

# MEMO

**To:** Lincoln Water and Sewer Commissioners  
**From:** Dave Fox, Manager, Raftelis  
**Date:** May 8, 2020  
**Re:** Water and Sewer Rate Study – Preliminary Results

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## Introduction

Raftelis Financial Consultants, Inc. (Raftelis) was engaged by the Town of Lincoln, New Hampshire (Town or Lincoln) to conduct a Water and Sewer Rate Study in order to assess the financial situation of the Town's Water and Sewer utilities, and to develop water and sewer rates and subsequent customer impacts of changing the Town's existing methodology for billing water and sewer. This memo will serve as a project update as to the work that we have completed, assumptions made, and the analyses that we have completed thus far. Raftelis has developed a Rate and Financial Model that projects revenue and revenue requirements to fiscal year (FY) 2050, as well as an affordability dashboard that calculates the financial burden of customers who fall into the lowest quintile, or the bottom 20% of the range of household incomes in the Town, and median household income brackets.

## Data Collected and Model Assumptions

When designing new water and sewer rates for the Town, Raftelis received relevant information that aided in calculating new rates, which included revenue requirements, Capital Improvement Plans (CIP), and the number of accounts in the Town. Our findings and calculations, as well as assumptions made to complete the calculations, are outlined below.

### Revenue Requirements

Raftelis received information regarding the annual revenue requirements for the Town, starting with FY 2016 to FY 2019. To project the future revenue requirements of the Town, Raftelis assumed a 3% increase per year for total revenue requirements, which is consistent with the national standard of inflation.

The CIP for the Town consists of several For CIP and financing, it was assumed that the repayment period for all proposed debts would be a 20-year period, with a 2-4% interest rate, depending on the source of the loan to fund capital projects. Revenue-backed loans for all water- and sewer-related capital projects were assumed to take on a 4% interest rate, while state-revolving fund loans for water and sewer capital projects were assumed to take on a 2% interest rate.

Existing debt service payments were logged into the model based on the debt service information received by Raftelis from the Town. We assumed the debt schedule would be paid in full each year from FY 2020 and beyond based on each issuances repayment schedule.

After establishing these assumptions, Raftelis forecasted the revenue requirements for each year until FY 2050. Although our model is forecasted 30 years, we focused our attention on the first five. The next five projected fiscal years of estimated revenue requirements can be seen in Table 1.

**Table 1. Forecasted Revenue Requirements, FY 2021 - FY 2025**

	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
	Projected	Projected	Projected	Projected	Projected
<b>Water Cashflow</b>					
<u>Revenue Requirements</u>					
Operating Expenses	\$ 382,704	\$ 394,185	\$ 419,510	\$ 418,191	\$ 430,736
Existing Debt Service	223,220	125,638	104,900	-	-
Proposed Debt Service	-	36,694	36,694	36,694	36,694
Cash-Funded (PAYGO)	200,000	216,000	216,000	212,000	206,000
<i>Subtotal: Water Revenue Requirements</i>	<i>\$ 805,924</i>	<i>\$ 772,516</i>	<i>\$ 777,104</i>	<i>\$ 666,885</i>	<i>\$ 673,430</i>
<b>Sewer Cashflow</b>					
<u>Revenue Requirements</u>					
Operating Expenses	\$ 265,490	\$ 273,455	\$ 281,659	\$ 290,108	\$ 298,812
Existing Debt Service	-	-	-	-	-
Proposed Debt Service	-	36,694	36,694	36,694	36,694
Cash-Funded (PAYGO)	285,000	285,000	135,000	135,000	120,000
<i>Subtotal: Sewer Revenue Requirements</i>	<i>\$ 550,490</i>	<i>\$ 595,149</i>	<i>\$ 453,353</i>	<i>\$ 461,802</i>	<i>\$ 455,506</i>
<b>Total: Water &amp; Sewer Revenue Requirements</b>	<b>\$ 1,356,414</b>	<b>\$ 1,367,665</b>	<b>\$ 1,230,457</b>	<b>\$ 1,128,687</b>	<b>\$ 1,128,936</b>

## Revenues

Raftelis used the projected revenue requirements to construct water and sewer rates to fully recover the projected revenue requirement from FY 2021 for both water and sewer and apply these rates to future fiscal years. To calculate the financial potential of generating revenues from water and sewer rates, we made several assumptions regarding water consumption, the number of water accounts, and the structure of both volumetric and fixed charges for water and sewer. Fire charges were not included in this study, as it was assumed that public and private fire charges would not be used to recover the projected revenue requirements.

