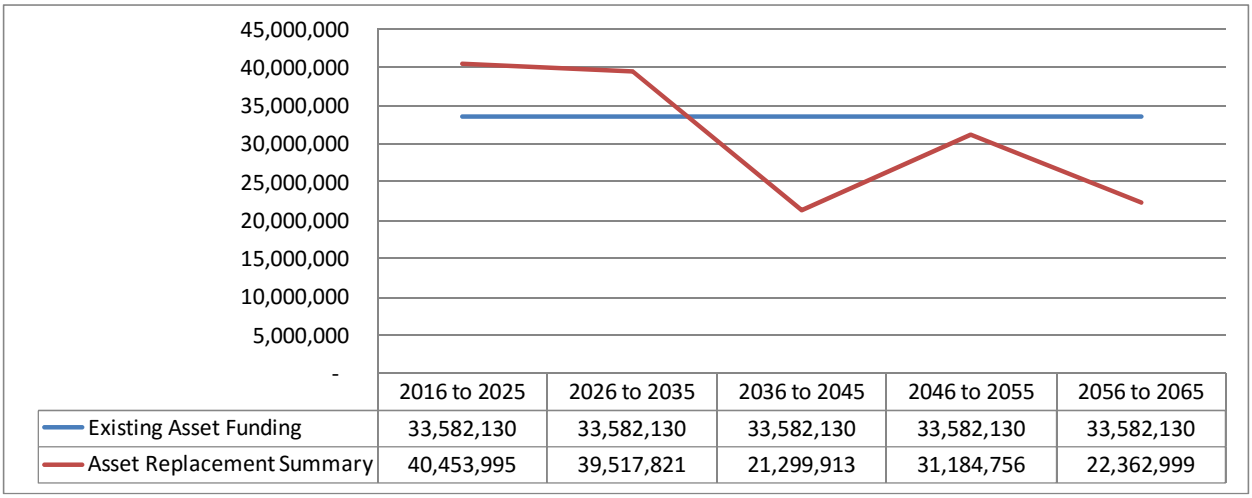
6.1.1 Water System Capital Costs

The water system capital budget requirements over the study period are presented in Appendix C. This reflects the projects identified in the City's 10-year Capital Budget Forecast in conjunction with the replacement of existing water system assets based on the asset inventory and life expectancies and age. It should be noted that some of the projects identified in the 10-year Capital Budget Forecast include asset replacement. Therefore these projects were rationalized with the projected asset replacement needs to ensure that there was no duplication in the projections. There is also an existing backlog of asset replacement requirements related to the water system estimated at approximately $33 million (in 2015 dollars) based on life expectancy. These capital needs are spread over the 21-year period from (2019 to 2039 inclusive) for better affordability due to the magnitude of the costs.

A comparison of the capital needs to the existing level of capital funding indicates that there is a funding gap which is estimated to be approximately $12.8 million over the next 20 years. However, beyond 2036 current funding levels appear to be sufficient as shown in Figure 6-1. The 2016 budget for existing asset replacement related capital expenditures is $3,687,134. This annual amount needs to be increased over the next twenty (20) years to close the funding gap.

If the capital investment is not increased in the short-term to the levels noted in Appendix C, then the funding gap would continue to exist beyond 2035 and the water system would not be financially sustainable.

Figure 6-1 : Capital Funding Gap (in $2015) – Water



	2016 to 2025	2026 to 2035	2036 to 2045	2046 to 2055	2056 to 2065
Existing Asset Funding	33,582,130	33,582,130	33,582,130	33,582,130	33,582,130
Asset Replacement Summary	40,453,995	39,517,821	21,299,913	31,184,756	22,362,999

Appendix C also shows the projected sources financing for the annual expenditures. Capital financing will be through the capital reserve and debt (to a maximum 30%). Other sources of financing such as provincial and/ or federal grants are unpredictable and are therefore not

considered over the long-term. However the City is encouraged to aggressively pursue these funding opportunities as they become available to reduce the overall amount to be funded from the rates and Water Capital Reserve Fund. The reserve fund requirements are discussed in Section 6.1.2.

6.1.2 Water System Reserve Fund Requirements

There are two (2) reserve funds being recommended as part of this study:

- The Water Capital Reserve Fund; and
- The Water Rate Stabilization Reserve.

Appendix D shows the projected continuity schedules for both reserves. This shows the transfers to and from the respective reserves and the opening and closing balances. Reserves are assumed to earn zero annual interest on balances.

Water Capital Reserve Fund

The Water Capital Reserve Fund, which had an opening balance of approximately $4.4 million at the beginning of 2016, will be a source of financing along with debt for future projects. This requires that annual contributions be made to the Water Capital Reserve Fund to ensure that sufficient funds are available particularly for the asset replacement/ rehabilitation projects required over the long-term. These annual contributions (to be raised through the water rates each year) are generally projected to range between $2.8 million starting in 2016 to approximately $4.8 million by 2027. The 2016 transfer includes an annual amount of $1,000,000 from the Sanitary Sewer Capital Reserve Fund for repayment of a loan from water. The loan is expected to be fully repaid by 2019. The reserve closing balance is targeted to be a minimum of 1% of the asset replacement value adjusted for inflation each year over the study period. The annual reserve balance is projected to be $4.5 million at the close of 2016 decreasing to approximately $3.4 million by 2019 and increasing again to approximately $3.8 by 2027.

Water Rate Stabilization (Operating) Reserve Fund

The Water Rate Stabilization Reserve Fund is required to provide a source of funding to offset any year-end operating deficits that may occur during the period and avoid unplanned rate spikes in the subsequent year. The annual contributions (to be raised through the water rates each year) are based on maintaining a target balance of 5% of the total operating expenditures i.e. the revenue requirements (approximately $1.2 million on average over 24 years). Transfers to this reserve fund are targeted to begin in 2019 and phased in at a rate of 1% per year until 2023. Annual contributions over the 24-year period are projected to range between $0 in 2016 and $245,241 depending on the reserve balance and its utilization.

6.1.3 Debt Related Costs

There is no existing water system debt. However, based on feedback from Council the City will utilize debt to finance future asset renewal projects which will tend to smooth the rates. The City also plans to incur some growth related debt to supplement the Water & Sanitary Development Charges Reserve Fund to be used to finance the growth portions of projects. This future growth related debt and resulting debt repayment does not affect the costs to be recovered from the water rates but are considered in the financial statements included in Section 8.

6.1.4 Water System Operations & Maintenance (O&M) Cost

The annual operating budget is based on the operations and maintenance needs of the water system. The annual budget reflects the costs as shown in Table 6-2. These costs include the Region's charges for supplying water to the City but do not include transfers to reserves as the capital related costs are addressed separately in Section 6.1.2. The O&M costs are offset by non-rate revenues with the resulting net costs to be recovered from rates.

The gross 2016 O&M cost including the Region's charges are estimated to be $17.8 million. This cost would be offset by $0.44 million in non-rate revenues for a Net O&M cost of approximately $17.3 million. The purchase of water from the Region budgeted to cost $12.3 million in 2016 accounts for a significant portion (approximately 60%) of the City's annual O&M costs.

The annual O&M costs (except for the Region's charges) and the non-rate revenues are assumed to increase by 3% each year to allow for inflation plus any operational changes that may be required. The Region's charges would increase based on the Region's projected uniform rates and the volume of water supplied to the City. The assumptions respecting the Region's charges are noted in Table 6-1. Appendix E presents the gross operating costs, non-rate revenues and net costs to be recovered from users through the City's fixed and consumption charges.

Table 6-2 : Operating and Maintenance Costs (Water)

Operating and Maintenance Costs	2016 Budget
Operating Expenditures	
Water Administration	$ 2,704,238
Water Meters	
Water Meter Replacement/Installation	$ 354,693
Hydrants	$ 10,621
Valves	$ 12,724
Water-City	
Infrastructure Management	$ 12,047
Miscellaneous	$ 280,305

Operating and Maintenance Costs	2016 Budget
Service Calls	$ 135,987
Subdivision Work	$ 4,307
Watermains	$ 942,058
Testing	$ 23,396
Hydrants	$ 225,876
Meters	$ 250,277
Service Repairs	$ 172,431
Vacuum Excavations	$ 46,878
Non Potable Pumping Station	$ 1,338
Water-Duel	
Miscellaneous	$ 2,264
Watermains	$ 19,290
Administration	$ 138,711
Prog-Water	$ 129,300
Wholesale Water Purchase from Region	$ 12,303,913
Gross	**$ 17,770,654**
Non-Rate Revenues	
Water Administration	$ 202,132
Interdepartmental Repayment	$ 121,132
Water Meter	$ 99,595
Water-City	$ 4,295
Recoveries-Regional Water	$ 10,777
Net	**$ 17,332,723**

6.1.5 Net Full Cost of Water System

The net full cost of managing the water system over the next twenty four (24) years is a reasonable estimate of full costs to be recovered through the rates and is comprised of:

- *Net* Annual O&M Costs (i.e. after non-rate revenues are considered);
- *Net* Capital costs (pipe replacement, growth and non growth projects) i.e. not including contributions from developers or grants;
- Water treatment (Regional) costs;
- Rate stabilization allowance;
- Capital reserve contributions; and
- Debt financing cost.

Table 6-3 is a summary of the projected costs related to the water system over the study period including the next 5 years. It shows that the average annual cost of managing the water system is approximately $30.6 million over the next 24 years compared to current (2016) annual costs of approximately $20.5 million. Debt repayment accounts for 3% of the annual costs. Operations cost are estimated to be approximately $7.6 million (25%) and the capital costs $3.9

million (13%). These are fixed costs that account for approximately 41% of the total annual costs. The purchase of water from the Region is estimated to be approximately $18.1 million (59%) of the overall net cost over the study period. These are variable costs because of the Region's rate structure for water treatment which is 100% volumetric. However most of the water treatment costs are fixed. Therefore if the Region were to change its current rate structure, then most of Region's cost would become a fixed cost to the City. The average annual full cost of service is approximately $22.0 million over the next 5 years.

The projected costs and net revenue requirements for each year over the next 24 years are used as the basis for developing the rates. The projected annual net full costs of managing the water system over the period are presented in Appendix F

Table 6-3: Average Annual Full Cost of Water System

Cost Component (Water)	2016	2016 (%)	Average ($) (2016 2020)	Average (%) (2016 2020)	Average ($) (2016 2039)	Average (%) (2016 2039)
Capital Reserve Transfers	$ 2,777,481	14%	$ 3,100,679	14%	$ 3,962,470	13%
Regional Charges	$12,303,913	60%	$13,058,563	59%	$18,083,887	59%
Operating Expenses	$ 5,466,741	27%	$ 5,811,017	26%	$ 7,580,721	25%
Debt Repayment	$ -	0%	$ 11,417	0%	$ 972,520	3%
Total	**$20,548,135**		**$21,981,676**		**$ 30,599,598**	

6.2 Full Cost Assessment – Sanitary Sewer System

6.2.1 Sanitary Sewer System Capital Costs

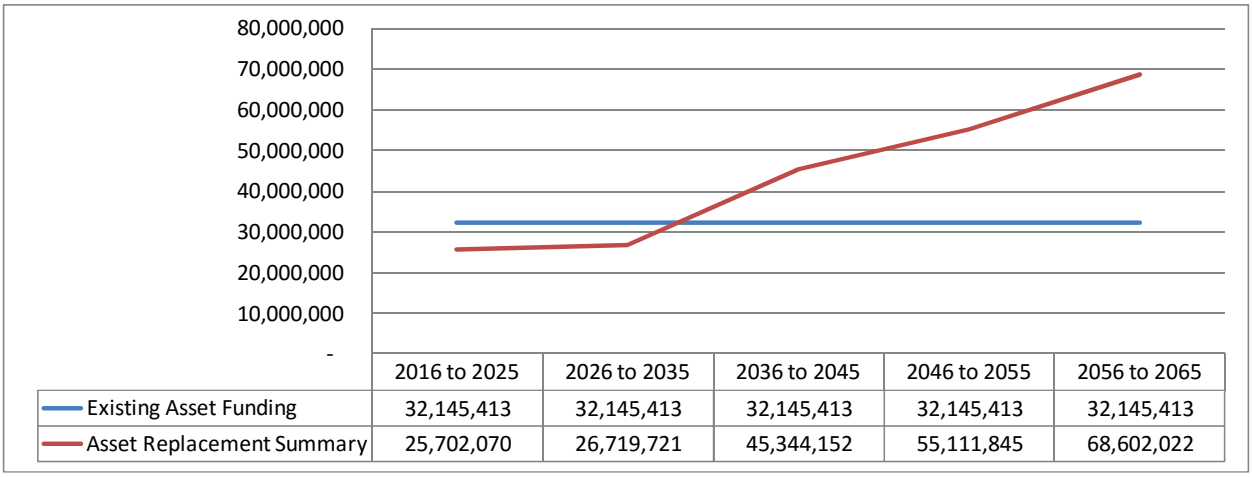
The sanitary sewer system capital budget requirements over the study period are presented in Appendix C. This reflects the projects identified in the City's 10-year Capital Budget Forecast in conjunction with the replacement of existing sanitary sewer assets based on the asset inventory and life expectancies and age. It should be noted that some of the projects identified in the 10-year Capital Budget Forecast include asset replacement. Therefore these projects were rationalized with the projected asset replacement needs to ensure that there was no duplication in the projections.

A comparison of the capital needs to the existing level of capital spending indicates that current funding levels are sufficient over the next 20 years until approximately 2035 as shown in Figure 6-2. However, a funding gap in excess of $72.6 million is projected beyond 2035 (i.e. between 2036 and 2065 which is outside the window of this study) but a prime candidate for the utilization of debt financing in the long-term. The 2016 budget for capital expenditures is $3.8

million. This annual amount should be sufficient for the next few years but should be increased over the 24-year period to address the increasing sanitary sewer needs.

If the capital investment is not increased to the levels noted in Appendix C, then the funding gap beyond 2035 would not be addressed and the sanitary sewer system would not be financially sustainable.

Figure 6-2: Capital Funding Gap (in $2015) – Sanitary Sewer



	2016 to 2025	2026 to 2035	2036 to 2045	2046 to 2055	2056 to 2065
Existing Asset Funding	32,145,413	32,145,413	32,145,413	32,145,413	32,145,413
Asset Replacement Summary	25,702,070	26,719,721	45,344,152	55,111,845	68,602,022

Appendix C also shows the projected sources financing for the annual expenditures. Capital financing will be through the Sanitary Sewer Capital Reserve Fund and debt (beyond 2025) in the long term. Other sources of financing such as provincial and/ or federal grants are unpredictable and are therefore not considered over the long-term. However the City is encouraged to aggressively pursue these funding opportunities as they become available to reduce the overall amount to be funded from the rates and capital reserve. The reserve fund requirements are discussed in Section 6.2.2.

6.2.2 Sanitary Sewer Reserve Fund Requirements

There are two (2) reserve funds being recommended as part of this study:

- The Sanitary Sewer Capital Reserve Fund; and
- The Sanitary Sewer Rate Stabilization (Operating) Reserve.

Appendix D shows the projected continuity schedules for both reserves. This shows the transfers to and from the respective reserves and the opening and closing balances.

Sanitary Sewer Capital Reserve Fund

The Sanitary Sewer Capital Reserve Fund, which had an opening balance of approximately $7.9 million at the beginning of 2016, will be a source of financing in conjunction with debt (beyond 2025) for future projects. This requires that annual contributions be made to the Sanitary Sewer Capital Reserve Fund to ensure that sufficient funds are available for the asset replacement/ rehabilitation projects. These annual contributions (to be raised through the sanitary sewer rates each year) are generally projected to range from $4.0 million in 2016 to approximately $3.0 million by 2026. The reserve closing balance is targeted to be a minimum of 1% of the asset replacement value adjusted for inflation each year over the study period. The annual reserve balance is projected to be $8.6 million at the close of 2016 increasing to $9.6 million by 2026.

Sanitary Sewer Rate Stabilization (Operating) Reserve Fund

The Sanitary Sewer Rate Stabilization Reserve Fund is required to provide a source of funding to offset any year-end operating deficits that may occur during the period and avoid unplanned rate spikes in the subsequent year. The annual contributions (to be raised through the sanitary sewer rates each year) are based on maintaining a target balance of 5% of the annual operating expenditures (approximately $1.7 million on average over 24 years). Transfers to this reserve fund are targeted to begin in 2019 and phased in at a rate of 1% per year until 2023. Annual contributions over the 24-year period are projected to range between $0 in 2016 and $346,196 depending on the reserve balance and its utilization.

6.2.3 Debt Related Costs

Similar to water there is no existing sanitary sewer system debt. However, based on feedback from Council the City will utilize debt to finance future asset renewal projects which will tend to smooth the rates. Debt financing is expected to play a major role in funding projects beyond the next 24 years when much of the sanitary sewer system becomes due for replacement. The City also plans to incur some growth related debt to supplement the Water & Sanitary Sewer Development Charges Reserve Fund to be used to finance the growth portions of projects. This future growth related debt and resulting debt repayment does not affect the costs to be recovered from the water rates but are considered in the financial statements included in Section 9.

6.2.4 Sanitary Sewer System Operations & Maintenance (O&M) Cost

The annual operating budget is based on the operations and maintenance needs of the sanitary sewer system. The annual budget reflects the costs as shown in Table 6-4. These costs include the Region's charges wastewater treatment but do not include transfers to reserves because the capital related costs are addressed separately in Sections 6.2.2. The O&M costs are offset by non-rate revenues with the resulting net costs to be recovered from rates.

Table 6-4: Operating and Maintenance Costs (Sanitary Sewer)

Operating and Maintenance Costs	2016 Budget
Operating Expenditures	
Sewer Administration	$2,346,514
Sewer Maintenance	
Zoom Camera	$179,476
Infrastructure Management	$19,543
Sanitary Sewer Flow Monitoring	$51,000
Laterals	$640,135
Sanitary Sewers	$341,400
Forcemain	*$2,412*
Pumping Station	*$247,743*
Prog-Sewer	$120,757
Interdepartmental Repayment	$1,108,632
Net Operating Surplus	$3,081,999
Regional Sewage Treatment Cost	$16,248,249
Gross	**$24,387,860**
Non-Rate Revenues	
Sewer Administration	$370,088
Interdepartmental Repayment	$12,500
Sewage Rev-Extra Sewage	$798,050
Net	**$23,207,222**

The gross 2016 O&M cost including the Region's charge is estimated to be $24,387,860. This cost would be offset by $1,180,638 in non-rate revenues for a Net O&M cost of approximately $23,207,222. Approximately $798,000 in revenue is expected to be received from the City of Kitchener annually for sanitary sewage that flows through the City of Waterloo's system. Wastewater treatment budgeted to cost $16,248,249 in 2016 accounts for a significant portion (approximately 67%) of the City's annual O&M costs.

The annual O&M costs (except for the Region's charges) and the non-rate revenues are assumed to increase by 3% each year to allow for inflation plus any potential regulatory changes. The Region's charges would increase based on the Region's projected uniform rates and the volume of wastewater treated from the City. The assumptions respecting the Region's charges are noted in Table 6-1. Appendix E summarizes the gross operating costs, non-rate revenues and net costs to be recovered from users through the City's fixed and consumption charges.

6.2.5 Net Full Cost of Sanitary Sewer System

The net full cost of managing the sanitary sewer system over the next twenty-four (24) years is a reasonable estimate of full costs to be recovered through the rates and is comprised of:

- *Net* Annual O&M Costs (i.e. after non-rate revenues are considered);
- *Net* Capital costs (pipe replacement, growth and non growth projects) i.e. not including contributions from developers or grants;
- Wastewater treatment (Regional) costs;
- Rate stabilization allowance; and
- Capital reserve contributions.

Table 6-5 is a summary of the projected costs for all the sanitary sewer system cost components over the study period. It shows that the average annual cost of managing the sanitary sewer system is approximately $38.3 million over the next 24 years compared to 2016 costs of approximately $24.5 million. The annual transfers to reserve are expected to decrease from approximately $3.2 million in 2016 to an average annual amount of approximately $2.9 million over the next 24 years as most of the sanitary sewer system needs are beyond 2035. There are currently no debt related costs based on the City's current capital needs. However, as indicated in Section 6.2.3 debt will play a future role in the long-term capital financing strategy (beyond 2025) for the sanitary sewer network and are estimated at approximately $524,000 (1%). Operations cost are estimated to be approximately $5.9 million (15%) and the capital costs $2.9 million (8%). These are fixed costs that account for approximately 24% of the total annual costs. The treatment of wastewater by the Region is estimated to be approximately $29 million and accounts for 76% of the overall net cost. These are variable costs because the Region's current rate structure for wastewater treatment is 100% volumetric. However most of the treatment costs are fixed. Therefore if the Region were to change its current rate structure, then most of Region's cost would become a fixed cost to the City.

