



Water and Wastewater Rate Study

Town of Renfrew

March 3, 2021

Watson & Associates Economists Ltd.
905-272-3600
info@watsonecon.ca

Table of Contents

	Page
Executive Summary	i
1. Introduction.....	1-1
1.1 Background.....	1-1
1.2 Study Process.....	1-2
1.3 Regulatory Changes in Ontario.....	1-2
1.4 Sustainable Water and Sewage Systems Act.....	1-3
1.5 Financial Plans Regulation	1-5
1.6 Water Opportunities Act, 2010.....	1-7
1.7 Infrastructure for Jobs and Prosperity Act, 2015 (I.J.P.A.)	1-8
1.8 Forecast Growth and Servicing Requirements	1-10
2. Capital Infrastructure Needs.....	2-1
2.1 Capital Forecast.....	2-1
3. Lifecycle Costing.....	3-1
3.1 Overview of Lifecycle Costing.....	3-1
3.1.1 Definition.....	3-1
3.1.2 Financing Costs	3-1
3.1.3 Costing Methods	3-4
3.2 Impact on Budgets.....	3-6
4. Capital Cost Financing Options	4-1
4.1 Summary of Capital Cost Financing Alternatives.....	4-1
4.2 Development Charges Act, 1997	4-2
4.3 Municipal Act	4-4
4.4 Grant Funding Availability	4-6
4.5 Existing Reserves/Reserve Funds.....	4-7
4.6 Debenture Financing.....	4-8
4.7 Infrastructure Ontario	4-8
4.8 Recommended Capital Financing Approach.....	4-9



Table of Contents (Cont'd)

	Page
5. Overview of Expenditures and Revenues	5-1
5.1 Water Operating Expenditures.....	5-1
5.2 Water Operating Revenues	5-1
5.3 Wastewater Operating Expenditures	5-6
5.4 Wastewater Operating Revenues	5-6
6. Pricing Structures	6-1
6.1 Introduction.....	6-1
6.2 Alternative Pricing Structures.....	6-2
6.3 Assessment of Alternative Pricing Structures	6-4
6.4 Rate Structures in Ontario	6-9
6.5 Recommended Rate Structures.....	6-10
7. Analysis of Water and Wastewater Rates and Policy Matters	7-1
7.1 Introduction.....	7-1
7.2 Water Rates.....	7-1
7.3 Wastewater Rates	7-3
7.4 Combined Water and Wastewater Impact for the Average Residential Customer.....	7-5
8. Recommendations	8-1
Appendix A Water System Inventory Data	A-1
Appendix B Wastewater System Inventory Data	B-1
Appendix C Detailed Water Rate Calculations.....	C-1
Appendix D Detailed Wastewater Rate Calculations.....	D-1



List of Acronyms and Abbreviations

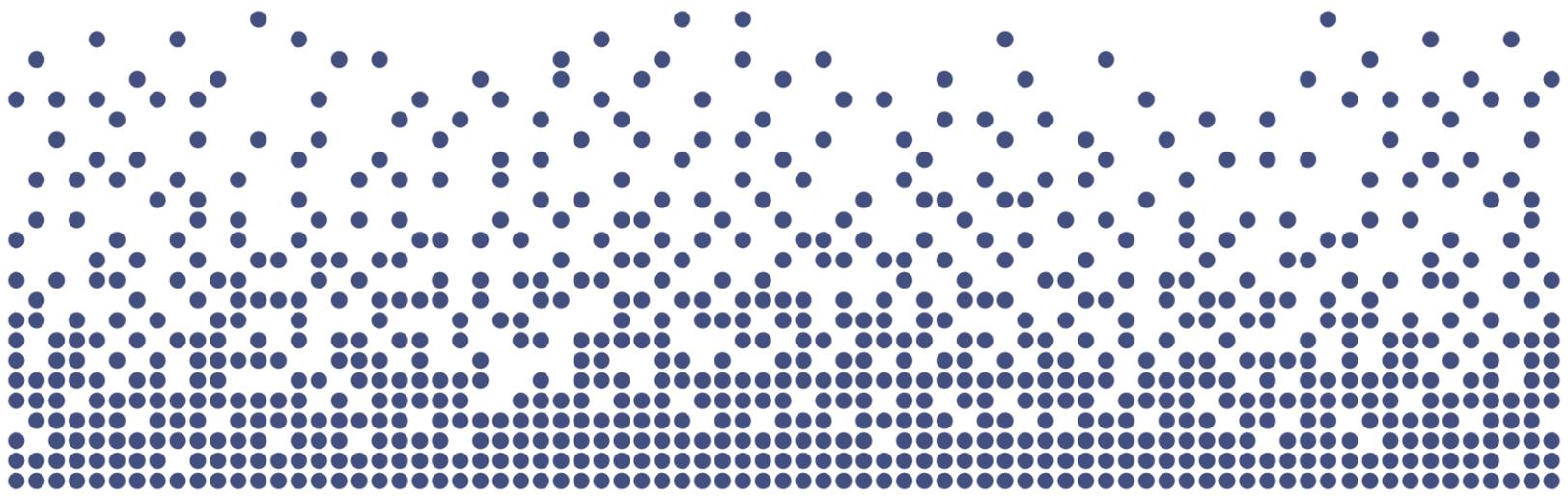
Acronym	Full Description of Acronym
A.M.O.	Association of Municipalities of Ontario
A.M.P.	Asset Management Plan
C.W.W.F.	Clean Water and Wastewater Fund
D.C.A.	Development Charges Act, 1997
F.I.R.	Financial Information Return
I.J.P.A.	Infrastructure for Jobs and Prosperity Act, 2015
I.O.	Infrastructure Ontario
LPAT	Local Planning Appeal Tribunal
M.O.E.	Ministry of Environment
O.C.I.F.	Ontario Community Infrastructure Fund
O.C.W.A.	Ontario Clean Water Agency
O.M.B.	Ontario Municipal Board
O. Reg.	Ontario Regulation
O.S.I.F.A.	Ontario Strategic Infrastructure Financing Authority
P.S.A.B.	Public Sector Accounting Board



List of Acronyms and Abbreviations (Cont'd)

P.T.I.F. Public Transit Infrastructure Fund

S.W.S.S.A. Sustainable Water and Sewage Systems Act, 2002



Executive Summary



Executive Summary

The Town of Renfrew retained Watson & Associates Economists Ltd. (Watson) to undertake a water and wastewater rate study. This study has been completed as part of a three-phased process in association with Dillon Consulting Limited (Dillon) and the Ontario Clean Water Agency (O.C.W.A.), which also includes the Town's Asset Management Plan, the Development Charges Study, and the Water Financial Plan. This rate study aims to provide an analysis for current capital and operating forecasts, costing for lifecycle cost requirements, current volumes and customer profiles. The results of this analysis provide updated water and wastewater base charges and volume rates for the Town of Renfrew. The rate analysis contained herein continues to provide fiscally responsible practices that are in line with current provincial legislation at a level of rate increases that are reasonable.

The analysis presented herein provides the following:

- The 2021 to 2030 capital spending program for water and wastewater is \$18.37 million and \$18.31 million (inflated), respectively;
- Annual operating expenditures are assumed to increase by 2% per annum for most expenditures. Expenditures related to utilities, fuels, chemicals and other materials have been increased at 5% per annum;
- The (O.C.W.A.) operating related charges have been inflated by 2.6% for 2022 and 2% thereafter based on the current contract with the Town;
- The present rate structure (base monthly charge and a constant volume rate) is continued;
- The relationship between the revenue from water base charges and operating expenditures has been calculated to increase from 32% to 40% over the forecast period. This is to ensure that the Town can generate a higher fixed portion of revenue to contribute towards the water operating expenditures, which are predominately fixed costs;
- With respect to the wastewater base charges, the revenue generated represents 40% of the wastewater operating expenditures. This relationship is proposed to be continued over the forecast period; and
- The total existing customers 3,361 for water and 3,311 for wastewater. Over the forecast period, it is estimated that an additional 227 customers will be added to the system.



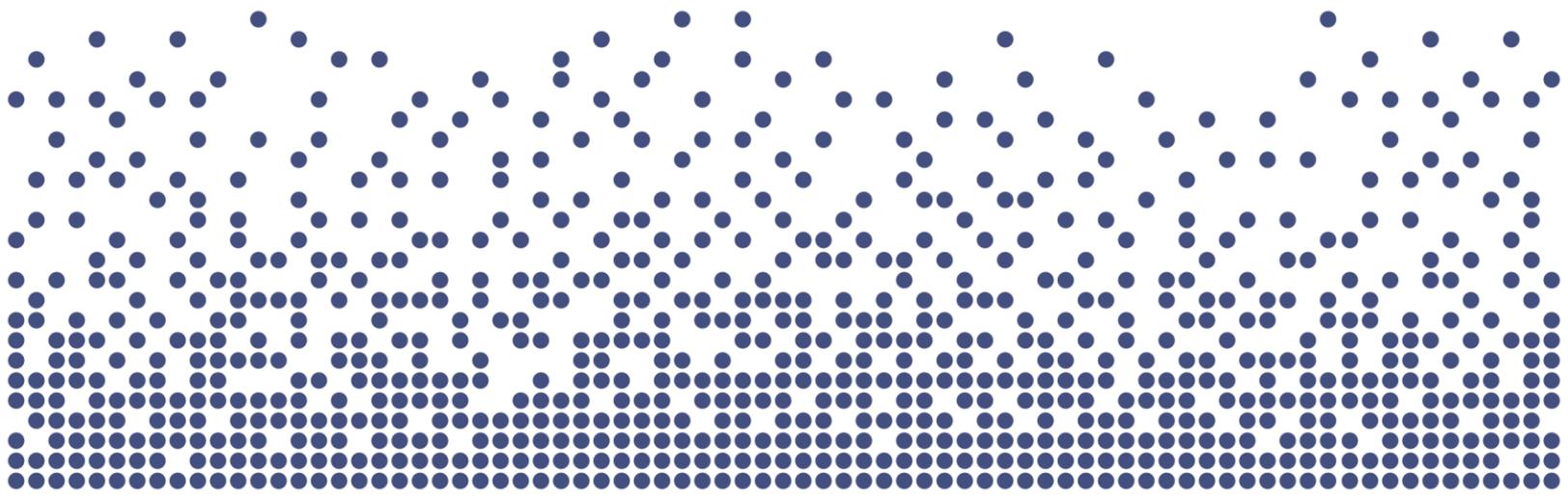
Based on the above information, rate increases for the Renfrew water system have been calculated to provide a 4% annual increase to the water bill. For wastewater, the rates have been calculated to increase at 1% per year. Therefore, the combined impact to the water and wastewater bill equates to an average increase of 2.5% per year over the next 10 years.

Table ES-1 summarizes the recommended water and wastewater rates and average annual bill (assuming an annual volume of 131 m³) based on the analysis provided herein over the forecast period.



Table ES-1
Town of Renfrew
Annual Average Residential Water and Wastewater Bill (Based on an annual usage of 131 m³)

Description	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Water											
Monthly Base Rate	\$18.47	\$19.76	\$21.15	\$22.42	\$23.76	\$25.42	\$27.20	\$29.11	\$30.56	\$31.78	\$32.74
Constant Rate	\$2.58	\$2.63	\$2.68	\$2.75	\$2.82	\$2.88	\$2.92	\$2.96	\$3.05	\$3.17	\$3.33
Annual Base Rate Bill	\$221.64	\$237.15	\$253.76	\$268.98	\$285.12	\$305.08	\$326.43	\$349.28	\$366.75	\$381.42	\$392.86
Annual Volume Bill	\$337.98	\$344.53	\$351.08	\$360.25	\$369.42	\$377.28	\$382.52	\$387.76	\$399.55	\$415.27	\$436.23
Total Annual Water Bill	\$559.62	\$581.68	\$604.84	\$629.23	\$654.54	\$682.36	\$708.95	\$737.04	\$766.30	\$796.69	\$829.09
Wastewater											
Monthly Base Rate	\$23.99	\$24.22	\$24.47	\$24.71	\$24.96	\$25.21	\$25.46	\$25.72	\$25.97	\$26.23	\$26.49
Constant Rate	\$2.38	\$2.40	\$2.42	\$2.44	\$2.46	\$2.48	\$2.50	\$2.53	\$2.56	\$2.59	\$2.62
Annual Base Rate Bill	\$287.82	\$290.70	\$293.61	\$296.54	\$299.51	\$302.50	\$305.53	\$308.58	\$311.67	\$314.78	\$317.93
Annual Volume Bill	\$311.78	\$314.40	\$317.02	\$319.64	\$322.26	\$324.88	\$327.50	\$331.43	\$335.36	\$339.29	\$343.22
Total Annual Wastewater Bill	\$599.60	\$605.10	\$610.63	\$616.18	\$621.77	\$627.38	\$633.03	\$640.01	\$647.03	\$654.07	\$661.15
Total Water & Wastewater Bill:	\$1,159.22	\$1,186.78	\$1,215.46	\$1,245.41	\$1,276.31	\$1,309.74	\$1,341.98	\$1,377.06	\$1,413.33	\$1,450.76	\$1,490.24
% Increase - Total Annual Bill*		2.4%	2.4%	2.5%	2.5%	2.6%	2.5%	2.6%	2.6%	2.6%	2.7%



Report



Chapter 1

Introduction



1. Introduction

1.1 Background

The Town of Renfrew currently services 3,361 metered water customers and 3,311 wastewater customers. The water source comes from the Bonnechere River with raw water treated and subsequently directed to two clearwells. The treated water is then pumped from the clearwells to the distribution system. The Town's wastewater is treated and directed to two settling tanks. The treated wastewater is discharged to the Bonnechere River via the Town's storm sewers.

The water and wastewater systems are metered and utilize rate structures with a bi-monthly base charge that varies based on meter size, as well as a volume charge on a per cubic metre basis. Table 1-1 provides the existing rates currently in effect.

Table 1-1
Town of Renfrew
Water and Wastewater Rates – 2020

2020 - Water Billing Rates			2020 - Wastewater Billing Rates		
Base Charge (Bi-monthly)			Base Charge (Bi-monthly)		
5/8" x 3/4"		36.94	5/8" x 3/4"		47.97
3/4"		36.94	3/4"		47.97
1"		52.53	1"		68.21
1 1/2"		76.69	1 1/2"		99.54
2"		124.27	2"		161.33
3"		292.46	3"		379.68
4"		431.65	4"		560.33
Volume Charge			Volume Charge		
\$	2.580	per m ³	\$	2.380	per m ³

Since the Walkerton crisis, the Province has continued to make legislative changes for municipal water and wastewater systems. Noted below are the historical changes along with pending legislation anticipated to be implemented in the future. Watson & Associates Economists Ltd. (Watson) was retained by the Town to assist in addressing these changes in a proactive manner as they relate to the water and wastewater systems. The assessment provided herein addresses changes recommended to the



water and wastewater rates based on the most current information and forecasts the implications over the next ten-year period.

1.2 Study Process

The objectives of the study and the steps involved in carrying out this assignment are summarized below:

- Identify all current and future water and wastewater system capital needs to assess the immediate and longer-term implications;
- Identify potential methods of cost recovery from the capital needs listing. These recovery methods may include other statutory authorities (e.g. *Development Charges Act, 1997 (D.C.A.)*, *Municipal Act*, etc.) as an offset to recovery through the water and wastewater rates;
- Identify existing operating costs by component and estimate future operating costs over the next ten years. This assessment identifies fixed and variable costs in order to project those costs sensitive to changes to the existing infrastructure inventory, as well as costs which may increase commensurate with growth; and
- Provide staff and Committee/Council the findings to assist in gaining approval of the rates for 2021 and future years.

1.3 Regulatory Changes in Ontario

Resulting from the water crisis in Walkerton, significant regulatory changes have been made in Ontario. These changes arise as a result of the Walkerton Commission and the 93 recommendations made by the Walkerton Inquiry Part II report. Areas of recommendation include:

- watershed management and source protection;
- quality management;
- preventative maintenance;
- research and development;
- new performance standards;
- sustainable asset management; and
- lifecycle costing.



The legislation which would have most impacted municipal water and wastewater rates was the *Sustainable Water and Sewage Systems Act* (S.W.S.S.A.) which would have required municipalities to implement full cost pricing. The legislation was enacted in 2002, however, it had not been implemented pending the approval of its regulations. The Act was repealed as of January 1, 2013. It is expected that the provisions of the *Water Opportunities Act* will implement the fundamental requirements of S.W.S.S.A. Furthermore, on December 27, 2017, O. Reg. 588/17 was released under the *Infrastructure for Jobs and Prosperity Act, 2015* (I.J.P.A.), which outlines the requirements for asset management for municipalities. The results of the asset management review under this Act will need to be considered in light of the recent investments undertaken by the Town and the capital spending plan provided herein. The following sections describe these various resulting changes.

1.4 Sustainable Water and Sewage Systems Act

As noted earlier, the S.W.S.S.A. was passed on December 13, 2002. The intent of the Act was to introduce the requirement for municipalities to undertake an assessment of the “full cost” of providing their water and wastewater services. It is noted, however, that this Act has been repealed. To provide broader context and understanding to other legislation discussed herein, a description of the Act is provided below.

Full costs for water service was defined in subsection 3(7) of the Act and included “...source protection costs, operating costs, financing costs, renewal and replacement costs and improvement costs associated with extracting, treating or distributing water to the public and such other costs which may be specified by regulation.” Similar provisions were made for wastewater services in subsection 4(7) with respect to “...collecting, treating or discharging waste water.”

The Act would have required the preparation of two reports for submission to the Ministry of the Environment (or such other member of the Executive Council as may be assigned the administration of this Act under the *Executive Council Act*). The first report was on the “full cost of services” and the second was the “cost recovery plan.” Once these reports were reviewed and approved by the Ministry, the municipality would have been required to implement the plans within a specified time period.

In regard to the **full cost of services** report, the municipality (deemed a regulated entity under the Act) would prepare and approve a report concerning the provision of water



and sewage services. This report was to include an inventory of the infrastructure, a management plan providing for the long-term integrity of the systems, and would address the full cost of providing the services (other matters may be specified by the regulations) along with the revenue obtained to provide them. A professional engineer would certify the inventory and management plan portion of the report. The municipality's auditor would be required to provide a written opinion on the report. The report was to be approved by the municipality and then be forwarded to the Ministry along with the engineer's certification and the auditor's opinion. The regulations would stipulate the timing for this report.

The second report was referred to as a **cost recovery plan** and would address how the municipality intended to pay for the full costs of providing the service. The regulations were to specify limitations on what sources of revenue the municipality may use. The regulations may have also provided limits as to the level of increases any customer or class of customer may experience over any period of time. Provision was made for the municipality to implement increases above these limits; however, ministerial approval would be required first. Similar to the first report, the municipal auditor would provide a written opinion on the report prior to Council's adoption, and this opinion must accompany the report when submitted to the Province.

The Act provided the Minister the power to approve or not approve the plans. If the Minister was not satisfied with the report or if a municipality did not submit a plan, the Minister may have a plan prepared. The cost to the Crown for preparing the plan would be recovered from the municipality. As well, the Minister may direct two or more regulated municipalities to prepare a joint plan. This joint plan may be directed at the onset or be directed by the Minister after receiving the individual plans from the municipalities.

The Minister also had the power to order a municipality to generate revenue from a specific revenue source or in a specified manner. The Minister may have also ordered a regulated entity to do or refrain from doing such things as the Minister considered advisable to ensure that the entity pays the full cost of providing the services to the public.

Once the plans were approved and in place, the municipality would be required to submit progress reports. The timing of these reports and the information to be contained therein would be established by the regulations. A municipal auditor's



opinion must be provided with the progress report. Municipalities would also revise the plans if they deem the estimate does not reflect the full cost of providing the services, as a result of a change in circumstances, regulatory or other changes that affect their plan, etc. The municipality would then revise its prior plan, provide an auditor's opinion, and submit the plan to the Minister.

1.5 Financial Plans Regulation

On August 16, 2007, the M.O.E. passed O. Reg 453/07 which requires the preparation of financial plans for water (and wastewater) systems. The M.O.E. has also provided a Financial Plan Guidance Document to assist in preparing the plans. A brief summary of the key elements of the regulation is provided below:

- The financial plan will represent one of the key elements for the municipality to obtain its Drinking Water Licence;
- The financial plans shall be for a period of at least six years, but longer planning horizons are encouraged;
- As the regulation is under the *Safe Drinking Water Act, 2002*, the preparation of the plan is mandatory for water and encouraged for wastewater;
- The plan is considered a living document (i.e. will be updated as annual budgets are prepared) but will need to be undertaken, at a minimum, every five years;
- The plans generally require the forecasting of capital, operating and reserve fund positions, providing detailed inventories, forecasting future users and volume usage and corresponding calculation of rates. In addition, P.S.A.B. information on the system must be provided for each year of the forecast (i.e. total non-financial assets, tangible capital asset acquisitions, tangible capital asset construction, betterments, write-downs, disposals, total liabilities and net debt);
- The financial plans must be made available to the public (at no charge) upon request and be available on the municipality's website. The availability of this information must also be advertised; and
- The financial plans are to be approved by Resolution of the Council or governing body indicating that the drinking water system is financially viable.

In general, the financial principles of the draft regulations follow the intent of S.W.S.S.A. to move municipalities towards financial sustainability. Many of the prescriptive



requirements, however, have been removed (e.g. preparation of two separate documents for provincial approval, auditor opinions, engineer certifications, etc.).

A Guideline (“Towards Financially Sustainable Drinking Shores – Water and Wastewater Systems”) had been developed to assist municipalities in understanding the Province’s direction and provided a detailed discussion on possible approaches to sustainability. The Province’s Principles of Financially Sustainable Water and Wastewater Services are provided below:

Principle #1: Ongoing public engagement and transparency can build support for, and confidence in, financial plans and the system(s) to which they relate.

Principle #2: An integrated approach to planning among water, wastewater, and stormwater systems is desirable given the inherent relationship among these services.

Principle #3: Revenues collected for the provision of water and wastewater services should ultimately be used to meet the needs of those services.

Principle #4: Lifecycle planning with mid-course corrections is preferable to planning over the short term, or not planning at all.

Principle #5: An asset management plan is a key input to the development of a financial plan.

Principle #6: A sustainable level of revenue allows for reliable service that meets or exceeds environmental protection standards, while providing sufficient resources for future rehabilitation and replacement needs.

Principle #7: Ensuring users pay for the services they are provided leads to equitable outcomes and can improve conservation. In general, metering and the use of rates can help ensure users pay for services received.

Principle #8: Financial plans are “living” documents that require continuous improvement. Comparing the accuracy of financial projections with actual results can lead to improved planning in the future.



Principle #9: Financial plans benefit from the close collaboration of various groups, including engineers, accountants, auditors, utility staff, and municipal Council.

1.6 Water Opportunities Act, 2010

As noted earlier, since the passage of the *Safe Drinking Water Act, 2002*, continuing changes and refinements to the legislation have been introduced. Some of these Bills have found their way into law, while others have not been approved. Bill 72, the *Water Opportunities Act, 2010*, was introduced into legislation on May 18, 2010 and received Royal Assent on November 29, 2010.

The Act provides for the following elements:

- The fostering of innovative water, wastewater and stormwater technologies, services and practices in the private and public sectors;
- Preparation of water conservation plans to achieve water conservation targets established by the regulations; and
- Preparation of sustainability plans for municipal water services, municipal wastewater services and municipal stormwater services.

With regard to the sustainability plans:

- The Act extends from the water financial plans and requires a more detailed review of the water financial plan and requires a full plan for wastewater and stormwater services; and
- Regulations will provide performance targets for each service – these targets may vary based on the jurisdiction of the regulated entity or the class of entity.

The financial plan shall include:

- An asset management plan for the physical infrastructure;
- A financial plan;
- For water, a water conservation plan;
- An assessment of risks that may interfere with the future delivery of the municipal service, including, if required by the regulations, the risks posed by climate change and a plan to deal with those risks; and



- Strategies for maintaining and improving the municipal service, including strategies to ensure the municipal service can satisfy future demand, consider technologies, services and practices that promote the efficient use of water and reduce negative impacts on Ontario's water resources, and increase co-operation with other municipal service providers.

Performance indicators will be established by service, with the following considerations:

- May relate to the financing, operation or maintenance of a municipal service or to any other matter in respect of what information may be required to be included in a plan;
- May be different for different municipal service providers or for municipal services in different areas of the Province.

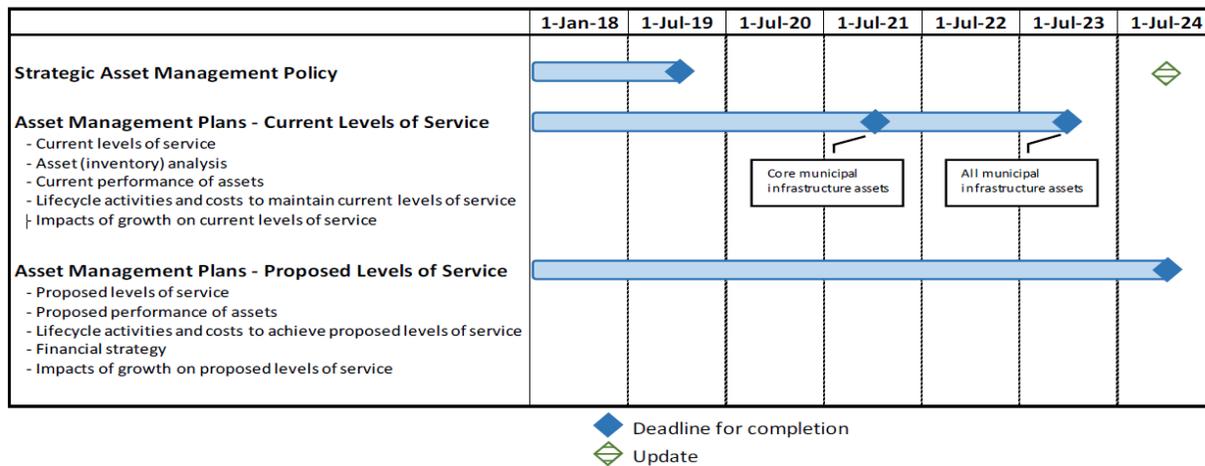
Regulations will prescribe:

- Timing;
- Contents of the plans;
- Which identified portions of the plan will require certification;
- Public consultation process; and
- Limitations, updates, refinements, etc.

As noted earlier, it is expected that this Act will implement the principles of the S.W.S.S.A. once all regulations are put in place.

1.7 Infrastructure for Jobs and Prosperity Act, 2015 (I.J.P.A.)

On June 4, 2015, the Province of Ontario passed the I.J.P.A. which, over time, will require municipalities to undertake and implement asset management plans for all infrastructure they own. On December 27, 2017, the Province released Ontario Regulation 588/17 under the I.J.P.A. which has three phases that municipalities must meet:



Every municipality in Ontario will have to prepare a strategic asset management policy by July 1, 2019. Municipalities will be required to review their strategic asset management policies at least every five years and make updates as necessary. The subsequent phases are as follows:

- Phase 1 – Asset Management Plan (by July 1, 2021):
 - For core assets, municipalities must have the following:
 - Inventory of assets;
 - Current levels of service measured by standard metrics; and
 - Costs to maintain levels of service.
- Phase 2 – Asset Management Plan (by July 1, 2023):
 - Same steps as Phase 1 but for all assets.
- Phase 3 – Asset Management Plan (by July 1, 2024):
 - Builds on Phase 1 and 2 by adding:
 - Proposed levels of service; and
 - Lifecycle management and financial strategy.

In relation to water and wastewater (which is considered a core asset), municipalities will need to have an asset management plan that addresses the related infrastructure by July 1, 2021 (Phase 1). O. Reg. 588/17 specifies that the municipality’s asset management plan must include the following for each asset category:

- The current levels of service being provided, determined in accordance with the following qualitative descriptions and technical metrics and based on data from at



most the two calendar years prior to the year in which all information required under this section is included in the asset management plan;

- The current performance of each asset category, including:
 - a summary of the assets in the category;
 - the replacement cost of the assets in the category;
 - the average age of the assets in the category, determined by assessing the average age of the components of the assets;
 - the information available on the condition of the assets in the category;
 - a description of the municipality's approach to assessing the condition of the assets in the category, based on recognized and generally accepted good engineering practices where appropriate; and
- The lifecycle activities that would need to be undertaken to maintain the current levels of service.

Dillon and O.C.W.A. are currently undertaking the Asset Management Plan for the Town to meet the July 1, 2021 deadline.

1.8 Forecast Growth and Servicing Requirements

As mentioned earlier, the Town of Renfrew services 3,361 metered water customers and 3,311 wastewater customers. Information on the existing number of customers and existing billable volumes was obtained from the Town.

For future water and wastewater customers to be added to the systems, consideration has been given to development potential within the serviced areas of the Town over the 2021 to 2030 forecast period. This provides an estimated 227 customers to be added to the water and wastewater system.

Based on historical information, the Town's volumes per customer is 131 m³ per year. For forecasting purposes, the assumed billable volumes per customer will be based on that figure.

Tables 1-2 and 1-3 provides the forecasted users and volumes for the Town's water and wastewater system, respectively.



Table 1-2
Town of Renfrew
2020 to 2030 Water System Forecast

Water Users Forecast

Year	Total Users	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
2020	17	9	17	17	17	17	17	17	17	17	17	17
2021	20		10	20	20	20	20	20	20	20	20	20
2022	20			10	20	20	20	20	20	20	20	20
2023	20				10	20	20	20	20	20	20	20
2024	20					10	20	20	20	20	20	20
2025	20						10	20	20	20	20	20
2026	22							11	22	22	22	22
2027	22								11	22	22	22
2028	22									11	22	22
2029	22										11	22
2030	22											11
Total	227	9	27	47	68	88	108	129	151	173	194	216
m ³ /user	131	131	131	131	131	131	131	131	131	131	131	131
Annual Flow		1,179	3,537	6,190	8,843	11,495	14,148	16,932	19,774	22,617	25,460	28,303

Water Customer Forecast	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Existing - Residential	3,053	3,053	3,053	3,053	3,053	3,053	3,053	3,053	3,053	3,053	3,053
Existing - Non-Residential	308	308	308	308	308	308	308	308	308	308	308
New - Growth	9	27	47	68	88	108	129	151	173	194	216
Total	3,370	3,388	3,408	3,429	3,449	3,469	3,490	3,512	3,534	3,555	3,577

Water Volume Forecast (m ³)	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Existing - Residential	390,291	390,291	390,291	390,291	390,291	390,291	390,291	390,291	390,291	390,291	390,291
Existing - Non-Residential	262,575	262,575	262,575	262,575	262,575	262,575	262,575	262,575	262,575	262,575	262,575
New	1,179	3,537	6,190	8,843	11,495	14,148	16,932	19,774	22,617	25,460	28,303
Total	654,045	656,403	659,056	661,709	664,361	667,014	669,798	672,640	675,483	678,326	681,169



**Table 1-3
Town of Renfrew
2020 to 2030 Wastewater System Forecast**

Wastewater Users Forecast

Year	Total Users	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
2020	17	9	17	17	17	17	17	17	17	17	17	17
2021	20		10	20	20	20	20	20	20	20	20	20
2022	20			10	20	20	20	20	20	20	20	20
2023	20				10	20	20	20	20	20	20	20
2024	20					10	20	20	20	20	20	20
2025	20						10	20	20	20	20	20
2026	22							11	22	22	22	22
2027	22								11	22	22	22
2028	22									11	22	22
2029	22										11	22
2030	22											11
Total	227	9	27	47	68	88	108	129	151	173	194	216
m ³ /user	131	131	131	131	131	131	131	131	131	131	131	131
Annual Flow		1,179	3,537	6,190	8,843	11,495	14,148	16,932	19,774	22,617	25,460	28,303

Wastewater Customer Forecast	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Existing - Residential	3,003	3,003	3,003	3,003	3,003	3,003	3,003	3,003	3,003	3,003	3,003
Existing - Non-Residential	308	308	308	308	308	308	308	308	308	308	308
New - Growth	9	27	47	68	88	108	129	151	173	194	216
Total	3,320	3,338	3,358	3,379	3,399	3,419	3,440	3,462	3,484	3,505	3,527

Wastewater Flows Forecast (m ³)	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Existing - Residential	380,291	380,291	380,291	380,291	380,291	380,291	380,291	380,291	380,291	380,291	380,291
Existing - Non-Residential	262,575	262,575	262,575	262,575	262,575	262,575	262,575	262,575	262,575	262,575	262,575
New	1,179	3,537	6,190	8,843	11,495	14,148	16,932	19,774	22,617	25,460	28,303
Total	644,045	646,403	649,056	651,709	654,361	657,014	659,798	662,640	665,483	668,326	671,169

Note: Above new flows are water flows on which the wastewater billing will be calculated



Chapter 2

Capital Infrastructure Needs



2. Capital Infrastructure Needs

2.1 Capital Forecast

Capital forecasts have been provided for the water and wastewater systems and are presented on Tables 2-1 and 2-2 (note: the costs are in inflated dollars). Forecasted capital needs were developed in consultation with Dillon Consulting and O.C.W.A. through their ongoing work on the Town's Asset Management Plan. Additional works were identified through the Town's Capital Forecasts.

The growth-related costs have been based on the 2016 D.C. study as well as input from staff. For the purposes of the calculations, we have assumed the growth-related portion of these projects are fully funded through D.C.s and do not currently impact the water and wastewater rates. The growth-related capital program may be further refined as part of the 2021 D.C. study.

A summary of the capital works related to the water and wastewater services is provided on the following tables.



Table 2-1
Town of Renfrew
2021 to 2030 Water Capital Forecast Summary (Inflated \$)

Description	Total 2021-2030	Years Undertaken
Major Capital Works:		
Major Reconstruction Projects (Linear Assets)	4,467,000	2021-2030
Major Reconstruction Projects (Linear Assets) - Grant Funded	1,675,000	2021-2030
Highway 60 Stewart St.	322,600	2021
Raglan St. S./County Road 52	107,500	2021
Water Tower Repairs	306,000	2021
Minor Waterworks to Support Road Resurfacing	650,000	2021-2030
W07 - 2014 Chev Express Cutaway	115,000	2027
W09 - 2016 Silverado LT	44,000	2027
Low Lift Pumphouse	196,000	2021
Water Meter Replacement Program	1,566,000	2021-2030
Water Treatment Plant Large Capital Works (OCWA)	1,926,000	2021-2030
WTP BCA Work		
Building Structural Repairs	66,000	2021
Building Envelope Repairs and Replacements	547,000	2021, 2026, 2028
Mechanical Systems Replacements	268,000	2021, 2025, 2030
Electrical Systems Replacements	372,000	2030
Minor Capital:		
Minor Capital Works (OCWA)	725,000	2021-2030
Leak Detection Distribution system	13,000	2024
Review loading rates at plant & amend appr.	31,000	2021
Hydrant Flow Testing	16,000	2024
Water Meter Testing	22,000	2024
Replace Watermain Locator	7,000	2025
2016 Trailer Black Landscaper	11,000	2025
Studies:		
Rate Study	35,000	2025, 2030
Growth Related:		
Residential - Northwest (R2-2)	1,304,000	2030
Residential - Northwest (R2-1)	628,000	2030
Industrial (I2-1)	427,000	2030
Industrial (I2-1)	140,000	2030
Industrial (I2-1)	280,000	2030
Communal - Whitton Road	165,000	2030
Communal - Whitton Road	762,000	2030
Communal - Gibbon Road	177,000	2030
Communal - Gibbon Road	201,000	2030
Communal - Froats Street	146,000	2030
Communal - Whitton Road/ O'Brien	500,000	2030
Communal - Hall Avenue	152,000	2030
Total Water	18,370,100	



Table 2-2
Town of Renfrew
2021 to 2030 Wastewater Capital Forecast Summary (Inflated \$)

Description	Total 2021-2030	Years Undertaken
Major Capital Works		
Major Reconstruction Projects (Linear Assets)	4,467,000	2021-2030
Major Reconstruction Projects (Linear Assets) - Grant Funded	1,675,000	2021-2030
Hwy 60 - Stewart St.	778,800	2021
Raglan St. S./County Road 52	94,100	2021
Pumping Stations:		
Lisgar Ave. Pumping Station Design	47,000	2022
Lisgar Ave. Pumping Station Construction	318,000	2023
O'Brien - Double 350mm Forcemain - Non-Growth Related Component	72,000	2024
O'Brien Rd Pumping Station Design - Non-Growth Related Component	24,000	2023
O'Brien Rd Pumping Station Construction - Non-Growth Related Component	162,000	2024
Arthur Ave. Pumping Station Design	44,000	2025
Arthur Ave. Pumping Station Construction	282,000	2026
Coleraine Pumping Station	28,000	2025
June St. Pumping Station	202,000	2023, 2030
Hunter Gate Pumping Station	562,000	2028
1995 V07 Sludge Truck	52,000	2022
Wastewater Treatment Plant Large Capital Works (OCWA)		
	687,000	2021-2030
WPCC BCA work		
WPCC concrete deck repairs over tunnel	82,000	2021
Replace WPCC sump pump	17,000	2021
Mechanical Systems Replacements	911,000	2024, 2029
Replace WPCC Roofing Membranes	299,000	2028
Exterior lighting repairs	18,000	2029
WPCC BCA Study	18,000	2030
Minor Capital Works:		
Minor Capital Works (From OCWA)	1,040,000	2021-2030
Sewage Main Line Camera Software & Tracks	37,000	2023
Studies		
Rate Study	35,000	2025, 2030



Table 2-2 (Cont'd)

Description	Total 2021-2030	Years Undertaken
Growth Related:		
Stewart St. Trunk Sanitary Upgrade	322,400	2021
Pump Station (New 10.7L/s) (C1-3)	475,000	2030
Pump Station (New 15.5L/s + 2.8L/s) (C2-1/ I2-4)	681,000	2030
Pump Station (New 5.9L/s + 7.4L/s) (R2-1 + R2-2)	555,000	2030
Double 100mm Forcemain (C1-3)	634,000	2030
Double 150mm Forcemain (C2-1/ I2-4))	573,000	2030
Double 150mm Forcemain (R2-1 + R2-2)	655,000	2030
<u>O'Brien Rd. PS Upgrade</u>		
Double 350mm Forcemain - Growth Related Component	407,000	2024
O'Brien Pumping Station (Growth Related) - Design	135,000	2023
O'Brien Pumping Station (Growth Related) - Construction	920,000	2024
Drain to C2-1 PS	146,000	2030
Sanitary Monitoring Program	853,000	2030
Total Wastewater	18,308,300	



Chapter 3

Lifecycle Costing



3. Lifecycle Costing

3.1 Overview of Lifecycle Costing

3.1.1 Definition

For many years, lifecycle costing has been used in the field of maintenance engineering and to evaluate the advantages of using alternative materials in construction or production design. The method has gained wider acceptance and use in the areas of industrial decision-making and the management of physical assets.

By definition, lifecycle costs are all the costs which are incurred during the lifecycle of a physical asset, from the time its acquisition is first considered to the time it is taken out of service for disposal or redeployment. The stages which the asset goes through in its lifecycle are specification, design, manufacture (or build), install, commission, operate, maintain and disposal. Figure 3-1 depicts these stages in a schematic form.

3.1.2 Financing Costs

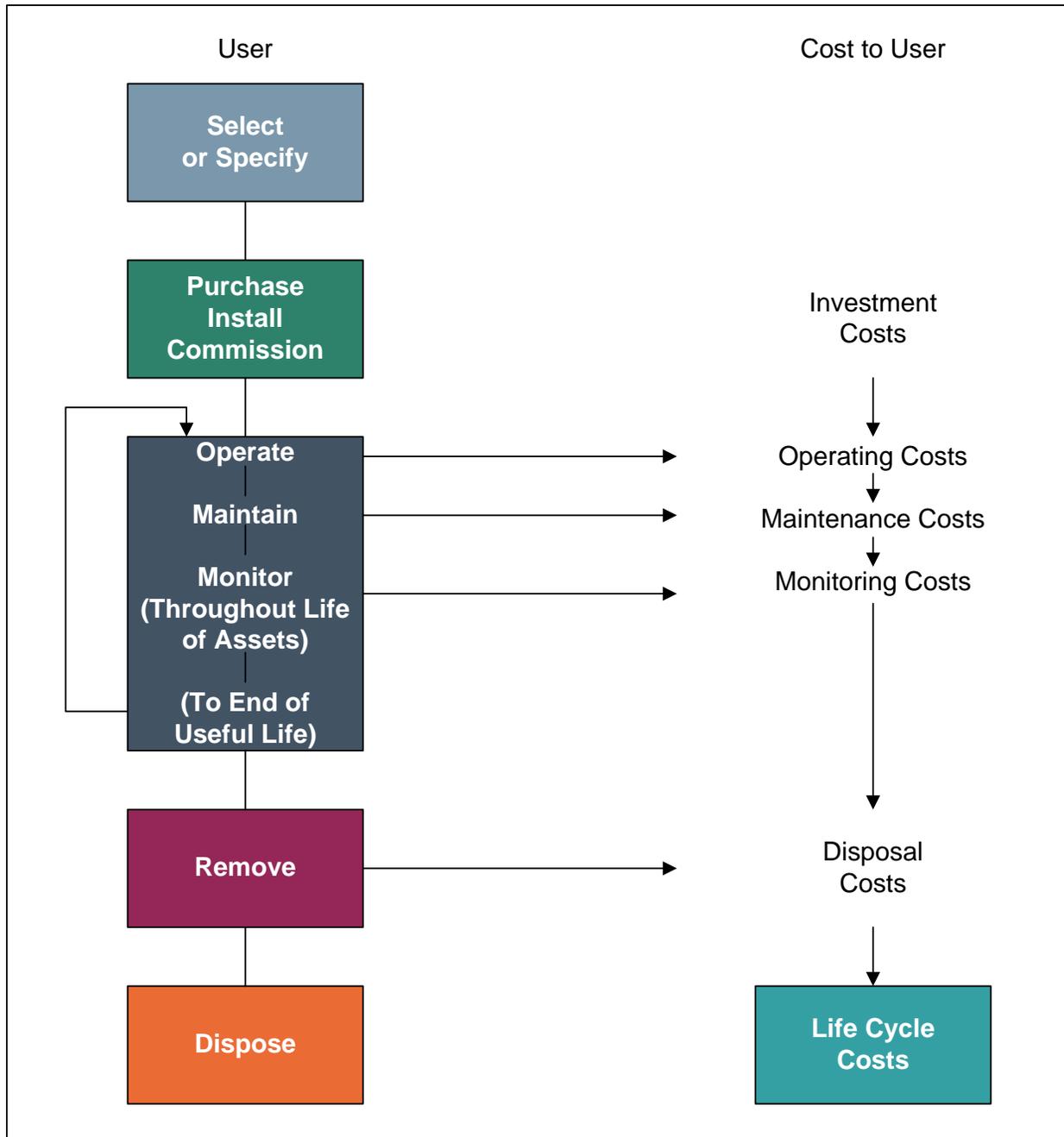
This section will focus on financing mechanisms in place to fund the costs incurred throughout the asset's life.

In a municipal context, services are provided to benefit tax/rate payers. Acquisition of assets is normally timed in relation to direct needs within the community. At times, economies of scale or technical efficiencies will lead to oversizing an asset to accommodate future growth within the Town. Over the past few decades, new financing techniques such as development charges have been employed based on the underlying principle of having tax/rate payers who benefit directly from the service paying for that service. Operating costs which reflect the cost of the service for that year are charged directly to all existing tax/rate payers who have received the benefit. Operating costs are normally charged through the tax base or user rates.

Capital expenditures are recouped through several methods, with operating budget contributions, development charges, reserves, developer contributions and debentures, being the most common.



Figure 3-1
Lifecycle Costing



New construction related to growth could produce development charges and developer contributions (e.g. works internal to a subdivision which are the responsibility of the developer to construct) to fund a significant portion of projects, where new assets are being acquired to allow growth within the Town to continue. As well, debentures could



be used to fund such works, with the debt charge carrying costs recouped from taxpayers in the future.

Capital construction to replace existing infrastructure, however, is largely not growth-related and will therefore not yield development charges or developer contributions to assist in financing these works. Hence, a municipality will be dependent upon debentures, reserves and contributions from the operating budget to fund these works.

Figure 3-2 depicts the costs of an asset from its initial conception through to replacement and then continues to follow the associated costs through to the next replacement.

As referred to earlier, growth-related financing methods such as development charges and developer contributions could be utilized to finance the growth-related component of the new asset. These revenues are collected (indirectly) from the new homeowner who benefits directly from the installation of this asset. Other financing methods may be used as well to finance the non-growth-related component of this project, such as reserves which have been collected from past tax/rate payers, operating budget contributions which are collected from existing tax/rate payers and debenturing which will be carried by future tax/rate payers. Ongoing costs for monitoring, operating and maintaining the asset will be charged annually to the existing tax/rate payer.

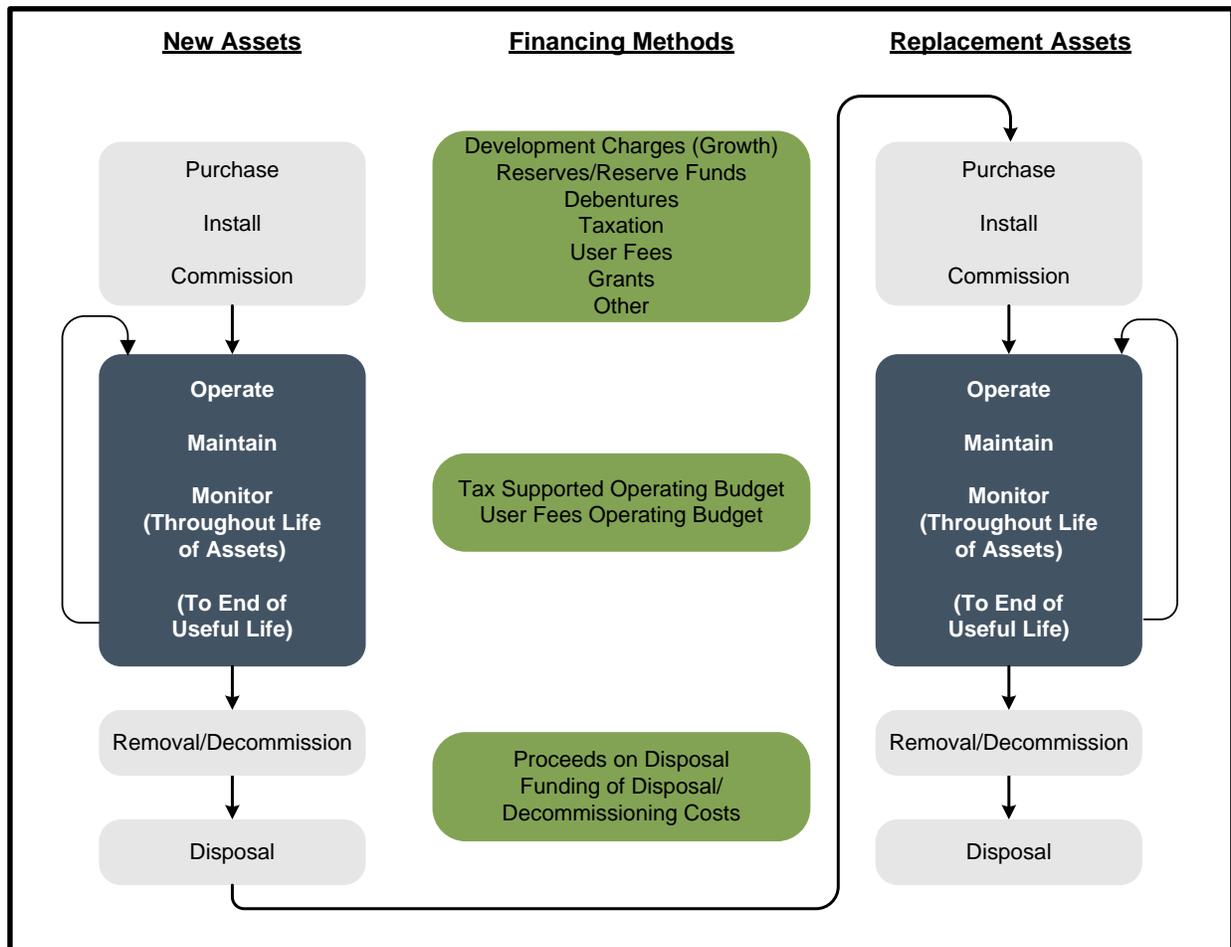
When the asset requires replacement, the sources of financing will be limited to reserves, debentures and contributions from the operating budget. At this point, the question is raised: "If the cost of replacement is to be assessed against the tax/rate payer who benefits from the replacement of the asset, should the past tax/rate payer pay for this cost or should future rate payers assume this cost?" If the position is taken that the past user has used up the asset, hence he should pay for the cost of replacement, then a charge should be assessed annually through the life of the asset, to have funds available to replace it when the time comes. If the position is taken that the future tax/rate payer should assume this cost, then debenturing and, possibly, a contribution from the operating budget should be used to fund this work.

Charging for the cost of using up an asset is the fundamental concept behind depreciation methods utilized by the private sector. This concept allows for expending the asset as it is used up in the production process. The tracking of these costs forms part of the product's selling price and, hence, end-users are charged for the asset's



depreciation. The same concept can be applied in a municipal setting to charge existing users for the asset's use and set those funds aside in a reserve to finance the cost of replacing the asset in the future.

Figure 3-2
Financing Lifecycle Costs



3.1.3 Costing Methods

There are two fundamental methods of calculating the cost of the usage of an asset and for the provision of the revenue required when the time comes to retire and replace it. The first method is the Depreciation Method. This method recognizes the reduction in the value of the asset through wear and tear and aging. There are two commonly used forms of depreciation: the straight-line method and the reducing balance method (shown graphically in Figure 3-3).



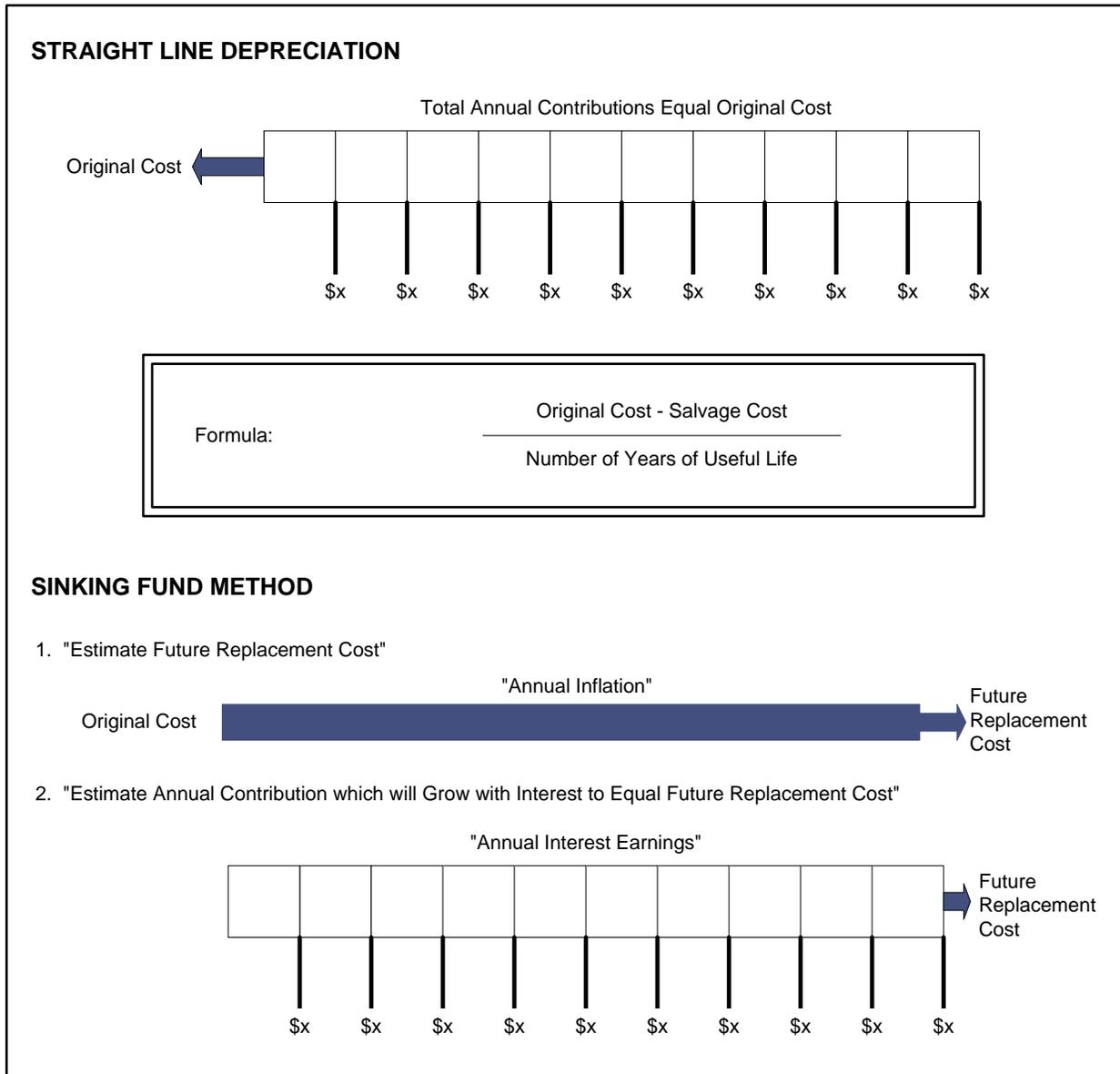
The straight-line method is calculated by taking the original cost of the asset, subtracting its estimated salvage value (estimated value of the asset at the time it is disposed of) and dividing this by the estimated number of years of useful life. The reducing balance method is calculated by utilizing a fixed percentage rate and this rate is applied annually to the undepreciated balance of the asset value.

