Performance Based Regulation
2022 Progress Report

2022-2024 Drainage and Wastewater Treatment Services
2022-2026 Water Services



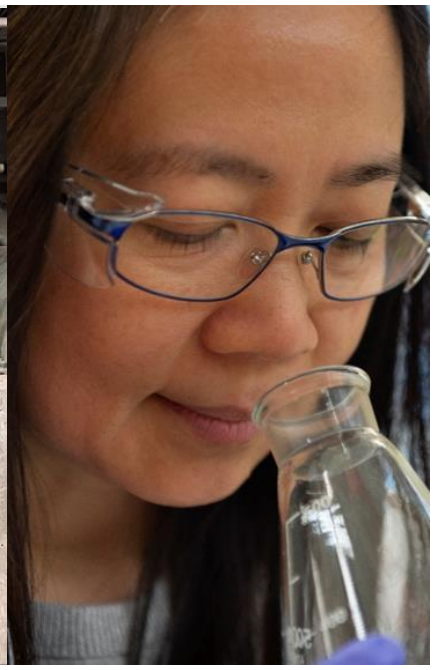


TABLE OF CONTENTS

1 Executive Summary

This report provides the annual update to the City of Edmonton on the operational and financial results for the year ended December 31, 2022 for water and fire protection services ("In-City Water"), wastewater treatment services ("Wastewater"), and sanitary and stormwater utility services ("Drainage Services") provided within Edmonton by EPCOR Water Services Inc. ("EWSI"). Throughout this report, reference will be made to "EPCOR Water Services" and "EPCOR Drainage Services" as these were the EPCOR business units that existed in 2022. Since July 3, 2023, EPCOR Water Services and Drainage Services have been amalgamated into a single business unit, that will be responsible for the ongoing commitments for the PBR plans referenced in this report. Edmonton City Council regulates In-City Water in accordance with the 2022-2026 Performance Based Regulation ("PBR") Plans approved in EPCOR Water Services Bylaw No. 19626 ("Bylaw 19626") and Drainage and Wastewater Treatment services in accordance with the 2022-2024 PBR Plan approved in EPCOR Drainage Services Bylaw No. 19627 ("Bylaw 19627"). The key features of these plans, which encompass rates, performance measures, and return on equity are described in Appendix A.

1.1 Financial Performance

In-City Water, Wastewater and Drainage Services' financial performance[1] for 2022 are summarized in Table 1.1-1 below:

Table 1.1-1
Revenue and Return on Equity
($ millions)

		A	B
		2022	
		PBR Forecast	Actual
1	**In-City Water**		
2	Regulated revenue	220.1	223.1
3	Return on equity	42.0	43.0
4	Rate of return on equity	7.90%	8.36%
5	**Wastewater**		
6	Regulated revenue	122.1	124.2
7	Return on equity	21.7	25.1
8	Rate of return on equity	9.94%	12.44%

[1] Consistent with the 2022-2024/2026 PBR Applications, all financial data in this report, including totals and sub-totals, are rounded to the nearest $0.1 million to ensure continuity of data between tables and between years. However, the sum of the rounded financial data in certain tables may not be equal to the related rounded total or sub-total.

		A	B
		2022	
		PBR Forecast	Actual
9	**Drainage Services**		
10	Regulated revenue	236.4	238.6
11	Return on equity	43.8	41.8
12	Rate of return on equity	6.31%	6.18%

Table 1.1-1 shows that 2022 actual financial performance, as measured by return on equity for In-City Water and Drainage Services was close to target, while 2022 financial performance for Wastewater Treatment exceeded the PBR forecast. Higher than forecast revenues were attributable to higher than forecast customer growth and higher than forecast consumption prior to the introduction of the consumption deferral on April 1, 2022. Actual to forecast differences in return on equity in 2022 for each utility are as follows:

- **In-City Water** achieved an 8.36% rate of return on equity, slightly higher than the forecast rate of return of 7.90%, largely due to higher than forecast revenue resulting from higher customer growth and higher water consumption prior to the introduction of the consumption deferral.

- **Wastewater** achieved a 12.44% rate of return on equity, compared to the forecast rate of return of 9.94%, reflecting higher than forecast revenue, lower than forecast operating expenses and a lower than forecast rate base due to lower capital additions over the 2017 to 2021 period resulting from project deferrals and other adjustments to the capital program.

- **Drainage Services** achieved a 6.18% rate of return on equity, slightly lower than its PBR forecast rate of return of 6.31%, with higher than forecast operating expenses, partially offset by higher than forecast revenue as well as lower than forecast depreciation and rate base. Operating expenses were higher primarily due to higher than anticipated costs for trunk cleaning and inspections due to the amount of solids found within the trunk network and longer than anticipated use of leased facilities due to the delayed move to the new shared facility, resulting in higher costs than forecast. Revenue was higher due to higher customer growth.

Detailed analyses of In-City Water, Wastewater and Drainage Services' financial performance for 2022 are provided in Sections 2.1, 2.2, and 2.3, respectively, of this report.

1.2 Capital Expenditures

In-City Water, Wastewater and Drainage Services' capital expenditures for 2022 and for the PBR Term (the "2022-2026 Water PBR term" and "2022-2024 Wastewater and Drainage PBR term") are summarized in Table 1.2-1 below:

Table 1.2-1
Capital Expenditures
($ millions)

	A	B	C	D
	2022		2022-2024/2026	
Capital Expenditures	PBR Forecast	Actual	PBR Forecast	Current Projection
In-City Water	91.5	126.2	429.3	550.8
Wastewater	52.1	45.7	171.7	177.0
Drainage Services	226.7	239.1	754.3	776.8

Over the course of the PBR term, changes to capital programs are required to address unforeseen needs for repairs or rehabilitation, changes in regulatory or operational requirements, customer demands, and other external factors. These changes are coordinated through EWSI's Capital Governance and Review group and are authorized by EWSI's Capital Project Steering Committee, EPCOR Utility Inc.'s (EUI) Financial Review Council, or EPCOR's Board of Directors, depending on the amount of the expenditure. EWSI also presents information on its capital programs, as well as business cases supporting significant new capital projects (i.e., not already included in the approved PBR application), to the City of Edmonton's Utility Committee.

- **In-City Water's** 2022-2026 projected capital expenditures of $550.8 million are $121.4 million (28%) greater than the PBR forecast. Significant projects contributing to this variance include projects that were delayed and carried over from the 2017-2021 PBR term, including the kīsikāw pīsim Solar Farm and Battery Storage System, Phosphoric Injection for Lead Control, and the Water/Drainage Real Estate Consolidation Project ($46.3 million); a higher than anticipated volume of utility infrastructure relocate requests from the City of Edmonton related to the LRT expansion, Yellowhead Trail upgrades, and water distribution main relocates ($40.0 million); and an increase in developer-driven growth projects such as the Network Private Development Transmission Mains Program and Water Services Connections Program ($36.6 million).

- **Wastewater's** 2022-2024 projected capital expenditures of $177 million are $5.3 million (3%) slightly greater than the PBR forecast. This difference reflects considerable efforts to rebalance Wastewater's capital program in response to changing priorities to ensure that Wastewater continues to provide a high level of service to its customers while mitigating risks and maintaining performance standards.

- **Drainage Services'** 2022-2024 projected capital expenditures of $776.8 million are $22.5 million (3%) slightly greater than the PBR forecast. This difference reflects various shifts between programs as Drainage Services continues to refine and reprioritize its overall capital expenditures program to address asset condition, mitigate the risk of failure, and maintain required service levels, while staying as close as possible to the approved capital envelope.

Detailed explanations for differences between capital expenditures in PBR forecast and EWSI's current projections are provided in Sections 2.1.5, 2.2.5 and 2.3.5.

1.3 Operational Performance

In-City Water's operational performance is measured by the results of indices prescribed in Schedule 3, Section 3 of Bylaw 19626 with each index consisting of one or more performance measures. Wastewater treatment and Drainage Services' operational performance is measured by the results of indices prescribed in Schedule 3, Section 3 and Section 4 of Bylaw 19627.

Operational performance under each index is measured independently on a points basis with 100 base points available if the standards for all performance measure indices are achieved. Bonus points are available for performance above standards and financial penalties are applied if EWSI does not meet the 100 base point standard.

In 2022, In-City Water exceeded the performance standards for all five of its performance measure indices, Wastewater treatment exceeded the performance standards for three of its four performance measure indices, and Drainage Services exceeded the performance standards for all four of its performance measure indices. Actual operational performance for each of the indices are summarized in Table 1.3-1 and discussed in Section 3 of this report.

Table 1.3-1
2022 Performance Measures and Standards

		A	B	C	D	E	F
	Performance Index	**In-City Water**		**Wastewater**		**Drainage Services**	
		Standard	**Actual Score**	**Standard**	**Actual Score**	**Standard**	**Actual Score**
1	Water Quality Index[2]	30.00	30.00	45.00	49.50	-	-
2	Customer Service Index	15.00	17.25	15.00	16.50	20.00	22.00
3	System Reliability and Optimization Index	25.00	28.25	25.00	24.70	30.00	31.60
4	Environmental Index[2]	15.00	17.25	-	-	35.00	38.50
5	Safety Index	15.00	17.25	15.00	15.20	15.00	16.50
6	**Aggregate Points Earned**	**100.00**	**110.00**	**100.00**	**105.90**	**100.00**	**108.60**

1.4 Rates and Bill Comparisons

In 2022, the average residential customer's monthly bill for In-City Water services, based on an average monthly consumption of 14.0 m^3, was **$41.90**, an increase of $2.75 (7.0%) from 2021. This increase is largely due to the addition of a fixed monthly charge for public fire

[2] Water Quality and Environmental are combined into one index for Wastewater's and Drainage's operational performance

protection services of $2.54 (6.5%). Prior to 2022, the cost of public fire protection was recovered by the City of Edmonton through property taxes.

The average residential customer's monthly wastewater treatment and sanitary drainage services bill in 2022, also based on an average monthly consumption of 14.0 m^3, was **$51.63**, an increase of $5.05 (10.9%) from 2021. This increase includes a special rate adjustment of $2.94 related to the corrosion/odour mitigation program approved as a separate initiative by City Council. The remainder of the increase reflects other capital and operating revenue requirement changes approved in the PBR applications.

The average residential customer's monthly stormwater drainage services bill in 2022, was **$14.94**, an increase of $1.19 (8.6%) from 2021. The 2022 bill includes a special rate adjustment of $2.29 for climate-related flood mitigation program costs approved by City Council following extensive engagement and consultation with stakeholders and reflects other capital and operating revenue requirement changes approved in the PBR applications.

EWSI undertakes annual bill comparison surveys with various cities and local municipalities. EWSI's residential water bills are competitive with most cities and municipalities included in the comparison. Drainage and Wastewater treatment bills are more difficult to compare because of variations in the nature and extent of wastewater treatment, the inclusion of certain services in property taxes, and geographic and climatic factors that influence the level of investment and approach to flood mitigation. EWSI has been proactive in addressing the increased risk of flooding related to climate change and is making substantial investments through its Stormwater Integrated Resource Plan program to assess and mitigate these risks. EWSI's average wastewater treatment and drainage bills are comparable to cities that have started addressing risks related to climate change.

1.5 Consumption Deferral Account

For the 2022-2024/2026 PBR terms, City Council directed that EWSI establish *"a deferral account for water consumption for each of Water Services, Wastewater Treatment and Drainage Services that would be accumulated during the 2022-2026 and 2022-2024 PBR terms and included in customer rates in each of the next PBR terms through a special rate adjustment"*. The effect of the consumption deferral on 2022 Water Services, Wastewater Treatment and Drainages Services is summarized in Table 1.5-1 below. This table shows that actual consumption from the beginning of the 2022-2026 PBR term starting April 1, 2022 to December 31, 2022, was greater than forecast due to higher than forecast customer growth, a hot and dry summer resulting in increased consumption per customer, and commercial consumption recovering to pre-pandemic levels more rapidly than anticipated in the PBR forecast. The cumulative effect of these factors results in EWSI accumulating $19.7 million during 2022 in the consumption deferral account which will be refunded to customers in the next PBR term as outlined and approved in the PBR Bylaws.

Table 1.5-1
In-City Water
Consumption Deferral

		A	B	C	D
		Consumption (ML)		Consumption Deferral	
		Forecast	Actual	ML	$M
1	In-City Water	64,547	69,673	5,127	8.1
2	Wastewater Treatment	62,323	67,289	4,966	5.5
3	Drainage Services	62,319	67,277	4,958	6.1
4	**Total Deferral**				**19.7**

1.6 Non-Routine Adjustments

Non-routine adjustments are defined in Bylaw 19626 for In-City Water Services and in Bylaw 19627 for Stormwater Utility Services, Sanitary Utility Services and Wastewater Treatment Services, as items that are "by their nature unusual, significant in size or nature and beyond the scope of control of EWSI". Bylaws 19626 and 19627 allow EWSI to request positive or negative non-routine adjustments to rates from either the City Manager or City Council, depending on the revenue requirement threshold specified in the respective Bylaws.

All non-routine adjustments applied for by EWSI during the 2022-2024 / 2022-2026 PBR terms are to be charged to the Adjustment Deferral Accounts. A two-step approach is then followed whereby EWSI would receive interim approval and funding for the proposed adjustment with a final true up of funding being completed based on actual costs.

During 2022, EWSI did not seek approval for any non-routine adjustments that met the criteria outlined in Schedule 3, Section 5.0 of Bylaws 19626 and 19627. EWSI may request approval in the future for expenditures that meet the non-routine adjustment criteria.

2 Financial Performance

2.1 In-City Water & Fire Protection

The City of Edmonton regulates water services and fire protection services provided by EWSI within the boundaries of the City of Edmonton ("In-City Water"). In addition to these services, EWSI provides water services to regional water customers pursuant to bulk water supply agreements with each regional water customer. Due to the fully integrated nature of EWSI's water system, operating expenses, capital expenditures, depreciation and amortization and rate base are presented and analyzed on a total system basis in Sections 2.1.3 to 2.1.10. In-City Water's share of the total system costs are calculated in accordance with a cost of service model developed jointly by EWSI, the Regional Water Customers Group (RWCG) and the City of Edmonton, shown as separate line items in each applicable table.

In-City Water's 2022 regulated revenues and revenue requirements are summarized in Table 2.1-1 below:

Table 2.1-1
In-City Water
Revenue and Revenue Requirements
($ millions)

		A	B
		2022	
	Description	PBR Forecast	Actual
1	Regulated revenue	220.1	223.1
2	Revenue requirement		
3	Operations and maintenance expenses	112.2	112.8
4	Less: revenue offsets	(6.3)	(4.2)
5	Depreciation and amortization	38.9	37.6
6	Return on rate base financed by debt	33.2	33.9
7	Return on rate base financed by equity	42.0	43.0
8	Revenue requirement	220.1	223.1
9	**Return on rate base financed by equity***	**7.90%**	**8.36%**

* In the PBR forecast, the special rate adjustment for rebasing is smoothed over the PBR term to mitigate "rate shock" at the beginning of the PBR term. Therefore, although EWSI's PBR forecast for the 2022-2026 PBR term is based on its awarded rate of return on 9.64%, PBR forecast rates of return for individual years of the PBR will differ from awarded ROE.

In 2022, EWSI achieved a rate of return on equity of 8.36%, slightly greater than its forecast rate of return of 7.90%. The factors contributing to forecast to actual differences are explained in Sections 2.1.1 to 2.1.9.

2.1.1 Customers and Consumption

In-City Water provides services to three customer classes:

1) **Residential**, defined as a service supplied to premises used primarily for domestic purposes, where no more than four separate dwelling units are metered by a single water meter and the service line to the premises is not greater than 50 millimeters in diameter;
2) **Multi-Residential**, defined as a service supplied to premises used primarily for domestic purposes; where more than four separate dwelling units are metered by a single water meter; and
3) **Commercial**, defined as a commercial, industrial and institutional customers within the City of Edmonton and all water customers not otherwise defined as Residential or Multi-Residential water service customers.

These classes are unchanged from the previous PBR term. Average monthly customer counts, total annual consumption and monthly consumption per customer are shown in Table 2.1.1-1 below:

Table 2.1.1-1
In-City Water
Customers, Consumption and Consumption per Customer

	A	B
Customers and Consumption	**2022**	
	PBR Forecast	**Actual**
1 **Customers** (average active services per month)		
2 Residential	278,978	282,685
3 Multi-Residential	3,789	3,800
4 Commercial	19,920	20,151
5 Total Customers	**302,687**	**306,636**
6 **Annual Consumption** (ML)		
7 Residential	44,870	47,400
8 Multi-Residential	17,658	18,695
9 Commercial	21,541	24,581
10 Total Annual Consumption	**84,069**	**90,623**
11 **Consumption per Customer** (m^3 per month)		
12 Residential	13.4	14.0
13 Multi-Residential	388.4	410.0
14 Commercial	90.1	101.7

The factors contributing to the differences between actual and forecast for 2022 are explained below:

- **Customer growth**, while higher than forecast, is consistent with historic growth rates. EWSI's PBR forecast was prepared during mid-2020 and anticipated a reduction in migration into Edmonton due to the COVID-19 pandemic, resulting in lower anticipated customer growth. In reality, 2021 and 2022 residential customer growth rates remained

at or near pre-pandemic levels, resulting in higher than expected customer counts at the beginning of the current PBR term.