The projected costs and net revenue requirements for each year over the next 24 years are used as the basis for developing the rates. The projected annual net full costs of managing the sanitary sewer system over the period are presented in Appendix F.

Table 6-5: Average Annual Full Cost of Sanitary Sewer System

Cost Component (Sanitary Sewer)	2016	2016 (%)	Average ($) (2016 2020)	Average (%) (2016 2020)	Average ($) (2016 2039)	Average (%) (2016 2039)
Capital Reserve Transfers	$ 3,227,783	13%	$ 2,954,049	11%	$ 2,895,828	8%
Regional Charges	$16,248,249	66%	$18,382,061	70%	$28,981,774	76%
Operating Expenses	$ 5,057,612	21%	$ 5,083,741	19%	$ 5,915,288	15%
Debt Repayment	$ -	0%	$ -	0%	$ 524,342	1%
Total	**$24,533,644**		**$26,419,851**		**$38,317,232**	

7 Financing the Water & Sanitary Sewer System Costs

This Section presents an analysis of the rate structure options, the preferred structure and the rates and charges required to provide sufficient revenues to recover the full costs associated with the management of the City's water and sanitary sewer systems.

7.1 Sources of Financing

The current methods of financing for each cost component are summarized in Table 7-1. In general, capital projects are funded through rates and reserves. The reserve funds are built through annual contributions included in the water and sanitary sewer rates and charges each year. The City also intends to use debt along with reserves to finance future capital needs. Growth related projects are funded primarily through the Development Charges (DC) Reserve and direct developer contributions. Any additional funding from the City for growth related projects is usually from the capital reserve fund. Therefore, only the "net" funding required through the capital reserve funds is considered for growth related projects in this study, as identified in the 2016 capital budget forecast. All other costs are recovered through the annual rates and charges. Periodically, specific projects and activities may be funded by grants available through Federal and Provincial Government funding programs and cost sharing arrangements with the Region. However, this type of financing is not always available and only considered in the study where funding has been confirmed.

Table 7-1: Funding Sources

Item	Funding Source
O&M	• Rates
Growth Projects	• DC Reserve Fund • Developer Contributions • Water Capital Reserve Fund for Water Projects • Sanitary Sewer Capital Reserve Fund for Sanitary Sewer Projects • Debt Financing (in the future)
Capital Replacement	• Water Capital Reserve Fund for Water Projects • Sanitary Sewer Capital Reserve Fund for Sanitary Sewer Projects • Debt Financing (in the future) • Transfers from Operating • Grants (as applicable)
Reserve Contributions	• Rates
Regional Charges	• Rates

7.2 Existing Rate Structure & Rates

The City's current rate structure for water includes a Water Service Charge (i.e. a base or fixed charge component) that is set according to the customer's meter size and a Water Rate (i.e. a uniform consumption rate). The key features of this rate structure are:

- The revenues from the Service Charges are guaranteed because they are fixed charges and can bring stability to the overall revenue stream; and
- This structure has all of the benefits of a uniform rate (e.g. promoting water conservation), but without the extreme volatility of relying 100% on consumption revenues. However, in the City's case the portion of revenue from the service charges is relatively small (approximately 6% for water and 0% for sanitary sewer) and is only a minor benefit to revenue stability.

The sanitary sewer rate structure includes only a volumetric rate that is applied to water consumption but does not include a Sanitary Sewer Service Charge component. Therefore 100% of the revenues are dependent on water use which can lead to revenue uncertainty and deficits due to lower consumption. The water and sanitary sewer rates are shown in Table 7-3.

In general the current rate structure recovers only approximately 6% of the annual water revenue and 0% of the annual sanitary sewer revenues from the fixed charges making revenues heavily dependent upon consumption. This increases the risk of incurring deficits especially in wet years when water consumption tends to be lower than predicted. This is particularly the case for sanitary sewer revenues which are based on water consumption. The revenue tends to

be lower in wet years but the cost of treatment tends to be higher due to inflow and infiltration. Most of the water and sanitary sewer costs are fixed (approximately 41% for water and 24% for sanitary sewer as noted in Section 6.1.5 and Section 6.2.5 respectively) whereas the revenue recovery tends to be more volatile i.e. the revenue structure does not match the cost structure. Although the Region's charges are volumetric most of the costs of treatment are fixed except for hydro and chemical costs. If the Region were to change its rate structure from 100% volumetric then the City's rate structure would need to be revisited and changed to suit the new cost structure. Therefore the existing rate structure is exposed to revenue volatility unless changes are made to recover a greater portion of revenues from the fixed charges (i.e. guaranteed revenue regardless of consumption). The creation of respective Water and Sanitary Sewer Rate Stabilization Reserve Funds is one way to mitigate some of the revenue volatility risk resulting from the current rate structure.

7.2.1 Service Charges

The Service Charges are calculated according to the size of the customer's meter using meter equivalency ratios. The smallest meter (15mm) which is typical for residential customers has a Meter Equivalency Ratio of 1. The charge for this meter size is calculated first and is used the baseline charge for calculating the service charges for the larger meter sizes. These are determined by multiplying the baseline charge by the respective equivalency ratio for each meter size. This method of calculating base or fixed charges for water and sanitary sewer is widely used in Ontario and is consistent with the American Water Works Association (AWWA) guidelines for fees and charges. The equivalency ratios are shown in Table 7-2.

Table 7-2: Meter Equivalent Ratios

Meter Size	Equivalency Ratio
15 mm	1.00
25 mm	2.02
40 mm	3.69
50 mm	4.62
75 mm	9.66
100 mm	14.24
150 mm	24.02
200 mm	36.27
250 mm	48.23

These ratios are also considered in the development of the alternative rate structures and rates discussed in this section. Under the existing rate structure there are services charges for the water system but not for the sanitary sewer system as shown in Table 7-3.

7.2.2 Uniform Consumption Rate

The uniform consumption rate is a water rate that is applied to each customer's metered consumption regardless of the type of customer, the size of the meter and volume consumed i.e. a single rate as opposed to multiple rates that vary depending on consumption or customer type. This portion of the charge is consistent with the concept of user pay because the cost to the customer increases with consumption and is generally within the control of the customer. Under the current structure there are separate uniform rates for water and sanitary sewer (i.e. a Water Rate and a Sanitary Sewer Rate) as shown in Table 7-3.

Table 7-3: Existing (2016) Water & Sanitary Sewer Rates and Charges

Meter Size (mm)		2016
Annual Water Service Charges ($/year)		
15 mm	$	35.76
25 mm	$	72.13
40 mm	$	131.98
50 mm	$	165.28
75 mm	$	345.43
100 mm	$	509.24
150 mm	$	859.10
200 mm	$	1,296.95
250 mm	$	1,724.59
Uniform Rate ($/m³)		
Water Rate ($/m³)	$	1.70
Sanitary Sewer Rate ($/m³)	$	2.17

7.3 Alternative Rate Structures & Rates

This section presents the projected future rates for the existing rate structure plus two (2) alternative structures developed based on the guiding principles discussed in Section 3.1 and feedback received from the Council Workshop and Public Open House. The future rates under each option are required to meet the water and sanitary sewer revenue requirements (i.e. to recover the full cost of managing the water and sanitary sewer systems based on the assessment of system costs over the study period). The cost impacts of each option to the different customer types are discussed and the preferred rate structure option and rates identified.

The first option is to continue using the existing rate structure and develop the rates required for full cost recovery. This is the rate structure described in Section 7.3.1. However, one of the main issues identified is the historical decline in water consumption and the resulting increased risk of not collecting sufficient rate revenues to fully offset the cost of service. This can result in annual deficits if not addressed. The existing structure is exposed to this risk as most of the

revenues are derived from consumption charges. Therefore the two (2) alternative rate structures are geared towards increasing revenue stability while at the same time maintaining consistency with the other guiding principles to the extent possible. ***In all three (3) options, implementation would begin in 2019 when the existing 2016 to 2018 rates become due for renewal.*** This is consistent with the feedback received from Council regarding the implementation strategy.

The rates required under each option over the 24-year study period are based on cash flow analyses undertaken.

7.3.1 Rate Structure Option 1 – Existing Structure

This option is the current structure used by the City to recover the costs of the water and sanitary sewer systems. The service charges and rates approved under By-Law 2016-001 will continue to apply for the period 2016 to 2018. In 2019 the service charges and rates are increased as needed to reflect full cost recovery for both systems. Under this option the City would continue to recover approximately 6% of the required water system revenues from the Water Service Charges (i.e. guaranteed revenue) and 94% from consumption based on the Water Rates. This means that there would continue to be a heavy reliance on the consumption based revenues each year which poses risk to revenue recovery. Sanitary sewer system costs would also continue to be recovered through the volumetric Sanitary Sewer Rate only i.e. without a service charge component. The 6-year water and sanitary sewer rate projections for Option 1 are provided in Table 7-4.

The Water Service Charges are projected to increase by 0.29%, 9.15% and 2.61% in 2019 (over 2018), 2020 and 2021 respectively. The water rate is projected to increase by 8.78%, 9.48% and 2.91% in 2019, 2020 and 2021. Similarly the Sanitary Sewer Rate is projected to increase by approximately 6.55% each year from 2019 to 2021 inclusive. These increases are necessary to recover the full cost of service. Rate and service charge projections for the study period are presented in Appendix I.

Table 7-4: Projected Service Charges & Rates – Option 1

Rate Component	2016	2017	2018	2019	2020	2021
Annual Water Service Charges						
Annual Increase (%)	2.41%	2.35%	2.62%	0.29%	9.15%	2.61%
15 mm	$35.76	$36.60	$37.56	$37.67	$41.11	$42.19
25 mm	$72.24	$74.04	$75.84	$76.06	$83.02	$85.18
40 mm	$132.00	$135.36	$138.72	$139.12	$151.85	$155.80
50 mm	$165.48	$169.56	$173.76	$174.26	$190.20	$195.16
75 mm	$345.72	$354.36	$363.24	$364.28	$397.61	$407.97
100 mm	$505.68	$518.28	$531.24	$532.76	$581.51	$596.66
150 mm	$859.92	$881.40	$903.48	$906.07	$988.98	$1,014.74
200 mm	$1,298.16	$1,330.56	$1,363.80	$1,367.71	$1,492.86	$1,531.75
250 mm	$1,726.20	$1,769.40	$1,813.68	$1,818.88	$1,985.31	$2,037.03
Uniform Rate						
Annual Increase (%)	2.41%	2.35%	2.87%	8.78%	9.48%	2.91%
Uniform Water Rate ($/m³)	$1.70	$1.74	$1.79	$1.95	$2.13	$2.19
Annual Increase (%)	3.33%	3.23%	5.80%	6.55%	6.55%	6.55%
Uniform Wastewater Rate ($/m³)	$2.17	$2.24	$2.37	$2.53	$2.69	$2.87

7.3.2 Rate Structure Option 2 – 15% of Revenue from Service Charges

Under this option a Sanitary Sewer Service Charge is introduced and 15% of the respective water and sanitary sewer system revenue requirements would be recovered from the respective service charges in 2019. The existing rate structure and rates remain in effect until 2018. Note that the new service charges will result in a revenue shift away from the consumption based revenue resulting in slight decrease in the Water Rate and the Sanitary Sewer Rate. All water and sanitary sewer service charges and rates are increased as needed beyond 2019 such that the service charges provide approximately 15% of the annual revenues for the remainder of the study period.

This option is intended to improve revenue stability beginning in 2019. After 2019 both sets of service charges and rates would increase as needed for full cost recovery. As a result the base Water Service Charge (i.e. for the 15mm meter) is projected to increase from $37.56 in 2018 to $94.17 in 2019 (i.e. an increase of 150.1%) and 9.1% thereafter. The Water Rate decreases from $1.79 m³ in 2018 to $1.76 m³ in 2019 (-1.6%) and 9.5% thereafter. Similarly, the Sanitary Sewer Service Charge is estimated to be $114.33 in 2019 but Sanitary Sewer Rate would decrease to from $2.37 in 2018 to $2.15 m³ in 2019. Table 7-5 and Table 7-6 show the projected 6-year rates for water and sanitary sewer respectively

Table 7-5: Projected Water Service Charges & Rates - Option 2

Rate Component	2016	2017	2018	2019	2020	2021
Annual Water Service Charges						
Annual Increase (%)	2.41%	2.35%	2.62%	150.72%	9.15%	2.61%
15 mm	$35.76	$36.60	$37.56	$94.17	$102.79	$105.46
25 mm	$72.24	$74.04	$75.84	$190.14	$207.54	$212.95
40 mm	$132.00	$135.36	$138.72	$347.79	$379.62	$389.51
50 mm	$165.48	$169.56	$173.76	$435.65	$475.51	$487.90
75 mm	$345.72	$354.36	$363.24	$910.70	$994.03	$1,019.93
100 mm	$505.68	$518.28	$531.24	$1,331.91	$1,453.78	$1,491.65
150 mm	$859.92	$881.40	$903.48	$2,265.18	$2,472.44	$2,536.86
200 mm	$1,298.16	$1,330.56	$1,363.80	$3,419.28	$3,732.14	$3,829.38
250 mm	$1,726.20	$1,769.40	$1,813.68	$4,547.20	$4,963.27	$5,092.58
Uniform Rate						
Annual Increase (%)	2.41%	2.35%	2.87%	-1.64%	9.48%	2.91%
Uniform Water Rate ($/m³)	$1.70	$1.74	$1.79	$1.76	$1.93	$1.98

Table 7-6: Projected Sanitary Sewer Service Charges & Rates – Option 2

Rate Component	2016	2017	2018	2019	2020	2021
Annual Wastewater Service Charges						
Annual Increase (%)					6.23%	6.24%
15 mm	-	-	-	$114.33	$121.45	$129.02
25 mm	-	-	-	$230.85	$245.23	$260.52
40 mm	-	-	-	$422.24	$448.55	$476.53
50 mm	-	-	-	$528.90	$561.86	$596.89
75 mm	-	-	-	$1,105.65	$1,174.54	$1,247.79
100 mm	-	-	-	$1,617.02	$1,717.77	$1,824.89
150 mm	-	-	-	$2,750.07	$2,921.41	$3,103.60
200 mm	-	-	-	$4,151.22	$4,409.86	$4,684.87
250 mm	-	-	-	$5,520.59	$5,864.56	$6,230.28
Uniform Rate						
Annual Increase (%)	3.33%	3.23%	5.80%	-9.43%	6.55%	6.55%
Uniform Wastewater Rate ($/m³)	$2.17	$2.24	$2.37	$2.15	$2.29	$2.44

7.3.3 Rate Structure Option 3 – Inclining Block Rate Structure

Under this option higher Water and Sanitary Sewer Rates would apply as consumption increases. The features of this structure include the following for both water and sanitary sewer:

- *A Bi-Monthly Service Charge that includes consumption of 14 m³.*

  This volume allows customers to meet their basic water use needs without additional consumption (volumetric) charges and is referred to as basic consumption. The full charge applies whether or not the maximum of 14 m³ is used.

- *A First Consumption Block (Block 1) for bi-monthly consumption greater than 14 m³ but not to exceed 34 m³.*

  This maximum volume represents the bi-monthly consumption for the average residential customer. The respective water and sanitary volumetric rates apply to the volume consumed within Block 1 (i.e. in excess of 14 m³ to a maximum of 34 m³) as measured by the customer's water meter. This is in addition to the Bi-Monthly Service Charges.

- *A Second Consumption Block (Block 2) for bi-monthly consumption greater than 34 m³.*

  The respective water and sanitary volumetric rates applicable to the volume consumed within Block 2 (i.e. in excess of 34 m³) as measured by the customer's water meter, are 1.2 times the respective rates for the Second Consumption Block. The Bi-Monthly Service Charges also apply.

The thresholds defining the volumetric blocks are based on reasonable use by the average residential customer. The Block 2 Rate being set using a factor of 1.2 times the Block 1 Rate is intended to provide price point incentive for customers using water within the Block 2 to conserve. According to the AWWA Manual *AWWAM1 Principles of Water Rates, Fees and Charges* there are no set criteria for establishing the factor except that it must be significant in order to have an effect on customer behaviour and trigger conservation. Note that in some jurisdictions this price premium is much higher e.g. City of Hamilton's block 2 rate is 2 times the block 1 rate. However, for the purposes of this rate design study, a lower factor of 1.2 is used to assess what the impacts might be to the higher consumption customers under a more moderate premium recognizing that a higher premium would result in even greater impacts.

Inclining block rates are typically considered for use when the following applies:

- The billing system can handle different customer classes and has the capacity to calculate the consumption within each block for each customer. In the City's case adjustments to the existing billing system would be required to incorporate the block billing;
- The water and/or sanitary system is approaching its operating capacity and there is a need to avoid or defer expansion. Note that the issue of plant capacity falls under the jurisdiction of the Region. If inclining rates are to have an impact on deferring plant capacity expansion, then there would need to be a concerted effort by the Region in collaboration with all the local area municipalities i.e. the City's efforts on its own would not be sufficient to defer plant capacity expansion;
- There is a desire to promote water conservation through pricing; and
- There is a willingness to incur the extra effort required to communicate and explain the rationale behind the inclining block rates to customers and administer the system.

Although this structure provides greater portion of the annual revenue through the Service Charges, promotes conservation and facilitates user pay there are some major drawbacks:

- The customers that require high volumes of water as part of their normal business would pay the higher Block 2 Rate but would not be able to reduce consumption to benefit from the lower Block 1 Rate.
- There would be very little incentive for the low volume customers to conserve as most of their consumption would fall within the volume included as part of the fixed service charge.
- Greater revenue instability because higher revenues expected from the Block 2 may not materialize as some customers conserve and reduce consumption within that block or have all their consumption fall within Block 1 at the lower rate.
- The potential loss of higher consumption users that pay the premium Block 2 rate would mean the loss revenues that would need to be recovered from the lower consumption users. This would require an increase to the Block 1 rate to ensure that sufficient revenues are recovered. Research suggests that reductions in consumption can be 18% or greater (Ref. 17). To address the reduction in consumption, it is assumed that a more conservative *reduction of 10% would occur in the Block 2 volumes under Option 3*.
- The complexity of administering the data collection and billing to align with the inclining block as part of the ongoing operations. This would increase the annual operating cost. The amount of this increase was not available at the time of preparing this report.

This option would become effective in 2019. As a result the base Water Service Charge (i.e. for the 15mm meter) is projected to increase from $37.56 in 2018 to $158.41in 2019 (i.e. an increase of 321.75%). However, the Water Rate for Block 1 is projected to increase from $1.79 in 2018 to $1.89 in 2019 i.e. an increase of 5.35%. Both the service charges and rates would increase by approximately 9.50% and 2.93% in 2020 and 2021 respectively but the average increases needed for full cost recovery are projected to be approximately 3% annually over the study period. Similarly, the Sanitary Sewer Service Charge is estimated to be $198.22 in 2019 but Sanitary Sewer Rate for Block 1 would decrease by 2.94%. Both the service charges and rates would increase by 6.57% in 2020 and 2021. Table 7-7 and

Table 7-8 show the projected 6-year rates for water and sanitary sewer respectively

The annual service charges and rates and their respective increases for each year between 2021 and 2039 are shown in Appendix I.