The first assumption made was that the billing cycles for the Town would be on a quarterly basis; customers would be billed every three months for their water and sewer consumption. Since the Town has not read meters for ten years, making previous consumption data relatively unreliable, we assumed that each year, the Town of Lincoln would consume 192,136 thousand gallons (Kgals), or 192,136,000 gallons of water. This number was contrived from a recent pumping study performed for the Town. The study looked at seasonal water production, which yielded the water consumption assumption of 192,136 Kgals, as the study served as a reasonable estimate for customer water consumption. We also assumed that there were approximately 3600 active water and sewer accounts. Each individual customer account represented a water and sewer account.

When designing the water and sewer rates for the Town, we assumed both fixed and volumetric charges for water and sewer for all utility customers. Fixed charges are flat charges that are the same every quarter for a customer and are to help fund the costs associated with meter repairs, replacements, maintenance, and billing. Volumetric charges are charges based on water consumption. We made several assumptions when establishing water and sewer rates for the Town, which include:

- Billed sewer consumption would be based on billed water consumption. This assumption is in line with many billing practices of other municipalities: other municipalities bill sewer consumption as a portion of or equal to metered water consumption.
- 20% of revenues generated from the established rates would come from fixed charges, while the remaining 80% of revenues would come from volumetric charges. This is for revenue stability purposes, as the portion of revenue coming from fixed charges will be consistent and steady each year, while volumetric charge revenues are much more volatile, as they are based on customer consumption behaviors;
- Fixed charges would be constructed so that they follow the American Water Works Association Industry Standards. These standards are ratios that scale the fixed charge prices based on the size of the meter; this means that, the larger the meter size, the higher the fixed charge would be for that customer.

Raffelis has provided within its Financial Model a tool that allows the Town to change these assumptions and recalculate new water and sewer rates based on the applied changes to the assumptions made above. Water and sewer calculated fixed and volumetric charges are shown in Table 2, which is split by whether the charge is for water or for sewer.

*Table 2. Calculated Water and Sewer Rates to go into Effect FY 2021*

	<u>FY 2021</u>
	<i>Projected</i>
<b>Water Rates</b>	
<u>Fixed Charges (Quarterly)</u>	
5/8"	\$ 11.19
3/4"	16.79
1"	27.98
1.5"	55.97
2"	89.55
3"	167.90
4"	279.83
6"	559.67
<u>Volumetric Charges (per Kgal)</u>	
Tier 1	\$ 3.36

		<b>FY 2021</b>
		<i>Projected</i>
<b>Sewer Rates</b>		
<u>Fixed Charges (Quarterly)</u>		
5/8"	\$	7.65
3/4"		11.47
1"		19.11
1.5"		38.23
2"		61.17
3"		114.69
4"		191.14
6"		382.28
<u>Volumetric Charges (per Kgal)</u>	\$	2.29

As of now, Raftelis has not calculated any charges for public and private fire protection, meaning all revenue requirements will be recovered with the calculated water and sewer rates seen in Table 2.

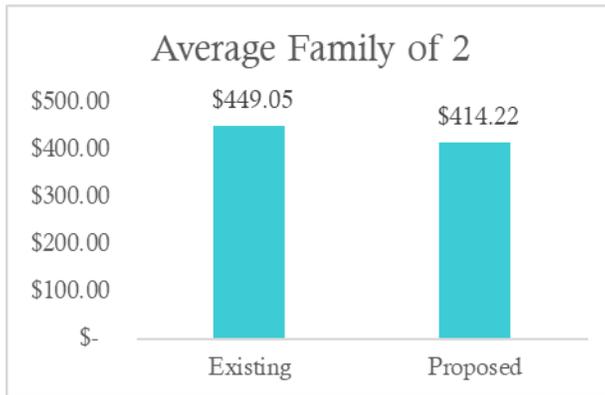
### Customer Impacts

To ensure that the calculated water and sewer rates do not significantly financially impact the customers of Lincoln, Raftelis conducted a customer impact survey using standard customer consumption information. We created five categories of customers to compare their existing utility billing method, which is based on property values, to the new billing method, which is using consumption and meter size information. The five categories included:

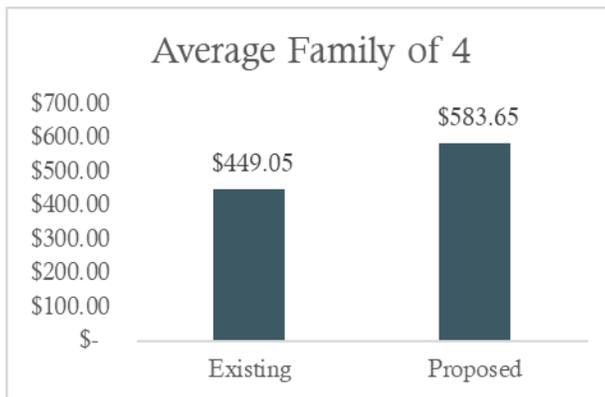
- A Household Family of 2, with an annual consumption amount of 60 Kgals, and assessed property value of \$203,100.00.
- A Household Family of 4, with an annual consumption amount of 90 Kgals, and assessed property value of \$203,100.00.
- A Motel, with an annual consumption of 1,000 Kgals, and assessed property value of \$1,701,800.00
- A Restaurant, with an annual consumption of 600 Kgals and assessed property value of \$2,575,500.00.
- The Loon property, with an annual consumption of 10,000 Kgals and assessed property value of \$24,604,900.00.

These 5 customer types were used to calculate utility bills under the current method of billing and compare the total annual bill to the new method of using water and sewer consumption. Figures 1-5 compare the annual utility bills based for each customer category using the existing and new billing methods. The “proposed” annual bills use the new fixed and volumetric water and sewer charges found in Table 2.

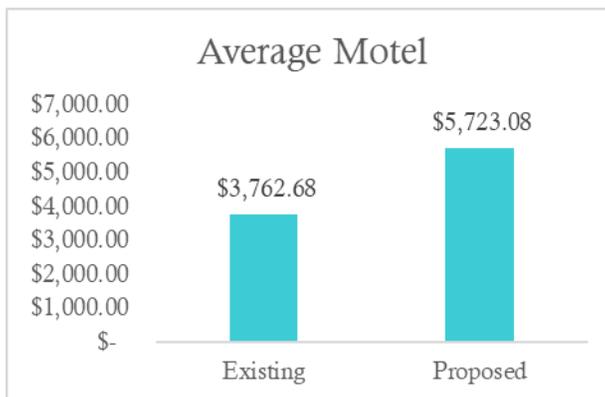
*Figure 1. Bill Comparison of Average Family of 2*



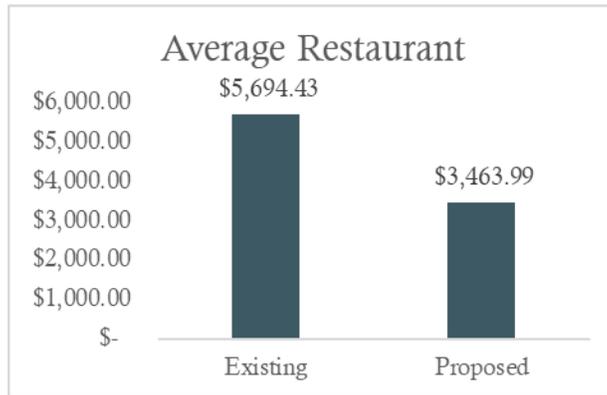
*Figure 2. Bill Comparison for Average Family of 4*



*Figure 3. Bill Comparison for Average Motel*



*Figure 4. Bill Comparison for Average Restaurant*



*Figure 5. Bill Comparison for Average Loon*



As the customer impacts show, the bills for the customer categories created, on average, increase by 8%. While this may seem problematic at first, it is important to observe the customer categories that have an increased utility bill under the new billing structure are customers that already use large quantities of water a year in comparison to their property values; loons, households of four, and motels. Although this change in billing methodology would have adverse impacts on some properties, it could be argued that this shift is just remedying a current inequity in the Town’s cost structure.