- **Consumption**

    - **Residential** – 2,530 ML (5.6%) greater than forecast, with 596 ML due to higher customer growth and 1,934 ML due to higher per customer consumption. Higher per customer consumption reflected both weather-related variation due to unusually hot and dry weather, as well as the on-going COVID-19 impacts of more people working at home;

    - **Multi-Residential** – 1,037 ML (5.9%) greater than forecast, with 53 ML due to customer growth and 983 ML due to higher per customer consumption. In addition to weather-related variation, EWSI added several very large multi-residential customers in 2022. Because of the small number of customers in this class and the variation in the number of units per customer, the addition of large customers can have outsized effects on consumption per customer; and

    - **Commercial** – 3,040 ML (14.1%) greater than forecast, with 220 ML due to higher than forecast customer growth and 2,820 ML due to higher consumption per customer. Similar to the residential customer class, weather-related variation contributed to the increase in commercial consumption per customer.

2.1.2 Revenue

In-City Water rates consist of fixed monthly service charges that vary with meter size and variable charges per cubic meter of water consumed. For the 2022-2026 PBR term, City Council directed EWSI to make the following two significant adjustments:

1. Include *"recovery of the public fire protection revenue requirement through water rates over the 2022-2026 PBR term by adding a special rate adjustment for public fire protection services to In-City Water's fixed monthly charges"*. Similar to water fixed monthly service charges, fire protection charges vary by meter size, but also by customer class, because of different fire flow requirements for each customer class. In prior years, the fire protection revenue requirement was recovered through property taxes; and

2. Establish *"a deferral account for water consumption for each of Water Services, Wastewater Treatment and Drainage Services that would be accumulated during the 2022-2026 and 2022-2024 PBR terms and included in customer rates in each of the next PBR terms through a special rate adjustment"*.

The effect of the consumption deferral on 2022 In-City water is summarized in Table 2.1.2-1 below. This table shows that actual consumption from the beginning of the 2022-2026 PBR

term starting April 1, 2022 to December 31, 2022 was 5,127 ML greater than forecast, resulting in a deferral of $8.1 million that will be refunded to customers in the next PBR term.

Table 2.1.2-1
In-City Water
Consumption Deferral

		A	B	C	D
		Consumption (ML)		Consumption Deferral	
		PBR Forecast	Actual	ML	$M
1	Residential	34,391	36,336	1,944	3.9
2	Multi-Residential	13,351	14,254	903	1.3
3	Commercial	16,805	19,084	2,279	3.0
4	**Total Consumption**	**64,547**	**69,673**	**5,127**	**8.1**

Table 2.1.2-2 below provides a comparison of 2022 In-City Water revenues to the PBR forecast.

Table 2.1.2-2
In-City Water
Revenue
($ millions)

		A	B
		2022	
	Description	PBR Forecast	Actual
1	In-City Water		
2	Fixed monthly service charges		
3	Residential	38.3	38.8
4	Multi-residential	2.4	2.4
5	Commercial	6.9	7.1
6	Fixed monthly service charges	47.5	48.3
7	Consumption charges billed to customers		
8	Residential	98.4	103.5
9	Multi-residential	29.5	30.8
10	Commercial	29.3	33.1
11	Consumption charges billed to customers	157.2	167.5
12	Less: Consumption deferral		
13	Residential	-	(3.9)
14	Multi-residential	-	(1.3)
15	Commercial	-	(3.0)
16	Consumption deferral		(8.1)
17	Consumption charges, net of deferral		
18	Residential	98.4	99.6
19	Multi-residential	29.5	29.6
20	Commercial	29.3	30.2
21	Consumption charges, net of deferral	157.2	159.3
22	**In-City Water revenue**	**204.7**	**207.7**

		A	B
		2022	
	Description	PBR Forecast	Actual
23	Fire Protection		
24	Public fire protection	12.6	12.8
25	Private fire protection	2.8	2.6
26	**Fire Protection revenue**	**15.4**	**15.4**
27	**Regulated Revenue**	**220.1**	**223.1**
28	Other revenue (“revenue offsets”)	6.3	4.6
29	**In-City Revenue**	**226.3**	**227.7**

Actual In-City revenue for 2022 was within 0.7% of the PBR forecast. This difference was attributable to the following factors:

- **Fixed monthly service charges** - $0.8 million greater than forecast due to higher customer counts.

- **Consumption charges** - $2.1 million greater than forecast, due to higher than forecast consumption per customer during the first three months of 2022, prior to the introduction of the consumption deferral, and higher than forecast customer growth.

- **Fire protection charges** - Prior to the 2022-2026 PBR term, public fire protection charges were not billed directly to EWSI’s customers. Instead, the cost of providing public fire protection, including dedicated reservoir capacity, oversizing of distribution mains to provide required fire flows and providing and maintaining fire hydrants, were charged directly to Edmonton Fire Rescue Services pursuant to a fire protection contract and were recovered through property taxes. As directed by City Council, effective April 1, 2022, EWSI charges customers directly for the costs of fire protection services. These charges vary by meter size and by customer class.

- **Other revenues** - $1.7 million lower than forecast. Other revenue (“revenue offsets”) are derived from temporary services, connection fees, water permits, late payment charges and other incidental services, as well as a regulatory adjustment of $1.0 million per year related to an over-collection of charges for valve casings and service box replacements during the 2017-2021 PBR term. The regulatory adjustment refunds this over-collection to customers through an increase in forecast other revenue, reducing the forecast revenue requirement and, therefore, rates over the 2022-2026 PBR term. The remainder of the variance relates to numerous small items, none of which were significant.

2.1.3 Operating Expenses by Function

Table 2.1.3-1 below provides a comparison of EWSI's total water system operating expenses for 2022 to the PBR forecast.

Table 2.1.3-1
EWSI Total System
Operating Expenses by Function
($ millions)

		A	B
		2022	
	Function	PBR Forecast	Actual
1	Power, Other Utilities and Chemicals		
2	Power and Other Utilities	10.5	12.4
3	Chemicals	12.5	8.5
4	Power, Other Utilities and Chemicals	23.0	20.9
5	Water Operations		
6	Water Treatment Plants	24.0	21.5
7	Water Distribution and Transmission	22.9	22.7
8	Operational Support Services	12.7	12.3
9	Less: Capitalized Overhead Costs	(9.1)	(7.1)
10	Water Operations	50.5	49.4
11	Billing, Meters and Customer Service	11.6	10.5
12	EWSI Shared Services	14.4	17.6
13	Corporate Shared Services	13.6	13.7
14	Franchise Fees and Property Taxes	17.6	18.4
15	**Total Operating Expenses**	**130.7**	**130.5**
16	In-City Share - %	85.9%	86.4%
17	**In-City Share of Operating Expenses**	**112.2**	**112.8**

Overall, total operating expenses for 2022 were $0.2 million lower than forecast. Explanations for significant variances include:

- **Power and Other Utilities** – $1.9 million greater than forecast due to higher water consumption per customer due to higher seasonal temperatures and higher customer growth, resulting in higher than forecast power consumption to treat and distribute water. In addition, delayed energization of the kīsikāw pīsim solar farm because of delayed regulatory approval resulted in higher net purchase of power than forecast for 2022.

- **Chemicals** – $4.0 million lower than forecast, with favourable water quality providing $3.1 million of savings due to lower usage of alum, carbon and caustic soda, and delays in implementing the phosphoric injection for lead mitigation project due to COVID-19, which resulted in a $0.9 million reduction in phosphoric acid purchases.

- **Water Treatment Plants** – $2.5 million lower than forecast primarily due to lower salary and benefits costs of $1.0 million due to vacancies and $1.1 million lower contractor costs

related to snow removal, lower general maintenance for the kīsikāw pīsim solar farm due to delayed energization and lower contractor spend on various miscellaneous activities.

- **Billing, Meters, and Customer Service** – $1.1 million lower than forecast primarily due to lower costs related to the move to the new Water/Drainage Shared Facility (Aurum facility).

- **EWSI Shared Services** – $3.2 million greater than forecast primarily due to higher salary and labour costs.

- **Franchise Fees and Property Taxes** – $0.8 million greater than forecast due to higher than forecast billed revenue. Franchise fees are calculated as 8% of eligible revenues less the municipal portion of property taxes. As noted in Section 2.1.2 above, water revenues were higher than forecast resulting in higher franchise fees paid to the City of Edmonton in 2022.

- In 2022, In-City Water's share of operating expenses were $112.8 million (86.4%), compared to $112.2 million (85.9%) in the PBR forecast. System wide costs are allocated between In-City customers and the RWCG using a cost of service model which was jointly developed by EWSI, RWCG and the City of Edmonton. The slight increase (0.5%) in In-City Water's share of operating expenses were primarily due to higher salary costs incurred by shared services groups providing support to the business unit because of wage inflation.

2.1.4 Operating Expenses by Cost Category

Table 2.1.4-1 below provides a breakdown of operating expenses by cost category for rows 10, 11 and 12 from Table 2.1.3-1.

Table 2.1.4-1
EWSI Total System
Operating Expenses by Cost Category
($ millions)

		A	B
		2022	
	Cost Category	PBR Forecast	Actual
1	Water Operations		
2	Staff costs and employee benefits	32.6	32.8
3	Contractors and consultants	8.6	8.0
4	Materials and supplies	3.7	3.8
5	Vehicles	0.4	0.9
6	Other	5.2	3.8
7	**Water Operations**	**50.5**	**49.4**
8	Billing, Meters and Customer Service		
9	Customer billing and collection services	8.2	8.8
10	Staff costs and employee benefits	6.4	5.4
11	Contractors and consultants	1.2	0.1
12	Vehicles	0.3	0.1
13	Other	1.2	0.8
14	Meter reading services (Recoveries)	(5.7)	(4.7)
15	**Billing, Meters and Customer Service**	**11.6**	**10.5**
16	EWSI Shared Services		
17	EWSI shared services allocation	10.5	12.5
18	Staff costs and employee benefits	3.6	4.9
19	Contractors and consultants	0.2	0.3
20	Other	0.2	(0.0)
21	EWSI Shared Services	**14.4**	**17.6**

2.1.5 Capital Expenditures by Major Project and Category

Table 2.1.5-1 compares PBR forecast to actual capital expenditures for 2022 by major category and by individual projects/programs in excess of $5.0 million. Table 2.1.5-1 also provides a comparison of the total 2022-2026 PBR forecast capital expenditures to EWSI's current forecast for the PBR term. Detailed variance explanations are provided below.

Table 2.1.5-1
EWSI Total System
Capital Expenditures
($ millions)

		A	B	C	D	E	F	
		Current Year			2022-2026			
	Major Category and Project	PBR Forecast	Actual	Variance	PBR Forecast	Projection	Variance	Note
1	**Health, Safety and Environment**							
2	kīsikāw pīsim Solar Farm and Battery Energy Storage System	1.0	16.8	(15.8)	1.0	20.4	(19.4)	1
3	Rossdale Ammonia Upgrades - Conversion to LAS	-	0.1	(0.1)	-	7.2	(7.2)	2
4	Projects < $5 million	2.4	1.3	1.1	10.4	7.3	3.1	
5	Subtotal	3.4	18.2	(14.8)	11.4	34.9	(23.5)	
6	**Regulatory**							
7	Water Services Replacement and Refurbishment Program	5.8	5.9	(0.1)	24.7	25.0	(0.3)	
8	Phosphoric Injection for Lead Control	-	9.7	(9.7)	-	10.8	(10.8)	3
9	Projects < $5 million	-	-	-	0.8	-	0.8	
10	Subtotal	5.8	15.6	(9.8)	25.5	35.8	(10.3)	
11	**Growth/Customer Requirements**							
12	Water Service Connections Program	5.4	6.6	(1.2)	28.4	40.9	(12.5)	4
13	Network Private Development Transmission Mains Program	4.6	23.6	(19.0)	15.0	39.9	(24.9)	5
14	QEII / 41 Avenue Crossing Project	-	-	-	14.1	13.4	0.7	
15	New Meter Purchases and Installations Program	2.6	1.9	0.8	13.9	13.5	0.3	
16	Customer Distribution Main Infrastructure Requests	2.1	3.2	(1.1)	11.2	12.2	(1.0)	
17	LRT Relocates Program	5.0	5.5	(0.5)	10.3	19.4	(9.2)	6
18	Private Development Construction Coordination Program	1.8	2.7	(0.9)	9.7	14.5	(4.7)	7
19	Winterburn Booster Station Project	0.6	-	0.6	7.2	-	7.2	8
20	Franchise Agreement Distribution Main Relocations	1.1	6.6	(5.4)	6.0	18.0	(12.0)	9
21	Yellowhead Trail Upgrades / Relocations Project	1.5	5.4	(3.9)	5.0	23.8	(18.8)	10
22	Projects < $5 million	1.5	0.8	0.7	4.2	5.0	(0.8)	
23	Subtotal	26.4	56.2	(29.8)	125.1	200.6	(75.6)	

		A	B	C	D	E	F	
		Current Year			2022-2026			
	Major Category and Project	PBR Forecast	Actual	Variance	PBR Forecast	Projection	Variance	Note
24	**Reliability and Life Cycle Improvements**							
25	Risk Based Distribution Main Renewals	5.5	3.4	2.1	29.0	19.2	9.7	11
26	Water Treatment Plants Flood Protection Project	5.9	3.5	2.3	22.9	55.5	(32.7)	12
27	Infill Fire Protection Program	3.9	1.2	2.8	20.2	15.5	4.7	13
28	EL Smith Stage 1 Filter Upgrades Project	3.5	3.0	0.5	13.5	16.1	(2.5)	14
29	Obsolete Valve Replacements Program	2.1	2.2	(0.1)	11.2	11.6	(0.4)	
30	Transmission Mains and Appurtenances	2.0	1.2	0.8	10.7	10.7	(0.0)	
31	Reservoir Structural Rehabilitation and Roof Replacement	2.1	0.0	2.0	9.6	11.2	(1.5)	
32	Vehicle and Fleet Additions Program	2.0	1.0	1.0	7.0	7.4	(0.4)	
33	Critical Pipeline Inspection Program	1.3	0.0	1.3	6.8	4.9	1.9	
34	Obsolete Hydrant Replacements Program	1.1	1.4	(0.2)	6.0	8.3	(2.3)	15
35	Water Meter Change Outs Program	-	0.8	(0.8)	5.8	8.3	(2.5)	16
36	EL Smith 5kV Upgrades and Electrical Room Expansion	5.0	0.1	4.9	5.0	7.8	(2.8)	17
37	EL Smith HLPH Expansion Project	-	0.3	(0.3)	5.0	1.9	3.1	18
38	Projects < $5 million	18.7	12.8	5.9	82.8	70.3	12.5	19
39	Subtotal	53.2	31.0	22.3	235.4	248.7	(13.2)	
40	**Performance Efficiency and Improvement**							
41	Water Main Cathodic Protection Program	2.9	2.4	0.5	15.1	15.1	(0.0)	
42	AMI Deployment Project	12.5	0.9	11.6	62.9	63.7	(0.9)	
43	Water D&T Facility	-	14.7	(14.7)	-	16.6	(16.6)	20
44	Projects < $5 million	1.0	0.4	0.7	5.1	4.5	0.6	
45	Subtotal	16.4	18.3	(1.9)	83.0	100.0	(16.9)	
46	**Capital Expenditures**	**105.2**	**139.3**	**(34.1)**	**480.4**	**619.9**	**(139.5)**	
47	**Contributions**							
48	Water Service Connections Contributions	(5.4)	(3.8)	(1.6)	(28.4)	(33.8)	5.4	4
49	Customer Infrastructure Requests Contributions	(2.1)	(3.2)	1.0	(11.2)	(12.2)	1.0	
50	Private Development Construction Coordination Contributions	(0.2)	(0.2)	(0.0)	(1.0)	(1.1)	0.1	
51	Solar Power Systems (including BESS) Contributions	(3.6)	(3.1)	(0.5)	(3.6)	(3.1)	(0.5)	
52	Water Treatment Plants Flood Protection Contributions	(2.3)	(2.9)	0.5	(6.7)	(18.9)	12.2	12
53	**Contributions**	**(13.7)**	**(13.1)**	(0.6)	**(51.0)**	**(69.1)**	**18.1**	
54	**Capital Expenditures, net of Contributions**	**91.5**	**126.2**	**(34.7)**	**429.3**	**550.8**	**(121.4)**	

Explanations for differences between PBR forecast capital expenditures and EWSI's current projection in excess of $2.0 million include:

1. **kīsikāw pīsim Solar Farm and Battery Energy Storage System** – $19.4 million greater than forecast. Longer than anticipated timeframes for regulatory and Bylaw approvals resulted in carryover of work from the 2017-2021 PBR term and delayed project completion. These delays meant that the solar farm was not fully commissioned until the end of 2022.

