



Bismarck, ND

Utility Cost of Service & Rate Design Update City Commission Meeting

*December 13, 2022
(revised January 18, 2023)*



1. Financial Plan – Water, Sewer, Stormwater
2. Water and Sewer Cost of Service Update
3. Rate Structure Design
 - Fixed Charge
 - Water – Adjusted Residential Tiers
 - Sewer – Winter Average
4. Bill Comparisons



Financial Plan Updates

Water

- No Rate Increase in FY23
- Focus on Rate Structure Changes
- Future increases of 4% annually
 - ✓ Potential Grant Funding for WTP Expansion
- Volatility of Water Sales and Impact of Rainfall

Sewer

- No Rate Increase in FY23
- Focus on Implementation of Winter Average for all Classes
- Future increases of 2.25% annually

Storm

- No Rate Increase in FY23
- No future increases
 - ✓ Adequate Investment



Cost of Service Update

1. Water Update

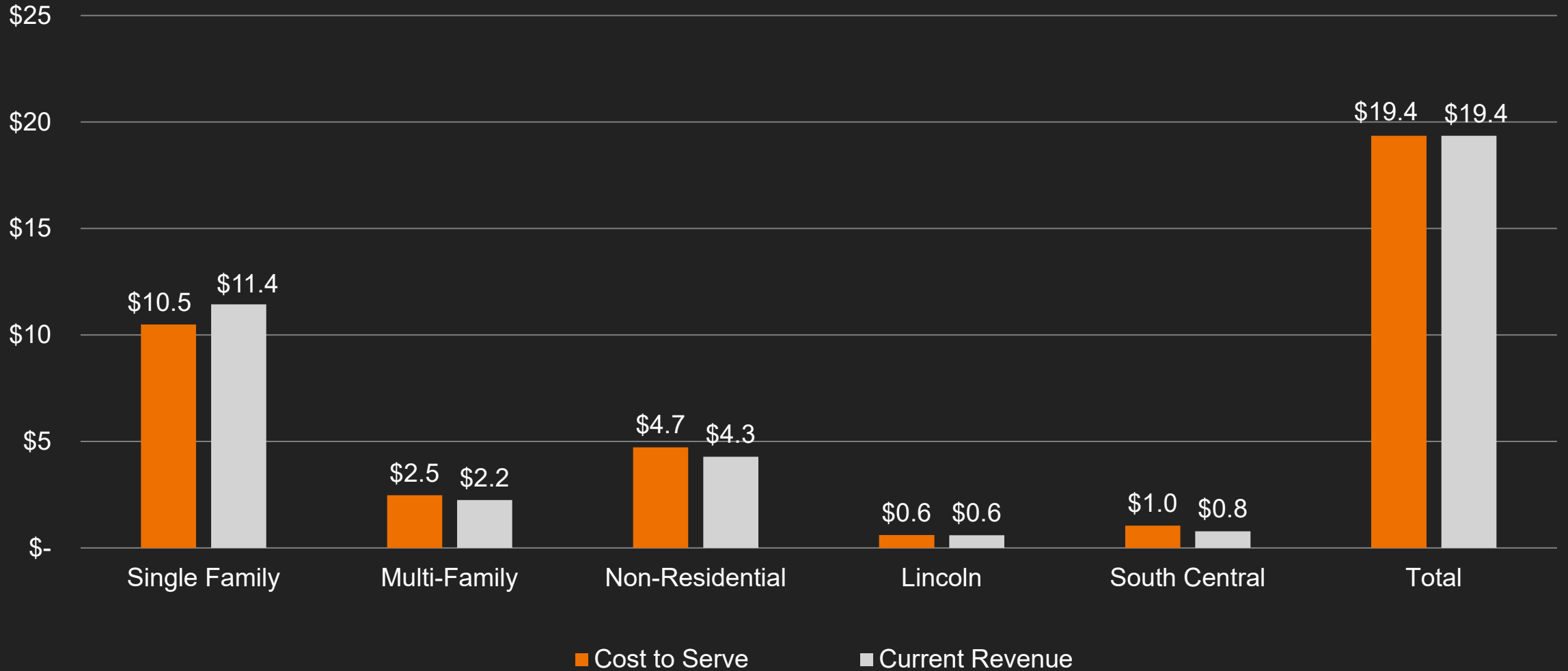
- No Irrigation Class
- Customer Water Use Changes
 - ✓ Reduced Residential Peaking
- South Central has increased water use and peaking

