City of Yellowknife
Water & Sewer Rate Structure Review

Final Report

InterGroup
CONSULTANTS

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TABLE OF CONTENTS

Executive Summary **1**

1.0 Introduction **7**

2.0 Overview of The Yellowknife Water and Sewer System **10**

3.0 Revenue Requirement And Revenue Forecast **12**

3.1 Revenue Requirement 12

3.2 Revenue Forecast: Separating Water and Sewer Services 14

3.3 Water and Sewer Utility Revenue Requirement 15

4.0 Cost Of Service Study **20**

4.1 Water Utility Cost of Service Study 20

4.2 Sewer Utility Cost of Service Study 21

4.3 Combined Utility Cost Recovery 23

5.0 Peer Municipality Comparison **25**

5.1 Summary 25

6.0 Recommended approach to Rate Structure **28**

6.1 A Phased Approach to Rate Re-structuring 29

7.0 Other Recommendations: Utility Sustainability **35**

7.1 Additional Sewage Disposal Charges 35

7.2 Non-Resident Bill Surcharge Proposal 37

7.3 Over Strength Matter Regulations 37

7.4 Utility Reserve Accounts 38

8.0 Summary of findings and Recommendations **40**

APPENDICES

APPENDIX A – Summary of Public Engagement

APPENDIX B – Project Terms of Reference

APPENDIX C – Utility Revenue Requirement Development Approaches

APPENDIX D – Utility Revenue Forecast

APPENDIX E - Cost of Service Study and Results

APPENDIX F – Peer Municipality Comparison

APPENDIX G – Overstrength Matter Regulations

LIST OF TABLES

Table 3-1: 2027 Yellowknife Water and Sewer Revenue Requirement ($000) 13
Table 3-2: 2020 Revenue Forecast Comparison to Actual 15
Table 3-3: Water Utility Revenue Requirement for 2024-2027 ($000) 16
Table 3-4: Sewer Utility Revenue Requirement for 2024-2027 ($000) 18
Table 4-1: Water Utility Revenue to Cost Ratio for 2027 at Existing Rates 21
Table 4-2: Sewer Utility Revenue to Cost Ratio for 2027 at Existing Rates 22
Table 4-3: Total Utility Revenue to Cost Ratio for 2027 at Existing Rates 23
Table 4-4: RCC Comparison by Revenue Component 24
Table 5-1: Peer Municipality Comparison Summary 25
Table 6-3: Utility Revenue to Cost Ratio for 2027 With a Phased Approach to Rate Re-Structuring 30
Table 6-4: Bill Impacts for a Phased Approach to Rate Restructuring 31
Table 6-5: Recommended Option Rate Structure 34

LIST OF FIGURES

Figure 3-1: Water Utility Revenue Requirement Trend by Component 17
Figure 3-2: Sewer Utility Revenue Requirement Trend by Component 19

EXECUTIVE SUMMARY

The current water and sewer rate structure for the City of Yellowknife has been in place since the 1990's. There are two key issues that need to be addressed in a comprehensive review:

1. There has been significant growth in trucked services and the current rate structure includes a degree of cross-subsidization, from piped services to trucked services – is this degree of cross-subsidization appropriate?
2. The current rate structure does not distinguish between water and sewer services. This is not reflective of industry best practices.

Other aspects of the current rate structure are dated in terms of industry best practices. For example, current rates include the use of 'Equivalent Residential Unit', which is based on floor space as opposed to actual water usage. Larger businesses that use very little water can see substantial charges. The industry trend is to base rates more on actual water usage, thereby sending the correct price signals to customers.

The Yellowknife Water and Sewer Rate Review (Rate Review) was initiated in the spring of 2021. This project has experienced some delays due to a number of events, including public health orders related to COVID outbreaks in the fall of 2021 and the evacuation of Yellowknife due to wildfires during the summer of 2023. In the three years since the Rate Review was initiated, system costs have increased, resulting in an additional factor to consider in the rate re-balancing analysis contained in this report.

The Rate Review has been undertaken by InterGroup Consultants. InterGroup specializes in utility regulatory economics, including capital planning, sales forecasting, preparing regulatory submissions and rate policy development and has been involved in utility and rate structure reviews for over 45 years. An Interim Report released in June 2023 contained rate options to support a public engagement process. A summary of the findings of this process can be found in **Appendix A**. InterGroup has now prepared this final report, with detailed rate recommendations, for the consideration of Yellowknife City Council.

To develop options for a revised rate structure, InterGroup developed a forecast for the **2025-2027 Revenue Requirement** and a detailed **Cost of Service Analysis (COSA)** model for separate water and sewer utilities. The degree to which various classes of customers are paying for water and sewer costs can be seen in the table below showing the combined water and sewer **Revenue to Cost Coverage (RCC)** ratio. The RCC is calculated by dividing revenues from a customer class by the costs to serve that customer class. A RCC ratio of over 100% indicates that revenues exceed costs and that customers in that class are paying rates higher than the costs to serve them. A RCC ratio of less than 100% indicates that revenues do not fully recover that costs to serve that class of customers.

Total Utility Revenue to Cost Ratio for 2027 at Existing Rates

Customer Type	2027 Forecast		
	Revenue Forecast at 2024 Approved Rates ($000)	COS Results ($000)	RCC Ratio
Combined Water & Sewer Service	**A**	**B**	**C=A/B**
Piped Service	**8,912**	**8,581**	**103.9%**
Residential	4,100	4,128	99.3%
Multi-residential	1,582	1,344	117.7%
Commercial	3,128	2,683	116.6%
Bulk (incl. Unmetered)	101	99	102.3%
Community gardens/services/surface lines	0	328	0.0%
Trucked	**1,514**	**2,367**	**64.0%**
Total	**10,426**	**10,949**	**95.2%**

As can be seen, by 2027, total system revenue, at 95.2 percent, will not fully recover the costs of the water and sewer system. Further, trucked water and sewer customers are only paying 64 percent of the costs incurred to serve them while piped services revenues are covering about 104 percent of the costs to serve those customers. Consistent with best practices, utilities aim for a **range of reasonableness with respect to the RCC of between 90 percent and 110 percent**. Therefore, commercial and multi-residential customers on piped services (about 117 percent), are paying more than their fair share of costs.

Other issues with the current rate structure include:

- There are multiple fixed fee components – the demand charge, the access fee, the infrastructure levy, and the insurance charge. No other municipality take this approach.
- The current rate structure utilizes the concept of *Equivalent Residential Unit (ERU)* that essentially utilizes floor space in determining charges for commercial customers. However, this concept does not capture or track the true cost of service. For example, a business with a substantial amount of floor space that has one bathroom and utilizes very little water or sewer services will receive very sizeable utility bills. No other municipalities reviewed take this approach.

This analysis was informed by a review of peer municipalities, the findings of which are presented in this report. The development of rate structure options was also informed by industry best practices, including the American Water Works Association Manual (AWWA). Key guiding principles include:

- ***Recover Full Cost of Providing Service:*** This ensures that the utility is sustainable in the long term and not underfunded or subsidized by other municipal revenues.
- ***Rates Should Reflect the Costs to Serve Customers***
- ***Rates and Fees Should be Easy to Understand:*** This speaks to the use of a complicated ERU noted above.

- ***Send a Price Signal to Consumers Regarding the Costs of Consumption:*** Simply put, this principle is about using a combination of fixed and variable rates that results in charging higher users more than lower users.
- ***Ensure Administrative Efficiency and Simplicity***
- ***Implement Separate Rates and Fees for Water and Sewer Utilities***
- ***Unexpected Changes to Customers Bills Should be Minimized***

Intergroup is proposing that the City proceed with a phased approach to minimize the impact on customer bills. The table below provides a summary of recommended utility bill impacts.

Recommended Bill Impacts for Water and Sewer Services – 2025 to 2027

Customer Classes	Phased Approach: W&S Rate and Fee Changes Only		
	Annual %	Annual $	3 Year $ Impact
Residential Average Bill (12 M3)	0.0%	$0	$0
Multi-Residential			
Average Bill (200 m3)	-0.7%	-$125	-$375
High Consumption (347 m3)	-5.2%	-$3,636	-$10,907
Commercial			
Average Bill (40 m3)	-1.7%	-$68	-$203
Low Consumption (3 M3)	-9.2%	-$526	-$1,578
High Consumption (1,348 m3)	-0.3%	-$319	-$957
Trucked			
Average Bill (8 m3)	9.6%	$231	$693
Low Consumption (5 m3)	8.9%	$167	$501
High Consumption (130 m3)	5.9%	$724	$2,173
Mid-Consumption (66 m3)	4.7%	$326	$977

To minimize bill impacts for trucked services customers, Intergroup is recommending a phased approach over at least the next five years, with a focus on rate simplification early on and moving towards full cost recovery over time:

- The first proposed step is to focus on rate rebalancing; implementation of separate water and sewer rates; ensuring rates are tied to the cost-of-service; and removing ERU from the Access Fee charge. This is reflected in the table above, with implementation from 2025 through to 2027.
- In year four, the City should consider further simplifying the rate structure by rolling the Infrastructure Levy into the water and sewer rates.
- The final phase – year five or six - should limit the rate structure components to only demand and consumption charges for both water and sewer utilities.

It should be noted that for the trucked service, average and low consumption customers are mainly residential, and mid/high consumption customers are mainly commercial class.