Table 7-7: Projected Water Service Charges & Rates – Option 3

Rate Component	2016	2017	2018	2019	2020	2021
Annual Water Service Charges						
Annual Increase (%)	2.41%	2.35%	2.62%	321.75%	9.50%	2.93%
15 mm	$35.76	$36.60	$37.56	$158.41	$173.45	$178.53
25 mm	$72.24	$74.04	$75.84	$319.85	$350.23	$360.49
40 mm	$132.00	$135.36	$138.72	$585.05	$640.62	$659.38
50 mm	$165.48	$169.56	$173.76	$732.83	$802.44	$825.93
75 mm	$345.72	$354.36	$363.24	$1,531.96	$1,677.47	$1,726.59
100 mm	$505.68	$518.28	$531.24	$2,240.50	$2,453.30	$2,525.15
150 mm	$859.92	$881.40	$903.48	$3,810.42	$4,172.33	$4,294.52
200 mm	$1,298.16	$1,330.56	$1,363.80	$5,751.82	$6,298.12	$6,482.56
250 mm	$1,726.20	$1,769.40	$1,813.68	$7,649.19	$8,375.69	$8,620.98
Uniform Rate						
Annual Increase (%)	2.41%	2.35%	2.87%	5.35%	9.50%	2.93%
Block 1 ($/m^3)	$1.70	$1.74	$1.79	$1.89	$2.06	$2.13
Block 2 ($/m^3)				$2.26	$2.48	$2.55

Table 7-8: Projected Sanitary Sewer Service Charges & Rates – Option 3

Rate Component	2016	2017	2018	2019	2020	2021
Annual Sanitary Sewer Service Charges						
Annual Increase (%)					6.57%	6.57%
15 mm	-	-	-	$193.22	$205.91	$219.44
25 mm	-	-	-	$390.15	$415.77	$443.09
40 mm	-	-	-	$713.63	$760.50	$810.46
50 mm	-	-	-	$893.89	$952.60	$1,015.17
75 mm	-	-	-	$1,868.65	$1,991.37	$2,122.19
100 mm	-	-	-	$2,732.91	$2,912.39	$3,103.71
150 mm	-	-	-	$4,647.87	$4,953.11	$5,278.48
200 mm	-	-	-	$7,015.94	$7,476.70	$7,967.84
250 mm	-	-	-	$9,330.30	$9,943.05	$10,596.22
Uniform Rate						
Annual Increase (%)	3.33%	3.23%	5.80%	-2.94%	6.57%	6.57%
Block 1 ($/m^3)	$2.17	$2.24	$2.37	$2.30	$2.45	$2.61
Block 2 ($/m^3)				$2.76	$2.94	$3.13

7.3.4 Potential Customer Impacts

The potential cost impacts to customers are driven by the following:

- The 2016-2018 rates are not at the point at which they provide sustainable levels of revenues to recover the full cost of service. Therefore rate increases are required beginning in 2019 to bring revenues up to sustainable levels, regardless of the rate structure option Council approves.
- Changes to the rate structure to obtain more revenues from the services charges to improve revenue security. As the base service charges increase, there is a greater impact to the low consumption user than the higher consumption user. Therefore it is recommended that staff continue to investigate the Region-wide affordability program to help offset this impact to eligible users.
- The inclining rates of Option 3 which tends to increase costs to the high consumption user compared the low consumption user. The number of customers estimated to be in each consumption block based on current billing and consumption data is shown in

Table 7-9. This indicates that approximately 31% of the customers would be exposed to the higher Block 2 rate.

Table 7-9: Number of Customers in Each Consumption Block (Option 3)

	Customers	
Block	Number	%
Service Charge Only	5,798	19
Service Charge + Block 1	15,045	50
Service Charge + Block 1 + Block 2	9,517	31
Total	30,360	100%

The potential customer impacts under each option are assessed by determining the *annual amount the average customer in each customer class would pay in 2019 for both water and wastewater compared to 2018.* The average customers are defined as follows:

- ***Small Residential*** - with a 15mm water meter and average annual consumption of 120 m³ per year.
- ***Average Residential*** - with a 15mm water meter and average annual consumption of 204 m³ per year.
- ***Residential Small Apartments*** - with a 25mm water meter and average annual consumption of 1,060 m³ per year.
- ***Small Commercial & Industrial*** - with a 40mm water meter and average annual consumption of 1,215 m³ per year.
- ***Large Commercial & Industrial*** - with a 50 mm water meter and average annual consumption of 8,227 m³ per year.
- ***Largest Commercial & Industrial*** - with a 50 mm water meter and average annual consumption of 192,000 m³ per year.

The average Large Commercial and Industrial customer is determined by the most common meter size and the average consumption for that meter size. Table 7-10 illustrates the 2019 annual cost to the average customer in each customer class and percentage increase compared to 2018 under the three (3) rate structure options. *It is important to note that the change in cost in 2019 is a one-time adjustment to reflect the change in rate structure and full cost recovery*. Option 1 is projected to have a relatively consistent cost impact to all customer classes i.e. 7.00%-7.51% in 2019. Option 2 is projected to have a much greater cost impact on the residential sector (26.19% for residential small and 13.47 % for average residential customers) than on the non-residential sector. Large commercial and industrial customers

would benefit from reductions of 3.75% to 5.98%. Option 3 is projected to result in reductions to the small and average residential customers (approximately 6.41% and 3.64% respectively) but would result in major increase to the other large customer classes ranging from approximately 20.87% to 32.48% for the Residential Small Apartments and Non-Residential Customers. These are significant increases that would require more specific consultation with the impacted customer classes prior to considering implementation. *Under all three (3) options the annual increases beyond 2019 would be approximately 3%-5% for all customer classes i.e. after the 2019 increase and rate structure changes are made and become the new baseline.*

Table 7-10: Annual 2019 vs. 2018 Costs to Customers

Description	2018	Option 1 (2019)	Option 2 (2019)	Option 3 (2019)
Small Residential - Single Family Homes Meter Size - 15 mm (Equivalency Unit - 1.00) Average Consumption - 120 m³/year				
Annual Increase to Total Bill (%)		7%	26%	-6%
Annual Increase to Total Bill ($)		$37.58	$140.59	-$34.43
Annual Bill ($)	$536.76	$574.34	$677.35	$502.33
Average Residential - Single Family Homes Meter Size - 15 mm (Equivalency Unit - 1.00) Average Consumption - 204 m³/year				
Annual Increase to Total Bill (%)		7%	13%	-4%
Annual Increase to Total Bill ($)		$63.82	$119.34	-$32.23
Annual Bill ($)	$886.20	$950.02	$1,005.54	$853.97
Residential - Small Apartments Meter Size - 25 mm (Equivalency Unit - 2.02) Average Consumption - 1060 m³/year				
Annual Increase to Total Bill (%)		7%	2%	23%
Annual Increase to Total Bill ($)		$331.25	$77.06	$1,026.87
Annual Bill ($)	$4,485.44	$4,816.69	$4,562.50	$5,512.31
Small Commercial and Industrial Meter Size - 40 mm (Equivalency Unit - 3.69) Average Consumption - 1215 m³/year				
Annual Increase to Total Bill (%)		7%	6%	32%

Description	2018	Option 1 (2019)	Option 2 (2019)	Option 3 (2019)
Annual Increase to Total Bill ($)		$379.83	$324.03	$1,686.48
Annual Bill ($)	$5,193.12	$5,572.95	$5,517.15	$6,879.60
Large Commercial and Industrial Meter Size - 50 mm (Equivalency Unit - 4.62) Average Consumption - 8,227 m³/year				
Annual Increase to Total Bill (%)		7%	-4%	23%
Annual Increase to Total Bill ($)		$2,569.61	-$1,289.84	$8,032.85
Annual Bill ($)	$34,396.72	$36,966.34	$33,106.89	$42,429.57
Largest Commercial and Industrial Meter Size - 50 mm (Equivalency Unit - 4.62) Average Consumption - 192,000 m³/year				
Annual Increase to Total Bill (%)		8%	-6%	21%
Annual Increase to Total Bill ($)		$59,960.30	-$47,768.29	$166,689.39
Annual Bill ($)	$798,893.76	$858,854.06	$751,125.47	$965,583.15

Table 7-11 summarizes the customer impacts under each option and compares the potential impacts under Options 2 and 3 to Option 1 i.e. the base option.

Table 7-11: Annual 2019 vs. 2018 Costs to Customers

Customer Type	Customer Impacts (2019 Compared to 2018)		
	Option 1 Current Rate Structure	Option 2 15% Revenue from Service Charges	Option 3 Inclining Block
Small Residential Single Family Homes 120 m³ per year	• Annual cost would increase by $37.58 (7.00%) or $3.13 per month in 2019 • Rate increases beyond 2019 are an average of 3% per year	• Annual cost would increase by $140.59 (26.19%) or $11.72 per month in 2019 • In 2019 customers would pay approximately $8.58 more per month compared to Option 1 • Rate increases beyond 2019 are an average of 3% per year	• Annual cost would decrease by $34.43 (6.41%) or $2.87 per month in 2019 • In 2019 customers would pay approximately $6.00 less per month compared to Option 1 • Rate increases beyond 2019 are an average of 3% per year
Average Residential Single Family Homes 204 m³ per year	• Annual cost would increase by $63.82 (7.20%) or $5.32 per month in 2019 • Rate increases beyond 2019 are an average of	• Annual cost would increase by $119.34 (13.47%) or $9.95 per month in 2019 • In 2019 customers would pay approximately $4.63 more per month compared to Option 1	• Annual cost would decrease by $32.23 (3.64%) or $2.69 per month in 2019 • In 2019 customers would pay approximately $8.00 less per month compared to Option 1

Customer Type	Customer Impacts (2019 Compared to 2018)		
	Option 1 **Current Rate Structure**	**Option 2** **15% Revenue from Service Charges**	**Option 3** **Inclining Block**
	3% per year	• Rate increases beyond 2019 are an average of 3% per year	• Rate increases beyond 2019 are an average of 3% per year
Residential Small Apts. 1,060 m³ per year	• Annual cost would increase by $331.25 (7.38%) or $27.60 per month in 2019 • Rate increases beyond 2019 are an average of 3% per year	• Annual cost would increase by $77.06 (1.72%) or $6.42 per month in 2019 • In 2019 customers would pay approximately $21.18 less per month compared to Option 1 • Rate increases beyond 2019 are an average of 3% per year	• Annual cost would increase by $1,026.87 (22.89%) or $85.57 per month in 2019 • In 2019 customers would pay approximately $57.97 more per month compared to Option 1 • Rate increases beyond 2019 are an average of 3% per year
Small Commercial & Industrial 1,215 m³ per year	• Annual cost would increase by $379.83 (7.31%) or $31.65 per month in 2019 • Rate increases beyond 2019 are an average of 3% per year	• Annual cost would increase by $324.03 (6.24%) or $27.00 per month in 2019 • In 2019 customers would pay approximately $4.65 less per month compared to Option 1 • Increases beyond 2019 average of 3% per year	• Annual cost would increase by $1,686.48 (32.48%) or $140.54 per month in 2019 • In 2019 customers would pay approximately $108.89 more per month compared to Option 1 • Increases beyond 2019 are an average of 3% per year
Large Commercial & Industrial 8,227 m³ per year	• Annual cost would increase by $2,569.61 (7.47%) or $214.13 per month in 2019 • Rate increases beyond 2019 are an average of 3% per year	• Annual cost would decrease by $1,289.84 (3.75%) or $107.49 per month in 2019 • In 2019 customers would pay approximately $321.62 less per month compared to Option 1 • Rate increases beyond 2019 are an average of 3% per year	• Annual cost would increase by $8,032.85 (23.35%) or $669.40 per month in 2019 • In 2019 customers would pay approximately $455.27 more per month compared to Option 1 • Rate increases beyond 2019 are an average of 3% per year
Largest Commercial & Industrial 192,000 m³ per year	• Annual cost would increase by $59,960.30 (7.51%) or $4,996.69 per month in 2019 • Rate increases beyond 2019 are an average of 3% per year	• Annual cost would decrease by $47,768.29 (5.98%) or $3,980.69per month in 2019 • In 2019 customers would pay approximately $8,977.38 less per month compared to Option 1 • Rate increases beyond 2019 are an average of 3% per year	• Annual cost would increase by $166,689.39 (20.87%) or $13,890.78 per month in 2019 • In 2019 customers would pay approximately $8,894.09 more per month compared to Option 1 • Rate increases beyond 2019 are an average of 3% per year

7.3.5 Options Analysis & Preferred Option

A qualitative assessment of how well each option aligns with the Guiding Principles in Section 3.1 is presented in this Section. Table 7-12 shows the results using full or partial circles. Full

alignment with the respective guiding principle is depicted by a full circle, some alignment by a partial circle and no alignment by no circle.

Table 7-12: Qualitative Analysis of Rate Options

Guiding Principles	Option 1	Option 2	Option 3
Full Cost Recovery			
Revenue Stability			
User Pay			
Fairness and Equity			
Uniform Rate Structure			
Water Conservation			
Capital Financing			
Ease of Administration			
Affordability			

Full Cost Recovery

- All options are designed to recover the full costs of managing the water and sanitary sewer systems over the study period.

Revenue Stability

- None of the three (3) options have fixed charge structures that fully align with the cost structures for water and sanitary sewer but they all provide a portion of revenues through the fixed charges.
- Option 1 offers the least revenue stability as only 6% of water revenues and 0% of the sanitary sewer revenues would be guaranteed. This is especially important given that the majority of costs to manage the water and sanitary sewer systems are for the most part fixed.
- Under Option 3 a larger portion of revenue (25% -27%) would be recovered from the service charges. However there is added revenue instability because the higher revenues expected from Block 2 at the higher rate may not materialize as some

customers conserve and reduce consumption within that block or have all their consumption fall within Block 1 at the lower rate. This would result in a reduction of total revenue notwithstanding the portion that is guaranteed from the Service Charges. There is also the risk of losing one or more high volume users and the revenues generated from those customers. The revenue loss would have to be recovered from the low volume users.

- Option 2offers the best revenue stability of the three (3) options with 15% from the fixed charges and does not have the added revenue risks associated with Option 3 regarding Block 2 revenues.

User Pay

- The concept of user pay is based on the philosophy that those who use more water should pay more. Under all three (3) options customers would pay more if their consumption increases as they all have a consumption rate component. However Option 3 aligns the best with this principle due to the higher rate charged for Block 2

Fairness and Reasonableness

- All options promote fairness and equity as the service charges plus a consumption charge is a reasonably fair approach to cost recovery to both the City as the owner/operator and the customers. This is the structure that is most common across Ontario.
- Each class of customers is exposed to the same ratios in the calculation of their service charges regardless of the rate structure option.
- All customers would pay the same consumption rate that applies under each option i.e. the customers are exposed to the same consumption rate regardless of customer class. However, customers that consume high volumes because of their business practices may not be able to realistically reduce their consumption to benefit from the lower Block 1 rate under Option 3. This may be considered to be unfair to these customers because they may be unable to reduce their consumption. The cost increase to the non-residential sector (estimated to be 31% of the customers) is expected to be in the range of 20% to 32%. This is significant even at a relatively low price premium of 1.2 times the Block 1 rate and could have adverse effects on attracting or retaining business within the City.
- Under Option 1, from a high level equity perspective, the residential and non-residential sectors would pay their fair share. Residential customers consume approximately 55% of the water and contribute 55% of the annual revenue, while the ICI consumers account for the remaining 45% of consumption and revenues. This is because the amount paid varies almost directly with consumption due to the low fixed charges. Under Option 2 the residential sector would pay approximately 5% more than they

consume while the non-residential sector would pay 5% less. The reverse is true under Option 3 where the non-residential sector would pay approximately 5% more than they consume. Therefore Option 1 is a fair and reasonable rate structure.

Uniform Rate Structure

- Options 1 and 2 have a uniform rate whereas Option 3 has inclining block rates. However, Option 3 partially meets this principle because it addresses Council's request to investigate an inclining block option.

Water Conservation

- All options promote water conservation as a significant proportion of the overall revenue would be derived from consumption. Option 3 provides the greatest incentive to reduce consumption due to the inclining block. However Options 1 and 2 offer a reasonable incentive for customers to reduce consumption with 85% to 94% of revenues from consumption for Options 2and 1 respectively.

Capital Financing

- All options are based on a combination of reserve and debt financing for capital projects based on the feedback received from Council via the workshop. Debt financing was incorporated to assist with addressing the water capital backlog over the next 20 years.

Easy to of Administration

- Option 1 is the easiest to administer because it is the existing rate structure. Option 2 will require some modifications to establish a service charge for sanitary sewer. Option 3 will have the greatest impact on administration due to the complexity of managing the information and billing requirements and the added cost to implement and administer.

Affordability

- Eligible customers stand to benefit from the affordability program when it is established regardless of the rate structure option.

Summary

Based on a qualitative review, all options would provide the level of funding to be fully sustainable over the long-term. Although Option 3 is best for water conservation and user pay it has significant disadvantages including:

- Revenue uncertainty resulting from conservation due to the higher Block 2 rate;

- Potentially high impacts (20% to 32% increases) to the non-residential customers that may affect the attraction and retention of business. These levels of increases are significant and would require further dialogue with the business community and volume data analysis prior to confirming the thresholds for each block and the factor to be used for setting the Block 2 rate; and
- The risk of shifting a much larger portion of costs to the residential sector should business customers relocate or discontinue operations.

Option 2 offers the most predictable revenues and would ensure that at least 15% of the annual water revenues would be guaranteed while providing sufficient incentive for customers to conserve. Therefore Option 2 would be best strictly from a revenue stability perspective.

Option 1 (existing rate structure) seems to be the best based on fairness and reasonableness. Its major disadvantage is the low level of revenue stability as only a marginal amount of the annual revenue is collected via fixed fees. This lack of revenue stability would be offset to some extent by the introduction of the rate stabilization reserves. Therefore Option 1 could be remain a viable option moving forward should Council not wish to proceed with Option 2 due to the relatively large impact to the small and average residential customers in 2019 compared to 2018.

8 O.Reg 453/07 Water System Financial Plan No. 112-301

Regulation 188/07 under the Safe Drinking Water Act requires Ontario municipalities to apply for and obtain Drinking Water System Licences as part of their overall DWQMS. One of the requirements of holding a valid drinking water licence is preparing and submitting to the Province an updated financial plan in accordance with O.Reg. 453/07. The financial plan must include financial statements on the following:

- The proposed or projected financial position of the drinking water systems;
- The proposed or projected gross cash receipts and gross cash payments;
- The proposed or projected financial operations of the drinking water system; and
- Details on the extent to which the above information applies to the replacement of lead service pipes, if applicable.

Appendix H lists each requirement of the regulation and references the respective financial statements and other relevant information required under each regulatory requirement. The financial plan must apply to a period of at least six (6) years with the first year being the year the existing license expires. In the City's case an updated Water System Financial Plan No.112-301 is required for the period 2016 to 2021. This plan is based on the results of the rate study. Upon Council's approval the financial plan would be made available to the public at no charge and posted on the City's website. It will also be submitted to the Province as part of the City's drinking water license renewal application. The license renewal application deadline is June 1, 2016.

8.1 Tangible Capital Assets (TCA) Analysis

The results of the rate study contained in this report are used as the basis for preparing the water system financial plan. The City's Tangible Capital Asset inventories were also used in the preparation of the water system financial plan. The amortization of the tangible capital assets is shown as a "non-cash" annual cost that reflects the annual "use" of assets until the end of their respective useful lives. Allowances are made to finance the replacement and/ or rehabilitation of the existing assets once they "expire" and can no longer play a role in providing the required drinking water service to customers. It should be noted however that since amortization is based on the original (historical) cost at the time the asset was placed in service it does not account for inflation since the year of installation. Therefore, basing asset replacement costs on amortization alone is not sufficient to cover the future replacement needs.

The TCA projections contained in the City's water financial plan are based on the following assumptions:

- Amortization of existing assets is based on the City's Tangible Capital Assets Policies and Procedures. Amortization of new infrastructure investments is based on straight line depreciation with full year depreciation charged in the year of acquisition;
- Historical costs, life expectancy and remaining useful life are as identified in the TCA data provided by the City;
- Fully depreciated assets continue to be used in service i.e. no asset removals; and
- New assets to be acquired are based on the capital forecast presented. The forecast includes projects in the City's Capital Budget Forecast and asset replacement projections based on the City's Asset Management Plan.

Asset Value

The water system is comprised of the following capital asset classes:

- Water Mains;
- Hydrants; and
- Valves

Table 8-1 shows the current capital asset value based on historical cost and accumulated amortization to 2015. This is reflected as the net book value (NBV) i.e. the "accounting" value, and indicates that the water system as a whole is approximately 30% depreciated or has approximately 70% remaining life based on the TCA data. This suggests that the water system assets are relatively new.

Table 8-1: Asset Amortization and 2015 Net Book Value (NBV)

2015 Water Asset Details		
Historical Cost	$93,412,072	100%
Accumulated Amortization	$27,992,677	30%
Net Book Value (2015)	$65,419,394	70%

8.2 Financial Statements

This financial plan involves the review, analysis and assessment of financial information contained in the rate study including costs, revenues, debt, cash transactions and Tangible Capital Assets (TCA) to prepare the following three (3) financial statements covering the period 2016 - 2021 as required under O.Reg 453/07:

- Statement of Financial Position;
- Statement of Operations; and
- Statement of Cash Flow.