2. Sewer Update

- All customers charged with use of Winter Average
 - ✓ reduces the amount of billable gallons
 - ✓ Changes allocation of costs to customer classes



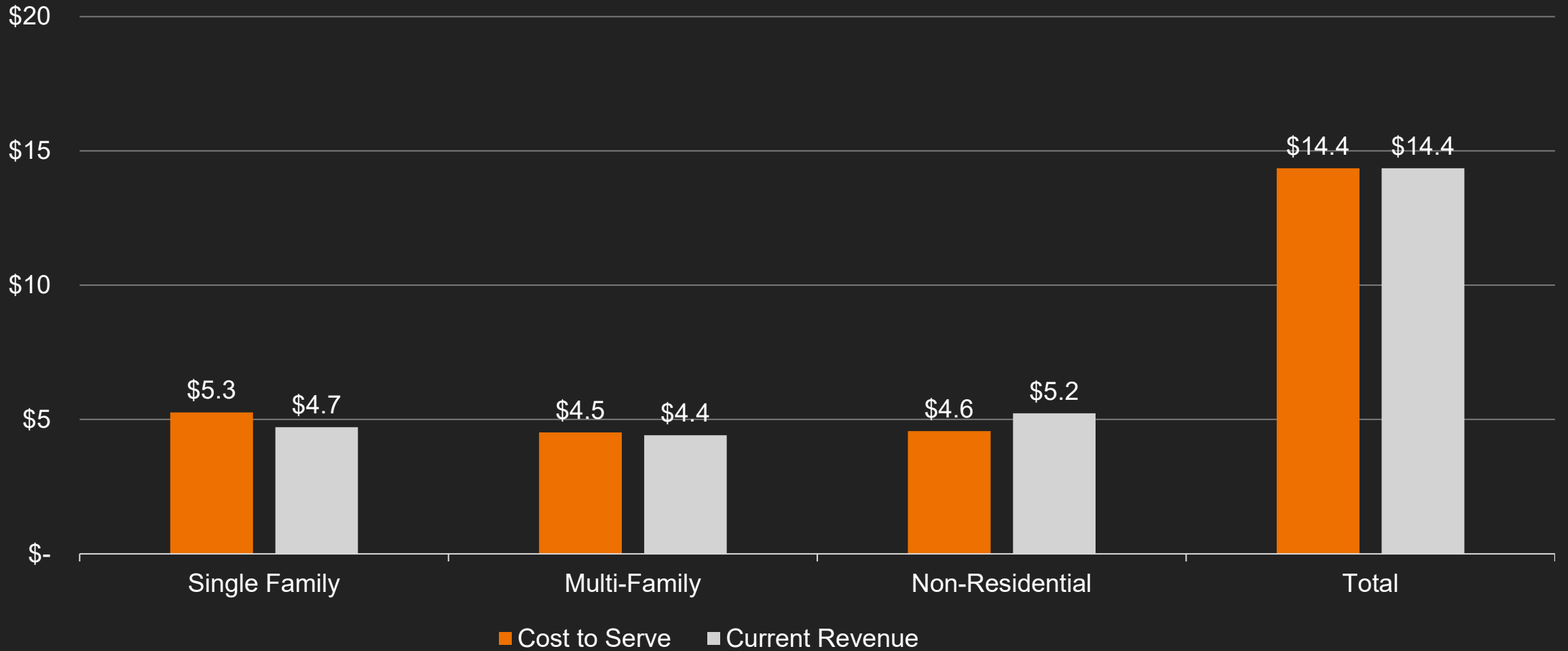
2022 Water Cost to Serve vs. Current Revenue (\$M)