2. **Rossdale Ammonia Upgrades** – $7.2 million greater than forecast (new project). This project provides for the use of liquid ammonium sulphate ("LAS") in chloranimation. This upgrade was advanced to address safety considerations with aqueous ammonia which requires pressurized storage tanks as well as special handling and safety procedures.

3. **Phosphoric Injection for Lead Control** – $10.8 million greater than forecast (carry-over project). Although this project was scheduled for completion during the 2017-2021 PBR term, COVID-19 related delays required deferral of work and carry-over of work into the 2022-2026 PBR term.

4. **Water Services Connections Program** – $12.5 million greater than forecast. This program provides for the construction of new water services for infill developments and redevelopments and for recovery of these costs from private developers. Cost increases reflect requests from developers for larger and more complex service connections (primarily infills) than anticipated in the PBR forecast. These cost increases are partially offset by a $5.4 million increase in expected contributions.

5. **Network Private Development Transmission Mains Program** – $24.9 million greater than forecast. This program provides for the reimbursement of costs of transmission mains constructed by developers, ensuring that EWSI design standards are met and the expansion is properly sized for the development being constructed, for future development, and for fire protection. The increase in costs for this program relate to an increased length of transmission mains that were not anticipated in the PBR forecast, in particular three locations; a long length of transmission main in north-east Edmonton to initiate development in the Horsehills area adjacent to Manning Freeway, a transmission main in south Edmonton required due to the required shut down of a transmission main on Ellerslie Road to accommodate road and bridge reconstruction and still support growth in the region, and finally a transmission main in southeast Edmonton to support development of the new hospital and coordination of transmission construction with road construction across the pipeline corridor in the region. EWSI may request approval for the expenditures that meet the non-routine adjustment criteria in the near future. EWSI is also assessing the timing of the construction for the $13.4M QEII/ 41 Avenue Crossing project to mitigate these cost increases.

6. **LRT Relocates** – $9.2 million greater than forecast. The PBR forecast was approved before the final approval and funding for the Metro/Capital Line LRT was secured. The City's approved track alignments require EWSI to complete more infrastructure relocations than anticipated in the PBR forecast. EWSI may request approval for the expenditures that meet the non-routine adjustment criteria in the near future.

7. **Private Development Construction Coordination** – $4.7 million greater than forecast. Expenditures on this project are forecast to increase significantly due to increases in Network Private Development Transmission Mains projects described in note 4 above.

8. **Winterburn Booster Station Project** – $7.2 million lower than forecast. The acquisition of the Parkland Booster Station from the Capital Region Parkland Water Service Commission in 2021 allowed EWSI to enhance its resilience in the Edmonton West Secondary Zone at a lower overall cost instead of building a new booster station.

9. **Franchise Agreement Distribution Main Relocations** – $12.0 million greater than forecast. EWSI has experienced higher than forecast hydrant relocation work requests from the City. EWSI may request approval for the expenditures that meet the non-routine adjustment criteria in the near future.

10. **Yellowhead Freeway Conversion** – $18.8 million greater than forecast. EWSI received greater volume of utility relocation requests from the City than were anticipated in the PBR forecast. EWSI may request approval for the expenditures that meet the non-routine adjustment criteria in the near future.

11. **Risk Based Distribution Main Renewals** – $9.7 million lower than forecast. The scope of this program has been reduced in the current PBR to enable EWSI to address high priority reliability-driven projects, in particular Water Treatment Plants Flood Protection, which have been determined to be higher overall risk.

12. **Water Treatment Plants Flood Protection** – $32.7 million greater than forecast and **Water Treatment Plants Flood Protection Contributions** $12.2 million greater than forecast. The scope of this project increased mainly due to the following factors as planning and design work proceeded:

    a. The complexity of flood protection infrastructure needed for the two water treatment plants, following more detailed study and review, resulting in higher than forecast costs; and

    b. Comprehensive community consultation and close collaboration with Indigenous communities to ensure that the project is conducted with respect for cultural sensitivities, fully recognizing the archaeological, historical and cultural significance of the plant sites resulting in delayed implementation of the project than anticipated.

EWSI was able to secure additional grant funding of $12.2 million through the Federal Disaster Mitigation and Adaptation Fund (DMAF) and the Alberta Community Resilience Program (ACRP).

13. **Infill Fire Protection Program** – $4.7 million lower than forecast. During the 2017-2021 PBR term, EWSI worked closely with infill developers to develop criteria for funding infill fire protection, to develop forecasts of eligible projects and to forecast the funding required over the 2022-2026 PBR forecast. Based on 2022 actual results, the expected costs of this program over the 2022-2026 PBR term have been reduced to reflect lower than expected volume of investment required due to the success of the Infill Fire Protection Assessment program with Edmonton Fire Rescue services that determines the actual fire flows required based on the building structure being proposed versus being determined solely by land zoning.

14. **E.L. Smith Stage 1 Filter Upgrades Project** – $2.5 million greater than forecast. The increase is attributable to advancing the Filter 5 upgrade project in order to realize efficiencies by aligning this upgrade with similar projects undertaken at E.L. Smith during the 2022-2026 PBR term.

15. **Obsolete Hydrant Replacement** – $2.3 million greater than forecast. Higher than expected deficiencies have led to increased hydrant replacements. EWSI has also identified a particular model of hydrant that has seen increased failures that requires accelerated replacement due to lack of available components and to ensure fire protection service levels are maintained.

16. **Water Meter Change outs program** – $2.5 million greater than forecast. Scheduled replacements have been reassessed to align with the Advanced Metering Infrastructure (AMI) Deployment Project.

17. **E.L. Smith 5kV Upgrades and Electrical Room Expansion** – $2.8 million greater than forecast. Cost increases reflect additional complexities identified during the design phase of this project.

18. **E.L. Smith High Lift Pump House (HLPH) Expansion Project** – $3.1 million lower than forecast. Implementation of this project has been deferred to the next PBR term to enable EWSI to address high priority reliability-driven projects such as Water Treatment Plants Flood Protection.

19. **Reliability & Life Cycle Improvements < $5.0 million** – $12.5 million lower than forecast. Implementation of smaller low-priority projects have been deferred to enable EWSI to address high priority projects such as Water Treatment Plants Flood Protection and Rossdale Ammonia Upgrades.

20. **Water D&T Facility** – $16.6 million greater than forecast (carry-over project). This project was expected to be completed during the 2017-2021 PBR term. The project was delayed due to changes in scope and the need to address higher than expected construction bid costs. This project, now known as the Water/Drainage Shared Facility (Aurum facility) was completed in December 2022.

2.1.6 Construction Work in Progress

In-City Water's rate base consists of plant in service. If a capital project is not completed (i.e., not placed into service) during the year, the capital expenditures on that project remain in Construction Work in Progress and are excluded from the rate base. In 2022, as shown in Table 2.1.6-1, the balance in Construction Work in Progress was $36.8 million greater than forecast.

Table 2.1.6-1
EWSI Total System
Construction Work in Progress
($ millions)

		A	B
		2022	
	CWIP Continuity	Forecast	Actual
1	Construction work in progress, beginning of year	9.3	63.2
2	Capital expenditures		
3	Capital expenditures before contributions	105.2	170.0
4	Contributions received	(13.7)	(43.8)
5	Capital expenditures, net of contributions received	91.5	126.2
6	Capital additions		
7	Plant in service		
8	EPCOR-constructed assets	(108.7)	(158.3)
9	Developer-constructed assets	(32.2)	(26.7)
10	Total Capital Additions	(140.9)	(185.1)
11	Contributions		
12	Contributions recognized	19.1	17.1
13	Developer-constructed assets	32.2	26.7
14	Total contributed assets	51.3	43.8
15	Capital additions, net	(89.6)	(141.2)
16	**Construction work in progress, end of year**	**11.3**	**48.1**

The PBR plan allows EWSI to capitalize the costs of financing certain projects remaining in Construction Work in Progress, using an Allowance for Funds Utilized During Construction (AFUDC). In 2022, AFUDC included in capital expenditures on eligible projects amounted to $2.5 million, compared to the PBR forecast amount of $0.9 million. This difference was attributable to AFUDC on projects that were forecast to be completed in 2021, such as the Water D&T Facility and kīsikāw pīsim Solar Farm, as well as higher than forecast capital expenditure in 2022.

2.1.7 Depreciation and Amortization

EWSI's total system depreciation expense and amortization of contributed assets for 2022 are shown in Table 2.1.7-1 below:

Table 2.1.7-1
EWSI Total System
Depreciation and Amortization
($ millions)

		A	B
	Depreciation and Amortization	**2022**	
		PBR Forecast	**Actual**
1	Gross depreciation expense	58.9	57.0
2	Amortization of contributions	(13.1)	(12.7)
3	**Depreciation, net**	**45.8**	**44.3**
4	In-City Water share - %	85.0%	85.0%
5	**In-City Water share - $**	**38.9**	**37.6**

Depreciation expense and amortization of contributions in 2022 were slightly lower than forecast due to lower than forecast opening asset balances as shown in Table 2.1.8-1.

2.1.8 Rate Base

In 2022, EWSI's total water system rate base, shown in Table 2.1.8-1 below, was $58.3 million lower than forecast, largely due to lower opening asset balances related to delays in completing projects originally scheduled for completion during the 2017-2021 PBR term.

Table 2.1.8-1
EWSI Total System
Mid-Year Rate Base
($ millions)

		A	B
	Description	**2022**	
		PBR Forecast	**Actual**
1	Plant in service, beginning of year	2,911.2	2,798.9
2	Capital additions		
3	EPCOR-funded	89.6	141.2
4	Developer-funded	51.3	43.8
5	Capital additions	140.9	185.1
6	Retirements and adjustments	-	(4.8)
7	Plant in service, end of year	3,052.2	2,979.2
8	Accumulated depreciation, beginning of year	738.0	716.2
9	Gross provision	58.9	57.0
10	Retirements and adjustments	-	(4.8)
11	Accumulated depreciation, end of year	796.9	768.5
12	Mid-Year Net Property	2,214.3	2,146.7
13	Other Rate Base Items		
14	Materials and supplies	4.0	4.8

	Description	A 2022 PBR Forecast	B 2022 Actual
15	Working capital	15.4	(2.4)
16	**Gross Mid-Year Rate Base**	**2,233.6**	**2,149.2**
17	Contributions, beginning of year	880.8	857.8
18	Developer contributions		
19	Contributed assets	32.2	26.7
20	Contributions	19.1	17.1
21	Developer contributions	51.3	43.8
22	Retirements and adjustments	-	(0.0)
23	Contributions, end of year	932.2	901.6
24	Accumulated amortization, beginning of year	203.6	203.3
25	Gross provision	13.1	12.7
26	Retirements and adjustments	-	(0.2)
27	Accumulated amortization, end of year	216.7	215.8
28	**Mid-Year Net Contributions**	**696.4**	**670.2**
29	**Mid-Year Rate Base**	**1,537.3**	**1,479.0**
30	In-City Water share - %	86.5%	87.1%
31	In-City Water share - $	1,329.2	1,287.5

2.1.9 Return on Rate Base

In-City Water was initially awarded a Return on Equity (ROE) of 9.89% for the 2022-2026 PBR Term, which, pursuant to City Council direction, was reduced to 9.64% to reflect the reduction in business risk provided by the consumption deferral account. In the PBR forecast, the special rate adjustment for rebasing was smoothed over the PBR term to mitigate “rate shock” at the beginning of the PBR term. The special rate adjustment for rebasing accounts for the difference between EWSI’s revenue requirement forecast for the PBR term and the revenue that would be realized if annual rate increases were limited to inflation. Therefore, although EWSI’s 2022-2026 PBR term is based on its awarded rate of return on 9.64%, PBR forecast rates of return for individual years of the PBR will differ from awarded ROE, with a 7.90% ROE forecast for 2022 due to the phasing in of the rebasing adjustment.

In 2022, In-City Water’s return on rate base was $1.7 million greater than forecast. Approximately $0.7 million was attributable to higher cost of debt (see Table 2.1.9-1) and the remaining $1.0 million attributable to higher than forecast customer growth and variation in operations and maintenance expenses explained in Section 2.1.3.

Table 2.1.9-1
In-City Water
Return on Mid-Year Rate Base
($ millions)

	A	B
Return on Rate Base	**2022**	
	PBR Forecast	**Actual**
1 In-City Water share - $	1,329.2	1,287.5
2 Deemed capital structure		
3 Debt (%)	60%	60%
4 Equity (%)	40%	40%
5 Cost of capital		
6 Cost of debt	4.17%	4.39%
7 Cost of equity	7.90%	8.36%
8 Return on Mid-Year Rate Base		
9 Return on Rate Base Financed by Debt	33.2	33.9
10 Return on Rate Base Financed by Equity	42.0	43.0
11 Total Return on In-City Water Rate Base	**75.2**	**76.9**

Return on rate base is calculated separately for the debt-financed and equity-financed portions of In-City Water's net rate base. The rate of return on debt is equal to the embedded cost of debt for EWSI's total water system, as calculated in Table 2.1.9-2 below:

Table 2.1.9-2
EWSI Water Services
Interest Expense and Cost of Debt
($ millions)

	A	B
Interest Expense and Cost of Debt	**2022**	
	PBR Forecast	**Actual**
1 Interest expense		
2 Interest on short-term debt	0.8	1.6
3 Interest on long-term debt	37.4	37.3
4 Total interest expense	38.3	38.9
5 Mid-year debt		
6 Mid-year short-term debt	34.5	23.1
7 Mid-year long-term debt	883.4	863.4
8 Mid-year debt	918.0	886.5
9 Average cost of debt	**4.17%**	**4.39%**

The embedded cost of debt was higher in 2022 due to higher than forecast interest rates on new debt issues related to the Bank of Canada's rate hikes during 2022. Under the terms of the PBR Plan, EWSI bears interest rate risk and therefore, higher than forecast debt costs are not borne by ratepayers. EWSI expects interest rates to remain higher than forecast for the majority of the PBR term.

2.1.10 Transactions with Affiliates

In-City Water derives a portion of its revenue and expenses from transactions with affiliates, including the City of Edmonton, EUI and its subsidiaries, and other EWSI business units. Table 2.1.10-1 provides a summary of In-City Water's 2022 actual and forecast transactions with affiliates.

Table 2.1.10-1
EWSI Total System
Transactions with Affiliates
($ millions)

		A	B
	Affiliate and Service	2022 PBR Forecast	2022 Actual
1	**Revenues from the provision of services to the City of Edmonton**		
2	Public fire protection	3.1	3.1
3	Water sales	3.5	3.6
4	Total	6.6	6.7
5	**Services provided by (recovered from):**		
6	**City of Edmonton**		
7	Franchise fees	16.8	17.6
8	Property taxes	0.8	0.7
9	Mobile equipment services	2.5	0.7
10	Other services	0.7	(0.0)
11	Total	20.8	19.1
12	**EPCOR Utilities Inc**.		
13	Corporate shared services	13.6	13.7
14	Interest on intercompany debentures	37.4	37.3
15	Interest on short-term debt	0.8	1.6
16	Other services	0.4	0.5
17	Total	52.2	53.1
18	**EPCOR Energy Alberta LP**		
19	Customer billing and collection services	8.2	8.8
20	Trouble call support services and other services	0.5	0.6
21	Total	8.7	9.5
22	**Other EPCOR Utilities Inc. subsidiaries**		
23	Hydrovac charges and space rentals from EPCOR Technologies Inc.	1.7	0.9
24	Other services (recoveries) from EPCOR Distribution and Transmission Inc.	0.0	(0.1)
25	Other recoveries from EPCOR Power Development	(0.2)	(0.3)
26	Total	1.5	0.5
27	**Other EWSI Business Units**		
28	Water shared services	10.5	12.5
29	Water sales to Wastewater Treatment	(0.5)	(0.4)
30	Meter reading services (recoveries) from Wastewater Treatment	(2.8)	(2.3)
31	Meter reading services (recoveries) from Drainage Services	(2.8)	(2.3)
32	Drainage Services rent (recoveries)	(0.4)	(0.3)
33	Drainage Services other services	(0.2)	(0.4)
34	Total	3.8	6.7
35	**Expenditures on capital projects arising from services provided by:**		
36	City of Edmonton	0.5	0.2
37	EPCOR Technologies Inc.	4.5	5.7
38	EPCOR Utilities Inc.	1.4	0.5
39	EPCOR Drainage Services	2.8	2.3
40	EPCOR Distribution and Transmission Inc.	0.2	0.8
41	Other EPCOR Business Units	0.1	0.1
42	Total	9.5	9.6

2.2 Wastewater Treatment

Wastewater's rate revenue and revenue requirements are summarized in Table 2.2-1 below.