The second method of lifecycle costing is the sinking fund method. This method first estimates the future value of the asset at the time of replacement. This is done by inflating the original cost of the asset at an assumed annual inflation rate. A calculation is then performed to determine annual contributions (equal or otherwise) which, when invested, will grow with interest to equal the future replacement cost.

The preferred method used herein for forecasting purposes is the sinking fund method of lifecycle costing.



Figure 3-3



3.2 Impact on Budgets

Detailed water and wastewater systems inventory information was obtained from the Town. The age of the water system dates back to the early 1900s. The water system has been expanded throughout the years. The wastewater system dates back to the early 1910s. The total value of existing water infrastructure is \$69.2 million, and the value of existing wastewater infrastructure is \$72.1 million.



The detailed water and wastewater inventories are provided in Appendices A and B, respectively, and is summarized in Figure 3-4. As mentioned earlier, the Town is currently undertaking an Asset Management Plan (A.M.P.) in conjunction with this rate study, and the information with respect to asset replacement has been incorporated into our analysis.

Figure 3-4
Town of Renfrew
Summary of Water and Wastewater Infrastructure

Area	Total Replacement Value	Amount included in 10-year forecast (Inflated \$)	Net Replacement for Future Lifecycle
Water			
Water Facilities	18,410,190	} 13,453,100	} 55,726,560
Water Vehicles & Equipment	284,360		
Water Meters	2,367,720		
Watermains	48,117,390		
Total Water	69,179,660	13,453,100	55,726,560
Wastewater			
Wastewater Facilities	37,664,380	} 11,916,900	} 60,215,560
Wastewater Vehicles & Equipment	282,520		
Sanitary Sewer Mains	34,185,560		
Total Wastewater	72,132,460	11,916,900	60,215,560
Total	141,312,120	25,370,000	115,942,120

Investment per customer is \$20,583 for water and \$21,786 for wastewater

With respect to lifecycle costing contained in the Appendices, the following information was taken into consideration:

- approximate age;
- material type;
- main lengths;
- diameter of the mains;
- estimated useful life; and
- estimated replacement costs.



Chapter 4

Capital Cost Financing Options



4. Capital Cost Financing Options

4.1 Summary of Capital Cost Financing Alternatives

Historically, the powers that municipalities had to raise alternative revenues to taxation to fund capital services have been restrictive. Over the past decade, legislative reforms have been introduced. Some of these have expanded municipal powers (e.g. Bill 26 introduced in 1996 to provide for expanded powers for imposing fees and charges), while others appear to restrict them (Bill 98 in 1997 providing amendments to the D.C.A.).

The Province passed a new *Municipal Act* which came into force on January 1, 2003. Part XII of the Act and O. Reg. 584/06 govern a municipality's ability to impose fees and charges. In contrast to the previous *Municipal Act*, this Act provides municipalities with broadly defined powers and does not differentiate between fees for operating and capital purposes. It is anticipated that the powers to recover capital costs under the previous *Municipal Act* will continue within the new Statutes and Regulations, as indicated by s.9(2) and s.452 of the new *Municipal Act*.

Under s.484 of *Municipal Act, 2001*, the *Local Improvement Act* was repealed with the in-force date of the *Municipal Act* (January 1, 2003). The municipal powers granted under the *Local Improvement Act* now fall under the jurisdiction of the *Municipal Act*. To this end, on December 20, 2002, O. Reg. 390/02 was filed, which allowed for the *Local Improvement Act* to be deemed to remain in force until April 1, 2003. O. Reg. 119/03 was enacted on April 19, 2003, which restored many of the previous *Local Improvement Act* provisions; however, the authority is now provided under the *Municipal Act*.

The methods of capital cost recovery available to municipalities are provided as follows:

Recovery Methods	Section Reference
• <i>Development Charges Act, 1997</i>	4.2
• <i>Municipal Act</i>	4.3
○ Fees and Charges	
○ Sewer and Water Area Charges	
○ Connection Fees	
○ Local Improvements	



Recovery Methods	Section Reference
• Grant Funding Availability	4.4
• Existing Reserves/Reserve Funds	4.5
• Debenture Financing	4.6
• Infrastructure Ontario	4.7
• Recommended Capital Financing Approach	4.8

4.2 Development Charges Act, 1997

In November, 1996, the Ontario Government introduced Bill 98, a new *Development Charges Act*. The Province's stated intentions were to "create new construction jobs and make home ownership more affordable" by reducing the charges and to "make municipal Council decisions more accountable and more cost effective." The basis for this Act is to allow municipalities to recover the growth-related capital cost of infrastructure necessary to accommodate new growth within the municipality. Generally, the Act provided the following changes to the former Act:

- Replace those sections of the 1989 Act that govern municipal development charges;
- Limit services which can be financed from development charges, specifically excluding parkland acquisition, administration buildings, and cultural, entertainment, tourism, solid waste management and hospital facilities;
- Ensure that the level of service used in the calculation of capital costs will not exceed the average level of service over the previous decade. Level of service is to be measured from both a quality and quantity perspective;
- Provide that uncommitted excess capacity available in existing municipal facilities and benefits to existing residents are removed from the calculation of the charge;
- Ensure that the development charge revenues collected by municipalities are spent only on those capital costs identified in the calculation of the development charge;
- Require municipalities to contribute funds (e.g. taxes, user charges or other non-development charge revenues) to the financing of certain projects primarily funded from development charges. The municipal contribution is 10 percent for services such as recreation, parkland development, libraries, etc.;
- Permit (but apparently not require) municipalities to grant developers credits for the direct provision of services identified in the development charge calculation



and, when credits are granted, require the municipality to reimburse the developer for the costs the municipality would have incurred if the project had been financed from the development charge reserve fund;

- Set out provisions for front-end financing capital projects (limited to essential services) required to service new development; and
- Set out provisions for appeals and complaints.

In late 2015, the Province approved further amendments to the D.C.A. With respect to water and wastewater, the only changes are for the municipality to provide an asset management calculation for the growth-related works and for the Council to consider (but not necessarily approve) area-specific rates.

Most recently, a number of amendments to the D.C.A. were made through the More Homes, More Choice Act, 2019 and the COVID-19 Economic Recovery Act, 2020. With respect to water and wastewater, a few changes may impact D.C. revenue collections:

1. Timing of Collection:

- a. D.C. Rate Freeze – For developments proceeding through site plan or zoning by-law amendment, the D.C. rate is frozen at the time the application is submitted. The D.C. remains frozen for two years after the application is approved. Should the D.C. study be updated to increase water and wastewater D.C. rates during this period, the Town would not be able to collect for this increase.
- b. D.C. Installment Payments – For rental housing and institutional development D.C.s are paid over 5 years and for non-profit housing, D.C.s are paid over 20 years. This provides a delay in receipt of D.C. revenues which will need to be cashflowed by the Town.

2. Mandatory Exemption (additional units) – For existing dwellings, one additional dwelling unit could be constructed within the existing dwelling. This additional dwelling unit is exempt from D.C.s. With the changes to the Act, one additional dwelling unit may be constructed within a new residential dwelling, which would be exempt from D.C.s. Further, one ancillary dwelling unit may be constructed on the same property as a new unit. This ancillary dwelling would be exempt from D.C.s. As these new additional units are exempt from D.C.s, no D.C. revenue may be collected for these units, however, each additional unit provides



4.3 Municipal Act

Part XII of the *Municipal Act* provides municipalities with broad powers to impose fees and charges via passage of a by-law. These powers, as presented in s.391(1), include imposing fees or charges:

- “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 local board; and
- for the use of its property including property under its control.”

Restrictions are provided to ensure that the form of the charge is not akin to a poll tax. Any charges not paid under this authority may be added to the tax roll and collected in a like manner. The fees and charges imposed under this part are not appealable to the Local Planning Appeal Tribunal (L.P.A.T., formerly known as the O.M.B.).

Section 221 of the previous *Municipal Act* permitted municipalities to impose charges, by by-law, on owners or occupants of land who would or might derive benefit from the construction of sewage (storm and sanitary) or water works being authorized (in a specific benefit area). For a by-law imposed under this section of the previous Act:

- A variety of different means could be used to establish the rate and recovery of the costs and could be imposed by a number of methods at the discretion of Council (i.e. lot size, frontage, number of benefiting properties, etc.);
- Rates could be imposed with respect to costs of major capital works, even though an immediate benefit was not enjoyed;
- Non-abutting owners could be charged;
- Recovery was authorized against existing works, where a new water or sewer main was added to such works, "notwithstanding that the capital costs of existing works has in whole or in part been paid;"
- Charges on individual parcels could be deferred;
- Exemptions could be established;
- Repayment was secured; and
- LPAT approval was not required.



While under the new *Municipal Act* no provisions are provided specific to the previous s.221, the intent to allow capital cost recovery through fees and charges is embraced within s.391. The new *Municipal Act* also maintains the ability of municipalities to impose capital charges for water and sewer services on landowners not receiving an immediate benefit from the works. Under s.391(2) of the Act, “a fee or charge imposed under subsection (1) for capital costs related to sewage or water 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.” Also, capital charges imposed under s.391 are not appealable to the LPAT on the grounds that the charges are “unfair or unjust.”

Section 222 of the previous *Municipal Act* permitted municipalities to pass a by-law requiring buildings to connect to the municipality's sewer and water systems, charging the owner for the cost of constructing services from the mains to the property line. Under the new *Municipal Act*, this power still exists under Part II, General Municipal Powers (s.9 (3) b of the *Municipal Act*). Enforcement and penalties for this use of power are contained in s.427 (1) of the *Municipal Act*.

Under the previous *Local Improvement Act*:

- A variety of different types of works could be undertaken, such as watermain, storm and sanitary sewer projects, supply of electrical light or power, bridge construction, sidewalks, road widening and paving;
- Council could pass a by-law for undertaking such work on petition of a majority of benefiting taxpayers, on a 2/3 vote of Council and on sanitary grounds, based on the recommendation of the Minister of Health. The by-law was required to go to the LPAT, which might hold hearings and alter the by-law, particularly if there were objections;
- The entire cost of a work was assessed only upon the lots abutting directly on the work, according to the extent of their respective frontages, using an equal special rate per metre of frontage; and
- As noted, this Act was repealed as of April 1, 2003; however, O. Reg. 119/03 was enacted on April 19, 2003 which restores many of the previous *Local Improvement Act* provisions; however, the authority is now provided under the *Municipal Act*.



4.4 Grant Funding Availability

Federal Infrastructure Funding

Phase 1 (April 1, 2016 to March 31, 2018)

Funding was provided by the Government of Canada to expressly help municipalities with repair and rehabilitation projects. Funding was mainly provided through the Clean Water and Wastewater Fund (C.W.W.F.) and Public Transit Infrastructure Fund (P.T.I.F.) in Federal Phase 1 projects. The C.W.W.F. was announced in Ontario on September 15, 2016. The Fund is \$1.1 billion for water, wastewater, and storm water systems in Ontario. The federal government provided \$569 million and Ontario and municipal governments provided \$275 million each.

Over 1,300 water, wastewater, and storm water projects have been approved in Ontario through the C.W.W.F. In Ontario, P.T.I.F. accounted for nearly \$1.5 billion of the national total of \$3.4 billion. The program was allocated by ridership numbers from the Canadian Urban Transit Association. The Association of Municipalities of Ontario (A.M.O.) understands that \$1 billion of Ontario's share has been approved.

Phase 2: Next Steps

The federal government announced Phase 2 of its infrastructure funding plan with a total of \$180 billion spent over 11 years. In addition to the balance of funding for previous green, social, and public transit infrastructure funds (\$20 billion each, including Phase 1), the government has added \$10.1 billion for trade and transportation infrastructure and \$2 billion for rural and northern communities. This funding must be implemented by agreements with each Province and Territory.

In Phase 2, Ontario will be eligible for \$11.8 billion including \$8.3 billion for transit, \$2.8 billion for green infrastructure, \$407 million for community, culture and recreation and \$250 million for rural and northern communities.

Federal Gas Tax

The federal Gas Tax is a permanent source of funding provided up front, twice-a-year, to Provinces and Territories, who in turn flow this funding to their municipalities to support local infrastructure priorities. Municipalities can pool, bank and borrow against



this funding, providing significant financial flexibility. Every year, the federal Gas Tax provides over \$2 billion and supports approximately 2,500 projects in communities across Canada. Each municipality selects how best to direct the funds with the flexibility provided to make strategic investments across 18 different project categories, which include other water and wastewater servicing.

Ontario Government

The Province has taken steps to increase municipal infrastructure funding. The Ontario Community Infrastructure Fund (O.C.I.F.) was increased in 2016 with formula-based support growing to \$200 million, and application funding growing to \$100 million annually by 2018/2019. As well, \$15 million annually will go to the new Connecting Links program to help pay for the construction and repair costs of municipal roads that connect communities to provincial highways. This is on top of the Building Ontario Up investment of \$130 billion in public infrastructure over 10 years starting in 2015.

Potential Grant Funding

From time to time, programs are made available by senior levels of government to assist municipalities in funding capital projects subsequent to major economic downturns (funding for municipalities were available after the U.S. financial crisis in 2008 rippled into Canada). If major grant funding were to be available after COVID-19, the Town could revisit the proposed capital forecast and rates provided herein.

4.5 Existing Reserves/Reserve Funds

The Town has established reserves and reserve funds for water and wastewater costs. The following table summarizes the water and wastewater reserves utilized in this analysis and their respective estimated balances at December 31, 2020:

Reserve	Dec. 31 2020 (estimated)
Water	
Development Charges Reserve Fund	274,014
Capital/Lifecycle Reserve Fund	2,427,705
Wastewater	
Development Charges Reserve Fund	307,323
Capital/Lifecycle Reserve Fund	1,219,332



4.6 Debenture Financing

Although it is not a direct method of minimizing the overall cost to the ratepayer, debentures are used by municipalities to assist in cash flowing large capital expenditures.

The Ministry of Municipal Affairs regulates the level of debt incurred by Ontario municipalities, through its powers established under the *Municipal Act*. Ontario Regulation 403/02 provides the current rules respecting municipal debt and financial obligations. Through the rules established under these regulations, a municipality's debt capacity is capped at a level where no more than 25% of the municipality's own purpose revenue may be allotted for servicing the debt (i.e. debt charges). The Town of Renfrew's 2019 calculation on Debt Capacity is shown on Schedule 81 of the Town's most recent Financial Information Return (F.I.R.). This calculates to the Town's estimated annual repayment limit of approximately \$3.1 million. Based upon 20-year financing at an assumed rate of 2.5%, the available debt for the Town is approximately \$48.35 million.

4.7 Infrastructure Ontario

Infrastructure Ontario (I.O.) is an arms-length crown corporation, which has been set up as a tool to offer low-cost and longer-term financing to assist municipalities in renewing their infrastructure (this corporation has merged the former O.S.I.F.A. into its operations). I.O. combines the infrastructure renewal needs of municipalities into an infrastructure investment "pool." I.O. will raise investment capital to finance loans to the public sector by selling a new investment product called Infrastructure Renewal Bonds to individual and institutional investors.

I.O. provides access to infrastructure capital that would not otherwise be available to smaller borrowers. Larger borrowers receive a longer term on their loans than they could obtain in the financial markets, and can also benefit from significant savings on transaction costs such as legal costs and underwriting commissions. Under the I.O. approach, all borrowers receive the same low interest rate. I.O. will enter into a financial agreement with each municipality subject to technical and credit reviews, for a loan up to the maximum amount of the loan request.



The first round of the former O.S.I.F.A.'s 2004/2005 infrastructure renewal program was focused on municipal priorities of clean water infrastructure, sewage treatment facilities, municipal roads and bridges, public transit and waste management infrastructure. The focus of the program was expanded in 2005/2006 somewhat to include:

- clean water infrastructure;
- sewage infrastructure;
- waste management infrastructure;
- municipal roads and bridges;
- public transit;
- municipal long-term care homes;
- renewal of municipal social housing and culture; and
- tourism and recreation infrastructure.

With the merging of O.S.I.F.A. and I.O., the program was broadened in late 2006 to also include municipal administrative buildings, local police and fire stations, emergency vehicles and equipment, ferries, docks and municipal airports.

To be eligible to receive these loans, municipalities must submit a formal application along with pertinent financial information. Allotments are prioritized and distributed based upon the Province's assessment of need.

The analysis provided herein assumes that the Town will require debt financing for both water and wastewater capital projects identified. Approximately \$2.4 million in non-growth-related debenture requirements for water services is required over the forecast period. For wastewater, approximately \$8.3 million in non-growth debentures is required. The growth-related capital has been assumed to be fully funded by the D.C. reserve funds for the purposes of the calculations provided herein. However, a portion of this may be recovered from growth-related debt depending on how the Town cashflows these works.

4.8 Recommended Capital Financing Approach

Of the various funding alternatives provided in this section, the following are recommended for further consideration by the Town of Renfrew for the capital expenditures (inflated) provided in Chapter 2:



Description	Water 2021-2030	Wastewater 2021-2030
Capital Financing		
Provincial/Federal Grants	1,675,000	1,675,000
Gas Tax Funding	180,200	296,900
Development Charges Reserve Fund	4,882,000	5,372,050
Non-Growth Related Debenture Requirements	2,426,000	8,328,350
Growth Related Debenture Requirements	-	-
Operating Contributions	-	-
Capital/Lifecycle Reserve Fund	9,206,900	2,636,000
Total Capital Financing	18,370,100	18,308,300

Based on the capital financing provided above, the growth-related capital has been assumed to be fully funded by the D.C. reserve funds for the purposes of the calculations undertaken as part of the rate study process. However, a portion of this amount may be recovered from growth-related debt or developer contributions, depending on the direction on which the Town cashflow's these works.

As noted earlier, the Town is currently undertaking a D.C. study process that will provide revised D.C. rates later this year. Through the D.C. study, the timing of the growth-related capital works will also be refined.

We would also note that the above D.C. funding assumes full cost recovery from growth. If the maximum D.C.-eligible amounts for the water and wastewater capital projects are not fully recovered (i.e. by Council providing discounts or exemptions), then the portion that is not generated through D.C.s will need to be recovered through other sources, which may impact the water/wastewater rates and non-D.C. reserve funds.

Tables 4-1 and 4-2 provide for the full capital expenditure and funding program by year for water and wastewater, respectively.



Table 4-1
Town of Renfrew
Capital Budget Forecast – Water (inflated \$)

Description	Total	Forecast									
		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Capital Expenditures											
Lifecycle:											
Major Capital Works											
Major Reconstruction Projects (Linear Assets)	4,467,000	408,000	416,000	424,000	433,000	442,000	450,000	459,000	469,000	478,000	488,000
Major Reconstruction Projects (Linear Assets) - Grant Funded	1,675,000	153,000	156,000	159,000	162,000	166,000	169,000	172,000	176,000	179,000	183,000
Highway 60 Stewart St.	322,600	322,600	-	-	-	-	-	-	-	-	-
Raglan St. S./County Road 52	107,500	107,500	-	-	-	-	-	-	-	-	-
Water Tower Repairs	306,000	306,000	-	-	-	-	-	-	-	-	-
Minor Waterworks to Support Road Resurfacing	650,000	54,000	56,000	59,000	61,000	63,000	66,000	69,000	71,000	74,000	77,000
W07 - 2014 Chev Express Cutaway	115,000	-	-	-	-	-	-	115,000	-	-	-
W09 - 2016 Silverado LT	44,000	-	-	-	-	-	-	44,000	-	-	-
Low Lift Pumphouse	196,000	196,000	-	-	-	-	-	-	-	-	-
Water Meter Replacement Program	1,566,000	143,000	146,000	149,000	152,000	155,000	158,000	161,000	164,000	167,000	171,000
Water Treatment Plant Large Capital Works (OCWA)	1,926,000	8,000	7,000	24,000	70,000	63,000	225,000	276,000	368,000	439,000	446,000
WTP BCA Work											
Building Structural Repairs	66,000	66,000	-	-	-	-	-	-	-	-	-
Building Envelope Repairs and Replacements	547,000	56,000	-	-	-	-	462,000	-	29,000	-	-
Mechanical Systems Replacements	268,000	74,000	-	-	-	72,000	-	-	-	-	122,000
Electrical Systems Replacements	372,000	-	-	-	-	-	-	-	-	-	372,000
Minor Capital:											
Minor Capital Works (OCWA)	725,000	62,000	65,000	41,000	59,000	44,000	51,000	101,000	99,000	100,000	103,000
Leak Detection Distribution system	13,000	-	-	-	13,000	-	-	-	-	-	-
Review loading rates at plant & amend appr.	31,000	31,000	-	-	-	-	-	-	-	-	-
Hydrant Flow Testing	16,000	-	-	-	16,000	-	-	-	-	-	-
Water Meter Testing	22,000	-	-	-	22,000	-	-	-	-	-	-
Replace Watermain Locator	7,000	-	-	-	-	7,000	-	-	-	-	-
2016 Trailer Black Landscaper	11,000	-	-	-	-	11,000	-	-	-	-	-
Studies:											
Rate Study	35,000	-	-	-	-	17,000	-	-	-	-	18,000
Growth Related:											
Residential - Northwest (R2-2)	1,304,000	-	-	-	-	-	-	-	-	-	1,304,000
Residential - Northwest (R2-1)	628,000	-	-	-	-	-	-	-	-	-	628,000
Industrial (I2-1)	427,000	-	-	-	-	-	-	-	-	-	427,000
Industrial (I2-1)	140,000	-	-	-	-	-	-	-	-	-	140,000
Industrial (I2-1)	280,000	-	-	-	-	-	-	-	-	-	280,000
Communal - Whitton Road	165,000	-	-	-	-	-	-	-	-	-	165,000
Communal - Whitton Road	762,000	-	-	-	-	-	-	-	-	-	762,000
Communal - Gibbon Road	177,000	-	-	-	-	-	-	-	-	-	177,000



Table 4-1
Capital Budget Forecast – Water (inflated \$) (Cont'd)

Description	Total	Forecast									
		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Communal - Gibbon Road	201,000	-	-	-	-	-	-	-	-	-	201,000
Communal - Froats Street	146,000	-	-	-	-	-	-	-	-	-	146,000
Communal - Whitton Road/ O'Brien	500,000	-	-	-	-	-	-	-	-	-	500,000
Communal - Hall Avenue	152,000	-	-	-	-	-	-	-	-	-	152,000
Total Capital Expenditures	18,370,100	1,987,100	846,000	856,000	988,000	1,040,000	1,581,000	1,397,000	1,376,000	1,437,000	6,862,000
Capital Financing											
Provincial/Federal Grants	1,675,000	153,000	156,000	159,000	162,000	166,000	169,000	172,000	176,000	179,000	183,000
Gas Tax Funding	180,200	180,200	-	-	-	-	-	-	-	-	-
Development Charges Reserve Fund	4,882,000	-	-	-	-	-	-	-	-	-	4,882,000
Non-Growth Related Debenture Requirements	2,426,000	-	-	-	-	174,000	722,000	415,000	230,000	218,000	667,000
Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-
Operating Contributions	-	-	-	-	-	-	-	-	-	-	-
Capital/Lifecycle Reserve Fund	9,206,900	1,653,900	690,000	697,000	826,000	700,000	690,000	810,000	970,000	1,040,000	1,130,000
Total Capital Financing	18,370,100	1,987,100	846,000	856,000	988,000	1,040,000	1,581,000	1,397,000	1,376,000	1,437,000	6,862,000



Table 4-2
Town of Renfrew
Capital Budget Forecast – Wastewater (inflated \$)

Description	Total	Forecast									
		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Capital Expenditures											
Lifecycle:											
Major Capital Works											
Major Reconstruction Projects (Linear Assets)	4,467,000	408,000	416,000	424,000	433,000	442,000	450,000	459,000	469,000	478,000	488,000
Major Reconstruction Projects (Linear Assets) - Grant Funded	1,675,000	153,000	156,000	159,000	162,000	166,000	169,000	172,000	176,000	179,000	183,000
Hwy 60 - Stewart St.	778,800	778,800	-	-	-	-	-	-	-	-	-
Raglan St. S./County Road 52	94,100	94,100	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-
Pumping Stations:											
Lisgar Ave. Pumping Station Design	47,000	-	47,000	-	-	-	-	-	-	-	-
Lisgar Ave. Pumping Station Construction	318,000	-	-	318,000	-	-	-	-	-	-	-
O'Brien - Double 350mm Forcemain - Non-Growth Related Component	72,000	-	-	-	72,000	-	-	-	-	-	-
O'Brien Rd Pumping Station Design - Non-Growth Related Component	24,000	-	-	24,000	-	-	-	-	-	-	-
O'Brien Rd Pumping Station Construction - Non-Growth Related Component	162,000	-	-	-	162,000	-	-	-	-	-	-
Arthur Ave. Pumping Station Design	44,000	-	-	-	-	44,000	-	-	-	-	-
Arthur Ave. Pumping Station Construction	282,000	-	-	-	-	-	282,000	-	-	-	-
Coleraine Pumping Station	28,000	-	-	-	-	28,000	-	-	-	-	-
June St. Pumping Station	202,000	-	-	11,000	-	-	-	-	-	-	191,000
Hunter Gate Pumping Station	562,000	-	-	-	-	-	-	-	562,000	-	-
	-	-	-	-	-	-	-	-	-	-	-
1995 V07 Sludge Truck	52,000	-	52,000	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-
Wastewater Treatment Plant Large Capital Works (OCWA)	687,000	28,000	-	3,000	6,000	11,000	35,000	42,000	87,000	150,000	325,000
	-	-	-	-	-	-	-	-	-	-	-
WPCC BCA work											
WPCC concrete deck repairs over tunnel	82,000	82,000	-	-	-	-	-	-	-	-	-
Replace WPCC sump pump	17,000	17,000	-	-	-	-	-	-	-	-	-
Mechanical Systems Replacements	911,000	-	-	-	809,000	-	-	-	-	102,000	-
Replace WPCC Roofing Membranes	299,000	-	-	-	-	-	-	-	299,000	-	-
Exterior lighting repairs	18,000	-	-	-	-	-	-	-	-	18,000	-
WPCC BCA Study	18,000	-	-	-	-	-	-	-	-	-	18,000
	-	-	-	-	-	-	-	-	-	-	-
Minor Capital Works:											
Minor Capital Works (From OCWA)	1,040,000	115,000	82,000	89,000	83,000	110,000	100,000	102,000	110,000	116,000	133,000
Sewage Main Line Camera Software & Tracks	37,000	-	-	37,000	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-
Studies											
Rate Study	35,000	-	-	-	-	17,000	-	-	-	-	18,000
	-	-	-	-	-	-	-	-	-	-	-



Table 4-2 (Cont'd)

Description	Total	Forecast									
		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Growth Related:	-	-	-	-	-	-	-	-	-	-	-
Stewart St. Trunk Sanitary Upgrade	322,400	322,400	-	-	-	-	-	-	-	-	-
Pump Station (New 10.7L/s) (C1-3)	475,000	-	-	-	-	-	-	-	-	-	475,000
Pump Station (New 15.5L/s + 2.8L/s) (C2-1/ I2-4)	681,000	-	-	-	-	-	-	-	-	-	681,000
Pump Station (New 5.9L/s + 7.4L/s) (R2-1 + R2-2)	555,000	-	-	-	-	-	-	-	-	-	555,000
Double 100mm Forcemain (C1-3)	634,000	-	-	-	-	-	-	-	-	-	634,000
Double 150mm Forcemain (C2-1/ I2-4)	573,000	-	-	-	-	-	-	-	-	-	573,000
Double 150mm Forcemain (R2-1 + R2-2)	655,000	-	-	-	-	-	-	-	-	-	655,000
O'Brien Rd. PS Upgrade	-	-	-	-	-	-	-	-	-	-	-
Double 350mm Forcemain - Growth Related Component	407,000	-	-	-	407,000	-	-	-	-	-	-
O'Brien Pumping Station (Growth Related) - Design	135,000	-	-	135,000	-	-	-	-	-	-	-
O'Brien Pumping Station (Growth Related) - Construction	920,000	-	-	-	920,000	-	-	-	-	-	-
Drain to C2-1 PS	146,000	-	-	-	-	-	-	-	-	-	146,000
Sanitary Monitoring Program	853,000	-	-	-	-	-	-	-	-	-	853,000
	-	-	-	-	-	-	-	-	-	-	-
Total Capital Expenditures	18,308,300	1,998,300	753,000	1,200,000	3,054,000	818,000	1,036,000	775,000	1,703,000	1,043,000	5,928,000
Capital Financing											
Provincial/Federal Grants	1,675,000	153,000	156,000	159,000	162,000	166,000	169,000	172,000	176,000	179,000	183,000
Gas Tax Funding	296,900	296,900	-	-	-	-	-	-	-	-	-
Development Charges Reserve Fund	5,372,050	322,400	-	135,000	1,327,000	-	-	-	-	-	3,587,650
Non-Growth Related Debenture Requirements	8,328,350	-	317,000	641,000	1,325,000	452,000	717,000	473,000	1,417,000	829,000	2,157,350
Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-
Operating Contributions	-	-	-	-	-	-	-	-	-	-	-
Capital/Lifecycle Reserve Fund	2,636,000	1,226,000	280,000	265,000	240,000	200,000	150,000	130,000	110,000	35,000	-
Total Capital Financing	18,308,300	1,998,300	753,000	1,200,000	3,054,000	818,000	1,036,000	775,000	1,703,000	1,043,000	5,928,000



Chapter 5

Overview of Expenditures and Revenues



5. Overview of Expenditures and Revenues

5.1 Water Operating Expenditures

In this report, the forecast water budget figures (2021 to 2030) are based on the 2020 operating budgets. The costs for each component of the operating budget have been reviewed with staff to establish forecast inflationary adjustments. Most of the expenditures have been assumed to increase at a rate of 2.0% annually. Operating expenditures related to utilities, fuels, chemicals, hydro and other materials have been inflated by 5.0% annually. Additionally, the Town has an operational contract with O.C.W.A. and the costs associated with their services have been inflated at 2.6% for 2022 and 2% thereafter (based on the operating contract).

Furthermore, annual contributions to the capital/lifecycle reserves and debenture expenditures have been included within the calculations.

5.2 Water Operating Revenues

The Town's fixed water revenue sources are generated primarily from base charges and late payment penalties that contribute towards the water expenditures. The revenues for water are calculated to have an overall increase to the water bill of 4% per year over the forecast period.

Note that the operating revenue presented herein represents the fixed component of the total operating revenue. The shortfall of the fixed revenue from the operating expenditures is what is used to calculate the recovery from the water volume rates, which is presented in Chapter 7. Table 5-1 provides for the operating budget for the water system.



**Table 5-1
Town of Renfrew
Operating Budget Forecast – Water (inflated \$)**

Description	Forecast									
	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Expenditures										
Operating Costs										
Waterworks Administration										
W-431-010-1120 REGULAR SALARIES & WAGES	8,500	8,700	8,900	9,100	9,300	9,500	9,700	9,900	10,100	10,300
W-431-010-1190 EMPLOYER BENEFITS COSTS	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400
W-431-010-2590 OTHER SUPPLIES	1,100	1,200	1,300	1,400	1,500	1,600	1,700	1,800	1,900	2,000
W-431-010-2610 NEW EQUIPMENT	3,100	3,200	3,300	3,400	3,500	3,600	3,700	3,800	3,900	4,000
W-431-010-3170 TRAINING & EDUCATION	8,300	8,500	8,700	8,900	9,100	9,300	9,500	9,700	9,900	10,100
W-431-010-3610 CONTRACTED SERVICES	3,000	3,100	3,200	3,300	3,400	3,500	3,600	3,700	3,800	3,900
Administration General										
W-431-101-1120 REGULAR SALARIES & WAGES	92,000	93,800	95,700	97,600	99,600	101,600	103,600	105,700	107,800	110,000
W-431-101-1190 EMPLOYER BENEFITS COSTS	23,900	24,400	24,900	25,400	25,900	26,400	26,900	27,400	27,900	28,500
W-431-101-2510 OFFICE SUPPLIES	3,800	3,900	4,000	4,100	4,200	4,300	4,400	4,500	4,600	4,700
W-431-101-2515 COMPUTER SUPPLIES	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500	3,600	3,700
W-431-101-2710 UNIFORMS	900	900	900	900	900	900	900	900	900	900
W-431-101-3111 CAR ALLOWANCE	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100
W-431-101-3120 POSTAGE & SHIPPING	18,500	18,900	19,300	19,700	20,100	20,500	20,900	21,300	21,700	22,100
W-431-101-3130 TELEPHONE	4,600	4,700	4,800	4,900	5,000	5,100	5,200	5,300	5,400	5,500
W-431-101-3162 STAFF DEVELOPMENT	7,000	7,100	7,200	7,300	7,400	7,500	7,700	7,900	8,100	8,300
W-431-101-3170 TRAINING & EDUCATION	5,400	5,500	5,600	5,700	5,800	5,900	6,000	6,100	6,200	6,300
W-431-101-3320 MEMBERSHIPS	3,400	3,500	3,600	3,700	3,800	3,900	4,000	4,100	4,200	4,300
W-431-101-3520 AUDIT	5,400	5,500	5,600	5,700	5,800	5,900	6,000	6,100	6,200	6,300
W-431-101-3550 INSURANCE	55,100	56,200	57,300	58,400	59,600	60,800	62,000	63,200	64,500	65,800
W-431-101-3610 CONTRACTED SERVICES	3,800	3,900	4,000	4,100	4,200	4,300	4,400	4,500	4,600	4,700
W-431-101-3765 OCWA CHARGES	632,620	648,900	661,900	675,100	688,600	702,400	716,400	730,700	745,300	760,200
W-431-101-3814 PROPERTY TAXES	59,500	60,700	61,900	63,100	64,400	65,700	67,000	68,300	69,700	71,100
W-431-101-4220 WRITE-OFFS	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000
W-431-101-7420 VEHICLE / EQPT. CHARGES	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100
Stores										
W-431-406-1120 REGULAR SALARIES & WAGES	12,900	13,200	13,500	13,800	14,100	14,400	14,700	15,000	15,300	15,600
W-431-406-1190 EMPLOYER BENEFITS COSTS	3,600	3,700	3,800	3,900	4,000	4,100	4,200	4,300	4,400	4,500
W-431-406-2310 CONSTRUCTION MATERIALS	1,600	1,700	1,800	1,900	2,000	2,100	2,200	2,300	2,400	2,500
W-431-406-7420 VEHICLE / EQPT. CHARGES	3,500	3,600	3,700	3,800	3,900	4,000	4,100	4,200	4,300	4,400
Water Trailers										
W-431-W06-2680 PARTS	330	340	350	360	370	380	390	400	410	420
2014 Chev Express Cutaway										
W-431-W07-1120 REGULAR SALARIES & WAGES	4,300	4,400	4,500	4,600	4,700	4,800	4,900	5,000	5,100	5,200
W-431-W07-1130 OVERTIME	-	-	-	-	-	-	-	-	-	-
W-431-W07-1190 EMPLOYER BENEFITS COSTS	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
W-431-W07-2522 LICENCES	430	440	450	460	470	480	490	500	510	520



Table 5-1 (Cont'd)
Operating Budget Forecast – Water (inflated \$)

Description	Forecast									
	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
W-431-W07-2680 PARTS	5,700	5,800	5,900	6,000	6,100	6,200	6,300	6,400	6,500	6,600
W-431-W07-2812 GAS & OIL	6,800	7,100	7,500	7,900	8,300	8,700	9,100	9,600	10,100	10,600
W-431-W07-7410 VEHICLE / EQPT RECOVERIES	(9,700)	(9,900)	(10,100)	(10,300)	(10,500)	(10,700)	(10,900)	(11,100)	(11,300)	(11,500)
2016 Chevy 1/2 Ton Waterworks truck										
W-431-W09-1120 REGULAR SALARIES & WAGES	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
W-431-W09-1190 EMPLOYER BENEFITS COSTS	300	300	300	300	300	300	300	300	300	300
W-431-W09-2680 PARTS	4,300	4,400	4,500	4,600	4,700	4,800	4,900	5,000	5,100	5,200
W-431-W09-2812 GAS & OIL	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000	3,200
W-431-W09-7410 VEHICLE / EQPT RECOVERIES	(14,000)	(14,300)	(14,600)	(14,900)	(15,200)	(15,500)	(15,800)	(16,100)	(16,400)	(16,700)
2018 Ford F150										
W-431-W10-1120 REGULAR SALARIES & WAGES	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
W-431-W10-1190 EMPLOYER BENEFITS COSTS	300	300	300	300	300	300	300	300	300	300
W-431-W10-2522 LICENCES	100	100	100	100	100	100	100	100	100	100
W-431-W10-2680 PARTS	3,900	4,000	4,100	4,200	4,300	4,400	4,500	4,600	4,700	4,800
W-431-W10-2812 GAS & OIL	4,300	4,500	4,700	4,900	5,100	5,400	5,700	6,000	6,300	6,600
W-431-W10-7410 VEHICLE / EQPT RECOVERIES	(8,900)	(9,100)	(9,300)	(9,500)	(9,700)	(9,900)	(10,100)	(10,300)	(10,500)	(10,700)
Waterworks (Garage)										
W-432-361-2310 CONSTRUCTION MATERIALS	5,500	5,800	6,100	6,400	6,700	7,000	7,400	7,800	8,200	8,600
W-432-361-2550 REPAIRS & REPLACEMENT	5,000	5,100	5,200	5,300	5,400	5,500	5,600	5,700	5,800	5,900
W-432-361-2560 CLEANING SUPPLIES	400	400	400	400	400	400	400	400	400	400
W-432-361-2610 NEW EQUIPMENT	3,900	4,000	4,100	4,200	4,300	4,400	4,500	4,600	4,700	4,800
W-432-361-2813 HEATING FUEL	7,600	8,000	8,400	8,800	9,200	9,700	10,200	10,700	11,200	11,800
W-432-361-2811 ELECTRICITY	6,400	6,700	7,000	7,400	7,800	8,200	8,600	9,000	9,500	10,000
W-432-361-3130 TELEPHONE	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100
W-432-361-3610 CONTRACTED SERVICES	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500	3,600	3,700
Transmission & Distribution										
Main Repairs										
W-433-362-1120 REGULAR SALARIES & WAGES	24,200	24,700	25,200	25,700	26,200	26,700	27,200	27,700	28,300	28,900
W-433-362-1190 EMPLOYER BENEFITS COSTS	6,800	6,900	7,000	7,100	7,200	7,300	7,400	7,500	7,700	7,900
W-433-362-2310 CONSTRUCTION MATERIALS	13,900	14,200	14,500	14,800	15,100	15,400	15,700	16,000	16,300	16,600
W-433-362-3610 CONTRACTED SERVICES	32,500	33,200	33,900	34,600	35,300	36,000	36,700	37,400	38,100	38,900
W-433-362-3810 EQUIPMENT RENTAL/LEASE	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500	3,600
W-433-362-7420 VEHICLE / EQPT. CHARGES	3,500	3,600	3,700	3,800	3,900	4,000	4,100	4,200	4,300	4,400
New Services										
W-433-363-2310 CONSTRUCTION MATERIALS	6,100	6,400	6,700	7,000	7,400	7,800	8,200	8,600	9,000	9,500
W-433-363-3610 CONTRACTED SERVICES	700	700	700	700	700	700	700	700	700	700
New Mains										
W-433-371-1120 REGULAR SALARIES & WAGES	35,700	36,400	37,100	37,800	38,600	39,400	40,200	41,000	41,800	42,600
W-433-371-1190 EMPLOYER BENEFITS COSTS	10,000	10,200	10,400	10,600	10,800	11,000	11,200	11,400	11,600	11,800
W-433-371-2310 CONSTRUCTION MATERIALS	21,100	22,200	23,300	24,500	25,700	27,000	28,400	29,800	31,300	32,900
W-433-371-3610 CONTRACTED SERVICES	10,800	11,000	11,200	11,400	11,600	11,800	12,000	12,200	12,400	12,600
W-433-371-7420 VEHICLE / EQPT. CHARGES	5,800	5,900	6,000	6,100	6,200	6,300	6,400	6,500	6,600	6,700
Water Meters										
W-433-372-1120 REGULAR SALARIES & WAGES	9,400	9,600	9,800	10,000	10,200	10,400	10,600	10,800	11,000	11,200



Table 5-1 (Cont'd)
Operating Budget Forecast – Water (inflated \$)

Description	Forecast									
	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
W-433-372-1190 EMPLOYER BENEFITS COSTS	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500
W-433-372-1990 ACCRUED PAYROLL	-	-	-	-	-	-	-	-	-	-
W-433-372-2310 CONSTRUCTION MATERIALS	18,900	19,800	20,800	21,800	22,900	24,000	25,200	26,500	27,800	29,200
W-433-372-2610 NEW EQUIPMENT	6,000	6,100	6,200	6,300	6,400	6,500	6,600	6,700	6,800	6,900
W-433-372-3610 CONTRACTED SERVICES	3,600	3,700	3,800	3,900	4,000	4,100	4,200	4,300	4,400	4,500
W-433-372-7420 VEHICLE / EQPT. CHARGES	2,900	3,000	3,100	3,200	3,300	3,400	3,500	3,600	3,700	3,800
Fire Hydrants										
W-433-373-1120 REGULAR SALARIES & WAGES	14,800	15,100	15,400	15,700	16,000	16,300	16,600	16,900	17,200	17,500
W-433-373-1190 EMPLOYER BENEFITS COSTS	4,200	4,300	4,400	4,500	4,600	4,700	4,800	4,900	5,000	5,100
W-433-373-2310 CONSTRUCTION MATERIALS	14,400	15,100	15,900	16,700	17,500	18,400	19,300	20,300	21,300	22,400
W-433-373-3610 CONTRACTED SERVICES	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100
W-433-373-7420 VEHICLE / EQPT. CHARGES	13,200	13,500	13,800	14,100	14,400	14,700	15,000	15,300	15,600	15,900
Valve Repairs										
W-433-381-1120 REGULAR SALARIES & WAGES	23,600	24,100	24,600	25,100	25,600	26,100	26,600	27,100	27,600	28,200
W-433-381-1190 EMPLOYER BENEFITS COSTS	6,600	6,700	6,800	6,900	7,000	7,100	7,200	7,300	7,400	7,500
W-433-381-2310 CONSTRUCTION MATERIALS	9,400	9,600	9,800	10,000	10,200	10,400	10,600	10,800	11,000	11,200
W-433-381-3610 CONTRACTED SERVICES	8,200	8,400	8,600	8,800	9,000	9,200	9,400	9,600	9,800	10,000
W-433-381-7420 VEHICLE / EQPT. CHARGES	4,100	4,200	4,300	4,400	4,500	4,600	4,700	4,800	4,900	5,000
Service Repairs										
W-433-382-1120 REGULAR SALARIES & WAGES	172,500	176,000	179,500	183,100	186,800	190,500	194,300	198,200	202,200	206,200
W-433-382-1190 EMPLOYER BENEFITS COSTS	48,400	49,400	50,400	51,400	52,400	53,400	54,500	55,600	56,700	57,800
W-433-382-2310 CONSTRUCTION MATERIALS	66,000	67,300	68,600	70,000	71,400	72,800	74,300	75,800	77,300	78,800
W-433-382-3610 CONTRACTED SERVICES	114,800	120,500	126,500	132,800	139,400	146,400	153,700	161,400	169,500	178,000
W-433-382-7420 VEHICLE / EQPT. CHARGES	19,300	19,700	20,100	20,500	20,900	21,300	21,700	22,100	22,500	23,000
Pumping Station (Kedrosky)										
W-433-533-1120 REGULAR SALARIES & WAGES	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300
W-433-533-1190 EMPLOYER BENEFITS COSTS	300	300	300	300	300	300	300	300	300	300
W-433-533-2310 CONSTRUCTION MATERIALS	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000	3,200
W-433-533-2814 ELECTRICITY	5,900	6,200	6,500	6,800	7,100	7,500	7,900	8,300	8,700	9,100
W-433-533-3610 CONTRACTED SERVICES	3,600	3,700	3,800	3,900	4,000	4,100	4,200	4,300	4,400	4,500
Elevated Tower - Minor Treatment Improvements										
W-434-396-2310 WTP - MAJOR MAINTENANCE	42,500	43,400	44,300	45,200	46,100	47,000	47,900	48,900	49,900	50,900
Sub Total Operating	1,820,780	1,867,480	1,911,600	1,956,620	2,002,940	2,050,460	2,099,180	2,149,200	2,200,620	2,253,940
Capital-Related										
Existing Debt (Principal) - Growth Related										
Existing Debt (Interest) - Growth Related										
New Growth Related Debt (Principal)	-	-	-	-	-	-	-	-	-	-
New Growth Related Debt (Interest)	-	-	-	-	-	-	-	-	-	-
Existing Debt (Principal) - Non-Growth Related	321,223	321,871	322,523	323,179	323,838	324,500	225,166	125,836	126,509	127,186
Existing Debt (Interest) - Non-Growth Related	93,315	87,906	82,494	77,118	71,660	66,237	60,811	58,942	58,268	57,592
New Non-Growth Related Debt (Principal)	-	-	-	-	-	6,812	35,246	52,373	62,687	72,788
New Non-Growth Related Debt (Interest)	-	-	-	-	-	4,350	22,230	31,724	36,164	40,047



Table 5-1 (Cont'd)
Operating Budget Forecast – Water (inflated \$)

Description	Forecast									
	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Transfer to Capital	-	-	-	-	-	-	-	-	-	-
Transfer to Capital/Lifecycle Reserve	366,124	429,396	504,381	582,780	668,459	735,383	873,017	1,040,179	1,127,636	1,230,227
Sub Total Capital Related	780,661	839,174	909,399	983,077	1,063,957	1,137,282	1,216,470	1,309,054	1,411,265	1,527,839
Total Expenditures	2,601,441	2,706,654	2,820,999	2,939,697	3,066,897	3,187,742	3,315,650	3,458,254	3,611,885	3,781,779
Revenues										
Base Charge	859,202	924,484	985,400	1,050,298	1,129,997	1,216,033	1,308,735	1,382,130	1,445,692	1,497,588
W-431-101-0861 INTEREST ON WATER	15,900	15,900	15,900	15,900	15,900	15,900	15,900	15,900	15,900	15,900
Contributions from Development Charges Reserve Fund	-	-	-	-	-	-	-	-	-	-
Contributions from Reserves / Reserve Funds	-	-	-	-	-	-	-	-	-	-
Total Operating Revenue	875,102	940,384	1,001,300	1,066,198	1,145,897	1,231,933	1,324,635	1,398,030	1,461,592	1,513,488
Water Billing Recovery - Total	1,726,340	1,766,269	1,819,698	1,873,499	1,921,000	1,955,809	1,991,016	2,060,224	2,150,293	2,268,291



5.3 Wastewater Operating Expenditures

Similar to water, the wastewater operating expenditures have been adjusted over the forecast period by an annual inflationary factor of 2.0%. Operating expenditures related to utilities, fuels, chemicals, and hydro have been inflated by 5.0% annually. As well, the operating contract with O.C.W.A. has been inflated at 2.6% for 2022 and 2% thereafter based on their current contract with the Town. Additionally, annual contributions to the capital/lifecycle reserves and debenture expenditures have been included within the calculations.

5.4 Wastewater Operating Revenues

The Town's fixed wastewater revenue sources are generated primarily from base charges and late payment penalties that contribute towards the wastewater expenditures. The shortfall between the expenditures and the fixed revenues is made up from the Town's volume rates (discussed further in Chapter 7). The revenues for wastewater are calculated to have an overall increase to the wastewater bill of 1% per year over the forecast period.

Table 5-2 provides for the operating budget for the wastewater system.