**Financial Analysis**

In addition to the customer impacts analysis, Raftelis also conducted a high-level financial analysis to see the five-year impacts on switching to a water and sewer consumption billing structure. Figures 6 and 7 show the cashflow of the water and sewer financial aspects of the utility.

Figure 6. Water Cashflow Under Consumption-Based Billing Structure

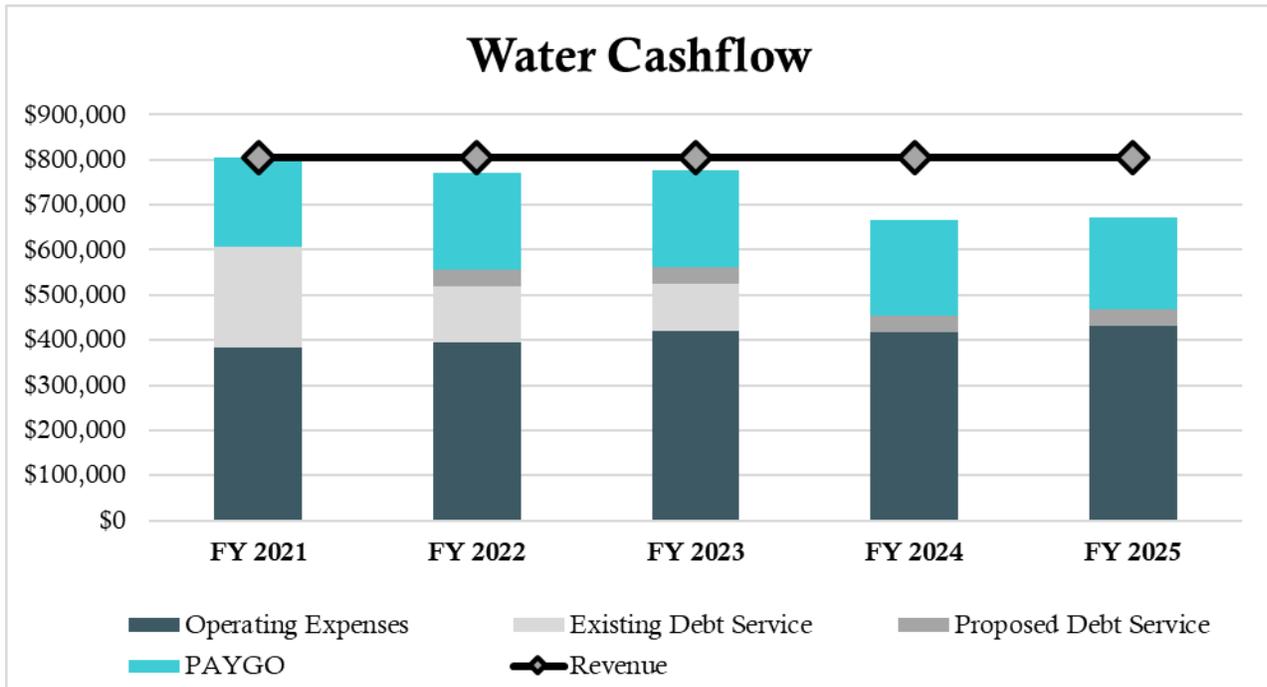
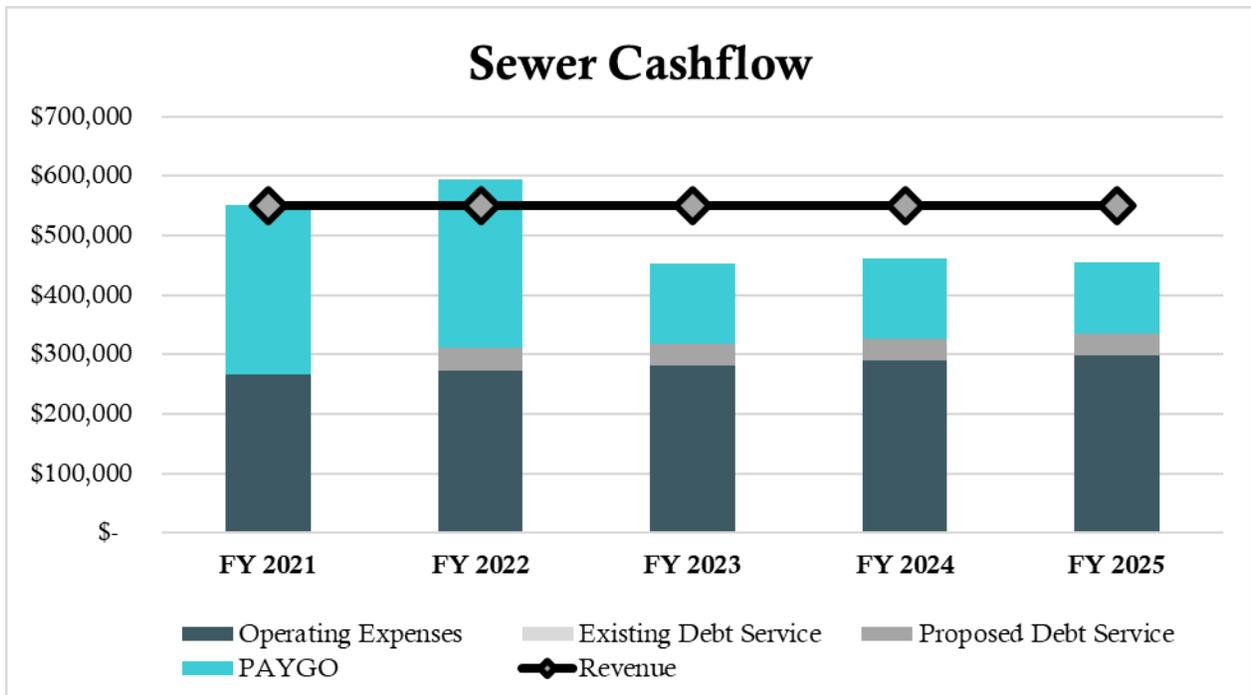


