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**Reference: JXN Rate Structure Analysis and Revenue Estimation**

## OVERVIEW

This memo summarizes the basis, data, estimates, and assumptions used in evaluating the new rate structure for JXN Water that has subsequently been implemented in 2024. The analysis performed by Stantec in 2023 was primarily intended to estimate the revenue potential of JXN's new rate structure based on the currently available billing information, customer count by meter size, and generally conservative estimates and assumptions. Additionally, the analysis included advisory support and input to certain rate structure components (such as fixed charges and tier pricing) for consideration by JXN Water in finalizing the new structure and affordability analysis based upon Stantec's extensive experience in municipal water rate setting.

## BASIS OF ANALYSIS

The approach to estimating the potential revenue from the new rate structure centered on examining the most current billing information available. The billing data available at the time of the analysis had significant limitations due to issues with the meters and billing system. As a result, a number of estimates and assumptions were necessary to derive a conservative estimate of the revenue generation potential of the new rate structure. The billing data and assumptions are further outlined in the sections below.

## DATA UTILIZED

The analysis used billing data from active Kamstrup meters for the 12 months ending July 2023. Additionally, approximately 30% of JXN customers have Mueller meters that do not report usage volumes. The data used in the analysis included:

- Monthly usage in cubic feet (CF) for customer with Kamstrup meters
- Meter sizes for customers with Kamstrup and Mueller meters

## KEY ASSUMPTIONS & DATA LIMITATIONS

A number of assumptions were required due to the lack of usage data from customers with Mueller meters, known errors and omissions in usage data from customers with Kamstrup meters, and the unavailability of a detailed list of customers participating in the Supplemental Nutrition Assistance Program (SNAP).

- **Maximum Billed Water Use:** A maximum of 190,000 cubic feet (CF) per month, or 1,900 hundred cubic feet (CCF), was set to eliminate outliers that might reflect erroneous meter reads to mitigate the potential to overstate billed volume and revenue in the calculation of each customer's average usage and volumetric charge. This maximum eliminated 0.04% of bills from the analysis. While some higher bills might be legitimate, this analysis erred on the side of conservatism. To get a sense of the magnitude of the conservatism resulting from this approach, the total estimated billed volume with the 1,900 CCF maximum came to approximately 8.5 million CCF. This compares to a total billed volume of 10.6 million CCF if the maximum were increased to 1,000,000 CCF, or a maximum of 1.0 billion

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CCF with no maximum. This clearly demonstrates the fact that at least a portion of the high readings are in fact outliers that should be removed from the analysis.

- **SNAP Customer Base:** Based on discussions with JXN Water staff and a high-level review of available billing information and typical residential meter sizes, residential customers are generally represented by the 5/8" and 1" meter sizes, and non-residential customers are fundamentally represented by larger meter sizes. With that understanding, an estimated 25% of the residential customer base was assumed to be SNAP recipients based on discussions with staff at JXN Water. This resulted in approximately 13,700 customers in the SNAP customer class. This estimate was another conservative assumption when compared to the latest data from the US Census Bureau (USCB) American Community Survey (ACS) which shows that approximately 10,000 households receive SNAP or other forms of assistance. Based on sensitivity analyses for this assumption, the model shows approximately a \$1 million dollar change in total revenue for every five percent point change in the number of SNAP customers.
- **Zero Usage and Null Bills:** Bills with zero usage were included in the analysis as customers with active accounts but showing no usage, whereas "Null" readings were omitted from the calculation of average usage altogether. Null readings were entries in the billing summary file that were completely missing a bill and were therefore reported as "Null". Approximately 45% of bills were reported as "Null", 5% were billed but with zero usage, and the remaining 50% were bills showing usage. While some of the zero usage and "Null" bills could be erroneous and should in fact be reporting usage, this conservative methodology helped prevent over-estimation of revenue.
- **Average Usage and Bills by Meter Size:** Due to the lack of usage data from customers with Mueller meters (and all pending start customers, regardless of meter type), and the recognition of known errors and omissions in usage from active customers with Kamstrup meters, customer usage and bills were estimated for active Mueller meter accounts and all pending accounts based on the average usage and bills by meter size from active customers with Kamstrup meters, applied to the number of customers.
- **Customers without Meters:** According to analyses conducted by consultants to JXN Water, there are likely approximately 4,000-5,000 additional parcels within the service area receiving service but without a meter. Adding all of these meters to the system would increase the total count of accounts by approximately 7-9%. This analysis did not increase the number of accounts based on this estimate due to uncertainty around the specific meter sizes for these customers, and to again err on the side of conservatism in the estimate.