2022 Sewer Cost to Serve vs. Current Revenue (\$M)

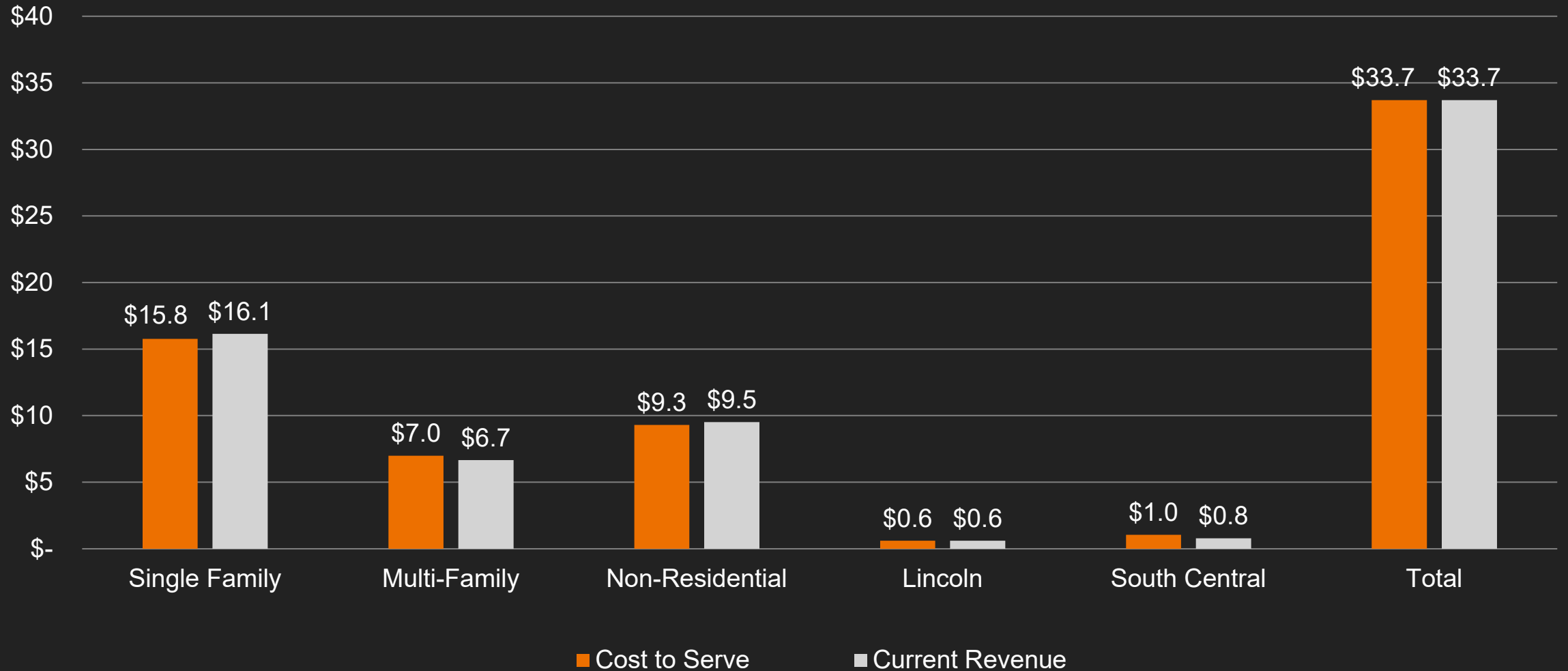
UTILITY COST OF SERVICE & RATE DESIGN UPDATE





2022 Combined Water and Sewer Cost to Serve vs. Current Revenue (\$M)

UTILITY COST OF SERVICE & RATE DESIGN UPDATE





Rate Design

Rate Structure Alternatives

Water and Sewer Minimum Charge

- Option A - Update using 2019 Methodology
 - ✓ WTR Recover Customer Service Costs and 50% Average Day Costs
 - ✓ SWR Recover Collection
- Option B (Water Only)
 - ✓ WTR Recover Customer Service Costs, 50% Max Day, 25% Max Hour Costs
- Option C (Water and Sewer)
 - ✓ WTR Recover Customer Service Costs
 - ✓ WTR & SWR Recover Debt Service - *Infrastructure Fee*