As noted above, these rate increases reflect not only a rate re-balancing but also escalating costs. In the Interim Report released in June 2023, proposed rate increases for trucked services customers were in the 5 percent range. Since that time, costs have increased as follows:

Category	2023 Analysis	2024 Update	Change ($000)	Main Drivers
Expenses				
Wages, Employee Costs	3,311	3,804	493	15% higher costs reflected in City's 2024-2026 budget - spread across all sales
Supplies and Services	5,526	6,979	1,453	26% higher costs reflected in City's 2024-2026 budget - spread across all sales
Contracted services	*2,643*	*3,511*	*868*	A 33% increase in trucked service costs in 2024
Utilities - fuel	*505*	*857*	*352*	A 70% fuel cost increase, spread across all sales
Revenues				
User fees	10,325	10,426	101	2.6% fees increase in 2024
Infrastructure Levy	2,107	3,264	1,157	Fee increase from $13.5 to $21 by 2026
Net Cost Increase			**688**	

As reflected in this table, there was a 2.6 percent rate increase applied to all customers in 2024 but it was not enough to cover all cost increases, resulting in a $688,000 deficit. As well, cost increases incurred on behalf of a specific customer class should be appropriately attributed to that customer class. As such, the 33 percent increase in trucked services costs is the primary driver that resulted in the proposed rate increase to an average trucked services customer going from 5 percent per year for three years to nearly 10 percent per year.

Finally, it should be noted that there is often no one 'right answer' regarding whether a level of cross-subsidization should remain in place. As reflected in the review of other municipalities, Hay River and Iqaluit still cross-subsidize trucked services, although they recognize that it is not ideal. Typically, debates revolve around the following points:

- **No Real Difference in Service** – all residents require water and sewer services.
- **Not a Choice Individual Consumers Can Make** – trucked versus piped services are determined by geography.
- **Perception of Fairness** – full cost or service or some level of equal access to similar services that have different cost structures?
- **Historical Considerations** – there may be relevant historical considerations that support one approach or the other.
- **Rates Can Impact Development Patterns** – for example, some businesses, particularly those with high water usage, may choose to locate in areas of the City with lower-cost piped services.

This report also addresses a number of other issues regarding the water and sewer system, including:

- Consideration of additional water and sewer charges for those customers accessing the trucked system from outside of municipal boundaries;
- The development of over strength matter regulations; and
- The establishment of utility reserve accounts.

With the revenue requirement and cost of service models in place, the City is now well-positioned to model any range of utility rate options/scenarios. This will prove to be an asset in future utility planning and development. Following the recommendations contained in this report will result in:

- A defendable and documented rationale for why and how water and sewer utility rates are established, which has never previously existed; and
- A simplified water and sewer rate structure and utility bills, tied directly to costs and consumption, that residents will better understand.

The recommendations reflected in this report, or as amended by City Council, will be considered during the annual City budgeting process.

1.0 INTRODUCTION

The City of Yellowknife ("City") owns and operates water and sewer utility system serving approximately 6,000 residential, commercial/industrial and multi-residential accounts serving about 22,000 residents.

The City has a mix of piped (underground) water and sewer infrastructure, which serves the majority of the City, as well as trucked water delivery and sewage pump out services.

The City maintains a Water and Sewer Fund, which finances both capital and operating costs of supply and treatment of potable water, distribution of potable water, and collection, treatment and disposal of sanitary sewage. The Water and Sewer Fund is financed through user fees and external government contributions.

The current water and sewer rate structure has been in place since the 1990's. Industry practice is that water and sewer rate structures are reviewed every five years to confirm that revenue and cost allocation methodology is consistent with the intentions of the utility and that future costs and capital improvements are appropriately funded. It has been at least fifteen years since the water and sewer rate structure has been reviewed in detail. There are two key issues that need to be addressed in a comprehensive review:

1. There has been significant growth in trucked services and the current rate structure includes a degree of cross-subsidization, from piped services to trucked services – is this degree of cross-subsidization appropriate?
2. The current rate structure does not distinguish between water and sewer services. This is not reflective of industry best practices.

Other aspects of the current rate structure are dated in terms of industry best practices. For example, current rates include the use of 'Equivalent Residential Unit', which is based on floor space as opposed to actual water usage. Larger businesses that use very little water can see substantial charges. The industry trend is to base rates more on actual water usage, thereby sending the correct price signals to customers.

To address these issues, the City of Yellowknife has engaged InterGroup Consultants Ltd (Intergroup). InterGroup specializes in utility regulatory economics, including capital planning, sales forecasting, preparing regulatory submissions and rate policy development and has been involved in utility and rate structure reviews for over 40 years. InterGroup recently completed a rate review for the Town of Hay River. In 2003, Intergroup provided a memorandum to the City that estimated that rates for trucked services were only covering 68 percent of trucked service costs.

Through this review, InterGroup has completed the following tasks:

- A detailed review of the current rate structure and the cost and revenue accounts.
- Development of a cost allocation methodology to establish separate cost of service models for water and sewer services.
- Development of water and sewer revenue requirements and load and revenue forecasts.

- Differentiated between piped and trucked services and identified the level of cross-subsidization in place today.
- Developed options with respect to rate and fee structures to inform a discussion with key stakeholders and the public on the 'rate balance' that needs to be achieved between trucked and piped water and sewer services.
- Undertook a jurisdictional scan of identified municipalities that have a hybrid trucked and piped system to further inform the rate balance discussion.
- Developed a recommended approach towards establishing a modernized rate structure that reflects appropriate cost allocation, sends appropriate price signals based more on usage, and proposes rate changes over time to avoid unnecessary 'rate shock' for some customers.

This exercise was initially completed in 2023 for the revenue requirement and revenue projections for 2024-2026. Due to the evacuation of Yellowknife in August of 2023, this report was not finalized, and rate recommendations were not implemented. Therefore, the revenue requirement and revenue projections have been updated to reflect utility budgets and costs for 2024 and extended out to 2027.

This exercise has included the review of detailed cost and system data and has resulted in a comprehensive cost of service model that can be revised to reflect the input received from key stakeholder engagement as well as political direction. While InterGroup has provided a recommended approach, it is important to note that in utility rate setting, there is no one 'right answer'. The rate system needs to fairly reflect system costs but should also reflect the principles and objectives of City residents and elected officials.

This report also addresses a number of other items:

- There are some users of the water and sewer system that are not being fully charged for all the costs incurred by the system. This would include, for example, some residents outside of municipal boundaries. These amounts in total are not material in terms of system costs, but in principle, all users should have a utility account with the City.
- City contractors do not feel they are being adequately compensated for some service callouts.
- The City does not currently have over-strength matter regulations. This is discussed further in Section 7.3.

The full terms of reference for InterGroup are reflected in Appendix B. It should be noted that modernizing the rate structure for a $18 million water and sewer utility is a complex undertaking, incorporating substantial technical analysis based upon industry best practises. While an effort has been made to ensure this document is as publicly consumable as possible, there is no avoiding the use of utility and accounting terms, methodology and analysis. With this in mind, the following report is structured as follows:

- Sections 2, 3, 4 and 5 summarize the review of the revenue requirements, cost of service analysis and peer municipality comparisons for each utility.

- Section 6 identifies the recommended rate structure, including a phased implementation over three years. The potential bill impacts from proposed rates are also detailed here.
- Section 7 provides recommendations to the City with respect to updating relevant By-laws arising from the findings and ensuring information consistency between related By-laws. This section also provides recommendations on other matters included in the study terms of reference.
- Section 8 provides a summary of findings and recommendations.

The recommendations reflected in this report, or as amended by City Council, will be considered during the annual City budgeting process.

2.0 OVERVIEW OF THE YELLOWKNIFE WATER AND SEWER SYSTEM

The City has a mix of piped (underground) water and sewer infrastructure, which serves the majority of the City, as well as trucked water delivery and sewage pump out services. The City's Public Works and Engineering Department is responsible for maintenance of the water and sewer system. This includes pumping and treatment, frost protection, water meters, maintenance of reservoirs, fixing water leaks, looking after water mains, maintenance of the sewer system, the storm sewer system, lift stations, and the sewage lagoon[1].

The City's piped water and sewage system includes 6 pumphouses, a Water Treatment Plant, and 14 lift stations. It also includes 62 km of buried water main and a slightly smaller quantity of sewer main, poly summer water line (above grade generally), approximately 11 km of forcemain, and a sewage lagoon system with control structures[2].

Trucked water delivery and sewage pump out services are provided in Old Town, Latham Island, N'dilǫ, Kam Lake Industrial Park, Grace Lake, Con and Rycon Trailer Park, commercial buildings at the Airport and some commercial buildings along Old Airport Road. Trucked services capture approximately 680 residents or just under 4% of the City's population, but this does not include commercial/industrial demand (about 1,600 employees)[3].

The City maintains a Water and Sewer Fund, which finances both capital and operating costs of supply and treatment of potable water, distribution of potable water, and collection, treatment and disposal of sewage. The costs of operating the Fund are recovered through charges to service users as well as external capital funding grants from other orders of government.

The City charges water and sewer rates as set out in By-law No. 4436 and as amended from time to time. The rates for 2024 are:

- Public Piped Service Users:
    - Access Fee of $9.75 per Equivalent Residential Unit (ERU) per month.
    - Monthly demand charge in the range of $12.25 to $1,828.00 based on water meter sizes.
    - Consumption charge of $4.50 per cubic metre of water consumption.
- Unmetered Users:
    - Single Family Residential Water Users: $187.00 per month.
    - Water used for construction purposes: $93.25 per month.
- Trucked Water Delivery and Sewage Pump Out:
    - Residentially zoned areas

[1] The City of Yellowknife webpage: https://www.yellowknife.ca/en/living-here/water-and-sewer.asp
[2] IBID
[3] IBID

- Access Fee of $70.75 per month.
- First 15,000 litres per month: $20.25 per 4,550 litres.
- Over 15,000 litres per month: $115.50 per 4,550 litres.

- Industrially and Commercially zoned areas:
  - Access Fee of $202.75 per month.
  - First 15,000 litres per month: $20.25 per 4,550 litres.
  - Over 15,000 litres per month: $115.50 per 4,550 litres.
- Bulk sales: $26.25 per 4,550 litres or portion thereof.