8.2.1 Statement of Financial Position

The Statement of Financial Position is presented in Table 8-2. This statement summarizes the City's water-related financial and non-financial assets i.e. Tangible Capital Assets (TCA) and liabilities, and provides the net financial asset (or net debt) position and accumulated surplus related to managing the water system. The financial assets are primarily cash balances in the water reserves and reserve funds. Liabilities consist of development charge reserve fund balances (i.e. deferred revenues) and long-term debt. The non-financial assets (TCA) include the City's water infrastructure. The historical costs are amortized over the asset life to arrive at the net book value each year from 2016 to 2021. New assets are added in the years acquired, developed or built. Contributed assets are primarily new infrastructure and facilities that would be transferred to the City's ownership and control by developers as they are completed. However this is assumed to be zero. It is also assumed that other non-financial assets such as inventory and prepaid expenses are zero.

Contained within the Statement of Financial Position are important indicators, the first being net financial assets (or net debt) which is defined as the difference between financial assets and liabilities. This indicator provides a measure of the water system's "future revenue requirement". Another important indicator in the Statement of Financial Position is the accumulated surplus. This indicator provides a measure of the resources available to the City for managing its water system. The accumulated surplus is projected to increase from approximately $72.6 million in 2016 to approximately $86.3 million by 2021. The accumulated surplus consists of the net financial assets that are available to fund future operations, plus the non-financial assets that are made up of net TCA balance representing past investments in water infrastructure. It is important to note that the non-financial assets (TCA) cannot be readily monetized without affecting the delivery of water operations.

Table 8-2 indicates that in 2016, the City's water system will be in a net financial asset position of $4.2 million. This will be reduced to a net financial asset position of $2.5 million by 2021. The net financial asset position indicates that financial resources will be available to fund future operations. The reduced net financial assets is due to a combination of a increase in the cash position that is more than offset by an increase in liabilities, with increases in deferred revenue balances and the introduction of debt in 2019.

The next important indicator contained in the Statement of Financial Position is the net book value of TCA. Another important indicator in the Statement of Financial Position is the accumulated surplus. This indicator provides a measure of the resources available to the City for managing its water system. The accumulated surplus is projected to increase from approximately $72.6 million in 2016 to approximately $86.3 million by 2021. The accumulated surplus consists of the net financial assets that are available to fund future operations, plus the non-financial assets that are made up of net TCA balance representing past investments in water infrastructure. It is important to note that the non-financial assets (TCA) cannot be readily monetized without affecting the delivery of water operations.

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Table 8-2 shows that net TCA are expected to grow by $15.4 million over the forecast period, or from $68.4 million in 2016 to $83.8 million 2021. This indicates that the City has plans to invest in significant tangible capital assets in excess of the consumption of existing assets. Further, a consumption ratio consisting of the accumulated amortization of the City's TCA as a percent of historical cost ratio highlights the aged condition of the assets and their potential replacement needs. The City's Water Asset Consumption Ratio actually declines over the forecast period from 30% to 28%, as newly acquired or constructed assets would more than offset the consumption of existing assets.

Another important indicator in the Statement of Financial Position is the accumulated surplus. This indicator provides a measure of the resources available to the City for managing its water system. The accumulated surplus is projected to increase from approximately $72.6 million in 2016 to approximately $86.3 million by 2021. The accumulated surplus consists of the net financial assets that are available to fund future operations, plus the non-financial assets that are made up of net TCA balance representing past investments in water infrastructure. It is important to note that the non-financial assets (TCA) cannot be readily monetized without affecting the delivery of water operations.

Table 8-2: Statement of Financial Position

Statement of Financial Position	2016	2017	2018	2019	2020	2021
Financial Assets						
Cash,Receivables and Investment	$6,767,426	$6,080,033	$6,563,808	$7,004,435	$6,711,995	$7,206,337
Total Financial Assets	**$6,767,426**	**$6,080,033**	**$6,563,808**	**$7,004,435**	**$6,711,995**	**$7,206,337**
Financial Liabilities						
Accounts Payable & Deferred Revenue	$2,068,633	$1,525,462	$1,732,356	$2,364,790	$2,872,351	$3,366,692
Long-term Liabilities	$534,197	$481,614	$427,454	$858,621	$1,169,636	$1,380,142
Total Financial Liabilities	**$2,602,831**	**$2,007,076**	**$2,159,810**	**$3,223,411**	**$4,041,987**	**$4,746,835**
Net Financial Assets (Net Debt)	**$4,164,595**	**$4,072,958**	**$4,403,999**	**$3,781,024**	**$2,670,009**	**$2,459,502**
Non-Financial Assests						
Tangible Capital Assets	$97,235,501	$101,396,201	$104,426,305	$108,247,701	$112,142,203	$116,085,079
Accumulated Amortization	**($28,800,415)**	**($29,534,931)**	**($30,410,031)**	**($31,003,111)**	**($31,622,734)**	**($32,265,603)**
Total Non-Financial Assets	**$68,435,086**	**$71,861,270**	**$74,016,275**	**$77,244,590**	**$80,519,469**	**$83,819,476**
Accumulated Surplus	**$72,599,681**	**$75,934,228**	**$78,420,273**	**$81,025,614**	**$83,189,478**	**$86,278,979**

Financial Indicators	2016	2017	2018	2019	2020	2021
Increase (Decrease) in Net Financial Assets	$392,962	($91,637)	$331,041	($622,974)	($1,111,016)	($210,506)
Increase (Decrease) in Net Tangible Capital Assets	$3,015,692	$3,426,184	$2,155,004	$3,228,316	$3,274,879	$3,300,007
Increase (Decrease) in Accumulated Surplus	$3,408,654	$3,334,547	$2,486,045	$2,605,341	$2,163,864	$3,089,501
Water Asset Consumption Ratio	30%	29%	29%	29%	28%	28%

8.2.2 Statement of Operations

The Statement of Operations is presented in Table 8-3. It summarizes the annual revenues and expenses associated with managing the City's water system. It provides a report on the transactions and events that have an influence on the accumulated surplus. The main revenue items included are:

- Revenues from Water Rates and Charges ;
- Earned Revenues (earned development charges); and
- Other Revenues (miscellaneous fees and charges, recoveries, etc)

The main expense items are:

- The annual cost of operating and maintaining the water system, including the cost of water purchases from the Region; and
- Amortization expenses on existing and added TCA.

The operating surplus (or deficit) is an important indicator contained in the Statement of Operations. An operating surplus (deficit) measures whether operating revenues generated in a year were sufficient to cover operating expenses incurred in that year. It is important to note that an annual surplus is necessary to ensure funds will be available to address non-expense items such as TCA acquisitions over and above amortization expenses, reserve/reserve fund contributions for asset replacement and rate stabilization, and repayment of outstanding debt principal. A ratio of operating surplus to total revenue is shown in Table 8-3 to reflect the percent of total revenue that can be allocated to funding the non-expense items noted above.

This ratio decreases from 15% in 2016 to 12% in 2021. The higher the ratio the greater proportion of operating revenues that are available for paying down debt, purchasing capital assets and setting aside in reserve for future use. Cash generated from operations is discussed in the Statement of Cash Flows section.

Table 8-3: Statement of Operations

Statement of Operations	2016	2017	2018	2019	2020	2021
Water Revenue						
User Revenue	$19,471,007	$20,143,317	$20,623,089	$21,822,413	$23,024,080	$24,610,398
Earned Revenue	$1,763,719	$1,649,661	$859,546	$490,371	$497,236	$504,197
Other Revenue	$1,437,931	$1,445,213	$1,452,652	$1,463,926	$475,536	$487,492
Total Revenues	**$22,672,657**	**$23,238,191**	**$22,935,287**	**$23,776,710**	**$23,996,852**	**$25,602,087**
Water Expenses						
Gross	$5,466,741	$5,569,487	$5,679,838	$5,902,122	$6,034,310	$6,171,363
Water Purchased from Region	$12,404,140	$12,875,909	$13,262,328	$13,703,114	$14,157,651	$14,635,550
Operating Expenses	**$17,870,881**	**$18,445,396**	**$18,942,166**	**$19,605,236**	**$20,191,961**	**$20,806,913**
Interest on Debt	$0	$0	$0	$0	$25,759	$35,089
Amortization	1,393,123	1,458,248	1,507,076	1,566,133	1,615,269	1,670,585
Total Expenses	$19,264,004	$19,903,645	$20,449,242	$21,171,369	$21,832,989	$22,512,586
Annual Surplus/(Deficit)	**$3,408,654**	**$3,334,547**	**$2,486,045**	**$2,605,341**	**$2,163,864**	**$3,089,501**
Accumulated Surplus/(Deficit), Beginning of Year	$69,191,027	$72,599,681	$75,934,228	$78,420,273	$81,025,614	$83,189,478
Accumulated Surplus/ (Deficit), End of Year	**$72,599,681**	**$75,934,228**	**$78,420,273**	**$81,025,614**	**$83,189,478**	**$86,278,978**

Financial Indicators	2016	2017	2018	2019	2020	2021
Increase (Decrease) in Total Revenues	($580,510)	$565,534	($302,904)	$841,422	$220,142	$1,605,235
Increase (Decrease) in Total Expenses	$879,750	$639,641	$545,597	$722,127	$661,620	$679,598
Increase (Decrease) in Annual Surplus	($1,460,260)	($74,107)	($848,501)	$119,296	($441,478)	$925,637
Operating Surplus Ratio	15%	14%	11%	11%	9%	12%

8.2.3 Statement of Cash Flow

The Statement of Cash Flow is presented in Table 8-4. This statement summarizes the main cash inflows and outflows related to the water system in four (4) main areas - operating, capital, investing and financing, and shows the annual changes in cash.

The operating cash transactions begin with the surplus or deficit identified in the Statement of Operations. This figure is adjusted to add or subtract non-cash items that were included as revenues or expenses (e.g. amortization expenses). It is assumed that there are no "investing activities" over the period. The capital section indicates the amounts to be spent to acquire capital assets (TCA) or to be received from the sale of assets. In the City's case, it is assumed that there are no assets to be sold to generate cash. The financing section identifies the funds to be received from development charges receipts, Provincial/Federal Grants and proceeds from the issuance of debenture as cash inflows, and the portion of debt repaid as cash outflows. No grant funding is projected over the forecast period.

Table 8-4 indicates that cash is generated from operations, which is used in funding the acquisition of TCA and towards building internal reserves. The City's cash position is projected to increase over the forecast period from $6.7 million in 2016 to $7.2 million in 2021.

Table 8-4: Statement of Cash Flow

Statement of Cashflows	2016	2017	2018	2019	2020	2021
Cash Provided by:						
Operating Activities						
Annual Surplus/(Deficit)	$3,408,654	$3,334,547	$2,486,045	$2,605,341	$2,163,864	$3,089,501
Non-Cash Items						
Amortization	$1,393,123	$1,458,248	$1,507,076	$1,566,133	$1,615,269	$1,670,585
Earned Revenue	($1,763,719)	($1,649,661)	($859,546)	($490,371)	($497,236)	($504,197)
Net Change in Cash Provided by Operating Activities	**$3,038,057**	**$3,143,134**	**$3,133,575**	**$3,681,103**	**$3,281,896**	**$4,255,888**
Capital Activities						
Purchase of TCA	($4,408,815)	($4,884,432)	($3,662,081)	($4,794,449)	($4,890,148)	($4,970,592)
Net Change in Cash Used in Capital Activities	**($4,408,815)**	**($4,884,432)**	**($3,662,081)**	**($4,794,449)**	**($4,890,148)**	**($4,970,592)**
Financing Activities						
DC Collections	$1,088,065	$1,106,489	$1,066,441	$1,122,805	$1,004,797	$998,539
Provincial/Federal Grants	$0	$0	$0	$0	$0	$0
Proceeds From Long-Term Debt	$0	$0	$0	$486,953	$410,951	$349,288
Repayment of Long-Term Debt	($51,052)	($52,583)	($54,161)	($55,785)	($99,936)	($138,782)
Net Change in Cash Used in Financing Activities	**$1,037,013**	**$1,053,906**	**$1,012,280**	**$1,553,972**	**$1,315,812**	**$1,209,045**
Net Change in Cash and Cash Equivalents	**($333,744)**	**($687,392)**	**$483,775**	**$440,627**	**($292,440)**	**$494,342**
Cash and Cash Equivalents, Beginning of the Year	$7,101,170	$6,767,426	$6,080,033	$6,563,808	$7,004,435	$6,711,995
Cash and Cash Equivalents, End of the Year	**$6,767,426**	**$6,080,033**	**$6,563,808**	**$7,004,435**	**$6,711,995**	**$7,206,337**

8.2.4 Lead Service Pipe Removal

The financial plan is also required to detail the extent to which the information described above relates directly to the replacement of lead service pipes.

The City of Waterloo 2016-2025 Capital Budget outlines the proposed rehabilitation and reconstruction projects for the next 10 years. Lead services are replaced as part of watermain rehabilitation projects and/or road reconstruction projects when undertaken. Although not all the streets contain lead services, all of the water services to the property line are replaced for every rehabilitation and reconstruction project.

Lead services are also replaced individually when they are found in the field or if requested by the owner, if the full rehabilitation project and reconstruction project has not been identified in the capital forecast, and if the new service can be connected to the customer side.

9 Sanitary Sewer System Financial Plan

Preparing a Sanitary Sewer System Financial Plan is not mandatory but has become a municipal best practice over the past few years. It is typically prepared in accordance with the requirements of O.Reg 453/07 which applies to water systems.

This financial plan involves the review, analysis and assessment of financial information contained in the rate study including costs, revenues, debt, cash transactions and Tangible Capital Assets (TCA) to prepare the following three (3) financial statements covering the period 2016 to 2021 as required under O.Reg. 453/07:

- Statement of Financial Position;
- Statement of Operations; and
- Statement of Cash Flow.

Appendix H lists each requirement of the regulation and references the respective financial statements and other items that contain relevant information required under each item. The financial plan applies to a period of (6) six years from 2016 to 2021 to be consistent with the period covered by the Water System Financial Plan. It is anticipated that the financial plan would be made available to the public at no charge on the City's website following final approval of the rate study and financial plan by Council.

9.1 Tangible Capital Assets (TCA) Analysis

The results of the rate study contained in this report are used as the basis for preparing the wastewater system financial plan. The City's Asset Inventories were also used in the preparation of the wastewater system financial plan. The amortization of the tangible capital assets is shown as a "non-cash" annual cost that reflects the annual "use" of assets until the end of their respective useful lives. Allowances are made to finance the replacement and/ or rehabilitation of the existing assets once they "expire" and can no longer play a role in providing the required wastewater service to customers. However, it should be noted that since amortization is based on the original (historical) cost at the time the asset was placed in service it does not account for inflation since the year of installation. Therefore, basing asset replacement costs on amortization alone is not sufficient to cover the future replacement needs.

The TCA projections contained in the City's wastewater financial plan are based on the following assumptions:

- Amortization of existing assets is based on the City's Tangible Capital Assets policies and procedures. Amortization of new infrastructure investments is based on straight line depreciation with full year depreciation charged in the year of acquisition;

- Historical costs, life expectancy and remaining useful life as per the TCA data provided by the City;
- Fully depreciated assets continue to be used in service i.e. no asset removals; and
- New assets to be acquired are based on the capital forecast. The forecast includes projects in the City's Capital Budget Forecast and asset replacement projections based on the City's Asset Management Plan.

Asset Value

The wastewater system is comprised of the following capital asset classes:

- Sanitary Sewer Gravity Mains;
- Sanitary Sewer Forcemains;
- Manholes; and
- Pumping Stations.

Table 9-1 shows the current capital asset value based on historical cost and accumulated amortization to 2015. This is reflected as the net book value (NBV) i.e. the "accounting" value, and indicates that the wastewater system as a whole is approximately 29% depreciated or has approximately 71% remaining life based on the TCA data. This suggests that the wastewater system assets are relatively new.

Table 9-1: Asset Amortization and 2015 Net Book Value (NBV)

2015 Sanitary Sewer Asset Details		
Historical Cost	$135,873,861	29%
Accumulated Amortization	$39,335,177	71%
Net Book Value (2015)	$96,538,684	100%

9.2 Statement of Financial Position

The Statement of Financial Position is presented in Table 9-2. This statement summarizes the City's sanitary sewer related financial and non-financial assets (Tangible Capital Assets – TCA) and liabilities, and provides the net financial asset/ (net debt) position and accumulated surplus related to managing the sanitary sewer system. The financial assets are primarily cash balances in the sanitary sewer reserves and reserve funds. Liabilities consist of development charge reserve fund balances (i.e. deferred revenues). The City does not have any outstanding long-term debt for the City's sanitary sewer system.The non-financial assets (TCA) include the City's sanitary sewer infrastructure. The historical costs are amortized over the asset life to arrive at the net book value each year from 2016 to 2021. New assets are added in the years acquired, developed or built. Contributed assets are primarily new infrastructure that would be transferred to the City's ownership and control by developers as they are completed. However

asset/ (net debt) position and accumulated surplus related to managing the sanitary sewer system. The financial assets are primarily cash balances in the sanitary sewer reserves and reserve funds. Liabilities consist of development charge reserve fund balances (i.e. deferred revenues). The City does not have any outstanding long-term debt for the City's sanitary sewer system.The non-financial assets (TCA) include the City's sanitary sewer infrastructure. The historical costs are amortized over the asset life to arrive at the net book value each year from 2016 to 2021. New assets are added in the years acquired, developed or built. Contributed assets are primarily new infrastructure that would be transferred to the City's ownership and control by developers as they are completed. However this is assumed to be zero. It is also assumed that other non-financial assets such as inventory and prepaid expenses are zero.

Contained within the Statement of Financial Position are important indicators, the first being net financial assets (or net debt) which is defined as the difference between financial assets and liabilities. This indicator provides a measure of the sanitary sewer system's "future revenue requirement". Another important indicator in the Statement of Financial Position is the accumulated surplus. This indicator provides measure of the resources available to the City for managing its system. The accumulated surplus is projected to increase from approximately $113.9 million in 2016 to approximately $126.5 million by 2021. The accumulated surplus is made up of the net TCA balance representing past investments in the sanitary sewer infrastructure and net financial assets. It is important to note that the non-financial assets (TCA) cannot be readily monetized without affecting the sanitary sewer operations.

Table 9-2 indicates that in 2016, the City's sanitary sewer system will be in a net financial asset position in the amount of $12.8 million. This will be increased to a net financial asset position of $14.1 million by 2021. The net financial asset position indicates that financial resources will be available to fund future operations. The increased net financial assets position is due to a combination of an increase in the cash position that is offset by increases in liabilities, mainly through an increase in a deferred revenue balance. The next important indicator contained in the Statement of Financial Position is the net book value of TCA. Another important indicator in the Statement of Financial Position is the accumulated surplus. This indicator provides measure of the resources available to the City for managing its system. The accumulated surplus is projected to increase from approximately $113.9 million in 2016 to approximately $126.5 million by 2021. The accumulated surplus is made up of the net TCA balance representing past investments in the sanitary sewer infrastructure and net financial assets. It is important to note that the non-financial assets (TCA) cannot be readily monetized without affecting the sanitary sewer operations.

Table 9-2 shows that net TCA are expected to grow by $11.3 million over the forecast period, or from $101.0 million in 2016 to $112.3 million 2021. This indicates that the City has plans to invest significant dollars in tangible capital assets in excess of the consumption of existing assets. Further, a consumption ratio consisting of the accumulated amortization of the City's TCA as a percent of historical cost ratio highlights the aged condition of the assets and their potential replacement needs. The City's Sanitary Sewer Asset Consumption Ratio remains fairly

stable over the forecast period, ranging from 29% - 30% as newly acquired or constructed assets essentially offset the consumption of existing assets.

Another important indicator in the Statement of Financial Position is the accumulated surplus. This indicator provides measure of the resources available to the City for managing its system. The accumulated surplus is projected to increase from approximately $113.9 million in 2016 to approximately $126.5 million by 2021. The accumulated surplus is made up of the net TCA balance representing past investments in the sanitary sewer infrastructure and net financial assets. It is important to note that the non-financial assets (TCA) cannot be readily monetized without affecting the sanitary sewer operations.