Water Usage Rates

- Single Family Residential - Update Current 5 Tier Structure; All Other Customer Classes - Unit Rate
- Single Family Residential - 4 Tier Structure; All Other Customer Classes - Unit Rate
- Uniform Rate for each Customer Class
- Uniform Rate for all Customers

Sewer Usage Rates

- Winter Average Billing, all classes



Water Minimum Charge & Utility Account Processing*

Meter Size	Current	Option A: Updated (Same as 2019 COS)	Option B (Customer Costs + Recover portion of Max Day / Max Hour)	Option C (Customer Costs + Recover Debt Capital)
5/8	\$10.25	\$10.64	\$12.21	\$10.67
3/4	\$13.16	\$13.37	\$15.21	\$12.90
1	\$18.96	\$18.82	\$21.21	\$17.36
1.5	\$33.48	\$32.44	\$36.21	\$28.51
2	\$50.89	\$48.79	\$54.21	\$41.89
3	\$106.03	\$100.57	\$111.21	\$84.26
4	\$178.59	\$168.69	\$186.21	\$140.01
6	\$396.27	\$373.07	\$411.21	\$307.26
8	\$468.84	\$441.19	\$486.21	\$363.01
10	\$1,223.45	\$1,149.69	\$1,266.21	\$942.81
Revenue	\$5,286,617	\$5,244,126	\$5,911,491	\$4,833,544
% of Gross Water Revenue Requirement	27.3%	27.1%	30.5%	24.0%

*Water minimum charge and utility account processing collectively referred to as fixed charge for evaluation



Sewer Minimum Charge

Meter Size	Current	Updated COS	Option C: Infrastructure Fee (Debt Service)
5/8	\$7.18	\$7.18	\$6.72
3/4	\$10.77	\$10.77	\$10.07
1	\$17.94	\$17.94	\$16.79
1.5	\$35.89	\$35.89	\$33.58
2	\$57.41	\$57.41	\$53.72
3	\$125.61	\$125.61	\$117.51
4	\$215.32	\$215.32	\$201.45
6	\$484.47	\$484.47	\$453.27
8	\$574.18	\$574.18	\$537.21
10	\$1,507.23	\$1,507.23	\$1,410.18
Revenue		\$4,115,322	\$3,849,474
% of Gross Sewer Revenue Requirement		21.5%	20.0%



Fixed Charge Evaluation

- **Option A** uses update from 2019 methodology to recover customer service costs and 50% of average day costs.
- **Option B** recovers customer service cost 50% of max day and 25% of max hour costs.
- **Option C** recovers customer service cost and includes infrastructure fee for debt service and/or portion of cash capital.

	Option A	Option B	Option C
Customer Affordability	—	✗	✓
Revenue Stability	—	✓	✗
Administrative Ease	✓	✓	✓
Consistency with Industry Practice	✓	✓	—
Transparency	—	—	✓

Key: ✓ Represents Best Alternative — Represents Neutral Alternative ✗ Represents Least Effective Alternative



Single Family Water Usage Tiers & Statistics

SFR	Current	4-Tier Alternative
Tier 1	0 – 4 Units	0 – 8 Units
Tier 2	5 – 8 Units	9 – 16 Units
Tier 3	9 – 18 Units	17 – 24 Units
Tier 4	19 – 24 Units	Over 24 Units
Tier 5	Over 24 Units	

CY2021	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Average	Summer Average	Winter Average
Median	5	4	4	5	7	16	14	16	9	6	4	4	8	11	4
70th Percentile	6	6	5	6	11	23	23	26	16	10	5	6	12	18	6
80th Percentile	7	7	6	7	14	29	28	32	20	12	6	7	15	23	7
95th Percentile	11	10	9	11	25	45	44	49	34	22	9	10	23	37	10
Max	93	71	112	107	116	598	606	378	235	158	59	87	218	349	88



Water Usage Rates under Fixed Charge Option A

Single Family Residential	Current	Updated COS	4-Tier	Unit Rate by Class	System-Wide Unit Rate
Tier 1	\$1.51	\$1.21	\$1.75		
Tier 2	\$3.05	\$2.65	\$4.79		
Tier 3	\$5.62	\$4.88	\$6.16		
Tier 4	\$7.09	\$6.24	\$7.86		
Tier 5	\$8.10	\$7.77			
Unit Rate				\$3.59	\$3.21