Table 5-2
Town of Renfrew
Operating Budget Forecast – Wastewater (inflated \$)

Description	Forecast									
	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Expenditures										
Operating Costs										
Sanitary Sewer System Operations										
S-412-101-1120 REGULAR SALARIES & WAGES	83,100	84,800	86,500	88,200	90,000	91,800	93,600	95,500	97,400	99,300
S-412-101-1190 EMPLOYER BENEFIT COSTS	21,400	21,800	22,200	22,600	23,100	23,600	24,100	24,600	25,100	25,600
S-412-101-2510 OFFICE SUPPLIES	4,300	4,400	4,500	4,600	4,700	4,800	4,900	5,000	5,100	5,200
S-412-101-2515 COMPUTER SUPPLIES	500	500	500	500	500	500	500	500	500	500
S-412-101-2570 PRINTING AND PHOTO	300	300	300	300	300	300	300	300	300	300
S-412-101-3120 POSTAGE & SHIPPING	600	600	600	600	600	600	600	600	600	600
S-412-101-3330 GENERAL ADVERTISING	300	300	300	300	300	300	300	300	300	300
S-412-101-3530 LEGAL	2,300	2,300	2,300	2,300	2,300	2,300	2,300	2,300	2,300	2,300
S-412-101-3814 PROPERTY TAXES	100	100	100	100	100	100	100	100	100	100
S-412-101-4220 WRITE-OFFS	16,000	16,000	16,000	16,000	16,000	16,000	16,000	16,000	16,000	16,000
New Services										
S-412-363-2550 REPAIRS & REPLACEMENT	3,700	3,800	3,900	4,000	4,100	4,200	4,300	4,400	4,500	4,600
Sewer Collection System										
S-412-552-1120 SALARIES & WAGES	51,800	52,800	53,900	55,000	56,100	57,200	58,300	59,500	60,700	61,900
S-412-552-1190 EMPLOYER BENEFIT COSTS	14,600	14,900	15,200	15,500	15,800	16,100	16,400	16,700	17,000	17,300
S-412-552-2310 CONSTRUCTION MATERIALS	63,100	66,300	69,600	73,100	76,800	80,600	84,600	88,800	93,200	97,900
S-412-552-3610 CONTRACTED SERVICES	113,700	116,000	118,300	120,700	123,100	125,600	128,100	130,700	133,300	136,000
S-412-552-3810 EQUIPMENT RENTAL/LEASE	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500	3,600	3,700
S-412-552-7420 VEHICLE / EQPT. CHARGES	23,300	23,800	24,300	24,800	25,300	25,800	26,300	26,800	27,300	27,800
Sewer Pump Station										
S-412-553-1120 SALARIES & WAGES	18,900	19,300	19,700	20,100	20,500	20,900	21,300	21,700	22,100	22,500
S-412-553-1190 EMPLOYER BENEFIT COSTS	5,300	5,400	5,500	5,600	5,700	5,800	5,900	6,000	6,100	6,200
S-412-553-2310 CONSTRUCTION MATERIALS	17,200	17,500	17,900	18,300	18,700	19,100	19,500	19,900	20,300	20,700
S-412-553-2814 ELECTRICITY	11,100	11,700	12,300	12,900	13,500	14,200	14,900	15,600	16,400	17,200
S-412-553-3610 CONTRACTED SERVICES	17,200	17,500	17,900	18,300	18,700	19,100	19,500	19,900	20,300	20,700
S-412-553-3750 EQUIPMENT REPAIRS & MAINT	500	500	500	500	500	500	500	500	500	500
S-412-553-7420 VEHICLE / EQPT. CHARGES	4,500	4,600	4,700	4,800	4,900	5,000	5,100	5,200	5,300	5,400
V07 Sludge Truck										
S-412-V07-2522 LICENSE	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
S-412-V07-2680 PARTS	8,800	9,000	9,200	9,400	9,600	9,800	10,000	10,200	10,400	10,600
Pollution Control Plant										
S-462-551-2310 WPCP - MAJOR MAINTENANCE	74,300	75,800	77,300	78,800	80,400	82,000	83,600	85,300	87,000	88,700
S-462-551-3550 INSURANCE	87,000	88,700	90,500	92,300	94,100	96,000	97,900	99,900	101,900	103,900
S-462-551-3765 OCWA CHARGES	850,509	872,400	889,800	907,600	925,800	944,300	963,200	982,500	1,002,200	1,022,200
S-462-551-3814 PROPERTY TAXES	110,500	112,700	115,000	117,300	119,600	122,000	124,400	126,900	129,400	132,000
Sub Total Operating	1,608,709	1,647,700	1,682,800	1,718,600	1,755,300	1,792,800	1,830,900	1,870,200	1,910,200	1,951,000



Table 5-2 (Cont'd)
Operating Budget Forecast – Wastewater (inflated \$)

Description	Forecast									
	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Capital-Related										
Existing Debt (Principal) - Growth Related										
Existing Debt (Interest) - Growth Related										
New Growth Related Debt (Principal)	-	-	-	-	-	-	-	-	-	-
New Growth Related Debt (Interest)	-	-	-	-	-	-	-	-	-	-
Existing Debt (Principal) - Non-Growth Related	332,356	332,810	333,266	333,725	334,186	334,650	335,117	335,585	336,057	336,530
Existing Debt (Interest) - Non-Growth Related	403,102	390,792	378,481	367,060	353,850	341,531	329,210	317,649	304,559	292,230
New Non-Growth Related Debt (Principal)	-	-	12,410	37,813	90,628	110,589	141,422	163,474	223,032	261,061
New Non-Growth Related Debt (Interest)	-	-	7,925	23,640	55,819	64,854	80,014	88,303	119,642	134,791
Transfer to Capital	-	-	-	-	-	-	-	-	-	-
Transfer to Capital/Lifecycle Reserve	263,922	272,866	265,695	236,479	164,607	148,013	121,085	108,263	36,133	580
Sub Total Capital Related	999,380	996,469	997,777	998,717	999,092	999,637	1,006,847	1,013,275	1,019,422	1,025,192
Total Expenditures	2,608,089	2,644,169	2,680,577	2,717,317	2,754,392	2,792,437	2,837,747	2,883,475	2,929,622	2,976,192
Revenues										
Base Charge	1,038,622	1,054,954	1,071,508	1,088,288	1,105,297	1,122,842	1,140,767	1,158,938	1,177,358	1,196,031
S-412-101-0861 INTEREST ON SEWER	18,100	18,500	18,900	19,300	19,700	20,100	20,500	20,900	21,300	21,700
Contributions from Development Charges Reserve Fund	-	-	-	-	-	-	-	-	-	-
Contributions from Reserves / Reserve Funds	-	-	-	-	-	-	-	-	-	-
Total Operating Revenue	1,056,722	1,073,454	1,090,408	1,107,588	1,124,997	1,142,942	1,161,267	1,179,838	1,198,658	1,217,731
Wastewater Billing Recovery - Total	1,551,367	1,570,715	1,590,169	1,609,729	1,629,395	1,649,494	1,676,480	1,703,637	1,730,964	1,758,462



Chapter 6

Pricing Structures

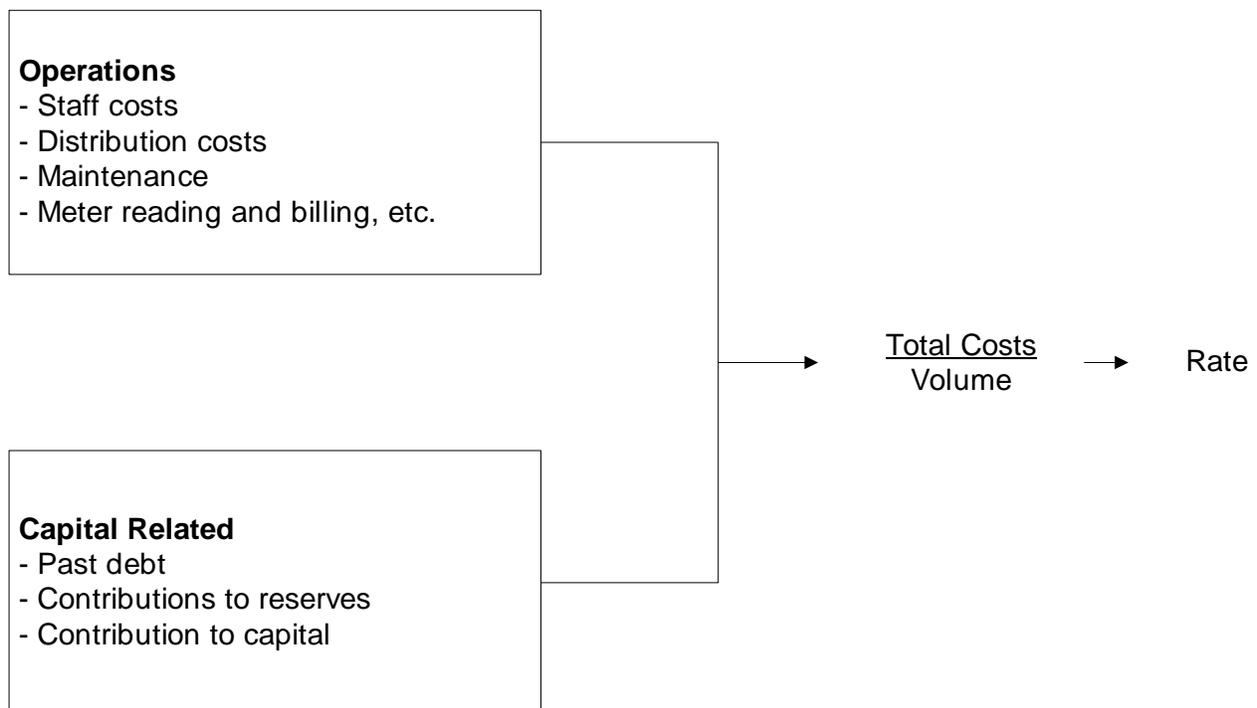


6. Pricing Structures

6.1 Introduction

Rates, in their simplest form, can be defined as total costs to maintain the utility function divided by the total expected volume to be generated for the period. Total costs are usually a combination of operating costs (e.g. staff costs, distribution costs, maintenance, administration, etc.) and capital-related costs (e.g. past debt to finance capital projects, transfers to reserves to finance future expenditures, etc.). The schematic below provides a simplified illustration of the rate calculation for water.

“Annual Costs”



These operating and capital expenditures will vary over time. Examples of factors that will affect the expenditures over time are provided below.

Operations

- Inflation;



- Increased maintenance as system ages; and
- Changes to provincial legislation.

Capital Related

- New capital will be built as areas expand;
- Replacement capital needed as system ages; and
- Financing of capital costs are a function of policy regarding reserves and direct financing from rates (pay as you go), debt and user pay methods (development charges, *Municipal Act*).

6.2 Alternative Pricing Structures

Throughout Ontario, and as well, Canada, the use of pricing mechanisms varies between municipalities. The use of a particular form of pricing depends upon numerous factors, including Council preference, administrative structure, surplus/deficit system capacities, economic/demographic conditions, to name a few.

Municipalities within Ontario have two basic forms of collecting revenues for water purposes, those being through incorporation of the costs within the tax rate charged on property assessment and/or through the establishment of a specific water rate billed to the customer. Within the rate methods, there are five basic rate structures employed along with other variations:

- Flat Rate (non-metered customers);
- Constant Rate;
- Declining Block Rate;
- Increasing (or Inverted) Block Rate;
- Hump Back Block Rate; and
- Base Charges.

The definitions and general application of the various methods are as follows:

Property Assessment: This method incorporates the total costs of providing water into the general requisition or the assessment base of the municipality. This form of collection is a "wealth tax," as payment increases directly with the value of property owned and bears no necessary relationship to actual consumption. This form is easy to



administer as the costs to be recovered are incorporated in the calculation for all general services, normally collected through property taxes.

Flat Rate: This rate is a constant charge applicable to all customers served. The charge is calculated by dividing the total number of user households and other entities (e.g. businesses) into the costs to be recovered. This method does not recognize differences in actual consumption but provides for a uniform spreading of costs across all users. Some municipalities define users into different classes of similar consumption patterns, that is, a commercial user, residential user and industrial user, and charge a flat rate by class. Each user is then billed on a periodic basis. No meters are required to facilitate this method, but an accurate estimate of the number of users is required. This method ensures set revenue for the collection period but is not sensitive to consumption, hence may cause a shortfall or surplus of revenues collected.

Constant Rate: This rate is a volume-based rate, in which the consumer pays the same price per unit consumed, regardless of the volume. The price per unit is calculated by dividing the total cost of the service by the total volume used by total consumers. The bill to the consumer climbs uniformly as the consumption increases. This form of rate requires the use of meters to record the volume consumed by each user. This method closely aligns the revenue recovery with consumption. Revenue collected varies directly with the consumption volume.

Declining Block Rates: This rate structure charges a successively lower price for set volumes, as consumption increases through a series of "blocks." That is to say that within set volume ranges, or blocks, the charge per unit is set at one rate. Within the next volume range, the charge per unit decreases to a lower rate, and so on. Typically, the first, or first and second blocks cover residential and light commercial uses. Subsequent blocks normally are used for heavier commercial and industrial uses. This rate structure requires the use of meters to record the volume consumed by each type of user. This method requires the collection and analysis of consumption patterns by user classification to establish rates at a level which does not over or under collect revenue from rate payers.

Increasing or Inverted Block Rates: The increasing block rate works essentially the same way as the declining block rate, except that the price of water in successive blocks increases rather than declines. Under this method the consumer's bill rises faster with higher volumes used. This rate structure also requires the use of meters to



record the volume consumed by each user. This method requires, as with the declining block structure, the collection and analysis of consumption patterns by user classification to establish rates at a level which does not over or under collect from rate payers.

The Hump Back Rate: The hump back rate is a combination of an increasing block rate and the declining block rate. Under this method the consumer's bill rises with higher volumes used up to a certain level and then begins to fall for volumes in excess of levels set for the increasing block rate.

6.3 Assessment of Alternative Pricing Structures

The adoption by a municipality or utility of any one particular pricing structure is normally a function of a variety of administrative, social, demographic and financial factors. The number of factors, and the weighting each particular factor receives, can vary between municipalities. The following is a review of some of the more prevalent factors.

Cost Recovery

Cost recovery is a prime factor in establishing a particular pricing structure. Costs can be loosely defined into different categories: operations, maintenance, capital, financing and administration. These costs often vary between municipalities and even within a municipality, based on consumption patterns, infrastructure age, economic growth, etc.

The pricing alternatives defined earlier can all achieve the cost recovery goal, but some do so more precisely than others. Fixed pricing structures, such as Property Assessment and Flat Rate, are established on the value of property or on the number of units present in the municipality, but do not adjust in accordance with consumption. Thus, if actual consumption for the year is greater than projected, the municipality incurs a higher cost of production, but the revenue base remains static (since it was determined at the beginning of the year), thus potentially providing a funding shortfall. Conversely, if the consumption level declines below projections, fixed pricing structures will produce more revenue than actual costs incurred.



The other pricing methods (declining block, constant rate, increasing block) are consumption-based and generally will generate revenues in proportion to actual consumption.

Administration

Administration is defined herein as the staffing, equipment and supplies required to support the undertaking of a particular pricing strategy. This factor not only addresses the physical tangible requirements to support the collection of the revenues, but also the intangible requirements, such as policy development.

The easiest pricing structure to support is the Property Assessment structure. As municipalities undertake the process of calculating property tax bills and the collection process for their general services, the incorporation of the water costs into this calculation would have virtually no impact on the administrative process and structure.

The Flat Rate pricing structure is relatively easy to administer as well. It is normally calculated to collect a set amount, either on a monthly, quarterly, semi-annual or annual basis, and is billed directly to the customer. The impact on administration centres mostly on the accounts receivable or billing area of the municipality, but normally requires minor additional staff or operating costs to undertake.

The three remaining methods, those being Increasing Block Rate, Constant Rate and Declining Block Rate, have a more dramatic effect on administration. These methods are dependent upon actual consumption and hence involve a major structure in place to administer. First, meters must be installed in all existing units in the municipality, and units to be subsequently built must be required to include these meters. Second, meter readings must be undertaken periodically. Hence staff must be available for this purpose or a service contract must be negotiated. Third, the billings process must be expanded to accommodate this process. Billing must be done per a defined period, requiring staff to produce the bills. Lastly, either through increased staffing or by service contract, an annual maintenance program must be set up to ensure meters are working effectively in recording consumed volumes.

The benefit derived from the installation of meters is that information on consumption patterns becomes available. This information provides benefit to administration in calculating rates which will ensure revenue recovery. Additionally, when planning what services are to be constructed in future years, the municipality or utility has documented



consumption patterns distinctive to its own situation, which can be used to project sizing of growth-related works.

Equity

Equity is always a consideration in the establishment of pricing structures but its definition can vary depending on a municipality's circumstances and based on the subjective interpretation of those involved. For example: is the price charged to a particular class of rate payer consistent with those of a similar class in surrounding municipalities; through the pricing structure does one class of rate payer pay more than another class; should one pay based on ability to pay, or on the basis that a unit of water costs the same to supply no matter who consumes it; etc.? There are many interpretations. Equity therefore must be viewed broadly in light of many factors as part of achieving what is best for the municipality as a whole.

Conservation

In today's society, conservation of natural resources is increasingly being more highly valued. Controversy continuously focuses on the preservation of non-renewable resources and on the proper management of renewable resources. Conservation is also a concept which applies to a municipality facing physical limitations in the amount of water which can be supplied to an area. As well, financial constraints can encourage conservation in a municipality where the cost of providing each additional unit is increasing.

Pricing structures such as property assessment and flat rate do not, in themselves, encourage conservation. In fact, depending on the price which is charged, they may even encourage resource "squandering," either because consumers, without the price discipline, consume water at will, or the customer wants to get his money's worth and hence adopts more liberal consumption patterns. The fundamental reason for this is that the price paid for the service bears no direct relationship to the volume consumed and hence is viewed as a "tax," instead of being viewed as the price of a purchased commodity.

The Declining Block Rate provides a decreasing incentive towards conservation. By creating awareness of volumes consumed, the consumer can reduce his total costs by restricting consumption; however, the incentive lessens as more water is consumed, because the marginal cost per unit declines as the consumer enters the next block



pricing range. Similarly, those whose consumption level is at the top end of a block have less incentive to reduce consumption.

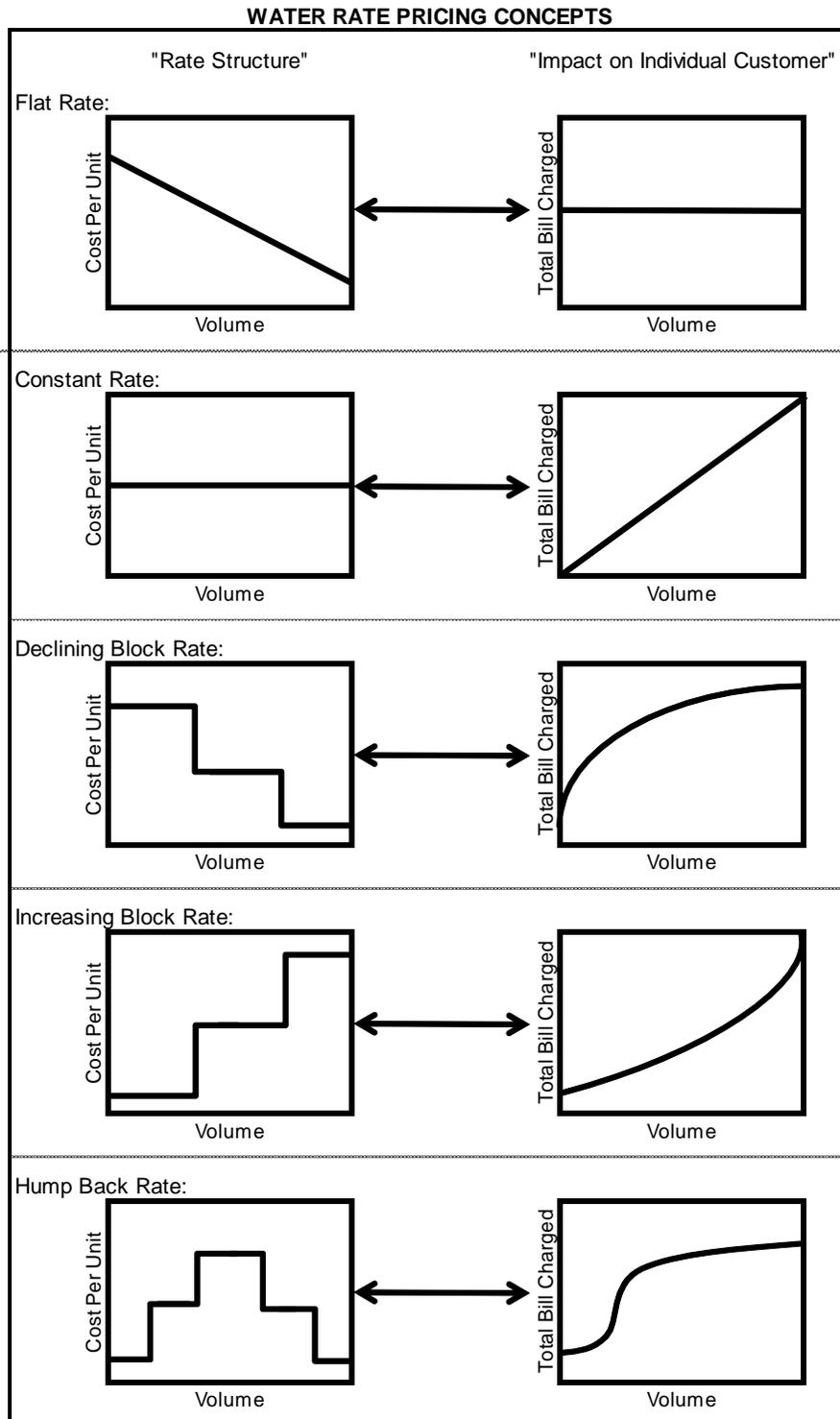
The Constant Rate structure presents the customer with a linear relationship between consumption and the cost thereof. As the consumer pays a fixed cost per unit, his bill will vary directly with the amount consumed. This method presents tangible incentive for consumers to conserve water. As metering provides direct feedback as to usage patterns and the consumer has direct control over the total amount paid for the commodity, the consumer is encouraged to use only those volumes that are reasonably required.

The Inverted Block method presents the most effective pricing method for encouraging conservation. Through this method, the price per unit consumed increases as total volumes consumed grow. The consumer becomes aware of consumption through metering with the charges increasing dramatically with usage. Hence, there normally is awareness that exercising control over usage can produce significant savings. This method not only encourages conservation methods, but may also penalize legitimate high-volume users if not properly structured.

Figure 6-1 provides a schematic representation of the various rate structures (note property tax as a basis for revenue recovery has not been presented for comparison, as the proportion of taxes paid varies in direct proportion to the market value of the property). The graphs on the left-hand side of the figure present the cost per unit for each additional amount of water consumed. The right-hand side of the figure presents the impact on the customer's bill as the volume of water increases. Following the schematic is a table summarizing each rate structure.



Figure 6-1





RATE STRUCTURE	COST PER UNIT AS VOLUME CONSUMPTION INCREASES	IMPACT ON CUSTOMER BILL AS VOLUME CONSUMPTION INCREASES
Flat Rate	Cost per unit decreases as more volume consumed	Bill remains the same no matter how much volume is consumed
Constant Rate	Cost per unit remains the same	Bill increases in direct proportion to consumption
Declining Block	Cost per unit decreases as threshold targets are achieved	Bill increases at a slower rate as volumes increase
Increasing Block	Cost per unit increases as threshold targets are achieved	Bill increases at a faster rate as volumes increase
Hump Back Rate	Combination of an increasing block at the lower consumption volumes and then converts to a declining block for the high	Bill increases at a faster rate at the lower consumption amounts and then slows as volumes increase

6.4 Rate Structures in Ontario

In a past survey of over 170 municipalities (approximately half of the municipalities who provide water and/or sewer), all forms of rate structures are in use by Ontario municipalities. The most common rate structure is the constant rate (for metered municipalities). Most municipalities (approximately 92%) who have volume rate structures also impose a base monthly charge.

Historically, the development of a base charge often reflected either the recovery of meter reading/billing/collection costs, plus administration or those costs plus certain fixed costs (such as capital contributions or reserve contributions). More recently, many municipalities have started to establish base charges based on ensuring a secure portion of the revenue stream which does not vary with volume consumption. Selection of the quantum of the base charge is a matter of policy selected by individual municipalities.



6.5 Recommended Rate Structures

Based on the foregoing, it is recommended that the current rate structure be continued.

As noted earlier, the needs for water and wastewater are significant throughout the forecast period. Given that the water and wastewater annual expenditures are relatively fixed, base charge revenues provides a stable revenue source for the Town to cover these expenditures. The current base charge revenues for water provides for 32% of the total operating expenditures, whereas wastewater base charge revenues provide for 40% of total operating expenditures.

In order to increase revenue stability for water, the relationship of the base charges to the operating expenditures have been proposed to increase by 1% per year from 32% to 40% by 2028. To achieve this relationship, the water base charges are calculated to increase at an average of 6% per year over the forecast. These increases to the base charges, coupled with the proposed increases to the volume rates (as discussed in Chapter 7), provide an overall annual water bill increase of 4% per year.

As for wastewater, it was noted that the base charge revenues already provide for 40% of the total wastewater operating expenditures. This relationship is proposed to be maintained over the forecast period. As a result, the recommended increase in wastewater base charges is 1% per year for the forecast period. The wastewater volume rates (calculated in Chapter 7) are also anticipated to increase by 1% over the forecast period, providing for an overall annual increase in the wastewater bill of 1% per annum.

The forecasted base charges and corresponding revenues are provided in Tables 6-1 and 6-2 for water and wastewater, respectively.



Table 6-1
Town of Renfrew
Base Charge Forecast – Water

Water	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Existing	3,361	3,361	3,361	3,361	3,361	3,361	3,361	3,361	3,361	3,361
New	27	47	68	88	108	129	151	173	194	216
Total Customers	3,388	3,408	3,429	3,449	3,469	3,490	3,512	3,534	3,555	3,577
Total Annual Revenue	\$859,202	\$924,484	\$985,400	\$1,050,298	\$1,129,997	\$1,216,033	\$1,308,735	\$1,382,130	\$1,445,692	\$1,497,588

¾" x ¾" Meter Size	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Existing	3,220	3,220	3,220	3,220	3,220	3,220	3,220	3,220	3,220	3,220
New	27	47	68	88	108	129	151	173	194	216
Subtotal Customers	3,247	3,267	3,288	3,308	3,328	3,349	3,371	3,393	3,414	3,436
Monthly Base Charge	\$19.76	\$21.15	\$22.42	\$23.76	\$25.42	\$27.20	\$29.11	\$30.56	\$31.78	\$32.74
Annual Base Charge	\$237.15	\$253.76	\$268.98	\$285.12	\$305.08	\$326.43	\$349.28	\$366.75	\$381.42	\$392.86
Total Annual Revenue	\$770,042	\$829,083	\$884,275	\$943,105	\$1,015,300	\$1,093,308	\$1,177,419	\$1,244,248	\$1,302,295	\$1,349,889

1" Meter Size	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Existing	69	69	69	69	69	69	69	69	69	69
New										
Subtotal Customers	69									
Monthly Base Charge	\$28.10	\$30.07	\$31.88	\$33.79	\$36.15	\$38.68	\$41.39	\$43.46	\$45.20	\$46.56
Annual Base Charge	\$337.24	\$360.85	\$382.50	\$405.45	\$433.83	\$464.20	\$496.69	\$521.53	\$542.39	\$558.66
Total Annual Revenue	\$23,270	\$24,899	\$26,393	\$27,976	\$29,934	\$32,030	\$34,272	\$35,986	\$37,425	\$38,548

1 ½" Meter Size	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Existing	30	30	30	30	30	30	30	30	30	30
New										
Subtotal Customers	30									
Monthly Base Charge	\$41.03	\$43.90	\$46.54	\$49.33	\$52.78	\$56.47	\$60.43	\$63.45	\$65.99	\$67.97
Annual Base Charge	\$492.35	\$526.81	\$558.42	\$591.93	\$633.36	\$677.70	\$725.14	\$761.39	\$791.85	\$815.61
Total Annual Revenue	\$14,770	\$15,804	\$16,753	\$17,758	\$19,001	\$20,331	\$21,754	\$22,842	\$23,756	\$24,468

2" Meter Size	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Existing	29	29	29	29	29	29	29	29	29	29
New										
Subtotal Customers	29									
Monthly Base Charge	\$66.48	\$71.14	\$75.41	\$79.93	\$85.53	\$91.51	\$97.92	\$102.81	\$106.93	\$110.14
Annual Base Charge	\$797.81	\$853.66	\$904.88	\$959.17	\$1,026.31	\$1,098.16	\$1,175.03	\$1,233.78	\$1,283.13	\$1,321.62
Total Annual Revenue	\$23,137	\$24,756	\$26,242	\$27,816	\$29,763	\$31,847	\$34,076	\$35,780	\$37,211	\$38,327

3" Meter Size	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Existing	9	9	9	9	9	9	9	9	9	9
New										
Subtotal Customers	9									
Monthly Base Charge	\$156.47	\$167.42	\$177.46	\$188.11	\$201.28	\$215.37	\$230.44	\$241.97	\$251.65	\$259.20
Annual Base Charge	\$1,877.59	\$2,009.02	\$2,129.57	\$2,257.34	\$2,415.35	\$2,584.43	\$2,765.34	\$2,903.61	\$3,019.75	\$3,110.34
Total Annual Revenue	\$16,898	\$18,081	\$19,166	\$20,316	\$21,738	\$23,260	\$24,888	\$26,132	\$27,178	\$27,993

4" Meter Size	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Existing	4	4	4	4	4	4	4	4	4	4
New										
Subtotal Customers	4									
Monthly Base Charge	\$230.93	\$247.10	\$261.92	\$277.64	\$297.07	\$317.87	\$340.12	\$357.13	\$371.41	\$382.55
Annual Base Charge	\$2,771.19	\$2,965.18	\$3,143.09	\$3,331.67	\$3,564.89	\$3,814.43	\$4,081.44	\$4,285.51	\$4,456.93	\$4,590.64
Total Annual Revenue	\$11,085	\$11,861	\$12,572	\$13,327	\$14,260	\$15,258	\$16,326	\$17,142	\$17,828	\$18,363



**Table 6-2
Town of Renfrew
Base Charge Forecast – Wastewater**

Wastewater	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Existing	3,311	3,311	3,311	3,311	3,311	3,311	3,311	3,311	3,311	3,311	3,311
New	9	27	47	68	88	108	129	151	173	194	216
Subtotal Customers	3,320	3,338	3,358	3,379	3,399	3,419	3,440	3,462	3,484	3,505	3,527
Total Annual Revenue	\$1,023,158	\$1,038,622	\$1,054,954	\$1,071,508	\$1,088,288	\$1,105,297	\$1,122,842	\$1,140,767	\$1,158,938	\$1,177,358	\$1,196,031

¾" x ¾" Meter Size	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Existing	3,170	3,170	3,170	3,170	3,170	3,170	3,170	3,170	3,170	3,170	3,170
New	9	27	47	68	88	108	129	151	173	194	216
Subtotal Customers	3,179	3,197	3,217	3,238	3,258	3,278	3,299	3,321	3,343	3,364	3,386
Monthly Base Charge	\$23.99	\$24.22	\$24.47	\$24.71	\$24.96	\$25.21	\$25.46	\$25.72	\$25.97	\$26.23	\$26.49
Annual Base Charge	\$287.82	\$290.70	\$293.61	\$296.54	\$299.51	\$302.50	\$305.53	\$308.58	\$311.67	\$314.78	\$317.93
Total Annual Revenue	\$914,980	\$929,362	\$944,601	\$960,052	\$975,718	\$991,601	\$1,008,009	\$1,024,785	\$1,041,796	\$1,059,045	\$1,076,535

1" Meter Size	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Existing	69	69	69	69	69	69	69	69	69	69	69
New											
Subtotal Customers	69										
Monthly Base Charge	\$34.11	\$34.45	\$34.79	\$35.14	\$35.49	\$35.84	\$36.20	\$36.57	\$36.93	\$37.30	\$37.67
Annual Base Charge	\$409.26	\$413.35	\$417.49	\$421.66	\$425.88	\$430.14	\$434.44	\$438.78	\$443.17	\$447.60	\$452.08
Total Annual Revenue	\$28,239	\$28,521	\$28,807	\$29,095	\$29,386	\$29,679	\$29,976	\$30,276	\$30,579	\$30,885	\$31,193

1½" Meter Size	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Existing	30	30	30	30	30	30	30	30	30	30	30
New											
Subtotal Customers	30										
Monthly Base Charge	\$49.77	\$50.27	\$50.77	\$51.28	\$51.79	\$52.31	\$52.83	\$53.36	\$53.89	\$54.43	\$54.98
Annual Base Charge	\$597.24	\$603.21	\$609.24	\$615.34	\$621.49	\$627.71	\$633.98	\$640.32	\$646.73	\$653.19	\$659.72
Total Annual Revenue	\$17,917	\$18,096	\$18,277	\$18,460	\$18,645	\$18,831	\$19,019	\$19,210	\$19,402	\$19,596	\$19,792

2" Meter Size	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Existing	29	29	29	29	29	29	29	29	29	29	29
New											
Subtotal Customers	29										
Monthly Base Charge	\$80.67	\$81.47	\$82.29	\$83.11	\$83.94	\$84.78	\$85.63	\$86.48	\$87.35	\$88.22	\$89.10
Annual Base Charge	\$967.98	\$977.66	\$987.44	\$997.31	\$1,007.28	\$1,017.36	\$1,027.53	\$1,037.81	\$1,048.18	\$1,058.67	\$1,069.25
Total Annual Revenue	\$28,071	\$28,352	\$28,636	\$28,922	\$29,211	\$29,503	\$29,798	\$30,096	\$30,397	\$30,701	\$31,008

3" Meter Size	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Existing	9	9	9	9	9	9	9	9	9	9	9
New											
Subtotal Customers	9										
Monthly Base Charge	\$189.84	\$191.74	\$193.66	\$195.59	\$197.55	\$199.52	\$201.52	\$203.53	\$205.57	\$207.63	\$209.70
Annual Base Charge	\$2,278.08	\$2,300.86	\$2,323.87	\$2,347.11	\$2,370.58	\$2,394.28	\$2,418.23	\$2,442.41	\$2,466.83	\$2,491.50	\$2,516.42
Total Annual Revenue	\$20,503	\$20,708	\$20,915	\$21,124	\$21,335	\$21,549	\$21,764	\$21,982	\$22,202	\$22,424	\$22,648

4" Meter Size	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Existing	4	4	4	4	4	4	4	4	4	4	4
New											
Subtotal Customers	4										
Monthly Base Charge	\$280.17	\$282.97	\$285.80	\$288.65	\$291.54	\$294.46	\$297.40	\$300.37	\$303.38	\$306.41	\$309.48
Annual Base Charge	\$3,361.98	\$3,395.60	\$3,429.56	\$3,463.85	\$3,498.49	\$3,533.47	\$3,568.81	\$3,604.50	\$3,640.54	\$3,676.95	\$3,713.72
Total Annual Revenue	\$13,448	\$13,582	\$13,718	\$13,855	\$13,994	\$14,134	\$14,275	\$14,418	\$14,562	\$14,708	\$14,855



Chapter 7

Analysis of Water and Wastewater Rates and Policy Matters



7. Analysis of Water and Wastewater Rates and Policy Matters

7.1 Introduction

To summarize the analysis undertaken thus far, Chapter 2 reviewed capital-related issues and responds to the provincial directives to maintain and upgrade infrastructure to required levels. Chapter 4 provided a review of capital financing options to which water and wastewater reserve contributions will be the predominant basis for financing future capital replacement. Chapter 5 established the 10-year operating forecast of expenditures including an annual capital reserve contribution. The base charge revenues are to ensure that fixed costs are recovered regardless of the amount of volume used by customers. This chapter will provide for the calculation of the volume rates over the forecast period. These calculations will be based on the net operating expenditures (the variable costs) provided in Chapter 5, divided by the water and wastewater volumes provided in section 1.8.

7.2 Water Rates

Based on the discussion of rate structures provided in section 6.5 and the recommendation to continue with the present structures, the rates are calculated by taking the net recoverable amounts from Table 5-1 (the product of total expenditures less non-rate revenues and deduct the base charge amounts provided in section 6.5) and completes the calculation by dividing them by the volumes resulting in the forecasted rates. This results in a water volume rate that is calculated to increase at an average of 3% per year over the forecast period.

Therefore, when combining the increases to the water base charges (from chapter 6) and the water volume rates, the overall annual water bill provides for an increase of 4% per year over the 2021 to 2030 forecast period. Detailed calculations of the volume rates are provided in Appendix C. A summary of the recommended water base charges and volume rates, along with the total annual bill for an average residential user who consumes 131 m³ per year, is presented in Table 7-1.



Table 7-1
Town of Renfrew
Average Annual Residential Water Bill (Based on an Annual Usage of 131m³)

Description	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Monthly Base Charge	\$18.47	\$19.76	\$21.15	\$22.42	\$23.76	\$25.42	\$27.20	\$29.11	\$30.56	\$31.78	\$32.74
Constant Rate	\$2.58	\$2.63	\$2.68	\$2.75	\$2.82	\$2.88	\$2.92	\$2.96	\$3.05	\$3.17	\$3.33
Annual Base Charge Bill	\$221.64	\$237.15	\$253.76	\$268.98	\$285.12	\$305.08	\$326.43	\$349.28	\$366.75	\$381.42	\$392.86
Volume	131	131	131	131	131	131	131	131	131	131	131
Annual Volume Bill	\$337.98	\$344.53	\$351.08	\$360.25	\$369.42	\$377.28	\$382.52	\$387.76	\$399.55	\$415.27	\$436.23
Total Annual Bill	\$559.62	\$581.68	\$604.84	\$629.23	\$654.54	\$682.36	\$708.95	\$737.04	\$766.30	\$796.69	\$829.09
% Increase - Total Annual Bill*		4%	4%	4%	4%	4%	4%	4%	4%	4%	4%

*Base Charge increases to provide fixed revenue to cover 40% of total operating expenditures by 2028



7.3 Wastewater Rates

Similar to water, the calculation of the wastewater rates takes the net recoverable amounts from Table 5-2 and completes the calculation by dividing them by the volumes, resulting in the forecast rates. Detailed calculations are provided in Appendix D.

Based on the operating and capital needs, coupled with the positive wastewater reserve balance, the wastewater volume rates are calculated to increase by 1% per year over the 2021 to 2030 forecast period.

Table 7-2 summarizes the recommended rates for wastewater and provides the average annual bill for a residential customer who uses 131 m³ per year.



Table 7-2
Town of Renfrew
Average Annual Residential Wastewater Bill (Based on an Annual Usage of 131m³)

Description	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Monthly Base Charge	\$23.99	\$24.22	\$24.47	\$24.71	\$24.96	\$25.21	\$25.46	\$25.72	\$25.97	\$26.23	\$26.49
Constant Rate	\$2.38	\$2.40	\$2.42	\$2.44	\$2.46	\$2.48	\$2.50	\$2.53	\$2.56	\$2.59	\$2.62
Annual Base Charge Bill	\$287.82	\$290.70	\$293.61	\$296.54	\$299.51	\$302.50	\$305.53	\$308.58	\$311.67	\$314.78	\$317.93
Volume	131	131	131	131	131	131	131	131	131	131	131
Annual Volume Bill	\$311.78	\$314.40	\$317.02	\$319.64	\$322.26	\$324.88	\$327.50	\$331.43	\$335.36	\$339.29	\$343.22
Total Annual Bill	\$599.60	\$605.10	\$610.63	\$616.18	\$621.77	\$627.38	\$633.03	\$640.01	\$647.03	\$654.07	\$661.15
% Increase - Total Annual Bill		1%	1%	1%	1%	1%	1%	1%	1%	1%	1%



7.4 Combined Water and Wastewater Impact for the Average Residential Customer

Based on the foregoing information, the combined impact of the water and wastewater base charges and volume rates provide an average increase of 2.5% per year to the total annual bill for residential customers. Table 7-3 presents the combined annual bill forecast for customers with a 5/8" meter and volume usage of 131 m³ per year.



Table 7-3
Town of Renfrew
Average Annual Residential Water and Wastewater Bill (Based on an Annual Usage of 131 m³)

Description	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Water											
Monthly Base Charge	\$18.47	\$19.76	\$21.15	\$22.42	\$23.76	\$25.42	\$27.20	\$29.11	\$30.56	\$31.78	\$32.74
Constant Rate	\$2.58	\$2.63	\$2.68	\$2.75	\$2.82	\$2.88	\$2.92	\$2.96	\$3.05	\$3.17	\$3.33
Annual Base Charge Bill	\$221.64	\$237.15	\$253.76	\$268.98	\$285.12	\$305.08	\$326.43	\$349.28	\$366.75	\$381.42	\$392.86
Annual Volume Bill	\$337.98	\$344.53	\$351.08	\$360.25	\$369.42	\$377.28	\$382.52	\$387.76	\$399.55	\$415.27	\$436.23
Total Annual Water Bill	\$559.62	\$581.68	\$604.84	\$629.23	\$654.54	\$682.36	\$708.95	\$737.04	\$766.30	\$796.69	\$829.09
Wastewater											
Monthly Base Charge	\$23.99	\$24.22	\$24.47	\$24.71	\$24.96	\$25.21	\$25.46	\$25.72	\$25.97	\$26.23	\$26.49
Constant Rate	\$2.38	\$2.40	\$2.42	\$2.44	\$2.46	\$2.48	\$2.50	\$2.53	\$2.56	\$2.59	\$2.62
Annual Base Charge Bill	\$287.82	\$290.70	\$293.61	\$296.54	\$299.51	\$302.50	\$305.53	\$308.58	\$311.67	\$314.78	\$317.93
Annual Volume Bill	\$311.78	\$314.40	\$317.02	\$319.64	\$322.26	\$324.88	\$327.50	\$331.43	\$335.36	\$339.29	\$343.22
Total Annual Wastewater Bill	\$599.60	\$605.10	\$610.63	\$616.18	\$621.77	\$627.38	\$633.03	\$640.01	\$647.03	\$654.07	\$661.15
Total Water & Wastewater Bill:	\$1,159.22	\$1,186.78	\$1,215.46	\$1,245.41	\$1,276.31	\$1,309.74	\$1,341.98	\$1,377.06	\$1,413.33	\$1,450.76	\$1,490.24
% Increase - Total Annual Bill		2.4%	2.4%	2.5%	2.5%	2.6%	2.5%	2.6%	2.6%	2.6%	2.7%



Chapter 8

Recommendations

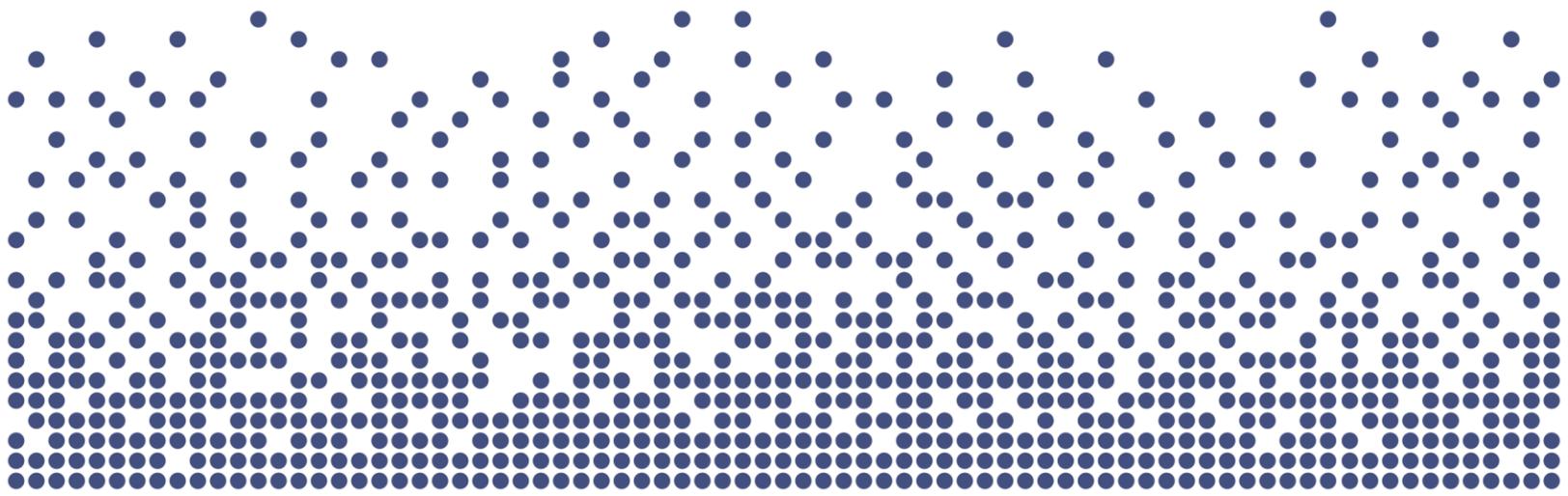


8. Recommendations

As presented within this report, capital and operating expenditures have been identified and forecast over a ten-year period for water and wastewater services.

Based upon the foregoing, the following recommendations are identified for consideration by Town Council:

1. That Council provide for the recovery of all water and wastewater costs through full cost recovery rates.
2. That Council consider the Capital Plan for water and wastewater as provided in Tables 2-1 and 2-2 and the associated Capital Financing Plan as set out in Tables 4-1 and 4-2.
3. That Council consider the base charges provided in Table 6-1 for water and Table 6-2 for wastewater.
4. That Council consider the volume rates for water and wastewater as provided in Tables 7-1 and 7-2, respectively.



Appendices



Appendix A

Water System Inventory Data



Appendix A: Water System Inventory Data

Table A-1
Town of Renfrew
Water Facilities Inventory

Asset	Component Description	Year Installed	Estimated Life	Replacement Year	Replacement Cost	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
WTP	Building	2006	95	2101	9,389,620	81	235,060	-
WTP	Solar	2016	20	2036	376,540	16	27,732	-
WTP	Mechanical	2006	25	2031	4,033,460	11	412,131	-
WTP	Electrical	2006	25	2031	2,906,700	11	297,001	-
WTP	Misc. Works	2008	25	2033	28,050	13	2,472	-
WTP	Pressure Control Upgrades	2008	15	2023	52,760	3	suggested for 10 year capital forecast	52,760
WTP	High lift pump	2010	15	2025	17,130	5	suggested for 10 year capital forecast	17,130
WTP	Chloramination system	2012	15	2027	73,440	7	suggested for 10 year capital forecast	73,440
Kedrosky Booster Station		2009	25	2034	295,420	14	24,402	-
Elevated Tower		2010	25	2035	1,237,070	15	96,276	-
Total					18,410,190		1,095,073	143,330



Table A-2
Town of Renfrew
Water Vehicles & Equipment Inventory

Description	Initial In-Use Year	Estimated Life	Replacement Year	Replacement Cost	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
1/2 Ton Pickup Truck (W010)	2018	10	2028	38,990	8	suggested for 10 year capital forecast	38,990
Express 4500 Cutaway (W007)	2014	20	2034	97,530	14	8,056	-
Chevy Silverado (W009)	2015	7	2022	37,250	2	suggested for 10 year capital forecast	37,250
Water Meter Mobile Unit	2013	10	2023	15,260	3	suggested for 10 year capital forecast	15,260
Water Meter Handheld Unit	2014	10	2024	8,080	4	suggested for 10 year capital forecast	8,080
Valve Turning Machine (E59)	2018	15	2033	87,250	13	7,688	-
Total				284,360		15,744	99,580



Table A-3
Town of Renfrew
Water Meters Inventory

Description	Year Installed	Estimated Life	Replacement Year	Total Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
2004 Water Meters	2004	30	2034	2,215,150	14	182,976	-
2005 Water Meters	2005	30	2035	89,430	15	6,960	-
2006 Water Meters	2006	30	2036	23,870	16	1,758	-
2007 Water Meters	2007	30	2037	19,510	17	1,365	-
2008 Water Meters	2008	30	2038	19,760	18	1,318	-
Total				2,367,720		194,377	0



**Table A-4
Town of Renfrew
Watermains Inventory**

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Argyle Street North	Munroe Avenue West	Barry Avenue	136	100	Cast Iron	1910	80	2020	84,500	0	suggested for 10 year capital forecast	84,500
Argyle Street North	Barry Avenue	O Gorman Avenue	158	100	Cast Iron	1910	80	2020	98,310	0	suggested for 10 year capital forecast	98,310
Plaunt Street South	Railway Avenue	Munroe Avenue East	84	200	Ductile Iron	1910	80	2020	53,900	0	suggested for 10 year capital forecast	53,900
Plaunt Street South	Railway Avenue	Munroe Avenue East	1	200	Ductile Iron	1910	80	2020	400	0	suggested for 10 year capital forecast	400
Plaunt Street South	Railway Avenue	Munroe Avenue East	153	100	Cast Iron	1910	80	2020	94,610	0	suggested for 10 year capital forecast	94,610
Plaunt Street South	Railway Avenue	Munroe Avenue East	8	100	Cast Iron	1910	80	2020	4,970	0	suggested for 10 year capital forecast	4,970
Railway Avenue	Raglan Street North	Plaunt Street North	4	150	Cast Iron	1910	80	2020	2,740	0	suggested for 10 year capital forecast	2,740
Renfrew Avenue East	Plaunt Street South	Raglan Street South	79	150	Cast Iron	1910	80	2020	48,880	0	suggested for 10 year capital forecast	48,880
Prince Avenue West	Raglan Street South	Plaunt Street South	71	200	Ductile Iron	1910	80	2020	45,250	0	suggested for 10 year capital forecast	45,250
Argyle Street South	Patrick Avenue	Munroe Avenue West	172	100	Cast Iron	1910	80	2020	106,990	0	suggested for 10 year capital forecast	106,990
Argyle Street South	Duke Avenue	Patrick Avenue	146	150	Cast Iron	1910	80	2020	90,820	0	suggested for 10 year capital forecast	90,820
Argyle Street South	Renfrew Avenue West	Duke Avenue	123	150	Cast Iron	1910	80	2020	76,020	0	suggested for 10 year capital forecast	76,020
Argyle Street South	Renfrew Avenue West	Duke Avenue	83	150	Cast Iron	1910	80	2020	51,470	0	suggested for 10 year capital forecast	51,470



Table A-4 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Argyle Street South	Prince Avenue West	Renfrew Avenue West	96	100	Cast Iron	1910	80	2020	59,600	0	suggested for 10 year capital forecast	59,600
Argyle Street South	Opeongo Road	Prince Avenue West	125	150	Ductile Iron	1910	80	2020	77,500	0	suggested for 10 year capital forecast	77,500
Patrick Avenue	Raglan Street South	Argyle Street North	12	200	Ductile Iron	1910	80	2020	7,530	0	suggested for 10 year capital forecast	7,530
Railway Avenue	Raglan Street North	Plaunt Street North	75	150	Cast Iron	1910	80	2020	46,660	0	suggested for 10 year capital forecast	46,660
Railway Avenue	Raglan Street North	Plaunt Street North	8	150	Cast Iron	1910	80	2020	4,770	0	suggested for 10 year capital forecast	4,770
Albert Street	Bruce Street	Elgin Avenue	12	150	Cast Iron	1920	80	2020	7,610	0	suggested for 10 year capital forecast	7,610
Albert Street	Bruce Street	Elgin Avenue	5	150	Cast Iron	1920	80	2020	2,820	0	suggested for 10 year capital forecast	2,820
Albert Street	Bruce Street	Elgin Avenue	10	150	Cast Iron	1920	80	2020	6,020	0	suggested for 10 year capital forecast	6,020
Albert Street	Bruce Street	Elgin Avenue	9	150	Transite	1920	80	2020	5,720	0	suggested for 10 year capital forecast	5,720
Albert Street	Hincks Avenue	Elgin Avenue	3	200	Cast Iron	1920	80	2020	2,030	0	suggested for 10 year capital forecast	2,030
Albert Street	Hincks Avenue	Elgin Avenue	45	25	Cast Iron	1920	80	2020	22,750	0	suggested for 10 year capital forecast	22,750
Albert Street	Arthur Avenue	Hincks Avenue	45	200	Cast Iron	1920	80	2020	28,990	0	suggested for 10 year capital forecast	28,990
Bonnechere Street North	Munroe Avenue West	Lisgar Avenue	3	150	Cast Iron	1920	80	2020	2,090	0	suggested for 10 year capital forecast	2,090
Munroe Avenue West	Lochiel Street North	Bonnechere Street North	6	250	Cast Iron	1920	80	2020	3,770	0	suggested for 10 year capital forecast	3,770
Lochiel Street North	Munroe Avenue West	Lisgar Avenue	6	250	Cast Iron	1920	80	2020	3,700	0	suggested for 10 year capital forecast	3,700



Table A-4 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Munroe Avenue West	Argyle Street North	Lochiel Street North	71	250	Cast Iron	1920	80	2020	47,070	0	suggested for 10 year capital forecast	47,070
Munroe Avenue West	Argyle Street North	Lochiel Street North	8	250	Cast Iron	1920	80	2020	5,280	0	suggested for 10 year capital forecast	5,280
Argyle Street North	Munroe Avenue West	Barry Avenue	6	250	Cast Iron	1920	80	2020	3,990	0	suggested for 10 year capital forecast	3,990
Munroe Avenue East	Plaunt Street North	Raglan Street North	5	150	Cast Iron	1920	80	2020	2,860	0	suggested for 10 year capital forecast	2,860
Munroe Avenue East	Plaunt Street North	Raglan Street North	2	150	Cast Iron	1920	80	2020	1,410	0	suggested for 10 year capital forecast	1,410
Bridge Street	Lochiel Street North	Ready Avenue	15	200	Cast Iron	1920	80	2020	9,600	0	suggested for 10 year capital forecast	9,600
Lochiel Street North	Lisgar Avenue	Barry Avenue	25	150	Transite	1920	80	2020	15,640	0	suggested for 10 year capital forecast	15,640
Railway Avenue	Plaunt Street North	Xavier Street	3	150	Cast Iron	1920	80	2020	1,610	0	suggested for 10 year capital forecast	1,610
Barr Street	Quarry Avenue	Renfrew Avenue East	15	150	Cast Iron	1920	80	2020	9,150	0	suggested for 10 year capital forecast	9,150
Lochiel Street South	Patrick Avenue	Munroe Avenue West	157	150	Cast Iron	1920	80	2020	97,320	0	suggested for 10 year capital forecast	97,320
Lochiel Street South	Patrick Avenue	Munroe Avenue West	15	150	Cast Iron	1920	80	2020	9,210	0	suggested for 10 year capital forecast	9,210
Lochiel Street South	Cross Avenue	Patrick Avenue	76	150	Cast Iron	1920	80	2020	47,220	0	suggested for 10 year capital forecast	47,220
Lochiel Street South	Cross Avenue	Patrick Avenue	3	150	Cast Iron	1920	80	2020	1,860	0	suggested for 10 year capital forecast	1,860
Lochiel Street South	Renfrew Avenue West	Cross Avenue	143	200	Cast Iron	1920	80	2020	91,670	0	suggested for 10 year capital forecast	91,670
Lochiel Street South	Renfrew Avenue West	Cross Avenue	10	200	Cast Iron	1920	80	2020	6,700	0	suggested for 10 year capital forecast	6,700



Table A-4 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Lochiel Street South	Prince Avenue West	Renfrew Avenue West	93	100	Cast Iron	1920	80	2020	57,980	0	suggested for 10 year capital forecast	57,980
Lochiel Street South	Prince Avenue West	Renfrew Avenue West	4	100	Cast Iron	1920	80	2020	2,250	0	suggested for 10 year capital forecast	2,250
Lochiel Street South	Opeongo Road	Prince Avenue West	92	100	Cast Iron	1920	80	2020	56,930	0	suggested for 10 year capital forecast	56,930
Argyle Street South	Renfrew Avenue West	Duke Avenue	5	150	Cast Iron	1920	80	2020	3,350	0	suggested for 10 year capital forecast	3,350
Argyle Street South	Patrick Avenue	Munroe Avenue West	4	200	Ductile Iron	1920	80	2020	2,530	0	suggested for 10 year capital forecast	2,530
Argyle Street South	Patrick Avenue	Munroe Avenue West	11	200	Ductile Iron	1920	80	2020	6,730	0	suggested for 10 year capital forecast	6,730
Patrick Avenue	Argyle Street North	Lochiel Street North	65	200	Ductile Iron	1920	80	2020	41,820	0	suggested for 10 year capital forecast	41,820
Lochiel Street South	Patrick Avenue	Munroe Avenue West	7	200	Ductile Iron	1920	80	2020	4,500	0	suggested for 10 year capital forecast	4,500
Cross Avenue	Bonnechere Street South	Lochiel Street North	72	150	Cast Iron	1920	80	2020	44,530	0	suggested for 10 year capital forecast	44,530
Bank Street North	Cross Avenue	Patrick Avenue	3	150	Cast Iron	1920	80	2020	1,970	0	suggested for 10 year capital forecast	1,970
Renfrew Avenue West	Argyle Street South	Lochiel Street South	17	50	Cast Iron	1920	80	2020	10,570	0	suggested for 10 year capital forecast	10,570
Renfrew Avenue West	Argyle Street South	Lochiel Street South	76	200	Cast Iron	1920	80	2020	48,860	0	suggested for 10 year capital forecast	48,860
Renfrew Avenue West	Argyle Street South	Lochiel Street South	8	200	Cast Iron	1920	80	2020	4,850	0	suggested for 10 year capital forecast	4,850
Lochiel Street South	Renfrew Avenue West	Cross Avenue	3	200	Cast Iron	1920	80	2020	1,700	0	suggested for 10 year capital forecast	1,700
Argyle Street South	Prince Avenue West	Renfrew Avenue West	8	200	Ductile Iron	1920	80	2020	5,310	0	suggested for 10 year capital forecast	5,310