The City's water and sewer system has annual operating and capital costs of about $18.5 million. About $11 million of these costs are collected through rate revenue and about $7.5 million is offset by non-rate revenue that is made up of external capital funding, some relatively minor grants, and about $3.2 million collected from an infrastructure levy charged on Yellowknife utility bills.

As noted in the Introduction, it is necessary to ensure there is a clear understanding of the rationale behind water and sewer rates, and that this rationale is linked with the cost of service. Separating water and sewer costs and rates and making other changes to simplify a complex rate structure based on usage will aid in the future planning and management of the system.

As the following analysis will demonstrate, making these changes will result in water and sewer bill impacts for customers, most notably for those customers on trucked services where the current rates do not cover costs. The following two sections examine this issue in detail, beginning with an analysis of the **Revenue Requirement** that provides the basis for a detailed **Cost of Service Analysis**.

3.0 REVENUE REQUIREMENT AND REVENUE FORECAST

3.1 REVENUE REQUIREMENT

The American Water Works Association (AWWA) defines revenue requirements as "the summation of the operation, maintenance, and capital costs that a utility must recover during the time period for which the rates will be in place." The revenue requirement must be sufficient to provide safe and reliable utility services.

It should be noted that there are two generally accepted approaches for revenue requirement determination: the cash-needs approach and the utility-basis approach. This review and the analysis detailed below has been completed based on a cash-needs approach. For more discussion on cash-needs versus utility-basis, please refer to **Appendix C**.

As noted earlier, a key challenge for the current system is that water and sewer services costs – and therefore rates – are combined. Therefore, to address this, the first step was developing separate revenue requirement estimates for the water and sewer utilities. This exercise included:

- Reviewing historical operating and capital expenses related water and sewer services and determining cost allocations between water and sewer services based on a line-by-line-item review of expenses (in coordination with the City staff).
- Preparing a 2025-2027 forecast for Operations and Maintenance Costs (O&M), administration, debt service costs and capital spending requirements based on historical costs as well as City budget information.

For reference in the discussion that follows, below is a summary of the total water and sewer 2027 revenue requirement forecast. These costs needed to be split between water services and sewer services.

Table 3-1: 2027 Yellowknife Water and Sewer Revenue Requirement ($000)

Line No.		Water	Sewer	
1	**Operation & Maintenance Expense**	**7,310**	**4,705**	
2	Wages and Employee Costs	2,083	1,721	
3	Supplies and Services	5,227	2,984	
	3(i) Contracted and general services	1,827	1,684	
	3(ii) Total Materials & supplies	341	105	
	3(iii) Maintenance	248	97	
	3(iv) Utilities - electricity	1,294	378	
	3(v) Utilities - fuel	819	38	
	3(vi) Vehicle O&M	81	67	
	3(vii) Administration Fee to General Fund	616	616	
4	**Debt Costs for Major Capital**	125	-	
5	**Capital Spending**	**2,350**	**4,000**	
	5(i) Water & Sewer Infrastructure Replacement	1,000	1,000	
	5(ii) Other Major Capital	1,350	3,000	
6	**Total Revenue Requirement**	**9,785**	**8,705**	**$ 18,490**
7	**Less: Non Rate Revenues**	**3,052**	**4,490**	
	7(i) External Capital Funding	1,177	2,615	
	7(ii) Non-Rate Revenue & Operating Grants	243	243	
	7(iii) Infrastructure Levy	1,632	1,632	
8	**Net Revenue Required from Treated Water Rates**	**6,734**	**4,215**	**$ 10,949**

Note that while it is a $18.5 million system, non-rate revenues, including external capital funding, results in a total of about $11 million in costs that need to be recovered through rates.

3.1.1 O&M and Administrative Fees

The review of historical expenditures included consideration of notable trends and other budgetary information provided by City staff.

The allocation of costs between water and sewer services was based on an analysis of each line item. Many O&M items could be directly assigned to water or sewer services based on the expense description.

All expenses related to pumphouses, the water treatment plant, water line maintenance, water meter services, trucked water delivery and reservoirs were assigned to the water utility revenue requirement. All expenses related to lift stations, lagoons, sewer line maintenance, and sewage pump-out were assigned to the sewer utility revenue requirement.

Wages and Employee costs were split based on a review of positions and discussions with the City on the estimated time allocation of these positions between water and sewer services. This resulted in a 55-45 percent split of Wages and Employee costs between water and sewer services. This ratio was also applied to other shared O&M expenses.

Administrative Fees were allocated equally (50-50) between water and sewer services.

3.1.2 Debt Service Cost

The allocation of Debt Service Costs was straightforward as all the existing debt instruments are related to the Water Treatment Plant, as follows:

- $20 million debt authorized by By-law No. 4681 to finance the Water Treatment Plant, with monthly payments of $139,060.93, including principal and interest at 3.098%.
- $3 million debt authorized by By-law No. 4737 to finance the Water Treatment Plant, with monthly payments of $21,754,22, including principal and interest at 3.708%.
- $0.839 million debt authorized by By-law No. 4737 to finance the Water Treatment Plant, with monthly payments of $6,198.00, including principal and interest at 3.981%.

3.1.3 Capital Spending Forecast

The Capital Spending forecast was developed based on a review of City's actual capital spending, approved budgets, and discussions with City staff with respect to planned capital projects, adjusted for any external (government) funding for these capital projects.

Capital projects directly related to water services or sewer services were included in the respective utility revenue requirements. The projects related to common infrastructure replacement were allocated based on a 50-50 percent split between water and sewer services.

3.1.4 Non-Rate Revenues

As noted above, non-rate revenues are included as offsets to the revenue requirement and comprise external capital funding; other revenue and operating grants; and the Infrastructure Levy collected from water and sewer service customers.

The forecast also included anticipated external funding related to water and sewer capital projects.

Other revenue and the Infrastructure Levy were allocated equally between water and sewer services.

3.2 REVENUE FORECAST: SEPARATING WATER AND SEWER SERVICES

The City water and sewer utility has three main categories of monthly fees:

- **Access Fee**: charged to customers both on piped and trucked services. For the piped service, the fees are based on an Equivalent Residential Unit (ERU) which varies from residence to residence. For the trucked service, a different access fee is charged to residential and trucked commercial customers with no ERU component.
- **Demand Charge**: charged to customers on piped service. This fee is based on the size of the meter, representing a cost to have the infrastructure in place to meet the maximum amount of potential demand for a building.[4]
- **Consumption Fees**: based on actual consumption for all customers, where the charge is:

[4] For example, while a business may use relatively little water on a month-to-month basis, the business may need to access a substantial quantity of water to support a fire suppression system.

- A single rate for piped metered customers
- A separate rate for trucked customers by consumption block (same approach for residential and commercial customers)
- A bulk sales rate in industrially and commercially zoned areas

The City also has some unmetered customer accounts which are charged a fixed monthly fee (not considered as material in the context of this analysis).

The sales forecast was prepared based on a detailed analysis of the billing data for the 2017-2020 period. This sales forecast, combined with the approved rates for each of the three monthly fees (access, demand and consumption)[5] by customer class resulted in a detailed revenue forecast. Additional information with respect to the methodology can be found in **Appendix D**.

As a cross-check of the methodology employed and the accuracy of the revenue forecast, a 2020 revenue estimate was prepared based on 2020 sales data and then compared to actual 2020 revenue. The difference between the forecast and actual revenue was about 1 percent, as shown in the table below.

Table 3-2: 2020 Revenue Forecast Comparison to Actual

	2020 Actual	2020 Estimate	Difference
W&S Piped Water Consumption	$ 6,099,614	$ 6,073,336	0%
W&S Trucked Water Consumption	$ 437,564	$ 436,935	0%
W&S Piped Water Fixed Charges	$ 2,251,483	$ 2,344,483	4%
W&S Trucked Water Fixed Charges	$ 983,195	$ 987,880	0%
	$ 9,771,856	**$ 9,842,635**	**1%**

With an appropriate allocation of system costs between water services and sewer services, and confidence in the methodology and forecast, following is an overview of the separate water and sewer revenue requirements.

3.3 WATER AND SEWER UTILITY REVENUE REQUIREMENT

Table 3-3 summarizes and Figure 3-1 illustrates the forecast water utility revenue requirements for 2024 to 2027.