Multifamily	Current	Updated COS		Unit Rate by Class	Unit Rate
	\$1.65	\$2.15		\$2.15	\$3.21

Non-Residential	Current	Updated COS		Unit Rate by Class	Unit Rate
	\$1.89	\$2.97		\$2.97	\$3.21



Water Usage Rates under Fixed Charge Option B

Single Family Residential	Current	Updated COS	4-Tier	Unit Rate by Class	Unit Rate
Tier 1	\$1.51	\$1.80	\$2.15		
Tier 2	\$3.05	\$2.75	\$4.13		
Tier 3	\$5.62	\$4.23	\$5.02		
Tier 4	\$7.09	\$5.13	\$6.13		
Tier 5	\$8.10	\$6.13			
Unit Rate				\$3.34	\$3.06

Multifamily	Current	Updated COS		Unit Rate by Class	Unit Rate
	\$1.65	\$2.07		\$2.07	\$3.06

Non-Residential	Current	Updated COS		Unit Rate by Class	Unit Rate
	\$1.89	\$2.88		\$2.88	\$3.06



Water Usage Rates under Fixed Charge Option C

Single Family Residential	Current	Updated COS	4-Tier	Unit Rate by Class	Unit Rate
Tier 1	\$1.51	\$1.38	\$1.90		
Tier 2	\$3.05	\$2.81	\$4.88		
Tier 3	\$5.62	\$5.02	\$6.22		
Tier 4	\$7.09	\$6.38	\$7.89		
Tier 5	\$8.10	\$7.89			
Unit Rate				\$3.70	\$3.30

Multifamily	Current	Updated COS		Unit Rate by Class	Unit Rate
	\$1.65	\$2.23		\$2.23	\$3.30

Non-Residential	Current	Updated COS		Unit Rate by Class	Unit Rate
	\$1.89	\$3.07		\$3.07	\$3.30



Water Usage Rate Evaluation

- **Alternative 1** same current 5 tier structure for single family residential based on updated COS
- **Alternative 2** new single family residential 4 tier structure
- **Alternative 3** uniform rate for each customer class
- **Alternative 4** uniform rate for all classes

	Alternative 1 Updated COS	Alternative 2 New SFR Tiers	Alternative 3 Unit Rate by Class	Alternative 4 System Unit Rate
Customer Affordability	✓	—	✗	✗
Proportional Equity	✓	✓	—	✗
Administrative Ease	—	—	✓	✓
Consistency with Industry Practice	✓	✓	✓	✓

Key: ✓ Represents Best Alternative — Represents Neutral Alternative ✗ Represents Least Effective Alternative



Sewer Usage Rates

Customer Class	Current	Option A: Updated COS Winter Average Billing for ALL Customer Classes	Option C Fixed Charge Winter Average Billing for ALL Customer Classes
Single Family Residential	\$2.36	\$2.94	\$3.11
Multifamily	\$3.94	\$4.78	\$4.83
Non-Residential	\$4.17	\$4.77	\$4.86

Current

- SFR billed for sewer using Winter Average (WA) water use.
- MFR and NR billed for sewer using all water use.



Bill Comparisons



Residential Rate Structure Alternatives

Option A:

Fixed Charge Recovery

WTR Customer & 50% Average Day
SWR Collection

Water Usage Rates

Current Rates (FY 2022)

Alternative 1 - 5 SFR Tiers, Irrigation by class

Alternative 2 - 4 SFR Tiers, Irrigation by class

Alternative 3 - Unit Rate by class

Alternative 4 – System-Wide Unit Rate

Sewer Usage Rates

Sewer usage rates based on winter average

Option B:

Fixed Charge Recovery

WTR Customer, 50% Max Day & 25%
Max hour
SWR Collection

Water Usage Rates

Current Rates (FY 2022)

Alternative 1 - 5 SFR Tiers, Irrigation by class

Alternative 2 - 4 SFR Tiers, Irrigation by class

Alternative 3 - Unit Rate by class

Alternative 4 – System-Wide Unit Rate

Sewer Usage Rates

Sewer usage rates based on winter average

Option C:

Infrastructure Fee

WTR Customer & Debt Service
SWR Debt Service

Water Usage Rates

Current Rates (FY 2022)

Alternative 1 - 5 SFR Tiers, Irrigation by class

Alternative 2 - 4 SFR Tiers, Irrigation by class

Alternative 3 - Unit Rate by class

Alternative 4 – System-Wide Unit Rate

Sewer Usage Rates

Sewer usage rates based on winter average



Residential – Combined Bill Comparison

$\frac{3}{4}$ " Meter

Monthly Use And Annual Percentile		2022 Current Rates	Alt 1: Updated COS, Same Tiers			Alt 2: New SFR Tiers			Alt 3: Unit Rate by Class			Alt 4: Unit Rate		
			Option A	Option B	Option C	Option A	Option B	Option C	Option A	Option B	Option C	Option A	Option B	Option C
3 CCF (3 CCF WA)	25%	\$35.54	\$36.59	\$40.20	\$36.43	\$38.21	\$41.25	\$37.99	\$43.73	\$44.82	\$43.39	\$42.59	\$43.98	\$42.19
8 CCF (4 CCF WA)	50%	\$51.61	\$51.34	\$55.94	\$52.16	\$49.90	\$54.94	\$50.60	\$64.62	\$64.46	\$65.00	\$61.58	\$62.22	\$61.80
15 CCF (7 CCF WA)	80%	\$98.03	\$94.32	\$94.37	\$96.62	\$92.25	\$92.67	\$94.08	\$98.57	\$96.66	\$100.22	\$92.87	\$92.46	\$94.22
19 CCF (8 CCF WA)	90%	\$124.34	\$118.14	\$115.13	\$121.16	\$118.46	\$114.80	\$120.72	\$115.87	\$112.96	\$118.12	\$108.65	\$107.64	\$110.52
23 CCF (10 CCF WA)	95%	\$157.42	\$148.98	\$141.53	\$152.90	\$148.98	\$140.76	\$151.82	\$136.11	\$132.20	\$139.14	\$127.37	\$125.76	\$129.94

- 48% of Residential customers have $\frac{3}{4}$ " meter
- WA = Winter Average



Residential – Combined Bill Comparison

1" Meter

Monthly Use And Average Percentile		2022 Current Rates	Alt 1: Updated COS, Same Tiers			Alt 2: New SFR Tiers			Alt 3: Unit Rate by Class			Alt 4: Unit Rate		
			Option A	Option B	Option C	Option A	Option B	Option C	Option A	Option B	Option C	Option A	Option B	Option C
3 CCF (3 CCF WA)	25%	\$41.34	\$42.04	\$46.20	\$40.89	\$43.66	\$47.25	\$42.45	\$49.18	\$50.82	\$47.85	\$48.04	\$49.98	\$46.65
8 CCF (4 CCF WA)	50%	\$57.41	\$56.79	\$61.94	\$56.62	\$55.35	\$60.94	\$55.06	\$70.07	\$70.46	\$69.46	\$67.03	\$68.22	\$66.26
15 CCF (7 CCF WA)	80%	\$103.83	\$99.77	\$100.37	\$101.08	\$97.70	\$98.67	\$98.54	\$104.02	\$102.66	\$104.68	\$98.32	\$98.46	\$98.68
19 CCF (8 CCF WA)	90%	\$130.14	\$123.59	\$121.13	\$125.62	\$123.91	\$120.80	\$125.18	\$121.32	\$118.96	\$122.58	\$114.10	\$113.64	\$114.98
23 CCF (10 CCF WA)	95%	\$163.22	\$154.43	\$147.53	\$157.36	\$154.43	\$146.76	\$156.28	\$141.56	\$138.20	\$143.60	\$132.82	\$131.76	\$134.40

- 48% of Residential customers have 1" meter
- WA = Winter Average



Multi-Family Rate Structure Alternatives

Option A:

Fixed Charge Recovery

WTR Customer & 50% Average Day
SWR Collection

Water Usage Rates

Current Rates (FY 2022)
Alternative 1 - Unit Rate by Class
Alternative 2 – System-Wide Unit Rate