Table A-4 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Prince Avenue West	Argyle Street South	Lochiel Street South	73	200	Ductile Iron	1920	80	2020	46,640	0	suggested for 10 year capital forecast	46,640
Lochiel Street South	Prince Avenue West	Renfrew Avenue West	6	200	Ductile Iron	1920	80	2020	3,940	0	suggested for 10 year capital forecast	3,940
Opeongo Road	Raglan Street South	Argyle Street South	59	200	Ductile Iron	1920	80	2020	37,990	0	suggested for 10 year capital forecast	37,990
Opeongo Road	Raglan Street South	Argyle Street South	25	200	Ductile Iron	1920	80	2020	16,100	0	suggested for 10 year capital forecast	16,100
Opeongo Road	Lochiel Street South	Argyle Street South	30	200	Ductile Iron	1920	80	2020	19,180	0	suggested for 10 year capital forecast	19,180
Opeongo Road	Lochiel Street South	Argyle Street South	62	25	Cast Iron	1920	80	2020	31,110	0	suggested for 10 year capital forecast	31,110
Argyle Street South	Renfrew Avenue West	Duke Avenue	83	200	Ductile Iron	1920	80	2020	53,450	0	suggested for 10 year capital forecast	53,450
Lochiel Street South	Renfrew Avenue West	Cross Avenue	67	200	Cast Iron	1920	80	2020	43,140	0	suggested for 10 year capital forecast	43,140
Lochiel Street South	Renfrew Avenue West	Cross Avenue	57	200	Cast Iron	1920	80	2020	36,410	0	suggested for 10 year capital forecast	36,410
Renfrew Avenue West	Raglan Street South	Argyle Street South	73	200	Cast Iron	1920	80	2020	47,050	0	suggested for 10 year capital forecast	47,050
Argyle Street South	Renfrew Avenue West	Duke Avenue	12	200	Cast Iron	1920	80	2020	7,840	0	suggested for 10 year capital forecast	7,840
Arthur Avenue	Stewart Street	Albert Street	75	50	Cast Iron	1922	80	2020	46,460	0	suggested for 10 year capital forecast	46,460
Arthur Avenue	Albert Street	Raglan Street North	69	200	Cast Iron	1922	80	2020	44,250	0	suggested for 10 year capital forecast	44,250
Arthur Avenue	Albert Street	Raglan Street North	26	200	Cast Iron	1922	80	2020	16,910	0	suggested for 10 year capital forecast	16,910
Arthur Avenue	Albert Street	Raglan Street North	45	200	Cast Iron	1922	80	2020	28,620	0	suggested for 10 year capital forecast	28,620



Table A-4 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Arthur Avenue	Raglan Street North	Dead End	11	200	Cast Iron	1922	80	2020	7,180	0	suggested for 10 year capital forecast	7,180
Arthur Avenue	Raglan Street North	Dead End	18	200	Cast Iron	1922	80	2020	11,770	0	suggested for 10 year capital forecast	11,770
Arthur Avenue	Albert Street	Raglan Street North	22	150	Cast Iron	1922	80	2020	13,930	0	suggested for 10 year capital forecast	13,930
Baldwin Street	Ready Avenue	Hincks Avenue	55	25	Cast Iron	1924	80	2020	27,540	0	suggested for 10 year capital forecast	27,540
Baldwin Street	Hincks Avenue	Elgin Avenue	99	150	Cast Iron	1924	80	2020	61,700	0	suggested for 10 year capital forecast	61,700
Baldwin Street	Ready Avenue	Hincks Avenue	124	150	Cast Iron	1924	80	2020	76,810	0	suggested for 10 year capital forecast	76,810
Baldwin Street	Hincks Avenue	Elgin Avenue	117	400	Cast Iron	1924	80	2020	92,600	0	suggested for 10 year capital forecast	92,600
Baldwin Street	Ready Avenue	Hincks Avenue	116	400	Cast Iron	1924	80	2020	92,060	0	suggested for 10 year capital forecast	92,060
Bridge Street	Lochiel Street North	Ready Avenue	194	250	Cast Iron	1926	80	2020	128,460	0	suggested for 10 year capital forecast	128,460
Bridge Street	Lochiel Street North	Ready Avenue	110	250	Cast Iron	1926	80	2020	72,650	0	suggested for 10 year capital forecast	72,650
Bridge Street	Lochiel Street North	Ready Avenue	29	250	Cast Iron	1926	80	2020	19,280	0	suggested for 10 year capital forecast	19,280
Bruce Street	Raglan Street North	Albert Street	121	150	Transite	1928	80	2020	75,290	0	suggested for 10 year capital forecast	75,290
Elgin Avenue	Rousselle Street	Baldwin Street	103	400	Cast Iron	1930	80	2020	81,520	0	suggested for 10 year capital forecast	81,520
Elgin Avenue	Rousselle Street	Baldwin Street	8	400	Cast Iron	1930	80	2020	6,270	0	suggested for 10 year capital forecast	6,270
Elgin Avenue	Baldwin Street	Stewart Street	142	100	Cast Iron	1930	80	2020	87,940	0	suggested for 10 year capital forecast	87,940



Table A-4 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Elgin Avenue	Stewart Street	Albert Street	131	150	Cast Iron	1930	80	2020	81,050	0	suggested for 10 year capital forecast	81,050
Elgin Avenue	Albert Street	Raglan Street South	117	150	PVC	1930	100	2030	72,450	10	suggested for 10 year capital forecast	72,450
Elgin Avenue	Albert Street	Raglan Street South	117	150	PVC	1930	100	2030	72,450	10	suggested for 10 year capital forecast	72,450
Elgin Avenue	Baldwin Street	Stewart Street	12	150	Cast Iron	1930	80	2020	7,730	0	suggested for 10 year capital forecast	7,730
Munroe Avenue West	Lochiel Street North	Bonnechere Street North	72	250	Cast Iron	1930	80	2020	47,380	0	suggested for 10 year capital forecast	47,380
Lisgar Avenue	Lochiel Street North	Bonnechere Street North	62	19	Copper	1930	80	2020	31,120	0	suggested for 10 year capital forecast	31,120
Bonnechere Street North	Munroe Avenue West	Lisgar Avenue	142	250	Cast Iron	1930	80	2020	93,750	0	suggested for 10 year capital forecast	93,750
Bonnechere Street North	Lisgar Avenue	Dead End	9	250	Cast Iron	1930	80	2020	6,230	0	suggested for 10 year capital forecast	6,230
Bonnechere Street North	Lisgar Avenue	Dead End	155	250	Cast Iron	1930	80	2020	102,670	0	suggested for 10 year capital forecast	102,670
Bonnechere Street North	Lisgar Avenue	Dead End	3	250	Cast Iron	1930	80	2020	1,820	0	suggested for 10 year capital forecast	1,820
Railway Avenue	Plaunt Street North	Xavier Street	108	150	Cast Iron	1930	80	2020	66,950	0	suggested for 10 year capital forecast	66,950
Renfrew Avenue East	Xavier Street	Plaunt Street South	114	150	Cast Iron	1930	80	2020	70,460	0	suggested for 10 year capital forecast	70,460
Xavier Street	Railway Avenue	Renfrew Avenue West	8	150	Cast Iron	1930	80	2020	4,840	0	suggested for 10 year capital forecast	4,840
Prince Avenue West	Queens Crescent	Carswell Street	443	100	Cast Iron	1930	80	2020	274,710	0	suggested for 10 year capital forecast	274,710
Bonnechere Street South	Patrick Avenue	Munroe Avenue West	160	100	Cast Iron	1930	80	2020	99,000	0	suggested for 10 year capital forecast	99,000
Bonnechere Street South	Patrick Avenue	Munroe Avenue West	9	100	Cast Iron	1930	80	2020	5,620	0	suggested for 10 year capital forecast	5,620



Table A-4 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Bonnechere Street South	Cross Avenue	Patrick Avenue	81	100	Cast Iron	1930	80	2020	50,430	0	suggested for 10 year capital forecast	50,430
Bonnechere Street	Renfrew Avenue West	Cross Avenue	90	150	Cast Iron	1930	80	2020	55,540	0	suggested for 10 year capital forecast	55,540
Bonnechere Street	Renfrew Avenue West	Cross Avenue	84	150	Cast Iron	1930	80	2020	52,370	0	suggested for 10 year capital forecast	52,370
Bonnechere Street	Renfrew Avenue West	Cross Avenue	95	150	Cast Iron	1930	80	2020	58,650	0	suggested for 10 year capital forecast	58,650
Bonnechere Street	Renfrew Avenue West	Cross Avenue	5	150	Cast Iron	1930	80	2020	2,870	0	suggested for 10 year capital forecast	2,870
Bonnechere Street	Prince Avenue West	Renfrew Avenue West	96	200	Ductile Iron	1930	80	2020	61,840	0	suggested for 10 year capital forecast	61,840
Bonnechere Street	Opeongo Road	Prince Avenue West	94	200	Ductile Iron	1930	80	2020	59,960	0	suggested for 10 year capital forecast	59,960
Bonnechere Street	Prince Avenue West	Renfrew Avenue West	91	100	Cast Iron	1930	80	2020	56,620	0	suggested for 10 year capital forecast	56,620
Patrick Avenue	Lochiel Street South	Bonnechere Street South	83	200	Ductile Iron	1930	80	2020	53,350	0	suggested for 10 year capital forecast	53,350
Bonnechere Street South	Patrick Avenue	Munroe Avenue West	9	200	Ductile Iron	1930	80	2020	5,860	0	suggested for 10 year capital forecast	5,860
Bonnechere Street South	Cross Avenue	Patrick Avenue	10	150	Cast Iron	1930	80	2020	6,020	0	suggested for 10 year capital forecast	6,020
Cross Avenue	Bonnechere Street South	Queen Street South	80	150	Cast Iron	1930	80	2020	49,890	0	suggested for 10 year capital forecast	49,890
Renfrew Avenue West	Lochiel Street South	Bonnechere Street South	77	200	Cast Iron	1930	80	2020	49,480	0	suggested for 10 year capital forecast	49,480
Bonnechere Street	Renfrew Avenue West	Cross Avenue	11	200	Cast Iron	1930	80	2020	7,100	0	suggested for 10 year capital forecast	7,100
Bonnechere Street	Renfrew Avenue West	Cross Avenue	3	200	Cast Iron	1930	80	2020	1,720	0	suggested for 10 year capital forecast	1,720



Table A-4 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Prince Avenue West	Lochiel Street South	Bonnechere Street South	78	200	Ductile Iron	1930	80	2020	49,710	0	suggested for 10 year capital forecast	49,710
Bonnechere Street	Prince Avenue West	Renfrew Avenue West	10	200	Ductile Iron	1930	80	2020	6,550	0	suggested for 10 year capital forecast	6,550
Bonnechere Street	Opeongo Road	Prince Avenue West	178	400	Cast Iron	1930	80	2020	141,670	0	suggested for 10 year capital forecast	141,670
Prince Avenue West	Queens Crescent	Carswell Street	9	400	Cast Iron	1930	80	2020	6,820	0	suggested for 10 year capital forecast	6,820
Opeongo Road	Bonnechere Street South	Lochiel Street South	86	100	Cast Iron	1930	80	2020	53,250	0	suggested for 10 year capital forecast	53,250
Bonnechere Street	Opeongo Road	Prince Avenue West	2	100	Cast Iron	1930	80	2020	970	0	suggested for 10 year capital forecast	970
Bonnechere Street	Opeongo Road	Prince Avenue West	4	100	Cast Iron	1930	80	2020	2,560	0	suggested for 10 year capital forecast	2,560
Opeongo Road	Lochiel Street South	Argyle Street South	315	400	Transite	1930	80	2020	250,370	0	suggested for 10 year capital forecast	250,370
Bonnechere Street	Opeongo Road	Prince Avenue West	12	200	Transite	1930	80	2020	7,490	0	suggested for 10 year capital forecast	7,490
Opeongo Road	Airth Boulevard	Bonnechere Street South	99	200	Transite	1930	80	2020	63,270	0	suggested for 10 year capital forecast	63,270
Grigg Avenue	Raglan Street North	Moore Street	116	100	Cast Iron	1932	80	2020	72,150	0	suggested for 10 year capital forecast	72,150
Hincks Avenue	Stewart Street	Baldwin Street	142	100	Cast Iron	1934	80	2020	87,800	0	suggested for 10 year capital forecast	87,800
Hincks Avenue	Stewart Street	Baldwin Street	137	200	Cast Iron	1934	80	2020	87,630	0	suggested for 10 year capital forecast	87,630
Hincks Avenue	Stewart Street	Albert Street	122	200	Cast Iron	1934	80	2020	78,540	0	suggested for 10 year capital forecast	78,540
Hincks Avenue	Stewart Street	Albert Street	9	200	Cast Iron	1934	80	2020	5,870	0	suggested for 10 year capital forecast	5,870



Table A-4 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Hincks Avenue	Albert Street	Raglan Street North	128	150	Transite	1934	80	2020	79,400	0	suggested for 10 year capital forecast	79,400
Hincks Avenue	Albert Street	Raglan Street North	6	150	Cast Iron	1934	80	2020	3,490	0	suggested for 10 year capital forecast	3,490
Raglan Street North	Grigg Avenue	Raglan Street North	231	100	Cast Iron	1936	80	2020	143,500	0	suggested for 10 year capital forecast	143,500
Raglan Street North	Bruce Street	Grigg Avenue	162	100	Cast Iron	1936	80	2020	100,620	0	suggested for 10 year capital forecast	100,620
Raglan Street North	Grigg Avenue	Raglan Street North	225	200	Ductile Iron	1936	80	2020	144,430	0	suggested for 10 year capital forecast	144,430
Raglan Street North	Grigg Avenue	Raglan Street North	5	200	Ductile Iron	1936	80	2020	3,010	0	suggested for 10 year capital forecast	3,010
Raglan Street North	Grigg Avenue	Raglan Street North	4	200	Cast Iron	1936	80	2020	2,690	0	suggested for 10 year capital forecast	2,690
Raglan Street North	Bruce Street	Grigg Avenue	134	200	Ductile Iron	1936	80	2020	85,670	0	suggested for 10 year capital forecast	85,670
Raglan Street North	Bruce Street	Grigg Avenue	15	200	Ductile Iron	1936	80	2020	9,850	0	suggested for 10 year capital forecast	9,850
Raglan Street North	Bruce Street	Grigg Avenue	5	150	Transite	1936	80	2020	3,310	0	suggested for 10 year capital forecast	3,310
Raglan Street North	Bruce Street	Grigg Avenue	2	200	Ductile Iron	1936	80	2020	1,150	0	suggested for 10 year capital forecast	1,150
Raglan Street North	Bruce Street	Grigg Avenue	2	100	Cast Iron	1936	80	2020	1,200	0	suggested for 10 year capital forecast	1,200
Raglan Street North	Bruce Street	Grigg Avenue	7	100	Cast Iron	1936	80	2020	4,380	0	suggested for 10 year capital forecast	4,380
Raglan Street North	Elgin Avenue	Bruce Street	107	150	Cast Iron	1936	80	2020	66,630	0	suggested for 10 year capital forecast	66,630
Raglan Street North	Elgin Avenue	Bruce Street	9	150	Cast Iron	1936	80	2020	5,740	0	suggested for 10 year capital forecast	5,740



Table A-4 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Raglan Street North	Hincks Avenue	Elgin Avenue	119	100	Cast Iron	1936	80	2020	73,940	0	suggested for 10 year capital forecast	73,940
Raglan Street North	Hincks Avenue	Elgin Avenue	114	400	Transite	1936	80	2020	90,920	0	suggested for 10 year capital forecast	90,920
Raglan Street North	Hincks Avenue	Elgin Avenue	4	400	Transite	1936	80	2020	3,500	0	suggested for 10 year capital forecast	3,500
Raglan Street North	Hincks Avenue	Elgin Avenue	24	150	Cast Iron	1936	80	2020	14,920	0	suggested for 10 year capital forecast	14,920
Raglan Street North	Grigg Avenue	Raglan Street North	6	100	Cast Iron	1936	80	2020	3,740	0	suggested for 10 year capital forecast	3,740
Ready Avenue	Stewart Street	Baldwin Street	5	150	Cast Iron	1938	80	2020	3,050	0	suggested for 10 year capital forecast	3,050
Ready Avenue	Baldwin Street	Dead End	46	250	Cast Iron	1938	80	2020	30,410	0	suggested for 10 year capital forecast	30,410
Ready Avenue	Stewart Street	Baldwin Street	6	250	Cast Iron	1938	80	2020	3,660	0	suggested for 10 year capital forecast	3,660
Ready Avenue	Stewart Street	Baldwin Street	91	250	Cast Iron	1938	80	2020	60,290	0	suggested for 10 year capital forecast	60,290
Ready Avenue	Stewart Street	Baldwin Street	3	250	Cast Iron	1938	80	2020	1,680	0	suggested for 10 year capital forecast	1,680
Ready Avenue	Stewart Street	Baldwin Street	11	250	Cast Iron	1938	80	2020	7,520	0	suggested for 10 year capital forecast	7,520
Ready Avenue	Stewart Street	Baldwin Street	40	250	Cast Iron	1938	80	2020	26,550	0	suggested for 10 year capital forecast	26,550
Ready Avenue	Stewart Street	Baldwin Street	2	250	Cast Iron	1938	80	2020	1,500	0	suggested for 10 year capital forecast	1,500
Stewart Street	Hincks Avenue	Elgin Avenue	119	150	Cast Iron	1940	80	2020	73,820	0	suggested for 10 year capital forecast	73,820
Stewart Street	Hincks Avenue	Elgin Avenue	7	100	Cast Iron	1940	80	2020	4,130	0	suggested for 10 year capital forecast	4,130



Table A-4 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Stewart Street	Hincks Avenue	Elgin Avenue	7	200	Cast Iron	1940	80	2020	4,300	0	suggested for 10 year capital forecast	4,300
Stewart Street	Arthur Avenue	Hincks Avenue	44	200	Cast Iron	1940	80	2020	27,950	0	suggested for 10 year capital forecast	27,950
Stewart Street	Arthur Avenue	Hincks Avenue	13	200	Cast Iron	1940	80	2020	8,210	0	suggested for 10 year capital forecast	8,210
Stewart Street	Arthur Avenue	Ready Avenue	57	200	Cast Iron	1940	80	2020	36,560	0	suggested for 10 year capital forecast	36,560
Blake Street	Mary Street	Lisgar Avenue	104	150	Transite	1940	80	2020	64,410	0	suggested for 10 year capital forecast	64,410
Blake Street	Dead End	Mary Street	81	150	Transite	1940	80	2020	49,960	0	suggested for 10 year capital forecast	49,960
Blake Street	Dead End	Mary Street	9	150	Transite	1940	80	2020	5,580	0	suggested for 10 year capital forecast	5,580
Munroe Avenue West	Bonnechere Street North	Queen Street North	73	150	Cast Iron	1940	80	2020	45,440	0	suggested for 10 year capital forecast	45,440
Bonnechere Street North	Munroe Avenue West	Lisgar Avenue	5	150	Cast Iron	1940	80	2020	3,020	0	suggested for 10 year capital forecast	3,020
Munroe Avenue West	Raglan Street North	Argyle Street North	87	250	Cast Iron	1940	80	2020	57,540	0	suggested for 10 year capital forecast	57,540
Munroe Avenue East	Plaunt Street North	Raglan Street North	82	150	Cast Iron	1940	80	2020	50,960	0	suggested for 10 year capital forecast	50,960
Lisgar Avenue	Queen Street North	Bank Street North	63	150	Ductile Iron	1940	80	2020	38,940	0	suggested for 10 year capital forecast	38,940
Queen Street North	Lisgar Avenue	O Gorman Avenue	8	150	Ductile Iron	1940	80	2020	4,700	0	suggested for 10 year capital forecast	4,700
Lisgar Avenue	Bonnechere Street North	Queen Street North	80	150	Cast Iron	1940	80	2020	49,380	0	suggested for 10 year capital forecast	49,380
Plaunt Street South	Railway Avenue	Munroe Avenue East	26	50	Cast Iron	1940	80	2020	16,360	0	suggested for 10 year capital forecast	16,360



Table A-4 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Queen Street North	Lisgar Avenue	O Gorman Avenue	149	150	Transite	1940	80	2020	92,310	0	suggested for 10 year capital forecast	92,310
Queen Street North	Lisgar Avenue	O Gorman Avenue	4	150	Transite	1940	80	2020	2,250	0	suggested for 10 year capital forecast	2,250
Duff Avenue	Harry Street	Ravine Drive	69	25	Cast Iron	1940	80	2020	34,620	0	suggested for 10 year capital forecast	34,620
Duff Avenue	Harry Street	Ravine Drive	76	150	Transite	1940	80	2020	47,160	0	suggested for 10 year capital forecast	47,160
Queen Street South	Cross Avenue	Patrick Avenue	80	100	Cast Iron	1940	80	2020	49,430	0	suggested for 10 year capital forecast	49,430
Queen Street South	Arnprior Avenue	Cross Avenue	145	100	Cast Iron	1940	80	2020	89,850	0	suggested for 10 year capital forecast	89,850
Queen Street South	Arnprior Avenue	Cross Avenue	15	25	Cast Iron	1940	80	2020	7,420	0	suggested for 10 year capital forecast	7,420
Queen Street South	Arnprior Avenue	Cross Avenue	11	200	Cast Iron	1940	80	2020	7,100	0	suggested for 10 year capital forecast	7,100
Queen Street South	Renfrew Avenue West	Arnprior Avenue	122	200	Cast Iron	1940	80	2020	78,460	0	suggested for 10 year capital forecast	78,460
Patrick Avenue	Bonnechere Street South	Queen Street North	69	200	Ductile Iron	1940	80	2020	43,980	0	suggested for 10 year capital forecast	43,980
Queen Street South	Patrick Avenue	Munroe Avenue West	9	200	Ductile Iron	1940	80	2020	5,460	0	suggested for 10 year capital forecast	5,460
Patrick Avenue	Queen Street South	Bank Street South	66	200	Ductile Iron	1940	80	2020	42,370	0	suggested for 10 year capital forecast	42,370
Queen Street South	Cross Avenue	Patrick Avenue	6	150	Cast Iron	1940	80	2020	3,920	0	suggested for 10 year capital forecast	3,920
Cross Avenue	Queen Street South	Bank Street South	80	150	Cast Iron	1940	80	2020	49,550	0	suggested for 10 year capital forecast	49,550
Renfrew Avenue West	Bonnechere Street South	Queen Street South	69	200	Cast Iron	1940	80	2020	44,010	0	suggested for 10 year capital forecast	44,010



Table A-4 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Queen Street South	Renfrew Avenue West	Arnprior Avenue	8	200	Cast Iron	1940	80	2020	5,320	0	suggested for 10 year capital forecast	5,320
Renfrew Avenue West	Queen Street South	Carswell Street	83	200	Cast Iron	1940	80	2020	53,220	0	suggested for 10 year capital forecast	53,220
Dufferin Street	Lisgar Avenue	Mary Street	119	150	Ductile Iron	1942	80	2022	74,100	2	suggested for 10 year capital forecast	74,100
Dufferin Street	Mary Street	Dead End	98	150	Ductile Iron	1942	80	2022	60,850	2	suggested for 10 year capital forecast	60,850
Dufferin Street	Joffre Avenue	Lisgar Avenue	7	150	Transite	1942	80	2022	4,530	2	suggested for 10 year capital forecast	4,530
Dufferin Street	Joffre Avenue	Lisgar Avenue	79	150	Ductile Iron	1942	80	2022	49,140	2	suggested for 10 year capital forecast	49,140
Francis Street	Sidney Avenue	McLean Street	164	100	Transite	1942	80	2022	101,650	2	suggested for 10 year capital forecast	101,650
Farewell Street	Mary Street	Dead End	69	150	Transite	1944	80	2024	42,500	4	suggested for 10 year capital forecast	42,500
Farewell Street	Lisgar Avenue	Mary Street	136	150	Transite	1944	80	2024	84,100	4	suggested for 10 year capital forecast	84,100
Harry Street	Joe Avenue	Munroe Avenue East	217	100	Transite	1944	80	2024	134,510	4	suggested for 10 year capital forecast	134,510
Harry Street	Joe Avenue	Munroe Avenue East	86	50	Ductile Iron	1944	80	2024	53,310	4	suggested for 10 year capital forecast	53,310
Harry Street	Joe Avenue	Munroe Avenue East	5	150	Transite	1944	80	2024	3,090	4	suggested for 10 year capital forecast	3,090
Harry Street	William Avenue	Joe Avenue	108	150	Transite	1944	80	2024	67,190	4	suggested for 10 year capital forecast	67,190
Harry Street	Sidney Avenue	William Avenue	176	150	Transite	1944	80	2024	108,910	4	suggested for 10 year capital forecast	108,910
Harry Street	Hall Avenue	Duff Avenue	145	100	Cast Iron	1944	80	2024	89,980	4	suggested for 10 year capital forecast	89,980



Table A-4 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Harry Street	Hall Avenue	Duff Avenue	38	100	Cast Iron	1944	80	2024	23,490	4	suggested for 10 year capital forecast	23,490
Harry Street	William Avenue	Joe Avenue	118	150	Cast Iron	1944	80	2024	73,450	4	suggested for 10 year capital forecast	73,450
Harry Street	Joe Avenue	Munroe Avenue East	4	25	Ductile Iron	1944	80	2024	2,200	4	suggested for 10 year capital forecast	2,200
Harry Street	William Avenue	Joe Avenue	5	150	Transite	1944	80	2024	3,080	4	suggested for 10 year capital forecast	3,080
Harry Street	William Avenue	Joe Avenue	4	150	Transite	1944	80	2024	2,520	4	suggested for 10 year capital forecast	2,520
Harry Street	William Avenue	Joe Avenue	5	150	Cast Iron	1944	80	2024	2,910	4	suggested for 10 year capital forecast	2,910
Harry Street	Sidney Avenue	William Avenue	7	100	Cast Iron	1944	80	2024	4,570	4	suggested for 10 year capital forecast	4,570
Harry Street	Duff Avenue	Sidney Avenue	159	100	Cast Iron	1944	80	2024	98,340	4	suggested for 10 year capital forecast	98,340
Harry Street	Duff Avenue	Sidney Avenue	4	100	Cast Iron	1944	80	2024	2,200	4	suggested for 10 year capital forecast	2,200
Harry Street	Duff Avenue	Sidney Avenue	9	25	Cast Iron	1944	80	2024	4,680	4	suggested for 10 year capital forecast	4,680
Haig Avenue	Vimy Boulevard	Dufferin Street	164	100	Transite	1946	80	2026	101,470	6	suggested for 10 year capital forecast	101,470
Haig Avenue	Dufferin Street	Ma-Te-Way Park Drive	191	150	Transite	1946	80	2026	118,200	6	suggested for 10 year capital forecast	118,200
Haig Avenue	Dufferin Street	Ma-Te-Way Park Drive	8	150	Transite	1946	80	2026	4,660	6	suggested for 10 year capital forecast	4,660
Jennet Street	Joe Avenue	Lorne Street South	230	300	Transite	1946	80	2026	156,820	6	suggested for 10 year capital forecast	156,820
Jennet Street	Joe Avenue	Sidney Avenue	280	300	Transite	1946	80	2026	191,090	6	suggested for 10 year capital forecast	191,090



Table A-4 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Jennet Street	Dead End	Sidney Avenue	85	300	Transite	1946	80	2026	58,370	6	suggested for 10 year capital forecast	58,370
Jennet Street	Dead End	Sidney Avenue	289	300	Transite	1946	80	2026	197,540	6	suggested for 10 year capital forecast	197,540
Jennet Street	Joe Avenue	Lorne Street South	316	50	Cast Iron	1946	80	2026	195,930	6	suggested for 10 year capital forecast	195,930
Jennet Street	Renfrew Avenue East	William Avenue	40	50	Cast Iron	1946	80	2026	24,550	6	suggested for 10 year capital forecast	24,550
Jennet Street	William Avenue	Joe Avenue	12	150	Cast Iron	1946	80	2026	7,160	6	suggested for 10 year capital forecast	7,160
Jennet Street	Sidney Avenue	Renfrew Avenue East	147	100	Cast Iron	1946	80	2026	91,290	6	suggested for 10 year capital forecast	91,290
Jennet Street	Sidney Avenue	Renfrew Avenue East	4	100	Cast Iron	1946	80	2026	2,260	6	suggested for 10 year capital forecast	2,260
Jennet Street	Sidney Avenue	Renfrew Avenue East	3	100	Cast Iron	1946	80	2026	2,150	6	suggested for 10 year capital forecast	2,150
Joffre Avenue	Vimy Boulevard	Dufferin Street	168	150	Transite	1948	80	2028	104,440	8	suggested for 10 year capital forecast	104,440
Joffre Avenue	Dufferin Street	Ma-Te-Way Park Drive	188	150	Transite	1948	80	2028	116,670	8	suggested for 10 year capital forecast	116,670
Joe Avenue	Harry Street	Jennet Street	42	25	Ductile Iron	1948	80	2028	21,290	8	suggested for 10 year capital forecast	21,290
Joe Avenue	Peter Street	Harry Street	75	25	Ductile Iron	1948	80	2028	37,490	8	suggested for 10 year capital forecast	37,490
Joffre Avenue	Dufferin Street	Ma-Te-Way Park Drive	359	400	Ductile Iron	1948	80	2028	285,270	8	suggested for 10 year capital forecast	285,270
Aberdeen Street	Basswood Avenue	Mason Avenue West	6	150	Transite	1950	80	2030	3,670	10	suggested for 10 year capital forecast	3,670
Aberdeen Street	Basswood Avenue	Mason Avenue West	6	150	Transite	1950	80	2030	3,670	10	suggested for 10 year capital forecast	3,670



Table A-4 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Aberdeen Street	Basswood Avenue	Mason Avenue West	196	150	Transite	1950	80	2030	121,310	10	suggested for 10 year capital forecast	121,310
Aberdeen Street	Mason Avenue West	McAndrew Avenue	83	150	Transite	1950	80	2030	51,220	10	suggested for 10 year capital forecast	51,220
Aberdeen Street	Basswood Avenue	Mason Avenue West	15	150	Transite	1950	80	2030	9,210	10	suggested for 10 year capital forecast	9,210
June Street	Lisgar Avenue	Mary Street	8	150	Cast Iron	1950	80	2030	4,900	10	suggested for 10 year capital forecast	4,900
Virmy Boulevard	Haig Avenue	Joffre Avenue	252	400	Transite	1950	80	2030	200,200	10	suggested for 10 year capital forecast	200,200
Munroe Avenue West	Queen Street North	Bank Street North	33	25	Cast Iron	1950	80	2030	16,800	10	suggested for 10 year capital forecast	16,800
O Gorman Avenue	Queen Street North	Bank Street North	69	150	Ductile Iron	1950	80	2030	42,530	10	suggested for 10 year capital forecast	42,530
Queen Street North	Lisgar Avenue	O Gorman Avenue	47	150	Ductile Iron	1950	80	2030	29,230	10	suggested for 10 year capital forecast	29,230
Lorne Street South	Munroe Avenue East	Jennet Street	172	300	Transite	1950	80	2030	117,160	10	suggested for 10 year capital forecast	117,160
Bank Street South	Munroe Avenue West	Lisgar Avenue	142	150	Ductile Iron	1950	80	2030	88,030	10	suggested for 10 year capital forecast	88,030
Bank Street South	Lisgar Avenue	O Gorman Avenue	152	150	Ductile Iron	1950	80	2030	94,070	10	suggested for 10 year capital forecast	94,070
Lorne Street South	Munroe Avenue East	Jennet Street	204	100	Cast Iron	1950	80	2030	126,320	10	suggested for 10 year capital forecast	126,320
Allan Avenue	Francis Street	McLean Street	171	150	Transite	1950	80	2030	106,050	10	suggested for 10 year capital forecast	106,050
Barr Street	Quarry Avenue	Renfrew Avenue East	7	150	Cast Iron	1950	80	2030	4,190	10	suggested for 10 year capital forecast	4,190
Xavier Street	Railway Avenue	Renfrew Avenue West	155	100	Cast Iron	1950	80	2030	96,150	10	suggested for 10 year capital forecast	96,150
Lynn Street	Quarry Avenue	Renfrew Avenue East	106	100	Transite	1950	80	2030	65,610	10	suggested for 10 year capital forecast	65,610



Table A-4 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Lynn Street	Quarry Avenue	Renfrew Avenue East	3	150	Transite	1950	80	2030	1,860	10	suggested for 10 year capital forecast	1,860
Lynn Street	Hall Avenue	Quarry Avenue	184	150	Transite	1950	80	2030	114,180	10	suggested for 10 year capital forecast	114,180
Lynn Street	Hall Avenue	Quarry Avenue	22	19	Transite	1950	80	2030	11,270	10	suggested for 10 year capital forecast	11,270
Railway Avenue	Plaunt Street North	Xavier Street	88	150	Cast Iron	1950	80	2030	54,600	10	suggested for 10 year capital forecast	54,600
Renfrew Avenue East	Lynn Street	Xavier Street	54	150	Cast Iron	1950	80	2030	33,370	10	suggested for 10 year capital forecast	33,370
Renfrew Avenue East	Barr Street	Lynn Street	81	150	Cast Iron	1950	80	2030	50,550	10	suggested for 10 year capital forecast	50,550
Lynn Street	Quarry Avenue	Renfrew Avenue East	3	100	Cast Iron	1950	80	2030	2,140	10	suggested for 10 year capital forecast	2,140
Ross Street	Arnprior Avenue	Thompson Avenue	84	100	Cast Iron	1950	80	2030	52,260	10	suggested for 10 year capital forecast	52,260
Ross Street	Arnprior Avenue	Thompson Avenue	9	100	Cast Iron	1950	80	2030	5,290	10	suggested for 10 year capital forecast	5,290
Ross Street	Dead End	Arnprior Avenue	62	100	Cast Iron	1950	80	2030	38,730	10	suggested for 10 year capital forecast	38,730
Gladstone Street	Thompson Avenue	Patrick Avenue	4	150	Ductile Iron	1950	80	2030	2,280	10	suggested for 10 year capital forecast	2,280
Gladstone Street	Thompson Avenue	Patrick Avenue	100	150	Ductile Iron	1950	80	2030	62,260	10	suggested for 10 year capital forecast	62,260
Gladstone Street	Thompson Avenue	Patrick Avenue	16	150	Ductile Iron	1950	80	2030	10,190	10	suggested for 10 year capital forecast	10,190
Carswell Street	Cross Avenue	Patrick Avenue	5	150	Cast Iron	1950	80	2030	3,210	10	suggested for 10 year capital forecast	3,210
Carswell Street	Cross Avenue	Patrick Avenue	9	150	Cast Iron	1950	80	2030	5,560	10	suggested for 10 year capital forecast	5,560



Table A-4 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Carswell Street	Cross Avenue	Patrick Avenue	70	150	Cast Iron	1950	80	2030	43,540	10	suggested for 10 year capital forecast	43,540
Carswell Street	Cross Avenue	Patrick Avenue	19	150	Cast Iron	1950	80	2030	11,550	10	suggested for 10 year capital forecast	11,550
Carswell Street	Thompson Avenue	Cross Avenue	18	150	Cast Iron	1950	80	2030	11,020	10	suggested for 10 year capital forecast	11,020
Carswell Street	Thompson Avenue	Cross Avenue	20	100	Cast Iron	1950	80	2030	12,380	10	suggested for 10 year capital forecast	12,380
Carswell Street	Arnprior Avenue	Thompson Avenue	90	150	Cast Iron	1950	80	2030	56,050	10	suggested for 10 year capital forecast	56,050
Carswell Street	Arnprior Avenue	Thompson Avenue	6	150	Cast Iron	1950	80	2030	3,550	10	suggested for 10 year capital forecast	3,550
Carswell Street	Renfrew Avenue West	Arnprior Avenue	148	150	Cast Iron	1950	80	2030	91,890	10	suggested for 10 year capital forecast	91,890
Carswell Street	Arnprior Avenue	Thompson Avenue	94	100	Cast Iron	1950	80	2030	58,380	10	suggested for 10 year capital forecast	58,380
Carswell Street	Renfrew Avenue West	Arnprior Avenue	115	100	Cast Iron	1950	80	2030	71,420	10	suggested for 10 year capital forecast	71,420
Carswell Street	Renfrew Avenue West	Prince Avenue West	94	150	Cast Iron	1950	80	2030	58,230	10	suggested for 10 year capital forecast	58,230
Bank Street South	Munroe Avenue West	Lisgar Avenue	13	150	Ductile Iron	1950	80	2030	7,900	10	suggested for 10 year capital forecast	7,900
Bank Street North	Patrick Avenue	Munroe Avenue West	146	150	Ductile Iron	1950	80	2030	90,620	10	suggested for 10 year capital forecast	90,620
Bank Street North	Cross Avenue	Patrick Avenue	81	150	Ductile Iron	1950	80	2030	50,350	10	suggested for 10 year capital forecast	50,350
Bank Street North	Arnprior Avenue	Cross Avenue	145	150	Transite	1950	80	2030	89,900	10	suggested for 10 year capital forecast	89,900
Queens Crescent	Dead End	Prince Avenue West	100	200	Cast Iron	1950	80	2030	64,370	10	suggested for 10 year capital forecast	64,370



Table A-4 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Bank Street North	Patrick Avenue	Munroe Avenue West	13	200	Ductile Iron	1950	80	2030	8,540	10	suggested for 10 year capital forecast	8,540
Patrick Avenue	Bank Street South	Carswell Street	86	200	Ductile Iron	1950	80	2030	55,040	10	suggested for 10 year capital forecast	55,040
Patrick Avenue	Carswell Street	Gladstone Street	64	200	Ductile Iron	1950	80	2030	40,780	10	suggested for 10 year capital forecast	40,780
Bank Street North	Patrick Avenue	Munroe Avenue West	5	150	Ductile Iron	1950	80	2030	2,850	10	suggested for 10 year capital forecast	2,850
Bank Street North	Patrick Avenue	Munroe Avenue West	4	150	Ductile Iron	1950	80	2030	2,230	10	suggested for 10 year capital forecast	2,230
Patrick Avenue	Bank Street South	Carswell Street	98	150	Galvanized	1950	80	2030	61,030	10	suggested for 10 year capital forecast	61,030
Patrick Avenue	Carswell Street	Gladstone Street	65	150	Galvanized	1950	80	2030	40,350	10	suggested for 10 year capital forecast	40,350
Bank Street North	Cross Avenue	Patrick Avenue	7	150	Cast Iron	1950	80	2030	4,090	10	suggested for 10 year capital forecast	4,090
Cross Avenue	Bank Street South	Carswell Street	72	150	Cast Iron	1950	80	2030	44,710	10	suggested for 10 year capital forecast	44,710
Carswell Street	Cross Avenue	Patrick Avenue	4	150	Cast Iron	1950	80	2030	2,500	10	suggested for 10 year capital forecast	2,500
Carswell Street	Thompson Avenue	Cross Avenue	4	100	Cast Iron	1950	80	2030	2,510	10	suggested for 10 year capital forecast	2,510
Thompson Avenue	Carswell Street	Gladstone Street	64	100	Cast Iron	1950	80	2030	39,390	10	suggested for 10 year capital forecast	39,390
Thompson Avenue	Gladstone Street	Ross Street	66	100	Cast Iron	1950	80	2030	40,680	10	suggested for 10 year capital forecast	40,680
Thompson Avenue	Ross Street	Dead End	36	25	Cast Iron	1950	80	2030	18,180	10	suggested for 10 year capital forecast	18,180
Carswell Street	Arnprior Avenue	Thompson Avenue	4	100	Cast Iron	1950	80	2030	2,440	10	suggested for 10 year capital forecast	2,440



Table A-4 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Arnprior Avenue	Carswell Street	Ross Street	114	100	Cast Iron	1950	80	2030	70,730	10	suggested for 10 year capital forecast	70,730
Ross Street	Arnprior Avenue	Thompson Avenue	14	100	Cast Iron	1950	80	2030	8,570	10	suggested for 10 year capital forecast	8,570
Renfrew Avenue West	Queen Street South	Carswell Street	30	200	Cast Iron	1950	80	2030	18,920	10	suggested for 10 year capital forecast	18,920
Renfrew Avenue West	Dead End	Carswell Street	51	200	Cast Iron	1950	80	2030	32,540	10	suggested for 10 year capital forecast	32,540
Renfrew Avenue West	Dead End	Carswell Street	7	200	Cast Iron	1950	80	2030	4,390	10	suggested for 10 year capital forecast	4,390
Renfrew Avenue West	Dead End	Carswell Street	435	200	Cast Iron	1950	80	2030	278,850	10	suggested for 10 year capital forecast	278,850
Prince Avenue West	Queens Crescent	Carswell Street	89	400	Cast Iron	1950	80	2030	70,920	10	suggested for 10 year capital forecast	70,920
Pine Avenue	York Street	Raglan Street South	44	100	Cast Iron	1950	80	2030	27,590	10	suggested for 10 year capital forecast	27,590
York Street	May Avenue	Pine Avenue	129	100	Cast Iron	1950	80	2030	79,790	10	suggested for 10 year capital forecast	79,790
Pine Avenue	Coleraine Drive	York Street	17	100	Cast Iron	1950	80	2030	10,380	10	suggested for 10 year capital forecast	10,380
Aberdeen Street	Basswood Avenue	Mason Avenue West	8	150	Transite	1950	80	2030	4,860	10	suggested for 10 year capital forecast	4,860
Bank Street South	Lisgar Avenue	O Gorman Avenue	12	150	Ductile Iron	1950	80	2030	7,480	10	suggested for 10 year capital forecast	7,480
Lisgar Avenue	Farewell Street	Bank Street North	156	150	Ductile Iron	1950	80	2030	96,800	10	suggested for 10 year capital forecast	96,800
Albert Street	Dead End	Bruce Street	127	200	Ductile Iron	1952	80	2032	81,140	12	7,673	-
Albert Street	Dead End	Bruce Street	6	150	Transite	1952	80	2032	3,640	12	344	-
Albert Street	Dead End	Bruce Street	17	150	Transite	1952	80	2032	10,660	12	1,008	-
Albert Street	Dead End	Bruce Street	216	150	Transite	1952	80	2032	133,810	12	12,653	-
Albert Street	Dead End	Bruce Street	167	150	Transite	1952	80	2032	103,730	12	9,809	-
Arthur Avenue	Raglan Street North	Dead End	116	200	Ductile Iron	1952	80	2032	74,200	12	7,016	-
Lisgar Avenue	Farewell Street	Bank Street North	5	150	Ductile Iron	1952	80	2032	3,080	12	291	-



Table A-4 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Lisgar Avenue	Farewell Street	Bank Street North	11	150	Ductile Iron	1952	80	2032	6,710	12	634	-
Lisgar Avenue	June Street	Farewell Street	76	150	Cast Iron	1952	80	2032	47,060	12	4,450	-
Lisgar Avenue	June Street	Farewell Street	8	150	Cast Iron	1952	80	2032	5,010	12	474	-
Lisgar Avenue	Dufferin Street	June Street	89	150	Cast Iron	1952	80	2032	54,900	12	5,191	-
Lisgar Avenue	Dufferin Street	June Street	6	150	Cast Iron	1952	80	2032	3,600	12	340	-
Lisgar Avenue	Blake Street	Dufferin Street	88	150	Cast Iron	1952	80	2032	54,880	12	5,189	-
Lisgar Avenue	Blake Street	Dufferin Street	2	150	Cast Iron	1952	80	2032	1,460	12	138	-
Lisgar Avenue	Tupper Street	Blake Street	95	150	Cast Iron	1952	80	2032	58,960	12	5,575	-
Lisgar Avenue	Dufferin Street	June Street	10	150	Ductile Iron	1952	80	2032	6,250	12	591	-
Lisgar Avenue	Dufferin Street	June Street	4	150	Ductile Iron	1952	80	2032	2,510	12	237	-
Lisgar Avenue	Tupper Street	Blake Street	3	100	Transite	1952	80	2032	1,600	12	151	-
Lisgar Avenue	Tupper Street	Blake Street	5	400	Transite	1952	80	2032	4,030	12	381	-
Lisgar Avenue	Smallfield Lane	Tupper Street	42	400	Transite	1952	80	2032	33,110	12	3,131	-
Lisgar Avenue	Dufferin Street	June Street	15	150	Ductile Iron	1952	80	2032	9,010	12	852	-
Munroe Avenue East	Lorne Street North	Plaunt Street North	102	150	Cast Iron	1952	80	2032	63,280	12	5,984	-
Munroe Avenue East	Harry Street	Lorne Street North	106	25	Cast Iron	1952	80	2032	53,150	12	5,026	-
Munroe Avenue East	Harry Street	Lorne Street North	120	150	Transite	1952	80	2032	74,430	12	7,038	-
Munroe Avenue East	Harry Street	Lorne Street North	9	150	Transite	1952	80	2032	5,550	12	525	-
Munroe Avenue East	Peter Street	Harry Street	78	150	Transite	1952	80	2032	48,400	12	4,577	-
Munroe Avenue East	Peter Street	Harry Street	10	150	Transite	1952	80	2032	6,270	12	593	-
Munroe Avenue East	Stevenson Crescent	Peter Street	31	150	Transite	1952	80	2032	19,170	12	1,813	-
Munroe Avenue East	Wilson Street	Stevenson Crescent	41	150	Transite	1952	80	2032	25,190	12	2,382	-
Munroe Avenue East	Wilson Street	Stevenson Crescent	10	150	Transite	1952	80	2032	6,500	12	615	-
Munroe Avenue East	Dead End	Wilson Street	56	100	Transite	1952	80	2032	34,430	12	3,256	-
Archibald Avenue	McLean Street	Francis Street	163	150	Transite	1952	80	2032	101,290	12	9,578	-
Airth Boulevard	Simpson Avenue	Wade Avenue	102	150	Transite	1952	80	2032	63,470	12	6,002	-
Airth Boulevard	Wade Avenue	Coleraine Drive	167	200	Transite	1952	80	2032	106,830	12	10,102	-
Airth Boulevard	Wade Avenue	Coleraine Drive	76	150	Transite	1952	80	2032	47,440	12	4,486	-
Airth Boulevard	Coleraine Drive	Raglan Street South	152	150	Transite	1952	80	2032	94,140	12	8,902	-
Airth Boulevard	Wade Avenue	Coleraine Drive	12	200	Transite	1952	80	2032	7,800	12	738	-
Barnet Boulevard	Eighth Street	Seventh Street	75	250	Transite	1952	80	2032	49,460	12	4,677	-
Baldwin Street	McAndrew Avenue	Mason Avenue West	74	150	Transite	1954	80	2034	46,080	14	3,806	-
Baldwin Street	Tasse Avenue	McAndrew Avenue	67	150	Cast Iron	1954	80	2034	41,590	14	3,435	-
Grigg Avenue	Moore Street	Dead End	73	150	Ductile Iron	1954	80	2034	45,360	14	3,747	-
Baldwin Street	Cameron Avenue	Tasse Avenue	68	150	Cast Iron	1954	80	2034	42,470	14	3,508	-
Baldwin Street	Elgin Avenue	Cameron Avenue	66	150	Cast Iron	1954	80	2034	41,170	14	3,401	-
Ma-Te-Way Park Drive	Joffre Avenue	Lisgar Avenue	12	150	Transite	1954	80	2034	7,160	14	591	-
Ma-Te-Way Park Drive	Joffre Avenue	Lisgar Avenue	98	400	Transite	1954	80	2034	78,000	14	6,443	-
Ma-Te-Way Park Drive	Joffre Avenue	Lisgar Avenue	2	400	Ductile Iron	1954	80	2034	1,410	14	116	-
Ma-Te-Way Park Drive	Joffre Avenue	Lisgar Avenue	5	400	Ductile Iron	1954	80	2034	3,890	14	321	-
Ma-Te-Way Park Drive	Haig Avenue	Joffre Avenue	90	400	Ductile Iron	1954	80	2034	71,320	14	5,891	-
Peter Street	Wilson Street	Munroe Avenue East	189	100	Transite	1954	80	2034	117,140	14	9,676	-
Peter Street	William Avenue	Joe Avenue	177	100	Transite	1954	80	2034	109,600	14	9,053	-
Peter Street	William Avenue	Joe Avenue	6	100	Transite	1954	80	2034	3,690	14	305	-
Peter Street	Joe Avenue	Wilson Street	33	25	Cast Iron	1954	80	2034	16,770	14	1,385	-



Table A-4 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Peter Street	William Avenue	Joe Avenue	100	25	Cast Iron	1954	80	2034	50,260	14	4,152	-
Peter Street	Wilson Street	Munroe Avenue East	11	150	Transite	1954	80	2034	6,790	14	561	-
Peter Street	William Avenue	Joe Avenue	13	150	Cast Iron	1954	80	2034	8,190	14	677	-
Charles Avenue	Francis Street	Coronation Street	3	150	Transite	1954	80	2034	1,670	14	138	-
Charles Avenue	Francis Street	Coronation Street	79	150	Transite	1954	80	2034	48,850	14	4,035	-
Charles Avenue	Coronation Street	McLean Street	113	150	Transite	1954	80	2034	69,920	14	5,776	-
Coleraine Drive	Airth Boulevard	Grant Boulevard	15	150	Transite	1954	80	2034	9,060	14	748	-
Coleraine Drive	Airth Boulevard	Grant Boulevard	66	150	Transite	1954	80	2034	40,710	14	3,363	-
Coleraine Drive	Airth Boulevard	Grant Boulevard	14	150	Transite	1954	80	2034	8,640	14	714	-
Coleraine Drive	Grant Boulevard	Simpson Avenue	81	150	Transite	1954	80	2034	50,280	14	4,153	-
Coleraine Drive	Simpson Avenue	Pine Avenue	14	150	Transite	1954	80	2034	8,380	14	692	-
Coleraine Drive	Simpson Avenue	Pine Avenue	78	150	Transite	1954	80	2034	48,310	14	3,991	-
Coleraine Drive	Simpson Avenue	Pine Avenue	8	150	Transite	1954	80	2034	4,760	14	393	-
Coleraine Drive	Dead End	Pine Avenue	41	150	Transite	1954	80	2034	25,710	14	2,124	-
Dominion Street	Hill Avenue	Hall Avenue	93	100	Cast Iron	1954	80	2034	57,900	14	4,783	-
Dominion Street	Hill Avenue	Hall Avenue	49	100	Cast Iron	1954	80	2034	30,380	14	2,509	-
Dominion Street	Hill Avenue	Hall Avenue	138	100	Transite	1954	80	2034	85,730	14	7,081	-
Dominion Street	Coumbes Street	Hill Avenue	89	150	Transite	1954	80	2034	55,380	14	4,574	-
Dominion Street	Coumbes Street	Hill Avenue	6	100	Cast Iron	1954	80	2034	3,930	14	325	-
Eighth Street	Barnet Boulevard	O'Brien Road	159	150	Transite	1954	80	2034	98,800	14	8,161	-
Eighth Street	Barnet Boulevard	O'Brien Road	106	150	Transite	1954	80	2034	65,980	14	5,450	-
Eighth Street	Barnet Boulevard	O'Brien Road	30	150	Transite	1954	80	2034	18,620	14	1,538	-
Coleraine Drive	Grant Boulevard	Simpson Avenue	9	150	Transite	1954	80	2034	5,450	14	450	-
Stewart Street	Hincks Avenue	Elgin Avenue	319	300	Transite	1955	80	2035	217,740	15	16,946	-
Basswood Avenue	Frank Dench Street	Aberdeen Street	199	150	Transite	1956	80	2036	123,570	16	9,101	-
Mary Street	Farewell Street	June Street	51	25	Cast Iron	1956	80	2036	25,700	16	1,893	-
Mary Street	Dufferin Street	Blake Street	3	100	Cast Iron	1956	80	2036	2,160	16	159	-
Mary Street	Dufferin Street	Blake Street	89	150	Transite	1956	80	2036	55,100	16	4,058	-
Mary Street	Blake Street	Tupper Street	51	150	Transite	1956	80	2036	31,570	16	2,325	-
Mary Street	Blake Street	Tupper Street	40	150	Transite	1956	80	2036	25,090	16	1,848	-
Ravine Drive	Duff Avenue	Sidney Avenue	85	150	Transite	1956	80	2036	53,000	16	3,903	-
Ravine Drive	Harry Street	Duff Avenue	97	150	Transite	1956	80	2036	60,050	16	4,423	-
Ravine Drive	Harry Street	Duff Avenue	119	150	Transite	1956	80	2036	73,760	16	5,432	-
Ravine Drive	Duff Avenue	Sidney Avenue	75	25	Cast Iron	1956	80	2036	37,600	16	2,769	-
Ravine Drive	Harry Street	Duff Avenue	75	25	Cast Iron	1956	80	2036	37,680	16	2,775	-
Coronation Street	Charles Avenue	George Avenue	6	150	Transite	1956	80	2036	3,440	16	253	-
Coronation Street	Charles Avenue	George Avenue	92	150	Transite	1956	80	2036	57,100	16	4,205	-
Coronation Street	Charles Avenue	George Avenue	16	150	Transite	1956	80	2036	9,990	16	736	-
Grant Boulevard	Dead End	Coleraine Drive	12	150	Transite	1956	80	2036	7,330	16	540	-
Fortington Street	King Street	Jordan Avenue	131	150	Transite	1956	80	2036	81,500	16	6,002	-
Fortington Street	Coumbes Street	King Street	235	150	Transite	1956	80	2036	146,030	16	10,755	-
Fortington Street	King Street	Jordan Avenue	317	400	Transite	1956	80	2036	252,180	16	18,573	-
Fortington Street	King Street	Jordan Avenue	40	400	Transite	1956	80	2036	32,120	16	2,366	-