Table 2.2-1
Wastewater Treatment Revenue Requirements
($ millions)

	Description	A 2022 PBR Forecast	B 2022 Actual
1	Regulated revenue	122.1	124.2
2	Revenue requirement		
3	Operations and maintenance expenses	70.8	70.6
4	Less: revenue offsets	(5.9)	(7.2)
5	Depreciation and amortization	23.2	23.3
6	Return on rate base financed by debt	12.3	12.4
7	Return on rate base financed by equity	21.7	25.1
8	Revenue requirement	122.1	124.2
9	**Return on rate base financed by equity***	**9.94%**	**12.44%**

* In the PBR forecast, the special rate adjustment for rebasing is smoothed over the PBR term to mitigate "rate shock" at the beginning of the PBR term. Therefore, although EWSI's PBR forecast for the 2022-2024 PBR term is based on its awarded rate of return on 9.64%, PBR forecast rates of return for individual years of the PBR will differ from awarded ROE.

In 2022, EWSI achieved a greater than forecast rate of return on equity of 12.44%. The factors contributing to forecast to actual differences are explained in Sections 2.2.1 to 2.2.9.

2.2.1 Customers and Consumption

Wastewater's customer counts, consumption and consumption per customer are similar to those of In-City Water.

Wastewater has two customer classes:

- **Residential Customer Class.** Unlike In-City Water, there are no separate rates for multi-residential customers. Instead, multi-residential water customers are subject to the same rates as residential wastewater customers. The common rate structure for residential and multi-residential customers recognizes that the costs of wastewater treatment are similar for both residential and multi-residential customers. Accordingly, charges to residential customers are based on a flat rate structure with a single consumption block.

- **Commercial Customer Class.** Consumption charges for commercial customers are based on a declining rate structure with three consumption blocks to recognize the economies of scale in wastewater treatment for larger commercial customers. In addition, commercial customers are charged overstrength fees for prescribed materials that exceed the concentrations shown in Part III of Schedule 1 to Bylaw 19627.

Differences in customer counts, almost entirely within the commercial customer class, are attributable to "water-only" customers who are not tied into the City's drainage system. Water-only customers include businesses in industrial parks that are served by septic systems, as well as seasonal water customers, such as commercial lawn watering services and golf courses. Table 2.2.1-1 below provides a comparison of 2022 PBR forecast to actual customer counts and consumption per customer.

Table 2.2.1-1
Wastewater
Customers, Consumption and Consumption per Customer

		A	B
		2022	
	Customers and Consumption	PBR Forecast	Actual
1	Customers		
2	Residential	278,868	282,366
3	Multi-Residential	3,789	3,800
4	Commercial	17,069	17,283
5	Total	299,725	303,449
6	Annual Consumption - ML		
7	Residential	44,853	46,856
8	Multi-Residential	17,658	18,501
9	Commercial	18,819	22,087
10	Total	81,330	87,444
11	Monthly Consumption per Customer		
12	Residential	13.4	13.8
13	Multi-Residential	388.4	405.7
14	Commercial	91.9	106.5

Actual to forecast differences in Wastewater's customer counts and consumption are attributable to the same factors discussed in Section 2.1.

2.2.2 Revenue

Wastewater's rates include fixed monthly services charges applied on a per connection basis, and consumption charges applied to each cubic metre of consumption. Besides rate revenues, Wastewater's other revenue consists primarily of over-strength surcharges that are subject to the same rate adjustment mechanism as Wastewater's rate revenue. The remaining other revenue is derived from a variety of sources, including provision of services to the Alberta Capital Region Wastewater Commission and other suburban customers, sale of nutrients derived from Ostara, late payment charges, and various other services. The effect of the consumption deferral for wastewater is summarized in Table 2.2.2-1 and Table 2.2.2-2 below. Actual consumption from the beginning of the PBR term effective April 1, 2022 to December 31, 2022 was 4,966 ML greater than forecast, resulting in a deferral of $5.5 million, which will be refunded to customers in the next PBR term.

Table 2.2.2-1
Wastewater Treatment Consumption Deferral

		A	B	C	D
		Consumption (ML)		Consumption Deferral	
		PBR Forecast	Actual	ML	$M
1	Residential	34,378	35,865	1,487	1.8
2	Multi-Residential	13,351	14,086	735	0.9
3	Commercial	14,594	17,338	2,744	2.7
4	**Total Consumption**	**62,323**	**67,289**	**4,966**	**5.5**

Table 2.2.2-2 below provides a comparison of Wastewater's 2022 actual and forecast revenue.

Table 2.2.2-2
Wastewater Treatment Revenue
($ millions)

		A	B
	Wastewater Treatment Revenue	2022	
		PBR Forecast	Actual
1	Fixed Monthly Service Charges		
2	Residential	19.9	20.1
3	Multi-Residential	0.3	0.3
4	Commercial	1.2	1.2
5	Fixed Monthly Service Charges	21.4	21.6
6	Consumption Charges		
7	Residential	53.2	55.6
8	Multi-Residential	20.9	22.0
9	Commercial	21.2	24.0
10	Consumption Charges	95.4	101.6
11	Less: Consumption Deferral		
12	Residential	-	(1.8)
13	Multi-Residential	-	(0.9)
14	Commercial	-	(2.7)
15	Consumption Deferral	-	(5.5)
16	Consumption Revenue, net of deferrals		
17	Residential	53.2	53.8
18	Multi-Residential	20.9	21.1
19	Commercial	21.2	21.3
20	Consumption Revenue, net of Deferral	95.4	96.2
21	Overstrength surcharges	5.4	6.4
22	**Regulated Revenue (Line 5 + 20 + 21)**	**122.1**	**124.2**
23	Other revenue ("revenue offsets")	5.9	7.2
24	**Revenue**	**128.0**	**131.4**

Wastewater's revenues were $3.4 million greater than forecast in 2022. This difference was primarily due to the following factors:

- Higher than forecast consumption during the first three months of 2022, prior to the implementation of the consumption deferral;

- Higher than forecast overstrength surcharges due to higher surchargeable matter in the effluent from industrial customers; and

- Higher than forecast other revenue of $1.1 million reflecting increased volume of biosolids management and treatment of effluent for Alberta Capital Region Wastewater Commission (ACRWC). The remainder of the variance was related to numerous items, none of which were individually significant.

2.2.3 Operating Expenses by Function

Table 2.2.3-1 below provides a comparison of Wastewater Treatment operating expenses for 2022 to the PBR forecast.

Table 2.2.3-1
Wastewater Treatment Operating Expenses by Function
($ millions)

		A	B
	Function	**2022**	
		PBR Forecast	**Actual**
1	Power, Other Utilities and Chemicals		
2	Power and Other Utilities	5.8	4.9
3	Chemicals	1.5	1.4
4	Power, Other Utilities and Chemicals	7.2	6.3
5	Wastewater Treatment		
6	Wastewater Treatment Plant	32.4	31.2
7	Operations Support Services	6.2	5.6
8	Less: Capitalized Overhead Costs	(3.3)	(2.3)
9	Wastewater Treatment	35.4	34.5
10	Billing, Meters and Customer Service	7.9	7.6
11	EWSI Shared Services	5.0	6.4
12	Corporate Shared Services	5.2	5.2
13	Franchise Fees and Property Taxes	10.0	10.6
14	**Total Operating Expenses**	**70.8**	**70.6**

Overall, Wastewater's operating expenses for 2022 were $0.2 million lower than forecast. Key factors contributing to this difference include:

- **Power and Other Utilities** – $0.9 million lower than forecast in 2022 due to lower than forecast power consumption and credits received for the energy curtailment program.

- **Wastewater Treatment** – $1.1 million lower than forecast in 2022 primarily due to lower than forecast biosolids management costs; partially offset by lower capitalized overhead. The remainder of the variance results from numerous small items, none of which were individually significant.

- **Billing, Meters and Customer Service** - $0.3 million lower than forecast in 2022 primarily due to vacant meter reading positions and project delays related to the AMI project. These decreases, which amounted to $0.5 million, were partially offset by higher fees for customer service, billing and collections service provided by EPCOR Energy Alberta GP Inc. due to higher than forecast growth in residential services.

- **EWSI Shared Services** – $1.4 million greater than forecast primarily due to higher salary and labour costs.

- **Franchise Fees and Property Taxes** – $0.6 million higher than forecast in 2022. Franchise fees are calculated as 8% of eligible revenue less the municipal portion of property taxes. As noted in Section 2.2.2 above, Wastewater revenues were higher than forecast, resulting in higher franchise fees paid to the City of Edmonton in 2022.

2.2.4 Operating Expenses by Cost Category

Table 2.2.4-1 below provides a breakdown of operating expenses by cost category for rows 9, 10 and 11 from Table 2.2.3-1

Table 2.2.4-1
Wastewater Treatment Operating Costs by Cost Category
($ millions)

		A	B
		2022	
	Cost Category	PBR Forecast	Actual
1	Wastewater Treatment Plant Operations		
2	Staff costs and employee benefits	16.9	17.5
3	Contractors and consultants	14.3	12.3
4	Materials and supplies	2.1	3.7
5	Vehicles	0.1	0.3
6	Other	2.0	0.8
7	**Wastewater Treatment Plant Operations Expenses**	**35.4**	**34.5**
8	Billing, Meters and Customer Service		
9	Customer billing and collection services	3.4	3.7
10	Contractors and consultants	4.5	3.9
11	**Billings, Meters and Customer Services Expenses**	**7.9**	**7.6**
12	EWSI Shared Services		
13	EWSI shared services allocation	3.3	3.9
14	Staff costs and employee benefits	1.4	2.4
15	Other	0.3	0.1
16	**EWSI Shared Services**	**5.0**	**6.4**

2.2.5 Capital Expenditures by Major Project and Category

Table 2.2.5-1 compares approved capital expenditures from the PBR forecast to actual capital expenditures for 2022 for each project with approved or forecast capital expenditures in excess of $5.0 million over the 2022-2024 PBR term, as well as for each project category.

Table 2.2.5-1
Wastewater Treatment Capital Expenditures
($ millions)

		A	B	C	D	E	F	
		2022			2022-2024			
	Major Category and Project	PBR Forecast	Actual	Variance	PBR Forecast	Projection	Variance	Note
1	**Health, Safety and Environment**			-			-	
2	Maintenance Hygiene Improvements	-	3.1	(3.1)	-	6.2	(6.2)	1
3	Projects < $5 million	0.2	0.9	(0.7)	0.8	1.8	(1.0)	
4	Sub-total	0.2	4.0	(3.8)	0.8	8.0	(7.2)	
5	**Regulatory**							
6	Odour Control Improvements	0.8	0.1	0.7	5.6	7.4	(1.8)	
7	Projects < $5 million	-	0.4	(0.4)	-	0.5	(0.5)	
8	Sub-total	0.8	0.5	0.3	5.6	7.9	(2.4)	
9	**Growth/Customer Requirements**			-			-	
10	Projects < $5 million	2.8	2.2	0.6	5.5	5.2	0.3	
11	**Reliability and Life Cycle Improvements**			-			-	
12	Digester 4 Upgrades Project	4.0	1.0	3.0	13.4	18.6	(5.2)	2
13	Utility Rack West	-	0.0	(0.0)	-	9.5	(9.5)	3
14	Square 1 Biogas System Upgrade	-	3.6	(3.6)	-	12.0	(12.0)	4
15	Gold Bar Primary Effluent Channel Upgrades	3.3	0.4	2.9	17.0	4.4	12.5	5
16	Aux Control Room E-House (EB-1)	1.9	0.3	1.6	11.2	5.0	6.2	6
17	600v Electrical Building (EB-2)	1.5	0.3	1.2	11.8	1.9	10.0	7
18	Clover Bar Dewatering Facility	14.6	0.4	14.2	38.4	0.6	37.8	8
19	EPT Scrubber Upgrades	-	10.3	(10.3)	-	14.9	(14.9)	9
20	Expand Flare Capacity	1.1	0.1	1.0	8.0	2.7	5.3	10
21	Projects < $5 million	16.1	20.2	(4.2)	41.6	65.4	(23.8)	11
22	Sub-total	42.5	36.7	5.9	141.4	135.0	6.3	
23	**Performance Efficiency and Improvement**			-			-	
24	Secondary Aeration Blower Upgrades	0.8	0.5	0.3	8.0	9.7	(1.7)	
25	Laboratory Facility Consolidation	2.9	0.0	2.8	5.9	5.4	0.5	
26	Projects < $5 million	2.1	1.8	0.3	4.5	5.7	(1.2)	
27	Sub-total	5.8	2.3	3.5	18.4	20.8	(2.4)	
28	**Capital Expenditures**	**52.1**	**45.7**	**6.4**	**171.7**	**177.0**	**(5.3)**	

Explanations for differences between PBR forecast capital expenditures and Wastewater's current projection in excess of $2.0 million include:

1. **Maintenance Hygiene Improvements** – $6.2 million greater than the 2022-2024 PBR forecast (carry-over project). The Maintenance Hygiene Improvements project was originally planned to be completed by the end of 2021. However, following extensive stakeholder consultation in relation to the Gold Bar Integrated Resource Plan (IRP) and this project, significant scope adjustments were made to the project, resulting in project delay and cost increases related to supply chain. This additional cost is expected to be managed through prioritization of projects and programs approved for the 2022-2024 PBR and is offset by the deferral of the new dewatering facility.

2. **Digester 4 Upgrades Project** – $5.2 million greater than the 2022-2024 PBR forecast. The increase is primarily due to higher commodity prices and inflation. Work on the Digester 4 project was delayed due to leak issues that were experienced during completion of the Digester 3 Upgrades project, and the shutdown of Digester 5 due to structural concerns. Furthermore, completing Digester 3 before commencing Digester 4 provided better operational capacity and reliability with Digester 3 returning to service.

3. **Utility Rack West** – $9.5 million greater than the 2022-24 PBR forecast. This project was not included in the 2022-2024 PBR forecast. However, this project has been advanced to facilitate efficient delivery of The Aux Control Room Electrical Upgrade Project (EB-1) and the 600V Electrical Building Project (EB-2) by utilizing pipe racks to support the re-routing of electrical cables to the new electrical buildings.

4. **Square 1 Biogas System Upgrade** – $12.0 million greater than the 2022-24 PBR forecast. The project was partially deferred from the 2017-2021 PBR term to the 2022-2024 PBR term due to a revision in the engineering solution to relocate new gas mixing compressors to a separate enclosure. In addition, project is expected to cost more than previously forecast due to increased construction and process skid supply costs.

5. **Gold Bar Primary Effluent Channel Upgrades Project** – $12.5 million lower than the 2022-24 PBR forecast. Given the complexities and risks associated with the project, additional design and engineering work has been extended delaying project completion into the next PBR term. EWSI expects the project will go into service in 2026.

6. **Aux Control Room E-House (EB-1)** – $6.2 million lower than the 2022-24 PBR forecast. Through the design development process, the duration of this project has been extended to better plan for addressing the complexities of commissioning and transferring electrical loads to minimize operations disruptions. This has shifted some of the work for this project into the next PBR term.

7. **600v Electrical Building (EB-2)** – $10.0 million lower than the 2022-24 PBR forecast. Through the design development process, the duration of this project has been extended to

better plan for addressing the complexities of commissioning and transferring electrical loads to minimize operations disruptions. This has shifted some of the work for this project into the next PBR term.

8. **Clover Bar Biosolids Dewatering Facility** – $37.8 million lower than the 2022-24 PBR forecast. The Dewatering Facility project is currently deferred due to expected high costs and will be reassessed in the next PBR application. EWSI is reviewing a number of alternatives including the long-term viability of using a third-party mobile dewatering facility, which is currently being used temporarily while the current dewatering facility is shut down.

9. **Enhanced Primary Treatment (EPT) Scrubber Upgrades** – $14.9 million higher than the 2022-24 PBR forecast. The EPT Scrubber Upgrades project was originally part of the Site HVAC Rehabilitation project to be completed in 2021 at a total cost of $9.5M. During the design development of the project, the EPT Scrubber Upgrades project was identified and set up as a standalone project. The project was subsequently delayed and is scheduled for completion in 2023. The increased cost is primarily due to a combination of project scope and design refinements, and a general increase in costs related to market conditions.

10. **Expand Flare Capacity** – $5.3 million lower than the 2022-24 PBR forecast. Implementation of this project has been deferred to the next PBR to address other critical projects approved in the current PBR.