## **RATE STRUCTURE**

The rate structure included both volumetric rates charged per hundred cubic feet (CCF) and Availability Charges (i.e., fixed monthly charges) that scale by meter size in a manner consistent with industry practices. Specifically, the Availability Charge increases for larger meters based on approximate hydraulic capacity for each meter size. Moreover, the new rate structure included a separate customer classification with lower fixed charges for customers who participate in SNAP. The volumetric rates reflect an inclining block rate structure applicable to all customers based upon monthly metered water use that serves to both promote conservation and enhance affordability for lower volume users. The details of the new rate structure are outlined in the tables below. Customers who receive only water or sewer service pay Availability Charge and volumetric rates equal to exactly one half the rates for customers who receive both utility services.

Reference: JXN Rate Structure Analysis and Revenue Estimation

**Table 1: Volumetric Rates**

Volumetric Rates	Threshold (CCF)	Rate (\$/CCF)
Tier 1	30	\$6.00
Tier 2	31 - 100	\$12.00
Tier 3	101 - 350	\$14.00
Tier 4	>350	\$16.00

**Table 2: Monthly Availability Charge**

Base Rates	Rate (\$/mo)
Non-SNAP 5/8"	\$40.00
SNAP 5/8"	\$10.00
Non-SNAP 1"	\$60.00
SNAP 1"	\$10.00
1 1/2"	\$200.00
2"	\$320.00
4"	\$640.00
6"	\$1,280.00

The table below shows the calculation of a typical bill for a residential customer receiving both water and sewer service with a 5/8" meter and six CCF of usage per month <sup>1</sup>.

**Table 3: Monthly Typical Residential Bill**

Typical Bill	
Availability Charge - 5/8" Meter	\$40.00
Usage (CCF)	6.00
Tier 1 Rate (\$/CCF)	\$6.00
Volumetric Charge (\$)	\$36.00
<b>Total Bill</b>	<b>\$76.00</b>

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<sup>1</sup> Six CCF is consistent with reporting on JXN Water's website showing typical bills by meter size. This is lower than the average usage calculated for all 5/8" meters in our analysis and shown in subsequent sections of this memo, but still serves as a useful example of residential bills.

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## BILLED REVENUE ESTIMATION

The total billed rate revenue estimation was completed based on the following:

- **Consumption Revenue:** Estimated applying the volumetric rates to each individual customer's average monthly consumption and calculating the average volumetric portion of customer bills by meter size.
- **Base Revenue:** Calculated using the number of customers by meter size and the corresponding Availability Charges.

This approach allowed for differentiation in usage characteristics for customers with small to large meters, which allowed the estimate to account for more usage in the higher tiers for customers with larger meters and greater usage. The average usage and average bills for each meter size resulting from this analysis are consistent with expectations based on similar analyses at other water and sewer utilities.

The table below summarizes the total revenue calculation with usage and average bills by meter size resulting from the analysis of the provided billing data, the number of active and pending Kamstrup and Mueller meters, the estimated number of SNAP participants, and the resulting Availability Charge revenue, volumetric revenue and total revenue (expressed in millions of dollars). It should be noted that the average monthly bill does not necessarily equate to the rates applied to the average monthly usage. This is a result of the fact that the average bill is based on each individual customer's average usage, meaning customers with much higher usage relative to peers at a given meter size pay more in the higher tiers, increasing the overall average bill for each meter size.

**Table 4: Billed Revenue Estimation Details and Results**

	<u>Typical Consumption &amp; Bill</u>		<u>Kamstrup</u>	<u>Mueller</u>	<u>Billed Revenue Estimate</u>		<u>Total Revenue (\$M)</u>
	<u>Avg. Monthly Usage (CCF)</u>	<u>Avg. Monthly Bill</u>	<u>No. of Meters</u>	<u>No. of Meters</u>	<u>Volumetric Revenue (\$M)</u>	<u>Availability Charge Revenue (\$M)</u>	
Non-Snap 5/8"	7.36	\$93.40	27,248	11,951	\$25.12	\$18.82	<b>\$43.93</b>
SNAP 5/8"	7.36	\$63.40	9,083	3,984	\$8.37	\$1.57	<b>\$9.94</b>
Non-Snap 1"	10.26	\$134.62	1,121	733	\$1.66	\$1.33	<b>\$2.99</b>
Snap 1"	10.26	\$84.62	374	244	\$0.55	\$0.07	<b>\$0.63</b>
1 1/2"	33.03	\$535.00	1,058	345	\$5.64	\$3.37	<b>\$9.01</b>
2"	88.91	\$1,397.61	892	225	\$14.44	\$4.29	<b>\$18.73</b>
4"	293.84	\$4,700.13	266	127	\$19.15	\$3.02	<b>\$22.17</b>
6"	412.16	\$7,407.14	47	39	\$6.32	\$1.32	<b>\$7.64</b>
<b>Total</b>			<b>40,088</b>	<b>17,647</b>	<b>\$81.26</b>	<b>\$33.79</b>	<b>\$115.04</b>