Table 9-2: Statement of Financial Position

Statement of Financial Position	2016	2017	2018	2019	2020	2021
Financial Assets						
Cash,Receivables and Investment	$13,731,061	$13,895,204	$12,164,873	$13,378,657	$16,515,184	$18,166,448
Total Financial Assets	**$13,731,061**	**$13,895,204**	**$12,164,873**	**$13,378,657**	**$16,515,184**	**$18,166,448**
Financial Liabilities						
Accounts Payable & Deferred Revenue	$894,210	$883,620	$513,420	$233,149	$1,760,764	$3,968,923
Long-term Liabilities	$0	$0	$0	$0	$0	$0
Total Financial Liabilities	**$894,210**	**$883,620**	**$513,420**	**$233,149**	**$1,760,764**	**$3,968,923**
Net Financial Assets (Net Debt)	**$12,836,851**	**$13,011,585**	**$11,651,453**	**$13,145,508**	**$14,754,420**	**$14,197,524**
Non-Financial Assests						
Tangible Capital Assets	$141,770,533	$145,955,938	$151,059,146	$154,957,662	$157,415,679	$160,653,548
Accumulated Amortization	($40,756,475)	($42,198,525)	($43,520,590)	($45,264,718)	($46,892,049)	($48,329,678)
Total Non-Financial Assets	**$101,014,058**	**$103,757,414**	**$107,538,555**	**$109,692,943**	**$110,523,630**	**$112,323,870**
Accumulated Surplus	**$113,850,909**	**$116,768,999**	**$119,190,008**	**$122,838,451**	**$125,278,050**	**$126,521,394**

Financial Indicators	2016	2017	2018	2019	2020	2021
Increase (Decrease) in Net Financial Assets	$966,414	$174,733	($1,360,132)	$1,494,055	$1,608,912	($556,895)
Increase (Decrease) in Net Tangible Capital Assets	$4,475,375	$2,743,356	$3,781,142	$2,154,388	$830,687	$1,800,240
Increase (Decrease) in Accumulated Surplus	$5,441,789	$2,918,089	$2,421,010	$3,648,443	$2,439,598	$1,243,345
Water Asset Consumption Ratio	29%	29%	29%	29%	30%	30%

9.3 Statement of Operations

The Statement of Operations is presented in Table 9-3. It summarizes the annual revenues and expenses associated with managing the City's sanitary sewer system. It provides a report on the transactions and events that have an influence on the accumulated surplus. The main revenue items included are:

- Revenues from Sanitary Sewer Rates and Charges ;
- Earned Revenues (earned development charges, capital contributions and sewer post period capacity recovery); and
- Other Revenues (miscellaneous fees and charges, additional sewage revenues (Kitchener), etc)

The main expense items are:

- The annual cost of operating and maintaining the sanitary sewer system including Regional charges for treating wastewater; and
- Amortization expenses on existing and new TCA.

The operating surplus/ (deficit) is an important indicator contained in the Statement of Operations. An operating surplus/ (deficit) measures whether operating revenues generated in a year were sufficient to cover operating expenses incurred in that year. It is important to note that an annual surplus is necessary to ensure funds will be available to address non-expense items such as TCA acquisitions over and above amortization expenses, reserve/reserve fund contributions for asset replacement and rate stabilization, and repayment of outstanding debt principal. A ratio of operating surplus to total revenue is shown in Table 9-3 to reflect the percent of total revenue that can be allocated to funding the non-expense items noted above. The higher the ratio the greater proportion of operating revenues that are available for paying down debt, purchasing capital assets and setting aside in reserves for future use. Cash generated from operations is discussed in the Statement of Cash Flows section.

Table 9-3: Statement of Operations

Statement of Operations	2016	2017	2018	2019	2020	2021
Water Revenue						
User Revenue	$22,639,530	$23,642,507	$24,500,418	$26,620,392	$27,414,835	$28,741,194
Earned Revenue	$4,955,280	$2,749,781	$3,010,247	$3,059,851	$959,828	$263,792
Other Revenue	$1,180,638	$1,100,638	$1,019,638	$1,056,580	$1,081,060	$1,121,094
Total Revenues	**$28,775,448**	**$27,492,926**	**$28,530,303**	**$30,736,823**	**$29,455,723**	**$30,126,080**
Water Expenses						
Gross	$5,057,612	$5,191,245	$5,263,715	$5,388,699	$4,517,432	$4,650,027
Wastewater Treated	$16,248,249	$17,291,318	$18,673,935	$19,469,577	$20,227,227	$21,906,220
Operating Expenses	**$21,305,861**	**$22,482,563**	**$23,937,650**	**$24,858,276**	**$24,744,659**	**$26,556,247**
Interest on Debt	$0	$0	$0	$0	$0	$0
Amortization	2,027,798	2,092,273	2,171,644	2,230,104	2,271,466	2,326,489
Total Expenses	$23,333,660	$24,574,836	$26,109,293	$27,088,380	$27,016,124	$28,882,736
Annual Surplus/(Deficit)	**$5,441,789**	**$2,918,089**	**$2,421,010**	**$3,648,443**	**$2,439,598**	**$1,243,345**
Accumulated Surplus/(Deficit), Beginning of Year	$108,409,121	$113,850,909	$116,768,999	$119,190,008	$122,838,451	$125,278,050
Accumulated Surplus/ (Deficit), End of Year	$113,850,909	$116,768,999	$119,190,008	$122,838,451	$125,278,050	$126,521,394

Financial Indicators	2016	2017	2018	2019	2020	2021
Increase (Decrease) in Total Revenues	$3,103,799	($1,282,523)	$1,037,378	$2,206,520	($1,281,100)	$670,357
Increase (Decrease) in Total Expenses	$3,392,720	$1,241,177	$1,534,457	$979,087	($72,256)	$1,866,611
Increase (Decrease) in Annual Surplus	($288,921)	($2,523,700)	($497,079)	$1,227,433	($1,208,844)	($1,196,254)
Operating Surplus Ratio	19%	11%	8%	12%	8%	4%

9.4 Statement of Cash Flow

The Statement of Cash Flow is presented in Table 9-4. This statement summarizes the main cash inflows and outflows related to the sanitary sewer system in four (4) main areas - operating, capital, investing and financing, and shows the annual changes in cash. Contained within the 2016 cash position is a receivable of approximately $3.95 million to be fully collected by 2021 from the Develop Charges Reserve Fund for capacity related projects funded in prior years from the Sanitary Sewer Capital Reserve Fund.

The operating cash transactions begin with the surplus or deficit identified in the Statement of Operations. This figure is adjusted to add or subtract non-cash items that were included as revenues or expenses (e.g. amortization expenses). It is assumed that there were no "investing activities" over the period. The capital section indicates the amounts spent to acquire capital assets (TCA) or received from the sale of assets. In the City's case, it is assumed that there are no assets to be sold to generate cash. The financing section identifies the funds received from development charges receipts, Provincial/Federal Grants and proceeds from the issuance of long-term debt as cash inflows, offset by the portion of debt repaid as cash outflows. No debt however is projected over the forecast period.

Table 9-4 indicates that cash has been generated from operations, which is used in funding the acquisition of TCA and towards building internal reserves over the forecast period. The City's cash position is projected to increase over the forecast period from $13.7 million in 2016 to $18.2 million in 2021.

Table 9-4: Statement of Cash Flows

Statement of Cashflows	2016	2017	2018	2019	2020	2021
Cash Provided by:						
Operating Activities						
Annual Surplus/(Deficit)	$5,441,789	$2,918,089	$2,421,010	$3,648,443	$2,439,598	$1,243,345
Non-Cash Items						
Amortization	$2,027,798	$2,092,273	$2,171,644	$2,230,104	$2,271,466	$2,326,489
Earned Revenue	($4,955,280)	($2,749,781)	($3,010,247)	($3,059,851)	($959,828)	($263,792)
Net Change in Cash Provided by Operating Activitie	**$2,514,307**	**$2,260,582**	**$1,582,406**	**$2,818,696**	**$3,751,236**	**$3,306,041**
Capital Activities						
Purchase of TCA	($6,503,173)	($4,835,629)	($5,952,785)	($4,384,491)	($3,102,152)	($4,126,728)
Net Change in Cash Used in Capital Activities	**($6,503,173)**	**($4,835,629)**	**($5,952,785)**	**($4,384,491)**	**($3,102,152)**	**($4,126,728)**
Financing Activities						
Other Municipal Sources						
DC Collections	$2,693,579	$2,739,190	$2,640,048	$2,779,579	$2,487,443	$2,471,951
Provincial/Federal Grants	$411,623	$0	$0	$0	$0	$0
Proceeds From Long-Term Debt	$0	$0	$0	$0	$0	$0
Repayment of Long-Term Debt	$0	$0	$0	$0	$0	$0
Net Change in Cash Used in Financing Activities	**$3,105,203**	**$2,739,190**	**$2,640,048**	**$2,779,579**	**$2,487,443**	**$2,471,951**
Net Change in Cash and Cash Equivalents	**($883,664)**	**$164,143**	**($1,730,331)**	**$1,213,784**	**$3,136,527**	**$1,651,264**
Cash and Cash Equivalents, Beginning of the Year	$14,614,725	$13,731,061	$13,895,204	$12,164,873	$13,378,657	$16,515,184
Cash and Cash Equivalents, End of the Year	**$13,731,061**	**$13,895,204**	**$12,164,873**	**$13,378,657**	**$16,515,184**	**$18,166,448**

10 Conclusions and Recommendations

10.1 Conclusions

Based on the information reviewed and analyses completed, the following are the main conclusions:

1. The average annual full cost of managing the City's water system over the study period (next 24 years) is anticipated to be $30.6 million compared to current (2016) annual costs of approximately $20.5 million. Therefore water rate and service charge increases are necessary to ensure that the system costs are fully funded and financially sustainable over the long-term as required by O. Reg 453/07.
2. The Region's Charges estimated at $18.1 million (annual average cost) for water treatment represent the largest portion of system costs (59%) over the next 24 years. Contributions to the capital reserve account for $3.9 million (13%), O&M activities related to the City's operations account for $7.6 million (25%) and debt repayment accounts for $0.97 million (3%)
3. A water infrastructure funding gap of approximately $33 million over the next 20 years would continue to exist if rates and service charges are not adjusted to generate sufficient funding levels.
4. The financial statements for the water system prepared based on the results of the rate study analyses and projections, indicate the following:

    - The accumulated surplus is projected to increase from approximately $72.6 million in 2016 to approximately $86.3 million by 2021.
    - The operating surplus ratio is projected to decrease from 15% in 2016 to 12% by 2021.
    - The cash position is projected to increase from $6.8 million in 2016 to $7.2 million in 2021.

    These indicate that the financial outlook for the water system over the 6-year period 2016 to 2021 is good.
5. The average annual full cost of managing the City's sanitary sewer system over the study period (next 24 years) is anticipated to be $38.3 million compared to 2016 costs of approximately $24.5 million. Therefore sanitary sewer rate increases are necessary to ensure that the system costs are fully funded and financially sustainable over the long-term.
6. The Region's Charges estimated at $29 million (annual average cost) for wastewater treatment represent the largest portion of system costs (76%) over the next 24 years. Contributions to the capital reserve account for $2.9 million (8%), O&M activities related

to the City's operations account for $5.9 million (15%) and debt repayment accounts for $0.5 million (1%)

7. The current funding levels are sufficient for meeting the projected needs over the next 20 years. However an infrastructure funding gap in excess of $72 million is projected beyond 2035 to 2065. Debt financing should be considered as part of the funding strategy to address this infrastructure funding gap which is projected to occur just beyond the study period
8. The financial statements for the sanitary sewer system prepared based on the results of the rate study analyses and projections, indicate the following:
    - The accumulated surplus is projected to increase from approximately $113.9 million in 2016 to approximately $126.5 million by 2021.
    - The operating surplus ratio is projected to decrease from 17% in 2016 to 4% by 2021.
    - The cash position is projected to increase from $13.7 million in 2016 to $18.2 million in 2021.

    These indicate that the financial outlook for the sanitary sewer system over the 6-year period 2016 to 2021 is good.
9. Based on a qualitative review, all options would provide the level of funding to be fully sustainable over the long-term. Although Option 3 is best from a water conservation and user pay guiding principle perspective, it has significant disadvantages including but not limited to:

    - Revenue uncertainty resulting from conservation due to the higher Block 2 rate;
    - Potentially high impacts (20.1% to 32.5% increases) to the non-residential customers that may affect the attraction and retention of business. These levels of increases are significant and would require further dialogue with the business community and volume data analysis prior to confirming the thresholds for each block and the factor to be used for setting the Block 2 rate; and
    - The risk of shifting a much larger portion of costs to the residential sector should business customers relocate or discontinue operations.

    Option 2 offers the most predictable revenues and would ensure that at least 15% of the annual water revenues would be guaranteed while providing sufficient incentive for customers to conserve.

    Option 1 still offers a fair and reasonable rate structure because the amount paid varies almost directly with consumption due to the low fixed water charges (none for sanitary sewer). Under Option 1, from a high level equity perspective, the residential and non-residential sectors pay their fair share. Residential customers consume approximately 55% of the water and contribute 55% of the annual revenue, while the non-residential

consumers account for the remaining 45% of consumption and revenues. The major disadvantage of the existing rate structure is the low level of revenue stability as only a marginal amount of the annual revenue is collected via fixed fees. This lack of revenue stability will be offset to some extent by the introduction of the rate stabilization reserves. Therefore Option 1 could be remain a viable option moving forward should Council not wish to proceed with Option 2 due to the large impact to the small and average residential customers.

10.2 Recommendations

The following are the primary recommendations for consideration by the City:

10. Implement the rate structure described as Option 2 in this report effective 2019 to achieve full cost recovery and ensure that 15% revenue recovery from the Water and Sanitary Sewer Service Charges. This would provide the best level of revenue stability compared to the other options. However, if the potential cost increases to the small and average residential customers under this option is of concern, then it would be reasonable to maintain the existing rate structure (Option 1) provided that the new rate stabilization reserve funds discussed in this report are established. The funds that would be available from these reserves would reduce the financial risks due to revenue volatility.
11. Increase transfers to the Water Capital Reserve Fund to the levels noted in Section 6.1.2 of this report and included in Appendix D, to meet the minimum target balance of 1% of asset value adjusted for annual inflation each year, subject to annual reviews of the water system's asset needs, to fully fund the capital requirements.
12. Maintain transfers to the Sanitary Sewer Capital Reserve Fund at the levels noted in Section 6.2.2 of this report and included in Appendix D, to meet the minimum target balance of 1% of asset value adjusted for annual inflation each year, subject to annual reviews of the sanitary sewer system's asset needs, to fully fund the capital requirements.
13. Utilize debt financing in the near term to help address the existing water capital shortfall and sanitary sewer capital shortfall projected in the longer term, in an effort to reduce the burden placed on the rates.
14. Establish a separate rate stabilization reserve fund for both water and sanitary sewer to be used for offsetting any deficits and stabilizing rates and service charges. These reserves to be phased-in at a rate of 1% of annual operating cost from 2019-2023 until the target balance of 5% of annual revenues is achieved.
15. Continue to take steps to identify and address the causes of non-revenue water and inflow and infiltration to the sanitary sewer system.
16. That the O.Reg. 453/07 Water System Financial Plan No. 112-301 including the Financial Statements contained herein be approved by Council and submitted to the Province of

Ontario on or before June 1, 2016 in accordance with the Drinking Water System Licence renewal requirements and O. Reg. 453/07.

That a copy of this document entitled: "*Water and Sanitary Sewer Rate Design Final Report & Water Financial Plan No. 112-301"* be posted on the City's website (http://www.waterloo.ca/ratereview/) and made available to the public at no charge.

17. That the Sanitary Sewer System Financial Plan including the Financial Statements contained herein be received by Council
18. The City should actively pursue Grant funding opportunities based on recent Federal Budget announcements to increase funding to municipalities for infrastructure and 'green' projects.

References

1. Development Charges Background Study, November 16 2012, Hemson Consulting Ltd.
2. People & Jobs Forecast 2015 -2025.
3. City of Waterloo 2015- 2024 Capital Budget (10 year program).
4. Water Production and Supply Volumes Records –City of Waterloo.
5. Wastewater Treatment Volumes Forecast – City of Waterloo.
6. Water & Wastewater Treatment Rates Forecast – Region of Waterloo.
7. City of Waterloo PSAB 3150 TCA Data (2014).
8. City of Waterloo 2015 and 2016 Operating Budgets.
9. City of Waterloo By-Law Number 2015-24.
10. City of Waterloo Debt Repayment Schedules (Growth).
11. City of Waterloo DC Reserves Continuity Schedule.
12. City of Waterloo Water Capital Reserve Continuity Schedule.
13. City of Waterloo Sanitary Sewer Capital Reserve Continuity Schedule
14. City of Waterloo Asset Management Plan (2014.)
15. City of Waterloo Water & Sanitary Sewer Asset Inventories.
16. City of Waterloo Debt Management Policy FC-009, Revised May 12, 2014.
17. Working Paper: Do Increasing Block Rate Water Budgets Reduce Residential Water Demand? A Case Study in Southern California, Water Science & Policy Centre, University of California Riverside, K. Baerenklau, K. Schwabe, A. Dinar, September 1, 2013.
18. Environment Canada (2011) 2011 Municipal Water Pricing Report: Full-Cost Rates for Water and the Chimera of “Affordability”, C. Bodimeade & S. Renzetti, March 1, 2013

Appendix A

EXCERPT OF CITY OF WATERLOO

BY-LAW 2015-079

THE CORPORATION OF THE CITY OF WATERLOO

BY-LAW NUMBER 2015-079

BEING a by-law to impose fees and charges on persons

WHEREAS section 391(1) of the *Municipal Act, 2001,* S.O. 2001, c. 25, as amended, authorizes a municipality to impose fees or charges on persons for services or activities provided or done by or on behalf of it, for costs payable by it for services or activities provided or done by or on behalf of any other municipality or any local board and for use of its property including property under its control;

AND WHEREAS section 391(2) of the *Municipal Act, 2001,* S.O. 2001, c. 25, as amended, states that a fee or charge imposed for capital costs related to services or activities may be imposed on persons not receiving an immediate benefit from the services or activities but who will receive a benefit at some later point in time;

AND WHEREAS section 391(3) of the *Municipal Act, 2001,* S.O. 2001, c. 25, as amended, states that the costs included in a fee or charge may include costs incurred by the municipality or local board related to administration, enforcement and the establishment, acquisition and replacement of capital assets;

AND WHEREAS section 391(4) of the *Municipal Act, 2001,* S.O. 2001, c. 25, as amended, states that a fee or charge may be imposed whether or not it is mandatory for the municipality or local board imposing the fee or charge to provide or do the service or activity, pay the costs or allow the use of its property;

AND WHEREAS section 391(5) of the *Municipal Act, 2001,* S.O. 2001, c. 25, as amended, states that, in the event of a conflict between a fee or charge by-law and the *Municipal Act, 2001,* S.O. 2001, c. 25, as amended, or any other act or regulation made under any other act, the by-law prevails;

AND WHEREAS section 69(1) of the *Planning Act,* R.S.O. 1990, c. P.13, as amended, states that the council of a municipality, by by-law, and a planning board, by resolution, may establish a tariff of fees for the processing of applications made in respect of planning matters, which tariff shall be designed to meet only the anticipated cost to the municipality or to a committee of adjustment or land division committee constituted by the council of the municipality in respect of the processing of each type of application provided for in the tariff;

AND WHEREAS section 69(2) of the *Planning Act,* R.S.O. 1990, c. P.13, as amended, states that, despite a tariff of fees established under subsection (1), the council of a municipality, a planning board, a committee of adjustment or a land division committee in processing an application may reduce the amount of or waive the requirement for the payment of a fee in respect of the application where the council, planning board or committee is satisfied that it would be unreasonable to require payment in accordance with the tariff;

AND WHEREAS section 69(3) of the *Planning Act,* R.S.O. 1990, c. P.13, as amended, states that any person who is required to pay a fee under subsection (1) for the processing of an application in respect of a planning matter may pay the amount of the fee under protest and thereafter appeal to the Ontario Municipal Board against the levying of the fee or the amount of the fee by giving written notice of appeal to the Ontario Municipal Board within thirty days of payment of the fee;

AND WHEREAS section 7(1)(c) of the *Building Code Act, 1992,* S.O. 1992, c. 23, as amended, states that the council of a municipality may require the payment of fees on applications for and on the issuance of permits, requiring the payment of fees for maintenance inspections, and prescribing the amounts of the fees;

AND WHEREAS section 7(2) of the *Building Code Act, 1992,* S.O. 1992, c. 23, as amended, states that the total amount of the fees authorized under section 7(1)(c) must not exceed the anticipated reasonable costs of the principal authority to administer and enforce the *Building Code Act, 1992,* S.O. 1992, c. 23, as amended, in its area of jurisdiction;

AND WHEREAS section 7(3) of the *Building Code Act, 1992,* S.O. 1992, c. 23, as amended, states that a regulation, by-law or resolution establishing fees under section 7(1)(c) must provide for reduced fees to be payable in respect of the construction of a building for which a registered code agency is appointed under section 4.2 of the *Building Code Act, 1992,* S.O. 1992, c. 23, as amended;

NOW THEREFORE BE IT ENACTED by the Council of The Corporation of the City of Waterloo as follows:

1.0 CITATION

1.1 This by-law shall be known as the "**Fees and Charges By-Law**", "**Fee Guide**" or "**Fee Schedule**" of The Corporation of the City of Waterloo (the "City").