[5] There is also a monthly insurance charge and a monthly infrastructure levy that are not tied to water consumption

Table 3-3: Water Utility Revenue Requirement for 2024-2027 ($000)

Line No.		Forecast 2024	2025	2026	2027
1	**Operation & Maintenance Expense**	**6,102**	**6,258**	**6,483**	**6,694**
1(i)	Wages and Employee Costs	1,802	1,922	2,001	2,083
1(ii)	Supplies and Services	4,300	4,336	4,482	4,611
2	**Administration Fee**	**573**	**587**	**602**	**616**
3	**Debt Costs for Major Capital**	**298**	**241**	**185**	**125**
4	**Capital Spending**	**1,400**	**10,115**	**23,180**	**2,350**
4(i)	Water Infrastructure Replacement	-	50	1,000	1,000
4(ii)	Other Capital	1,400	10,065	22,180	1,350
5	**Total Revenue Requirement**	**8,373**	**17,201**	**30,449**	**9,785**
6	**Less: Non Rate Revenues**	**2,484**	**10,678**	**21,000**	**3,052**
6(i)	External Capital Funding	1,000	9,000	19,128	1,177
6(ii)	Non-Rate Revenue & Operating Grants	243	243	243	243
6(iii)	Infrastructure Levy	1,241	1,435	1,629	1,632
7	**Net Revenue Required from Treated Water Rates**	**5,889**	**6,523**	**9,450**	**6,734**
8	**Revenues at Exisitng Rates**	**6,256**	**6,256**	**6,256**	**6,256**

Figure 3-1: Water Utility Revenue Requirement Trend by Component

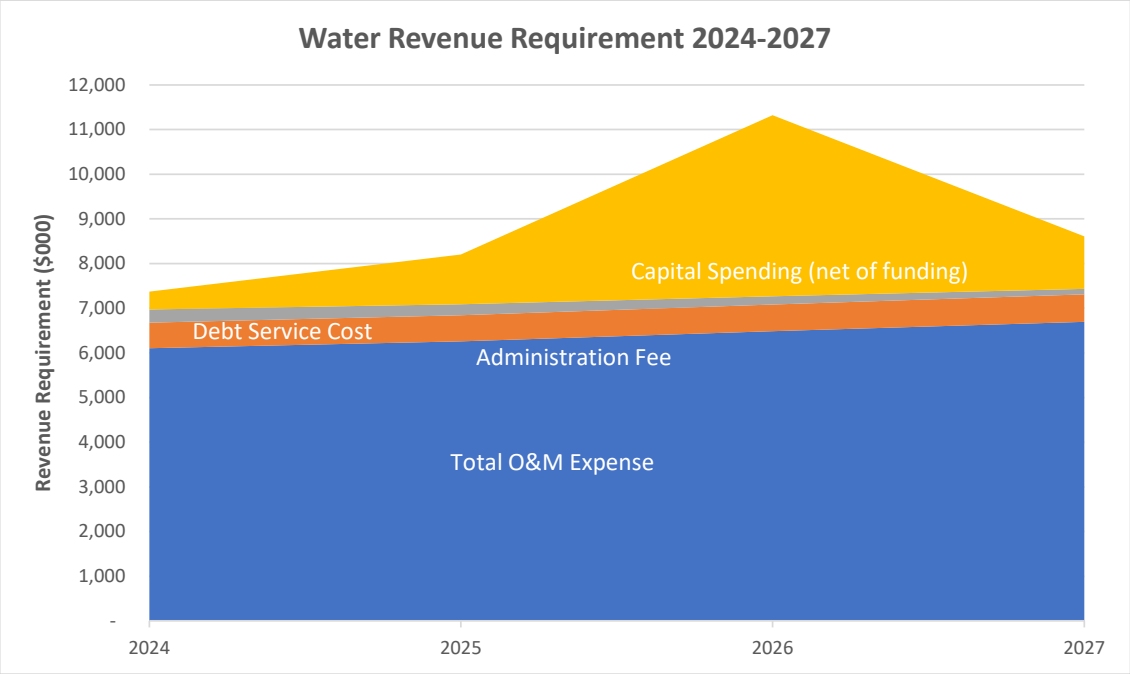

Table 3-2 and Figure 3-1 indicate the following:

- Water service operating costs (wages and supplies & services) are the largest revenue requirement component and are forecast to increase during the 2024-2027 period.
- The 'Total Revenue Requirement' (line 5 in table 3-3) is significantly higher than the Net Revenue as it is driven by the capital spending forecast. However, this capital spending is largely offset by external capital funding. Over the 2023-2027 period, capital spending for the water system totals $40.1 million and capital funding plus a share of the infrastructure levy for the water system totals $38.7 million.
- There is some variance between Net Revenue required and Forecast Revenue on a year-to-year basis, but this variance reduces by 2027. Rates should not be changed annually to reflect fluctuating costs such as capital improvements.

That the City is forecast to generate sufficient revenue to almost entirely fund the operating and capital costs of the water utility is no surprise; systems were in place to ensure that future revenue was sufficient to cover planned system costs. However, this exercise is an important step in developing separate cost of service models for the water and sewer utilities.

A similar methodology was used to develop a forecast for the sewer utility, as follows.

Table 3-4: Sewer Utility Revenue Requirement for 2024-2027 ($000)

Line No.		Forecast 2024	2025	2026	2027
1	**Operation & Maintenance Expense**	**3,687**	**3,838**	**3,965**	**4,089**
1(i)	Wages and Employee Costs	1,488	1,588	1,653	1,721
1(ii)	Supplies and Services	2,199	2,251	2,312	2,368
2	**Administration Fee**	573	587	602	616
3	**Debt Costs for Major Capital**	-	-	-	-
4	**Capital Spending**	**6,060**	**8,350**	**4,000**	**4,000**
4(i)	Sewer Infrastructure Replacement	-	50	1,000	1,000
4(ii)	Other Capital	6,060	8,300	3,000	3,000
5	**Total Revenue Requirement**	**10,320**	**12,775**	**8,567**	**8,705**
6	**Less: Non Rate Revenues**	**7,544**	**7,945**	**4,872**	**4,490**
6(i)	External Capital Funding	6,060	6,267	3,000	2,615
6(ii)	Non-Rate Revenue & Operating Grants	243	243	243	243
6(iii)	Infrastructure Levy	1,241	1,435	1,629	1,632
7	**Net Revenue Required from Treated Water Rates**	**2,776**	**4,831**	**3,695**	**4,215**
8	**Revenues at Exisitng Rates**	**4,170**	**4,170**	**4,170**	**4,170**

Figure 3-2: Sewer Utility Revenue Requirement Trend by Component

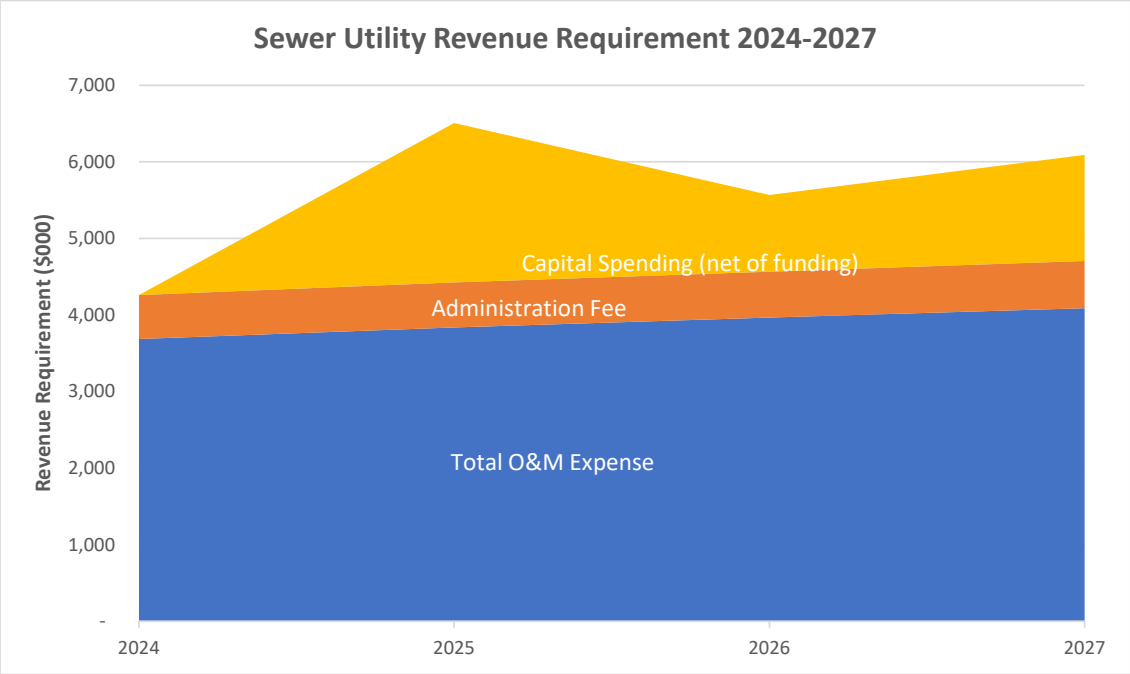

Table 3-4 and Figure 3-2 indicate the following:

- Sewer service operating costs (wages and supplies & services) are the largest revenue requirement component and forecast to increase during the 2024-2027 period.
- There is no existing debt associated with sewer services capital, indicating that capital upgrades have been financed on a cash basis.
- The 'Total Revenue Requirement' (prior to non-rate revenue offsets) is significantly higher for the sewer service, driven by the capital spending forecast that is largely offset by external capital funding (similar to the water service). Over 2023-2027 capital spending is $26.1 million and capital funding plus the 50 percent share of the infrastructure levy totals $26.0 million.

As with the water services forecast, there is some fluctuation between the revenue requirement and forecast revenue, but this variance generally equalizes over time. There will be a relatively small shortfall by 2027.

With the revenue requirement and forecast determined for separate water and sewer services, a detailed cost of service model was then developed for both utilities.

4.0 COST OF SERVICE STUDY

4.1 WATER UTILITY COST OF SERVICE STUDY

The relative levels of rates charged to the various customer classes of a utility are ideally developed based on principles related to the **cost of service**, or the cost to provide the service to these customers. Key cost drivers for water utility costs include:

1) the water demand (at peak day and peak hour),
2) the water consumption, and
3) the number of customers served in each rate class.

A **Cost-of-Service Analysis (COSA)** starts with a utility's revenue requirement, consistent with Manual of American Water Works Association, M1 Principles of Water Rates, Fees and Charges ("AWWA Manual"). The COSA has three key steps:

1) **Functionalization** - the revenue requirement is separated according to function or role that the costs relate to, such as supply and treatment, pumping, transmission and distribution, administration, and general costs.
2) **Classification** - in this step the functionalized costs are classified into cost components according to the AWWA Manual approach (base costs, extra capacity, which includes maximum day and peak hour demands, and customer related costs.
3) **Allocation** - this step the involves allocation of the costs to each customer class based on customer class characteristics (residential, commercial, industrial, etc.).