Sewer Usage Rates

Sewer usage rates based on winter
average

Option B:

Fixed Charge Recovery

WTR Customer, 50% Max Day & 25%
Max hour
SWR Collection

Water Usage Rates

Current Rates (FY 2022)
Alternative 1 - Unit Rate by Class
Alternative 2 – System-Wide Unit Rate

Sewer Usage Rates

Sewer usage rates based on winter
average

Option C:

Infrastructure Fee

WTR Customer & Debt Service
SWR Debt Service

Water Usage Rates

Current Rates (FY 2022)
Alternative 1 - Unit Rate by Class
Alternative 2 – System-Wide Unit Rate

Sewer Usage Rates

Sewer usage rates based on winter
average



Multi-Family – Combined Bill Comparison

1" Meter

	2022 Current Rates	Alt 1: Updated COS, Unit Rate			Alt 2: Unit Rate		
		Option A	Option B	Option C	Option A	Option B	Option C
6 CCF (Year-Round)	\$70.44	\$78.36	\$80.27	\$76.53	\$84.72	\$86.21	\$82.95
6 CCF Summer, 2 CCF Winter	\$70.44	\$59.23	\$61.14	\$57.20	\$65.59	\$67.08	\$63.62
41 CCF (Year-Round)	\$266.09	\$321.04	\$320.15	\$323.79	\$364.50	\$360.74	\$367.66
41 CCF Summer, 11 CCF Winter	\$266.09	\$177.53	\$176.64	\$178.76	\$220.99	217.23	\$222.63
149 CCF (Year-Round)	\$869.81	\$1069.8	\$1060.4	\$1086.7	\$1227.8	\$1207.9	\$1246.2
149 CCF Summer, 51 CCF Winter	\$869.81	\$601.08	\$591.55	\$612.97	\$759.02	\$739.06	\$772.40

- 52% of Multi-Family customers have 1" meter



Non-Residential Rate Structure Alternatives

Option A:

Fixed Charge Recovery

WTR Customer & 50% Average Day
SWR Collection

Water Usage Rates

Current Rates (FY 2022)
Alternative 1 - Unit Rate by Class
Alternative 2 - System-Wide Unit Rate

Sewer Usage Rates

Sewer usage rates based on winter
average

Option B:

Fixed Charge Recovery

WTR Customer, 50% Max Day & 25%
Max hour
SWR Collection

Water Usage Rates

Current Rates (FY 2022)
Alternative 1 - Unit Rate by Class
Alternative 2 - System-Wide Unit Rate

Sewer Usage Rates

Sewer usage rates based on winter
average

Option C:

Infrastructure Fee

WTR Customer & Debt Service
SWR Debt Service

Water Usage Rates

Current Rates (FY 2022)
Alternative 1 - Unit Rate by Class
Alternative 2 - System-Wide Unit Rate

Sewer Usage Rates

Sewer usage rates based on winter
average



Non-Residential – Combined Bill Comparison

1" Meter

	2022 Current Rates	Alt 1: Updated COS, Unit Rate			Alt 2: Unit Rate		
	Option A	Option A	Option B	Option C	Option A	Option B	Option C
2 CCF (Year-Round)	\$49.02	\$52.24	\$54.45	\$50.00	\$52.72	\$54.81	\$50.46
2 CCF Summer, 1 CCF Winter	\$49.02	\$47.48	\$49.69	\$45.12	\$47.96	\$50.05	\$45.58
47 CCF (Year-Round)	\$321.72	\$400.43	\$398.59	\$406.68	\$411.71	\$407.05	\$417.49
47 CCF Summer, 24 CCF Winter	\$321.72	\$291.16	\$289.32	\$294.46	\$302.44	\$297.78	\$305.27
191 CCF (Year-Round)	\$1194.4	\$1514.6	\$1499.8	\$1548.0	\$1560.5	\$1534.2	\$1592.0
191 CCF Summer, 132 CCF Winter	\$1194.4	\$1235.5	\$1220.7	\$1258.7	\$1281.3	\$1255.1	\$1302.6

- 47% of Non-Residential customers have 1" meter



Questions?