11. **Projects < $5 million** – Explanations for some of the larger projects making up the variance under this category include:

    a. Clover Bar Edmonton Waste Management (EWMC) Groundwater Transfer – This $3.1 million project was not included in the 2022-2024 PBR forecast. The project was initiated to support the City of Edmonton in addressing groundwater release management in response to regulatory requirements imposed on the City's waste management operations. EWSI expects the project to be completed in 2025.

    b. Gold Bar Operation Center - $3.3 million higher than 2022-24 PBR forecast primarily due to project delays resulting from protracted stakeholder engagement requirements and scope changes.

    c. Gold Bar Loop 5 Rehab and Upgrade – This $3.1 million project was scheduled for the 2025-2027 PBR term. However, the project was advanced to meet operational heating requirements as the equipment is at the end of its useful life. The project will replace the remaining equipment on heating Loop 5. EWSI expects the commissioning of the system in 2023.

2.2.6 Construction Work in Progress

Wastewater's rate base consists of plant in service. If a capital project has not been completed (i.e., not placed into service) during the year, the capital expenditures on that project remain in Construction Work in Progress and are excluded from the rate base. The 2022 year-end balance of Wastewater's Construction Work in Progress, shown in Table 2.2.6-1 below, was $8.0 million greater than forecast, almost entirely due to changes in the timing of project completion.

Table 2.2.6-1
Wastewater Treatment Construction Work in Progress
($ millions)

		A	B
Construction Work in Progress		**2022**	
		PBR Forecast	**Actual**
1	Balance, beginning of year	13.9	43.1
2	Capital expenditures	52.1	45.7
3	Capital additions	(21.1)	(35.8)
4	**Balance, end of year**	**45.0**	**53.0**

The PBR plan allows EWSI to capitalize the costs of financing certain projects remaining in Construction Work in Progress, using AFUDC. In 2022, because of the higher average balance of Construction Work in Progress, AFUDC included in capital expenditures on eligible projects amounted to $2.6 million, compared to the PBR forecast amount of $1.7 million.

2.2.7 Depreciation and Amortization

Wastewater's depreciation expense and amortization of contributed assets for 2022 are shown in Table 2.2.7-1 below:

Table 2.2.7-1
Wastewater Treatment Depreciation and Amortization
($ millions)

		A	B
Depreciation and Amortization		**2022**	
		PBR Forecast	**Actual**
1	Gross depreciation expense	24.2	24.2
2	Amortization of contributions	(0.9)	(0.9)
3	**Depreciation, net**	**23.2**	**23.3**

Wastewater's 2022 depreciation expense was in line with forecast despite lower than forecast plant in service at the end of 2022, (see Table 2.2.8-1, line 5). This was primarily due to the completion of a higher number of capital maintenance and repair projects with shorter expected useful life, resulting in higher effective depreciation.

2.2.8 Rate Base

Wastewater's 2022 mid-year rate base, shown in Table 2.2.8-1 below, was $41.9 million lower than forecast, reflecting lower than forecast capital additions over the 2017 to 2021 period resulting from project deferrals and other adjustments to the capital program described in Section 2.2.5.

Table 2.2.8-1
Wastewater Treatment Mid-Year Rate Base
($ millions)

		A	B
	Components of Mid-Year Rate Base, net of Contributions	**2022**	
		PBR Forecast	**Actual**
1	Plant in Service		
2	Balance, beginning of year	785.5	738.1
3	Capital additions	21.1	35.8
4	Retirements and adjustments	-	(4.1)
5	Balance, end of year	806.6	769.9
6	Mid-Year Plant in service	796.1	754.0
7	Accumulated Depreciation		
8	Balance, beginning of year	218.3	212.9
9	Depreciation expense	24.2	24.2
10	Retirements and adjustments	-	(4.1)
11	Balance, end of year	242.4	233.0
12	Mid-Year Accumulated Depreciation	230.4	222.9
13	Other Rate Base Items		
14	Working Capital	(0.8)	(8.7)
15	Materials and Supplies	1.4	2.2
16	**Gross Mid-Year Rate Base**	566.3	524.5
17	Contributions		
18	Balance, beginning of year	41.0	41.0
19	Contributions in aid of construction	-	-
20	Balance, end of year	41.0	41.0
21	Mid-Year Contributions	41.0	41.0
22	Accumulated Amortization		
23	Balance, beginning of year	20.2	20.2
24	Amortization of contributions	0.9	0.9
25	Balance, end of year	21.2	21.2
26	Mid-Year Accumulated Amortization	31.1	31.1
27	**Mid-Year Contributions**	20.3	20.3
28	**Mid-Year Rate Base**	**546.1**	**504.2**

Unlike In-City Water, where contributions relate primarily to developer-funded assets, contributions included in Wastewater's rate base offset the cost of non-utility assets included in Wastewater's plant in service. This treatment ensures that the capital costs associated with these assets are not borne by utility ratepayers. The cost of operating these assets, as well as any related revenues are also excluded from Wastewater's financial results.

2.2.9 Return on Rate Base

In 2022, Wastewater's return on equity, shown in Table 2.2.9-1, was $3.4 million greater than forecast enabling Wastewater to achieve a return on equity of 12.44% in 2022. The increase in return on equity was primarily attributed to the increase in overstrength charges to industrial customers, and other revenue as noted in Section 2.2.2. The lower than forecast rate base also contributed to the higher rate of return on equity.

Table 2.2.9-1
Wastewater Treatment Return on Rate Base
($ millions)

	A	B
Return on Rate Base	**2022**	
	PBR Forecast	**Actual**
1 Mid-year Rate Base	546.1	504.2
2 Deemed Capital Structure		
3 Debt (%)	60.00%	60.00%
4 Equity (%)	40.00%	40.00%
5 Cost of Capital		
6 Cost of Debt	3.75%	4.09%
7 Cost of Equity	9.94%	12.44%
8 Weighted Average Cost of Capital (WACC)	6.11%	7.43%
9 Return on Mid-Year Rate Base		
10 Return on Rate Base Financed by Debt	12.3	12.4
11 Return on Rate Base Financed by Equity	21.7	25.1
12 **Return on Mid-year Rate Base**	**34.0**	**37.4**

Wastewater's weighted average cost of debt is shown in Table 2.2.9-2 below. The embedded cost of debt was higher in 2022 due to higher than forecast interest rates on new debt issues related to the Bank of Canada's rate hikes during 2022. Under the PBR Plan, EWSI bears interest rate risk and therefore, higher than forecast debt costs are not borne by ratepayers. EWSI expects interest rates to remain higher than forecast for the majority of the PBR term.

Table 2.2.9-2
Wastewater Treatment Interest Expense and Cost of Debt
($ millions)

	A	B
Interest Expense and Cost of Debt	**2022**	
	PBR Forecast	**Actual**
1 Interest Expense		
2 Interest on short-term debt	0.8	1.1
3 Interest on intercompany debentures	11.9	12.0
4 Total Interest expense	12.7	13.1
5 Mid-year debt and other long-term liabilities		
6 Mid-Year Short-term debt	35.1	12.1
7 Mid-Year Long-term debt	303.6	308.5
8 Total Mid-year debt and other long-term liabilities	338.7	320.5
9 **Embedded cost of Debt**	**3.75%**	**4.09%**

2.2.10 Transactions with Affiliates

Wastewater derives a portion of its revenue and expenses from affiliate transactions including the City of Edmonton, EUI, and its subsidiaries, and other EPCOR Water Services Inc. business units. Table 2.2.10-1 summarizes Wastewater's transactions with affiliates.

Table 2.2.10-1
Wastewater Treatment Transactions with Affiliates
($ millions)

		A	B
	Affiliate and Service	**2022**	
		PBR Forecast	**Actual**
1	**Revenues from the provision of services to the City of Edmonton**		
2	Wastewater Treatment Services	1.4	1.6
3	**Services provided by (recovered from):**		
4	**City of Edmonton**		
5	Franchise Fees	9.3	9.9
6	Property Taxes	0.7	0.7
7	Regulatory Services	0.2	-
8	Biosolids Contractor Service	0.4	0.6
9	Other Services	0.2	0.1
10	Total	10.8	11.3
11	**EPCOR Utilities Inc.**		
12	Corporate Shared Service Costs	5.2	5.2
13	Interest on Intercompany Loans	11.9	12.0
14	Interest on Short-term debt	0.8	1.1
15	Other Services	0.1	0.3
16	Total	18.0	6.6
17	**EPCOR Energy Alberta LP**		
18	Billing and Collection Services	3.0	3.0
19	**Other EWSI Business Units**		
20	EWSI Shared Services Allocation	3.3	3.9
21	Meter reading services from In-City Water	2.8	2.3
22	Water purchases from In-City Water	0.4	0.4
23	Regulatory services from Drainage Services	1.7	1.6
24	Laboratory services recoveries from Drainage Services	(0.4)	(0.3)
25	Total	7.9	7.9
26	**Expenditures on capital projects arising from services provided by:**		
27	City of Edmonton	0.0	0.1
28	EPCOR Technologies Inc.	0.1	0.2
29	EPCOR Utilities Inc.	0.1	0.2
30	Total	0.3	0.5

2.3 Drainage Services

Drainage Services provides sanitary utility and stormwater utility services within the boundaries of the City of Edmonton. These services are regulated by the City of Edmonton pursuant to the PBR Plan for 2022 to 2024 prescribed in Drainage Services and Wastewater Treatment Bylaw 19627. Drainage Services revenue and revenue requirements are summarized in Table 2.3-1 below.

Table 2.3-1
Drainage Services
Revenue and Revenue Requirement
($ millions)

		A	B
		2022	
		PBR Forecast	Actual
1	Regulated revenue		
2	Sanitary utility	143.6	144.7
3	Stormwater Utility	92.8	93.9
4	Regulated revenue	236.4	238.6
5	Revenue requirement		
6	Operating costs	122.4	127.7
7	Less: revenue offsets	(6.3)	(5.3)
8	Depreciation and amortization	42.0	39.7
9	Return on rate base financed by debt	34.5	34.7
10	Return on rate base financed by equity	43.8	41.8
11	Revenue requirement	236.4	238.6
12	**Rate of return on rate base financed by equity***	**6.31%**	**6.18%**

* In the PBR forecast, the special rate adjustment for rebasing is smoothed over the PBR term to mitigate "rate shock" at the beginning of the PBR term. Therefore, although EWSI's PBR forecast for the 2022-2024 PBR term is based on achieving a fair rate of return of 9.95% by 2026, PBR forecast rates of return for individual years of the PBR will differ from awarded ROE.

In 2022, EWSI achieved a rate of return on equity of 6.18%, slightly lower than its forecast rate of return of 6.31%. The factors contributing to differences between forecast and actual are explained in Sections 2.3.1 to 2.3.9.

2.3.1 Customers and Consumption

Drainage Services provides sanitary and stormwater utility services to the same customers served by Wastewater. Therefore, actual to forecast differences in Drainage Services' customer counts and consumption are attributable to the same factors discussed in section 2.2.1.

2.3.2 Revenue

Drainage Service's rate revenues are derived from both sanitary utility and stormwater utility services. Sanitary utility revenues are comprised of flat monthly service charges based on meter

size and variable monthly charges based on monthly metered water consumption. Stormwater utility revenues are based on parcel area, development intensity, and run-off coefficients based on the zoning of individual land parcels.

For the 2022-2024 PBR term, City Council directed Drainage Services to establish *"a deferral account for water consumption for each of Water Services, Wastewater Treatment and Drainage Services that would be accumulated during the 2022-2026 and 2022-2024 PBR terms and included in customer rates in each of the next PBR terms through a special rate adjustment"*.

The effect of the consumption deferral for the sanitary utility is summarized in Table 2.3.2-1 below. This table shows that actual consumption from the beginning of the 2022-2024 PBR term starting April 1, 2022, to December 31, 2022, was 4,958 ML greater than forecast, resulting in a deferral of $6.1 million that will be refunded to customers in the next PBR term.

Table 2.3.2-1
Drainage Services
Sanitary Utility Consumption Deferral

		A	B	C	D
		Consumption (ML)		**Consumption Deferral**	
		PBR Forecast	**Actual**	**ML**	**$M**
1	Residential	34,378	35,865	1,487	1.9
2	Multi-residential	13,351	14,086	734	0.9
3	Commercial	14,590	17,327	2,736	3.3
4	**Total Consumption**	**62,319**	**67,277**	**4,958**	**6.1**

Table 2.3.2-2 below provides a comparison of Drainage Services 2022 revenues to the PBR forecast. In 2022, sanitary rate revenues were $1.1 million greater than forecast and stormwater utility rate revenues were $1.1 million greater than forecast. After adjusting for the consumption deferral, actual to forecast differences for both sanitary utility and stormwater utility rate revenue were attributable to higher than forecast customer growth. The variance in other revenue was comprised of numerous small differences in revenues derived from various sources such as biosolids management, compliance and monitoring, late payment charges, etc., none of which were individually significant.

Table 2.3.2-2
Drainage Services
Revenue
($ millions)

		A	B
		2022	
	Description	PBR Forecast	Actual
1	**Sanitary Utility**		
2	Flat monthly charges		
3	Residential	36.4	36.9
4	Multi-residential:	2.4	2.4
5	Commercial, including large wholesale	6.0	6.1
6	Flat monthly charges	44.8	45.4
7	Variable monthly charges billed		
8	Residential	55.0	57.5
9	Multi-residential	21.7	22.7
10	Commercial, including large wholesale	22.0	25.2
11	Variable monthly charges billed	98.7	105.5
12	Consumption deferral		
13	Residential	-	(1.9)
14	Multi-residential	-	(0.9)
15	Commercial, including large wholesale	-	(3.3)
16	Consumption deferral	-	(6.1)
17	Variable monthly charge revenue		
18	Residential	55.0	55.6
19	Multi-residential:	21.7	21.8
20	Commercial, including large wholesale	22.0	21.9
21	Variable monthly charge revenue	98.7	99.3
22	**Sanitary Utility regulated revenue**	**143.6**	**144.7**
23	**Stormwater Utility**		
24	Residential	49.2	49.5
25	Multi-residential	5.2	5.6
26	Commercial	38.4	38.8
27	**Stormwater Utility regulated revenue**	**92.8**	**93.9**
28	Drainage Services regulated revenue	236.4	238.6
29	Other revenue (“revenue offsets”)	6.3	5.3
30	**Drainage Services Revenue**	**242.7**	**243.9**

2.3.3 Operating Expenses by Function

Table 2.3.3-1 provides a comparison of Drainage Service's 2022 actual operating expenses to the PBR forecast:

Table 2.3.3-1
Drainage Services
Operating Expenses by Function
($ millions)

		A	B
		2022	
	Function	PBR Forecast	Actual
1	Drainage planning and operations		
2	Operations		
3	Pipeline maintenance	18.7	16.4
4	Flow control facilities	11.7	9.8
5	Monitoring and compliance	6.2	9.4
6	Stormwater Integrated Resource Plan	4.3	3.8
7	Corrosion and Odour Reduction	3.3	4.6
8	General maintenance and other	6.5	5.4
9	Operations	50.7	49.5
10	One Water planning and project support		
11	One Water planning	6.8	5.7
12	Project support	10.1	9.5
13	One Water planning and project support	16.9	15.2
14	Operational support services	0.4	4.2
15	Drainage planning and operations	68.0	69.0
16	Billing, meters and customer service	7.7	8.7
17	EWSI Shared Services	18.6	18.6
18	Corporate shared services	16.3	19.0
19	Franchise fees and property taxes	11.8	12.5
20	**Total operating expenses**	**122.4**	**127.7**

Total operating expenses for 2022 were $5.3 million greater than forecast. Key factors contributing to this variance include:

- **Pipeline maintenance, Flow control facilities, and Monitoring and compliance** - $1.0 million lower than forecast primarily due to a reorganization within Drainage Services resulting in the transfer of staff between Pipeline maintenance, Flow control facilities and Monitoring and compliance functions, resulting in variances within these functions without materially impacting the work completed in these functions. The remainder of the variance results from numerous small items such as lower spending on contractors, chemicals, and materials, none of which were individually significant.

- **General maintenance and other** - $1.1 million lower than forecast primarily due to lower biosolids management costs paid to Water Services, as a result of lower biosolids handling during the first three months of the year.

- **Stormwater Integrated Resource Plan (SIRP) -** $0.5 million lower than forecast primarily due to lower participation in the home backwater valve subsidy program than anticipated. Participation in the program was lower than anticipated as a higher proportion of homes inspected through the program already had backwater valves installed.

- **Corrosion and Odour Reduction (CORe) -** $1.3 million greater than forecast primarily due to higher than anticipated costs for trunk cleaning and inspections due to the amount of solids found within the trunk network once access to the network through new manholes was obtained. This was partially offset by lower chemicals and material costs due to a reassessment of pump station chemical treatment capital projects indicating that pumping optimization being more effective for some of the locations.

- **One Water planning -** $1.1 million lower than forecast due to higher transfers of staff costs and employee benefits into Operations for SIRP and CORe areas of $0.7 million and lower than anticipated contractor costs of $0.4 million, due to increasing the use of internal resources for strategic planning studies versus external consultants.