1.2 Should any by-law refer to the City's, or a department of the City's, "Fee Guide" or "Fee Schedule", the aforesaid by-law, in using any of the aforementioned terms, shall be interpreted to mean this by-law, regardless of any definition to the contrary contained within that by-law.

2.0 DEFINITIONS

For the purposes of this by-law:

2.1 "*Building Code Act*" means *Building Code Act, 1992,* S.O. 1992, c. 23, as amended;

2.2 "*Building Code*" means Ontario Regulation 350/06, as amended;

2.3 "Chief Building Official" means the chief building official of the City, or his or her designate, appointed or constituted under sections 3 or 4 of the *Building Code Act*;

2.4 "City" means The Corporation of the City of Waterloo;

2.5 "Council" means the municipal Council of the City;

2.6 “Commissioner” means a commissioner of a department of the City and shall include the Chief Financial Officer/Treasurer and the Chief Human Resources Officer, or his or her designate;

2.7 “*Municipal Act*” means the *Municipal Act, 2001,* S.O. 2001, c. 25, as amended;

2.8 “person” includes an individual, unincorporated association, sole proprietorship, partnership, corporation or municipality; and,

2.9 “*Planning Act*” means the *Planning Act,* R.S.O. 1990, c. P.13, as amended.

3.0 FEES AND CHARGES

3.1 The City hereby imposes the fees and charges outlined in **Schedule “A”** to this by-law pursuant to the provisions of the *Municipal Act*.

3.1.1 The fees and charges imposed on a person by the City, as outlined in **Schedule “A”** to this by-law, constitute a debt of the person to the City.

3.1.2 The Treasurer of the City may add fees and charges imposed by the City, as outlined in **Schedule “A”** to this by-law, to the tax roll for the following property in the City and collect them in the same manner as municipal taxes:

3.1.2.1 in the case of fees and charges for the supply of a public utility, the property to which the public utility was supplied; and,

3.1.2.2 in all other cases, any property for which all of the owners are responsible for paying the fees and charges.

3.1.3 If the City uses a registered collection agency in good standing under the *Collection Agencies Act* to recover a debt, including taxes, payable to the City, the collection agency may also recover its reasonable costs of collecting the debt but those costs shall not exceed an amount approved by the City.

3.1.4 The City may sell any prescribed debt payable to the City to any other person in accordance with the rules and conditions prescribed under the *Municipal Act*.

3.1.4.1 A person who acquires a debt outlined in section **3.1.4** has the priority of the City with respect to the debt.

3.1.5 The powers of a Commissioner to increase, decrease or waive a fee outlined in section 3.1.6, below, should only be used in exceptional circumstances, as determined by the Commissioner.

3.1.6 The fees and charges imposed on a person by the City, as outlined in **Schedule “A”** to this by-law, may be increased, decreased or waived completely by the Commissioner to whose department the fee or charge relates in the following circumstances:

3.1.6.1 where there is a material change to the program or service being offered;

3.1.6.2 where a large-scale event, such as a conference or trade show, is being held at a City facility or on City-owned or City-operated property and where a negotiated agreement is required;

3.1.6.3 where, by imposing a fee or charge, the City is decreasing access or imposing a barrier to a person with a disability or their support person;

3.1.6.4 where a fee is set incorrectly by way of an administrative error; or,

3.1.6.5 where imposing a fee or charge would be, in the opinion of the Commissioner, unreasonable, given the circumstances.

3.1.7 A Commissioner may only increase the amount of a fee or charge pursuant to section **3.1.6** of this by-law in order to recover or partially recover the City's actual costs in delivering the applicable program or service.

3.1.8 A Commissioner may impose a new fee or charge not outlined in **Schedule "A"** to this by-law, but still under the provisions of the *Municipal Act,* where a new program or service is being offered by the City. The new fee or charge imposed by a Commissioner shall:

3.1.8.1 not exceed the City's actual cost to deliver the new program or service; and,

3.1.8.2 shall be included in **Schedule "A"** of this by-law, as soon as is practicable.

3.1.9 Should a Commissioner increase, decrease or waive a fee or charge pursuant to section **3.1.6** of this by-law, or should a Commissioner impose a new fee or charge pursuant to section **3.1.8** of this by-law, the Commissioner shall report to Council on an annual basis and outline the specific actions taken and the rationale for so doing.

3.2 The City hereby imposes a tariff of fees outlined in **Schedule "B"** pursuant to the provisions of the *Planning Act*.

3.2.1 Any person may apply to Council, in a manner or form prescribed by the City, if that person feels that there are particular circumstances which would make it unreasonable for the City to require payment in accordance with the tariff of fees outlined in **Schedule "B"**.

3.2.2 Following its consideration of the aforementioned application, Council may reduce the amount of, or waive the requirement for the payment of, a fee pursuant to **Schedule "B"**.

3.3 The City hereby imposes the fees and charges outlined in **Schedule "C"** pursuant to the provisions of the *Building Code Act*.

3.3.1 Every twelve (12) months, the Chief Building Official shall prepare a report that contains such information as may be prescribed in the *Building Code Act* and its regulations about the fees and charges outlined in **Schedule "C"** and the costs

of the City to administer and enforce the *Building Code Act* in its area of jurisdiction.

3.3.2 The City shall make its report pursuant to section **3.3.1** available to the public in the manner required by regulation under the *Building Code Act*.

3.3.3 If the City proposes to change any fee or charge imposed under **Schedule "C"** the City shall:

3.3.3.1 give notice of the proposed changes in fees or charges to such persons as may be prescribed by regulation under the *Building Code Act*; and,

3.3.3.2 hold a public meeting concerning the proposed changes in a manner determined by the Chief Building Official.

3.3.4 The notice of proposed changes in fees or charges outlined in section **3.3.3.1** of this by-law must contain the information prescribed by the regulations under the *Building Code Act*, including information about the public meeting, and must be given in the manner prescribed by the regulations under the *Building Code Act.*

3.3.5 The public meeting concerning proposed changes in fees or charges outlined in section **3.3.3.2** of this by-law must be held within the period specified by regulation under the *Building Code Act* before the regulation, by-law or resolution to implement the proposed changes is made.

3.3.6 Section 398 of the *Municipal Act* applies, with necessary modifications, to fees established by the City under **Schedule "C"** and, with the approval of the Treasurer of the City, to fees established under section 7(1)(c) of the *Building Code Act* by a conservation authority whose area of jurisdiction includes any part of the local municipality.

3.4 All fees and charges imposed by this by-law, including all fees and charges outlined in the schedules to this by-law, shall:

3.4.1 not include applicable taxes, unless otherwise indicated; and,

3.4.2 be in full force and effect on the effective date noted in the schedule, unless no effective date is noted, in which case, they shall be in full force and effect immediately following their passage by Council.

4.0 SEVERABILITY

4.1 If a Court of competent jurisdiction should declare any section or part of a section of this by-law to be invalid, such section or part of a section shall not be construed as having persuaded or influenced Council to pass the remainder of this by-law and it is hereby declared that the remainder of this by-law shall be valid and shall remain in full force and effect.

5.0 REPEAL & AMENDMENT

5.1 By-Law 2015-051 is hereby repealed.

5.2 Should this by-law conflict with any other by-law or resolution of Council, or any staff report approved by Council, in relation to fees and charges imposed under the *Municipal Act, Planning Act, Building Code Act* or any other act, this by-law shall take precedence, unless specifically stated to the contrary.

6.0 COMING INTO FORCE

6.1 This by-law shall come into force on the date of its passage by Council.

Read a FIRST, SECOND and THIRD time this 14th day of December, 2015.

Signed by:

_____
MAYOR – David Jaworsky

Signed by:

_____
CITY CLERK – Olga Smith

Integrated Planning & Public Works Department – Water-Sewer-Stormwater Services Division
Schedule "A" to Fees and Charges Bylaw

WATER AND SANITARY SEWER

Water Rate	**Fee**	**Effective Date of Fee**	**Fee**	**Effective Date of Fee**
(per cubic metre)	**$ 1.60**	1-Jan-2014	**$ 1.66**	1-Feb-2015
Sanitary Sewer Rate				
(per cubic metre)	**$ 2.00**	1-Jan-2014	**$ 2.10**	1-Feb-2015
Service Charges				
Fire Protection Charge (large commercial accounts)	**$ 20.48**	1-Jan-2014	**$ 20.89**	1-Feb-2015
15mm Water Meter Charge (single family residential accounts)	**$ 2.85**	1-Jan-2014	**$ 2.91**	1-Feb-2015
25mm Water Meter Charge (small apartments, i.e. Triplex accounts)	**$ 5.75**	1-Jan-2014	**$ 5.87**	1-Feb-2015
40mm Water Meter Charge (small commercial, industrial accounts)	**$ 10.53**	1-Jan-2014	**$ 10.74**	1-Feb-2015
50mm Water Meter Charge (large commercial, industrial accounts)	**$ 13.19**	1-Jan-2014	**$ 13.45**	1-Feb-2015
75mm Water Meter Charge (large commercial, industrial accounts)	**$ 27.56**	1-Jan-2014	**$ 28.11**	1-Feb-2015
100mm Water Meter Charge (large commercial, industrial accounts)	**$ 40.30**	1-Jan-2014	**$ 41.11**	1-Feb-2015
150mm Water Meter Charge (large commercial, industrial accounts)	**$ 68.54**	1-Jan-2014	**$ 69.91**	1-Feb-2015
200mm Water Meter Charge (large commercial, industrial accounts)	**$ 103.47**	1-Jan-2014	**$ 105.54**	1-Feb-2015
250mm Water Meter Charge (large commercial, industrial accounts)	**$ 137.59**	1-Jan-2014	**$ 140.34**	1-Feb-2015
Meter Pit Charge	**$ 35.17**	1-Jan-2014	**$ 35.87**	1-Feb-2015
Water Meters				
Water Meter Accuracy Deposit	**$ 127.55**	1-Jan-2014	**$ 150.00**	1-Feb-2015
Water Meter Replacement Fee - (Damaged, Frozen or Missing) plus Meter Cost	**$ 72.00**	1-Jan-2014	**$ 73.10**	1-Feb-2015
Remote/Mounting Bracket Assembly	**$ 38.15**	1-Jan-2014	**$ 38.73**	1-Feb-2015
Tail Piece Replacement	**$ 19.05**	1-Jan-2014	**$ 19.34**	1-Feb-2015
Remote Re-wiring	**$ 152.75**	1-Jan-2014	**$ 155.09**	1-Feb-2015
15mm Meter Kit (complete)	**$ 161.45**	1-Jan-2014	**$ 163.92**	1-Feb-2015
Verification Administration	**$ 38.15**	1-Jan-2014	**$ 38.73**	1-Feb-2015
Miscellaneous Minor Repairs	**$ 76.35**	1-Jan-2014	**$ 77.52**	1-Feb-2015
Security Tag Replacement	**$ 63.25**	1-Jan-2014	**$ 64.22**	1-Feb-2015
Water Meters - New				
15 mm	**$ 102.50**	1-Jan-2014	**$ 106.80**	1-Feb-2015
25 mm	**$ 225.00**	1-Jan-2014	**$ 199.20**	1-Feb-2015
40 mm	**$ 451.00**	1-Jan-2014	**$ 594.00**	1-Feb-2015
50 mm	**$ 602.00**	1-Jan-2014	**$ 714.00**	1-Feb-2015
75 mm	**$ 2,649.00**	1-Jan-2014	**$ 2,196.00**	1-Feb-2015
100 mm compound	**n/a - new**		**$ 3,720.00**	1-Feb-2015
100 mm fire rated	**$ 10,020.00**	1-Jan-2014	**$ 8,280.00**	1-Feb-2015
150 mm compound	**n/a - new**		**$ 6,330.00**	1-Feb-2015
150 mm fire rated	**$ 11,400.00**	1-Jan-2014	**$ 11,040.00**	1-Feb-2015
200 mm compound	**n/a - new**		**$ 10,200.00**	1-Feb-2015
200 mm fire rated	**$ 15,451.00**	1-Jan-2014	**$ 16,800.00**	1-Feb-2015
250 mm compound	**n/a - new**		**$ 13,200.00**	1-Feb-2015
250 mm fire rated	**$ 21,881.00**	1-Jan-2014	**$ 23,592.00**	1-Feb-2015

Appendix B

W&WW VOLUMES AND GROWTH PROJECTIONS

Appendix B - W&WW Volumes and Growth Projections

Water Volumes and Growth Projections

Description	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
Volume Purchased by Waterloo from Region (1000 m^3)	12,286	12,274	12,268	12,319	12,369	12,426	12,455	12,491	12,536	12,580	12,623	12,662	12,704	12,747	12,790	12,832	12,875	12,917	12,961	13,004	13,047	13,090	13,134	13,178
Volume Sold to Customers (1000 m^3)	10,535	10,451	10,355	10,398	10,441	10,484	10,527	10,570	10,613	10,655	10,698	10,741	10,784	10,827	10,870	10,913	10,956	10,999	11,042	11,085	11,128	11,171	11,214	11,257
Non-Revenue Water (1000 m^3)	1,751	1,823	1,914	1,921	1,928	1,943	1,928	1,922	1,924	1,924	1,924	1,921	1,920	1,920	1,919	1,919	1,918	1,918	1,918	1,918	1,919	1,919	1,919	1,920
Non-Revenue Water (%)	14%	15%	16%	16%	16%	16%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%
Number of Customer Accounts	30,360	30,360	30,360	30,606	30,852	31,098	31,344	31,590	31,836	32,082	32,328	32,574	32,820	33,066	33,312	33,558	33,804	34,050	34,296	34,542	34,788	35,034	35,280	35,526

Sanitary Sewer Volumes and Growth Projections

Description	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
Waterloo Volume Treated by the Region (1000 m^3)	16,265	16,193	16,358	16,084	15,779	16,136	16,110	16,093	16,041	16,032	16,082	16,072	16,064	16,058	16,062	16,067	16,065	16,063	16,063	16,064	16,064	16,064	16,064	16,064
Billable Wastewater Volume from Customers (1000 m^3)	10,326	10,279	10,209	10,252	10,295	10,339	10,382	10,425	10,469	10,512	10,555	10,599	10,642	10,685	10,729	10,772	10,815	10,859	10,902	10,945	10,989	11,032	11,075	11,119
Number of Customers	29,819	29,819	29,819	30,065	30,311	30,557	30,803	31,049	31,295	31,541	31,787	32,033	32,279	32,525	32,771	33,017	33,263	33,509	33,755	34,001	34,247	34,493	34,739	34,985

Appendix C

PROJECTED CAPITAL BUDGET REQUIREMENTS

Appendix C - Projected Capital Budget Requirements

Projected Capital Budget Requirements - Water Capital Projections

Water Capital Projections ($000)	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
Capital	6,503	4,836	5,953	4,384	3,102	4,127	2,131	2,259	3,238	4,053	4,210	4,210	4,210	4,210	4,210	4,210	4,210	4,210	4,210	4,210	4,210	4,210	4,210	4,210
Backlog	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Capital	**6,503**	**4,836**	**5,953**	**4,384**	**3,102**	**4,127**	**2,131**	**2,259**	**3,238**	**4,053**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**

Projected Capital Budget Requirements - Water Capital Financing

Capital Financing ($000)	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
Provincial/Federal Grants	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gas Tax Allocation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Additional Gas Tax Allocation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Recoveries	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Reserve	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Contribution from Contingency Reserve	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Development Charges	1,764	1,650	860	490	497	504	511	518	526	533	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Non-Growth Related Debenture Requirements	-	-	-	487	411	349	788	682	463	853	1,868	1,868	1,868	1,868	1,868	1,868	1,868	1,868	1,868	1,868	1,868	1,868	1,868	1,868
Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Water Capital Reserve	2,645	3,235	2,803	3,817	3,982	4,117	4,044	4,193	4,143	3,974	4,358	4,358	4,358	4,358	4,358	4,358	4,358	4,358	4,358	4,358	4,358	4,358	4,358	4,358
Total Capital Financing	**4,409**	**4,884**	**3,662**	**4,794**	**4,890**	**4,971**	**5,343**	**5,393**	**5,132**	**5,360**	**6,226**	**6,226**	**6,226**	**6,226**	**6,226**	**6,226**	**6,226**	**6,226**	**6,226**	**6,226**	**6,226**	**6,226**	**6,226**	**6,226**

Appendix C - Projected Capital Budget Requirements

Projected Capital Budget Requirements - Sanitary Sewer Capital Projections

Sanitary Sewer Capital Projections ($000)	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
Capital	6,503	4,836	5,953	4,384	3,102	4,127	2,131	2,259	3,238	4,053	4,210	4,210	4,210	4,210	4,210	4,210	4,210	4,210	4,210	4,210	4,210	4,210	4,210	4,210
Backlog	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Capital	**6,503**	**4,836**	**5,953**	**4,384**	**3,102**	**4,127**	**2,131**	**2,259**	**3,238**	**4,053**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**

Projected Capital Budget Requirements - Sanitary Sewer Capital Financing

Capital Financing ($000)	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
Provincial/Federal Grants	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gas Tax Allocation	412	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Additional Gas Tax Allocation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Recoveries	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Reserve	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Contribution from Contingency Reserve	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Development Charges	3,763	1,929	2,185	2,235	260	264	267	271	570	1,959	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Non-Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	1,263	1,263	1,263	1,263	1,263	1,263	1,263	1,263	1,263	1,263	1,263	1,263	1,263	1,263
Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sanitary Sewer Reserve	2,329	2,906	3,767	2,150	2,842	3,863	1,863	1,988	2,669	2,093	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947
Total Capital Financing	**6,503**	**4,836**	**5,953**	**4,384**	**3,102**	**4,127**	**2,131**	**2,259**	**3,238**	**4,053**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**

Appendix D

PROJECTED RESERVES CONTINUITY SCHEDULE

Appendix D - Projected Reserves Continuity Schedule

Projected Reserves Continuity Schedule - Water Capital Reserve

Capital Reserve ($000)	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
Opening Balance	4,357	4,489	3,928	3,718	3,379	3,379	3,379	3,379	3,379	3,379	3,379	3,379	3,850	3,965	4,084	4,207	4,333	4,463	4,597	4,734	4,877	5,023	5,173	5,329
Transfer from Operating	1,777	1,674	1,170	2,478	3,982	4,117	4,044	4,193	4,143	3,974	4,358	4,829	4,474	4,477	4,481	4,484	4,488	4,492	4,496	4,500	4,504	4,509	4,513	4,518
Transfer from Operating-Sewer Loan	1,000	1,000	1,000	1,000																				
Transfer to Capital	2,645	3,235	2,803	3,817	3,982	4,117	4,044	4,193	4,143	3,974	4,358	4,358	4,358	4,358	4,358	4,358	4,358	4,358	4,358	4,358	4,358	4,358	4,358	4,358
Transfer to Operating	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Closing Balance	4,489	3,928	3,718	3,379	3,379	3,379	3,379	3,379	3,379	3,379	3,379	3,850	3,965	4,084	4,207	4,333	4,463	4,597	4,734	4,877	5,023	5,173	5,329	5,489
Interest	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Projected Reserves Continuity Schedule - Water Rate Stabilizations Reserve

Rate Stabilization ($000)	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
Total Operating Cost	17,771	18,219	18,689	19,539	20,129	20,748	21,353	21,987	22,415	23,101	23,836	24,588	25,368	26,174	27,004	27,861	28,744	29,656	30,597	31,567	32,568	33,602	34,668	35,768
RSR Target (% of Net Costs to Be Recovered from Users)	0%	0%	0%	1%	2%	3%	4%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
RSR Target ($)	-	-	-	195	403	622	854	1,099	1,121	1,155	1,192	1,229	1,268	1,309	1,350	1,393	1,437	1,483	1,530	1,578	1,628	1,680	1,733	1,788
Year End RSR Balance	-	-	-	195	403	622	854	1,099	1,121	1,155	1,192	1,229	1,268	1,309	1,350	1,393	1,437	1,483	1,530	1,578	1,628	1,680	1,733	1,788
Shortfall from Target	-	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Surplus from Target	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Appendix D - Projected Reserves Continuity Schedule