Upon completion of this analysis, a determination can be made with respect to system costs and the different customer classes that are paying for these system costs. This is referred to as the **Revenue to Cost Coverage Ratio (RCC)**. The RCC is calculated by dividing revenues from a customer class by the costs to serve that customer class. A RCC ratio over 100% indicates that revenues exceed costs and that customers in that class are paying rates higher than the costs to serve them. A RCC ratio of less than 100% indicates that revenues do not fully recover that costs to serve that class of customers.

With respect to the RCC, and with utility costs and revenue recovery generally, there are diminishing returns from trying to allocate every single line-item cost to individual customer classes. As such, consistent with best practices, utilities aim for a **range of reasonableness with respect to the RCC of between 90 percent and 110 percent**.

A detailed COSA for the water utility was prepared for the City based on the revenue requirement forecast to 2027, discussed earlier.

Table 4-1 provides a summary of the water utility RCC ratio by customer class based on existing rates. Additional details of the water utility COSA can be found in **Appendix E**, Cost of Service Study Methods and Results.

Table 4-1: Water Utility Revenue to Cost Ratio for 2027 at Existing Rates

Customer Type	2027 Forecast		
	Revenue Forecast at 2024 Approved Rates ($000)	COS Results ($000)	RCC Ratio
Water Service	**A**	**B**	**C=A/B**
Piped Service	**5,347**	**5,298**	**100.9%**
Residential	2,460	2,478	99.3%
Multi-residential	949	856	110.9%
Commercial	1,877	1,698	110.5%
Bulk (incl. Unmetered)	61	62	98.3%
Community gardens/services/surface lines	0	204	0.0%
Trucked	**908**	**1,436**	**63.3%**
Total	**6,256**	**6,734**	**92.9%**

Table 4-1 reflects the following results from the COSA:

- Overall, there is about a 7 percent under-recovery of water service costs at currently approved rates.
- Residential customers show essentially a full cost recovery, whereas multi-residential and commercial customer classes pay about 11 percent over their cost of service, which is close to within the range of reasonableness of between 90 and 110 percent of the cost of service.
- With an RCC of 63 percent, trucked service customers are under-paying their cost of service for trucked water. The allocated net cost (after non-rate revenue offsets) is $1.436 million (mainly reflecting contracted water delivery), and the revenue from these customers is $0.908 million.
- Community Gardens/Services do not generate any revenue but incur $0.204 million in costs.

4.2 SEWER UTILITY COST OF SERVICE STUDY

The sewer utility COSA was developed in the same manner as the water service COSA, and consistent with the AWWA manual.

After the costs were functionalized, they were classified and subsequently allocated to the appropriate customer class.

In almost all jurisdictions the sewer flows are not metered (except in cases where the customers have effluent meters). Therefore, sewer flows are estimated based on water usage and return factors (not all water used is returned to the sewer system).

The return factor recognizes that a portion of customers' water consumption does not return to the sewer collection system.

In the absence of return factor information by customer type specific to the City of Yellowknife, InterGroup assumed an equal return factor for all customer types. Any potential differences in return factors for different customer classes is deemed to be not material. For modelling purposes a 90 percent return factor for all water consumption was assumed and charged towards sanitary sewer use.

Table 4-2 provides a summary of the RCC ratios by customer class based on existing rates. As with the water utility, additional detail on the sewer services COSA can be found in Appendix D.

Table 4-2: Sewer Utility Revenue to Cost Ratio for 2027 at Existing Rates

Customer Type	2027 Forecast		
	Revenue Forecast at 2024 Approved Rates ($000)	COS Results ($000)	RCC Ratio
Sewer Service	**A**	**B**	**C=A/B**
Piped Service	**3,565**	**3,284**	**108.6%**
Residential	1,640	1,649	99.4%
Multi-residential	633	488	129.7%
Commercial	1,251	985	127.0%
Bulk (incl. Unmetered)	41	37	108.9%
Community gardens/services/surface lines	0	124	0.0%
Trucked	**606**	**931**	**65.0%**
Total	**4,170**	**4,215**	**98.9%**

Table 4-2 reflects the following results from the sewer COSA:

- Overall, there is about 1% shortfall in recovering sewer services costs at currently approved rates.
- Residential piped customers are paying rates that are very close to the actual cost of service (99 percent).
- Multi-residential (130 percent) and commercial customers (127 percent) are paying more than their cost of service and are materially above the range of reasonableness.
- Trucked service customers have a RCC ratio of only 65 percent, significantly below the cost of service. The allocated cost of $0.931 million (mainly reflecting contracted sewer pump out services) is about $0.325 million more than the revenue of $0.606 million.
- While community gardens do not cause any costs to the sewer system, due to the 90 percent return factor discussed above, the model reflects $0.124 million in sewer costs for

community gardens. To eliminate this line item, the $0.124 million could be spread across the customer base, which would make it immaterial.

To further inform the discussion on cost recovery, consider the COSA for the combined water and sewer services.

4.3 COMBINED UTILITY COST RECOVERY

Table 4-3 summarizes total cost recovery by customer class under the existing rates.

Table 4-3: Total Utility Revenue to Cost Ratio for 2027 at Existing Rates

Customer Type	2027 Forecast		
	Revenue Forecast at 2024 Approved Rates ($000)	COS Results ($000)	RCC Ratio
Combined Water & Sewer Service	**A**	**B**	**C=A/B**
Piped Service	**8,912**	**8,581**	**103.9%**
Residential	4,100	4,128	99.3%
Multi-residential	1,582	1,344	117.7%
Commercial	3,128	2,683	116.6%
Bulk (incl. Unmetered)	101	99	102.3%
Community gardens/services/surface lines	0	328	0.0%
Trucked	**1,514**	**2,367**	**64.0%**
Total	**10,426**	**10,949**	**95.2%**

With a RCC ratio of 95.2 percent, the City does not recover the water and sewer forecast revenue requirement at currently approved rates. As noted above, there are customers that are over-paying – multi-residential and commercial customers - and trucked services customers that are underpaying. These customers clearly fall outside of the range of reasonableness of RCC ratios between 90 percent and 110 percent.

Over time, ideally, rate adjustments are made so that all customers pay rates that fall into the range of reasonableness for the services they are provided.

In addition to examining customer costs and revenues, analysis was undertaken on the various rate components of the existing rate structure. Table 4-4 shows revenue and cost coverage ratios by water and sewer fee component.

Table 4-4: RCC Comparison by Revenue Component

	Existing Rate	Revenue at Existing Rate ($000)	Assigned Cost of Service ($000)	Cost Recovery Ratio
Access Fee (Customer-related costs)	9.75 - 202.75	2,465	1,133	218%
Demand Charge	12.25 - 1828.00	1,065	1,692	63%
Consumption charge	4.50 / 4.45	6,896	8,124	85%
Total		10,426	10,948	95%

As reflected, the fees do not recover system costs, with a RCC of 95 percent. With respect to the fee components, the following should be noted:

- Access Fees:
  - Access fees typically reflect customer-related costs. In the COSA, customer-related costs were identified largely as the 15 percent in administration costs transferred from the City's general fund.
  - With a RCC of 218 percent, revenue collected via the access fee is very high. This is due in part to the use of the 'Equivalent Residential Unit' – based on floor space – that is a component of the calculation used in determining the access fee.
  - It is the commercial and multi-residential customers that are paying high access fees due to the ERU component. The average customer is not even covering the cost of service related to the access fee (the COSA for the access fee is $12.67 and the access fee rate is $9.75. For commercial customers, the access fee ranges up to $202.75 due to ERU, much higher than the cost of service).
- Demand Charge:
  - As noted earlier, the demand charge represents the cost to have the infrastructure in place to meet the maximum amount of potential demand for a building.
  - While it is typical that utilities design rates targeting less than full cost recovery from the demand component, the current RCC of 63% is very low.
- Consumption Charge:
  - The consumption charge RCC of 85 percent relatively close to full cost and can be fully resolved over time through a revised rate structure.

As noted earlier, ideally, there is only a fixed-cost component and a consumption cost component to the fee structure. In addition to the above charges, there is also the infrastructure levy and the insurance charge. While these represent 'non-rate revenue', in the interests of simplifying the rate structure, consideration could be given to including these charges within either the fixed or consumption components of a simplified rate structure. To further consider this issue, following is a summary of the findings from a review of other jurisdictions.

5.0 PEER MUNICIPALITY COMPARISON

The Study scope of work requires that the rate recommendations draw upon industry standards such as Canadian Water and Wastewater Association and the American Water Works Association, industry best practices and examples from five other Canadian municipalities of comparable sizes and structure, which also provide piped and trucked service areas.

InterGroup researched Canadian municipalities and identified only three other comparable-sized municipalities that provide piped and trucked utility services – Dawson City, Yukon; the Town of Hay River, NT, and Iqaluit, Nunavut. With respect to other aspects of the rate review, InterGroup added Haines Junction, Yukon, and Whitehorse, Yukon to this list as comparators.

The review focused on understanding the rate structure of the municipalities (fixed vs variable charges; customer categories; utility rates approach) and the level of cross-subsidies that may exist (as currently exist between Yellowknife piped and trucked services). Where possible, InterGroup followed up with the municipal utilities directly to discuss their approach to water and sewer rates.

Table 5-1 summarizes the peer utility review findings with respect to key characteristics, with additional highlights detailed below.