- **Project support -** $0.6 million lower than forecast primarily due to lower staff costs and employee benefits resulting from the timing of staff vacancies.

- **Operational support services** - $3.8 million greater than forecast primarily due to higher facility lease and utility costs incurred during the year because of the delayed move and consolidation of resources at EWSI's new Water/Drainage Shared Facility (Aurum facility), which was initially anticipated to be completed in 2021.

- **Billing, meters and customer services** - $1.0 million greater than forecast due to higher customer growth resulting in higher meter reading charges and fees for customer service, billing and collections service provided by EPCOR's billing arm (EPCOR Energy Alberta GP Inc.)

- **Corporate Shared Services** – $2.7 million greater than forecast primarily due to higher salary costs incurred by the Corporate groups providing support to the business unit as a result of wage inflation.

- **Franchise Fees and Property Taxes -** $0.7 million greater than forecast. Franchise fees are calculated as 8% of eligible revenue less the municipal portion of property taxes. As noted in Section 2.3.2 above, Drainage Services revenues were higher than forecast, resulting in higher franchise fees paid to the City of Edmonton in 2022.

2.3.4 Operating Expenses by Cost Category

Table 2.3.4-1 below provides a breakdown of operating expenses by cost category for rows 15, 16 and 17 from Table 2.3.3-1

Table 2.3.4-1
Drainage Services
Operating Expenses by Cost Category
($ millions)

		A	B
		2022	
	Cost Category	PBR Forecast	Actual
1	Drainage Services planning and operations		
2	Staff costs and employee benefits	48.6	45.4
3	Contractors and consultants	13.4	16.5
4	Materials and supplies	6.3	5.6
5	Vehicles	(5.7)	(4.5)
6	Other	3.5	5.4
7	EWSI shared services allocation	1.8	0.5
8	**Drainage Services planning and operations**	**68.0**	**69.0**
9	Billing, meters and customer service		
10	Customer billing and collection services	4.9	6.6
11	Meter services	2.8	2.1
12	**Billing, meters and customer service**	**7.7**	**8.7**
13	EWSI Shared Services		
14	Staff costs and employee benefits	9.0	10.8
15	Contractors and consultants	2.5	0.8
16	Materials and supplies	1.0	0.9
17	EWSI shared services allocation	1.7	1.3
18	Other	4.5	4.8
19	**EWSI Shared Services**	**18.6**	**18.6**

2.3.5 Capital Expenditures by Major Project and Category

Table 2.3.5-1 provides a comparison of forecast to actual capital expenditures for 2022 and PBR forecast to EWSI's current projection for each project or program with capital expenditures in excess of $10.0 million over the 2022-2024 term.

Table 2.3.5-1
Drainage Services
Capital Expenditures and Contributions
($ millions)

		A	B	C	D	E	F	
	Major Category and Projects	2022			2022-2024			
		PBR Forecast	Actual	Variance	PBR Forecast	Projection	Variance	
1	Drainage Neighbourhood Renewal Program	28.0	22.2	5.7	76.5	52.8	23.7	1
2	Drainage System Expansion							
3	Private Development Construction Coordination	4.0	4.6	(0.6)	11.6	13.6	(2.0)	
4	Service Connections Program	6.6	9.3	(2.7)	18.5	25.6	(7.0)	
5	Projects < $10 million	7.7	10.2	(2.6)	27.5	31.1	(3.6)	
6	Sub-total	18.3	24.1	(5.9)	57.6	70.3	(12.7)	2
7	Drainage System Rehabilitation							
8	Proactive Service Renewal	-	0.0	(0.0)	10.3	8.0	2.3	
9	Drill Drop Manholes Program	4.5	9.0	(4.5)	13.1	22.0	(8.9)	
10	Pump Station Rehabilitation Program	5.0	2.7	2.3	15.5	18.5	(3.0)	
11	Fleet & Vehicles Program	3.7	2.5	1.1	13.2	9.7	3.5	
12	Small Trunk Rehabilitation Program	0.1	2.0	(1.9)	18.8	16.0	2.8	
13	High Priority Replacement Program	17.0	24.0	(7.0)	52.1	57.8	(5.7)	
14	Outfall Rehabilitation	3.2	1.8	1.4	8.2	18.2	(10.0)	3
15	Local Sewer Rehabilitation	2.0	3.4	(1.5)	5.4	10.7	(5.4)	
16	Arterial Roadway	3.3	3.1	0.2	8.6	10.7	(2.0)	
17	Projects < $10 million	11.7	6.9	4.8	20.8	29.6	(8.8)	
18	Sub-total	50.5	55.6	(5.0)	166.0	201.3	(35.3)	
19	Flood Mitigation							
20	Dry Pond Program	13.8	18.2	(4.4)	46.3	25.4	20.9	4
21	Projects < $10 million	1.4	0.9	0.5	1.4	1.0	0.4	
22	Sub-total	15.2	19.1	(3.9)	47.7	26.4	21.3	
23	Real Estate	-	22.1	(22.1)	-	25.2	(25.2)	5

	Major Category and Projects	A	B	C	D	E	F	
		2022			2022-2024			
		PBR Forecast	Actual	Variance	PBR Forecast	Projection	Variance	
24	Stormwater Integrated Resource Plan							
25	Dry Pond Program	24.6	5.5	19.1	81.5	57.3	24.1	6
26	LID Program	7.8	10.9	(3.0)	53.1	55.0	(2.0)	
27	Proactive Manhole Relining Program	6.1	5.7	0.4	18.7	15.6	3.2	
28	Proactive Pipe Relining Program	7.5	2.9	4.6	22.9	19.8	3.1	
29	Projects < $10 million	21.9	14.0	7.9	57.2	40.3	16.8	7
30	Sub-total	67.9	38.9	29.1	233.3	188.1	45.3	
31	Sanitary Servicing Strategy Fund							
32	SW5	7.5	-	7.5	32.8	-	32.8	8
33	Projects < $10 million	5.4	7.9	(2.5)	5.8	11.7	(5.9)	
34	Sub-total	12.9	7.9	4.9	38.6	11.7	26.9	
35	Corrosion and Odour Reduction (CORe)							
36	Large Trunk Renewal Program	21.0	15.3	5.7	79.0	81.2	(2.2)	
37	CORe Duggan Tunnel Project	11.7	2.1	9.6	56.3	63.7	(7.4)	
38	CORe Drop Structure Modification Program	6.1	5.6	0.5	22.0	20.9	1.1	
39	CORe Access Manhole Program	6.2	7.2	(1.0)	17.9	22.4	(4.5)	
40	Projects < $10 million	1.8	3.6	(1.8)	5.3	7.0	(1.7)	
41	Sub-total	46.8	33.9	12.9	180.4	195.1	(14.7)	9
42	LRT Relocates Program	21.8	34.9	(13.1)	48.5	58.9	(10.3)	10
43	Developer and City-contributed	127.6	102.0	25.6	382.7	328.6	54.1	11
44	**Capital Expenditures**	**388.9**	**360.8**	**28.1**	**1,231.4**	**1,158.3**	**73.1**	
45	Contributions							
46	Drainage System Expansion							
47	Service Connections Program	(6.6)	(5.1)	(1.5)	(18.5)	(18.8)	0.2	
48	Private Development Construction Coordination Program	(0.3)	(0.3)	(0.0)	(0.3)	(1.0)	0.7	
49	Projects < $10 million	-	0.1	(0.1)	-	0.1	(0.1)	
50	Sub-total	(6.9)	(5.3)	(1.6)	(18.8)	(19.7)	0.9	
51	Flood Mitigation							
52	Dry Pond Program	(4.5)	(5.8)	1.3	(13.6)	(6.6)	(7.0)	4
53	Stormwater Integrated Resource Plan							
54	Dry Pond Program	(8.8)	(1.7)	(7.1)	(21.0)	(16.5)	(4.6)	6
55	Projects < $10 million	(3.1)	(0.5)	(2.6)	(6.7)	(1.8)	(4.9)	7
56	Sub-total	(11.9)	(2.2)	(9.7)	(27.8)	(18.3)	(9.5)	
57	Sanitary Servicing Strategy Fund							
58	SW5	(7.5)	-	(7.5)	(32.8)	-	(32.8)	8
59	Projects < $10 million	(3.9)	(6.4)	2.5	(1.3)	(8.3)	7.0	

	Major Category and Projects	A	B	C	D	E	F	
		2022			2022-2024			
		PBR Forecast	Actual	Variance	PBR Forecast	Projection	Variance	
60	Sub-total	(11.4)	(6.4)	(5.0)	(34.1)	(8.3)	(25.8)	
61	Developer and City-contributed	(127.6)	(102.0)	(25.6)	(382.7)	(328.6)	(54.1)	11
62	**Contributions**	(162.2)	(121.7)	(40.5)	(477.0)	(381.4)	(95.6)	
63	**Capital Expenditures, net of Contributions**	**226.7**	**239.1**	**(12.4)**	**754.3**	**776.8**	**(22.5)**	

In 2022, capital expenditures, net of contributions were $12.4 million greater than forecast. Since weather-related delays, scope and design changes, supply chain disruptions and other factors can affect capital expenditures in any single year of the PBR term, capital expenditures are more appropriately assessed over the entire 2022-2024 PBR term. Over the 2022-2024 PBR term, capital expenditures are currently projected to be $22.5 million higher than the PBR forecast. Explanations for projects and programs with projected costs that are $10.0 million greater or lower than the PBR forecast are provided below:

1. **Drainage neighbourhood renewal -** $23.7 million lower than PBR forecast due to the need to focus resources on emergency drainage system rehabilitation projects and the ability to defer some renewal work into the future.

2. **Drainage system expansion program** - $12.7 million greater than PBR forecast primarily due to a higher volume of service connection applications than forecast.

3. **Outfall rehabilitation -** $10.0 million greater than PBR forecast, as a result of new projects identified to manage the increased damage to outfalls during the 2021 spring river breakup season. This outcome reflects an updated risk ranking approach that prioritizes outfall remediation work, revised design requirements, and higher construction costs due to carryover of projects previously forecast to be completed in 2021.

4. **Dry pond program -** $20.9 million lower than forecast due to both lower than expected bids from contractors and efficiencies in project delivery for the Malcolm Tweddle dry pond. These savings are partially offset by a $7.0 million decrease in grants and contributions.

5. **Real estate (Water/Drainage Shared Facility)** - $25.2 million greater than forecast, as a result of construction delays driven by scope and design changes to address higher than expected construction bid costs.

6. **SIRP dry pond program -** $24.1 million lower than forecast. Longer-than-anticipated timeframes for land assembly involving the City of Edmonton, and school boards and public consultation are expected to push expenditures in dry ponds into future PBR terms. Lower capital spending in the 2022-2024 PBR term is partially offset by a $4.6 million decrease in contributions from grants.

7. **SIRP projects < $10 million** - $16.8 million lower than forecast, primarily due to design delays for the Outfall and Automatic Gates Program, which are projected to push expenditures into future PBR terms, as well as lower-than-anticipated public uptake on the Home Flooding program. Lower capital spending in the 2022-2024 PBR term is partially offset by a $4.9 million decrease in contributions from grants that align with the construction expenditure.

8. **Sanitary Servicing Strategy Fund (SSSF) - SW5 -** $32.8 million lower than forecast. This fully contributed project has been cancelled in response to updated capacity and demand forecasts showing that the existing infrastructure is sufficient to meet anticipated customer demand in southwest Edmonton.

9. **Corrosion and Odour Reduction (CORe) program -** $14.7 million greater than forecast primarily due to advancing the Duggan Tunnel project in the current PBR term, a new project to rehabilitate deteriorated trunk sections related to the NL2 Large Trunk in North Edmonton and unexpected poor ground conditions at Access Manhole Program locations requiring scope and construction methodology changes, resulting in cost increases.

10. **LRT Relocates Program** - $10.3 million greater than forecast. The PBR forecast was approved before the final approval and funding for the Metro/Capital Line LRT was secured. The City's approved track alignments require EWSI to complete more infrastructure relocations than anticipated in the PBR forecast.

11. **Developer and City contributed assets** - $54.1 million lower than forecast. These reflect drainage infrastructure completed by private developers and the City and transferred to EWSI on substantial completion of the development, the timing of which can vary due to individual development schedules. EWSI's current projections show a significant decrease in the value of these fully contributed assets than was anticipated in the 2022-2024 PBR forecast.

2.3.6 Construction Work in Progress

Drainage Services' rate base consists of plant in service. If a capital project is not completed (i.e., not placed into service) during the year, the capital expenditures on that project remain in Construction Work in Progress and are excluded from the rate base. Because of the long timeframes required to complete large, complex projects, Drainage Services has larger balances of Construction Work in Progress than Water or Wastewater. Drainage Services' 2022 construction work in progress is summarized in Table 2.3.6-1 below:

Table 2.3.6-1
Drainage Services
Construction Work in Progress
($ millions)

		A	B
		2022	
		PBR Forecast	Actual
1	Construction work in progress, beginning of year	68.0	127.3
2	Capital expenditures		
3	Capital expenditures before contributions	388.9	360.8
4	Contributions received	(162.2)	(121.7)
5	Sub-total	226.7	239.1
6	Capital additions		
7	Sanitary Utility	(150.1)	(159.2)
8	Stormwater Utility	(148.3)	(210.0)
9	Combined Sewer	(23.4)	(46.2)
10	SIRP	(82.9)	(43.1)
11	CORe	(27.3)	(17.9)
12	Sub-total	(432.0)	(476.4)
13	Contributions recognized		
14	Sanitary	87.1	123.8
15	Stormwater	86.7	146.0
16	Combined	7.7	(76.0)
17	SIRP	9.5	2.1
18	Sub-total	191.0	196.0
19	**Construction work in progress, end of year**	**53.6**	**85.9**

The 2022-2024 PBR Plan allows Drainage to capitalize the costs of financing certain projects remaining in Construction Work in Progress, using AFUDC. In 2022, AFUDC included in capital expenditures on eligible projects amounted to $8.2 million.

2.3.7 Depreciation and Amortization

Depreciation expense and amortization of contributions are shown in Table 2.3.7-1 below:

Table 2.3.7-1
Drainage Services
Depreciation and Amortization
($ millions)

		A	B
	Depreciation and Amortization	2022	
		PBR Forecast	Actual
1	Provision for depreciation	88.3	86.3
2	Amortization of contributions	(46.3)	(46.6)
3	**Depreciation, net of amortization of contributions**	**42.0**	**39.7**

Drainage's net depreciation expense was $2.3 million lower than the PBR forecast. This difference is consistent with lower than forecast opening balances of plant in service and contributions.

2.3.8 Rate Base

Drainage's mid-year rate base, shown in Table 2.3.8-1 below was $41.3 million lower than forecast due to lower opening balances of plant in service and contributions, largely due to the carry-over projects which remained under construction work in progress. The mid-year rate base has been allocated between the sanitary utility excluding CORe, CORe capital, the stormwater utility excluding SIRP and SIRP capital.

Table 2.3.8-1
Drainage Services
Mid-Year Rate Base
($ millions)

		A	B
		2022	
	Description	PBR Forecast	Actual
1	Plant in Service, beginning of year	5,752.7	5,637.4
2	Capital additions	432.0	476.4
3	Retirements and adjustments	(16.0)	(20.4)
4	Plant in Service, end of year	6,168.8	6,093.4
5	Accumulated depreciation, beginning of year	1,109.9	1,099.2
6	Gross Provision	88.9	86.6
7	Retirements and adjustments	(16.0)	(10.5)
8	Accumulated depreciation, end of year	1,182.8	1,175.2
9	Mid-Year Net Property	4,814.4	4,728.2
10	Other Rate Base Items		
11	Materials and Supplies	1.3	2.0
12	Working Capital	13.9	13.6
13	**Gross Mid-Year Rate Base**	4,829.6	4,743.8
14	Contributions, beginning of year	(3,625.6)	(3,592.3)
15	Additions	(191.0)	(196.0)
16	Contributions, end of years	(3,816.6)	(3,788.3)
17	Accumulated amortization, beginning of year	621.9	624.0
18	Gross Provision	46.3	46.7
19	Accumulated amortization, end of year	668.2	670.7
20	**Mid-Year Net Contributions**	(3,076.0)	(3,042.9)
21	Adjustment to SIRP Rate Base[3]	(20.3)	(8.8)
22	Mid-Year Rate Base	1,733.3	1,692.0
23	**Allocated to:**		
24	Sanitary Utility	798.2	777.1
25	Stormwater Utility	772.1	827.2
26	SIRP	60.9	26.5
27	CORe	102.1	61.2
28	**Mid-Year Rate Base**	**1,733.3**	**1,692.0**

[3] The costs of pre-SIRP flood mitigation plant in service were embedded in pre-2022 rates. Therefore, depreciation and returns on SIRP assets are only included in Drainage's rate base starting April 1, 2022, the date when the new PBR rates came into effect.