Projected Reserves Continuity Schedule - Sanitary Sewer Capital Reserve

Capital Reserve ($000)	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2028	2039
Opening Balance	7,919	8,599	8,157	6,491	7,001	8,646	8,681	9,646	9,646	9,646	9,646	9,646	9,646	9,646	9,646	9,646	9,646	9,646	9,646	9,646	9,646	9,646	9,646	9,646
Transfer from Operating	3,228	2,644	2,276	2,835	3,788	3,898	2,828	1,988	2,669	2,093	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947
SPPC Repayment	781	820	825	825	700																			
Transfer to Capital	2,329	2,906	3,767	2,150	2,842	3,863	1,863	1,988	2,669	2,093	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947
Transfer to Operating	1,000	1,000	1,000	1,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Closing Balance	8,599	8,157	6,491	7,001	8,646	8,681	9,646	9,646	9,646	9,646	9,646	9,646	9,646	9,646	9,646	9,646	9,646	9,646	9,646	9,646	9,646	9,646	9,646	9,646
Interest	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Projected Reserves Continuity Schedule - Sanitary Sewer Rate Stabilization Reserve

Rate Stabilization ($000)	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
Total Operating Cost	21,306	22,483	23,938	25,109	24,993	26,862	28,108	29,125	30,245	31,938	32,978	34,204	35,474	36,795	38,185	39,346	40,484	41,662	42,876	44,129	45,417	46,740	48,102	49,505
RSR Target (% of Net Costs to Be Recovered from Users)	0%	0%	0%	1%	2%	3%	4%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
RSR Target ($)	-	-	-	251	500	806	1,124	1,456	1,512	1,597	1,649	1,710	1,774	1,840	1,909	1,967	2,024	2,083	2,144	2,206	2,271	2,337	2,405	2,475
Year End RSR Balance	-	-	-	251	500	806	1,152	1,273	1,273	1,597	1,649	1,710	1,774	1,840	1,909	1,967	2,024	2,083	2,144	2,206	2,271	2,337	2,405	2,475
Shortfall from Target	-	-	-	0	0	0	-	183	239	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Surplus from Target	-	-	-	-	-	-	28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Appendix E

SYSTEM COSTS AND REVENUE REQUIREMENTS

Appendix E - System Costs and Revenue Requirements

System Costs and Revenue Requirements - Water System

Cost/Revenue Item ($000)	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
Municipal Capital Forecast	4,409	4,884	3,662	3,171	3,520	3,806	2,715	3,121	3,588	2,517	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Replacement Costs from Asset Replacement Summary	-	-	-	-	-	-	371	-	22	1,531	4,892	5,038	5,190	3,508	3,613	3,722	3,833	3,948	1,823	1,878	1,934	1,992	2,052	2,561
Backlog	-	-	-	1,623	1,370	1,164	2,257	2,272	1,521	1,313	1,334	1,187	1,036	2,718	2,613	2,504	2,392	2,277	4,403	4,348	4,292	4,234	4,174	3,665
Total Capital Requirements	**4,409**	**4,884**	**3,662**	**4,794**	**4,890**	**4,971**	**5,343**	**5,393**	**5,132**	**5,360**	**6,226**	**6,226**	**6,226**	**6,226**	**6,226**	**6,226**	**6,226**	**6,226**	**6,226**	**6,226**	**6,226**	**6,226**	**6,226**	**6,226**
Debt Financing	-	-	-	487	411	349	788	682	463	853	1,868	1,868	1,868	1,868	1,868	1,868	1,868	1,868	1,868	1,868	1,868	1,868	1,868	1,868
Capital Reserve Financing	2,645	3,235	2,803	3,817	3,982	4,117	4,044	4,193	4,143	3,974	4,358	4,358	4,358	4,358	4,358	4,358	4,358	4,358	4,358	4,358	4,358	4,358	4,358	4,358
Transfer from Operating	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Financing (Grants, Third Party, etc.)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DC Reserve Financing	1,764	1,650	860	490	497	504	511	518	526	533	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Capital Financing	**4,409**	**4,884**	**3,662**	**4,794**	**4,890**	**4,971**	**5,343**	**5,393**	**5,132**	**5,360**	**6,226**	**6,226**	**6,226**	**6,226**	**6,226**	**6,226**	**6,226**	**6,226**	**6,226**	**6,226**	**6,226**	**6,226**	**6,226**	**6,226**
Operating and Maintenance	17,771	18,219	18,689	19,539	20,129	20,748	21,353	21,987	22,415	23,101	23,836	24,588	25,368	26,174	27,004	27,861	28,744	29,656	30,597	31,567	32,568	33,602	34,668	35,768
Transfer to Capital Reserves	1,777	1,674	1,170	2,478	3,982	4,117	4,044	4,193	4,143	3,974	4,358	4,829	4,474	4,477	4,481	4,484	4,488	4,492	4,496	4,500	4,504	4,509	4,513	4,518
Debt Repayment	-	-	-	-	57	105	146	239	319	373	473	692	911	1,130	1,292	1,462	1,640	1,767	1,906	2,071	2,190	2,190	2,190	2,190
Less Non-Rate Revenue	1,438	1,445	1,453	1,464	476	487	500	512	526	539	555	571	588	605	623	641	660	667	687	708	729	751	773	796
Revenue Requirements (from Users)	**20,986**	**21,338**	**21,312**	**23,481**	**24,644**	**25,458**	**26,042**	**26,931**	**27,403**	**27,987**	**29,222**	**30,680**	**31,340**	**32,386**	**33,399**	**34,448**	**35,532**	**36,582**	**37,686**	**38,846**	**39,991**	**41,051**	**42,144**	**43,272**
Revenue from Base Charge	1,218	1,247	1,279	1,292	1,421	1,468	1,502	1,553	1,580	1,613	1,686	1,771	1,809	1,869	1,928	1,989	2,051	2,113	2,177	2,244	2,310	2,371	2,434	2,499
Revenue from Uniform Rate	17,878	18,186	18,535	20,245	22,256	22,999	23,524	24,335	24,753	25,277	26,407	27,747	28,336	29,285	30,204	31,155	32,138	33,111	34,110	35,161	36,198	37,152	38,136	39,152
Annual Increase ($)	617	337	382	1,723	2,139	790	559	863	445	557	1,203	1,425	626	1,010	978	1,012	1,045	1,035	1,063	1,118	1,103	1,015	1,047	1,081
Annual Increase (%)	3%	2%	2%	9%	10%	3%	2%	3%	2%	2%	4%	5%	2%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%

Appendix E - System Costs and Revenue Requirements

System Costs and Revenue Requirements - Water System

Cost/Revenue Item ($000)	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
Municipal Capital Forecast	6,503	4,836	5,953	4,384	3,102	4,127	2,131	2,259	3,238	4,053	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Replacement Costs from Asset Replacement Summary	-	-	-	-	0	-	-	-	-	0	4,210	4,210	4,210	4,210	4,210	4,210	4,210	4,210	4,210	4,210	4,210	4,210	4,210	4,210
Total Capital Requirements	**6,503**	**4,836**	**5,953**	**4,384**	**3,102**	**4,127**	**2,131**	**2,259**	**3,238**	**4,053**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**
Debt Financing	-	-	-	-	-	-	-	-	-	-	1,263	1,263	1,263	1,263	1,263	1,263	1,263	1,263	1,263	1,263	1,263	1,263	1,263	1,263
Capital Reserve Financing	2,329	2,906	3,767	2,150	2,842	3,863	1,863	1,988	2,669	2,093	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947
Transfer from Operating	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Financing (Grants, Third Party, etc.)	412	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DC Reserve Financing	3,763	1,929	2,185	2,235	260	264	267	271	570	1,959	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Capital Financing	**6,503**	**4,836**	**5,953**	**4,384**	**3,102**	**4,127**	**2,131**	**2,259**	**3,238**	**4,053**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**	**4,210**
Operating and Maintenance	21,306	22,483	23,938	25,109	24,993	26,862	28,108	29,125	30,245	31,938	32,978	34,204	35,474	36,795	38,185	39,346	40,484	41,662	42,876	44,129	45,417	46,740	48,102	49,505
Transfer to Capital Reserves	3,228	2,644	2,276	2,835	3,788	3,898	2,828	1,988	2,669	2,093	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947
Debt Repayment	-	-	-	-	-	-	-	-	-	-	-	148	296	444	592	740	888	1,036	1,184	1,332	1,480	1,480	1,480	1,480
Less Non-Rate Revenue	1,181	1,101	1,020	1,057	1,081	1,121	1,160	1,199	1,239	1,260	1,297	1,336	1,375	1,416	1,458	1,502	1,546	1,580	1,627	1,676	1,726	1,778	1,832	1,886
Revenue Requirements (from Users)	**25,714**	**26,227**	**27,233**	**29,001**	**29,862**	**31,881**	**32,096**	**32,311**	**34,153**	**35,291**	**37,222**	**38,634**	**40,092**	**41,602**	**43,182**	**44,535**	**45,866**	**47,225**	**48,635**	**50,084**	**51,571**	**52,945**	**54,361**	**55,819**
Revenue from Base Charge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Revenue from Uniform Rate	22,353	23,026	24,194	25,888	27,700	29,639	29,776	29,914	31,675	32,772	34,628	35,963	37,341	38,769	40,265	41,531	42,773	44,065	45,380	46,732	48,118	49,389	50,698	52,046
Annual Increase ($)	1,139	673	1,168	1,694	1,812	1,939	137	137	1,762	1,096	1,856	1,335	1,378	1,428	1,496	1,266	1,242	1,292	1,315	1,352	1,386	1,271	1,309	1,348
Annual Increase (%)	5%	3%	5%	7%	7%	7%	0%	0%	6%	3%	6%	4%	4%	4%	4%	3%	3%	3%	3%	3%	3%	3%	3%	3%

Appendix F

PROJECTED FULL COST OF SERVICE

Appendix F - Projected Full Cost of Service

Projected Full Cost of Service - Water System

Cost Component	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
O&M	5,467	5,569	5,680	6,098	6,242	6,391	6,545	6,706	6,635	6,806	7,011	7,221	7,438	7,661	7,891	8,128	8,372	8,623	8,882	9,149	9,423	9,706	9,997	10,297
Regional Charge	12,304	12,649	13,010	13,442	13,888	14,357	14,808	15,281	15,780	16,295	16,825	17,367	17,930	18,512	19,113	19,732	20,372	21,032	21,715	22,419	23,145	23,896	24,671	25,470
Capital Expenditure	1,777	1,674	1,170	2,478	3,982	4,117	4,044	4,193	4,143	3,974	4,358	4,829	4,474	4,477	4,481	4,484	4,488	4,492	4,496	4,500	4,504	4,509	4,513	4,518
Debt Repayment	-	-	-	-	57	105	146	239	319	373	473	692	911	1,130	1,292	1,462	1,640	1,767	1,906	2,071	2,190	2,190	2,190	2,190
Total	**19,548**	**19,893**	**19,859**	**22,017**	**24,169**	**24,971**	**25,543**	**26,419**	**26,877**	**27,448**	**28,667**	**30,109**	**30,752**	**31,781**	**32,777**	**33,807**	**34,872**	**35,915**	**36,999**	**38,138**	**39,262**	**40,300**	**41,371**	**42,475**

Projected Full Cost of Service - Sanitary Sewer System

Cost Component	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
O&M	5,058	5,191	5,264	5,640	4,766	4,956	5,133	5,048	5,072	5,545	5,430	5,601	5,769	5,943	6,123	6,293	6,479	6,673	6,873	7,080	7,292	7,511	7,736	7,968
Regional Charge	16,248	17,291	18,674	19,470	20,227	21,906	22,975	24,076	25,173	26,393	27,548	28,603	29,705	30,852	32,062	33,053	34,006	34,989	36,003	37,049	38,125	39,229	40,366	41,537
Capital Expenditure	3,228	2,644	2,276	2,835	3,788	3,898	2,828	1,988	2,669	2,093	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947
Debt Repayment	-	-	-	-	-	-	-	-	-	-	-	148	296	444	592	740	888	1,036	1,184	1,332	1,480	1,480	1,480	1,480
Total	**24,534**	**25,126**	**26,214**	**27,944**	**28,781**	**30,760**	**30,936**	**31,112**	**32,914**	**34,031**	**35,925**	**37,299**	**38,717**	**40,185**	**41,724**	**43,033**	**44,319**	**45,645**	**47,008**	**48,408**	**49,844**	**51,167**	**52,529**	**53,932**

Appendix G

ANNUAL CASH FLOW

Appendix G - Annual Cash Flow

Annual Cash Flow - Water System

Annual Cash Flow ($000)	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
Annual Opening Balance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Revenue from Base Charge	1,218	1,247	1,279	1,292	1,421	1,468	1,502	1,553	1,580	1,613	1,686	1,771	1,809	1,869	1,928	1,989	2,051	2,113	2,177	2,244	2,310	2,371	2,434	2,499
Revenue from Uniform Rate	17,878	18,186	18,535	20,245	22,256	22,999	23,524	24,335	24,753	25,277	26,407	27,747	28,336	29,285	30,204	31,155	32,138	33,111	34,110	35,161	36,198	37,152	38,136	39,152
Non-Rate Revenues	1,438	1,445	1,453	1,464	476	487	500	512	526	539	555	571	588	605	623	641	660	667	687	708	729	751	773	796
Operating Expenditures	17,771	18,219	18,689	19,539	20,129	20,748	21,353	21,987	22,415	23,101	23,836	24,588	25,368	26,174	27,004	27,861	28,744	29,656	30,597	31,567	32,568	33,602	34,668	35,768
(Contributions to) Capital Reserve - #1 - (Cash Budget)	1,777	1,674	1,593	2,478	3,982	4,117	4,044	4,193	4,143	3,974	4,358	4,829	4,474	4,477	4,481	4,484	4,488	4,492	4,496	4,500	4,504	4,509	4,513	4,518
(Contributions to) Capital Reserve - #2 - (Cash Budget)	1,000	1,000	1,000	1,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(Contributions to) Lifecycle Reserve - (Cash Budget)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Debt Repayment - (Cash Outflow)	-	-	-	-	57	105	146	239	319	373	473	692	911	1,130	1,292	1,462	1,640	1,767	1,906	2,071	2,190	2,190	2,190	2,190
Annual Closing Balance	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Annual Cash Flow - Sanitary Sewer

Annual Cash Flow ($000)	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
Annual Opening Balance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Revenue from Base Charge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Revenue from Uniform Rate	22,353	23,026	24,194	25,888	27,700	29,639	29,776	29,914	31,675	32,772	34,628	35,963	37,341	38,769	40,265	41,531	42,773	44,065	45,380	46,732	48,118	49,389	50,698	52,046
Non-Rate Revenues	1,181	1,101	1,020	1,057	1,081	1,121	1,160	1,199	1,239	1,260	1,297	1,336	1,375	1,416	1,458	1,502	1,546	1,580	1,627	1,676	1,726	1,778	1,832	1,886
Loan Repayment	1,000	1,000	1,000	1,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Operating Expenditures	21,306	22,483	23,938	25,109	24,993	26,862	28,108	29,125	30,245	31,938	32,978	34,204	35,474	36,795	38,185	39,346	40,484	41,662	42,876	44,129	45,417	46,740	48,102	49,505
(Contributions to) Capital Reserve - #1 - (Cash Budget)	3,228	2,644	2,276	2,835	3,788	3,898	2,828	1,988	2,669	2,093	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947	2,947
(Contributions to) Capital Reserve - #2 - (Cash Budget)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(Contributions to) Lifecycle Reserve - (Cash Budget)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Debt Repayment - (Cash Outflow)	-	-	-	-	-	-	-	-	-	-	-	148	296	444	592	740	888	1,036	1,184	1,332	1,480	1,480	1,480	1,480
Annual Closing Balance	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Appendix H

REQUIREMENTS OF ONTARIO REGULATIONS 453/07

Appendix A: Requirements of O.Reg. 453/07

Requirements			How Requirements are Met
1.	The financial plans must be approved by a resolution that is passed by,		
	i.	The council of the municipality, if the owner of the drinking water system is a municipality.	• It is expected the Council will approve the Updated Financial Plan prior to June 1st 2016.
	ii.	The governing body of the owner, if the owner of the drinking water system has a governing body and is not a municipality.	• N/A
2.	The financial plans must apply to a period of at least six years.		• Applies for 6 years from 2016 to 2021 inclusive.
3.	The first year to which the financial plans must apply must be the year determined in accordance with the following rules:		
	i.	If the financial plans are required by subsection 2, the first year to which the financial plans must apply must be the year in which the drinking water system's existing municipal drinking water licence would otherwise expire.	• The licence expires in 2016 for the water systems (No.112-301). Therefore, the first year of the Updated Financial Plan is 2016
	ii.	If the financial plans are required by a condition that was included in a municipal drinking water licence under subsection 1 (3), the first year to which the financial plans must apply must be the later of 2010 and the year in which the first licence for the system was issued.	• N/A
4.	Subject to subsection (2), for each year to which the financial plans apply, the financial plans must include the following:		
	i.	Details of the proposed or projected financial position of the drinking water system itemized by:	• See Statement of Financial Position for all water systems combined in Financial Plan.
		a. Total financial assets	• See Statement of Financial Position for all water systems combined in Financial Plan.
		b. Total liabilities	• See Statement of Financial Position for all water systems combined in Financial Plan.
		c. Net financial assets (debt)	• See Statement of Financial Position for all water systems combined in Financial Plan.
		d. Non-financial assets that are tangible capital assets, tangible capital assets under construction, inventories of supplies and prepaid expenses.	• See Statement of Financial Position for all water systems combined in Financial Plan. TCA Projections in Financial Plan.
		e. Changes in tangible capital assets that are additions, donations, write downs and disposals.	• See Statement of Financial Position for all water systems combined in Financial Plan. TCA Projections in Financial Plan.

Appendix A: Requirements of O.Reg. 453/07

	ii.	Details of the proposed or projected financial operations of the drinking water system itemized by,	• See Statement of Operations for all water systems combined in Financial Plan.
		a. Total revenues, further itemized by water rates, user charges and other revenues.	• See Statement of Operations for all water systems combined in Financial Plan.
		b. Total expenses, further itemized by amortization expenses, interest expenses and other expenses	• See Statement of Operations for all water systems combined in Financial Plan.
		c. Annual surplus or deficit, and	• See Statement of Operations for all water systems combined in Financial Plan.
		d. Accumulated surplus or deficit	• See Statement of Operations for all water systems combined in Financial Plan.
	iii.	Details of the drinking water system's proposed or projected gross cash receipts and gross cash payments itemized by,	• See Statement of Cash Flow for all water systems combined in Financial Plan.
		a. Operating transactions that are cash received from revenues, cash paid for operating expenses and finance charges, - done in full cost report	• See Statement of Cash Flow for all water systems combined in Financial Plan.
		b. Capital transactions that are proceeds on the sale of tangible capital assets and cash used to acquire capital assets,	• See Statement of Cash Flow for all water systems combined in Financial Plan.
		c. Investing transactions that are acquisitions and disposal of investments,	• See Statement of Cash Flow for all water systems combined in Financial Plan.
		d. Financing transactions that are proceeds from the issuance of debt and debt repayment.	• See Statement of Cash Flow for all water systems combined in Financial Plan.
		e. Changes in cash and cash equivalents during the year,	• See Statement of Cash Flow for all water systems combined in Financial Plan.
		f. Cash and cash equivalents at the beginning and end of the year.	• See Statement of Cash Flow for all water systems combined in Financial Plan.
	iv.	Details of the extent to which the information described in subparagraphs i, ii and iii relates directly to the replacement of lead service pipes as defined in section 15.1- 3 of Schedule 15.1 to Ontario Regulation 170/03 (Drinking Water Systems), made under the Act.	• Lead services are replaced as part of watermain rehabilitation projects and/or road reconstruction projects when undertaken. Although not all the streets contain lead services, all of the water services to the property line are replaced for every rehabilitation and reconstruction project.
5.	The owner of the drinking water system must.		
	i.	Make the financial plans available, on request, to members of the public who are served by the drinking water system without charge,	• This will be done by the municipality following Council approval.
	ii.	Make the financial plans available to members of the public without charge through publication on the Internet, if the owner maintains a website on the Internet,	• The Financial Plan will be posted on the municipality's website and made available for public review at no charge.