Table 5-1: Peer Municipality Comparison Summary

	Yellowknife	Dawson	Hay River	Iqaluit	Haines Junction	Whitehorse
Fixed Charges	X	X	X		X	X
Variable Charges	X		X	X	X	X
Multiple Fixed Fees	X					
Different Consumption Rates by Class			X			
Separate Water and Sewer Rates		X	X			
Piped and Trucked Water Service	X	X	X	X		
Piped and Trucked Sewer Service	X			X		
Trucked Water Subsidized by Piped	X		X	X		

Overall, the following is noted with respect to the peer municipalities review:

- The City of Yellowknife is the only municipality that has multiple fixed fees per customer in its rate structure.
- Most of the peer utilities charge both fixed and variable fees for water and sewer services.
- Most municipalities do not have different consumption rates by customer class.
- Two utilities – Dawson and Hay River - set separate rates for water and sewer services.
- In Hay River and Iqaluit, trucked services are subsidized to a degree by piped services. In Dawson, Yukon, both piped and trucked services are subsidized by property taxes and government grants.

5.1 SUMMARY

The City of Yellowknife rate structure includes two fixed fees, the access fee and demand charge, as well as an infrastructure levy. None of the peer municipalities reviewed have multiple fixed fees in their rate structure. The City's rate structure also includes the previously referenced Equivalent Residential Unit component (based on floor space) applied to some fees, including the access fee.

Again, none of the peer utilities reviewed include an ERU component in their water and sewer rate structure.

All of the municipalities, (other than Hay River), have the same consumption charges for metered residential and commercial customers.

In discussions with the peer municipalities, most recognized that their systems currently reflect various degrees of subsidization and cross-subsidization between services, and for some, between different customer classes. With reference to Table 3-1, the Yellowknife Revenue Requirement, with nearly $5 million in external capital funding, the Yellowknife system is subsidized by up to 30 percent. This is not necessarily a problem as long as external funding is maintained. Establishing reserve funds (discussed later in this paper) is one way to help in planning future system costs and mitigate any potential risks associated with external capital funding.

The key area of focus in this review is that of cross-subsidization and the rationalization of rates that are ideally based on consumption.

The three municipalities (Dawson, Hay River and Iqaluit) provide both piped and trucked water and/or sewer service all recognize the issue of cross-subsidization:

- Dawson City provides piped water, trucked water and piped sanitary sewer. The 'block charges' in Dawson are not tied to costs and in correspondence, city officials note that the city is working towards a more sustainable approach to the system (with no metered rates, Dawson can be considered somewhat of an outlier).

- The Town of Hay River similarly provides piped water, trucked water and piped sanitary sewer. The Town does not provide trucked sanitary sewer services. It is up to the customer to seek out and pay their own service provider for trucked sanitary sewer service.

- The water rates for truck water delivery are set at increasing block rates per gallon, which are significantly higher than the rates for piped water consumption. Additionally, the trucked water rates are even higher for commercial and government customers. The rates for residential truck water delivery ranges from $43.05 to $162.52 per gallon in 2021. The rates are set at $160.86 per gallon for commercial customers and at $182.80 per gallon for government customers. There is clearly a level of cross-subsidization.

- The City of Iqaluit provides both piped and trucked water delivery and sewer service. Both piped and trucked service customers pay the same rates for the water/sewer service.

  A city report from 2015 states that the City analyzed all water/sewer accounts for inefficiencies, overspending and areas where cost savings could be realized. As per the analysis, the Water and Sewer Fund (which pays for both piped services and trucked services) was noted to be running an average deficit of about $1M per year for the past five years and the majority of this deficit was determined to be directly attributable to the cost of delivering trucked services.

  The City notes that trucked services accounts for approximately 11% of the demand for water and sewer services, yet uses approximately 40% of the Water & Sewer Fund. The document states that considering that both residents served via truck and residents served via pipes pay the same rates, the effect is that piped service residents heavily subsidize those residents on trucked water.

It should be noted that there have been some unique challenges with the Iqaluit's water system, including a water crisis where the city was without clean tap water for two months in 2022. However, the City of Iqaluit's water and sewer services funding structure remain a valid comparator to the City of Yellowknife for analysis of their cross-subsidization of trucked services as the funding system is not impacted by the recent water crisis challenges in the City.

In conclusion, none of the peer municipalities reviewed have relatively straightforward rate structures representing the true cost of service. However, all individuals contacted recognized that that is the ideal to work towards.

Detailed peer municipalities review, including reference documents and notes from direct contacts with the municipal utilities reviewed are provided in Appendix F.

6.0 RECOMMENDED APPROACH TO RATE STRUCTURE

A number of observations and conclusions have been drawn from the preceding analysis:

- The water and sewer rate structure has evolved over time to be very complicated, and it has been many years since a full review has been undertaken.
- There are multiple fixed fee components – the demand charge, the access fee, the infrastructure levy, and the insurance charge. No other municipality takes this approach.
- The current rate structure utilizes the concept of *Equivalent Residential Unit (ERU)* that essentially utilizes floor space in determining charges for commercial customers. However, this concept does not capture or track the true cost of service. For example, a business with a substantial amount of floor space that has one bathroom and utilizes very little water or sewer services will receive very sizeable utility bills. No other municipalities reviewed take this approach.
- While the current rate structure does take into account both trucked and piped services, it does not distinguish between water and sewer services, meaning there is no specific charge for sewer services. This is important in terms of sending the right price signals and in planning for future development and system requirements.
- Rates do not reflect the actual cost of service to various customers and there is a degree of cross-subsidization throughout the system, but most notably, between piped services and the more expensive trucked services.
- The revenue to cost coverage ratio for combined trucked water and sewer services is 64 percent. The range of reasonableness is generally considered to be between 90 percent and 110 percent.
- In addition to cross-subsidization, the full revenue requirement to cover system costs is partially collected via non-rate revenues. In this context all customers are being subsidized by other government funding of about $3.8 million in the example of 2027 forecast. As well, there is about $2 million per year in non-rate revenue from the *Infrastructure Levy* found on utility bills. With approved increases in the infrastructure levy, this revenue is projected to increase to $3.3 million by 2027.

Consider these findings in the context of generally accepted utility rate principles and objectives, consistent with the AWAA manual and industry best practices, such as:

- ***Recover Full Cost of Providing Service:*** This ensures that the utility is sustainable in the long term and not underfunded or subsidized by other municipal revenues.
- ***Rates Should Reflect the Costs to Serve Customers***
- ***Rates and Fees Should be Easy to Understand:*** This speaks to the use of a complicated ERU noted above.

- ***Send a Price Signal to Consumers Regarding the Costs of Consumption:*** Simply put, this principle is about using a combination of fixed and variable rates that results in charging higher users more than lower users.
- ***Ensure Administrative Efficiency and Simplicity***
- ***Implement Separate Rates and Fees for Water and Sewer Utilities***
- ***Unexpected Changes to Customers Bills Should be Minimized***

While these objectives (or principles) should guide the way forward, due to the complexity of the undertaking, as well as 'rate shock' for certain customers, it would be difficult to address all of these issues at once. The recommended rate structure and the associated customer bill impacts are presented below.

6.1 A PHASED APPROACH TO RATE RE-STRUCTURING

To minimize rate impacts, recommendations for the rate structure are as follows:

1. Link the Access Fee to the cost of service study results and remove ERU to simplify the rate structure. This reduces commercial and multi-residential revenue (due to ERU removal) but increases residential revenue (due to Access Fee increase for residential customers to ensure it covers the cost of service).
2. Implement separate water and sewer rates.
3. Set separate residential and commercial/multi-residential consumption rates to minimize the bill impacts from removal of ERU in the Access Fee calculation. Over time, consumption rates should be consistent across customer classes.
4. Target 90% combined water/sewer utility RCC ratio for the trucked service.
5. Reduce multi-residential and commercial classes rates, which have very high RCC ratios, with incremental revenue from other rate adjustments.

Under this option, in the interim period the ERU component of the access fee will be phased out.

Note that ERU will continue to apply to the Infrastructure Levy as per the current rate structure.

Table 6-3 summarizes total revenue and cost recovery by customer class under this option.

Table 6-3: Utility Revenue to Cost Ratio for 2027 With a Phased Approach to Rate Re-Structuring

Customer Type	2027 Forecast			COS Results ($000)	RCC Ratio
	Water	Sewer	Total		
	A	B	C=A+B	D	E=C/D
Piped Service	**5,517**	**3,301**	**8,818**	**8,581**	**102.8%**
Residential	2,536	1,592	4,128	4,128	100.0%
Multi-residential	993	554	1,547	1,344	115.1%
Commercial	1,924	1,105	3,029	2,683	112.9%
Bulk (incl. Unmetered)	64	50	114	99	115.1%
Community gardens/services/surface lines	0	0	0	328	0.0%
Trucked	**836**	**1,295**	**2,131**	**2,367**	**90.0%**
Total	**6,353**	**4,596**	**10,949**	**10,949**	**100.0%**

The following is noted with respect to the RCC ratios by class by 2027:

- Trucked service RCC ratio is increased to 90%.
- Full cost recovery in the residential class RCC ratio (100%).
- Multi-residential and commercial class RCC ratios reduced to 115.1% and 112.9% (from current 117.7% and 116.6%)
- Piped service still subsidizes trucked service, however the piped service RCC ratio reduced from 103.9% to 102.8%

Estimated average annual bill impacts over a three-year implementation period for the recommended rate structure are presented in Table 6-4.