2.3.9 Return on Rate Base

Table 2.3.9-1 provides a comparison of Drainage's PBR forecast and actual returns on rate base for 2022. Returns are calculated separately for the debt-financed and equity-financed portions of Drainage's net rate base with returns on the debt-financed portion made at Drainage's average cost of debt and returns on the equity-financed portion made at the rates of return on equity awarded for the 2022-2024 PBR term.

Table 2.3.9-1
Drainage Services
Return on Mid-Year Rate Base
($ millions)

		A	B
		2022	
	Description	PBR Forecast	Actual
1	Drainage Services mid-year rate base	1,733.3	1,692.0
2	Deemed capital structure		
3	Debt	60.00%	60.00%
4	Equity	40.00%	40.00%
5	Cost rates		
6	Debt	3.32%	3.41%
7	Equity	6.31%	6.18%
8	Return on rate base		
9	Debt	34.5	34.7
10	Equity	43.8	41.8
11	**Total return on mid-year rate base**	**78.3**	**76.5**

Return on rate base is calculated separately for the debt-financed and equity-financed portions of Drainage Services net rate base. The rate of return on debt is equal to the embedded cost of debt for EWSI's total water system, as calculated in Table 2.1.9-2 below:

Table 2.3.9-2
Drainage Services
Interest Expense and Cost of Debt
($ millions)

		A	B
		2022	
		PBR Forecast	Actual
1	Interest expense		
2	Interest on long-term debt	35.4	35.1
3	Interest on short term debt	0.9	1.1
4	Interest expense	36.3	36.1
5	Mid-year debt		
6	Mid-year long-term debt	1,055.7	1,050.7
7	Mid-year short-term debt	36.9	7.8
8	Mid-year debt	1,092.6	1,058.5
9	**Embedded Cost of Debt**	**3.32%**	**3.41%**

Table 2.3.9-2 shows that the average cost of debt was slightly higher than forecast due to higher than forecast interest rates on new debt issues related to the Bank of Canada's rate hikes during 2022. Under the terms of the PBR Plan, EWSI bears interest rate risk and higher debt costs are not borne by ratepayers. EWSI expects interest rates to remain higher than forecast for the remainder of the PBR term.

Prior to 2022, Drainage Services earned a rate of return on equity that was significantly lower than a rate of return that would be considered fair for a utility requiring financing through external capital markets. In the 2022-2024 PBR Application, EWSI recognized that an immediate move to a fair rate of return would create financial hardship for many customers and proposed that the rate of return on equity for sanitary (excluding CORe) and stormwater (excluding SIRP) be reduced from the fair rate of return of 9.95% to 5.50% for 2022 and "ramped up" in a linear fashion by 1.1% per year to achieve a fair return of 9.95% by 2026. Because of their unique nature, SIRP and CORe were recognized as requiring a fair rate of return commencing in 2022 and were awarded a rate of return on equity of 9.95% for the entire 2022-2024 PBR term. In 2022, EWSI forecast a combined rate of return on equity of 6.31%. The actual rate of return on equity was slightly lower, primarily due to higher than forecast operating expenses, partially offset by lower than forecast depreciation and amortization.

2.3.10 Transactions with Affiliates

Drainage Services derives a portion of its revenue and expenses from transactions with affiliates, including the City of Edmonton, EUI and its subsidiaries. Table 2.3.10-1 provides a summary of Drainage Services' 2022 forecast and actual transactions with affiliates.

Table 2.3.10-1
Drainage Services
Transactions with Affiliates
($ millions)

		A	B
		2022	
	Affiliate and Service	PBR Forecast	Actual
1	**Revenues from the provision of services to the City of Edmonton**		
2	Utility Revenue	3.6	3.9
3	Other Services	0.1	0.0
4	Total	3.7	3.9
5	**Services provided by (recovered from):**		
6	**City of Edmonton**		
7	Franchise Fees	10.2	11.1
8	Property Taxes	1.6	1.4
9	Other Services	0.2	4.1
10	Total	12.0	16.6
11	**EPCOR Utilities Inc.**		
12	Corporate Shared Service Costs	16.3	19.0
13	Interest on Intercompany Loans	35.4	35.1
14	Interest on Short-term debt	0.9	1.1
15	Other services	3.9	3.7
16	Total	56.8	58.8
17	**Other Affiliate**		
18	EPCOR Technologies Inc.	(0.2)	3.1
19	EPCOR Commercial Services Inc.	0.3	(0.1)
20	EPCOR Water Services	1.7	1.7
21	EPCOR Distribution and Transmission Inc.	0.1	(0.1)
22	EPCOR Energy Services	4.2	4.9
23	Total	6.1	9.6
24	**Expenditures on capital projects arising from services provided by:**		
25	City of Edmonton	(18.6)	3.1
26	EPCOR Technologies Inc.	3.3	5.5
27	EPCOR Utilities Inc.	0.3	1.0
28	EPCOR Water Services	(2.1)	(2.3)
29	EPCOR Distribution and Transmission Inc.	-	0.1
30	Total	(17.1)	7.4

3 Operational Performance

3.1 Water Services

Table 3.1-1 summarizes the 2022 operational performance for Water Services:

Table 3.1-1
Water Services 2022 Operational Performance

Index and Performance Measure	Benchmark	Performance		Base Points	Points Earned	Maximum Bonus Points	Total Points Earned
		Target	Actual				
1.0 Water Quality Index	Non-suspect test results	99.7%	99.8%	**30.0**	**30.0**	**-**	**30.00**
2.0 Customer Service Index							
2.1 Post Service Audit Factor	% satisfied	75.0%	90.1%		4.5		
2.2 Home Sniffing Factor	% satisfaction	94.4%	92.9%		3.7		
2.3 Response Time Factor	min to confirm breaks	25	14.8		5.3		
2.4 Planned Construction Impact Factor	% compliance	95.8%	100.0%		3.9		
2.0 Customer Service Index				**15.0**	**17.4**	**2.25**	**17.25**
3.0 **System Reliability & Optimization Index**							
3.1 Water Main Break Factor	# of breaks	365	278		7.7		
3.2 Repair Duration Factor	% fixed within 24 hrs	95.4%	97.3%		6.4		
3.3 Water Loss Factor	leakage index (ILI)	1.23	0.87		8.1		
3.4 System Energy Efficiency Factor	kWh /ML treated	281.0	245.8		7.1		
3.0 System Reliability & Optimization Index				**25.0**	**29.3**	**3.25**	**28.25**
4.0 Environmental Index							
4.1 Water Conservation (Residential) Factor	m^3/month/household	16.8	14.8		5.7		
4.2 Environmental Incident Management Factor	# of incidents	5	2		12.5		
4.3 Solids Residual Management Factor	# days	120	150.8		6.3		
4.0 Environmental Index				**15.0**	**24.4**	**2.25**	**17.25**
5.0 Safety Index							
5.1 Near Miss Reporting Factor	# completed	550	837		5.7		
5.2 Work Site Inspections/Observations Factor	# conducted	1,032	3,492		12.7		
5.3 Lost Time Frequency Rate	frequency rate	0.40	0.21		7.3		
5.4 All Injury Frequency Rate	frequency rate	1.00	0.21		18.2		
5.0 Safety Index				**15.0**	**43.8**	**2.25**	**17.25**
Aggregate Points Earned (sum of all the above indices)				**100.0**	**145.0**	**10.00**	**110.0**
Points Required at Performance Standard							**100.0**
Points Above / (Below) Performance Standard							**10.0**

Water Services quality is measured by the results of five indices shown in Table 3.1-1 above. Performance under each index is measured independently on a point basis with 100 base points available if the standards in all five areas are achieved. In total, up to 10 additional bonus points for performance above the standard are available. In 2022, Water Services exceeded performance standards for each index and earned maximum bonus points. Highlights and improvement opportunities for each index are provided below:

3.1.1 Water Quality Index

The water quality index measures the overall quality of water that is delivered to the customer and provides reassurance that water quality consistently meets or exceeds the federal and provincial water quality standards. This index consists of a single performance measure:

- **Water Quality Index Factor** (actual 99.8% vs target 99.7%), calculated as the percentage of water quality test results that meet EWSI's internal water standards. Both federal and provincial government water quality standards are incorporated into EWSI's Approval to Operate from Alberta Environment and Parks (AEP). In some cases, EWSI's internal water standards have stricter limits for critical parameters to provide early warnings of potential water quality problems.

  In 2022, EWSI collected and tested 58,066 treated drinking water samples, including randomly selected samples from plant reservoirs, field reservoirs and the distribution network, as well as specific testing to address water quality complaints and depressurization events. All water quality test results met Health Canada's Drinking Water Quality Guidelines and AEP water quality testing requirements and only 98 samples (0.17%) did not meet EWSI's internal water quality standards.

Areas for Improvement

- In 2023, EWSI plans to review its distribution water quality sampling practices and methodology to ensure sampling achieves AEP's monthly random sampling count and distributed location requirements.

3.1.2 Customer Service Index

The customer service index is a composite measure of the customers' perception of satisfaction with EWSI's service, the aesthetic quality of water and speed of response to customer issues. This index includes the following performance measures:

- **Post Service Audit Factor** (actual 90.1% vs target 75.0%), calculated as the percentage of customers responding "completely" or "very satisfied" with the level of service received from EWSI's Emergency group. In 2022, EWSI updated the post-service audit

questionnaire to obtain greater feedback from customers regarding their experience with EWSI, so that EWSI can continue to improve customer experience.

- **Home Sniffing Factor** (actual 92.9% vs target 94.4%), calculated as the percentage of participants in the home sniffing survey responding “completely” or “very satisfied”. In 2022, home sniffing odour intensity trends were used to track customer satisfaction before, during, and after spring runoff, enabling water plant operators to make operational adjustments on a real time basis.

- **Response Time Factor** (actual 14.8 minutes vs target 25 minutes), calculated as the average number of minutes needed to confirm a water main break from the time a call is received at EWSI’s dispatch office. Implementation of an Emergency Support Team in early 2022 contributed to a reduction in response times to possible main breaks.

- **Planned Construction Impact Factor** (actual 100.0% vs target 95.8%), means the percentage of the total planned construction events where EWSI complies with required construction notification procedures. In 2022, on-going training and improvements to construction coordination and communication plans resulted in performance exceeding the PBR standard.

Areas for Improvement

- **Post Service Audit Factor:** In 2023, EWSI will continue to focus on improving customer experience by examining root causes derived from customers’ comments in the post service questionnaire.

- **Home Sniffing Factor:** In 2023, the Home Sniffing program will be rebranded as the Spring Home Analysis Runoff Program (SHARP) with updated guidelines for random selection of program participants, so that all areas of the city are adequately represented.

- **Response Time Factor:** Response times greater than 25 minutes will continue to be investigated to ensure continued success.

- **Planned Construction Impact Factor:** Training and construction processes will continue to be reviewed to minimize impacts of planned construction activities.

3.1.3 System Reliability and Optimization Index

The System Reliability Index is a measure of the confidence that customers can place in the reliability of the waterworks system. This index includes the following performance measures:

- **Water Main Break Factor** (actual 278 main breaks vs target 365), calculated as the number of water main breaks that occurred in the year. Main break rates continue to

fluctuate with variations in weather and temperature, with the overall number of main breaks continuing to decline due to the replacement of cast iron mains with PVC mains.

- **Water Main Break Repair Duration Factor** (actual 97.3% vs target 95.4%), calculated as the percentage of water main breaks repaired within 24 hours from the time that the flow of water is shut off, excluding main breaks on arterial or collector roads. EWSI reviewed each main break that exceeded 24 hours to identify issues and find efficiencies for future repairs.

- **Water Loss Factor** (actual 0.87 vs target 1.23), measured using the Infrastructure Leakage Index ("ILI"), a industry-standard performance indicator quantifying how well a water distribution system is managed for the control of "real" water losses (i.e., leakage).

- **System Energy Efficiency Factor** (actual 245.8 kWh/ML of water treated vs target 281 kWh/ML), calculated as the energy used at all water facilities in kWh divided by the average annual water production per residential customer account (ML/kWh/customer).

  In 2022, EWSI exceeded the energy efficiency target by implementing several energy efficiency improvements including completion of an energy audit to identify improvement opportunities for water treatment plant and reservoir operations.

Areas for Improvement

- **Water Main Break Factor:** In 2023, EWSI will utilize AI software to identify and evaluate main break patterns, enabling further refinement of risk-based asset management programs.

- **Water Main Break Repair Duration Factor:** In 2023, EWSI plans to implement an online water outage map to provide more information directly to impacted customers. Planned improvements to the outage map includes providing additional information such as traffic impacts related to main breaks, unidirectional flushing and other interruptions. All processes for mobilization of resources to main break site will be reviewed to further reduce repair duration.

- **Water Loss Factor (ILI):** Although the ILI exceeded the PBR standard, EWSI continues to explore opportunities for identifying and minimizing water losses.

- **System Energy Efficiency Factor:** Planned energy efficiency improvements include:

  - Leveraging energy audit to identify climate change mitigation strategies and integrating recommendations into future capital project plans;

- Implementing an energy management dashboard to share near-real time solar farm generation and usage, energy efficiency indices, and other energy related data with stakeholders; and

- Completing the solar farm and battery system operation optimization plan.

3.1.4 Environment Index

The environmental index measures the success of programs and policies designed to mitigate and report adverse environmental impacts. This index includes the following performance measures:

- **Water Conservation Factor** (actual 14.8 m^3 vs target 16.8 m^3), calculated as the average monthly consumption per residential customer. In 2022, hybrid-working arrangements and hot, dry weather during late summer months continued to impact residential consumption per customer. Ongoing improvements in water usage habits and technology, including the use of more efficient appliances and toilets contributed to the Water Conservation Factor remaining better than the standard.

- **Environmental Incident Management Factor** (actual 2 vs target 5), calculated as the number of incidents reportable to municipal, provincial or federal regulators that are considered preventable. In 2022, there were two reportable release events. First, a small loss of refrigerant to the atmosphere from an aging building chiller unit at the Rossdale water treatment plant and, second, a release of approximately one thousand cubic meters of potable water from the Rosslyn reservoir to the stormwater management system and into the North Saskatchewan River due to a partially open value after a regular maintenance activity at the reservoir. Following this release, reservoir fill procedures were reviewed and additional controls were implemented.

- **Solids Residual Management Factor** (actual 150.8 vs target 120), calculated as the number of days that the water treatment plants operate in direct filtration mode. Direct filtration reduces the solids load of water returned to the North Saskatchewan River during water treatment. In 2022, solids discharged during winter months were reduced by 50% relative to baseline conventional treatment.

Areas for Improvement

- **Water Conservation Factor:** EWSI expects average monthly residential consumption to continue to decline due to changes in technology and water conservation awareness.

- **Environment Incident Management Factor:** Continued emphasis on improving operational controls and maintaining the environmental management systems to ISO

14001 standard with a focus on root cause analysis and implementing effective corrective action plans.

- **Solids Residual Management Factor:** In 2023, EWSI will implement its new Wastestream Monitoring Program which was approved by Alberta Environment and Protected Areas in December 2022. This program will build on previous assessment work for quantifying residuals discharged to the river and their impacts, helping to inform future residual management strategies.

3.1.5 Safety Index

The safety index is a measure of the success of programs and policies that maximize the safety of employees and the public. The performance measures comprising this index include:

- **Near Miss Reporting Factor** (actual 837 vs target 550), calculated as the number of near miss reports completed each year. In 2022, EWSI implemented a new Mind on Task initiative to encourage personnel to focus on identifying hazards before an event occurs in order to support a proactive approach to safety.

- **Work Site Inspections and Observations Factor** (actual 3,492 vs target 1,032), calculated as the number of Work Site Inspections and Observations completed each year. The higher number of inspections and observations completed reflects continued focus on proactive field engagement.

- **Lost Time Injury Frequency Factor** (actual 0.21 vs target 0.40), calculated as the frequency of disability injuries and illnesses and the **All Injury Frequency Factor** (actual 0.21 vs target 1.00), calculated as the frequency of disability injuries and medical aid injuries. These factors are key measures for assessing the effectiveness of safety programs. In 2022, strategies based on causal themes were identified to reinforce reducing and/or eliminating workplace injuries.

Areas for Improvement

- **Near Miss Reporting Factor**: Near miss and hazard identification reporting will continue to be a focus in 2023 to support EWSI's proactive approach to safety.

- **Work Site Inspections / Observations Factor**: In 2023, there will be a continued focus on inspections and observations to support a proactive approach to safety.

- **Lost Time Frequency Rate Factor and All Injury Frequency Rate Factor**: EWSI endeavours to eliminate workplace injuries and, to this end, will implement causal

investigation methodology in 2023 to improve root cause identification and prevent re-occurrence of workplace injuries.