Table A-4 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Fortington Street	King Street	Jordan Avenue	5	150	Transite	1956	80	2036	3,200	16	236	-
Fortington Street	King Street	Jordan Avenue	7	150	Transite	1956	80	2036	4,510	16	332	-
Fifth Street	Fourth Street	O Brien Road	138	150	Transite	1956	80	2036	85,480	16	6,296	-
Fifth Street	Fourth Street	O Brien Road	141	150	Transite	1956	80	2036	87,570	16	6,450	-
Mary Street	June Street	Dufferin Street	88	100	Cast Iron	1956	80	2036	54,630	16	4,024	-
Mary Street	Dufferin Street	Blake Street	4	100	Cast Iron	1956	80	2036	2,380	16	175	-
Grant Boulevard	Dead End	Coleraine Drive	135	150	Transite	1956	80	2036	83,480	16	6,148	-
Bruce Street	Albert Street	Stewart Street	124	150	Transite	1958	80	2038	76,620	18	5,111	-
Bruce Street	Albert Street	Stewart Street	12	100	Cast Iron	1958	80	2038	7,640	18	510	-
Tupper Street	Mary Street	Lisgar Avenue	89	100	Transite	1958	80	2038	54,920	18	3,663	-
Sidney Avenue	Jennet Street	Harry Street	94	100	Cast Iron	1958	80	2038	58,440	18	3,898	-
Sidney Avenue	Harry Street	Ravine Drive	93	25	Cast Iron	1958	80	2038	46,570	18	3,106	-
Sidney Avenue	Harry Street	Ravine Drive	136	150	Transite	1958	80	2038	84,240	18	5,619	-
Rotary Avenue	Francis Street	Wilson Street	197	150	Transite	1958	80	2038	122,040	18	8,140	-
Francis Street	Charles Avenue	Dead End	83	150	Transite	1958	80	2038	51,570	18	3,440	-
Francis Street	George Avenue	Rotary Avenue	77	150	Transite	1958	80	2038	47,610	18	3,176	-
Francis Street	Allan Avenue	George Avenue	80	150	Transite	1958	80	2038	49,550	18	3,305	-
Francis Street	Allan Avenue	George Avenue	2	150	Transite	1958	80	2038	1,360	18	91	-
Francis Street	Archibald Avenue	Allan Avenue	67	150	Transite	1958	80	2038	41,500	18	2,768	-
Francis Street	Archibald Avenue	Allan Avenue	14	150	Transite	1958	80	2038	8,570	18	572	-
Francis Street	McNab Avenue	Archibald Avenue	91	150	Transite	1958	80	2038	56,170	18	3,747	-
Francis Street	Sidney Avenue	McNab Avenue	82	150	Transite	1958	80	2038	50,640	18	3,378	-
Francis Street	Rotary Avenue	Charles Avenue	41	150	Transite	1958	80	2038	25,590	18	1,707	-
Sidney Avenue	Francis Street	Ravine Drive	4	150	Transite	1958	80	2038	2,240	18	149	-
Francis Street	Sidney Avenue	McLean Street	50	150	Transite	1958	80	2038	31,060	18	2,072	-
Renfrew Avenue East	Jennet Street	Barr Street	37	150	Cast Iron	1958	80	2038	22,640	18	1,510	-
Fourth Street	O Brien Road	Railway Avenue	19	150	Transite	1958	80	2038	11,660	18	778	-
Fourth Street	O Brien Road	Railway Avenue	199	150	Transite	1958	80	2038	123,610	18	8,245	-
Fourth Street	Railway Avenue	Fifth Street	139	150	Transite	1958	80	2038	86,300	18	5,756	-
Bruce Street	Maloney Street	Moore Street	59	38	PVC	1960	100	2060	29,640	40	1,084	-
Bruce Street	Maloney Street	Moore Street	520	38	PVC	1960	100	2060	260,770	40	9,533	-
Moore Street	Grigg Avenue	Dead End	125	150	Ductile Iron	1960	80	2040	77,240	20	4,724	-
Moore Street	Bruce Street	Grigg Avenue	164	150	Transite	1960	80	2040	101,730	20	6,221	-
Moore Street	Grigg Avenue	Dead End	17	100	Cast Iron	1960	80	2040	10,780	20	659	-
Moore Street	Bruce Street	Grigg Avenue	11	38	PVC	1960	100	2060	5,460	40	200	-
Moore Street	Bruce Street	Grigg Avenue	9	38	PVC	1960	100	2060	4,380	40	160	-
Moore Street	Elgin Avenue	Bruce Street	3	38	PVC	1960	100	2060	1,380	40	50	-
Bruce Street	Moore Street	Raglan Street North	114	150	Transite	1960	80	2040	70,840	20	4,332	-
Cameron Avenue	Rousselle Street	Baldwin Street	105	150	Transite	1960	80	2040	64,870	20	3,967	-
Cameron Avenue	Baldwin Street	Stewart Street	3	150	Cast Iron	1960	80	2040	2,070	20	127	-
Cameron Avenue	Baldwin Street	Stewart Street	8	150	Cast Iron	1960	80	2040	4,700	20	287	-
Cameron Avenue	Baldwin Street	Stewart Street	103	200	Ductile Iron	1960	80	2040	65,870	20	4,028	-
Cameron Avenue	Baldwin Street	Stewart Street	41	200	Ductile Iron	1960	80	2040	26,590	20	1,626	-



Table A-4 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Cameron Avenue	Baldwin Street	Stewart Street	111	100	Cast Iron	1960	80	2040	69,060	20	4,223	-
Bruce Street	Albert Street	Stewart Street	11	150	Transite	1960	80	2040	6,800	20	416	-
Moore Street	Elgin Avenue	Bruce Street	22	38	PVC	1960	100	2060	11,230	40	411	-
Moore Street	Elgin Avenue	Bruce Street	105	200	Ductile Iron	1960	80	2040	67,480	20	4,127	-
Moore Street	Elgin Avenue	Bruce Street	10	200	Ductile Iron	1960	80	2040	6,500	20	398	-
Vimy Boulevard	Joffre Avenue	Lisgar Avenue	103	150	Cast Iron	1960	80	2040	63,970	20	3,912	-
Vimy Boulevard	Joffre Avenue	Lisgar Avenue	6	150	Transite	1960	80	2040	3,700	20	226	-
Vimy Boulevard	Haig Avenue	Joffre Avenue	104	100	Cast Iron	1960	80	2040	64,410	20	3,939	-
Vimy Boulevard	Joffre Avenue	Lisgar Avenue	14	400	Transite	1960	80	2040	11,070	20	677	-
Wilson Street	Rotary Avenue	Munroe Avenue East	115	150	Transite	1960	80	2040	71,050	20	4,345	-
Wilson Street	Rotary Avenue	Munroe Avenue East	9	150	Transite	1960	80	2040	5,350	20	327	-
Wilson Street	Peter Street	Rotary Avenue	103	150	Transite	1960	80	2040	63,620	20	3,891	-
William Avenue	Harry Street	Jennet Street	66	150	Cast Iron	1960	80	2040	41,120	20	2,515	-
William Avenue	Peter Street	Harry Street	67	150	Cast Iron	1960	80	2040	41,660	20	2,548	-
William Avenue	Dead End	Peter Street	71	150	Cast Iron	1960	80	2040	43,920	20	2,686	-
William Avenue	Peter Street	Harry Street	81	100	Cast Iron	1960	80	2040	50,420	20	3,084	-
William Avenue	Dead End	Peter Street	71	100	Cast Iron	1960	80	2040	43,750	20	2,676	-
George Avenue	Coronation Street	Francis Street	80	150	Transite	1960	80	2040	49,740	20	3,042	-
George Avenue	McLean Street	Coronation Street	93	150	Transite	1960	80	2040	57,610	20	3,523	-
James Avenue	James Crescent	Wade Avenue	111	150	Transite	1960	80	2040	69,060	20	4,223	-
James Avenue	Wade Avenue	James Crescent	126	150	Transite	1960	80	2040	78,110	20	4,777	-
James Avenue	James Crescent	Wade Avenue	14	150	Transite	1960	80	2040	8,610	20	527	-
James Crescent	Wade Avenue	Wade Avenue	22	150	Transite	1960	80	2040	13,550	20	829	-
Coumbes Street	Coumbes Lane	Barr Street	6	250	Ductile Iron	1960	80	2040	3,780	20	231	-
Coumbes Street	Coumbes Lane	Barr Street	16	250	Ductile Iron	1960	80	2040	10,750	20	657	-
Coumbes Street	Barr Street	Dominion Street	92	250	Ductile Iron	1960	80	2040	60,690	20	3,712	-
Coumbes Street	Dominion Street	New Street	14	250	Ductile Iron	1960	80	2040	9,160	20	560	-
Coumbes Street	Dominion Street	New Street	84	250	Ductile Iron	1960	80	2040	55,350	20	3,385	-
Coumbes Street	Dominion Street	New Street	20	250	Ductile Iron	1960	80	2040	13,130	20	803	-
Coumbes Street	Dominion Street	New Street	21	150	Ductile Iron	1960	80	2040	12,850	20	786	-
Coumbes Street	New Street	King Street	116	250	Ductile Iron	1960	80	2040	76,570	20	4,683	-
Coumbes Street	King Street	Fortington Street	97	250	Ductile Iron	1960	80	2040	64,260	20	3,930	-
Coumbes Street	Dominion Street	New Street	11	150	Ductile Iron	1960	80	2040	6,920	20	423	-
Jordan Avenue	Fortington Street	New Street	12	150	Transite	1960	80	2040	7,180	20	439	-
Jordan Avenue	Fortington Street	New Street	154	150	Transite	1960	80	2040	95,650	20	5,850	-
Barnet Boulevard	Fourth Street	First Street	428	250	Transite	1960	80	2040	283,670	20	17,348	-
Coumbes Street	Fortington Street	Barr Street	457	50	Cast Iron	1960	80	2040	283,600	20	17,344	-
O'Brien Road	Fifth Street	Sixth Street	13	150	Transite	1960	80	2040	8,160	20	499	-
O'Brien Road	Fifth Street	Sixth Street	74	150	Transite	1960	80	2040	45,640	20	2,791	-
O'Brien Road	Fourth Street	Fifth Street	85	150	Transite	1960	80	2040	52,900	20	3,235	-



Table A-4 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
O'Brien Road	Fifth Street	Sixth Street	8	150	Transite	1960	80	2040	4,830	20	295	-
Vimy Boulevard	Joffre Avenue	Lisgar Avenue	4	400	Cast Iron	1960	80	2040	2,930	20	179	-
Frank Dench Street	Basswood Avenue	Oak Crescent	24	150	Transite	1962	80	2042	14,750	22	835	-
Frank Dench Street	Mason Avenue West	Basswood Avenue	45	150	Transite	1962	80	2042	28,050	22	1,589	-
Frank Dench Street	Mason Avenue West	Basswood Avenue	132	150	Transite	1962	80	2042	82,160	22	4,653	-
Frank Dench Street	Basswood Avenue	Oak Crescent	13	150	Transite	1962	80	2042	7,990	22	452	-
Martin Street	Dead End	Hall Avenue	156	150	Transite	1962	80	2042	96,490	22	5,464	-
Martin Street	Dead End	Hall Avenue	4	150	Transite	1962	80	2042	2,510	22	142	-
Mason Avenue West	Baldwin Street	Aberdeen Street	44	150	Transite	1964	80	2044	27,560	24	1,457	-
Mason Avenue West	Baldwin Street	Aberdeen Street	45	150	Transite	1964	80	2044	28,060	24	1,484	-
Mason Avenue West	Stewart Street	Frank Dench Street	30	150	Transite	1964	80	2044	18,750	24	991	-
Mason Avenue West	Baldwin Street	Aberdeen Street	6	150	Transite	1964	80	2044	3,970	24	210	-
McLean Street	Charles Avenue	George Avenue	3	150	Transite	1964	80	2044	2,040	24	108	-
McLean Street	Charles Avenue	George Avenue	109	150	Transite	1964	80	2044	67,780	24	3,584	-
McLean Street	George Avenue	Allan Avenue	11	150	Transite	1964	80	2044	7,110	24	376	-
McLean Street	George Avenue	Allan Avenue	67	150	Transite	1964	80	2044	41,530	24	2,196	-
McLean Street	Allan Avenue	Archibald Avenue	11	150	Transite	1964	80	2044	6,810	24	360	-
McLean Street	Allan Avenue	Archibald Avenue	77	150	Transite	1964	80	2044	47,910	24	2,533	-
McLean Street	Archibald Avenue	McNab Avenue	83	150	Transite	1964	80	2044	51,480	24	2,722	-
McLean Street	Archibald Avenue	McNab Avenue	4	150	Transite	1964	80	2044	2,400	24	127	-
McLean Street	McNab Avenue	Sidney Avenue	94	150	Transite	1964	80	2044	58,300	24	3,082	-
McLean Street	Sidney Avenue	Francis Street	130	150	Transite	1964	80	2044	80,880	24	4,276	-
McLean Street	Sidney Avenue	Francis Street	8	150	Transite	1964	80	2044	5,100	24	270	-
McLean Street	Francis Street	Hall Avenue	151	150	Transite	1964	80	2044	93,490	24	4,943	-
Pine Avenue	Coleraine Drive	York Street	77	150	Transite	1964	80	2044	48,000	24	2,538	-
Pine Avenue	Coleraine Drive	Coleraine Drive	42	150	Transite	1964	80	2044	25,920	24	1,370	-
Pine Avenue	Simpson Avenue	Coleraine Drive	115	150	Transite	1964	80	2044	71,440	24	3,777	-
Pine Avenue	Simpson Avenue	Coleraine Drive	38	150	Transite	1964	80	2044	23,630	24	1,249	-
Simpson Avenue	Pine Avenue	Coleraine Drive	155	150	Transite	1964	80	2044	96,240	24	5,088	-
Simpson Avenue	Airth Boulevard	Pine Avenue	101	150	Transite	1964	80	2044	62,620	24	3,311	-
Simpson Avenue	Airth Boulevard	Pine Avenue	11	150	Transite	1964	80	2044	6,760	24	357	-
Albert Street	Bruce Street	Elgin Avenue	115	150	Transite	1965	80	2045	71,390	25	3,657	-
Mutual Avenue	Dead End	Raglan Street North	23	150	Transite	1965	80	2045	14,140	25	724	-
Mutual Avenue	Dead End	Raglan Street North	140	150	Transite	1965	80	2045	86,950	25	4,454	-
Mutual Avenue	Dead End	Raglan Street North	245	150	Transite	1965	80	2045	152,200	25	7,796	-
Arthur Avenue	Raglan Street North	Dead End	304	100	Cast Iron	1965	80	2045	188,320	25	9,646	-
Mutual Avenue	Dead End	Raglan Street North	197	50	Cast Iron	1965	80	2045	122,230	25	6,261	-
Stevenson Crescent	Stevenson Crescent	Munroe Avenue East	162	150	Transite	1965	80	2045	100,540	25	5,150	-
Stevenson Crescent	Stevenson Crescent	Munroe Avenue East	132	150	Transite	1965	80	2045	81,900	25	4,195	-
Stevenson Crescent	Stevenson Crescent	Munroe Avenue East	146	150	Transite	1965	80	2045	90,810	25	4,651	-
Stevenson Crescent	Stevenson Crescent	Munroe Avenue East	31	150	Transite	1965	80	2045	19,210	25	984	-
Barnet Boulevard	First Street	Raglan Street South	4	200	Ductile Iron	1965	80	2045	2,380	25	122	-
Barnet Boulevard	First Street	Raglan Street South	16	250	Transite	1965	80	2045	10,550	25	540	-
Barnet Boulevard	First Street	Raglan Street South	128	250	Transite	1965	80	2045	84,850	25	4,346	-



Table A-4 (cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Barnet Boulevard	First Street	Raglan Street South	90	250	Transite	1965	80	2045	59,620	25	3,054	-
Barnet Boulevard	First Street	Raglan Street South	12	250	Transite	1965	80	2045	8,150	25	417	-
Barnet Boulevard	First Street	Raglan Street South	227	38	PVC	1965	100	2065	114,130	45	3,870	-
McAndrew Avenue	Stewart Street	Baldwin Street	139	300	Transite	1966	80	2046	95,020	26	4,722	-
McAndrew Avenue	Baldwin Street	Rousselle Street	136	300	Transite	1966	80	2046	93,040	26	4,624	-
McAndrew Avenue	Aberdeen Street	Dead End	409	31	Cast Iron	1966	80	2046	205,480	26	10,212	-
McAndrew Avenue	Rousselle Street	Aberdeen Street	8	400	Cast Iron	1966	80	2046	6,480	26	322	-
McAndrew Avenue	Rousselle Street	Aberdeen Street	9	400	Cast Iron	1966	80	2046	6,790	26	337	-
McAndrew Avenue	Rousselle Street	Aberdeen Street	2	400	Cast Iron	1966	80	2046	1,460	26	73	-
McAndrew Avenue	Aberdeen Street	Dead End	126	400	Cast Iron	1966	80	2046	100,500	26	4,995	-
McAndrew Avenue	Rousselle Street	Aberdeen Street	55	100	Transite	1966	80	2046	34,320	26	1,706	-
McAndrew Avenue	Stewart Street	Baldwin Street	121	150	Transite	1966	80	2046	75,300	26	3,742	-
McAndrew Avenue	Baldwin Street	Rousselle Street	8	150	Transite	1966	80	2046	4,730	26	235	-
McNab Avenue	Francis Street	McLean Street	132	150	Transite	1966	80	2046	81,910	26	4,071	-
McNab Crescent	Dead End	McLean Street	31	150	Transite	1966	80	2046	19,150	26	952	-
McAndrew Avenue	Rousselle Street	Aberdeen Street	6	100	Transite	1966	80	2046	3,440	26	171	-
New Street	Jordan Avenue	Hall Avenue	173	100	Cast Iron	1966	80	2046	107,460	26	5,341	-
New Street	Coumbes Street	Jordan Avenue	97	150	Transite	1966	80	2046	59,950	26	2,979	-
New Street	Coumbes Street	Jordan Avenue	174	150	Ductile Iron	1966	80	2046	108,120	26	5,373	-
New Street	Jordan Avenue	Hall Avenue	15	150	Transite	1966	80	2046	9,130	26	454	-
King Street	Coumbes Street	Park Avenue	262	400	Transite	1966	80	2046	208,480	26	10,361	-
King Street	Park Avenue	Fortington Street	90	150	Transite	1966	80	2046	56,070	26	2,787	-
King Street	Coumbes Street	Park Avenue	33	150	Transite	1966	80	2046	20,330	26	1,010	-
King Street	Coumbes Street	Park Avenue	18	400	Transite	1966	80	2046	14,490	26	720	-
Seventh Street	O'Brien Road	Barnet Boulevard	306	300	Transite	1966	80	2046	209,340	26	10,404	-
Seventh Street	O'Brien Road	Barnet Boulevard	20	150	Transite	1966	80	2046	12,580	26	625	-
Seventh Street	O'Brien Road	Barnet Boulevard	148	150	Transite	1966	80	2046	92,040	26	4,574	-
Seventh Street	O'Brien Road	Barnet Boulevard	123	150	Transite	1966	80	2046	76,560	26	3,805	-
Rousselle Street	Tasse Avenue	McAndrew Avenue	68	400	Cast Iron	1968	80	2048	53,630	28	2,520	-
Tasse Avenue	Baldwin Street	Stewart Street	127	200	Ductile Iron	1968	80	2048	81,430	28	3,826	-
Tasse Avenue	Baldwin Street	Stewart Street	6	200	Ductile Iron	1968	80	2048	3,760	28	177	-
Tasse Avenue	Rousselle Street	Baldwin Street	127	200	Ductile Iron	1968	80	2048	81,230	28	3,817	-
Raglan Street North	Grigg Avenue	Raglan Street North	4	150	Ductile Iron	1968	80	2048	2,240	28	105	-
Raglan Street North	Grigg Avenue	Raglan Street North	7	200	Ductile Iron	1968	80	2048	4,460	28	210	-
Rousselle Street	Cameron Avenue	Tasse Avenue	95	400	Cast Iron	1968	80	2048	75,320	28	3,539	-
Rousselle Street	Elgin Avenue	Cameron Avenue	57	400	Cast Iron	1968	80	2048	45,330	28	2,130	-
Sidney Avenue	Francis Street	Ravine Drive	9	150	Transite	1968	80	2048	5,840	28	274	-
Sidney Avenue	McLean Street	Francis Street	11	150	Transite	1968	80	2048	6,610	28	311	-
Sidney Avenue	Francis Street	Ravine Drive	4	150	Transite	1968	80	2048	2,520	28	118	-
Sidney Avenue	McLean Street	Francis Street	115	100	Transite	1968	80	2048	71,200	28	3,346	-
Wade Avenue	Airth Boulevard	James Avenue	77	200	Transite	1968	80	2048	49,200	28	2,312	-
Wade Avenue	James Avenue	James Avenue	17	200	Transite	1968	80	2048	10,680	28	502	-



Table A-4 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Wade Avenue	James Avenue	James Avenue	100	200	Transite	1968	80	2048	64,370	28	3,025	-
Wade Avenue	James Avenue	James Avenue	125	200	Transite	1968	80	2048	80,060	28	3,762	-
Wade Avenue	James Avenue	Vanier Crescent	14	200	Transite	1968	80	2048	9,220	28	433	-
Wade Avenue	James Avenue	Vanier Crescent	83	200	Ductile Iron	1968	80	2048	53,160	28	2,498	-
O'Brien Road	Sixth Street	Seventh Street	105	400	Transite	1968	80	2048	83,520	28	3,925	-
Sixth Street	Barnet Boulevard	O'Brien Road	123	150	Transite	1968	80	2048	76,010	28	3,572	-
Sixth Street	Barnet Boulevard	O'Brien Road	73	150	Transite	1968	80	2048	45,150	28	2,122	-
Stewart Street	McAndrew Avenue	Mason Avenue West	103	38	Transite	1970	80	2050	51,800	30	2,313	-
Stewart Street	McAndrew Avenue	Mason Avenue West	17	300	Transite	1970	80	2050	11,450	30	511	-
Stewart Street	McAndrew Avenue	Mason Avenue West	5	300	Transite	1970	80	2050	3,110	30	139	-
Stewart Street	Tasse Avenue	McAndrew Avenue	143	300	Transite	1970	80	2050	97,510	30	4,354	-
Stewart Street	Tasse Avenue	McAndrew Avenue	97	38	Transite	1970	80	2050	48,600	30	2,170	-
Tasse Avenue	Baldwin Street	Stewart Street	6	200	Ductile Iron	1970	80	2050	3,830	30	171	-
Stewart Street	Elgin Avenue	Cameron Avenue	110	100	Cast Iron	1970	80	2050	68,260	30	3,048	-
Raglan Street South	Pine Avenue	Hall Avenue	86	400	Transite	1970	80	2050	68,170	30	3,044	-
Raglan Street South	Pine Avenue	Hall Avenue	102	400	Transite	1970	80	2050	80,750	30	3,605	-
Raglan Street South	Pine Avenue	May Avenue	88	400	Transite	1970	80	2050	69,610	30	3,108	-
Raglan Street South	May Avenue	Bolger Lane	150	400	Transite	1970	80	2050	118,860	30	5,307	-
Raglan Street South	Bolger Lane	Airth Boulevard	32	400	Transite	1970	80	2050	25,820	30	1,153	-
Raglan Street South	Muriel Avenue	Airth Boulevard	77	400	Transite	1970	80	2050	61,030	30	2,725	-
Raglan Street South	Muriel Avenue	Airth Boulevard	72	400	Transite	1970	80	2050	57,240	30	2,556	-
Raglan Street South	Erindale Avenue	Haramis Drive	63	400	Transite	1970	80	2050	49,900	30	2,228	-
Raglan Street South	Erindale Avenue	Haramis Drive	43	400	Transite	1970	80	2050	34,050	30	1,520	-
Airth Boulevard	Massey Court	Simpson Avenue	139	150	Transite	1970	80	2050	86,050	30	3,842	-
Raglan Street South	Pine Avenue	May Avenue	12	100	Cast Iron	1970	80	2050	7,340	30	328	-
Raglan Street South	Barnet Boulevard	Erindale Avenue	88	400	Transite	1970	80	2050	69,960	30	3,124	-
Raglan Street South	Barnet Boulevard	McGarry Avenue	79	200	Ductile Iron	1970	80	2050	50,660	30	2,262	-
Raglan Street South	McGarry Avenue	Ivy Avenue	44	200	Ductile Iron	1970	80	2050	28,110	30	1,255	-
Raglan Street South	Ivy Avenue	Graham Avenue	32	200	Ductile Iron	1970	80	2050	20,430	30	912	-
Raglan Street South	Pine Avenue	Hall Avenue	29	200	Cast Iron	1970	80	2050	18,570	30	829	-
Raglan Street South	Pine Avenue	Hall Avenue	93	400	Transite	1970	80	2050	74,130	30	3,310	-
Raglan Street South	Pine Avenue	Hall Avenue	110	200	Cast Iron	1970	80	2050	70,680	30	3,156	-
Raglan Street South	Pine Avenue	Hall Avenue	26	200	Cast Iron	1970	80	2050	16,600	30	741	-
Raglan Street South	Pine Avenue	Hall Avenue	17	400	Transite	1970	80	2050	13,600	30	607	-
Raglan Street South	Pine Avenue	Hall Avenue	28	400	Transite	1970	80	2050	22,340	30	997	-
Raglan Street South	Pine Avenue	Hall Avenue	9	50	Cast Iron	1970	80	2050	5,510	30	246	-
Muriel Avenue	Muriel Avenue	Raglan Street South	411	150	PVC	1970	100	2070	255,190	50	8,121	-
Frank Dench Street	Basswood Avenue	Oak Crescent	79	150	Transite	1972	80	2052	48,820	32	2,080	-
Airth Boulevard	Opeongo Road	Centennial Drive	204	200	Transite	1972	80	2052	130,980	32	5,581	-
Lisgar Avenue	Smallfield Lane	Tupper Street	136	400	Transite	1973	80	2053	107,930	33	4,499	-
Lisgar Avenue	Riverview Drive	Smallfield Lane	65	150	Transite	1973	80	2053	40,110	33	1,672	-
Lisgar Avenue	Riverview Drive	Smallfield Lane	60	150	Transite	1973	80	2053	37,400	33	1,559	-



Table A-4 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Lisgar Avenue	Riverview Drive	Smallfield Lane	69	200	PVC	1973	100	2073	44,280	53	1,363	-
Lisgar Avenue	Riverview Drive	Smallfield Lane	48	200	PVC	1973	100	2073	30,840	53	949	-
Airth Boulevard	Centennial Drive	Vanier Crescent	12	200	Transite	1974	80	2054	7,950	34	325	-
Airth Boulevard	Centennial Drive	Vanier Crescent	74	200	Transite	1974	80	2054	47,160	34	1,925	-
Airth Boulevard	Vanier Crescent	Massey Court	8	200	Ductile Iron	1974	80	2054	5,020	34	205	-
Airth Boulevard	Vanier Crescent	Massey Court	75	200	Transite	1974	80	2054	47,820	34	1,952	-
Airth Boulevard	Vanier Crescent	Massey Court	9	200	Transite	1974	80	2054	5,760	34	235	-
Mason Avenue West	Dead End	Aberdeen Street	115	150	Transite	1974	80	2054	71,610	34	2,923	-
McAndrew Avenue	Aberdeen Street	Dead End	709	400	Transite	1975	80	2055	563,380	35	22,536	-
Bolger Lane	Bolger Lane	Raglan Street South	70	150	Transite	1975	80	2055	43,260	35	1,730	-
Haramis Drive	Kedrosky Drive	Raglan Street South	91	200	Ductile Iron	1975	80	2055	58,640	35	2,346	-
Erindale Avenue	Kedrosky Drive	Raglan Street South	91	200	Ductile Iron	1975	80	2055	58,300	35	2,332	-
Erindale Avenue	Hillsview Street	Kedrosky Drive	40	200	Ductile Iron	1975	80	2055	25,490	35	1,020	-
Erindale Avenue	Hillsview Street	Kedrosky Drive	11	200	Ductile Iron	1975	80	2055	7,180	35	287	-
Erindale Avenue	Hillsview Street	Kedrosky Drive	34	50	Ductile Iron	1975	80	2055	21,030	35	841	-
Erindale Avenue	Hillsview Street	Kedrosky Drive	104	200	Ductile Iron	1975	80	2055	66,580	35	2,663	-
Erindale Avenue	Hillsview Street	Kedrosky Drive	7	200	Ductile Iron	1975	80	2055	4,300	35	172	-
Erindale Avenue	McDougall Road	Hillsview Street	84	200	Ductile Iron	1975	80	2055	53,630	35	2,145	-
Erindale Avenue	Ivy Avenue	McDougall Road	62	200	Ductile Iron	1975	80	2055	40,060	35	1,602	-
Erindale Avenue	Ivy Avenue	McDougall Road	109	200	Ductile Iron	1975	80	2055	69,880	35	2,795	-
Erindale Avenue	McDougall Road	Hillsview Street	8	200	Ductile Iron	1975	80	2055	5,410	35	216	-
Haramis Drive	Dead End	Kedrosky Drive	5	200	Ductile Iron	1975	80	2055	3,420	35	137	-
Barnet Boulevard	Fourth Street	First Street	130	250	Transite	1975	80	2055	85,950	35	3,438	-
First Street	McGarry Avenue	Barnet Boulevard	80	150	Transite	1975	80	2055	49,640	35	1,986	-
Graham Avenue	Dead End	Raglan Street South	76	150	Transite	1975	80	2055	46,940	35	1,878	-
McGarry Avenue	First Street	Raglan Street South	189	150	Transite	1975	80	2055	117,460	35	4,699	-
McGarry Avenue	First Street	Raglan Street South	56	150	Transite	1975	80	2055	34,480	35	1,379	-
Graham Avenue	Dead End	Raglan Street South	161	100	Transite	1975	80	2055	99,900	35	3,996	-
Graham Avenue	Dead End	Raglan Street South	70	150	Transite	1975	80	2055	43,420	35	1,737	-
Graham Avenue	Dead End	Raglan Street South	13	150	Transite	1975	80	2055	8,220	35	329	-
McAndrew Avenue	Aberdeen Street	Dead End	45	400	Cast Iron	1976	80	2056	36,110	36	1,417	-
McAndrew Avenue	Aberdeen Street	Dead End	126	100	Transite	1976	80	2056	78,300	36	3,072	-
McAndrew Avenue	Aberdeen Street	Dead End	11	400	Transite	1976	80	2056	8,410	36	330	-
McAndrew Avenue	Aberdeen Street	Dead End	141	400	Transite	1976	80	2056	111,840	36	4,388	-
McAndrew Avenue	Aberdeen Street	Dead End	98	400	Transite	1976	80	2056	77,650	36	3,046	-
Massey Court	Dead End	Airth Boulevard	79	150	Transite	1976	80	2056	49,020	36	1,923	-
Smallfield Lane	Dead End	Lisgar Avenue	183	400	Transite	1977	80	2057	145,720	37	5,611	-
Smallfield Lane	Dead End	Lisgar Avenue	26	400	Ductile Iron	1977	80	2057	21,050	37	811	-
Oak Crescent	Dead End	Frank Dench Street	46	150	Ductile Iron	1978	80	2058	28,470	38	1,077	-
Oak Crescent	Dead End	Frank Dench Street	66	150	Ductile Iron	1978	80	2058	41,060	38	1,553	-
Oak Crescent	Dead End	Frank Dench Street	86	150	Transite	1978	80	2058	53,630	38	2,028	-
Oak Crescent	Dead End	Frank Dench Street	87	150	Transite	1978	80	2058	53,910	38	2,039	-



Table A-4 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Oak Crescent	Dead End	Frank Dench Street	10	150	Transite	1978	80	2058	6,100	38	231	-
Opeongo Road	Airth Boulevard	Bonnechere Street South	200	200	Transite	1978	80	2058	128,160	38	4,847	-
Opeongo Road	Airth Boulevard	Bonnechere Street South	9	200	Transite	1978	80	2058	5,820	38	220	-
Opeongo Road	City Limits	Airth Boulevard	16	200	Transite	1978	80	2058	10,570	38	400	-
Vanier Crescent	Wade Avenue	Airth Boulevard	38	200	Ductile Iron	1978	80	2058	24,320	38	920	-
Hillsview Street	Erindale Avenue	Ivy Avenue	115	200	Ductile Iron	1980	80	2060	73,470	40	2,686	-
Ivy Avenue	Hillsview Street	Kedrosky Drive	8	200	Ductile Iron	1980	80	2060	5,100	40	186	-
Ivy Avenue	Kedrosky Drive	Raglan Street South	84	150	Ductile Iron	1980	80	2060	52,360	40	1,914	-
Ivy Avenue	Hillsview Street	Kedrosky Drive	83	200	Ductile Iron	1980	80	2060	53,460	40	1,954	-
Ivy Avenue	Erindale Avenue	Hillsview Street	161	200	Ductile Iron	1980	80	2060	103,430	40	3,781	-
Ivy Avenue	Erindale Avenue	Hillsview Street	30	200	Ductile Iron	1980	80	2060	19,490	40	712	-
Ivy Avenue	McDougall Road	Erindale Avenue	98	200	Ductile Iron	1980	80	2060	63,030	40	2,304	-
Ivy Avenue	McDougall Road	Erindale Avenue	98	200	Ductile Iron	1980	80	2060	62,970	40	2,302	-
Ivy Avenue	McDougall Road	Erindale Avenue	7	200	Ductile Iron	1980	80	2060	4,690	40	171	-
Ivy Avenue	McDougall Road	Erindale Avenue	80	200	Ductile Iron	1980	80	2060	51,240	40	1,873	-
Ivy Avenue	McDougall Road	Erindale Avenue	16	200	Ductile Iron	1980	80	2060	10,110	40	370	-
Ivy Avenue	Dead End	McDougall Road	48	200	Ductile Iron	1980	80	2060	30,960	40	1,132	-
Eighth Street	Dead End	Barnet Boulevard	53	200	Ductile Iron	1980	80	2060	34,090	40	1,246	-
Booth Road	Mask Road	Innovation Drive	137	300	Ductile Iron	1980	80	2060	93,290	40	3,410	-
Barr Street	Hall Avenue	Quarry Avenue	7	150	Cast Iron	1982	80	2062	4,400	42	156	-
Barr Street	Hill Avenue	Hall Avenue	191	150	Transite	1982	80	2062	118,740	42	4,205	-
Barr Street	Hill Avenue	Hall Avenue	79	150	Transite	1982	80	2062	49,250	42	1,744	-
Barnet Boulevard	Gillan Road	Eighth Street	51	250	Transite	1982	80	2062	33,760	42	1,196	-
Barnet Boulevard	Gillan Road	Eighth Street	14	250	Transite	1982	80	2062	8,960	42	317	-
Barnet Boulevard	Gillan Road	Eighth Street	15	200	Transite	1982	80	2062	9,580	42	339	-
Barnet Boulevard	Gillan Road	Eighth Street	81	250	Transite	1982	80	2062	53,650	42	1,900	-
Barnet Boulevard	Gillan Road	Eighth Street	261	250	Transite	1982	80	2062	172,680	42	6,116	-
Barnet Boulevard	Gillan Road	Eighth Street	165	250	Transite	1982	80	2062	109,550	42	3,880	-
Mask Road	O'Brien Road	Booth Road	84	300	Ductile Iron	1982	80	2062	57,300	42	2,029	-
Mask Road	O'Brien Road	Booth Road	158	300	Ductile Iron	1982	80	2062	108,010	42	3,825	-
Ma-Te-Way Park Drive	Dead End	Haig Avenue	280	200	Ductile Iron	1983	80	2063	179,300	43	6,256	-
Ma-Te-Way Park Drive	Dead End	Haig Avenue	11	100	Ductile Iron	1983	80	2063	6,660	43	232	-
Ma-Te-Way Park Drive	Dead End	Haig Avenue	5	100	Ductile Iron	1983	80	2063	3,320	43	116	-
Ma-Te-Way Park Drive	Dead End	Haig Avenue	149	200	Ductile Iron	1983	80	2063	95,510	43	3,332	-
Ma-Te-Way Park Drive	Dead End	Haig Avenue	3	200	Ductile Iron	1983	80	2063	2,170	43	76	-
Ma-Te-Way Park Drive	Dead End	Haig Avenue	47	200	Ductile Iron	1983	80	2063	30,270	43	1,056	-
Ma-Te-Way Park Drive	Dead End	Haig Avenue	42	200	Ductile Iron	1983	80	2063	27,000	43	942	-
Ma-Te-Way Park Drive	Dead End	Haig Avenue	132	200	Ductile Iron	1983	80	2063	84,610	43	2,952	-
Ma-Te-Way Park Drive	Dead End	Haig Avenue	10	200	Ductile Iron	1983	80	2063	6,280	43	219	-
Dominion Street	Quarry Avenue	Hall Avenue	7	150	Cast Iron	1984	80	2064	4,440	44	153	-
Dominion Street	Quarry Avenue	Hall Avenue	5	200	Cast Iron	1984	80	2064	3,070	44	106	-
Gibbons Road	Dead End	Wrangler Road	114	300	Ductile Iron	1984	80	2064	77,570	44	2,667	-



Table A-4 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Gibbons Road	Dead End	Wrangler Road	127	300	Ductile Iron	1984	80	2064	86,990	44	2,991	-
Gibbons Road	Dead End	Wrangler Road	143	250	Ductile Iron	1984	80	2064	94,620	44	3,254	-
Smallfield Lane	Dead End	Lisgar Avenue	610	50	PVC	1985	100	2085	378,710	65	10,462	-
Vimy Boulevard	Haig Avenue	Joffre Avenue	173	200	Ductile Iron	1985	80	2065	111,010	45	3,764	-
Centennial Drive	Wade Avenue	Airth Boulevard	101	200	Ductile Iron	1985	80	2065	64,570	45	2,190	-
Centennial Drive	Wade Avenue	Airth Boulevard	7	200	Ductile Iron	1985	80	2065	4,430	45	150	-
Centennial Drive	Dead End	Wade Avenue	80	200	Ductile Iron	1985	80	2065	51,290	45	1,739	-
Centennial Drive	Dead End	Wade Avenue	20	200	Ductile Iron	1985	80	2065	12,950	45	439	-
Kedrosky Drive	Haramis Drive	Erindale Avenue	106	200	Ductile Iron	1985	80	2065	67,720	45	2,296	-
Kedrosky Drive	Haramis Drive	Erindale Avenue	14	200	Ductile Iron	1985	80	2065	8,770	45	297	-
Kedrosky Drive	Erindale Avenue	Ivy Avenue	116	200	Ductile Iron	1985	80	2065	74,260	45	2,518	-
Kedrosky Drive	Erindale Avenue	Ivy Avenue	73	200	Ductile Iron	1985	80	2065	46,740	45	1,585	-
Kedrosky Drive	Erindale Avenue	Ivy Avenue	8	200	Ductile Iron	1985	80	2065	5,260	45	178	-
McDougall Road	Erindale Avenue	Ivy Avenue	70	200	Ductile Iron	1985	80	2065	45,160	45	1,531	-
McDougall Road	Erindale Avenue	Ivy Avenue	118	200	Ductile Iron	1985	80	2065	75,740	45	2,568	-
McDougall Road	Erindale Avenue	Ivy Avenue	6	200	Ductile Iron	1985	80	2065	4,030	45	137	-
McDougall Road	Erindale Avenue	Ivy Avenue	96	200	Ductile Iron	1985	80	2065	61,510	45	2,086	-
Haramis Drive	Kedrosky Drive	Raglan Street South	8	200	Ductile Iron	1985	80	2065	5,010	45	170	-
Coumbes Lane	Dead End	Coumbes Street	104	150	Transite	1985	80	2065	64,810	45	2,198	-
Coumbes Lane	Dead End	Coumbes Street	13	150	Transite	1985	80	2065	8,180	45	277	-
Coumbes Street	Raglan Street South	Coumbes Lane	19	200	Ductile Iron	1985	80	2065	11,890	45	403	-
Coumbes Street	Coumbes Lane	Barr Street	106	200	Ductile Iron	1985	80	2065	68,220	45	2,313	-
Coumbes Street	Coumbes Lane	Barr Street	191	250	Ductile Iron	1985	80	2065	126,190	45	4,279	-
Barr Street	Coumbes Street	Hall Avenue	27	150	Ductile Iron	1985	80	2065	16,820	45	570	-
Hall Avenue	Martin Street	McLean Street	5	150	Transite	1986	80	2066	3,310	46	111	-
Les Fraser Street	Dead End	Hall Avenue	7	200	Transite	1986	80	2066	4,210	46	141	-
Les Fraser Street	Dead End	Hall Avenue	118	200	Transite	1986	80	2066	75,550	46	2,527	-
Hall Avenue	Harry Street	Robert Drive	39	200	Cast Iron	1986	80	2066	25,120	46	840	-
Hall Avenue	Harry Street	Robert Drive	8	200	Cast Iron	1986	80	2066	4,990	46	167	-
Hall Avenue	McLean Street	Harry Street	86	200	Cast Iron	1986	80	2066	55,440	46	1,855	-
Hall Avenue	Les Fraser Street	Martin Street	161	200	Cast Iron	1986	80	2066	103,530	46	3,463	-
Hall Avenue	Mayhew Street	Les Fraser Street	32	200	Cast Iron	1986	80	2066	20,280	46	678	-
Hall Avenue	Mayhew Street	Les Fraser Street	11	200	Cast Iron	1986	80	2066	7,100	46	238	-
Hall Avenue	Mayhew Street	Les Fraser Street	10	200	Cast Iron	1986	80	2066	6,220	46	208	-
Hall Avenue	Mayhew Street	Les Fraser Street	10	200	Cast Iron	1986	80	2066	6,530	46	218	-
Hall Avenue	Mayhew Street	Les Fraser Street	32	200	Cast Iron	1986	80	2066	20,390	46	682	-
Hall Avenue	Harry Street	Robert Drive	5	300	Transite	1986	80	2066	3,330	46	111	-
Hall Avenue	McLean Street	Harry Street	129	300	Transite	1986	80	2066	88,380	46	2,957	-
Hall Avenue	McLean Street	Harry Street	7	300	Transite	1986	80	2066	4,970	46	166	-
Hall Avenue	McLean Street	Harry Street	4	300	Transite	1986	80	2066	2,460	46	82	-
Hall Avenue	McLean Street	Harry Street	7	200	Cast Iron	1986	80	2066	4,490	46	150	-
Hall Avenue	Martin Street	McLean Street	52	300	Transite	1986	80	2066	35,570	46	1,190	-



Table A-4 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Hall Avenue	Martin Street	McLean Street	53	200	Cast Iron	1986	80	2066	34,150	46	1,142	-
Hall Avenue	Martin Street	McLean Street	12	200	Cast Iron	1986	80	2066	7,920	46	265	-
Hall Avenue	Martin Street	McLean Street	6	50	Cast Iron	1986	80	2066	4,010	46	134	-
Hall Avenue	Gillan Road	Mayhew Street	89	300	Transite	1986	80	2066	61,110	46	2,044	-
Hall Avenue	Gillan Road	Mayhew Street	14	250	Transite	1986	80	2066	9,540	46	319	-
Gillan Road	Hall Avenue	O Brien Road	103	250	Transite	1986	80	2066	68,100	46	2,278	-
Gillan Road	Hall Avenue	O Brien Road	334	250	Transite	1986	80	2066	221,210	46	7,400	-
Gillan Road	Hall Avenue	O Brien Road	150	250	Transite	1986	80	2066	99,040	46	3,313	-
Gillan Road	Barnet Boulevard	O Brien Road	5	150	Transite	1986	80	2066	3,210	46	107	-
Gillan Road	City Limits	Barnet Boulevard	111	150	Transite	1986	80	2066	68,810	46	2,302	-
Gillan Road	City Limits	Barnet Boulevard	32	150	Transite	1986	80	2066	19,750	46	661	-
Hall Avenue	Lynn Street	Plaunt Street South	161	150	Cast Iron	1986	80	2066	99,730	46	3,336	-
Hall Avenue	Dominion Street	Barr Street	66	150	Cast Iron	1986	80	2066	41,150	46	1,377	-
Hall Avenue	New Street	Dominion Street	66	200	Cast Iron	1986	80	2066	42,490	46	1,421	-
Hall Avenue	New Street	Dominion Street	12	200	Cast Iron	1986	80	2066	8,010	46	268	-
Hall Avenue	Robert Drive	New Street	61	200	Cast Iron	1986	80	2066	38,980	46	1,304	-
Hall Avenue	Robert Drive	New Street	4	200	Cast Iron	1986	80	2066	2,300	46	77	-
Hall Avenue	Robert Drive	New Street	12	200	Cast Iron	1986	80	2066	7,460	46	250	-
Hall Avenue	Harry Street	Robert Drive	63	200	Cast Iron	1986	80	2066	40,310	46	1,349	-
Hall Avenue	Harry Street	Robert Drive	12	200	Cast Iron	1986	80	2066	7,640	46	256	-
Hall Avenue	Harry Street	Robert Drive	5	200	Cast Iron	1986	80	2066	3,510	46	117	-
Hall Avenue	Harry Street	Robert Drive	55	200	Cast Iron	1986	80	2066	35,020	46	1,172	-
Hall Avenue	Barr Street	Lynn Street	87	150	Cast Iron	1986	80	2066	53,770	46	1,799	-
Gillan Road	Hall Avenue	O Brien Road	8	200	Cast Iron	1986	80	2066	4,950	46	166	-
O Brien Road	Eighth Street	Gillan Road	161	200	Cast Iron	1986	80	2066	103,090	46	3,449	-
O Brien Road	Eighth Street	Gillan Road	24	200	Cast Iron	1986	80	2066	15,120	46	506	-
O Brien Road	Eighth Street	Gillan Road	11	200	Transite	1986	80	2066	7,260	46	243	-
O Brien Road	Eighth Street	Gillan Road	209	200	Cast Iron	1986	80	2066	133,860	46	4,478	-
O Brien Road	Eighth Street	Gillan Road	53	400	Transite	1986	80	2066	42,280	46	1,414	-
O Brien Road	Eighth Street	Gillan Road	14	400	Transite	1986	80	2066	10,990	46	368	-
O Brien Road	Eighth Street	Gillan Road	257	400	Transite	1986	80	2066	204,410	46	6,838	-
O Brien Road	Eighth Street	Gillan Road	18	250	Transite	1986	80	2066	12,020	46	402	-
O Brien Road	Eighth Street	Gillan Road	169	250	Transite	1986	80	2066	111,810	46	3,740	-
O Brien Road	Seventh Street	Eighth Street	77	250	Transite	1986	80	2066	50,930	46	1,704	-
O Brien Road	Seventh Street	Eighth Street	7	250	Transite	1986	80	2066	4,910	46	164	-
O Brien Road	Sixth Street	Seventh Street	92	250	Transite	1986	80	2066	60,590	46	2,027	-
O Brien Road	Eighth Street	Gillan Road	262	400	Transite	1986	80	2066	208,310	46	6,969	-
O Brien Road	Seventh Street	Eighth Street	18	150	Transite	1986	80	2066	11,220	46	375	-
O Brien Road	Seventh Street	Eighth Street	10	150	Transite	1986	80	2066	5,930	46	198	-
O Brien Road	Eighth Street	Gillan Road	10	150	Transite	1986	80	2066	6,170	46	206	-
O Brien Road	Seventh Street	Eighth Street	2	300	Transite	1986	80	2066	1,520	46	51	-



Table A-4 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
O'Brien Road	Fortington Street	Sixth Street	45	250	Transite	1986	80	2066	29,680	46	993	-
O'Brien Road	Fifth Street	Sixth Street	3	250	Transite	1986	80	2066	2,110	46	71	-
Gillan Road	Hall Avenue	O'Brien Road	13	250	Transite	1986	80	2066	8,920	46	298	-
Gillan Road	Barnet Boulevard	O'Brien Road	294	250	Transite	1986	80	2066	194,610	46	6,510	-
O'Brien Road	Eighth Street	Gillan Road	29	350	Ductile Iron	1986	80	2066	19,800	46	662	-
O'Brien Road	Mask Road	Gillan Road	138	350	Ductile Iron	1986	80	2066	94,150	46	3,150	-
O'Brien Road	Mask Road	Gillan Road	67	350	Ductile Iron	1986	80	2066	45,740	46	1,530	-
O'Brien Road	Mask Road	Gillan Road	291	350	Ductile Iron	1986	80	2066	198,510	46	6,641	-
O'Brien Road	Mask Road	Gillan Road	174	350	Ductile Iron	1986	80	2066	118,630	46	3,969	-
O'Brien Road	Innovation Drive	Mask Road	18	350	Ductile Iron	1986	80	2066	12,460	46	417	-
O'Brien Road	Innovation Drive	Mask Road	157	350	Ductile Iron	1986	80	2066	107,150	46	3,585	-
O'Brien Road	Innovation Drive	Mask Road	123	350	Ductile Iron	1986	80	2066	83,810	46	2,804	-
O'Brien Road	Innovation Drive	Mask Road	14	350	Ductile Iron	1986	80	2066	9,720	46	325	-
O'Brien Road	Innovation Drive	Mask Road	8	350	Ductile Iron	1986	80	2066	5,330	46	178	-
Hall Avenue	Harry Street	Robert Drive	14	50	Cast Iron	1986	80	2066	8,540	46	286	-
Hall Avenue	Les Fraser Street	Martin Street	217	300	Transite	1986	80	2066	147,940	46	4,949	-
Hall Avenue	Mayhew Street	Les Fraser Street	188	300	Transite	1986	80	2066	128,590	46	4,302	-
Vimy Boulevard	Dead End	Haig Avenue	27	200	Ductile Iron	1987	80	2067	17,190	47	568	-
Vimy Boulevard	Dead End	Haig Avenue	125	200	Ductile Iron	1987	80	2067	80,230	47	2,649	-
Vimy Boulevard	Dead End	Haig Avenue	35	200	Ductile Iron	1987	80	2067	22,320	47	737	-
Lynn Street	Hall Avenue	Quarry Avenue	6	150	Cast Iron	1988	80	2068	3,850	48	126	-
Robert Drive	Dead End	Hall Avenue	97	150	Ductile Iron	1988	80	2068	60,020	48	1,957	-
Robert Drive	Dead End	Hall Avenue	92	150	Ductile Iron	1988	80	2068	57,030	48	1,859	-
Robert Drive	Dead End	Hall Avenue	6	150	Ductile Iron	1988	80	2068	3,510	48	114	-
Innovation Drive	Booth Road	O'Brien Road	88	300	Ductile Iron	1988	80	2068	59,970	48	1,955	-
Innovation Drive	Booth Road	O'Brien Road	74	300	Ductile Iron	1988	80	2068	50,230	48	1,638	-
Innovation Drive	Booth Road	O'Brien Road	59	300	Ductile Iron	1988	80	2068	40,580	48	1,323	-
Vanier Crescent	Wade Avenue	Airth Boulevard	131	200	Ductile Iron	1990	80	2070	84,060	50	2,675	-
Vanier Crescent	Wade Avenue	Airth Boulevard	81	200	Ductile Iron	1990	80	2070	51,700	50	1,645	-
Wrangler Road	Gibbons Road	O'Brien Road	83	350	Ductile Iron	1990	80	2070	56,690	50	1,804	-
Wrangler Road	Gibbons Road	O'Brien Road	149	350	Ductile Iron	1990	80	2070	102,080	50	3,249	-
Arthur Avenue	Raglan Street North	Dead End	297	100	Cast Iron	1995	80	2075	184,410	55	5,559	-
Arthur Avenue	Raglan Street North	Dead End	120	100	Cast Iron	1995	80	2075	74,220	55	2,237	-
Arthur Avenue	Raglan Street North	Dead End	127	100	Cast Iron	1995	80	2075	79,070	55	2,383	-
Arthur Avenue	Raglan Street North	Dead End	177	100	Cast Iron	1995	80	2075	109,990	55	3,315	-
Arthur Avenue	Raglan Street North	Dead End	3	100	Cast Iron	1995	80	2075	1,590	55	48	-
Lorne Street North	Dead End	Munroe Avenue East	120	300	Transite	1995	80	2075	81,740	55	2,464	-
Lorne Street North	Dead End	Munroe Avenue East	110	300	Transite	1995	80	2075	75,360	55	2,272	-
Lorne Street North	Dead End	Munroe Avenue East	199	100	Cast Iron	1995	80	2075	123,230	55	3,715	-
Mayhew Street	Dead End	Hall Avenue	145	200	Ductile Iron	1995	80	2075	92,670	55	2,793	-
Mayhew Street	Dead End	Hall Avenue	6	200	Ductile Iron	1995	80	2075	3,870	55	117	-
Wade Avenue	Vanier Crescent	Centennial Drive	7	200	Ductile Iron	1995	80	2075	4,420	55	133	-