Table 6-4: Bill Impacts for a Phased Approach to Rate Restructuring

Customer Classes	Phased Approach: W&S Rate and Fee Changes Only		
	Annual %	Annual $	3 Year $ Impact
Residential Average Bill (12 M3)	0.0%	$0	$0
Multi-Residential			
Average Bill (200 m3)	-0.7%	-$125	-$375
High Consumption (347 m3)	-5.2%	-$3,636	-$10,907
Commercial			
Average Bill (40 m3)	-1.7%	-$68	-$203
Low Consumption (3 M3)	-9.2%	-$526	-$1,578
High Consumption (1,348 m3)	-0.3%	-$319	-$957
Trucked			
Average Bill (8 m3)	9.6%	$231	$693
Low Consumption (5 m3)	8.9%	$167	$501
High Consumption (130 m3)	5.9%	$724	$2,173
Mid-Consumption (66 m3)	4.7%	$326	$977

As the current situation evolved over a period of 20 years, Intergroup is recommending the phased approach over at least the next five years, with a focus on rate simplification early on and moving towards appropriate cost recovery over time:

- The first proposed step is to focus on rate rebalancing; implementation of separate water and sewer rates; adding rate premiums to trucked sewer service; and removing ERU from Access Fee charge. This would be implemented over three years.
- In year four, the City should look at further simplifying rate structure by rolling Infrastructure Levy into the water and sewer rates.
- The final phase – year five or six - should limit the rate structure components to only demand and consumption charges for both water and sewer utilities.

As noted earlier in this report, the rate impact on trucked customers has increased significantly from the Interim Report released in June 2023. At that time, proposed rate increases for trucked services customers were in the 5 percent range and in the table above, rate impacts are 9.6 percent per year for three years for the average customer on trucked services. Since that time, costs have increased as follows:

Category	2023 Analysis	2024 Update	Change ($000)	Main Drivers
Expenses				
Wages, Employee Costs	3,311	3,804	493	A 15% increase in costs reflected in City's 2024-2026 budget - spread across all sales
Supplies and Services	5,526	6,979	1,453	A 26% increase in costs reflected in City's 2024-2026 budget - spread across all sales
Contracted services	*2,643*	*3,511*	*868*	A 33% increase in trucked service costs in 2024
Utilities - fuel	*505*	*857*	*352*	A 70% fuel cost increase, spread across all sales
Revenues				
User fees	10,325	10,426	101	2.6% fees increase in 2024
Infrastructure Levy	2,107	3,264	1,157	A 55% increase in levy revenue, from $13.5 to $21 by 2026
Net Cost Increase			**688**	Cost increase not offset by revenue

It should be noted that the rate impact for trucked services does not include any costs related to piped system and distribution costs, even though there are clearly some of these costs associated with providing trucked services. InterGroup removed these costs to be seen as responsive to some comments received during the public engagement process (see Appendix A) and to minimize the rate impacts on trucked services customers as much as possible. Making this change based upon the costs in the Interim Report would have reduced rate impacts to 3.5 percent per year. However, with the increased costs in the table above, the rate impact has risen to 9.6 percent for the average customer on trucked services. These cost increases were partially addressed through across-the-board rate increases in 2024, but as can be seen, there remains a deficit of $688,000.

As a final issue with respect to this analysis and the recommended option, further consider the issue of cross-subsidization. Should trucked services 'pay their own way', or should some level of cross-subsidization remain in place? This is not an easy item to debate and there is often no 'right answer'. As reflected in the review of other municipalities, Hay River and Iqaluit still cross-subsidize trucked services, although they recognize that it is not ideal. Typically, debates revolve around the following points:

- **No Real Difference in Service** – all residents require water and sewer services.
- **Not a Choice Individual Consumers Can Make** – trucked versus piped services are determined by geography.
- **Perception of Fairness** – full cost of service or some level of equal access to similar services that have different cost structures?
- **Historical Considerations** – there may be relevant historical considerations that support one approach or the other. Anecdotally, it appears that the GNWT did provide financial support specifically for trucked customers in the past, but these previously ear-marked funds have now been bundled into general City financing.

- **Rates Can Impact Development Patterns** – for example, some businesses, particularly those with high water usage, may choose to locate in areas of the City with lower-cost piped services.

Based upon the COSA, discussions with other municipalities, and discussions with City staff, InterGroup is recommending a phased approach, where the Infrastructure Levy and Insurance Premium are not rolled into rates at this time, therefore minimizing the impacts on customer bills. This approach still separates water and sewer charges, simplifies the approach to rates, and does move trucked services into the range of reasonableness, with a 90% RCC ratio.

InterGroup is not recommending the maintenance of direct cross-subsidization between piped and trucked services. It can be argued that the recommended approach does reflect a minimal degree of cross-subsidization as trucked services are at a 90% RCC ratio and the RCC for a number of piped customers is over 100%. However, if a decision was made to move beyond the range of reasonableness of 90%, reducing rates for trucked services, it is recommended that it be an identified cross—subsidy, not hidden within the cost-of-service model. This will ensure future service and development decisions are made in the context of actual costs.

Table 6-5: Recommended Option Rate Structure

	Existing Rates	Recommended Option						
		Water			Sewer			Combined
	2024	2025	2026	2027	2025	2026	2027	2025
Access Fee - Piped Water	$ 9.75	$ 3.22	$ 3.54	$ 3.89	$ 7.51	$ 8.26	$ 9.08	$ 12.98
Access Fee - Trucked Residential	$ 70.75	$ 23.79	$ 26.66	$ 29.87	$ 55.50	$ 62.20	$ 69.70	$ 99.57
Access Fee - Trucked Commercial	$ 202.75	$ 68.16	$ 76.39	$ 85.60	$ 159.05	$ 178.23	$ 199.74	$ 285.34
Monthly Demand Charge								
5/8	$ 12.25	$ 12.25	$ 12.25	$ 12.25				$ 12.25
3/4	$ 18.25	$ 18.25	$ 18.25	$ 18.25				$ 18.25
1	$ 30.50	$ 33.55	$ 38.58	$ 46.30				$ 46.30
1.5	$ 67.00	$ 73.70	$ 84.76	$ 101.71				$ 101.71
2	$ 115.75	$ 127.33	$ 146.42	$ 175.71				$ 175.71
3	$ 256.00	$ 281.60	$ 323.84	$ 388.61				$ 388.61
4	$ 451.00	$ 496.10	$ 570.52	$ 684.62				$ 684.62
6	$ 1,036.00	$ 1,139.60	$ 1,310.54	$ 1,572.65				$ 1,572.65
8	$ 1,828.00	$ 2,010.80	$ 2,312.42	$ 2,774.90				$ 2,774.90
Consumption Charge per cubic meter								
Piped - Residential	$ 4.50	$ 2.82	$ 2.95	$ 2.57	$ 1.88	$ 1.97	$ 1.71	$ 4.28
Piped - Comm/MR	$ 4.50	$ 2.98	$ 3.27	$ 3.05	$ 1.99	$ 2.18	$ 2.03	$ 5.09
Trucked	$ 4.45	$ 2.99	$ 3.35	$ 3.76	$ 1.99	$ 2.24	$ 2.51	$ 6.26
Over 4.550 m^3 (Trucked only)	$ 25.38	$ 17.07	$ 19.13	$ 21.43	$ 11.38	$ 12.75	$ 14.29	$ 35.72
Bulk	$ 5.77	$ 3.60	$ 3.74	$ 3.89	$ 2.40	$ 2.50	$ 2.60	$ 6.49
Infrastructure Levy ($/ERU)	$ 16.00	$ 18.50	$ 21.00	$ 21.00				$ 21.00
Insurance Premium ($/ERU)	$ 10.00	$ 10.00	$ 10.00	$ 10.00				$ 10.00

7.0 OTHER RECOMMENDATIONS: UTILITY SUSTAINABILITY

While the focus of this review was on the rationalization of the water and sewer rate structure, there were other issues to be addressed, as identified in the study terms of reference:

- Some City contractors feel they are not being adequately compensated for some service call-outs with respect to trucked services.
- There are some users of the water and sewer system that are not being fully charged for all the costs incurred by the system. This would include, for example, some residents outside of the municipal boundaries. These amounts in total are not material in terms of system costs, but in principle, all users should have a utility account with the City.
- The City does not currently have over-strength matter regulations. This issue and a proposed way forward is discussed below.
- While not specifically in the study terms of reference, recommendations are also provided with respect to the establishment of reserve funds.

7.1 ADDITIONAL SEWAGE DISPOSAL CHARGES

There are a number or trucked services customers that require more than two deliveries/pick up per week. InterGroup is aware of the trucked water delivery and sewage collection contract revisions during 2024. However, the City's arrangement with the contractors as of beginning of 2024 is based on the following:

- The water contractor receives payment based on gallons of water delivered plus a fixed fee for each delivery above two per week.
- The sewage contractor is paid a fixed charge covering two pick ups per week. Any additional stops are currently considered a private arrangement between the sewage contractor and the customer.

One issue with respect to the private arrangements between the sewage contractor and customer is that the sewage from the additional trip is still released into City facilities but there is no charge to the customer for this. The customer is only paying the transportation costs.

The review of the current arrangements, including discussions with the City's contractors, identified several potential concerns with the current structure:

- Sewage contractors have noted payment asymmetry between water and sewer trucked service. Water delivery contractor is compensated based on the volume delivered plus delivery charges for incremental trips over two per week, whereas sewage contractor does not get compensated on a per volume collected basis.

- There are also some customers who are on piped water and pumped sewage with large sewer tanks. This also requires more than two sewage pick ups not covered by the City contract, for which these customers pay directly to the sewage contractor.

- Extra delivery/pick up payments arranged directly between customers and the contractor and not through the City. With respect to the private arrangements between the sewage contractor and customer, the understanding is that the sewage from the additional trip is still released into City facilities but there is no charge to the customer for this. The customer is only paying the transportation costs.

From the utility revenue requirement perspective, the rates require to be designed to collect the costs included in the revenue requirement. So long as the City recovers the cost of trucked service (commodity and transportation) the payment mechanism issues will be outside of the rate design.

Two options have been identified to address this issue:

InterGroup developed a proposal that links delivery and volume components of the trucked water and sewer service. It is noted however that this proposal can only be implemented after corresponding revisions have been made to the current contract arrangements for trucked service.