Figure 7. Sewer Cashflow Under Consumption-Based Billing Structure



The figures show that, if the Town were to consume the same amount of water each year, and not change nor increase the new billing rate structure, the town would meet and exceed the revenue requirements from FY 2023 onward. In addition to these figures, Raftelis has constructed a financial model tool that allows

for the Town to increase or decrease water and sewer rates based on the forecasted revenue requirements, as well as the number years that display on the charts.

### Affordability Analysis

After the financial analysis was completed, Raftelis also conducted an affordability analysis to see the impacts of the new water and sewer billing structure on low-income and median-income residential families in Lincoln. Using Census information, Raftelis found that, based on a 20-kgal per quarter consumption amount, a household making approximately \$43,000 would only use 1.2% of their total annual salary to pay their annual utility bill. Households that make approximately \$22,000 would use only 2.3% of their total annual income to pay their utility bills for the entire year. Both percentages are considered low, and thus, Raftelis concluded that the new water and sewer rates would not provide a financial burden on both median- and low-income households within the Town.

### Conclusion

Raftelis has calculated new water and sewer fixed and volumetric charges for the Town of Lincoln based on the projected revenue requirements for FY 2021 and onward. The calculated water and sewer rates can be found in Table 2. Switching to a billing structure that revolves around metered consumption has several benefits, including:

- Conservation promotion. Billing customers based on their water consumption will help to incentivize customers to reduce their water use as the cost of using water from the utility for each customer will be based on the amount of water they consume in each quarter.
- Changing revenue requirements. Revenue requirements differ between whether they are coming from water or sewer. Having a billing system in place that separates revenue generated from water use and sewer use allows for the utility to more easily adjust their rates to conform to upcoming utility projects or expenses that may fall into a water or sewer category.
- Customer equity. Billing customers based on their water consumption, rather than their property value, provides for a more equitable cost structure. By billing customers based on the demand they're placing on the system, rather than on property value which has no direct correlation with demand, customers will receive bills which are much more equitable and explainable.
- Better ability to perform long-term financial planning. By generating each utilities' revenues from user charges, rather than taxes, it will be easier to do more proactive and long-term financial planning to ensure financial sustainability of the funds.
- Apply for grants and low-interest loans. Under the current billing system, Lincoln is unable to apply for utility-related grants and loans, as the billing structure is based on property values and not consumption. By moving to a billing system based on consumption, Lincoln can additionally apply for loans and grants to fund future capital projects.