Table A-4 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Wade Avenue	Vanier Crescent	Centennial Drive	71	200	Ductile Iron	1995	80	2075	45,600	55	1,375	-
Wade Avenue	Vanier Crescent	Centennial Drive	144	200	Ductile Iron	1995	80	2075	92,460	55	2,787	-
Munroe Avenue East	Lorne Street North	Plaunt Street North	13	300	Transite	2000	80	2080	8,580	60	247	-
Dominion Street	Quarry Avenue	Hall Avenue	19	100	Cast Iron	2003	80	2083	11,850	63	332	-
Dominion Street	Quarry Avenue	Hall Avenue	208	100	Cast Iron	2003	80	2083	129,070	63	3,622	-
June Street	Lisgar Avenue	Mary Street	125	150	PVC	2010	100	2110	-	90	-	-
June Street	Mary Street	Dead End	102	150	PVC	2010	100	2110	-	90	-	-
June Street	Mary Street	Dead End	13	150	PVC	2010	100	2110	-	90	-	-
Raglan Street North	Mutual Avenue	Bridge Street	123	150	PVC	2010	100	2110	438,750	90	10,550	-
Barr Street	Quarry Avenue	Renfrew Avenue East	104	150	PVC	2010	100	2110	-	90	-	-
Barr Street	Hall Avenue	Quarry Avenue	106	150	PVC	2010	100	2110	-	90	-	-
Barr Street	Hall Avenue	Quarry Avenue	132	150	PVC	2010	100	2110	-	90	-	-
Quarry Avenue	Lynn Street	Jennet Street	176	100	PVC	2010	100	2110	-	90	-	-
Quarry Avenue	Barr Street	Lynn Street	93	100	PVC	2010	100	2110	192,610	90	4,632	-
Quarry Avenue	Dominion Street	Barr Street	25	100	PVC	2010	100	2110	52,330	90	1,258	-
Foxden Street	Eagle Avenue	NA	10	1	PVC	2010	80	2090	5,970	70	159	-
Elk Street	Eagle Avenue	NA	10	1	PVC	2010	80	2090	5,970	70	159	-
Elk Street	Elk Street	Otteridge Avenue	98	1	PVC	2010	80	2090	58,480	70	1,560	-
Otteridge Avenue	Elk Street	NA	130	1	PVC	2010	80	2090	77,580	70	2,069	-
Otteridge Avenue	Elk Street	Froats Street	75	1	PVC	2010	80	2090	44,760	70	1,194	-
Froats Street	Otteridge Avenue	NA	6	1	PVC	2010	80	2090	3,580	70	95	-
Froats Street	Otteridge Avenue	O Brien Road	207	1	PVC	2010	80	2090	123,530	70	3,294	-
Elgin Avenue	Albert Street	Raglan Street South	117	150	PVC	2013	100	2113	55,950	93	1,330	-
Queen Street North	Munroe Avenue West	Lisgar Avenue	9	200	PVC	2014	80	2094	14,140	74	368	-
Queen Street North	Munroe Avenue West	Lisgar Avenue	148	200	PVC	2014	80	2094	225,180	74	5,856	-
Prince Avenue West	Carswell Street	Dead End	79	150	PVC	2014	80	2094	59,810	74	1,556	-
Carswell Street	Dead End	Prince Avenue West	74	150	PVC	2014	80	2094	56,020	74	1,457	-
Queen Street South	Patrick Avenue	Munroe Avenue West	157	200	PVC	2014	80	2094	238,370	74	6,199	-
Prince Avenue West	Carswell Street	Dead End	16	200	PVC	2014	80	2094	12,110	74	315	-
Lochiel Street North	Munroe Avenue West	Lisgar Avenue	151	200	PVC	2015	80	2095	26,700	75	690	-
Plaunt Street South	Hall Avenue	Quarry Avenue	16	100	PVC	2016	80	2096	15,530	76	399	-
Plaunt Street South	Renfrew Avenue East	Railway Avenue	150	200	PVC	2016	80	2096	197,850	76	5,086	-
Plaunt Street South	Quarry Avenue	Renfrew Avenue East	65	200	PVC	2016	80	2096	83,710	76	2,152	-
Plaunt Street South	Quarry Avenue	Renfrew Avenue East	65	200	PVC	2016	80	2096	83,710	76	2,152	-
Plaunt Street South	Quarry Avenue	Renfrew Avenue East	10	200	PVC	2016	80	2096	15,220	76	391	-
Plaunt Street South	Hall Avenue	Quarry Avenue	55	200	PVC	2016	80	2096	76,100	76	1,956	-
Plaunt Street South	Hall Avenue	Quarry Avenue	205	200	PVC	2016	80	2096	273,950	76	7,043	-
Plaunt Street South	Renfrew Avenue East	Railway Avenue	10	200	PVC	2016	80	2096	15,220	76	391	-
Plaunt Street South	Hall Avenue	Quarry Avenue	10	200	PVC	2016	80	2096	15,220	76	391	-
Coumbes Street	Raglan Street South	Coumbes Lane	90	200	PVC	2016	80	2096	223,950	76	5,757	-
Coumbes Street	Coumbes Lane	Barr Street	29	200	PVC	2016	80	2096	69,160	76	1,778	-
Coumbes Street	Barr Street	Dominion Street	6	200	PVC	2016	80	2096	13,170	76	339	-



Table A-4 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Barr Street	Coumbes Street	Hall Avenue	10	200	PVC	2016	80	2096	23,050	76	593	-
Colerain Subdivision	Coleraine Subdivision	Coleraine Subdivision	430	50-150	PVC	2016	80	2096	107,480	76	2,763	-
Munroe Avenue East	Lorne Street North	Plaunt Street North	40	200	PVC	2018	100	2118	72,860	98	1,702	-
O Gorman Avenue	Bonnechere Street North	Argyle Street North	108	250	Cast Iron	2018	100	2118	177,110	98	4,136	-
Easement	Lochiel Street North	Argyle Street North	48	250	PVC	2018	100	2118	78,720	98	1,838	-
Plaunt Street South	Munroe Avenue East	Dead End	139	100	PVC	2018	100	2118	253,200	98	5,913	-
Railway Avenue	Munroe Avenue East	Dead End	136	100	PVC	2018	100	2118	247,740	98	5,786	-
Railway Avenue	Munroe Avenue East	Dead End	16	100	PVC	2018	100	2118	29,150	98	681	-
Railway Avenue	Munroe Avenue East	Dead End	187	100	PVC	2018	100	2118	340,640	98	7,955	-
Munroe Avenue West	Raglan Street North	Argyle Street North	14	200	PVC	2018	100	2118	22,960	98	536	-
Raglan Street North	Munroe Avenue West	Easement	137	250	PVC	2018	100	2118	224,670	98	5,247	-
Raglan Street North	Raglan Street North	Bridge Street	10	200	PVC	2018	100	2118	16,400	98	383	-
Raglan Street North	Easement	O'Gorman Avenue	152	300	PVC	2018	100	2118	249,270	98	5,821	-
Bridge Street	Argyle Street North	Raglan Street North	34	300	PVC	2018	100	2118	55,760	98	1,302	-
Lochiel Street North	O Gorman Avenue	Bridge Street	10	200	Cast Iron	2018	100	2118	4,850	98	113	-
Raglan Street North	Munroe Avenue West	Bridge Street	181	300	Transite	2018	100	2118	93,710	98	2,188	-
Raglan Street North	Munroe Avenue West	Patrick Avenue	135	200	PVC	2018	100	2118	221,390	98	5,170	-
Easement	Raglan Street South	Plaunt Street South	10	200	PVC	2018	100	2118	16,400	98	383	-
Raglan Street South	Railway Avenue	Patrick Avenue	188	200	PVC	2018	100	2118	308,310	98	7,200	-
Raglan Street South	Renfrew Avenue East	Railway Avenue	158	200	PVC	2018	100	2118	259,110	98	6,051	-
Raglan Street South	Renfrew Avenue West	Renfrew Avenue East	53	200	PVC	2018	100	2118	86,920	98	2,030	-
Raglan Street South	Prince Avenue East	Renfrew Avenue West	108	200	PVC	2018	100	2118	177,110	98	4,136	-
Prince Avenue West	Raglan Street South	Plaunt Street South	12	200	PVC	2018	100	2118	19,680	98	460	-
Raglan Street South	Opeongo Road	Prince Avenue East	108	200	PVC	2018	100	2118	177,110	98	4,136	-
Opeongo Road	Raglan Street South	Argyle Street South	17	200	PVC	2018	100	2118	27,880	98	651	-
Raglan Street South	Hall Avenue	Opeongo Road	80	200	PVC	2018	100	2118	131,200	98	3,064	-
Hall Avenue	Plaunt Street South	Raglan Street South	70	150	PVC	2018	100	2118	127,510	98	2,978	-
Munroe Avenue East	Plaunt Street North	Raglan Street North	82	250	PVC	2019	100	2119	83,770	99	1,950	-
Munroe Avenue East	Harry Street	Lorne Street North	106	150	Transite	2019	100	2119	9,690	99	226	-
Munroe Avenue East	Harry Street	Lorne Street North	106	150	Transite	2019	100	2119	204,850	99	4,768	-
Argyle Street North	Barry Avenue	O Gorman Avenue	158	250	PVC	2019	100	2119	55,600	99	1,294	-
Renfrew Avenue East	Plaunt Street South	Raglan Street South	79	250	PVC	2019	100	2119	75,830	99	1,765	-
Opeongo Road	Lochiel Street South	Argyle Street South	315	400	Transite	2019	100	2119	371,570	99	8,649	-
Opeongo Road	Lochiel Street South	Argyle Street South	315	400	Transite	2019	100	2119	50,120	99	1,167	-
Railway Avenue	Raglan Street North	Plaunt Street North	75	250	PVC	2019	100	2119	68,610	99	1,597	-
Renfrew Avenue West	Raglan Street South	Argyle Street South	73	250	PVC	2019	100	2119	69,200	99	1,611	-
Barnet Boulevard	Barnet Boulevard	Sixth Street	10	200	PVC	2019	100	2119	42,740	99	995	-
Total			70,218						48,117,390		1,521,296	13,952,310



Appendix B

Wastewater System Inventory Data



Appendix B: Wastewater System Inventory Data

Table B-1
Town of Renfrew
Wastewater Facilities Inventory

Asset	Component Description	Year Installed	Estimated Life	Replacement Year	Replacement Cost	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
WPCP - NEW	Building	2009	95	2104	17,922,760	84	442,259	-
WPCP - NEW	Equipment	2009	15	2024	7,964,040	4	suggested for 10 year capital forecast	7,964,040
WPCP - NEW	Conveying Systems	2009	35	2044	743,410	24	39,305	-
WPCP - NEW	Mechanical	2009	25	2034	5,185,460	14	428,329	-
WPCP - NEW	Electrical	2009	25	2034	4,986,720	14	411,913	-
WPCP - NEW	Mechanical	2010	25	2035	861,990	15	67,085	-
Total					37,664,380		1,388,890	7,964,040



Table B-2
Town of Renfrew
Wastewater Vehicles & Equipment Inventory

Description	Initial In-Use Year	Estimated Life	Replacement Year	Replacement Cost	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
5 Ton Dump Truck (V007)	1995	15	2020	138,380	0	suggested for 10 year capital forecast	138,380
Generator (E020)	2007	20	2027	26,450	7	suggested for 10 year capital forecast	26,450
Pumps (E60)	2018	15	2033	25,800	13	2,273	-
Sewer Machine	2009	10	2020	21,710	0	suggested for 10 year capital forecast	21,710
Sewer Camera	2010	10	2020	15,990	0	suggested for 10 year capital forecast	15,990
Sewer Camera	2016	10	2026	38,730	6	suggested for 10 year capital forecast	38,730
Thompson Steamer	2017	15	2032	15,460	12	1,462	-
Total				282,520		3,735	241,260



**Table B-3
Town of Renfrew
Sewer Mains Inventory**

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
									60,420		2,698	
Wade Avenue	James Avenue	Airth Boulevard	99	250	Concrete	1960	90	2050		30		-
Vanier Crescent	James Crescent	Airth Boulevard	40	200	PVC	1990	100	2090	22,300	70	595	-
Vanier Crescent	James Crescent	Airth Boulevard	96	200	PVC	1990	100	2090	53,530	70	1,428	-
Vanier Crescent	James Crescent	Airth Boulevard	30	200	PVC	1990	100	2090	16,730	70	446	-
Vanier Crescent	James Crescent	Airth Boulevard	53	200	PVC	1975	100	2075	29,270	55	882	-
Centennial Drive	Dead End	Airth Boulevard	111	250	PVC	1990	100	2090	67,780	70	1,808	-
Centennial Drive	Wade Avenue	Airth Boulevard	57	250	PVC	1990	100	2090	34,660	70	924	-
Centennial Drive	Wade Avenue	Airth Boulevard	51	250	PVC	1975	100	2075	30,970	55	934	-
Massey Court	Dead End	Airth Boulevard	34	200	Concrete	1975	90	2065	18,960	45	643	-
Massey Court	Dead End	Airth Boulevard	51	200	Concrete	1975	90	2065	28,440	45	964	-
Coleraine Drive	Grant Boulevard	Simpson Avenue	48	300	Concrete	1960	90	2050	33,460	30	1,494	-
Coleraine Drive	Simpson Avenue	May Avenue	23	300	Concrete	1960	90	2050	16,030	30	716	-
Coleraine Drive	Simpson Avenue	Grant Boulevard	40	250	Concrete	1960	90	2050	24,230	30	1,082	-
Coleraine Drive	Grant Boulevard	Airth Boulevard	63	250	Concrete	1960	90	2050	38,340	30	1,712	-
Coleraine Drive	Pine Avenue	Easement	83	250	Concrete	1960	90	2050	50,600	30	2,259	-
Easement	Coleraine Drive	May Avenue	60	300	Concrete	1960	90	2050	41,470	30	1,852	-
May Avenue	Easement	May Avenue	53	300	Concrete	1950	90	2040	36,590	20	2,238	-
May Avenue	Easement	May Avenue	57	300	Concrete	1970	90	2060	39,730	40	1,452	-
Graham Avenue	Dead End	Raglan Street South	89	200	Concrete	1970	90	2060	49,630	40	1,814	-
Graham Avenue	Dead End	Raglan Street South	86	200	Concrete	1970	90	2060	47,950	40	1,753	-
McGarry Avenue	First Street	NA	76	200	Concrete	1970	90	2060	42,100	40	1,539	-
McGarry Avenue	NA	Raglan Street South	117	200	Concrete	1970	90	2060	64,960	40	2,375	-
Barnet Boulevard	First Street	NA	42	200	Concrete	2019	90	2109	32,860	89	793	-
Barnet Boulevard	First Street	Raglan Street South	87	200	Concrete	2019	90	2109	67,990	89	1,642	-
Barnet Boulevard	First Street	Raglan Street South	47	200	Concrete	2019	90	2109	36,650	89	885	-
Ivy Avenue	Erindale Avenue	Hillsview Street	34	200	PVC	1980	100	2080	18,960	60	545	-
Ivy Avenue	Erindale Avenue	Hillsview Street	44	200	PVC	1980	100	2080	24,530	60	706	-
Ivy Avenue	Erindale Avenue	Hillsview Street	83	200	PVC	1980	100	2080	46,280	60	1,331	-
Ivy Avenue	Hillsview Street	Kedrosky Drive	99	200	PVC	1980	100	2080	55,200	60	1,588	-
Kedrosky Drive	Ivy Avenue	NA	63	200	Concrete	1980	90	2070	34,850	50	1,109	-
Kedrosky Drive	NA	Erindale Avenue	53	200	Concrete	1980	90	2070	29,550	50	940	-
Kedrosky Drive	NA	Erindale Avenue	97	200	Concrete	1980	90	2070	53,810	50	1,712	-
McDougall Road	NA	Erindale Avenue	44	250	PVC	1980	100	2080	26,990	60	776	-
McDougall Road	NA	Erindale Avenue	43	250	PVC	1980	100	2080	26,070	60	750	-
McDougall Road	NA	Erindale Avenue	95	250	PVC	1980	100	2080	58,270	60	1,676	-
McDougall Road	NA	Erindale Avenue	14	250	PVC	1980	100	2080	8,590	60	247	-
Erindale Avenue	Dead End	Hillsview Street	69	250	PVC	1980	100	2080	42,320	60	1,217	-



Table B-3 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Erindale Avenue	Dead End	Hillsview Street	37	250	PVC	1980	100	2080	22,690	60	653	-
Erindale Avenue	Hillsview Street	Kedrosky Drive	37	250	PVC	1980	100	2080	22,690	60	653	-
Erindale Avenue	Hillsview Street	Kedrosky Drive	79	250	PVC	1980	100	2080	48,460	60	1,394	-
Erindale Avenue	Hillsview Street	Kedrosky Drive	40	250	PVC	1980	100	2080	24,530	60	706	-
Erindale Avenue	Hillsview Street	Kedrosky Drive	46	250	PVC	1980	100	2080	28,210	60	812	-
Erindale Avenue	Kedrosky Drive	Raglan Street South	68	250	Concrete	1970	90	2060	41,400	40	1,513	-
Erindale Avenue	Kedrosky Drive	Raglan Street South	8	250	Concrete	1970	90	2060	4,910	40	179	-
Erindale Avenue	Kedrosky Drive	Raglan Street South	8	250	PVC	1970	100	2070	4,600	50	146	-
Sixth Street	Barnet Boulevard	O Brien Road	79	200	Concrete	1960	90	2050	44,050	30	1,967	-
Sixth Street	Barnet Boulevard	O Brien Road	108	200	Concrete	1960	90	2050	60,220	30	2,689	-
Sixth Street	Barnet Boulevard	O Brien Road	106	200	Concrete	1960	90	2050	58,830	30	2,627	-
Seventh Street	Barnet Boulevard	O Brien Road	77	200	Concrete	1960	90	2050	42,660	30	1,905	-
Seventh Street	Barnet Boulevard	O Brien Road	84	200	Concrete	1960	90	2050	46,560	30	2,079	-
Seventh Street	Barnet Boulevard	O Brien Road	99	200	Concrete	1960	90	2050	54,920	30	2,452	-
Eighth Street	NA	NA	115	200	PVC	1985	100	2085	64,120	65	1,771	-
Eighth Street	NA	NA	66	200	PVC	1985	100	2085	36,520	65	1,009	-
Eighth Street	NA	Barnet Boulevard	102	200	PVC	1985	100	2085	56,880	65	1,571	-
Eighth Street	Barnet Boulevard	O Brien Road	17	200	PVC	1960	100	2060	9,480	40	347	-
Eighth Street	Barnet Boulevard	O Brien Road	46	200	Concrete	1960	90	2050	25,370	30	1,133	-
Eighth Street	Barnet Boulevard	O Brien Road	91	200	Concrete	1960	90	2050	50,740	30	2,266	-
Eighth Street	Barnet Boulevard	O Brien Road	91	200	Concrete	1960	90	2050	50,740	30	2,266	-
O Brien Road	Fifth Street	Sixth Street	58	200	PVC	2016	90	2106	48,850	86	1,195	-
O Brien Road	Seventh Street	Sixth Street	21	150	PVC	2016	90	2106	16,420	86	402	-
O Brien Road	Seventh Street	Sixth Street	50	200	PVC	2016	90	2106	42,470	86	1,039	-
O Brien Road	Eighth Street	Seventh Street	69	200	PVC	2016	90	2106	58,620	86	1,433	-
O Brien Road Service	Froats intersection	Froats intersection	212	200	PVC	2017	90	2107	340,100	87	8,281	-
Argyle Street	Opeongo Road	Prince Avenue East	21	200	Vitrified Clay	1930	70	2020	11,430	0	suggested for 10 year capital forecast	11,430
Argyle Street	Prince Avenue East	Renfrew Avenue East	95	200	Vitrified Clay	1930	70	2020	52,970	0	suggested for 10 year capital forecast	52,970
Argyle Street	Renfrew Avenue East	NA	87	200	Vitrified Clay	1930	70	2020	48,510	0	suggested for 10 year capital forecast	48,510
Argyle Street	Renfrew Avenue East	NA	92	200	Vitrified Clay	1930	70	2020	51,020	0	suggested for 10 year capital forecast	51,020
Argyle Street	Renfrew Avenue East	Patrick Avenue	91	200	Vitrified Clay	1930	70	2020	50,740	0	suggested for 10 year capital forecast	50,740



Table B-3 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Argyle Street	Renfrew Avenue East	Patrick Avenue	89	200	Vitrified Clay	1930	70	2020	49,630	0	suggested for 10 year capital forecast	49,630
Argyle Street	Patrick Avenue	Munroe Avenue East	82	200	Vitrified Clay	1930	70	2020	45,720	0	suggested for 10 year capital forecast	45,720
Argyle Street	Patrick Avenue	Munroe Avenue East	18	200	Vitrified Clay	1930	70	2020	9,760	0	suggested for 10 year capital forecast	9,760
Argyle Street	Patrick Avenue	Munroe Avenue East	70	200	Vitrified Clay	1930	70	2020	39,030	0	suggested for 10 year capital forecast	39,030
Argyle Street	Munroe Avenue East	O Gorman Avenue	93	200	Vitrified Clay	1930	70	2020	51,860	0	suggested for 10 year capital forecast	51,860
Argyle Street	Munroe Avenue East	O Gorman Avenue	100	200	Vitrified Clay	1930	70	2020	55,480	0	suggested for 10 year capital forecast	55,480
Argyle Street	NA	Munroe Avenue East	106	200	Vitrified Clay	1930	70	2020	59,110	0	suggested for 10 year capital forecast	59,110
New Street	O'Brien Road	Hall Avenue	110	200	Concrete	1960	90	2050	61,060	30	2,726	-
New Street	O'Brien Road	Hall Avenue	144	200	Concrete	1960	90	2050	80,290	30	3,585	-
New Street	Jordan Avenue	Hall Avenue	53	200	Concrete	1960	90	2050	29,550	30	1,319	-
New Street	Jordan Avenue	Hall Avenue	61	200	Vitrified Clay	1960	70	2030	34,010	10	suggested for 10 year capital forecast	34,010
New Street	Jordan Avenue	Hall Avenue	61	200	Vitrified Clay	1985	70	2055	34,010	35	1,360	-
Dominion Street	O'Brien Road	Hall Avenue	88	200	Concrete	1960	90	2050	48,790	30	2,178	-
Dominion Street	Hall Avenue	Hall Avenue	74	200	Concrete	1960	90	2050	41,260	30	1,842	-
Dominion Street	Hall Avenue	Hall Avenue	78	200	Concrete	1960	90	2050	43,210	30	1,929	-
Dominion Street	Hall Avenue	Hall Avenue	47	200	Vitrified Clay	1960	70	2030	25,930	10	suggested for 10 year capital forecast	25,930
Dominion Street	Hall Avenue	Hall Avenue	76	200	Vitrified Clay	1985	70	2055	42,380	35	1,695	-
Barr Street	NA	O'Brien Road	56	200	Concrete	1985	90	2075	31,230	55	941	-
Barr Street	NA	O'Brien Road	4	200	Concrete	1960	90	2050	2,230	30	100	-
Barr Street	O'Brien Road	Hall Avenue	90	200	Concrete	1985	90	2075	50,180	55	1,513	-
Barr Street	O'Brien Road	Hall Avenue	41	200	Concrete	1985	90	2075	22,860	55	689	-
Barr Street	O'Brien Road	Hall Avenue	50	200	Concrete	1985	90	2075	27,880	55	840	-
Barr Street	O'Brien Road	Hall Avenue	91	200	Concrete	1985	90	2075	50,740	55	1,529	-
Barr Street	O'Brien Road	Hall Avenue	123	200	PVC	2010	70	2080	60,000	60	1,726	-
Barr Street	Hall Avenue	Quarry Avenue	61	200	PVC	2010	70	2080	29,630	60	852	-
Barr Street	Hall Avenue	Quarry Avenue	66	200	PVC	2010	70	2080	32,080	60	923	-
Barr Street	Quarry Avenue	Renfrew Avenue East	76	200	PVC	2010	70	2080	36,980	60	1,064	-



Table B-3 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Dominion Street	Hall Avenue	Easement	92	200	Vitrified Clay	1990	70	2060	51,300	40	1,875	-
Dominion Street	Hall Avenue	Easement	91	200	Concrete	1990	90	2080	50,740	60	1,460	-
Quarry Avenue	NA	Lynn Street	123	200	Vitrified Clay	2010	70	2080	60,000	60	1,726	-
Quarry Avenue	Lynn Street	Barr Street	90	200	Vitrified Clay	2010	70	2080	44,080	60	1,268	-
Quarry Avenue	Dominion Street	Barr Street	74	200	Vitrified Clay	1930	70	2020	41,260	0	suggested for 10 year capital forecast	41,260
Lochiel Street North	Cross Avenue	Patrick Avenue	71	225	Vitrified Clay	1930	70	2020	35,630	0	suggested for 10 year capital forecast	35,630
Lochiel Street North	Patrick Avenue	Munroe Avenue East	100	225	Vitrified Clay	1930	70	2020	50,180	0	suggested for 10 year capital forecast	50,180
Lochiel Street North	Patrick Avenue	Munroe Avenue East	58	225	Vitrified Clay	1930	70	2020	28,860	0	suggested for 10 year capital forecast	28,860
Lochiel Street North	Munroe Avenue East	Lisgar Avenue	88	250	PVC	2015	100	2115	75,150	95	1,773	-
Lochiel Street North	Lisgar Avenue	O Gorman Avenue	112	250	PVC	2015	100	2115	95,650	95	2,257	-
Lochiel Street North	Lisgar Avenue	O Gorman Avenue	61	200	PVC	1930	100	2030	34,010	10	suggested for 10 year capital forecast	34,010
Baldwin Street	Mason Avenue West	McAndrew Avenue	80	250	Concrete	1960	90	2050	49,070	30	2,191	-
Baldwin Street	McAndrew Avenue	Tasse Avenue	74	250	Concrete	1960	90	2050	45,390	30	2,027	-
Baldwin Street	Tasse Avenue	Cameron Avenue	82	250	Concrete	1960	90	2050	50,300	30	2,246	-
Baldwin Street	Cameron Avenue	Hincks Avenue	75	250	Concrete	1960	90	2050	45,700	30	2,041	-
Baldwin Street	Cameron Avenue	Hincks Avenue	51	250	Concrete	1930	90	2020	31,280	0	suggested for 10 year capital forecast	31,280
Baldwin Street	Hincks Avenue	Ready Avenue	190	250	Concrete	1930	90	2020	116,230	0	suggested for 10 year capital forecast	116,230
Albert Street	NA	NA	107	200	PVC	1960	100	2060	59,660	40	2,181	-
Albert Street	NA	Bruce Street	53	200	PVC	1960	100	2060	29,550	40	1,080	-
Albert Street	NA	Bruce Street	22	200	Concrete	1960	90	2050	12,270	30	548	-
Albert Street	NA	Bruce Street	77	200	Concrete	1960	90	2050	42,660	30	1,905	-
Albert Street	Bruce Street	Elgin Avenue	121	200	Concrete	1960	90	2050	67,190	30	3,000	-
Albert Street	Elgin Avenue	Hincks Avenue	99	200	Concrete	1930	90	2020	54,920	0	suggested for 10 year capital forecast	54,920
Easement	Dominion Street	Barr Street	59	200	PVC	2016	90	2106	50,120	86	1,226	-
McAndrew Avenue	NA	Aberdeen Street	61	200	Concrete	1975	90	2065	34,010	45	1,153	-
McAndrew Avenue	Aberdeen Street	Baldwin Street	184	200	Concrete	1960	90	2050	102,600	30	4,581	-
McAndrew Avenue	Stewart Street	NA	55	200	Concrete	1960	90	2050	30,670	30	1,369	-
McAndrew Avenue	Stewart Street	NA	56	200	Concrete	1960	90	2050	31,230	30	1,394	-
McAndrew Avenue	Stewart Street	NA	48	200	Concrete	1960	90	2050	26,490	30	1,183	-
Tasse Avenue	Dead End	NA	63	200	PVC	1960	100	2060	34,850	40	1,274	-
Tasse Avenue	NA	Baldwin Street	76	200	Concrete	1960	90	2050	42,380	30	1,892	-



Table B-3 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Tasse Avenue	Stewart Street	Baldwin Street	118	200	Concrete	1960	90	2050	65,800	30	2,938	-
Cameron Avenue	Rousselle Street	Baldwin Street	91	200	Vitrified Clay	1960	70	2030	50,740	10	suggested for 10 year capital forecast	50,740
Cameron Avenue	Rousselle Street	Baldwin Street	14	200	Vitrified Clay	1960	70	2030	7,810	10	suggested for 10 year capital forecast	7,810
Cameron Avenue	Stewart Street	Baldwin Street	120	200	Vitrified Clay	1960	70	2030	66,630	10	suggested for 10 year capital forecast	66,630
Ma-Te-Way Park Drive	NA	NA	105	200	PVC	1985	100	2085	58,270	65	1,610	-
Ma-Te-Way Park Drive	NA	NA	69	200	PVC	1985	100	2085	38,200	65	1,055	-
Ma-Te-Way Park Drive	NA	NA	68	200	PVC	1985	100	2085	37,920	65	1,048	-
Ma-Te-Way Park Drive	NA	Haig Avenue	56	200	PVC	1985	100	2085	31,230	65	863	-
Ma-Te-Way Park Drive	NA	Haig Avenue	78	200	PVC	1950	100	2050	43,210	30	1,929	-
Ma-Te-Way Park Drive	Haig Avenue	NA	127	200	PVC	1985	100	2085	70,540	65	1,949	-
Haig Avenue	Ma-Te-Way Park Drive	Dufferin Street	94	200	Concrete	1950	90	2040	52,410	20	3,205	-
Haig Avenue	Ma-Te-Way Park Drive	Dufferin Street	94	200	Concrete	1950	90	2040	52,410	20	3,205	-
Haig Avenue	Dufferin Street	Vimy Boulevard	82	200	Concrete	1950	90	2040	45,720	20	2,796	-
Haig Avenue	Dufferin Street	Vimy Boulevard	92	200	Concrete	1950	90	2040	51,300	20	3,137	-
Joffre Avenue	Ma-Te-Way Park Drive	Dufferin Street	78	200	Concrete	1950	90	2040	43,210	20	2,643	-
Joffre Avenue	Ma-Te-Way Park Drive	Dufferin Street	110	200	Concrete	1950	90	2040	61,340	20	3,751	-
Joffre Avenue	Dufferin Street	Vimy Boulevard	183	200	Concrete	1950	90	2040	101,760	20	6,223	-
Vimy Boulevard	NA	Lisgar Avenue	34	200	PVC	1985	100	2085	18,680	65	516	-
Vimy Boulevard	NA	Lisgar Avenue	44	250	PVC	1985	100	2085	26,990	65	746	-
Vimy Boulevard	NA	Lisgar Avenue	114	300	PVC	1985	100	2085	79,110	65	2,186	-
Vimy Boulevard	NA	Lisgar Avenue	39	300	PVC	1950	100	2050	26,830	30	1,198	-
Vimy Boulevard	NA	Lisgar Avenue	46	300	Concrete	1950	90	2040	32,060	20	1,961	-
Vimy Boulevard	NA	Lisgar Avenue	98	300	Concrete	1950	90	2040	68,310	20	4,178	-
Vimy Boulevard	NA	Lisgar Avenue	104	300	Concrete	1950	90	2040	72,490	20	4,433	-
Oak Crescent	NA	NA	49	200	Concrete	1975	90	2065	27,040	45	917	-
Oak Crescent	NA	Frank Dench Street	72	200	Concrete	1975	90	2065	40,150	45	1,361	-
Oak Crescent	NA	Frank Dench Street	69	200	Concrete	1975	90	2065	38,470	45	1,305	-
Frank Dench Street	Oak Crescent	Basswood Avenue	84	200	Concrete	1975	90	2065	46,560	45	1,579	-
Frank Dench Street	Basswood Avenue	Mason Avenue West	100	200	Concrete	1960	90	2050	55,760	30	2,490	-
Frank Dench Street	Basswood Avenue	Mason Avenue West	86	200	Concrete	1960	90	2050	47,950	30	2,141	-
Elgin Avenue	Stewart Street	Baldwin Street	73	200	Concrete	1930	90	2020	40,430	0	suggested for 10 year capital forecast	40,430
Elgin Avenue	Stewart Street	Baldwin Street	31	200	Concrete	1930	90	2020	17,010	0	suggested for 10 year capital forecast	17,010
Elgin Avenue	NA	Baldwin Street	77	200	Concrete	1930	90	2020	42,660	0	suggested for 10 year capital forecast	42,660
Aberdeen Street	Basswood Avenue	Mason Avenue West	91	200	Concrete	1960	90	2050	50,460	30	2,253	-



Table B-3 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Aberdeen Street	Basswood Avenue	Mason Avenue West	101	200	Concrete	1960	90	2050	56,040	30	2,502	-
Mason Avenue West	Stewart Street	Frank Dench Street	88	200	Concrete	1960	90	2050	48,790	30	2,178	-
Mason Avenue West	NA	Frank Dench Street	56	200	Concrete	1960	90	2050	31,230	30	1,394	-
Mason Avenue West	NA	NA	45	200	PVC	1960	100	2060	25,090	40	917	-
Mason Avenue West	Aberdeen Street	Baldwin Street	62	200	Concrete	1960	90	2050	34,290	30	1,531	-
Mason Avenue West	Frank Dench Street	Baldwin Street	28	250	Concrete	1960	90	2050	17,170	30	767	-
Mason Avenue West	Baldwin Street	NA	14	200	Concrete	1960	90	2050	7,530	30	336	-
Mason Avenue West	NA	Baldwin Street	126	200	Concrete	1960	90	2050	70,260	30	3,137	-
Hincks Avenue	Albert Street	Raglan Street North	131	200	Vitrified Clay	1930	70	2020	72,770	0	suggested for 10 year capital forecast	72,770
Hincks Avenue	Raglan Street North	Arthur Avenue	48	200	PVC	1930	100	2030	26,760	10	suggested for 10 year capital forecast	26,760
Hincks Avenue	NA	Baldwin Street	19	150	Vitrified Clay	1930	70	2020	10,590	0	suggested for 10 year capital forecast	10,590
Hincks Avenue	NA	Stewart Street	66	200	Vitrified Clay	1930	70	2020	36,800	0	suggested for 10 year capital forecast	36,800
Hincks Avenue	NA	Albert Street	70	200	Vitrified Clay	1930	70	2020	38,750	0	suggested for 10 year capital forecast	38,750
Hincks Avenue	NA	Albert Street	109	200	Vitrified Clay	1930	70	2020	60,500	0	suggested for 10 year capital forecast	60,500
Moore Street	NA	Grigg Avenue	59	200	PVC	1960	100	2060	32,620	40	1,192	-
Moore Street	NA	Grigg Avenue	74	200	PVC	1960	100	2060	41,260	40	1,508	-
Moore Street	Grigg Avenue	Bruce Street	159	200	Concrete	1960	90	2050	88,660	30	3,959	-
Hall Avenue	Plaunt Street South	Lynn Street	98	200	Vitrified Clay	1985	70	2055	54,650	35	2,186	-
Hall Avenue	Lynn Street	Barr Street	86	200	Vitrified Clay	1985	70	2055	47,950	35	1,918	-
Hall Avenue	Barr Street	Dominion Street	77	300	Concrete	1985	90	2075	53,670	55	1,618	-
Hall Avenue	Dominion Street	New Street	81	300	Concrete	1985	90	2075	56,460	55	1,702	-
Hall Avenue	New Street	NA	75	300	Concrete	1985	90	2075	52,280	55	1,576	-
Hall Avenue	Robert Drive	NA	41	300	Concrete	1985	90	2075	28,230	55	851	-
Hall Avenue	NA	NA	77	300	Concrete	1985	90	2075	53,670	55	1,618	-
Hall Avenue	NA	NA	77	300	Concrete	1985	90	2075	53,320	55	1,607	-
Hall Avenue	NA	Les Fraser Street	45	300	Concrete	1960	90	2050	31,370	30	1,401	-
Hall Avenue	NA	Les Fraser Street	93	300	Concrete	1995	90	2085	64,470	65	1,781	-
Hall Avenue	Les Fraser Street	Martin Street	56	300	Concrete	1960	90	2050	38,680	30	1,727	-
Hall Avenue	Les Fraser Street	Martin Street	49	300	Concrete	1960	90	2050	34,150	30	1,525	-
Hall Avenue	Les Fraser Street	Martin Street	57	300	Concrete	1960	90	2050	39,730	30	1,774	-
Hall Avenue	Martin Street	McLean Street	79	300	Concrete	1960	90	2050	55,060	30	2,458	-
Hall Avenue	McLean Street	NA	70	300	Concrete	1950	90	2040	48,790	20	2,984	-



Table B-3 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Hall Avenue	Harry Street	NA	12	300	Concrete	1985	90	2075	8,360	55	252	-
Hall Avenue	Plaunt Street South	NA	33	200	PVC	1985	100	2085	18,400	65	508	-
Fifth Street	O Brien Road	Barnet Boulevard	33	200	Concrete	1960	90	2050	18,400	30	822	-
Fifth Street	Barnet Boulevard	O Brien Road	58	200	Concrete	1960	90	2050	32,340	30	1,444	-
Fifth Street	Barnet Boulevard	O Brien Road	31	200	Concrete	1960	90	2050	17,010	30	759	-
Raglan Street South	Graham Avenue	McGarry Avenue	34	250	PVC	1970	100	2070	20,850	50	664	-
Raglan Street South	Graham Avenue	McGarry Avenue	47	250	PVC	1970	100	2070	28,830	50	917	-
Raglan Street South	McGarry Avenue	Barnet Boulevard	87	250	PVC	1970	100	2070	53,060	50	1,689	-
Raglan Street South	Barnet Boulevard	Erindale Avenue	89	250	PVC	1970	100	2070	54,590	50	1,737	-
Raglan Street South	Erindale Avenue	Muriel Avenue	92	250	PVC	1970	100	2070	56,430	50	1,796	-
Raglan Street South	Erindale Avenue	Muriel Avenue	52	250	PVC	1970	100	2070	31,890	50	1,015	-
Raglan Street South	NA	Erindale Avenue	8	250	PVC	1970	100	2070	4,910	50	156	-
Raglan Street South	May Avenue	Airth Boulevard	97	375	Concrete	1970	90	2060	48,430	40	1,770	-
Raglan Street South	May Avenue	Airth Boulevard	95	375	Concrete	1970	90	2060	47,420	40	1,733	-
Raglan Street South	NA	May Avenue	5	375	Concrete	1970	90	2060	2,260	40	83	-
Raglan Street South	May Avenue	NA	97	375	Concrete	1970	90	2060	48,680	40	1,780	-
Raglan Street South	NA	Hall Avenue	74	250	PVC	1970	100	2070	45,080	50	1,435	-
Raglan Street South	NA	Hall Avenue	68	250	PVC	1970	100	2070	41,710	50	1,327	-
Raglan Street South	NA	Hall Avenue	61	250	PVC	1970	100	2070	37,420	50	1,191	-
Raglan Street South	NA	Hall Avenue	33	225	CIPP	2018	90	2108	44,410	88	1,077	-
Raglan Street South	NA	Hall Avenue	78	225	CIPP	2018	90	2108	105,910	88	2,568	-
Raglan Street South	Opeongo Road	Prince Avenue East	115	225	CIPP	2018	90	2108	157,160	88	3,810	-
Raglan Street South	Prince Avenue East	Renfrew Avenue East	157	225	CIPP	2018	90	2108	213,530	88	5,177	-
Raglan Street South	Prince Avenue East	Renfrew Avenue East	157	225	CIPP	2019	90	2109	9,060	89	219	-
Fortington Street	O Brien Road	Coumbes Lane	38	250	PVC	2016	90	2106	32,550	86	796	-
Fortington Street	Coumbes Lane	King Street	114	300	Concrete	1960	90	2050	79,460	30	3,548	-
Fortington Street	Coumbes Lane	King Street	125	300	Concrete	1960	90	2050	87,130	30	3,890	-
Fortington Street	King Street	Jordan Avenue	145	300	Concrete	1960	90	2050	101,070	30	4,513	-
Bonnechere Street	Munroe Avenue East	Lisgar Avenue	139	200	Vitrified Clay	1930	70	2020	77,510	0	suggested for 10 year capital forecast	77,510
Bonnechere Street	Renfrew Avenue East	Cross Avenue	93	200	Vitrified Clay	1930	70	2020	51,580	0	suggested for 10 year capital forecast	51,580
Bonnechere Street	Renfrew Avenue East	Cross Avenue	93	200	Vitrified Clay	1930	70	2020	51,580	0	suggested for 10 year capital forecast	51,580
Bonnechere Street	Renfrew Avenue East	Cross Avenue	92	200	Vitrified Clay	1930	70	2020	51,300	0	suggested for 10 year capital forecast	51,300
Queen Street North	NA	Prince Avenue East	35	150	Vitrified Clay	1930	70	2020	19,520	0	suggested for 10 year capital forecast	19,520
Harry Street	NA	NA	18	200	Concrete	1950	90	2040	9,760	20	597	-



Table B-3 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Harry Street	NA	Munroe Avenue East	96	200	Concrete	1950	90	2040	53,530	20	3,274	-
Harry Street	Munroe Avenue East	Joe Avenue	65	150	Concrete	1950	90	2040	35,970	20	2,200	-
Harry Street	William Avenue	Joe Avenue	91	150	Concrete	1950	90	2040	50,740	20	3,103	-
Harry Street	Sidney Avenue	NA	83	200	Concrete	1950	90	2040	46,280	20	2,830	-
Harry Street	Sidney Avenue	William Avenue	69	200	Concrete	1950	90	2040	38,200	20	2,336	-
Plaunt Street South	NA	NA	108	200	PVC	2016	90	2106	165,310	86	4,042	-
Plaunt Street South	NA	NA	90	200	PVC	2016	90	2106	137,760	86	3,369	-
Plaunt Street South	NA	NA	104	200	PVC	2016	90	2106	159,190	86	3,893	-
Renfrew Avenue East	Plaunt Street South	Xavier Street	116	225	Vitrified Clay	1930	70	2020	58,210	0	suggested for 10 year capital forecast	58,210
Renfrew Avenue East	Barr Street	Lynn Street	94	225	Vitrified Clay	1930	70	2020	47,170	0	suggested for 10 year capital forecast	47,170
Renfrew Avenue East	Lynn Street	Xavier Street	61	225	Vitrified Clay	1930	70	2020	30,360	0	suggested for 10 year capital forecast	30,360
Renfrew Avenue East	Lochiel Street North	Bonnechere Street	82	225	Vitrified Clay	1930	70	2020	40,900	0	suggested for 10 year capital forecast	40,900
Renfrew Avenue East	Queen Street North	Bonnechere Street	69	225	Vitrified Clay	1930	70	2020	34,380	0	suggested for 10 year capital forecast	34,380
Renfrew Avenue East	Queen Street North	Bonnechere Street	11	225	Vitrified Clay	1930	70	2020	5,520	0	suggested for 10 year capital forecast	5,520
Renfrew Avenue East	Plaunt Street South	Raglan Street South	23	200	Vitrified Clay	1930	70	2020	12,880	0	suggested for 10 year capital forecast	12,880
Renfrew Avenue East	Plaunt Street South	Raglan Street South	23	200	Vitrified Clay	2019	70	2089	9,430	69	253	-
Renfrew Avenue East	Queen Street North	NA	23	200	Concrete	1930	90	2020	12,820	0	suggested for 10 year capital forecast	12,820
Renfrew Avenue East	NA	Queen Street North	64	200	Concrete	1930	90	2020	35,410	0	suggested for 10 year capital forecast	35,410
Xavier Street	Renfrew Avenue East	Railway Avenue	81	225	Vitrified Clay	1930	70	2020	40,650	0	suggested for 10 year capital forecast	40,650
Xavier Street	Renfrew Avenue East	Railway Avenue	77	225	Vitrified Clay	1930	70	2020	38,640	0	suggested for 10 year capital forecast	38,640
Sidney Avenue	Jennet Street	Ravine Drive	90	250	Concrete	1950	90	2040	54,900	20	3,358	-
Sidney Avenue	Jennet Street	Ravine Drive	112	250	Concrete	1950	90	2040	68,700	20	4,201	-
Sidney Avenue	Jennet Street	Ravine Drive	26	250	Concrete	1950	90	2040	15,950	20	975	-



Table B-3 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
King Street	Coumbes Lane	O'Brien Road	125	200	Concrete	1960	90	2050	69,700	30	3,112	-
O'Brien Road	King Street	Fortington Street	65	200	PVC	2016	90	2106	55,220	86	1,350	-
Plaunt Street South	Dead End	Munroe Avenue East	22	200	PVC	2018	90	2108	50,030	88	1,213	-
Plaunt Street South	Dead End	Munroe Avenue East	54	200	PVC	2018	90	2108	122,800	88	2,977	-
Plaunt Street South	Dead End	Munroe Avenue East	65	200	PVC	2018	90	2108	147,820	88	3,584	-
Jennet Street	William Avenue	Joe Avenue	103	200	Concrete	1950	90	2040	57,430	20	3,512	-
Jennet Street	Joe Avenue	Lorne Street North	68	200	Vitrified Clay	1950	70	2020	37,920	0	suggested for 10 year capital forecast	37,920
Jennet Street	Joe Avenue	Lorne Street North	76	200	Vitrified Clay	1950	70	2020	42,380	0	suggested for 10 year capital forecast	42,380
Jennet Street	Renfrew Avenue East	Sidney Avenue	120	250	Concrete	1950	90	2040	73,300	20	4,483	-
Jennet Street	Dead End	Sidney Avenue	139	200	Concrete	1950	90	2040	77,230	20	4,723	-
Haramis Drive	NA	NA	58	200	PVC	2000	100	2100	32,060	80	807	-
Haramis Drive	NA	NA	7	200	PVC	2000	100	2100	3,900	80	98	-
Haramis Drive	NA	NA	65	200	PVC	2000	100	2100	36,240	80	912	-
Haramis Drive	NA	NA	16	200	PVC	2000	100	2100	8,920	80	224	-
Haramis Drive	NA	NA	45	200	PVC	2000	100	2100	25,090	80	631	-
Haramis Drive	NA	NA	73	200	PVC	2000	100	2100	40,700	80	1,024	-
Haramis Drive	NA	NA	17	200	PVC	2000	100	2100	9,480	80	239	-
Haramis Drive	NA	Kedrosky Drive	84	200	PVC	2000	100	2100	46,840	80	1,179	-
Haramis Drive	Kedrosky Drive	Raglan Street South	91	200	PVC	1970	100	2070	50,460	50	1,606	-
Kedrosky Drive	Erindale Avenue	Haramis Drive	85	200	PVC	1980	100	2080	47,400	60	1,364	-
Dufferin Street	Lisgar Avenue	Joffre Avenue	38	200	Vitrified Clay	1950	70	2020	20,910	0	suggested for 10 year capital forecast	20,910
Dufferin Street	NA	Mary Street	105	150	Vitrified Clay	1950	70	2020	58,550	0	suggested for 10 year capital forecast	58,550
Dufferin Street	NA	Mary Street	41	150	Vitrified Clay	1950	70	2020	22,860	0	suggested for 10 year capital forecast	22,860
Hillsview Street	Ivy Avenue	Erindale Avenue	41	200	PVC	1980	100	2080	22,860	60	658	-
Hillsview Street	Ivy Avenue	Erindale Avenue	50	200	PVC	1980	100	2080	27,880	60	802	-
Stevenson Crescent	NA	NA	107	200	Concrete	1965	90	2055	59,660	35	2,387	-
Stevenson Crescent	NA	NA	25	200	Concrete	1965	90	2055	13,940	35	558	-
Stevenson Crescent	NA	NA	62	200	Concrete	1965	90	2055	34,570	35	1,383	-
Stevenson Crescent	NA	NA	35	200	Concrete	1965	90	2055	19,520	35	781	-
Stevenson Crescent	NA	NA	50	200	Concrete	1965	90	2055	27,600	35	1,104	-
Stevenson Crescent	NA	NA	86	200	Concrete	1965	90	2055	47,950	35	1,918	-
Stevenson Crescent	NA	NA	12	200	Concrete	1965	90	2055	6,690	35	268	-
McLean Street	McNab Avenue	Archibald Avenue	86	200	Concrete	1960	90	2050	47,950	30	2,141	-
McLean Street	Archibald Avenue	Allan Avenue	85	200	Concrete	1960	90	2050	47,120	30	2,104	-
McLean Street	Allan Avenue	George Avenue	32	200	Concrete	1960	90	2050	17,840	30	797	-



Table B-3 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
McLean Street	George Avenue	Charles Avenue	58	200	Concrete	1960	90	2050	32,340	30	1,444	-
McLean Street	George Avenue	Charles Avenue	62	200	Concrete	1960	90	2050	34,570	30	1,544	-
McLean Street	Hall Avenue	Sidney Avenue	152	200	Concrete	1960	90	2050	84,760	30	3,785	-
McLean Street	Hall Avenue	Sidney Avenue	155	200	Concrete	1960	90	2050	86,150	30	3,847	-
George Avenue	McLean Street	Coronation Street	86	200	Concrete	1960	90	2050	47,950	30	2,141	-
George Avenue	Coronation Street	Francis Street	38	200	Concrete	1960	90	2050	20,910	30	934	-
George Avenue	Coronation Street	Francis Street	44	200	Concrete	1960	90	2050	24,260	30	1,083	-
Carswell Street	Prince Avenue East	Renfrew Avenue East	38	200	Vitrified Clay	1930	70	2020	21,190	0	suggested for 10 year capital forecast	21,190
Carswell Street	Renfrew Avenue East	Arnprior Avenue	79	200	Vitrified Clay	1930	70	2020	43,770	0	suggested for 10 year capital forecast	43,770
Carswell Street	Renfrew Avenue East	Arnprior Avenue	34	200	Vitrified Clay	1930	70	2020	18,960	0	suggested for 10 year capital forecast	18,960
Carswell Street	Arnprior Avenue	Thompson Avenue	93	200	Vitrified Clay	1930	70	2020	51,860	0	suggested for 10 year capital forecast	51,860
Carswell Street	Thompson Avenue	Cross Avenue	33	200	Vitrified Clay	1930	70	2020	18,400	0	suggested for 10 year capital forecast	18,400
Carswell Street	Cross Avenue	Patrick Avenue	8	200	Vitrified Clay	1930	70	2020	4,180	0	suggested for 10 year capital forecast	4,180
Carswell Street	Cross Avenue	Patrick Avenue	80	200	Vitrified Clay	1930	70	2020	44,610	0	suggested for 10 year capital forecast	44,610
Carswell Street	NA	Prince Avenue East	63	150	Vitrified Clay	1930	70	2020	35,130	0	suggested for 10 year capital forecast	35,130
Prince Avenue East	Bonnechere Street	Queen Street North	56	150	Vitrified Clay	1930	70	2020	30,950	0	suggested for 10 year capital forecast	30,950
Prince Avenue East	Queen Street North	Carswell Street	96	150	Vitrified Clay	1930	70	2020	53,530	0	suggested for 10 year capital forecast	53,530
Prince Avenue East	NA	Carswell Street	66	150	Vitrified Clay	1930	70	2020	36,800	0	suggested for 10 year capital forecast	36,800
Prince Avenue East	Argyle Street	Lochiel Street North	33	150	PVC	1930	100	2030	18,400	10	suggested for 10 year capital forecast	18,400
Charles Avenue	McLean Street	Coronation Street	104	200	Concrete	1960	90	2050	57,990	30	2,589	-
Charles Avenue	Coronation Street	Francis Street	82	200	Concrete	1960	90	2050	45,720	30	2,041	-