Based on this calculation, JXN is projected to generate approximately \$115 million dollars of billed revenue per year from the new rate structure. Additionally, approximately 29% of the revenue can be considered fixed revenue from the Availability Charge. It should be noted, however, that historical bill collection rates in the JXN service area have been very low. While this has been a challenge in recent years, JXN has been taking measures to remedy this problem, including verifying and correcting customer information in the billing system, replacing faulty meters, and commencing shut-offs for nonpayment for customers with multiple

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months of delinquent bills. Moreover, it is important to consider the potential offsetting impacts that the new rate structure may have in terms of reduced bills for lower income households.

## UTILITY BILL AFFORDABILITY

To better understand the impacts of the new rate structure on customers, it is helpful to evaluate the average residential bills relative to service area incomes. The table below shows the typical residential bill for water and sewer service (estimated using the average usage for customers with 5/8-inch meters reflecting 7.4 CCF of water use) as a percent of the City of Jackson’s median household income (MHI) and lowest quintile income (LQI), as well as the typical SNAP participant customer’s combined water and sewer bill relative to the LQI.

**Table 5: Residential Bill Affordability**

Metric	Income Basis	Monthly Bill	Annual Bill	Result
Bill as a Percent of MHI	\$40,631	\$84.40	\$1,012.80	2.5%
Bill as a Percent of LQI	\$16,312	\$84.40	\$1,012.80	6.2%
SNAP Bill as a Percent of LQI	\$16,312	\$54.40	\$652.80	4.0%

*\* Income data based on US Census Bureau, American Community Survey, 2022 Estimates*

The United States Environmental Protection Agency (US EPA) generally considers combined water and sewer bills greater than or equal to 4.5% of income to be unaffordable. As demonstrated, the typical residential bill remains below this 4.5% threshold for customers at the MHI level, and for SNAP customers at the LQI level. Non-SNAP customers at the LQI level, however, would be above this 4.5% threshold for affordability.

Comparing JXN Water’s combined water and sewer bills to peers in the south region serving fewer than 100,000 accounts, bills for JXN Water customers are very near the average among the peers. Based on information from the AWWA 2023 Rate Survey, and an average monthly usage of 7.4 CCF, the average combined bill in the region equals approximately \$88.60 per month, with a median combined bill among peers of \$83.20 per month. This places JXN Water’s combined bills squarely among the mid-range of peer agencies.

Additionally, affordability can be evaluated based on the number of hours worked per month at minimum wage to pay the combined water and sewer bill. Using the Mississippi minimum wage of \$7.25 per hour, and the \$84.40 bill shown in Table 5, this equates to 11.6 hours per month. This drops to 7.5 hours per month when using the SNAP customer class bill of \$54.40. Eight hours per month is generally considered to be a rule of thumb for affordable water and sewer utility service when evaluated using this method.

June 18, 2024

Ted Henifin

Page 6 of 6

**Reference:** JXN Rate Structure Analysis and Revenue Estimation

## **RESULTS AND FUTURE CONSIDERATIONS**

The rate structure at JXN Water follows a common and industry-accepted approach to charging for water and sewer service. The inclusion of the Availability Charge, a fixed charge that scales with meter size based on hydraulic capacity, and an inclining block volumetric rate structure is a common approach within the industry, and one that helps JXN accomplish its policy objectives.

The revenue estimation analysis, based on data available up to July 2023, provides a conservative initial estimate of approximately \$115 million in annual billed revenue under the new rate structure. As more Kamstrup meters replace Mueller meters, inactive or unbilled accounts are identified and billed as appropriate, and billing systems and practices are improved, the accuracy of accounts and metered water use will improve and allow for this revenue estimate to be further refined.

Finally, while evaluations of economic conditions and utility service affordability within the JXN Water service area demonstrate the challenges facing residents in the region, typical bills relative to MHI, and typical SNAP customer bills relative to LQI and minimum wage incomes, are shown to be within generally accepted ranges for affordability. Additionally, JXN Water's typical combined bill ranks within the mid-range of peer agencies of similar size around the southern region of the United States.