- **Option 1**: Add a volumetric component (m3) to the City contract fee for sewage.
    - This is possible with the proposed separate rates for water and sewer service.
    - The sewer volumetric component can be linked to water delivery volumes based on some return factor parameter (i.e. ratio of water delivered to be returned via sewage. The earlier discussion regarding sewer rates was based upon a return factor of 90 percent). To implement this option, current cost information will be required from the City contractor.
    - Extra delivery charges (over two per week) remain arranged between customers and contractor. With volumetric rates developed, the City would be able to ensure that the full cost to the City of additional sewage pick ups is being appropriately charged.

      It is noted however that this proposal can only be implemented after corresponding revisions have been made to the current contract arrangements for trucked service. The approach requires that associated costs are defined with the contractor, included in revenue requirement and reflected in rates. Note that this is a cost arrangement issue with the contractor and not a rate design issue per se.
- **Option 2**: Fixed fee for additional sewer pick up:
    - As per InterGroup's discussion with the contractor, they need 0.5 hours for an extra trip at $150/hr, translating to a charge of $75/trip. Considering the contractor can service multiple customers with one truck load, $50/trip is recommended as the initial rate for additional sewage pick up.

It is recommended that these options will be further discussed with City contractors.

7.2 NON-RESIDENT BILL SURCHARGE PROPOSAL

There is a small number of out-of-town (non-resident) customers who purchase water from the City's trucked service contractor and directly pay the City's contractor for sewage pick up (i.e. non-resident customers do not have accounts with the City).

As these non-resident customers are located outside of the City and do not have accounts with the City, they should pay for the commodity (i.e. water), but are not expected to pay towards the non-commodity costs of the utility (transmission, distribution, administration, sewer collection).

The COSA shows that the commodity cost is $5.11/m3. The City charges the water contractor a bulk rate of $5.60/m3, so the City is fully recovering the cost of commodity to supply to non-resident customers.

However, if the City intends to generate additional revenue from non-resident customers, a premium could be added to the bulk water and sewer rates charged to City contractors. For example, the City of Penticton has 10 percent premium added to out-of-town customer bills to ensure some level of contribution towards non-commodity costs. This was implemented by a council decision and not driven by a cost of service analysis.

The bulk water volume is approximately 1% of the total volume billed. Assuming bulk purchases are mainly done for resale to non-resident customers, the easiest option for the City would be to increase bulk water rates (e.g. by 10%).

Increasing bulk water rates will not require non-resident customer consumption information from the water contractor.

If non-resident customers are a smaller portion of the bulk purchase users, then a premium could be added to the volume purchased by the contractor for resale to non-resident customers. However this requires working with the contractor to obtain the volume delivered to these customers and ensure that the surcharge/premium is collected and transferred to the City (considering that non-resident customers do not have accounts with the City).

7.3 OVER STRENGTH MATTER REGULATIONS

Over strength matter refers to the concentration of dissolved and suspended matter in sewage, as indicated by biochemical oxygen demand or suspended solids. Simply put, over strength matter places additional demands on the sewer system and as such, regulations and appropriate rates should be in place to manage the discharge of over strength matter into the system.

The study Terms of Reference note that City of Yellowknife is lacking clear regulations pertaining to over strength matter discharges to sewage and storm water systems. As part of the study, the City requested development of these regulations and potential surcharges to permit the discharge of over strength matter in accordance with best environmental practices for lagoon and wetlands treatment systems.

This assignment was addressed by undertaking a review of the relevant documents and by having discussions with relevant staff from municipalities and regulators. Detailed analysis of the issue and InterGroup's recommendations with respect to the over strength matter regulations are provided in Appendix F.

7.4 UTILITY RESERVE ACCOUNTS

While not specifically included in the study terms of reference, InterGroup is proposing that the City consider establishing reserve accounts within their accounting structure. Currently funding for the water and sanitary sewer utility comes from revenue generated from water and sewer billing, grants, the Water and Sewer Fund and the Capital Fund. It is noted that there is no separation of revenue and expenses for the Water and Sanitary Sewer Utility and the Capital Fund is not specific to the Water and Sanitary Sewer Utility but is used to fund other capital projects in the transportation and facilities areas.

With the separation of water and sewer rates, the City should move towards treating the water and sewer operations as separate utilities. The chart of accounts should be revised to create separate cost and revenue centers as well as specific account numbers for the water and sewer utilities so that expenses can be properly budgeted for and tracked. As well, establishing reserve funds specific to the water and sewer utilities is advised. Reserve funds allow for the management of anticipated future expenditures. It contains funding for capital improvements and provides a mechanism to smooth out costs over time.

The City of Yellowknife currently uses two reserve accounts to fund water and sanitary sewer requirements. The first is the Water and Sewer Fund. The second is the Capital Fund which funds not only water and sanitary sewer projects but also other projects such as transportation and facilities.

In the recent past the City of Penticton established a Reserve Policy that codified the purpose and amounts that should be maintained in reserves. The City of Yellowknife should consider the following and look at establishing its own Utility Reserve Policy for water and sewer.

- Two different reserve balances should be established:
    - A Minimal Reserve Balance to ensure that the reserve is not depleted to the degree that it is no longer able to serve its intended purpose; and
    - An Optimal Reserve Balance to meet the guiding principles of the reserve and to ensure that excess funds are not remaining idle that could be used for other corporate priorities.
- The guiding principals of the reserve should be to:
    - Ensure stable and predictable levies so that residents and businesses are not adversely affected by large rate increases;
    - Focus on long-term financial sustainability to ensure reserve levels are sufficient to achieve community goals.
    - Safeguard and maintain existing assets by replacing assets in accordance with their life cycles while managing the risk of asset failure.
    - Providing for operating emergencies resulting from climatic events, catastrophic events, law enforcement events, legal claims, insurance claims, environmental hazards and changes to legislation and regulation.
    - Finance new capital assets to match one time grant funds or to leverage external funding to quickly respond to opportunities.

- The City of Yellowknife should consider setting the following utility reserves:
  - Sanitary Sewer Capital Reserve – To fund sanitary sewer utility equipment and infrastructure. Minimum Reserve Balance 2% of the total cost of the sanitary sewer fund tangible capital assets. Optimum Reserve Balance 5% of the total cost of the sanitary sewer fund tangible capital assets.
  - Sanitary Sewer Surplus – To provide working capital for sanitary sewer operating and capital funding. Minimum Reserve Balance 7.5% of net annual expenditures. Optimum Reserve Balance 15% of net annual expenditures.
  - Water Capital Reserve – To fund water utility equipment and infrastructure. Minimum Reserve Balance 2% of the total cost of the water fund tangible capital assets. Optimum Reserve Balance 5% of the total cost of the water fund tangible capital assets.
  - Water Surplus – To provide working capital for water operating and capital funding. Minimum Reserve Balance 7.5% of net annual expenditures. Optimum Reserve Balance 15% of net annual expenditures.

8.0 SUMMARY OF FINDINGS AND RECOMMENDATIONS

This water and sewer rate structure review has provided the City with a detailed analysis of the water and sewer revenue requirement and detailed cost of service models for separate water and sewer utilities. This work will provide the City with useful planning and analysis tools to help manage the system into the future.

This analysis articulated the level of cross-subsidy between piped services and trucked services as well as highlighted issues with respect to the use of floor space – the Equivalent Residential Unit – in establishing rates. The use of the ERU concept is dated in terms of industry best practices. Most jurisdictions base rates on the quantity of water used.

A review of peer municipalities provided a number of findings that pointed to the need for the City to simplify its current rate structure:

- None of the peer utilities reviewed include an ERU component in their water and sewer rate structure.
- None of the peer municipalities reviewed have multiple fixed fees in their rate structure.
- Most of the peer utilities charge both fixed and variable fees for water and sewer service.
- Most municipalities do not have different consumption rates by customer class.

While some of the utilities noted that there is a degree of cross-subsidization within their rate structure, they all acknowledged that this is not an ideal approach. At the very least, levels of cross-subsidy should be clearly reflected in the rate structure.

Based upon a detailed COSA, InterGroup is recommending a phased approach to rate restructuring as the resulting bill impacts are spread out over time:

- The first proposed step is to focus on rate rebalancing; implementation of separate water and sewer rates; adding rate premiums to trucked sewer service; and removing ERU from Access Fee charge. This 'phased approach' would be implemented over three years.
- In year four, the City should look at further simplifying rate structure by rolling the Infrastructure Levy into the water and sewer rates.
- The final phase – year five or six - should limit the rate structure components to only demand and consumption charges for both water and sewer utilities.

The extended time frame for the project due to events including public health orders in 2021 and the wildfire evacuation in 2023 resulted in somewhat of a moving target as costs increased over this timeframe. By not having a cost-of-service model or a clear rationale for the establishment of fair and defendable water and sewer rates, the problem was exasperated over this time, with the level of cross-subsidization from piped services customers to trucked services customers

increasing. This resulted in the impact on the average trucked services customer increasing from 5 percent per year for three years to 9.6 percent per year.

Finally, this review provided a number of other recommendations:

- Develop additional sewage disposal charges for trucked customers requiring more than two trips per week, as covered by the existing City contract. Two options were presented; a volumetric component or a fixed fee. This issue will be further discussed with City contractors. It is important that customers requiring extra services pay for all of the costs associated with these services, and not just the additional transportation charge from extra call-outs.

- Develop a non-resident bill surcharge to capture those customers utilizing City water and sewer services but only paying the cost of the commodity and making no contribution towards infrastructure costs. For simplicity, it is proposed that a 10 percent surcharge be added to non-resident rates.

- Implement recommendations with respect to Water and Sewer Services Bylaw 4663 and Fees and Charges Bylaw 4436 to address Over Strength matter regulations.

- Establish utility reserve accounts.

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