Table B-3 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Coronation Street	George Avenue	Charles Avenue	79	200	Concrete	1960	90	2050	44,050	30	1,967	-
Francis Street	NA	Charles Avenue	73	200	Concrete	1960	90	2050	40,700	30	1,817	-
Francis Street	Charles Avenue	Rotary Avenue	48	200	Concrete	1960	90	2050	26,760	30	1,195	-
Francis Street	NA	George Avenue	30	200	Concrete	1960	90	2050	16,450	30	734	-
Francis Street	George Avenue	Rotary Avenue	70	200	Concrete	1960	90	2050	38,750	30	1,730	-
Francis Street	NA	McNab Avenue	37	200	Concrete	1960	90	2050	20,630	30	921	-
Francis Street	NA	Archibald Avenue	45	200	Vitrified Clay	1960	70	2030	24,810	10	suggested for 10 year capital forecast	24,810
Francis Street	Archibald Avenue	Allan Avenue	41	200	Concrete	1960	90	2050	22,580	30	1,008	-
Francis Street	Archibald Avenue	Allan Avenue	49	200	Concrete	1960	90	2050	27,040	30	1,207	-
Francis Street	George Avenue	Allan Avenue	40	200	Concrete	1960	90	2050	22,030	30	984	-
McNab Avenue	Francis Street	McLean Street	65	200	Concrete	1960	90	2050	35,970	30	1,606	-
McNab Avenue	Francis Street	McLean Street	47	200	Concrete	1960	90	2050	26,210	30	1,170	-
Lorne Street North	Railway Avenue	Jennet Street	117	200	Vitrified Clay	1930	70	2020	65,240	0	suggested for 10 year capital forecast	65,240
Lorne Street North	Jennet Street	Munroe Avenue East	97	200	Vitrified Clay	1950	70	2020	54,090	0	suggested for 10 year capital forecast	54,090
Lorne Street North	Jennet Street	Munroe Avenue East	109	200	Vitrified Clay	1950	70	2020	60,500	0	suggested for 10 year capital forecast	60,500
Lorne Street North	Munroe Avenue East	NA	116	200	Vitrified Clay	1950	70	2020	64,400	0	suggested for 10 year capital forecast	64,400
Lorne Street North	NA	NA	129	200	Vitrified Clay	1995	70	2065	71,930	45	2,439	-
Lisgar Avenue	NA	NA	94	200	PVC	1975	100	2075	52,140	55	1,572	-
Lisgar Avenue	NA	Tupper Street	102	200	PVC	1975	100	2075	56,880	55	1,715	-
Lisgar Avenue	Tupper Street	Tupper Street	8	200	PVC	1950	100	2050	4,460	30	199	-
Lisgar Avenue	Tupper Street	Tupper Street	3	200	Concrete	1950	90	2040	1,390	20	85	-
Lisgar Avenue	Tupper Street	Blake Street	94	250	Concrete	1950	90	2040	57,660	20	3,526	-
Lisgar Avenue	Blake Street	Dufferin Street	98	250	Concrete	1950	90	2040	59,800	20	3,657	-
Lisgar Avenue	Dufferin Street	June Street	92	250	Concrete	1950	90	2040	56,120	20	3,432	-
Lisgar Avenue	June Street	Farewell Street	79	250	Concrete	1950	90	2040	48,150	20	2,945	-
Lisgar Avenue	June Street	Farewell Street	7	250	Concrete	1950	90	2040	3,990	20	244	-
Lisgar Avenue	NA	Farewell Street	10	375	Concrete	1950	90	2040	4,770	20	292	-
Lisgar Avenue	Farewell Street	Bank Street North	87	375	Concrete	1950	90	2040	43,410	20	2,655	-
Lisgar Avenue	Farewell Street	Bank Street North	85	375	Concrete	1930	90	2020	42,660	0	suggested for 10 year capital forecast	42,660
Farewell Street	Dead End	Mary Street	48	200	Concrete	1950	90	2040	26,760	20	1,637	-
Farewell Street	Mary Street	Lisgar Avenue	142	250	Concrete	1950	90	2040	87,100	20	5,327	-



Table B-3 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Mary Street	Dufferin Street	June Street	92	250	Vitrified Clay	1950	70	2020	56,120	0	suggested for 10 year capital forecast	56,120
Mary Street	June Street	Farewell Street	64	250	Vitrified Clay	1950	70	2020	38,950	0	suggested for 10 year capital forecast	38,950
Mary Street	June Street	Farewell Street	30	250	Vitrified Clay	1950	70	2020	18,090	0	suggested for 10 year capital forecast	18,090
Mary Street	Tupper Street	Blake Street	53	150	Vitrified Clay	1950	70	2020	29,550	0	suggested for 10 year capital forecast	29,550
Blake Street	NA	Mary Street	79	250	Vitrified Clay	1950	70	2020	48,460	0	suggested for 10 year capital forecast	48,460
Blake Street	Mary Street	Lisgar Avenue	109	250	Concrete	1950	90	2040	66,860	20	4,089	-
Bonnechere Street	Opeongo Road	Renfrew Avenue East	67	200	Concrete	1930	90	2020	37,360	0	suggested for 10 year capital forecast	37,360
Bonnechere Street	Opeongo Road	Renfrew Avenue East	1	150	Vitrified Clay	1930	70	2020	560	0	suggested for 10 year capital forecast	560
Bonnechere Street	Lisgar Avenue	O Gorman Avenue	161	200	Vitrified Clay	1930	70	2020	89,770	0	suggested for 10 year capital forecast	89,770
Bonnechere Street	Patrick Avenue	Cross Avenue	39	150	Vitrified Clay	1930	70	2020	21,750	0	suggested for 10 year capital forecast	21,750
Bonnechere Street	Patrick Avenue	Munroe Avenue East	5	150	Vitrified Clay	1930	70	2020	2,790	0	suggested for 10 year capital forecast	2,790
Bonnechere Street	Patrick Avenue	Munroe Avenue East	2	200	Vitrified Clay	1930	70	2020	1,120	0	suggested for 10 year capital forecast	1,120
Bank Street North	Patrick Avenue	Munroe Avenue East	86	250	Concrete	1930	90	2020	52,440	0	suggested for 10 year capital forecast	52,440
Bank Street North	Patrick Avenue	Munroe Avenue East	82	250	Concrete	1930	90	2020	50,300	0	suggested for 10 year capital forecast	50,300
Bank Street North	Munroe Avenue East	Lisgar Avenue	66	250	Concrete	1930	90	2020	40,480	0	suggested for 10 year capital forecast	40,480
Bank Street North	Munroe Avenue East	Lisgar Avenue	76	250	Concrete	1930	90	2020	46,310	0	suggested for 10 year capital forecast	46,310



Table B-3 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Bank Street North	Lisgar Avenue	O Gorman Avenue	76	250	Concrete	1930	90	2020	46,620	0	suggested for 10 year capital forecast	46,620
Bank Street North	Lisgar Avenue	O Gorman Avenue	78	375	Concrete	1930	90	2020	38,890	0	suggested for 10 year capital forecast	38,890
Cross Avenue	Carswell Street	Bank Street North	43	200	Vitrified Clay	1930	70	2020	23,980	0	suggested for 10 year capital forecast	23,980
Cross Avenue	Bank Street North	Queen Street North	42	200	Vitrified Clay	1930	70	2020	23,140	0	suggested for 10 year capital forecast	23,140
Cross Avenue	Bank Street North	Queen Street North	89	200	Vitrified Clay	1930	70	2020	49,350	0	suggested for 10 year capital forecast	49,350
Cross Avenue	Bonnechere Street	Queen Street North	78	250	Vitrified Clay	1930	70	2020	47,540	0	suggested for 10 year capital forecast	47,540
Patrick Avenue	Gladstone Street	Carswell Street	61	200	Concrete	1930	90	2020	33,730	0	suggested for 10 year capital forecast	33,730
Patrick Avenue	Carswell Street	Bank Street North	99	250	Concrete	1930	90	2020	60,720	0	suggested for 10 year capital forecast	60,720
Patrick Avenue	NA	Queen Street North	23	150	Vitrified Clay	1930	70	2020	12,550	0	suggested for 10 year capital forecast	12,550
Patrick Avenue	Lochiel Street North	Bonnechere Street	23	150	Vitrified Clay	1930	70	2020	12,820	0	suggested for 10 year capital forecast	12,820
Duff Avenue	Harry Street	Ravine Drive	43	225	Vitrified Clay	1950	70	2020	21,580	0	suggested for 10 year capital forecast	21,580
Duff Avenue	Ravine Drive	NA	22	225	Vitrified Clay	1950	70	2020	10,790	0	suggested for 10 year capital forecast	10,790
Ravine Drive	Sidney Avenue	Duff Avenue	79	225	Vitrified Clay	1950	70	2020	39,650	0	suggested for 10 year capital forecast	39,650
Archibald Avenue	Francis Street	McLean Street	78	200	Concrete	1960	90	2050	43,490	30	1,942	-
Archibald Avenue	McLean Street	Francis Street	82	200	Concrete	1960	90	2050	45,720	30	2,041	-
Allan Avenue	McLean Street	Francis Street	78	250	Concrete	1960	90	2050	47,540	30	2,123	-
Allan Avenue	McLean Street	Francis Street	91	250	Concrete	1960	90	2050	55,510	30	2,479	-
Martin Street	NA	Hall Avenue	86	200	Concrete	1960	90	2050	47,680	30	2,129	-



Table B-3 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Martin Street	NA	Hall Avenue	88	200	Concrete	1960	90	2050	48,790	30	2,178	-
Thompson Avenue	NA	Ross Street	17	150	Vitrified Clay	1930	70	2020	9,480	0	suggested for 10 year capital forecast	9,480
Thompson Avenue	Ross Street	Carswell Street	127	150	Vitrified Clay	1930	70	2020	70,820	0	suggested for 10 year capital forecast	70,820
Queen Street North	Renfrew Avenue East	Cross Avenue	109	200	Vitrified Clay	1930	70	2020	60,500	0	suggested for 10 year capital forecast	60,500
Queen Street North	Cross Avenue	Patrick Avenue	82	300	Vitrified Clay	1930	70	2020	57,150	0	suggested for 10 year capital forecast	57,150
Queen Street North	Patrick Avenue	Munroe Avenue East	166	375	PVC	2014	70	2084	259,880	64	7,235	-
Queen Street North	Munroe Avenue East	Lisgar Avenue	138	375	PVC	2014	70	2084	217,810	64	6,064	-
Queen Street North	Lisgar Avenue	O Gorman Avenue	159	375	Vitrified Clay	1930	70	2020	79,790	0	suggested for 10 year capital forecast	79,790
Queen Street North	Renfrew Avenue East	NA	61	200	Vitrified Clay	1930	70	2020	34,010	0	suggested for 10 year capital forecast	34,010
Queen Street North	NA	Cross Avenue	3	200	Vitrified Clay	1930	70	2020	1,390	0	suggested for 10 year capital forecast	1,390
Gladstone Street	NA	NA	56	200	Vitrified Clay	1930	70	2020	31,230	0	suggested for 10 year capital forecast	31,230
Easement	Gladstone Street	Carswell Street	64	200	Concrete	1930	90	2020	35,690	0	suggested for 10 year capital forecast	35,690
Sidney Avenue	McLean Street	NA	124	250	Concrete	1950	90	2040	76,060	20	4,652	-
Sidney Avenue	McLean Street	NA	27	250	Concrete	1950	90	2040	16,250	20	994	-
Raglan Street South	Renfrew Avenue East	Railway Avenue	148	300	CIPP	2018	90	2108	201,570	88	4,887	-
Raglan Street South	Renfrew Avenue East	Railway Avenue	8	300	CIPP	2018	90	2108	10,250	88	249	-
Raglan Street North	Munroe Avenue East	O Gorman Avenue	101	300	CIPP	2018	90	2108	138,370	88	3,355	-
Raglan Street South	Railway Avenue	Patrick Avenue	151	300	CIPP	2018	90	2108	206,700	88	5,011	-
Raglan Street South	Patrick Avenue	Munroe Avenue East	83	300	CIPP	2018	90	2108	112,740	88	2,733	-
Raglan Street South	Patrick Avenue	Munroe Avenue East	84	300	CIPP	2018	90	2108	114,450	88	2,775	-
Raglan Street North	Munroe Avenue East	O Gorman Avenue	94	300	CIPP	2018	90	2108	128,120	88	3,106	-
Raglan Street North	Munroe Avenue East	O Gorman Avenue	94	300	CIPP	2019	90	2109	27,170	89	656	-
Raglan Street North	Munroe Avenue East	O Gorman Avenue	103	300	CIPP	2018	90	2108	140,080	88	3,396	-
O Gorman Avenue	Bank Street North	Queen Street North	75	375	Concrete	1930	90	2020	37,390	0	suggested for 10 year capital forecast	37,390
O Gorman Avenue	Queen Street North	Bonnechere Street	14	450	PVC	2018	90	2108	18,790	88	456	-
O Gorman Avenue	Bonnechere Street	Lochiel Street North	22	450	PVC	2018	90	2108	29,040	88	704	-



Table B-3 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
O Gorman Avenue	Bonnechere Street	Lochiel Street North	22	450	PVC	2019	90	2109	129,080	89	3,116	-
O Gorman Avenue	Lochiel Street North	Argyle Street	22	450	PVC	2018	90	2108	29,040	88	704	-
O Gorman Avenue	Lochiel Street North	Argyle Street	22	450	PVC	2019	90	2109	129,080	89	3,116	-
O Gorman Avenue	Argyle Street	Bridge Street	22	450	PVC	2018	90	2108	29,040	88	704	-
O Gorman Avenue	Argyle Street	Bridge Street	22	450	PVC	2019	90	2109	129,470	89	3,126	-
O Gorman Avenue	Bridge Street	Raglan Street North	22	450	PVC	2018	90	2108	29,040	88	704	-
Munroe Avenue East	Lorne Street North	Harry Street	128	375	Concrete	1950	90	2040	64,240	20	3,929	-
Munroe Avenue East	Harry Street	Peter Street	87	375	Concrete	1950	90	2040	43,410	20	2,655	-
Munroe Avenue East	Peter Street	Wilson Street	81	375	Concrete	1950	90	2040	40,400	20	2,471	-
Munroe Avenue East	Wilson Street	NA	52	375	Concrete	1950	90	2040	25,840	20	1,580	-
Munroe Avenue East	NA	NA	61	375	Concrete	1950	90	2040	30,610	20	1,872	-
Munroe Avenue East	Plaunt Street South	Lorne Street North	46	200	PVC	2018	90	2108	104,610	88	2,536	-
Munroe Avenue East	Lorne Street North	Lorne Street North	68	150	Vitrified Clay	1950	70	2020	37,920	0	suggested for 10 year capital forecast	37,920
Gibbons Road	NA	Wrangler Road	84	250	PVC	1985	100	2085	51,520	65	1,423	-
Gibbons Road	NA	Wrangler Road	82	250	PVC	1985	100	2085	49,990	65	1,381	-
Gibbons Road	NA	Wrangler Road	67	250	PVC	1985	100	2085	41,100	65	1,135	-
Gibbons Road	NA	Wrangler Road	40	250	PVC	1985	100	2085	24,530	65	678	-
Wrangler Road	Gibbons Road	O Brien Road	107	250	PVC	1985	100	2085	65,320	65	1,805	-
Wrangler Road	Gibbons Road	O Brien Road	107	250	PVC	1985	100	2085	65,630	65	1,813	-
Wrangler Road	NA	O Brien Road	88	250	Concrete	1985	90	2075	53,980	55	1,627	-
Wrangler Road	NA	O Brien Road	60	250	Concrete	1985	90	2075	36,800	55	1,109	-
Wrangler Road	NA	O Brien Road	31	250	Concrete	1985	90	2075	18,710	55	564	-
O Brien Road	NA	O Brien Road	14	300	Concrete	1985	90	2075	9,410	55	284	-
O Brien Road	NA	O Brien Road	4	300	Concrete	1985	90	2075	2,790	55	84	-
O Brien Road	NA	NA	137	300	Concrete	1960	90	2050	95,490	30	4,264	-
O Brien Road	NA	NA	117	300	Concrete	1960	90	2050	81,550	30	3,641	-
Jordan Avenue	Fortington Street	NA	62	300	Concrete	1960	90	2050	43,210	30	1,929	-
Jordan Avenue	New Street	Fortington Street	70	200	Concrete	1960	90	2050	38,750	30	1,730	-
Jordan Avenue	Fortington Street	New Street	2	200	Concrete	1960	90	2050	1,120	30	50	-
Peter Street	Joe Avenue	William Avenue	142	250	PVC	1950	100	2050	86,790	30	3,875	-
Peter Street	NA	William Avenue	69	250	Vitrified Clay	1950	70	2020	42,320	0	suggested for 10 year capital forecast	42,320
Peter Street	NA	Wilson Street	28	150	Vitrified Clay	1950	70	2020	15,610	0	suggested for 10 year capital forecast	15,610
Peter Street	Wilson Street	Munroe Avenue East	91	150	Vitrified Clay	1950	70	2020	50,740	0	suggested for 10 year capital forecast	50,740
Peter Street	NA	Munroe Avenue East	67	150	Vitrified Clay	1950	70	2020	37,080	0	suggested for 10 year capital forecast	37,080



Table B-3 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Railway Avenue	Plaunt Street South	Xavier Street	70	200	Vitrified Clay	1930	70	2020	39,030	0	suggested for 10 year capital forecast	39,030
Railway Avenue	Plaunt Street South	Raglan Street South	58	200	Vitrified Clay	1930	70	2020	32,060	0	suggested for 10 year capital forecast	32,060
Ready Avenue	NA	Baldwin Street	62	300	Concrete	1930	90	2020	42,870	0	suggested for 10 year capital forecast	42,870
Ready Avenue	Baldwin Street	Stewart Street	123	300	Concrete	1930	90	2020	85,730	0	suggested for 10 year capital forecast	85,730
Ready Avenue	Baldwin Street	Stewart Street	49	300	Concrete	1930	90	2020	33,800	0	suggested for 10 year capital forecast	33,800
Ready Avenue	Stewart Street	NA	23	300	Concrete	1930	90	2020	16,030	0	suggested for 10 year capital forecast	16,030
Stewart Street	Bruce Street	Elgin Avenue	74	250	Vitrified Clay	1960	70	2030	45,080	10	suggested for 10 year capital forecast	45,080
Stewart Street	Elgin Avenue	Hincks Avenue	115	250	Vitrified Clay	1930	70	2020	70,540	0	suggested for 10 year capital forecast	70,540
Stewart Street	Hincks Avenue	Arthur Avenue	7	250	PVC	1930	100	2030	3,990	10	suggested for 10 year capital forecast	3,990
Stewart Street	Hincks Avenue	Arthur Avenue	60	250	Vitrified Clay	1930	70	2020	36,800	0	suggested for 10 year capital forecast	36,800
Stewart Street	Arthur Avenue	Ready Avenue	55	250	Vitrified Clay	1930	70	2020	33,730	0	suggested for 10 year capital forecast	33,730
Stewart Street	Ready Avenue	NA	68	250	Vitrified Clay	1930	70	2020	41,400	0	suggested for 10 year capital forecast	41,400
Coumbes Lane	NA	Barr Street	24	250	PVC	2016	90	2106	20,810	86	509	-
Coumbes Lane	Coumbes Lane	Raglan Street South	101	200	PVC	2016	90	2106	85,370	86	2,088	-
Coumbes Lane	NA	Coumbes Street	12	150	Vitrified Clay	1985	70	2055	6,690	35	268	-
Coumbes Lane	NA	Coumbes Street	78	150	Vitrified Clay	1985	70	2055	43,490	35	1,740	-
Renfrew Avenue East	Barr Street	Jennet Street	1	250	Vitrified Clay	1930	70	2020	610	0	suggested for 10 year capital forecast	610
Renfrew Avenue East	Bonnechere Street	Argyle Street	25	150	PVC	1930	100	2030	13,940	10	suggested for 10 year capital forecast	13,940



Table B-3 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Elgin Avenue	Arthur Avenue	Raglan Street North	97	150	PVC	1930	100	2030	54,090	10	suggested for 10 year capital forecast	54,090
Elgin Avenue	Raglan Street North	Albert Street	8	150	Vitrified Clay	1930	70	2020	4,180	0	suggested for 10 year capital forecast	4,180
Elgin Avenue	Stewart Street	Albert Street	15	150	Vitrified Clay	1930	70	2020	8,360	0	suggested for 10 year capital forecast	8,360
Arthur Avenue	NA	Stewart Street	77	150	Vitrified Clay	1930	70	2020	42,660	0	suggested for 10 year capital forecast	42,660
Munroe Avenue East	Bonnechere Street	Queen Street North	39	150	Vitrified Clay	1930	70	2020	21,750	0	suggested for 10 year capital forecast	21,750
Munroe Avenue East	Bank Street North	Queen Street North	25	150	Vitrified Clay	1930	70	2020	13,660	0	suggested for 10 year capital forecast	13,660
Munroe Avenue East	Queen Street North	Bank Street North	40	150	Vitrified Clay	1930	70	2020	22,300	0	suggested for 10 year capital forecast	22,300
Munroe Avenue East	Lochiel Street North	Argyle Street	82	200	Concrete	1930	90	2020	45,440	0	suggested for 10 year capital forecast	45,440
Munroe Avenue East	Bonnechere Street	Lochiel Street North	38	150	Vitrified Clay	1930	70	2020	21,190	0	suggested for 10 year capital forecast	21,190
June Street	NA	Mary Avenue	54	150	PVC	2010	70	2080	68,320	60	1,965	-
June Street	Lisgar Avenue	Mary Avenue	66	150	PVC	2010	70	2080	83,500	60	2,402	-
June Street	Lisgar Avenue	Mary Avenue	49	150	PVC	2010	70	2080	61,990	60	1,783	-
Ross Street	Arnprior Avenue	Thompson Avenue	42	150	Vitrified Clay	1930	70	2020	23,420	0	suggested for 10 year capital forecast	23,420
Ross Street	NA	Arnprior Avenue	47	150	Vitrified Clay	1930	70	2020	26,210	0	suggested for 10 year capital forecast	26,210
Arnprior Avenue	NA	Ross Street	8	150	Vitrified Clay	1930	70	2020	4,180	0	suggested for 10 year capital forecast	4,180
Arnprior Avenue	Ross Street	Carswell Street	107	150	Vitrified Clay	1930	70	2020	59,380	0	suggested for 10 year capital forecast	59,380
Bank Street North	Patrick Avenue	Cross Avenue	74	150	Vitrified Clay	1930	70	2020	40,980	0	suggested for 10 year capital forecast	40,980
Bank Street North	Arnprior Avenue	Cross Avenue	59	200	Vitrified Clay	1930	70	2020	32,900	0	suggested for 10 year capital forecast	32,900



Table B-3 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Opeongo Road	Lochiel Street North	Bonnechere Street	76	150	Vitrified Clay	1930	70	2020	42,380	0	suggested for 10 year capital forecast	42,380
Opeongo Road	NA	Bonnechere Street	7	150	Vitrified Clay	1930	70	2020	3,900	0	suggested for 10 year capital forecast	3,900
Lochiel Street North	Opeongo Road	Prince Avenue East	19	150	Vitrified Clay	1930	70	2020	10,590	0	suggested for 10 year capital forecast	10,590
Lochiel Street North	Prince Avenue East	Renfrew Avenue East	51	150	Vitrified Clay	1930	70	2020	28,160	0	suggested for 10 year capital forecast	28,160
Lochiel Street North	Prince Avenue East	Renfrew Avenue East	46	200	Vitrified Clay	1930	70	2020	25,650	0	suggested for 10 year capital forecast	25,650
Lochiel Street North	Renfrew Avenue East	NA	86	150	Vitrified Clay	1930	70	2020	47,950	0	suggested for 10 year capital forecast	47,950
Lochiel Street North	Renfrew Avenue East	NA	142	150	Vitrified Clay	1930	70	2020	79,180	0	suggested for 10 year capital forecast	79,180
Lochiel Street North	NA	Cross Avenue	65	150	Vitrified Clay	1930	70	2020	36,240	0	suggested for 10 year capital forecast	36,240
Wilson Street	Peter Street	NA	47	200	Concrete	1950	90	2040	26,210	20	1,603	-
Wilson Street	NA	Munroe Avenue East	84	200	Concrete	1950	90	2040	46,560	20	2,847	-
Wilson Street	NA	Munroe Avenue East	128	200	Concrete	1950	90	2040	71,370	20	4,365	-
York Street	NA	NA	41	150	Vitrified Clay	1950	70	2020	22,860	0	suggested for 10 year capital forecast	22,860
York Street	NA	NA	9	150	Vitrified Clay	1950	70	2020	4,740	0	suggested for 10 year capital forecast	4,740
York Street	NA	NA	5	150	Vitrified Clay	1950	70	2020	2,510	0	suggested for 10 year capital forecast	2,510
York Street	Pine Avenue	NA	77	150	Vitrified Clay	1950	70	2020	42,940	0	suggested for 10 year capital forecast	42,940
Pine Avenue	York Street	Raglan Street South	28	150	Vitrified Clay	1970	70	2040	15,610	20	955	-
Plaunt Street South	Railway Avenue	Renfrew Avenue East	121	200	PVC	2016	90	2106	185,210	86	4,529	-
Plaunt Street South	Railway Avenue	NA	64	200	PVC	2016	90	2106	97,960	86	2,395	-
Plaunt Street South	Railway Avenue	Munroe Avenue East	79	200	PVC	2018	90	2108	179,650	88	4,355	-
Plaunt Street South	Railway Avenue	Munroe Avenue East	85	200	PVC	2018	90	2108	193,300	88	4,686	-
Plaunt Street South	Railway Avenue	Munroe Avenue East	120	200	PVC	2018	90	2108	272,890	88	6,616	-
Lynn Street	Hall Avenue	Quarry Avenue	82	150	Vitrified Clay	1930	70	2020	45,720	0	suggested for 10 year capital forecast	45,720



Table B-3 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Lynn Street	Hall Avenue	Quarry Avenue	105	150	Vitrified Clay	1930	70	2020	58,550	0	suggested for 10 year capital forecast	58,550
Lynn Street	Quarry Avenue	Renfrew Avenue East	54	150	Vitrified Clay	1930	70	2020	29,830	0	suggested for 10 year capital forecast	29,830
Les Fraser Street	NA	Hall Avenue	91	150	Vitrified Clay	1960	70	2030	50,740	10	suggested for 10 year capital forecast	50,740
Bruce Street	NA	Albert Street	69	200	Vitrified Clay	1960	70	2030	38,200	10	suggested for 10 year capital forecast	38,200
Bruce Street	Albert Street	Stewart Street	70	150	Vitrified Clay	1960	70	2030	39,030	10	suggested for 10 year capital forecast	39,030
Bruce Street	Albert Street	Stewart Street	72	150	Vitrified Clay	1960	70	2030	39,870	10	suggested for 10 year capital forecast	39,870
Bruce Street	Moore Street	Raglan Street North	144	200	Vitrified Clay	1930	70	2020	80,020	0	suggested for 10 year capital forecast	80,020
Barnet Boulevard	NA	NA	5	150	Concrete	1985	90	2075	2,510	55	76	-
Easement	Barnet Boulevard	O Brien Road	319	300	Concrete	1985	90	2075	222,000	55	6,692	-
Easement	Barnet Boulevard	O Brien Road	88	300	Concrete	1985	90	2075	61,340	55	1,849	-
William Avenue	Renfrew Avenue East	Jennet Street	139	300	Concrete	1930	90	2020	96,880	0	suggested for 10 year capital forecast	96,880
William Avenue	Harry Street	Peter Street	82	300	Concrete	1950	90	2040	57,150	20	3,495	-
William Avenue	Peter Street	NA	6	300	Concrete	1950	90	2040	3,830	20	234	-
Joe Avenue	Harry Street	Jennet Street	78	200	Vitrified Clay	1950	70	2020	43,210	0	suggested for 10 year capital forecast	43,210
Jennet Street	NA	NA	48	200	Vitrified Clay	1950	70	2020	26,760	0	suggested for 10 year capital forecast	26,760
McNab Crescent	NA	McLean Street	38	200	Vitrified Clay	1960	70	2030	21,190	10	suggested for 10 year capital forecast	21,190
Harry Street	Duff Avenue	Hall Avenue	91	200	Concrete	1950	90	2040	50,740	20	3,103	-
Harry Street	Duff Avenue	Hall Avenue	60	200	Concrete	1950	90	2040	33,460	20	2,046	-
Moore Street	NA	Bruce Street	21	200	Vitrified Clay	1960	70	2030	11,430	10	suggested for 10 year capital forecast	11,430
Moore Street	NA	Bruce Street	3	200	Vitrified Clay	1960	70	2030	1,390	10	suggested for 10 year capital forecast	1,390



Table B-3 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Barnet Boulevard	Muriel Avenue	Second Street	77	200	Concrete	1975	90	2065	42,660	45	1,447	-
Barnet Boulevard	Muriel Avenue	Second Street	76	200	Concrete	1975	90	2065	42,380	45	1,437	-
Barnet Boulevard	Second Street	Muriel Avenue	32	200	Concrete	1975	90	2065	17,840	45	605	-
Barnet Boulevard	NA	Raglan Street South	67	200	PVC	2019	100	2119	52,420	99	1,220	-
Gillan Road	Barnet Boulevard	O'Brien Road	112	450	Concrete	1985	90	2075	55,960	55	1,687	-
Gillan Road	NA	O'Brien Road	89	450	Concrete	1985	90	2075	44,660	55	1,346	-
Gillan Road	O'Brien Road	NA	102	450	Concrete	1995	90	2085	51,190	65	1,414	-
Gillan Road	O'Brien Road	NA	100	450	Concrete	1985	90	2075	50,180	55	1,513	-
Gillan Road	NA	NA	17	450	Concrete	1995	90	2085	8,530	65	236	-
Gillan Road	NA	Hall Avenue	102	450	Concrete	1995	90	2085	50,940	65	1,407	-
Gillan Road	NA	Hall Avenue	107	450	Concrete	1995	90	2085	53,450	65	1,477	-
Gillan Road	O'Brien Road	NA	99	450	Concrete	1995	90	2085	49,680	65	1,372	-
McLean Street	NA	Francis Street	103	450	Concrete	1960	90	2050	51,440	30	2,297	-
McLean Street	Francis Street	Sidney Avenue	106	450	Concrete	1960	90	2050	53,200	30	2,375	-
McLean Street	McNab Avenue	Archibald Avenue	70	450	Concrete	1960	90	2050	35,130	30	1,569	-
McLean Street	Sidney Avenue	McNab Avenue	103	450	Concrete	1960	90	2050	51,440	30	2,297	-
McLean Street	Archibald Avenue	Allan Avenue	83	450	Concrete	1960	90	2050	41,400	30	1,849	-
McLean Street	Allan Avenue	George Avenue	81	450	Concrete	1960	90	2050	40,650	30	1,815	-
McLean Street	George Avenue	Charles Avenue	142	450	Concrete	1960	90	2050	71,260	30	3,182	-
McLean Street	Hall Avenue	Francis Street	91	450	Concrete	1960	90	2050	45,420	30	2,028	-
Hall Avenue	Gillan Road	NA	73	450	Concrete	1995	90	2085	36,380	65	1,005	-
Hall Avenue	Gillan Road	NA	83	450	Concrete	1995	90	2085	41,650	65	1,151	-
Hall Avenue	NA	Les Fraser Street	76	450	Concrete	1995	90	2085	38,140	65	1,054	-
Hall Avenue	NA	Les Fraser Street	92	450	Concrete	1995	90	2085	45,920	65	1,269	-
Hall Avenue	Les Fraser Street	NA	75	450	Concrete	1960	90	2050	37,390	30	1,669	-
Hall Avenue	NA	Martin Street	76	450	Concrete	1960	90	2050	37,890	30	1,692	-
Hall Avenue	Martin Street	McLean Street	89	450	Concrete	1960	90	2050	44,410	30	1,983	-
Allan Avenue	NA	NA	60	250	Concrete	1960	90	2050	36,800	30	1,643	-
Fifth Street	NA	NA	113	250	Concrete	1960	90	2050	69,000	30	3,081	-
Mayhew Street	NA	NA	101	200	PVC	1995	100	2095	56,320	75	1,456	-
Mayhew Street	NA	NA	90	200	PVC	1995	100	2095	50,180	75	1,297	-
Mayhew Street	NA	NA	98	200	PVC	1995	100	2095	54,650	75	1,413	-
Mayhew Street	NA	Hall Avenue	95	200	PVC	1995	100	2095	52,690	75	1,362	-
Raglan Street North	Munroe Avenue East	NA	71	900	PVC	1930	100	2030	35,630	10	suggested for 10 year capital forecast	35,630
Raglan Street North	Munroe Avenue East	NA	27	900	Concrete	1930	90	2020	13,300	0	suggested for 10 year capital forecast	13,300
Raglan Street North	Munroe Avenue East	NA	83	750	PVC	1930	100	2030	41,400	10	suggested for 10 year capital forecast	41,400
Raglan Street North	NA	NA	101	750	PVC	1930	100	2030	50,440	10	suggested for 10 year capital forecast	50,440



Table B-3 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Raglan Street North	NA	NA	18	900	PVC	1930	100	2030	9,030	10	suggested for 10 year capital forecast	9,030
Raglan Street North	NA	NA	120	750	PVC	1930	100	2030	59,970	10	suggested for 10 year capital forecast	59,970
Raglan Street North	NA	NA	26	750	PVC	1930	100	2030	13,050	10	suggested for 10 year capital forecast	13,050
O'Brien Road	Wrangler Road	Mask Road	105	300	Concrete	1985	90	2075	72,840	55	2,196	-
O'Brien Road	Wrangler Road	Mask Road	108	300	Concrete	1985	90	2075	75,280	55	2,269	-
O'Brien Road	Mask Road	NA	94	300	Concrete	1985	90	2075	65,520	55	1,975	-
O'Brien Road	Wrangler Road	Mask Road	104	300	Concrete	1985	90	2075	72,490	55	2,185	-
Mask Road	NA	NA	66	200	Concrete	1985	90	2075	36,800	55	1,109	-
Mask Road	NA	NA	98	200	Concrete	1985	90	2075	54,650	55	1,647	-
Mask Road	NA	O'Brien Road	99	200	Concrete	1985	90	2075	54,920	55	1,655	-
Hall Avenue	Plaunt Street South	Raglan Street South	38	200	PVC	1930	100	2030	20,910	10	suggested for 10 year capital forecast	20,910
Raglan Street North	NA	Grigg Avenue	15	200	PVC	1930	100	2030	8,360	10	suggested for 10 year capital forecast	8,360
Raglan Street North	NA	Grigg Avenue	45	200	PVC	1930	100	2030	25,090	10	suggested for 10 year capital forecast	25,090
Raglan Street North	Grigg Avenue	Bruce Street	58	200	PVC	1930	100	2030	32,340	10	suggested for 10 year capital forecast	32,340
Raglan Street North	Grigg Avenue	Bruce Street	101	200	PVC	1930	100	2030	56,320	10	suggested for 10 year capital forecast	56,320
Raglan Street North	Bruce Street	Elgin Avenue	120	200	PVC	1930	100	2030	66,910	10	suggested for 10 year capital forecast	66,910
Raglan Street North	Elgin Avenue	Hincks Avenue	70	200	PVC	1930	100	2030	39,030	10	suggested for 10 year capital forecast	39,030
Raglan Street North	Elgin Avenue	Hincks Avenue	50	200	PVC	1930	100	2030	27,880	10	suggested for 10 year capital forecast	27,880
Raglan Street South	May Avenue	Pine Avenue	60	250	PVC	1970	100	2070	36,500	50	1,162	-
Raglan Street South	Pine Avenue	NA	72	250	PVC	1970	100	2070	43,860	50	1,396	-
Raglan Street South	Pine Avenue	Hall Avenue	50	250	PVC	1970	100	2070	30,670	50	976	-
Raglan Street South	Pine Avenue	Hall Avenue	82	250	PVC	1970	100	2070	49,990	50	1,591	-



Table B-3 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Grigg Avenue	NA	Munroe Avenue East	16	150	Vitrified Clay	1960	70	2030	8,640	10	suggested for 10 year capital forecast	8,640
Grigg Avenue	Raglan Street North	Munroe Avenue East	143	150	Vitrified Clay	1930	70	2020	79,740	0	suggested for 10 year capital forecast	79,740
Pine Avenue	NA	NA	37	200	Concrete	1960	90	2050	20,350	30	909	-
Pine Avenue	NA	NA	41	200	Concrete	1960	90	2050	22,860	30	1,021	-
Pine Avenue	NA	NA	59	200	Concrete	1960	90	2050	32,620	30	1,456	-
Pine Avenue	NA	NA	65	200	Concrete	1960	90	2050	35,970	30	1,606	-
Airth Boulevard	NA	NA	34	200	Concrete	1975	90	2065	18,960	45	643	-
Airth Boulevard	NA	NA	79	200	Concrete	1975	90	2065	43,770	45	1,484	-
Airth Boulevard	NA	NA	85	250	Concrete	1975	90	2065	52,140	45	1,768	-
Airth Boulevard	Vanier Crescent	Massey Court	88	250	Concrete	1975	90	2065	53,670	45	1,820	-
Airth Boulevard	Vanier Crescent	Massey Court	64	250	Concrete	1975	90	2065	38,950	45	1,321	-
Airth Boulevard	Massey Court	Simpson Avenue	36	250	Concrete	1975	90	2065	22,080	45	749	-
Airth Boulevard	Massey Court	Simpson Avenue	33	250	Concrete	1960	90	2050	20,240	30	904	-
Airth Boulevard	NA	Simpson Avenue	69	200	Concrete	1960	90	2050	38,470	30	1,718	-
Airth Boulevard	NA	Coleraine Drive	41	200	Concrete	1960	90	2050	22,860	30	1,021	-
Grant Boulevard	Dead End	Coleraine Drive	127	250	PVC	1960	100	2060	77,900	40	2,848	-
Grant Boulevard	Dead End	Coleraine Drive	29	250	PVC	1960	100	2060	17,790	40	650	-
Airth Boulevard	NA	Coleraine Drive	120	250	Concrete	1960	90	2050	73,600	30	3,286	-
Airth Boulevard	NA	Coleraine Drive	121	250	Concrete	1960	90	2050	74,220	30	3,314	-
Airth Boulevard	Coleraine Drive	NA	20	250	Concrete	1960	90	2050	12,270	30	548	-
Airth Boulevard	NA	Coleraine Drive	163	250	Concrete	1970	90	2060	99,670	40	3,644	-
Wade Avenue	NA	Centennial Drive	98	200	PVC	1990	100	2090	54,650	70	1,457	-
Wade Avenue	NA	Centennial Drive	92	200	PVC	1990	100	2090	51,300	70	1,368	-
Wade Avenue	NA	Centennial Drive	56	200	PVC	1990	100	2090	30,950	70	825	-
Wade Avenue	James Avenue	NA	73	200	Concrete	1960	90	2050	40,700	30	1,817	-
Wade Avenue	James Avenue	NA	47	200	Concrete	1960	90	2050	25,930	30	1,158	-
Wade Avenue	NA	James Avenue	98	250	Concrete	1960	90	2050	59,800	30	2,670	-
Wade Avenue	NA	James Avenue	81	250	Concrete	1960	90	2050	49,380	30	2,205	-
Simpson Avenue	Airth Boulevard	Pine Avenue	106	300	Concrete	1960	90	2050	73,530	30	3,283	-
Simpson Avenue	Pine Avenue	Pine Avenue	75	300	Concrete	1960	90	2050	52,280	30	2,334	-
Simpson Avenue	Pine Avenue	Coleraine Drive	94	300	Concrete	1960	90	2050	65,170	30	2,910	-
NA	NA	NA	47	600	Concrete	1955	90	2045	23,590	25	1,208	-
0	Hall Avenue	Sidney Avenue	72	600	PVC	2009	80	2089	116,340	69	3,123	-
0	Sidney Avenue	Rotary Avenue	66	600	PVC	2009	80	2089	106,650	69	2,863	-
0	Hall Avenue	Sidney Avenue	103	600	PVC	2009	80	2089	166,430	69	4,468	-
0	Hall Avenue	Sidney Avenue	14	600	PVC	2009	80	2089	22,620	69	607	-
0	Hall Avenue	Sidney Avenue	83	600	PVC	2009	80	2089	133,310	69	3,579	-
0	Hall Avenue	Sidney Avenue	43	600	PVC	2009	80	2089	68,670	69	1,844	-
0	Hall Avenue	Sidney Avenue	74	600	PVC	2009	80	2089	118,770	69	3,189	-



Table B-3 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
0	NA	Hall Avenue	43	450	PVC	2009	80	2089	68,670	69	1,844	-
0	NA	Hall Avenue	44	600	PVC	2009	80	2089	71,100	69	1,909	-
0	Hall Avenue	NA	22	600	PVC	2009	80	2089	35,550	69	954	-
0	Hall Avenue	NA	81	600	PVC	2009	80	2089	130,890	69	3,514	-
0	Hall Avenue	Sidney Avenue	48	600	PVC	2009	80	2089	76,750	69	2,060	-
0	Hall Avenue	Sidney Avenue	66	600	PVC	2009	80	2089	106,650	69	2,863	-
0	Hall Avenue	Sidney Avenue	73	600	PVC	2009	80	2089	117,960	69	3,167	-
0	Hall Avenue	Sidney Avenue	74	600	PVC	2009	80	2089	118,770	69	3,189	-
0	Hall Avenue	NA	7	750	PVC	2009	80	2089	10,500	69	282	-
0	Hall Avenue	NA	26	750	PVC	2009	80	2089	42,010	69	1,128	-
0	Hall Avenue	NA	70	750	PVC	2009	80	2089	113,110	69	3,037	-
0	NA	Hall Avenue	28	750	PVC	2009	80	2089	45,240	69	1,215	-
0	Hall Avenue	NA	11	750	PVC	2009	80	2089	17,770	69	477	-
0	NA	NA	7	300	PVC	2009	80	2089	10,500	69	282	-
NA	NA	NA	83	450	Concrete	1960	90	2050	41,650	30	1,860	-
NA	NA	NA	12	450	Concrete	1960	90	2050	6,020	30	269	-
NA	NA	NA	3	450	Concrete	1960	90	2050	1,250	30	56	-
NA	NA	NA	13	450	Concrete	1960	90	2050	6,520	30	291	-
NA	NA	NA	44	600	Concrete	1960	90	2050	22,080	30	986	-
NA	NA	NA	9	600	Concrete	1960	90	2050	4,520	30	202	-
NA	NA	NA	96	450	Concrete	1960	90	2050	48,180	30	2,151	-
NA	NA	NA	23	450	Concrete	1960	90	2050	11,540	30	515	-
NA	NA	NA	21	450	Concrete	1960	90	2050	10,540	30	471	-
Raglan Street South	NA	May Avenue	23	250	Vitrified Clay	1970	70	2040	14,110	20	863	-
Raglan Street South	May Avenue	Airth Boulevard	55	250	Vitrified Clay	1970	70	2040	33,730	20	2,063	-
TRUNK SEWER	O'Brien Road	Hall Avenue	116	450	Concrete	1960	90	2050	57,960	30	2,588	-
TRUNK SEWER	O'Brien Road	Hall Avenue	118	450	Concrete	1960	90	2050	59,220	30	2,644	-
TRUNK SEWER	O'Brien Road	Hall Avenue	102	450	Concrete	1960	90	2050	51,190	30	2,286	-
TRUNK SEWER	Fourth Street	Fifth Street	74	150	Concrete	1960	90	2050	40,980	30	1,830	-
TRUNK SEWER	Fourth Street	Fifth Street	55	150	Concrete	1960	90	2050	30,670	30	1,369	-
TRUNK SEWER	Fourth Street	Fifth Street	58	450	Concrete	1960	90	2050	29,110	30	1,300	-
Easement	NA	NA	60	450	Concrete	1960	90	2050	30,110	30	1,344	-
Easement	NA	NA	91	450	Concrete	1960	90	2050	45,670	30	2,039	-
Easement	NA	NA	24	450	Concrete	1960	90	2050	12,040	30	538	-
Easement	NA	NA	165	450	Concrete	1960	90	2050	82,800	30	3,697	-
Easement	NA	NA	67	450	Concrete	1960	90	2050	33,620	30	1,501	-
Easement	NA	NA	71	200	Vitrified Clay	1975	70	2045	39,590	25	2,028	-
Easement	NA	NA	81	250	PVC	1975	100	2075	49,680	55	1,498	-
Easement	NA	NA	59	250	PVC	1975	100	2075	36,190	55	1,091	-
Easement	NA	NA	27	250	PVC	1975	100	2075	16,560	55	499	-
Easement	NA	NA	40	250	Concrete	1975	90	2065	24,530	45	832	-
TRUNK SEWER	NA	NA	68	600	Concrete	1950	90	2040	34,130	20	2,087	-
TRUNK SEWER	NA	NA	82	600	Concrete	1960	90	2050	41,150	30	1,837	-
TRUNK SEWER	NA	NA	31	600	Concrete	1960	90	2050	15,310	30	684	-



Table B-3 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
TRUNK SEWER	NA	NA	44	600	Concrete	1960	90	2050	22,080	30	986	-
TRUNK SEWER	NA	NA	69	375	Concrete	1930	90	2020	34,380	0	suggested for 10 year capital forecast	34,380
TRUNK SEWER	NA	NA	27	375	Concrete	1930	90	2020	13,300	0	suggested for 10 year capital forecast	13,300
TRUNK SEWER	NA	NA	33	375	Concrete	1930	90	2020	16,310	0	suggested for 10 year capital forecast	16,310
TRUNK SEWER	NA	NA	39	375	Concrete	1930	90	2020	19,320	0	suggested for 10 year capital forecast	19,320
TRUNK SEWER	NA	NA	81	600	Concrete	1955	90	2045	40,400	25	2,069	-
TRUNK SEWER	NA	NA	143	375	Concrete	1955	90	2045	71,510	25	3,663	-
TRUNK SEWER	NA	NA	129	450	Concrete	1960	90	2050	64,740	30	2,891	-
TRUNK SEWER	NA	NA	23	600	Concrete	1955	90	2045	11,290	25	578	-
Hall Avenue	Hall Avenue	0	0	375	Concrete	2010	90	2100	12,530	80	315	-
TRUNK SEWER	NA	NA	200	375	Concrete	1985	90	2075	100,370	55	3,025	-
TRUNK SEWER	NA	NA	14	375	Concrete	1955	90	2045	6,770	25	347	-
TRUNK SEWER	NA	NA	77	375	Concrete	1955	90	2045	38,640	25	1,979	-
TRUNK SEWER	NA	NA	69	375	Concrete	1950	90	2040	34,630	20	2,118	-
TRUNK SEWER	NA	NA	45	375	Concrete	1960	90	2050	22,580	30	1,008	-
TRUNK SEWER	NA	NA	75	375	Concrete	1960	90	2050	37,390	30	1,669	-
TRUNK SEWER	NA	NA	68	375	Concrete	1960	90	2050	33,870	30	1,512	-
TRUNK SEWER	NA	NA	48	375	Concrete	1960	90	2050	24,090	30	1,076	-
TRUNK SEWER	NA	NA	54	375	Concrete	1960	90	2050	26,850	30	1,199	-
TRUNK SEWER	NA	NA	27	600	Concrete	1965	90	2055	13,550	35	542	-
TRUNK SEWER	NA	NA	5	600	Concrete	1965	90	2055	2,260	35	90	-
TRUNK SEWER	NA	NA	41	600	Concrete	1965	90	2055	20,320	35	813	-
TRUNK SEWER	NA	NA	72	600	Concrete	1965	90	2055	36,130	35	1,445	-
TRUNK SEWER	NA	NA	32	450	Concrete	1965	90	2055	15,810	35	632	-
TRUNK SEWER	NA	NA	43	450	Concrete	1965	90	2055	21,580	35	863	-
TRUNK SEWER	NA	NA	55	450	Concrete	1965	90	2055	27,600	35	1,104	-
TRUNK SEWER	NA	NA	36	600	Concrete	1965	90	2055	17,820	35	713	-
TRUNK SEWER	NA	NA	75	600	Concrete	1965	90	2055	37,390	35	1,496	-
TRUNK SEWER	NA	NA	31	600	Concrete	1965	90	2055	15,560	35	622	-
TRUNK SEWER	NA	NA	43	600	Concrete	1965	90	2055	21,330	35	853	-
TRUNK SEWER	NA	NA	52	600	Concrete	1965	90	2055	26,100	35	1,044	-
TRUNK SEWER	NA	NA	5	375	Concrete	1965	90	2055	2,510	35	100	-
TRUNK SEWER	NA	NA	90	375	Concrete	1930	90	2020	45,170	0	suggested for 10 year capital forecast	45,170



Table B-3 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
TRUNK SEWER	NA	NA	82	375	Concrete	1930	90	2020	41,150	0	suggested for 10 year capital forecast	41,150
TRUNK SEWER	NA	NA	23	375	Concrete	1930	90	2020	11,540	0	suggested for 10 year capital forecast	11,540
TRUNK SEWER	NA	NA	41	375	Concrete	1995	90	2085	20,580	65	569	-
TRUNK SEWER	NA	NA	30	375	Concrete	1995	90	2085	15,060	65	416	-
TRUNK SEWER	NA	NA	67	450	Concrete	1995	90	2085	33,620	65	929	-
TRUNK SEWER	NA	NA	84	450	Concrete	1965	90	2055	41,900	35	1,676	-
TRUNK SEWER	NA	NA	41	450	Concrete	1965	90	2055	20,320	35	813	-
TRUNK SEWER	NA	NA	45	450	Concrete	1965	90	2055	22,580	35	903	-
TRUNK SEWER	NA	NA	11	450	Concrete	1965	90	2055	5,520	35	221	-
TRUNK SEWER	NA	NA	8	600	Concrete	1965	90	2055	4,010	35	160	-
TRUNK SEWER	Lorne Street South	NA	56	225	Vitrified Clay	1995	70	2065	27,850	45	944	-
TRUNK SEWER	Lorne Street South	NA	33	225	Vitrified Clay	1965	70	2035	16,310	15	1,269	-
TRUNK SEWER	Lorne Street South	NA	80	225	Vitrified Clay	1965	70	2035	39,900	15	3,105	-
TRUNK SEWER	Raglan Street South	NA	22	450	Vitrified Clay	1930	70	2020	11,040	0	suggested for 10 year capital forecast	11,040
TRUNK SEWER	Raglan Street South	NA	38	450	Vitrified Clay	1965	70	2035	18,820	15	1,465	-
TRUNK SEWER	NA	NA	22	600	Concrete	1960	90	2050	10,790	30	482	-
TRUNK SEWER	NA	NA	50	600	Concrete	1960	90	2050	24,840	30	1,109	-
TRUNK SEWER	NA	NA	60	600	Concrete	1965	90	2055	29,860	35	1,194	-
TRUNK SEWER	NA	NA	85	450	Concrete	1965	90	2055	42,410	35	1,696	-
TRUNK SEWER	NA	NA	61	450	Concrete	1965	90	2055	30,360	35	1,214	-
TRUNK SEWER	NA	NA	2	450	Concrete	1965	90	2055	1,000	35	40	-
TRUNK SEWER	NA	NA	87	600	Concrete	1965	90	2055	43,410	35	1,736	-
TRUNK SEWER	NA	NA	60	600	Concrete	1965	90	2055	30,110	35	1,204	-
TRUNK SEWER	NA	NA	66	600	Concrete	1965	90	2055	32,870	35	1,315	-
Raglan/Mutual	NA	NA	73	200	PVC	2010	90	2100	105,510	80	2,655	-
Raglan/Mutual	NA	NA	60	200	PVC	2010	90	2100	87,960	80	2,213	-
Raglan/Mutual	NA	NA	45	200	PVC	2010	90	2100	66,860	80	1,682	-
Raglan/Mutual	NA	NA	57	200	PVC	2010	70	2080	83,700	60	2,408	-
Raglan/Mutual	NA	NA	21	200	PVC	2010	70	2080	29,640	60	853	-
Raglan/Mutual	NA	NA	31	200	PVC	2010	70	2080	46,000	60	1,323	-
TRUNK SEWER	NA	NA	21	200	Vitrified Clay	1965	70	2035	11,430	15	890	-
TRUNK SEWER	NA	NA	31	200	Vitrified Clay	1965	70	2035	17,290	15	1,346	-
TRUNK SEWER	NA	NA	77	200	Vitrified Clay	1965	70	2035	42,660	15	3,320	-
TRUNK SEWER	NA	NA	71	200	Vitrified Clay	1965	70	2035	39,310	15	3,059	-
TRUNK SEWER	NA	NA	61	200	Vitrified Clay	1965	70	2035	33,730	15	2,625	-
TRUNK SEWER	NA	NA	112	200	Vitrified Clay	1965	70	2035	62,450	15	4,860	-