Appendix A: Requirements of O.Reg. 453/07

	iii.	Provide notice advising the public of the availability of the financial plans under subparagraphs i and ii, if applicable, in a manner that, in the opinion of the owner, will bring the notice to the attention of members of the public who are served by the drinking water system.	• A notice will be issued following Council approval.
6.	The owner of the drinking water system must give a copy of the financial plans to the Ministry of Municipal Affairs and Housing. O. Reg. 453/07, s. 3 (1).		• Will be submitted following Council approval.
		Each of the following sub-subparagraphs applies only if the information referred to in the sub-subparagraph is known to the owner at the time the financial plans are prepared.	• The Financial Plan was prepared using available information at the time of preparation and may not contain all desired items. Reasonable assumptions were made and these are noted in the Financial Plan.
	1.	Sub-subparagraphs 4 i A, B and C of subsection (1).	• The Financial Plan was prepared using available information at the time of preparation and may not contain all desired items. Reasonable assumptions were made and these are noted in the Financial Plan.
	2.	Sub-subparagraphs 4 iii A, C, E and F of subsection (1). O. Reg. 453/07, s. 3 (2).	• The Financial Plan was prepared using available information at the time of preparation and may not contain all desired items. Reasonable assumptions were made and these are noted in the Financial Plan.

Appendix I

SERVICE CHARGES & RATE PROJECTIONS

Appendix I - Service Charges and Rate Projections

Service Charges & Rate Projections - Option 1

Rate Component	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
Annual Water Service Charges																								
Annual Increase (%)	2.41%	2.35%	2.62%	0.29%	9.15%	2.61%	1.57%	2.73%	1.01%	1.41%	3.76%	4.36%	1.43%	2.66%	2.45%	2.47%	2.48%	2.36%	2.35%	2.42%	2.29%	1.98%	2.00%	2.02%
15 mm	35.76	36.60	37.56	37.67	41.11	42.19	42.85	44.02	44.46	45.09	46.78	48.82	49.52	50.84	52.09	53.37	54.70	55.98	57.30	58.69	60.03	61.22	62.45	63.71
25 mm	72.24	74.04	75.84	76.06	83.02	85.18	86.51	88.87	89.77	91.04	94.47	98.59	100.00	102.66	105.18	107.77	110.44	113.04	115.70	118.50	121.21	123.62	126.09	128.64
40 mm	132.00	135.36	138.72	139.12	151.85	155.80	158.25	162.56	164.21	166.53	172.79	180.32	182.91	187.77	192.38	197.13	202.01	206.77	211.63	216.75	221.71	226.11	230.63	235.29
50 mm	165.48	169.56	173.76	174.26	190.20	195.16	198.22	203.62	205.69	208.59	216.43	225.87	229.11	235.20	240.97	246.92	253.04	259.00	265.09	271.50	277.71	283.22	288.89	294.73
75 mm	345.72	354.36	363.24	364.28	397.61	407.97	414.37	425.67	429.98	436.05	452.45	472.18	478.95	491.69	503.74	516.18	528.96	541.42	554.15	567.55	580.55	592.07	603.92	616.12
100 mm	505.68	518.28	531.24	532.76	581.51	596.66	606.01	622.54	628.85	637.73	661.71	690.56	700.46	719.09	736.73	754.91	773.61	791.83	810.45	830.05	849.06	865.90	883.24	901.07
150 mm	859.92	881.40	903.48	906.07	988.98	1,014.74	1,030.65	1,058.76	1,069.48	1,084.59	1,125.37	1,174.44	1,191.27	1,222.96	1,252.95	1,283.87	1,315.68	1,346.67	1,378.34	1,411.67	1,443.99	1,472.63	1,502.12	1,532.46
200 mm	1,298.16	1,330.56	1,363.80	1,367.71	1,492.86	1,531.75	1,555.76	1,598.19	1,614.38	1,637.18	1,698.74	1,772.82	1,798.22	1,846.06	1,891.33	1,938.00	1,986.02	2,032.79	2,080.60	2,130.91	2,179.70	2,222.94	2,267.44	2,313.24
250 mm	1,726.20	1,769.40	1,813.68	1,818.88	1,985.31	2,037.03	2,068.96	2,125.39	2,146.92	2,177.24	2,259.11	2,357.62	2,391.41	2,455.02	2,515.22	2,577.29	2,641.15	2,703.35	2,766.93	2,833.83	2,898.72	2,956.22	3,015.41	3,076.31
Uniform Rate																								
Annual Increase (%)	2.41%	2.35%	2.87%	8.78%	9.48%	2.91%	1.87%	3.03%	1.31%	1.70%	4.05%	4.65%	1.71%	2.94%	2.73%	2.74%	2.75%	2.62%	2.62%	2.68%	2.55%	2.24%	2.26%	2.27%
Uniform Water Rate ($/m³)	1.70	1.74	1.79	1.95	2.13	2.19	2.23	2.30	2.33	2.37	2.47	2.58	2.63	2.70	2.78	2.85	2.93	3.01	3.09	3.17	3.25	3.33	3.40	3.48
Annual Increase (%)	3.33%	3.23%	5.80%	6.55%	6.55%	6.55%	0.04%	0.04%	5.45%	3.03%	5.23%	3.43%	3.41%	3.40%	3.44%	2.73%	2.58%	2.61%	2.58%	2.57%	2.56%	2.24%	2.25%	2.26%
Uniform Wastewater Rate ($/m³)	2.17	2.24	2.37	2.53	2.69	2.87	2.87	2.87	3.03	3.12	3.28	3.39	3.51	3.63	3.75	3.86	3.95	4.06	4.16	4.27	4.38	4.48	4.58	4.68

Appendix I - Service Charges and Rate Projections

Service Charges & Rate Projections - Option 2

Rate Component	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
Annual Water Service Charges																								
Annual Increase (%)	2.41%	2.35%	2.62%	150.72%	9.15%	2.61%	1.57%	2.73%	1.01%	1.41%	3.76%	4.36%	1.43%	2.66%	2.45%	2.47%	2.48%	2.36%	2.35%	2.42%	2.29%	1.98%	2.00%	2.02%
15 mm	35.76	36.60	37.56	94.17	102.79	105.46	107.12	110.04	111.15	112.72	116.96	122.06	123.81	127.10	130.22	133.43	136.74	139.96	143.25	146.72	150.08	153.05	156.12	159.27
25 mm	72.24	74.04	75.84	190.14	207.54	212.95	216.29	222.19	224.44	227.61	236.16	246.46	249.99	256.65	262.94	269.43	276.10	282.61	289.25	296.25	303.03	309.04	315.23	321.59
40 mm	132.00	135.36	138.72	347.79	379.62	389.51	395.61	406.40	410.52	416.32	431.97	450.81	457.27	469.43	480.94	492.81	505.02	516.92	529.07	541.87	554.27	565.27	576.59	588.23
50 mm	165.48	169.56	173.76	435.65	475.51	487.90	495.54	509.06	514.22	521.48	541.09	564.68	572.77	588.01	602.43	617.30	632.59	647.49	662.72	678.74	694.28	708.05	722.23	736.82
75 mm	345.72	354.36	363.24	910.70	994.03	1,019.93	1,035.92	1,064.17	1,074.95	1,090.13	1,131.12	1,180.45	1,197.37	1,229.22	1,259.36	1,290.44	1,322.41	1,353.56	1,385.39	1,418.89	1,451.37	1,480.17	1,509.80	1,540.29
100 mm	505.68	518.28	531.24	1,331.91	1,453.78	1,491.65	1,515.03	1,556.36	1,572.12	1,594.32	1,654.27	1,726.41	1,751.15	1,797.73	1,841.82	1,887.27	1,934.03	1,979.58	2,026.13	2,075.13	2,122.64	2,164.75	2,208.09	2,252.68
150 mm	859.92	881.40	903.48	2,265.18	2,472.44	2,536.86	2,576.62	2,646.89	2,673.71	2,711.47	2,813.42	2,936.11	2,978.18	3,057.41	3,132.38	3,209.68	3,289.21	3,366.67	3,445.85	3,529.17	3,609.97	3,681.59	3,755.30	3,831.14
200 mm	1,298.16	1,330.56	1,363.80	3,419.28	3,732.14	3,829.38	3,889.39	3,995.48	4,035.96	4,092.95	4,246.85	4,432.05	4,495.56	4,615.15	4,728.32	4,845.00	4,965.05	5,081.98	5,201.49	5,327.27	5,449.24	5,557.34	5,668.61	5,783.09
250 mm	1,726.20	1,769.40	1,813.68	4,547.20	4,963.27	5,092.58	5,172.40	5,313.48	5,367.31	5,443.10	5,647.77	5,894.06	5,978.52	6,137.56	6,288.06	6,443.24	6,602.88	6,758.38	6,917.32	7,084.58	7,246.79	7,390.56	7,538.52	7,690.78
Uniform Rate																								
Annual Increase (%)	2.41%	2.35%	2.87%	-1.64%	9.48%	2.91%	1.87%	3.03%	1.31%	1.70%	4.05%	4.65%	1.71%	2.94%	2.73%	2.74%	2.75%	2.62%	2.62%	2.68%	2.55%	2.24%	2.26%	2.27%
Uniform Water Rate ($/m³)	1.70	1.74	1.79	1.76	1.93	1.98	2.02	2.08	2.11	2.15	2.23	2.34	2.38	2.45	2.51	2.58	2.65	2.72	2.79	2.87	2.94	3.01	3.08	3.14

Rate Component	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
Annual Wastewater Service Charges																								
Annual Increase (%)					6.23%	6.24%	-0.25%	-0.25%	5.15%	2.74%	4.94%	3.14%	3.13%	3.12%	3.16%	2.46%	2.31%	2.34%	2.31%	2.31%	2.30%	1.98%	2.00%	2.01%
15 mm	-	-	-	114.33	121.45	129.02	128.70	128.39	135.00	138.70	145.55	150.12	154.82	159.65	164.70	168.75	172.64	176.69	180.77	184.95	189.21	192.96	196.81	200.77
25 mm	-	-	-	230.85	245.23	260.52	259.87	259.24	272.58	280.06	293.89	303.13	312.60	322.37	332.56	340.73	348.59	356.76	365.01	373.44	382.04	389.62	397.40	405.38
40 mm	-	-	-	422.24	448.55	476.53	475.34	474.17	498.59	512.26	537.55	554.45	571.79	589.64	608.29	623.23	637.62	652.56	667.65	683.07	698.79	712.65	726.89	741.49
50 mm	-	-	-	528.90	561.86	596.89	595.41	593.94	624.53	641.66	673.33	694.51	716.22	738.58	761.94	780.66	798.67	817.39	836.29	855.61	875.30	892.66	910.49	928.79
75 mm	-	-	-	1,105.65	1,174.54	1,247.79	1,244.68	1,241.62	1,305.56	1,341.37	1,407.58	1,451.85	1,497.23	1,543.99	1,592.81	1,631.95	1,669.61	1,708.74	1,748.24	1,788.64	1,829.79	1,866.09	1,903.36	1,941.61
100 mm	-	-	-	1,617.02	1,717.77	1,824.89	1,820.35	1,815.88	1,909.38	1,961.76	2,058.59	2,123.33	2,189.70	2,258.09	2,329.49	2,386.73	2,441.80	2,499.03	2,556.81	2,615.89	2,676.08	2,729.16	2,783.67	2,839.61
150 mm	-	-	-	2,750.07	2,921.41	3,103.60	3,095.88	3,088.26	3,247.29	3,336.37	3,501.05	3,611.15	3,724.03	3,840.33	3,961.76	4,059.11	4,152.78	4,250.11	4,348.37	4,448.84	4,551.21	4,641.48	4,734.19	4,829.32
200 mm	-	-	-	4,151.22	4,409.86	4,684.87	4,673.21	4,661.72	4,901.77	5,036.24	5,284.82	5,451.02	5,621.41	5,796.97	5,980.26	6,127.21	6,268.60	6,415.52	6,563.84	6,715.51	6,870.03	7,006.30	7,146.24	7,289.84
250 mm	-	-	-	5,520.59	5,864.56	6,230.28	6,214.78	6,199.50	6,518.72	6,697.55	7,028.14	7,249.16	7,475.76	7,709.23	7,952.98	8,148.41	8,336.44	8,531.82	8,729.07	8,930.77	9,136.26	9,317.48	9,503.59	9,694.56
Uniform Rate																								
Annual Increase (%)	3.33%	3.23%	5.80%	-9.43%	6.55%	6.55%	0.04%	0.04%	5.45%	3.03%	5.23%	3.43%	3.41%	3.40%	3.44%	2.73%	2.58%	2.61%	2.58%	2.57%	2.56%	2.24%	2.25%	2.26%
Uniform Wastewater Rate ($/m³)	2.17	2.24	2.37	2.15	2.29	2.44	2.44	2.44	2.57	2.65	2.79	2.88	2.98	3.08	3.19	3.28	3.36	3.45	3.54	3.63	3.72	3.81	3.89	3.98

Appendix I - Service Charges and Rate Projections

Service Charges & Rate Projections - Option 3

Rate Component	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
Annual Water Service Charges																								
Annual Increase (%)	2.41%	2.35%	2.62%	321.75%	9.50%	2.93%	1.88%	3.04%	1.32%	1.72%	4.07%	4.67%	1.73%	2.96%	2.75%	2.76%	2.76%	2.64%	2.63%	2.70%	2.56%	2.26%	2.27%	2.29%
15 mm	35.76	36.60	37.56	158.41	173.45	178.53	181.90	187.43	189.91	193.17	201.04	210.42	214.06	220.39	226.44	232.68	239.12	245.43	251.89	258.68	265.31	271.30	277.46	283.80
25 mm	72.24	74.04	75.84	319.85	350.23	360.49	367.28	378.46	383.46	390.05	405.92	424.88	432.22	445.00	457.22	469.83	482.82	495.56	508.60	522.32	535.71	547.79	560.23	573.04
40 mm	132.00	135.36	138.72	585.05	640.62	659.38	671.80	692.25	701.40	713.45	742.48	777.15	790.59	813.96	836.31	859.37	883.13	906.43	930.29	955.38	979.88	1,001.98	1,024.73	1,048.15
50 mm	165.48	169.56	173.76	732.83	802.44	825.93	841.49	867.11	878.57	893.66	930.03	973.45	990.28	1,019.57	1,047.55	1,076.44	1,106.20	1,135.39	1,165.28	1,196.70	1,227.39	1,255.07	1,283.57	1,312.91
75 mm	345.72	354.36	363.24	1,531.96	1,677.47	1,726.59	1,759.12	1,812.67	1,836.62	1,868.17	1,944.20	2,034.97	2,070.16	2,131.37	2,189.88	2,250.27	2,312.48	2,373.51	2,435.99	2,501.67	2,565.82	2,623.69	2,683.27	2,744.60
100 mm	505.68	518.28	531.24	2,240.50	2,453.30	2,525.15	2,572.72	2,651.03	2,686.06	2,732.20	2,843.39	2,976.15	3,027.62	3,117.14	3,202.71	3,291.03	3,382.02	3,471.26	3,562.64	3,658.70	3,752.53	3,837.15	3,924.29	4,013.99
150 mm	859.92	881.40	903.48	3,810.42	4,172.33	4,294.52	4,375.42	4,508.61	4,568.18	4,646.66	4,835.76	5,061.54	5,149.07	5,301.32	5,446.85	5,597.06	5,751.80	5,903.58	6,058.99	6,222.35	6,381.92	6,525.85	6,674.04	6,826.59
200 mm	1,298.16	1,330.56	1,363.80	5,751.82	6,298.12	6,482.56	6,604.68	6,805.74	6,895.65	7,014.12	7,299.57	7,640.38	7,772.50	8,002.32	8,221.99	8,448.74	8,682.32	8,911.43	9,146.02	9,392.61	9,633.49	9,850.75	10,074.43	10,304.71
250 mm	1,726.20	1,769.40	1,813.68	7,649.19	8,375.69	8,620.98	8,783.38	9,050.76	9,170.34	9,327.88	9,707.49	10,160.73	10,336.43	10,642.06	10,934.20	11,235.74	11,546.38	11,851.07	12,163.04	12,490.98	12,811.32	13,100.23	13,397.71	13,703.95
Uniform Rate																								
Annual Increase (%)	2.41%	2.35%	2.87%	5.35%	9.50%	2.93%	1.88%	3.04%	1.32%	1.72%	4.07%	4.67%	1.73%	2.96%	2.75%	2.76%	2.76%	2.64%	2.63%	2.70%	2.56%	2.26%	2.27%	2.29%
Block 1 ($/m^3)	1.70	1.74	1.79	1.89	2.06	2.13	2.17	2.23	2.26	2.30	2.39	2.51	2.55	2.62	2.70	2.77	2.85	2.92	3.00	3.08	3.16	3.23	3.30	3.38
Block 2 ($/m^3)				2.26	2.48	2.55	2.60	2.68	2.71	2.76	2.87	3.01	3.06	3.15	3.23	3.32	3.42	3.51	3.60	3.70	3.79	3.88	3.96	4.05

Rate Component	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
Annual Sanitary Sewer Service Charges																								
Annual Increase (%)					6.57%	6.57%	0.06%	0.06%	5.47%	3.05%	5.25%	3.45%	3.43%	3.42%	3.45%	2.75%	2.59%	2.63%	2.59%	2.59%	2.57%	2.25%	2.26%	2.27%
15 mm	-	-	-	193.22	205.91	219.44	219.57	219.70	231.72	238.79	251.32	259.98	268.89	278.08	287.69	295.58	303.25	311.21	319.27	327.53	335.96	343.53	351.30	359.29
25 mm	-	-	-	390.15	415.77	443.09	443.35	443.62	467.88	482.15	507.45	524.95	542.93	561.49	580.89	596.84	612.31	628.38	644.66	661.33	678.36	693.64	709.34	725.47
40 mm	-	-	-	713.63	760.50	810.46	810.95	811.43	855.80	881.91	928.19	960.19	993.07	1,027.03	1,062.51	1,091.68	1,119.98	1,149.38	1,179.16	1,209.65	1,240.79	1,268.74	1,297.47	1,326.96
50 mm	-	-	-	893.89	952.60	1,015.17	1,015.79	1,016.39	1,071.97	1,104.68	1,162.64	1,202.72	1,243.92	1,286.45	1,330.90	1,367.43	1,402.88	1,439.71	1,477.01	1,515.21	1,554.21	1,589.22	1,625.20	1,662.15
75 mm	-	-	-	1,868.65	1,991.37	2,122.19	2,123.47	2,124.74	2,240.92	2,309.30	2,430.47	2,514.26	2,600.38	2,689.29	2,782.20	2,858.58	2,932.67	3,009.67	3,087.64	3,167.49	3,249.02	3,322.22	3,397.43	3,474.67
100 mm	-	-	-	2,732.91	2,912.39	3,103.71	3,105.58	3,107.44	3,277.36	3,377.36	3,554.57	3,677.12	3,803.06	3,933.09	4,068.98	4,180.68	4,289.05	4,401.65	4,515.68	4,632.47	4,751.71	4,858.76	4,968.76	5,081.71
150 mm	-	-	-	4,647.87	4,953.11	5,278.48	5,281.67	5,284.83	5,573.80	5,743.88	6,045.26	6,253.67	6,467.87	6,689.01	6,920.11	7,110.08	7,294.38	7,485.89	7,679.82	7,878.45	8,081.23	8,263.29	8,450.37	8,642.47
200 mm	-	-	-	7,015.94	7,476.70	7,967.84	7,972.66	7,977.43	8,413.63	8,670.36	9,125.31	9,439.90	9,763.22	10,097.04	10,445.88	10,732.65	11,010.85	11,299.92	11,592.66	11,892.49	12,198.59	12,473.40	12,755.80	13,045.78
250 mm	-	-	-	9,330.30	9,943.05	10,596.22	10,602.62	10,608.97	11,189.06	11,530.48	12,135.49	12,553.86	12,983.84	13,427.77	13,891.69	14,273.05	14,643.02	15,027.46	15,416.76	15,815.49	16,222.57	16,588.03	16,963.58	17,349.23
Uniform Rate																								
Annual Increase (%)	3.33%	3.23%	5.80%	-2.94%	6.57%	6.57%	0.06%	0.06%	5.47%	3.05%	5.25%	3.45%	3.43%	3.42%	3.45%	2.75%	2.59%	2.63%	2.59%	2.59%	2.57%	2.25%	2.26%	2.27%
Block 1 ($/m^3)	2.17	2.24	2.37	2.30	2.45	2.61	2.61	2.62	2.76	2.84	2.99	3.10	3.20	3.31	3.42	3.52	3.61	3.70	3.80	3.90	4.00	4.09	4.18	4.28
Block 2 ($/m^3)				2.76	2.94	3.13	3.14	3.14	3.31	3.41	3.59	3.71	3.84	3.97	4.11	4.22	4.33	4.45	4.56	4.68	4.80	4.91	5.02	5.13