Table B-3 (Cont'd)

Street	From	To	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
TRUNK SEWER	NA	NA	173	200	Concrete	1975	90	2065	96,190	45	3,262	-
TRUNK SEWER	NA	NA	6	200	Concrete	1975	90	2065	3,070	45	104	-
TRUNK SEWER	NA	NA	18	200	Concrete	1965	90	2055	10,040	35	402	-
Fourth Street	NA	Easement	90	450	Concrete	1960	90	2050	45,170	30	2,017	-
Fourth Street	NA	O Brien Road	81	450	Concrete	1960	90	2050	40,650	30	1,815	-
TRUNK SEWER	NA	NA	47	600	Concrete	1950	90	2040	23,340	20	1,427	-
TRUNK SEWER	NA	NA	75	600	Concrete	1950	90	2040	37,640	20	2,302	-
TRUNK SEWER	NA	NA	72	600	Concrete	1955	90	2045	36,130	25	1,851	-
TRUNK SEWER	NA	NA	66	375	Concrete	1955	90	2045	33,120	25	1,696	-
TRUNK SEWER	NA	NA	23	100	Vitrified Clay	1930	70	2020	9,620	0	suggested for 10 year capital forecast	9,620
TRUNK SEWER	NA	NA	53	450	Concrete	1985	90	2075	26,350	55	794	-
TRUNK SEWER	NA	NA	14	375	Concrete	1985	90	2075	6,770	55	204	-
TRUNK SEWER	NA	NA	77	375	Concrete	1985	90	2075	38,640	55	1,165	-
TRUNK SEWER	NA	NA	100	300	Concrete	1985	90	2075	69,350	55	2,090	-
TRUNK SEWER	NA	NA	52	300	Concrete	1985	90	2075	35,900	55	1,082	-
TRUNK SEWER	NA	NA	38	600	Concrete	1965	90	2055	18,820	35	753	-
TRUNK SEWER	NA	NA	20	600	Concrete	1965	90	2055	10,040	35	402	-
TRUNK SEWER	NA	NA	122	750	Concrete	1995	90	2085	61,220	65	1,691	-
TRUNK SEWER	NA	NA	11	750	Concrete	1995	90	2085	5,270	65	146	-
TRUNK SEWER	NA	NA	0	0	0	2009	90	2099	138,410	79	3,501	-
Munroe Avenue East	Plaunt Street South	Munroe Avenue East	19	200	PVC	2019	90	2109	27,670	89	668	-
Foxden Street	Foxden Street	Gillan Road	107	375	PVC	2010	90	2100	49,930	80	1,256	-
Foxden Street	Eagle Avenue	Foxden Street	126	375	PVC	2010	90	2100	58,990	80	1,484	-
Foxden Street	NA	Eagle Avenue	21	200	PVC	2010	90	2100	9,570	80	241	-
Eagle Avenue	Elk Street	Foxden Street	98	375	PVC	2010	90	2100	45,580	80	1,147	-
Elk Street	NA	Eagle Avenue	18	200	PVC	2010	90	2100	8,410	80	212	-
Elk Street	Elk Street	Eagle Avenue	98	375	PVC	2010	90	2100	50,800	80	1,278	-
Elk Street	Elk Street	Elk Street	95	375	PVC	2010	90	2100	44,370	80	1,116	-
Elk Street	Elk Street	Otteridge Avenue	29	200	PVC	2010	90	2100	13,540	80	341	-
Elk Street	Elk Street	Otteridge Avenue	59	200	PVC	2010	90	2100	30,560	80	769	-
Otteridge Avenue	NA	Otteridge Avenue	6	200	PVC	2010	90	2100	3,110	80	78	-
Otteridge Avenue	Otteridge Avenue	Elk Street	100	200	PVC	2010	90	2100	51,890	80	1,306	-
Otteridge Avenue	Eagle Avenue	Froats Street	87	200	PVC	2010	90	2100	44,990	80	1,132	-
Froats Street	Otteridge Avenue	Froats Street	21	250	PVC	2010	90	2100	10,740	80	270	-
Froats Street	Froats Street	Froats Street	50	250	PVC	2010	90	2100	28,770	80	724	-
Froats Street	Froats Street	Froats Street	63	250	PVC	2010	90	2100	35,730	80	899	-
Plaunt Street South			8	150	PVC	2016	90	2106	15,530	86	380	-
Plaunt Street South			9	1,200	PVC	2016	90	2106	15,530	86	380	-
Coleraine Subdivision	Coleraine Subdivision	Coleraine Subdivision	300	200	PVC	2016	90	2106	232,680	86	5,690	-
Total			51,606						34,185,560		978,798	7,122,180



Appendix C

Detailed Water Rate Calculations



Appendix C: Detailed Water Rate Calculations

Table C-1
Town of Renfrew
Capital Budget Forecast (Uninflated \$)

Description	Total	Forecast									
		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Capital Expenditures											
Lifecycle:	-										
Major Capital Works											
Major Reconstruction Projects (Linear Assets)	4,000,000	400,000	400,000	400,000	400,000	400,000	400,000	400,000	400,000	400,000	400,000
Major Reconstruction Projects (Linear Assets) - Grant Funded	1,500,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000
Highway 60 Stewart St.	322,600	322,600									
Raglan St. S./County Road 52	107,500	107,500									
Water Tower Repairs	300,000	300,000									
Minor Waterworks to Support Road Resurfacing	580,500	53,000	54,100	55,200	56,300	57,400	58,500	59,700	60,900	62,100	63,300
W07 - 2014 Chev Express Cutaway	100,000							100,000			
W09 - 2016 Silverado LT	38,200							38,200			
Low Lift Pumphouse	192,500	192,500									
Water Meter Replacement Program	1,400,000	140,000	140,000	140,000	140,000	140,000	140,000	140,000	140,000	140,000	140,000
Water Treatment Plant Large Capital Works (OCWA)	1,645,482	7,600	6,400	23,000	65,000	56,800	199,680	240,320	314,160	366,960	365,560
WTP BCA Work											
Building Structural Repairs	65,000	65,000									
Building Envelope Repairs and Replacements	490,000	55,000					410,000		25,000		
Mechanical Systems Replacements	237,500	72,500				65,000					100,000
Electrical Systems Replacements	305,000										305,000
Minor Capital:											
Minor Capital Works (OCWA)	640,725	60,914	62,098	38,409	54,165	40,086	44,954	87,735	84,240	83,278	84,847
Leak Detection Distribution system	12,000				12,000						
Review loading rates at plant & amend appr.	30,000	30,000									
Hydrant Flow Testing	15,000				15,000						
Water Meter Testing	20,000				20,000						
Replace Watermain Locator	6,000					6,000					
2016 Trailer Black Landscaper	10,000					10,000					
Studies:											
Rate Study	30,000					15,000					15,000
Growth Related:	-										
Residential - Northwest (R2-2)	1,070,000										1,070,000
Residential - Northwest (R2-1)	515,000										515,000
Industrial (I2-1)	350,000										350,000
Industrial (I2-1)	115,000										115,000
Industrial (I2-1)	230,000										230,000
Communal - Whitton Road	135,000										135,000
Communal - Whitton Road	625,000										625,000
Communal - Gibbon Road	145,000										145,000
Communal - Gibbon Road	165,000										165,000
Communal - Froats Street	120,000										120,000
Communal - Whitton Road/ O'Brien	410,000										410,000
Communal - Hall Avenue	125,000										125,000
Total Capital Expenditures	16,053,007	1,956,614	812,598	806,609	912,465	940,286	1,403,134	1,215,955	1,174,301	1,202,338	5,628,707



**Table C-2
Town of Renfrew
Capital Budget Forecast (Inflated \$)**

Description	Total	Forecast									
		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Capital Expenditures											
Lifecycle:											
Major Capital Works											
Major Reconstruction Projects (Linear Assets)	4,467,000	408,000	416,000	424,000	433,000	442,000	450,000	459,000	469,000	478,000	488,000
Major Reconstruction Projects (Linear Assets) - Grant Funded	1,675,000	153,000	156,000	159,000	162,000	166,000	169,000	172,000	176,000	179,000	183,000
Highway 60 Stewart St.	322,600	322,600	-	-	-	-	-	-	-	-	-
Raglan St. S./County Road 52	107,500	107,500	-	-	-	-	-	-	-	-	-
Water Tower Repairs	306,000	306,000	-	-	-	-	-	-	-	-	-
Minor Waterworks to Support Road Resurfacing	650,000	54,000	56,000	59,000	61,000	63,000	66,000	69,000	71,000	74,000	77,000
W07 - 2014 Chev Express Cutaway	115,000	-	-	-	-	-	-	115,000	-	-	-
W09 - 2016 Silverado LT	44,000	-	-	-	-	-	-	44,000	-	-	-
Low Lift Pumphouse	196,000	196,000	-	-	-	-	-	-	-	-	-
Water Meter Replacement Program	1,566,000	143,000	146,000	149,000	152,000	155,000	158,000	161,000	164,000	167,000	171,000
Water Treatment Plant Large Capital Works (OCWA)	1,926,000	8,000	7,000	24,000	70,000	63,000	225,000	276,000	368,000	439,000	446,000
WTP BCA Work											
Building Structural Repairs	66,000	66,000	-	-	-	-	-	-	-	-	-
Building Envelope Repairs and Replacements	547,000	56,000	-	-	-	-	462,000	-	29,000	-	-
Mechanical Systems Replacements	268,000	74,000	-	-	-	72,000	-	-	-	-	122,000
Electrical Systems Replacements	372,000	-	-	-	-	-	-	-	-	-	372,000
Minor Capital:											
Minor Capital Works (OCWA)	725,000	62,000	65,000	41,000	59,000	44,000	51,000	101,000	99,000	100,000	103,000
Leak Detection Distribution system	13,000	-	-	-	13,000	-	-	-	-	-	-
Review loading rates at plant & amend appr.	31,000	31,000	-	-	-	-	-	-	-	-	-
Hydrant Flow Testing	16,000	-	-	-	16,000	-	-	-	-	-	-
Water Meter Testing	22,000	-	-	-	22,000	-	-	-	-	-	-
Replace Watermain Locator	7,000	-	-	-	-	7,000	-	-	-	-	-
2016 Trailer Black Landscaper	11,000	-	-	-	-	11,000	-	-	-	-	-
Studies:											
Rate Study	35,000	-	-	-	-	17,000	-	-	-	-	18,000
Growth Related:											
Residential - Northwest (R2-2)	1,304,000	-	-	-	-	-	-	-	-	-	1,304,000
Residential - Northwest (R2-1)	628,000	-	-	-	-	-	-	-	-	-	628,000
Industrial (I2-1)	427,000	-	-	-	-	-	-	-	-	-	427,000
Industrial (I2-1)	140,000	-	-	-	-	-	-	-	-	-	140,000
Industrial (I2-1)	280,000	-	-	-	-	-	-	-	-	-	280,000
Communal - Whitton Road	165,000	-	-	-	-	-	-	-	-	-	165,000
Communal - Whitton Road	762,000	-	-	-	-	-	-	-	-	-	762,000
Communal - Gibbon Road	177,000	-	-	-	-	-	-	-	-	-	177,000
Communal - Gibbon Road	201,000	-	-	-	-	-	-	-	-	-	201,000
Communal - Froats Street	146,000	-	-	-	-	-	-	-	-	-	146,000
Communal - Whitton Road/ O'Brien	500,000	-	-	-	-	-	-	-	-	-	500,000
Communal - Hall Avenue	152,000	-	-	-	-	-	-	-	-	-	152,000
Total Capital Expenditures	18,370,100	1,987,100	846,000	856,000	988,000	1,040,000	1,581,000	1,397,000	1,376,000	1,437,000	6,862,000
Capital Financing											
Provincial/Federal Grants	1,675,000	153,000	156,000	159,000	162,000	166,000	169,000	172,000	176,000	179,000	183,000
Gas Tax Funding	180,200	180,200	-	-	-	-	-	-	-	-	-
Development Charges Reserve Fund	4,882,000	-	-	-	-	-	-	-	-	-	4,882,000
Non-Growth Related Debenture Requirements	2,426,000	-	-	-	-	174,000	722,000	415,000	230,000	218,000	667,000
Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-
Operating Contributions	-	-	-	-	-	-	-	-	-	-	-
Capital/Lifecycle Reserve Fund	9,206,900	1,653,900	690,000	697,000	826,000	700,000	690,000	810,000	970,000	1,040,000	1,130,000
Total Capital Financing	18,370,100	1,987,100	846,000	856,000	988,000	1,040,000	1,581,000	1,397,000	1,376,000	1,437,000	6,862,000



Table C-3
Town of Renfrew
Schedule of Non-Growth Related Debenture Repayments (Inflated \$)

Debenture Year	Principal (Inflated)	Forecast									
		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
2021	-	-	-	-	-	-	-	-	-	-	-
2022	-	-	-	-	-	-	-	-	-	-	-
2023	-	-	-	-	-	-	-	-	-	-	-
2024	-	-	-	-	-	-	-	-	-	-	-
2025	174,000	-	-	-	-	-	11,162	11,162	11,162	11,162	11,162
2026	722,000	-	-	-	-	-	-	46,314	46,314	46,314	46,314
2027	415,000	-	-	-	-	-	-	-	26,621	26,621	26,621
2028	230,000	-	-	-	-	-	-	-	-	14,754	14,754
2029	218,000	-	-	-	-	-	-	-	-	-	13,984
2030	667,000	-	-	-	-	-	-	-	-	-	-
Total Annual Debt Charges	2,426,000	-	-	-	-	-	11,162	57,476	84,097	98,851	112,835

Table C-4
Town of Renfrew
Schedule of Growth Related Debenture Repayments (Inflated \$)

Debenture Year	Principal (Inflated)	Forecast									
		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
2021	-	-	-	-	-	-	-	-	-	-	-
2022	-	-	-	-	-	-	-	-	-	-	-
2023	-	-	-	-	-	-	-	-	-	-	-
2024	-	-	-	-	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-	-	-	-	-
2026	-	-	-	-	-	-	-	-	-	-	-
2027	-	-	-	-	-	-	-	-	-	-	-
2028	-	-	-	-	-	-	-	-	-	-	-
2029	-	-	-	-	-	-	-	-	-	-	-
2030	-	-	-	-	-	-	-	-	-	-	-
Total Annual Debt Charges	-	-	-	-	-	-	-	-	-	-	-

Table C-5
Town of Renfrew
Water Development Charges Reserve Fund Continuity (Inflated \$)

Description	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Opening Balance	274,014	396,731	522,782	652,220	785,137	921,628	1,064,848	1,211,867	1,362,782	1,517,654
Development Charge Proceeds	119,763	122,160	124,583	127,073	129,630	135,293	137,997	140,771	143,574	146,446
Transfer to Capital	-	-	-	-	-	-	-	-	-	4,882,000
Transfer to Operating	-	-	-	-	-	-	-	-	-	-
Closing Balance	393,778	518,891	647,365	779,293	914,767	1,056,921	1,202,845	1,352,638	1,506,356	(3,217,900)
Interest	2,953	3,892	4,855	5,845	6,861	7,927	9,021	10,145	11,298	(24,134)
Required from Development Charges	-	-	-	-	-	-	-	-	-	4,882,000

Table C-6
Town of Renfrew
Water Capital/Lifecycle Reserve Fund Continuity (Inflated \$)

Description	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Opening Balance	2,427,705	1,139,929	879,325	686,706	443,486	411,946	457,329	520,346	590,525	678,162
Transfer from Operating	366,124	429,396	504,381	582,780	668,459	735,383	873,017	1,040,179	1,127,636	1,230,227
Transfer to Capital	1,653,900	690,000	697,000	826,000	700,000	690,000	810,000	970,000	1,040,000	1,130,000
Commitments from Prior Years	-	-	-	-	-	-	-	-	-	-
Transfer to Operating	-	-	-	-	-	-	-	-	-	-
Closing Balance	1,139,929	879,325	686,706	443,486	411,946	457,329	520,346	590,525	678,162	778,388



**Table C-7
Town of Renfrew
Operating Budget Forecast (Inflated \$)**

Description	Forecast									
	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Expenditures										
Operating Costs										
Waterworks Administration										
W-431-010-1120 REGULAR SALARIES & WAGES	8,500	8,700	8,900	9,100	9,300	9,500	9,700	9,900	10,100	10,300
W-431-010-1190 EMPLOYER BENEFITS COSTS	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400
W-431-010-2590 OTHER SUPPLIES	1,100	1,200	1,300	1,400	1,500	1,600	1,700	1,800	1,900	2,000
W-431-010-2610 NEW EQUIPMENT	3,100	3,200	3,300	3,400	3,500	3,600	3,700	3,800	3,900	4,000
W-431-010-3170 TRAINING & EDUCATION	8,300	8,500	8,700	8,900	9,100	9,300	9,500	9,700	9,900	10,100
W-431-010-3610 CONTRACTED SERVICES	3,000	3,100	3,200	3,300	3,400	3,500	3,600	3,700	3,800	3,900
Administration General										
W-431-101-1120 REGULAR SALARIES & WAGES	92,000	93,800	95,700	97,600	99,600	101,600	103,600	105,700	107,800	110,000
W-431-101-1190 EMPLOYER BENEFITS COSTS	23,900	24,400	24,900	25,400	25,900	26,400	26,900	27,400	27,900	28,500
W-431-101-2510 OFFICE SUPPLIES	3,800	3,900	4,000	4,100	4,200	4,300	4,400	4,500	4,600	4,700
W-431-101-2515 COMPUTER SUPPLIES	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500	3,600	3,700
W-431-101-2710 UNIFORMS	900	900	900	900	900	900	900	900	900	900
W-431-101-3111 CAR ALLOWANCE	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100
W-431-101-3120 POSTAGE & SHIPPING	18,500	18,900	19,300	19,700	20,100	20,500	20,900	21,300	21,700	22,100
W-431-101-3130 TELEPHONE	4,600	4,700	4,800	4,900	5,000	5,100	5,200	5,300	5,400	5,500
W-431-101-3162 STAFF DEVELOPMENT	7,000	7,100	7,200	7,300	7,400	7,500	7,600	7,700	7,800	7,900
W-431-101-3170 TRAINING & EDUCATION	5,400	5,500	5,600	5,700	5,800	5,900	6,000	6,100	6,200	6,300
W-431-101-3320 MEMBERSHIPS	3,400	3,500	3,600	3,700	3,800	3,900	4,000	4,100	4,200	4,300
W-431-101-3520 AUDIT	5,400	5,500	5,600	5,700	5,800	5,900	6,000	6,100	6,200	6,300
W-431-101-3550 INSURANCE	55,100	56,200	57,300	58,400	59,600	60,800	62,000	63,200	64,500	65,800
W-431-101-3610 CONTRACTED SERVICES	3,800	3,900	4,000	4,100	4,200	4,300	4,400	4,500	4,600	4,700
W-431-101-3765 OCWA CHARGES	632,620	648,900	661,900	675,100	688,600	702,400	716,400	730,700	745,300	760,200
W-431-101-3814 PROPERTY TAXES	59,500	60,700	61,900	63,100	64,400	65,700	67,000	68,300	69,700	71,100
W-431-101-4220 WRITE-OFFS	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000
W-431-101-7420 VEHICLE / EQPT. CHARGES	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100
Stores										
W-431-406-1120 REGULAR SALARIES & WAGES	12,900	13,200	13,500	13,800	14,100	14,400	14,700	15,000	15,300	15,600
W-431-406-1190 EMPLOYER BENEFITS COSTS	3,600	3,700	3,800	3,900	4,000	4,100	4,200	4,300	4,400	4,500
W-431-406-2310 CONSTRUCTION MATERIALS	1,600	1,700	1,800	1,900	2,000	2,100	2,200	2,300	2,400	2,500
W-431-406-7420 VEHICLE / EQPT. CHARGES	3,500	3,600	3,700	3,800	3,900	4,000	4,100	4,200	4,300	4,400
Water Trailers										
W-431-W06-2680 PARTS	330	340	350	360	370	380	390	400	410	420
2014 Chev Express Cutaway										
W-431-W07-1120 REGULAR SALARIES & WAGES	4,300	4,400	4,500	4,600	4,700	4,800	4,900	5,000	5,100	5,200
W-431-W07-1130 OVERTIME	-	-	-	-	-	-	-	-	-	-
W-431-W07-1190 EMPLOYER BENEFITS COSTS	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
W-431-W07-2522 LICENCES	430	440	450	460	470	480	490	500	510	520
W-431-W07-2680 PARTS	5,700	5,800	5,900	6,000	6,100	6,200	6,300	6,400	6,500	6,600
W-431-W07-2812 GAS & OIL	6,800	7,100	7,500	7,900	8,300	8,700	9,100	9,600	10,100	10,600
W-431-W07-7410 VEHICLE / EQPT RECOVERIES	(9,700)	(9,900)	(10,100)	(10,300)	(10,500)	(10,700)	(10,900)	(11,100)	(11,300)	(11,500)
2016 Chevy 1/2 Ton Waterworks truck										
W-431-W09-1120 REGULAR SALARIES & WAGES	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
W-431-W09-1190 EMPLOYER BENEFITS COSTS	300	300	300	300	300	300	300	300	300	300
W-431-W09-2680 PARTS	4,300	4,400	4,500	4,600	4,700	4,800	4,900	5,000	5,100	5,200
W-431-W09-2812 GAS & OIL	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000	3,200
W-431-W09-7410 VEHICLE / EQPT RECOVERIES	(14,000)	(14,300)	(14,600)	(14,900)	(15,200)	(15,500)	(15,800)	(16,100)	(16,400)	(16,700)
2018 Ford F150										
W-431-W10-1120 REGULAR SALARIES & WAGES	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
W-431-W10-1190 EMPLOYER BENEFITS COSTS	300	300	300	300	300	300	300	300	300	300
W-431-W10-2522 LICENCES	100	100	100	100	100	100	100	100	100	100
W-431-W10-2680 PARTS	3,900	4,000	4,100	4,200	4,300	4,400	4,500	4,600	4,700	4,800
W-431-W10-2812 GAS & OIL	4,300	4,500	4,700	4,900	5,100	5,400	5,700	6,000	6,300	6,600
W-431-W10-7410 VEHICLE / EQPT RECOVERIES	(8,900)	(9,100)	(9,300)	(9,500)	(9,700)	(9,900)	(10,100)	(10,300)	(10,500)	(10,700)
Waterworks (Garage)										
W-432-361-2310 CONSTRUCTION MATERIALS	5,500	5,800	6,100	6,400	6,700	7,000	7,400	7,800	8,200	8,600
W-432-361-2550 REPAIRS & REPLACEMENT	5,000	5,100	5,200	5,300	5,400	5,500	5,600	5,700	5,800	5,900
W-432-361-2560 CLEANING SUPPLIES	400	400	400	400	400	400	400	400	400	400
W-432-361-2610 NEW EQUIPMENT	3,900	4,000	4,100	4,200	4,300	4,400	4,500	4,600	4,700	4,800
W-432-361-2813 HEATING FUEL	7,600	8,000	8,400	8,800	9,200	9,700	10,200	10,700	11,200	11,800
W-432-361-2811 ELECTRICITY	6,400	6,700	7,000	7,400	7,800	8,200	8,600	9,000	9,500	10,000
W-432-361-3130 TELEPHONE	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100
W-432-361-3610 CONTRACTED SERVICES	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500	3,600	3,700
Transmission & Distribution										
Main Repairs										
W-433-362-1120 REGULAR SALARIES & WAGES	24,200	24,700	25,200	25,700	26,200	26,700	27,200	27,700	28,300	28,900
W-433-362-1190 EMPLOYER BENEFITS COSTS	6,800	6,900	7,000	7,100	7,200	7,300	7,400	7,500	7,700	7,900
W-433-362-2310 CONSTRUCTION MATERIALS	13,900	14,200	14,500	14,800	15,100	15,400	15,700	16,000	16,300	16,600
W-433-362-3610 CONTRACTED SERVICES	32,500	33,200	33,900	34,600	35,300	36,000	36,700	37,400	38,100	38,900
W-433-362-3810 EQUIPMENT RENTAL/LEASE	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500	3,600
W-433-362-7420 VEHICLE / EQPT. CHARGES	3,500	3,600	3,700	3,800	3,900	4,000	4,100	4,200	4,300	4,400
New Services										
W-433-363-2310 CONSTRUCTION MATERIALS	6,100	6,400	6,700	7,000	7,400	7,800	8,200	8,600	9,000	9,500
W-433-363-3610 CONTRACTED SERVICES	700	700	700	700	700	700	700	700	700	700
New Mains										
W-433-371-1120 REGULAR SALARIES & WAGES	35,700	36,400	37,100	37,800	38,600	39,400	40,200	41,000	41,800	42,600
W-433-371-1190 EMPLOYER BENEFITS COSTS	10,000	10,200	10,400	10,600	10,800	11,000	11,200	11,400	11,600	11,800
W-433-371-2310 CONSTRUCTION MATERIALS	21,100	22,200	23,300	24,500	25,700	27,000	28,400	29,800	31,300	32,900
W-433-371-3610 CONTRACTED SERVICES	10,800	11,000	11,200	11,400	11,600	11,800	12,000	12,200	12,400	12,600
W-433-371-7420 VEHICLE / EQPT. CHARGES	5,800	5,900	6,000	6,100	6,200	6,300	6,400	6,500	6,600	6,700



Table C-7 (Cont'd)

Description	Forecast									
	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Water Meters										
W-433-372-1120 REGULAR SALARIES & WAGES	9,400	9,600	9,800	10,000	10,200	10,400	10,600	10,800	11,000	11,200
W-433-372-1190 EMPLOYER BENEFITS COSTS	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500
W-433-372-1990 ACCRUED PAYROLL	-	-	-	-	-	-	-	-	-	-
W-433-372-2310 CONSTRUCTION MATERIALS	18,900	19,800	20,800	21,800	22,900	24,000	25,200	26,500	27,800	29,200
W-433-372-2610 NEW EQUIPMENT	6,000	6,100	6,200	6,300	6,400	6,500	6,600	6,700	6,800	6,900
W-433-372-3610 CONTRACTED SERVICES	3,600	3,700	3,800	3,900	4,000	4,100	4,200	4,300	4,400	4,500
W-433-372-7420 VEHICLE / EQPT. CHARGES	2,900	3,000	3,100	3,200	3,300	3,400	3,500	3,600	3,700	3,800
Fire Hydrants										
W-433-373-1120 REGULAR SALARIES & WAGES	14,800	15,100	15,400	15,700	16,000	16,300	16,600	16,900	17,200	17,500
W-433-373-1190 EMPLOYER BENEFITS COSTS	4,200	4,300	4,400	4,500	4,600	4,700	4,800	4,900	5,000	5,100
W-433-373-2310 CONSTRUCTION MATERIALS	14,400	15,100	15,900	16,700	17,500	18,400	19,300	20,300	21,300	22,400
W-433-373-3610 CONTRACTED SERVICES	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100
W-433-373-7420 VEHICLE / EQPT. CHARGES	13,200	13,500	13,800	14,100	14,400	14,700	15,000	15,300	15,600	15,900
Valve Repairs										
W-433-381-1120 REGULAR SALARIES & WAGES	23,600	24,100	24,600	25,100	25,600	26,100	26,600	27,100	27,600	28,200
W-433-381-1190 EMPLOYER BENEFITS COSTS	6,600	6,700	6,800	6,900	7,000	7,100	7,200	7,300	7,400	7,500
W-433-381-2310 CONSTRUCTION MATERIALS	9,400	9,600	9,800	10,000	10,200	10,400	10,600	10,800	11,000	11,200
W-433-381-3610 CONTRACTED SERVICES	8,200	8,400	8,600	8,800	9,000	9,200	9,400	9,600	9,800	10,000
W-433-381-7420 VEHICLE / EQPT. CHARGES	4,100	4,200	4,300	4,400	4,500	4,600	4,700	4,800	4,900	5,000
Service Repairs										
W-433-382-1120 REGULAR SALARIES & WAGES	172,500	176,000	179,500	183,100	186,800	190,500	194,300	198,200	202,200	206,200
W-433-382-1190 EMPLOYER BENEFITS COSTS	48,400	49,400	50,400	51,400	52,400	53,400	54,500	55,600	56,700	57,800
W-433-382-2310 CONSTRUCTION MATERIALS	66,000	67,300	68,600	70,000	71,400	72,800	74,300	75,800	77,300	78,800
W-433-382-3610 CONTRACTED SERVICES	114,800	120,500	126,500	132,800	139,400	146,400	153,700	161,400	169,500	178,000
W-433-382-7420 VEHICLE / EQPT. CHARGES	19,300	19,700	20,100	20,500	20,900	21,300	21,700	22,100	22,500	23,000
Pumping Station (Kedrosky)										
W-433-533-1120 REGULAR SALARIES & WAGES	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300
W-433-533-1190 EMPLOYER BENEFITS COSTS	300	300	300	300	300	300	300	300	300	300
W-433-533-2310 CONSTRUCTION MATERIALS	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000	3,200
W-433-533-2814 ELECTRICITY	5,900	6,200	6,500	6,800	7,100	7,500	7,900	8,300	8,700	9,100
W-433-533-3610 CONTRACTED SERVICES	3,600	3,700	3,800	3,900	4,000	4,100	4,200	4,300	4,400	4,500
Elevated Tower - Minor Treatment Improvements										
W-434-396-2310 WTP - MAJOR MAINTENANCE	42,500	43,400	44,300	45,200	46,100	47,000	47,900	48,900	49,900	50,900
Sub Total Operating	1,820,780	1,867,480	1,911,600	1,956,620	2,002,940	2,050,460	2,099,180	2,149,200	2,200,620	2,253,940
Capital-Related										
Existing Debt (Principal) - Growth Related	-	-	-	-	-	-	-	-	-	-
Existing Debt (Interest) - Growth Related	-	-	-	-	-	-	-	-	-	-
New Growth Related Debt (Principal)	-	-	-	-	-	-	-	-	-	-
New Growth Related Debt (Interest)	-	-	-	-	-	-	-	-	-	-
Existing Debt (Principal) - Non-Growth Related	321,223	321,871	322,523	323,179	323,838	324,500	225,166	125,836	126,509	127,186
Existing Debt (Interest) - Non-Growth Related	93,315	87,906	82,494	77,118	71,660	66,237	60,811	58,942	58,268	57,592
New Non-Growth Related Debt (Principal)	-	-	-	-	-	6,812	35,246	52,373	62,687	72,788
New Non-Growth Related Debt (Interest)	-	-	-	-	-	4,350	22,230	31,724	36,164	40,047
Transfer to Capital	-	-	-	-	-	-	-	-	-	-
Transfer to Capital/Lifecycle Reserve	366,124	429,396	504,381	582,780	668,459	735,383	873,017	1,040,179	1,127,636	1,230,227
Sub Total Capital Related	780,661	839,174	909,399	983,077	1,063,957	1,137,282	1,216,470	1,309,054	1,411,265	1,527,839
Total Expenditures	2,601,441	2,706,654	2,820,999	2,939,697	3,066,897	3,187,742	3,315,650	3,458,254	3,611,885	3,781,779
Revenues										
Base Charge	859,202	924,484	985,400	1,050,298	1,129,997	1,216,033	1,308,735	1,382,130	1,445,692	1,497,588
W-431-101-0861 INTEREST ON WATER	15,900	15,900	15,900	15,900	15,900	15,900	15,900	15,900	15,900	15,900
Contributions from Development Charges Reserve Fund	-	-	-	-	-	-	-	-	-	-
Contributions from Reserves / Reserve Funds	-	-	-	-	-	-	-	-	-	-
Total Operating Revenue	875,102	940,384	1,001,300	1,066,198	1,145,897	1,231,933	1,324,635	1,398,030	1,461,592	1,513,488
Water Billing Recovery - Total	1,726,340	1,766,269	1,819,698	1,873,499	1,921,000	1,955,809	1,991,016	2,060,224	2,150,293	2,268,291

Table C-8
Town of Renfrew
Water Rate Forecast (Inflated \$)

Description	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Total Water Billing Recovery	1,726,340	1,766,269	1,819,698	1,873,499	1,921,000	1,955,809	1,991,016	2,060,224	2,150,293	2,268,291
Total Volume (m ³)	656,403	659,056	661,709	664,361	667,014	669,798	672,640	675,483	678,326	681,169
Constant Rate	2.63	2.68	2.75	2.82	2.88	2.92	2.96	3.05	3.17	3.33



Appendix D

Detailed Wastewater Rate Calculations



Appendix D: Detailed Wastewater Rate Calculations

Table D-1
Town of Renfrew
Wastewater Capital Budget Forecast (Uninflated \$)

Description	T Total	Forecast									
		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Major Capital Works											
Major Reconstruction Projects (Linear Assets)	4,000,000	400,000	400,000	400,000	400,000	400,000	400,000	400,000	400,000	400,000	400,000
Major Reconstruction Projects (Linear Assets) - Grant Funded	1,500,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000
Hwy 60 - Stewart St.	778,800	778,800									
Raglan St. S./County Road 52	94,100	94,100									
Pumping Stations:											
Lisgar Ave. Pumping Station Design	45,000		45,000								
Lisgar Ave. Pumping Station Construction	300,000			300,000							
O'Brien - Double 350mm Forcemain - Non-Growth Related Component	66,300				66,300						
O'Brien Rd Pumping Station Design - Non-Growth Related Component	22,500			22,500							
O'Brien Rd Pumping Station Construction - Non-Growth Related Component	150,000				150,000						
Arthur Ave. Pumping Station Design	40,000					40,000					
Arthur Ave. Pumping Station Construction	250,000						250,000				
Coleraine Pumping Station	25,000					25,000					
June St. Pumping Station	167,000			10,000							157,000
Hunter Gate Pumping Station	480,000								480,000		
1995 V07 Sludge Truck	50,000		50,000								
Wastewater Treatment Plant Large Capital Works (OCWA)	578,540	27,000	-	3,000	6,000	9,800	30,700	36,300	73,900	125,300	266,540
WPCC BCA work											
WPCC concrete deck repairs over tunnel	80,000	80,000									
Replace WPCC sump pump	17,000	17,000									
Mechanical Systems Replacements	832,000				747,000					85,000	
Replace WPCC Roofing Membranes	255,000								255,000		
Exterior lighting repairs	15,000									15,000	
WPCC BCA Study	15,000										15,000
Minor Capital Works:											
Minor Capital Works (From OCWA)	928,654	112,728	78,938	84,025	76,252	99,298	88,986	88,399	94,157	97,085	108,786
Sewage Main Line Camera Software & Tracks	35,000			35,000							
Studies											
Rate Study	30,000					15,000					15,000
Growth Related:											
Stewart St. Trunk Sanitary Upgrade	322,400	322,400									
Pump Station (New 10.7L/s) (C1-3)	390,000										390,000
Pump Station (New 15.5L/s + 2.8L/s) (C2-1/ I2-4)	559,000										559,000
Pump Station (New 5.9L/s + 7.4L/s) (R2-1 + R2-2)	455,000										455,000
Double 100mm Forcemain (C1-3)	520,000										520,000
Double 150mm Forcemain (C2-1/ I2-4)	470,000										470,000
Double 150mm Forcemain (R2-1 + R2-2)	537,000										537,000
O'Brien Rd. PS Upgrade											
Double 350mm Forcemain - Growth Related Component	375,700				375,700						
O'Brien Pumping Station (Growth Related) - Design	127,500			127,500							
O'Brien Pumping Station (Growth Related) - Construction	850,000				850,000						
Drain to C2-1 PS	120,000										120,000
Sanitary Monitoring Program	700,000										700,000
Total Capital Expenditures	16,181,494	1,982,028	723,938	1,132,025	2,821,252	739,098	919,686	674,699	1,453,057	872,385	4,863,326



**Table D-2
Town of Renfrew
Wastewater Capital Budget Forecast (Inflated \$)**

Description	Total	Forecast									
		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Capital Expenditures											
Lifecycle:											
Major Capital Works											
Major Reconstruction Projects (Linear Assets)	4,467,000	408,000	416,000	424,000	433,000	442,000	450,000	459,000	469,000	478,000	488,000
Major Reconstruction Projects (Linear Assets) - Grant Funded	1,675,000	153,000	156,000	159,000	162,000	166,000	169,000	172,000	176,000	179,000	183,000
Hwy 60 - Stewart St.	778,800	778,800	-	-	-	-	-	-	-	-	-
Raglan St. S./County Road 52	94,100	94,100	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-
Pumping Stations:											
Lisgar Ave. Pumping Station Design	47,000	-	47,000	-	-	-	-	-	-	-	-
Lisgar Ave. Pumping Station Construction	318,000	-	-	318,000	-	-	-	-	-	-	-
O'Brien - Double 350mm Forcmain - Non-Growth Related Component	72,000	-	-	-	72,000	-	-	-	-	-	-
O'Brien Rd Pumping Station Design - Non-Growth Related Component	24,000	-	-	24,000	-	-	-	-	-	-	-
O'Brien Rd Pumping Station Construction - Non-Growth Related Component	162,000	-	-	-	162,000	-	-	-	-	-	-
Arthur Ave. Pumping Station Design	44,000	-	-	-	-	44,000	-	-	-	-	-
Arthur Ave. Pumping Station Construction	282,000	-	-	-	-	-	282,000	-	-	-	-
Coleraine Pumping Station	28,000	-	-	-	-	28,000	-	-	-	-	-
June St. Pumping Station	202,000	-	-	11,000	-	-	-	-	-	-	191,000
Hunter Gate Pumping Station	562,000	-	-	-	-	-	-	-	562,000	-	-
	-	-	-	-	-	-	-	-	-	-	-
1995 V07 Sludge Truck	52,000	-	52,000	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-
Wastewater Treatment Plant Large Capital Works (OCWA)	687,000	28,000	-	3,000	6,000	11,000	35,000	42,000	87,000	150,000	325,000
	-	-	-	-	-	-	-	-	-	-	-
WPCC BCA work											
WPCC concrete deck repairs over tunnel	82,000	82,000	-	-	-	-	-	-	-	-	-
Replace WPCC sump pump	17,000	17,000	-	-	-	-	-	-	-	-	-
Mechanical Systems Replacements	911,000	-	-	-	809,000	-	-	-	-	102,000	-
Replace WPCC Roofing Membranes	299,000	-	-	-	-	-	-	299,000	-	-	-
Exterior lighting repairs	18,000	-	-	-	-	-	-	-	-	18,000	-
WPCC BCA Study	18,000	-	-	-	-	-	-	-	-	-	18,000
	-	-	-	-	-	-	-	-	-	-	-
Minor Capital Works:											
Minor Capital Works (From OCWA)	1,040,000	115,000	82,000	89,000	83,000	110,000	100,000	102,000	110,000	116,000	133,000
Sewage Main Line Camera Software & Tracks	37,000	-	-	37,000	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-
Studies											
Rate Study	35,000	-	-	-	-	17,000	-	-	-	-	18,000
	-	-	-	-	-	-	-	-	-	-	-
Growth Related:											
Stewart St. Trunk Sanitary Upgrade	322,400	322,400	-	-	-	-	-	-	-	-	-
Pump Station (New 10.7L/s) (C1-3)	475,000	-	-	-	-	-	-	-	-	-	475,000
Pump Station (New 15.5L/s + 2.8L/s) (C2-1/ I2-4)	681,000	-	-	-	-	-	-	-	-	-	681,000
Pump Station (New 5.9L/s + 7.4L/s) (R2-1 + R2-2)	555,000	-	-	-	-	-	-	-	-	-	555,000
Double 100mm Forcmain (C1-3)	634,000	-	-	-	-	-	-	-	-	-	634,000
Double 150mm Forcmain (C2-1/ I2-4)	573,000	-	-	-	-	-	-	-	-	-	573,000
Double 150mm Forcmain (R2-1 + R2-2)	655,000	-	-	-	-	-	-	-	-	-	655,000
	-	-	-	-	-	-	-	-	-	-	-
O'Brien Rd. PS Upgrade											
Double 350mm Forcmain - Growth Related Component	407,000	-	-	-	407,000	-	-	-	-	-	-
O'Brien Pumping Station (Growth Related) - Design	135,000	-	-	135,000	-	-	-	-	-	-	-
O'Brien Pumping Station (Growth Related) - Construction	920,000	-	-	-	920,000	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-
Drain to C2-1 PS	146,000	-	-	-	-	-	-	-	-	-	146,000
Sanitary Monitoring Program	853,000	-	-	-	-	-	-	-	-	-	853,000
	-	-	-	-	-	-	-	-	-	-	-
Total Capital Expenditures	18,308,300	1,998,300	753,000	1,200,000	3,054,000	818,000	1,036,000	775,000	1,703,000	1,043,000	5,928,000
Capital Financing											
Provincial/Federal Grants	1,675,000	153,000	156,000	159,000	162,000	166,000	169,000	172,000	176,000	179,000	183,000
Gas Tax Funding	296,900	296,900	-	-	-	-	-	-	-	-	-
Development Charges Reserve Fund	5,372,050	322,400	-	135,000	1,327,000	-	-	-	-	-	3,587,650
Non-Growth Related Debenture Requirements	8,328,350	-	317,000	641,000	1,325,000	452,000	717,000	473,000	1,417,000	829,000	2,157,350
Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-
Operating Contributions	-	-	-	-	-	-	-	-	-	-	-
Capital/Lifecycle Reserve Fund	2,636,000	1,226,000	280,000	265,000	240,000	200,000	150,000	130,000	110,000	35,000	-
Total Capital Financing	18,308,300	1,998,300	753,000	1,200,000	3,054,000	818,000	1,036,000	775,000	1,703,000	1,043,000	5,928,000



Table D-3
Town of Renfrew
Schedule of Non-Growth-Related Debenture Repayments (Inflated \$)

Debenture Year	Principal (Inflated)	Forecast										
		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	
2021			-	-	-	-	-	-	-	-	-	-
2022	317,000			20,335	20,335	20,335	20,335	20,335	20,335	20,335	20,335	20,335
2023	641,000				41,118	41,118	41,118	41,118	41,118	41,118	41,118	41,118
2024	1,325,000					84,995	84,995	84,995	84,995	84,995	84,995	84,995
2025	452,000						28,995	28,995	28,995	28,995	28,995	28,995
2026	717,000							45,993	45,993	45,993	45,993	45,993
2027	473,000								30,342	30,342	30,342	30,342
2028	1,417,000									90,896	90,896	90,896
2029	829,000										53,178	53,178
2030	2,157,350											
Total Annual Debt Charges	8,328,350	-	-	20,335	61,453	146,448	175,442	221,436	251,777	342,674	395,852	

Table D-4
Town of Renfrew
Schedule of Growth-Related Debenture Repayments (Inflated \$)

Debenture Year	Principal (Inflated)	Forecast										
		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	
2021	-		-	-	-	-	-	-	-	-	-	-
2022	-		-	-	-	-	-	-	-	-	-	-
2023	-		-	-	-	-	-	-	-	-	-	-
2024	-		-	-	-	-	-	-	-	-	-	-
2025	-		-	-	-	-	-	-	-	-	-	-
2026	-		-	-	-	-	-	-	-	-	-	-
2027	-		-	-	-	-	-	-	-	-	-	-
2028	-		-	-	-	-	-	-	-	-	-	-
2029	-		-	-	-	-	-	-	-	-	-	-
2030	-		-	-	-	-	-	-	-	-	-	-
Total Annual Debt Charges	-	-	-	-	-	-	-	-	-	-	-	-

Table D-5
Town of Renfrew
Wastewater Development Charges Reserve Fund Continuity (Inflated \$)

Description	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Opening Balance	307,323	128,794	276,617	292,478	(889,502)	(740,345)	(583,186)	(421,586)	(255,473)	(84,743)
Development Charge Proceeds	142,912	145,764	148,684	151,642	154,668	161,501	164,738	168,015	171,362	174,789
Transfer to Capital	322,400	-	135,000	1,327,000	-	-	-	-	-	3,587,650
Transfer to Operating	-	-	-	-	-	-	-	-	-	-
Closing Balance	127,835	274,558	290,301	(882,880)	(734,834)	(578,844)	(418,448)	(253,572)	(84,112)	(3,497,603)
Interest	959	2,059	2,177	(6,622)	(5,511)	(4,341)	(3,138)	(1,902)	(631)	(26,232)
Required from Development Charges	322,400	-	135,000	1,327,000	-	-	-	-	-	3,587,650

Table D-6
Town of Renfrew
Wastewater Capital/Lifecycle Reserve Fund Continuity (Inflated \$)

Description	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Opening Balance	1,219,332	257,254	250,121	250,816	247,295	211,902	209,916	201,001	199,264	200,397
Transfer from Operating	263,922	272,866	265,695	236,479	164,607	148,013	121,085	108,263	36,133	580
Transfer to Capital	1,226,000	280,000	265,000	240,000	200,000	150,000	130,000	110,000	35,000	-
Transfer to Operating	-	-	-	-	-	-	-	-	-	-
Closing Balance	257,254	250,121	250,816	247,295	211,902	209,916	201,001	199,264	200,397	200,977



**Table D-7
Town of Renfrew
Operating Budget Forecast (Inflated \$)**

Description	Forecast									
	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Expenditures										
Operating Costs										
Sanitary Sewer System Operations										
S-412-101-1120 REGULAR SALARIES & WAGES	83,100	84,800	86,500	88,200	90,000	91,800	93,600	95,500	97,400	99,300
S-412-101-1190 EMPLOYER BENEFIT COSTS	21,400	21,800	22,200	22,600	23,100	23,600	24,100	24,600	25,100	25,600
S-412-101-2510 OFFICE SUPPLIES	4,300	4,400	4,500	4,600	4,700	4,800	4,900	5,000	5,100	5,200
S-412-101-2515 COMPUTER SUPPLIES	500	500	500	500	500	500	500	500	500	500
S-412-101-2570 PRINTING AND PHOTO	300	300	300	300	300	300	300	300	300	300
S-412-101-3120 POSTAGE & SHIPPING	600	600	600	600	600	600	600	600	600	600
S-412-101-3330 GENERAL ADVERTISING	300	300	300	300	300	300	300	300	300	300
S-412-101-3530 LEGAL	2,300	2,300	2,300	2,300	2,300	2,300	2,300	2,300	2,300	2,300
S-412-101-3814 PROPERTY TAXES	100	100	100	100	100	100	100	100	100	100
S-412-101-4220 WRITE-OFFS	16,000	16,000	16,000	16,000	16,000	16,000	16,000	16,000	16,000	16,000
New Services										
S-412-363-2550 REPAIRS & REPLACEMENT	3,700	3,800	3,900	4,000	4,100	4,200	4,300	4,400	4,500	4,600
Sewer Collection System										
S-412-552-1120 SALARIES & WAGES	51,800	52,800	53,900	55,000	56,100	57,200	58,300	59,500	60,700	61,900
S-412-552-1190 EMPLOYER BENEFIT COSTS	14,600	14,900	15,200	15,500	15,800	16,100	16,400	16,700	17,000	17,300
S-412-552-2310 CONSTRUCTION MATERIALS	63,100	66,300	69,600	73,100	76,800	80,600	84,600	88,800	93,200	97,900
S-412-552-3610 CONTRACTED SERVICES	113,700	116,000	118,300	120,700	123,100	125,600	128,100	130,700	133,300	136,000
S-412-552-3810 EQUIPMENT RENTAL/LEASE	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500	3,600	3,700
S-412-552-7420 VEHICLE / EQPT. CHARGES	23,300	23,800	24,300	24,800	25,300	25,800	26,300	26,800	27,300	27,800
Sewer Pump Station										
S-412-553-1120 SALARIES & WAGES	18,900	19,300	19,700	20,100	20,500	20,900	21,300	21,700	22,100	22,500
S-412-553-1190 EMPLOYER BENEFIT COSTS	5,300	5,400	5,500	5,600	5,700	5,800	5,900	6,000	6,100	6,200
S-412-553-2310 CONSTRUCTION MATERIALS	17,200	17,500	17,900	18,300	18,700	19,100	19,500	19,900	20,300	20,700
S-412-553-2814 ELECTRICITY	11,100	11,700	12,300	12,900	13,500	14,200	14,900	15,600	16,400	17,200
S-412-553-3610 CONTRACTED SERVICES	17,200	17,500	17,900	18,300	18,700	19,100	19,500	19,900	20,300	20,700
S-412-553-3750 EQUIPMENT REPAIRS & MAINT	500	500	500	500	500	500	500	500	500	500
S-412-553-7420 VEHICLE / EQPT. CHARGES	4,500	4,600	4,700	4,800	4,900	5,000	5,100	5,200	5,300	5,400
V07 Sludge Truck										
S-412-V07-2522 LICENSE	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
S-412-V07-2680 PARTS	8,800	9,000	9,200	9,400	9,600	9,800	10,000	10,200	10,400	10,600
Pollution Control Plant										
S-462-551-2310 WPCP - MAJOR MAINTENANCE	74,300	75,800	77,300	78,800	80,400	82,000	83,600	85,300	87,000	88,700
S-462-551-3550 INSURANCE	87,000	88,700	90,500	92,300	94,100	96,000	97,900	99,900	101,900	103,900
S-462-551-3765 OCWA CHARGES	850,509	872,400	889,800	907,600	925,800	944,300	963,200	982,500	1,002,200	1,022,200
S-462-551-3814 PROPERTY TAXES	110,500	112,700	115,000	117,300	119,600	122,000	124,400	126,900	129,400	132,000
Sub Total Operating	1,608,709	1,647,700	1,682,800	1,718,600	1,755,300	1,792,800	1,830,900	1,870,200	1,910,200	1,951,000
Capital-Related										
Existing Debt (Principal) - Growth Related	-	-	-	-	-	-	-	-	-	-
Existing Debt (Interest) - Growth Related	-	-	-	-	-	-	-	-	-	-
New Growth Related Debt (Principal)	-	-	-	-	-	-	-	-	-	-
New Growth Related Debt (Interest)	-	-	-	-	-	-	-	-	-	-
Existing Debt (Principal) - Non-Growth Related	332,356	332,810	333,266	333,725	334,186	334,650	335,117	335,585	336,057	336,530
Existing Debt (Interest) - Non-Growth Related	403,102	390,792	378,481	367,060	353,850	341,531	329,210	317,649	304,559	292,230
New Non-Growth Related Debt (Principal)	-	-	12,410	37,813	90,628	110,589	141,422	163,474	223,032	261,061
New Non-Growth Related Debt (Interest)	-	-	7,925	23,640	55,819	64,854	80,014	88,303	119,642	134,791
Transfer to Capital	-	-	-	-	-	-	-	-	-	-
Transfer to Capital/Lifecycle Reserve	263,922	272,866	265,695	236,479	164,607	148,013	121,085	108,263	36,133	580
Sub Total Capital Related	999,380	996,469	997,777	998,717	999,092	999,637	1,006,847	1,013,275	1,019,422	1,025,192
Total Expenditures	2,608,089	2,644,169	2,680,577	2,717,317	2,754,392	2,792,437	2,837,747	2,883,475	2,929,622	2,976,192
Revenues										
Base Charge	1,038,622	1,054,954	1,071,508	1,088,288	1,105,297	1,122,842	1,140,767	1,158,938	1,177,358	1,196,031
S-412-101-0861 INTEREST ON SEWER	18,100	18,500	18,900	19,300	19,700	20,100	20,500	20,900	21,300	21,700
Contributions from Development Charges Reserve Fund	-	-	-	-	-	-	-	-	-	-
Contributions from Reserves / Reserve Funds	-	-	-	-	-	-	-	-	-	-
Total Operating Revenue	1,056,722	1,073,454	1,090,408	1,107,588	1,124,997	1,142,942	1,161,267	1,179,838	1,198,658	1,217,731
Wastewater Billing Recovery - Total	1,551,367	1,570,715	1,590,169	1,609,729	1,629,395	1,649,494	1,676,480	1,703,637	1,730,964	1,758,462

**Table D-8
Town of Renfrew
Wastewater Rate Forecast (Inflated \$)**

Description	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Total Wastewater Billing Recovery	1,551,367	1,570,715	1,590,169	1,609,729	1,629,395	1,649,494	1,676,480	1,703,637	1,730,964	1,758,462
Total Volume (m ³)	646,403	649,056	651,709	654,361	657,014	659,798	662,640	665,483	668,326	671,169
Constant Rate	2.40	2.42	2.44	2.46	2.48	2.50	2.53	2.56	2.59	2.62