3.2 Wastewater Treatment Services

Table 3.2-1 summarizes Wastewater Treatment Services 2022 operational performance:

Table 3.2-1
Wastewater Treatment Services 2022 Operational Performance

A	B	C	D	E	F	G	H
Description	Benchmark	Performance		Base Points	Points Earned	Maximum Bonus Points	Total Points Earned
		Standard	Actual				
1.0 Water Quality & Environment Index							
1.1 Wastewater Quality Factor	WELP	26.0	16.7		35.1		
1.2 Environmental Incident Factor	# of incidents	5	3		37.5		
1.0 Water Quality & Environment Index				**45.0**	**72.6**	**4.5**	**49.5**
2.0 Customer Service Index							
2.1 H_2S - 1-hour Exceedance Factor	exceedance std	4	0.5		40.0		
2.2 H_2S - 24-hour Exceedance Factor	exceedance std	1	1		5.0		
2.3 Scrubber Uptime Factor	% on-line	96.0%	98.3%		5.1		
2.0 Customer Service Index				**15.0**	**50.1**	**1.5**	**16.5**
3.0 System Reliability and Optimization Index							
3.1 Enhanced Primary Treatment Factor	% in use	94.0%	100.0%		8.9		
3.2 Biosolids Inventory Reduction Factor	relative reduction	1.05	0.97		7.7		
3.3 Energy Efficiency Factor	kWh / ML treated	508	521		8.1		
3.0 System Reliability and Optimization Index				**25.0**	**24.7**	**2.5**	**24.7**
4.0 Safety Index							
4.1 Near Miss Reporting Factor	# completed	220	300		5.1		
4.2 Work Site Inspection/Observation Factor	# conducted	919	1,499		6.1		
4.3 Lost Time Frequency Rate	frequency rate	0.75	1.34		2.1		
4.4 All Injury Frequency Rate	frequency rate	1.00	2.02		1.9		
4.0 Safety Index				**15.0**	**15.2**	**1.5**	**15.2**
Aggregate Points Earned (sum of all the above indices)				**100.0**	**162.6**	**10.0**	**105.9**
Points Required at Performance Standard							**100.0**
Points Above / (Below) Performance Standard							**5.9**

Wastewater Treatment Services quality is measured by the results of four indices. As with Water Services, performance under each index is measured independently on a point basis with 100 base points available if the standards in all five areas are achieved. In total, up to 10 additional bonus points for performance above the standard are available. In 2022, Wastewater exceeded performance standards for three of the four indices, earning 5.9 bonus points. Highlights and opportunities for improvement for each index are provided below:

3.2.1 Wastewater Quality and Environmental Index

The Wastewater Quality and Environmental index measures the success of operational processes and procedures designed to manage the quality of effluent returned back the North Saskatchewan River and to manage adverse environmental impacts. The performance measures comprising this index include:

- **Wastewater Quality Factor** (actual 16.7 vs target 26.0), determined by the Wastewater Effluent Limit Performance (WELP) index is an aggregate measure of the percentage of the discharge limits for five parameters in the Gold Bar wastewater treatment plant's final effluent. In 2022, Wastewater achieved a record low WELP. Contributing factors included the use of "winter mode" to control ammonia in the bioreactors by increasing aeration and limiting process tanks out of service.

- **Environmental Incident Factor** (actual 3 vs target 5), calculated as the actual number of environmental incidents that are both reportable and preventable. The three reportable incidents in 2022 included one release of biosolids supernatant and two H_2S exceedances. EWSI conducted root cause investigations for each incident and implemented corrective actions.

Areas for Improvement

- **Wastewater Quality Factor**: In 2023, Wastewater will continue to optimize the use of the "winter operation mode" and limit process downtime. Installation of a secondary system will be implemented to further improve the overall performance of the biological nutrient removal (BNR) process.

- **Environmental Incident Factor**: In 2023, EWSI will utilize additional data from the new Gold Bar Park Road Air Quality Monitoring Station to better determine sources of odours and to improve the effectiveness of ongoing odour reduction projects.

3.2.2 Customer Service Index

Wastewater's customer service index includes three equally weighted odour related factors. These factors, recognize that Wastewater's customer interactions are primarily related to

odour concerns from customers who live near to the Gold Bar Wastewater Treatment Plant. The performance measures comprising this index include:

- **H_2S – 1 Hour Exceedance Factor** (0.5 actual vs 4 target), measured as the number of exceedances of the 1-hour limit averaged between Gold Bar and Beverly air quality monitoring stations and **H_2S – 24 Hour Exceedance Factor** (1 actual vs 1 target), measured as the number of exceedances of the 24-hour limit averaged between Gold Bar and Beverly air quality monitoring stations. In 2022, there were two air quality events at the Strathcona Industrial Association (SIA) air quality monitoring station at Beverly, including one 1-hr H_2S exceedance and one 24-hour H_2S exceedance. Both events took place during the planned shutdown of a scrubber for maintenance. Although investigations were not conclusive, the Gold Bar Wastewater Treatment Plant may have contributed to these exceedances, which were deemed as non-preventable.

- **Scrubber Uptime Factor** (actual 98.3% vs target 96.0%), measured as the percentage of the time that the odour control systems at the Gold Bar Wastewater Treatment Plant are operating. In 2022, preventative and corrective maintenance activities limited scrubber downtime.

Areas for Improvement

- **H_2S – 1-hr and 24-hr Exceedance Factors**: In 2023, the newly commissioned EPCOR Air Quality Monitoring Station on Gold Bar Park Road will allow for intervention when high levels of H_2S are observed, reducing H_2S exceedances.

- **Scrubber Uptime Factor**: In 2023, construction of two additional odour scrubbers will provide additional redundancy for the EPT and West Scrubbers and tie in points for future redundancy of the Fermenter and East Scrubbers.

3.2.3 System Reliability and Optimization Index

The system reliability and optimization index is a measure of the performance of the Gold Bar Wastewater Treatment Plant. The performance measures comprising this index include:

- **Enhanced Primary Treatment (EPT) Factor** (actual 100% vs target 94.0%), calculated as the percentage of time that the EPT facility ran during wet weather events when the influent flow rate exceeded the EPT event threshold. Preventative maintenance, including inspection and cleaning of two of the four EPT clarifiers contributed to strong results in 2022.

- **Biosolids Inventory Reduction Factor** (actual 0.97 vs 1.05 target). This factor measures the reduction in the biosolids inventory at the Clover Bar Biosolids Recycling Facility and is calculated as the three-year average of the total dry tonnes of biosolids

removed from the lagoons to the total dry tonnes of biosolids deposited in the lagoons. Performance in 2022 was lower than target due to a critical power failure at the dewatering facility and due to lower than expected solids content (Total Suspended Solids or "TSS") of the biosolids deposits.

- **Energy Efficiency Factor** (actual 521 kWh/ML vs target 508 kWh/ML), calculated as the energy used in all wastewater facilities in kWh divided by the volume of wastewater effluent that either receives ultraviolet (UV) treatment or is membrane plant effluent. Lower than target energy efficiency reflected both increased energy consumption throughout 2022, as well as lower flow volumes.

Areas for Improvement

- **Enhanced Primary Treatment (EPT) Factor**: EWSI has scheduled inspection and cleaning of the remaining two clarifiers in 2023 and has commenced planning for proactive replacement of assets nearing end-of-life to minimize unplanned downtime.

- **Biosolids Inventory Reduction Factor**: Efforts will continue in 2023 to explore more non-agricultural re-use opportunities of biosolids, as well as development of additional on-site biosolids dewatering processes in response to the loss of production resulting from the dewatering facility shut down.

- **Energy Efficiency Factor**: In 2023, EWSI will continue to work on planning and design for upgraded secondary aeration blowers and the UV system. EWSI will also optimize the use of other equipment such as secondary aeration trimmer blowers.

3.2.4 Safety Index

The safety index is a measure of the success of programs and the application of policies that maximize the safety of employees and the public. The performance measures comprising this index include:

- **Near Miss Reporting Factor** (actual 300 vs target 220), calculated as the number of near miss reports completed each year. During 2022, there was a continued internal monthly promotion of near miss and hazard identification reporting to demonstrate to employees the impact of site-specific reporting.

- **Work Site Inspections / Observations Factor** (actual 1,499 vs target 919), calculated as the number of Work Site Inspections and Observations completed each year. Higher than target results reflect EWSI's continued emphasis to monitor and measure inspections and observations to ensure employee engagement.

- **Lost Time Injury Frequency Rate Factor** (actual 1.34 vs target 0.75) calculated as the frequency of disability injuries and illnesses and **All Injury Frequency Rate Factor** (actual 2.02 vs target 1.00**)** calculated as the frequency of disability injuries and medical aid injuries. These factors are key measures for assessing the effectiveness of safety programs. In 2022, following lost time events, EWSI undertook root cause analysis to identify causal themes and provide a basis for developing strategies to reduce workplace injuries.

Areas for Improvement

- **Near Miss Reporting Factor**: In 2023, EWSI will continue to focus on near miss and hazard identification to promote reporting and demonstrate the benefit of site-specific reporting.

- **Near Miss Reporting Factor**: There will be a continued focus on inspection and observation completion to ensure engagement and proactive field presence.

- **Lost Time Frequency Rate Factor**: EWSI endeavours to eliminate workplace injuries and, to this end, will implement causal investigation methodology in 2023 to improve root cause identification and prevent re-occurrence of workplace injuries.

3.3 Drainage Services

Table 3.3-1 summarizes Drainage Services 2022 operational performance:

Table 3.3-1
Drainage Services 2022 Operational Performance

A	B	C	D	E	F	G	H
Description	Benchmark	Performance		Base Points	Points Earned	Maximum Bonus Points	Points with Maximum Bonus Points
		Standard	Actual				
1.0 Environmental Index							
1.1 Stormwater Flow and Flow Monitoring Factor	% area monitored	63.0	70.0		13.0		
1.2 Environmental Incident Management Factor	% reportable	50	14		41.7		
1.3 Green Hectares Factor	managed area	45.0	36.9		9.6		
1.0 Environmental Index				**35.0**	**64.2**	**3.5**	**38.5**
2.0 Customer Service Index							
2.1 Service Maintenance Calls Factor	% resolved in 24h	80.0	96.8		6.0		
2.2 Emergency Dig-Ups – Service Restored Factor	% restored in 48h	98.0	98.0		5.0		
2.3 Service Connections Factor	% within 6 weeks	85.0	80.4		4.7		
2.4 Sewer Odour Hotspots Factor	% city area	15.0	7.0		10.8		
2.0 Customer Service Index				**20.0**	**26.5**	**2.0**	**22.0**
3.0 System Reliability and Optimization Index							
3.1 Blocked Sewers Factor	# per 100 km	2.10	2.54		6.2		
3.2 Sewer Renewal Factor	km renewed	60.0	56.6		7.1		
3.3 Infrastructure Condition Rating Level Factor	% > minimum	90.0	90.1		7.5		
3.4 Full Property Flood Proofing Inspections	# inspections	750	1,077		10.8		
3.0 System Reliability and Optimization Index				**30.0**	**31.6**	**3.0**	**31.6**
4.0 Safety Index							
4.1 Near Miss Reporting Factor	# completed	750	1,721		8.6		
4.2 Work Site Inspection/Observation Factor	# conducted	1300	2,262		6.5		
4.3 Lost Time Frequency Rate	frequency rate	0.75	0.18		16.0		
4.4 All Injury Frequency Rate	frequency rate	4.00	1.23		12.2		
4.0 Safety Index				**15.0**	**43.4**	**1.5**	**16.5**
Aggregate Points Earned (sum of all the above indices)				**100.0**	**162.6**	**10.0**	**108.6**
Points Required at Performance Standard							**100.0**
Points Above / (Below) Performance Standard							**8.6**

Drainage Services service quality is measured by the results of four indices. Performance under each index is measured independently on a point basis with 100 base points available if the standards in all five areas are achieved. In total, up to 10 additional bonus points for performance above standard are available. In 2022, Drainage Services exceeded performance standards for each index, earning 8.6 bonus points. Highlights and opportunities for improvement for each index are provided below:

3.3.1 Environmental Index

The environmental index measures the success of Drainage Services programs and policies designed to mitigate and report adverse environmental impacts. The performance measures comprising this index include:

1. **Stormwater Flow Monitoring Factor** (actual 70.0% vs target 63.0%), defined as percentage of storm drainage area being monitored relative to all qualified hydrologically-effective drainage areas serviced by outfalls. In 2022, construction and activation of five new permanent outfall monitoring sites contributed to better than target performance.

2. **Environment Incident Management Factor** (actual 14 vs target 50), calculated as the number of incidents reportable to municipal, provincial or federal regulators that are considered preventable. The low number of reportable environment incidents in 2022 reflects proactive inspection and maintenance programs designed to minimize third party releases of prohibited or restricted waste.

3. **Green Hectares Factor** (actual 36.9 hectares vs target 45 hectares), measured by the area where the volume of green infrastructure managed runoff is spread evenly to a 15mm depth. While 2022 actual performance was lower than the PBR target, Drainage Services successfully implemented Low Impact Development (LID) at 82 locations in partnership with City of Edmonton, EPCOR construction sites and with a few commercial properties throughout the city.

Areas for Improvement

- **Stormwater Flow Monitoring Factor**: Nine additional permanent outfall monitoring sites are scheduled for construction and activation in 2023. Since projects can extend beyond a single year, some projects will be combined to improve design and construction efforts which in turn is expected to improve completion timelines.

- **Environment Incident Management Factor**: In 2023, EWSI will continue to provide educational programs for customers and other stakeholders on proper maintenance of private infrastructure so that risks are identified, and incidents minimized.

- **Green Hectares Factor**: In 2023, Drainage Services will continue to enhance the overarching LID Strategy that will guide planning and development of Green Hectare projects for construction on both public lands and for commercial and industrial sites to increase storage of stormwater and slow water moving into the system. Drainage Services will also continue efforts to increase awareness and education of LIDs and small storage facilities within EPCOR, the City of Edmonton, and the development industry which includes both commercial and industrial sites as well as new and retrofit development projects through the modernization of standards work.

3.3.2 Customer Service Index

The Customer Service Index measures the success of Drainage Services programs and policies pertaining to customer service. This index is comprised of the following performance measures:

- **Service Maintenance Calls Factor** (actual 96.8% vs target 80.0%), defined as the percentage of service maintenance sewer trouble calls resolved within 24 hours. In 2022, Drainage Services achieved higher than standard performance through implementation of shift changes that took into account call volumes, as well as from the introduction of smaller, easier to mobilize and operate equipment.

- **Emergency Dig-Ups with Service Restored Factor** (actual 98.0% vs target 98.0%), defined as the percentage of emergency dig-ups restored within 48 hours from the time the call is referred from Drainage Operations to Drainage Construction as an emergency dig-up. In 2022, Drainage Services implemented a new less costly and less invasive technology, enabling more timely repairs on some service connections than traditional open cut repairs.

- **Service Connections Factor** (actual 80.4% vs target 85.0%), calculated as the percentage of new installations of sanitary, storm, and common trench water service connection completed within a six-week timeframe. In 2022, Drainage Services investigated alternate work methods to ensure the safety and efficiency of service connection installations and established a working committee to improve work opportunities with the developer community.

- **Sewer Odour Hotspots Factor** (actual 7.0% vs target 15.0%), measured as the percentage of the city area with odour hotspots. In 2022, Drainage Services expanded monitoring and inspection of odour sources through the sewer system. Drainage Services also completed debris and sediment cleaning, constructed air recirculation chambers and completed the first odour control optimization pump station. Finally, Drainage Services installed a chemical dosage system at a pump station with the third highest point source of hydrogen sulfide, which completely eliminated odours from this one facility.

Areas for Improvement

- **Service Maintenance Calls Factor**: For 2023, Drainage Services will implement new initiatives to decrease time at customer locations and minimize repeat calls, including adding personnel and standardizing responses for first call resolution and issue assessment techniques.

- **Emergency Dig-Ups with Service Restored Factor**: For 2023, Drainage Services will explore opportunities, such as hydraulic shoring and directional drilling, to improve operational efficiencies and crew safety, as well as reducing the time required to complete work and restore service.

- **Service Connections Factor**: For 2023, Drainage Services will continue to implement hydraulic shoring to improve field efficiencies and reduce crew time.

- **Sewer Odour Hotspots Factor**: In 2023, Drainage Services will continue to monitor and inspect odour sources throughout the sewer system and will expand pump station odour control optimization.

3.3.3 Reliability and Optimization Index

The System Reliability Index measures the reliability of the sanitary and stormwater drainage systems. The performance measures comprising this index include:

- **Blocked Sewers Factor** (actual 2.54 vs target 2.10), calculated as the number of blocked sewers per 100 km of sanitary and combined sewer pipe. In 2022, Drainage Services experienced an increase in the number of blockages due to grease, rags and wipes. Each blockage was assessed to determine if a change to an existing flushing program or a new flushing program was warranted.

- **Sewer Renewal Factor** (actual 56.6 km vs target 60.0 km), measured as the km of sewers renewed / relined as part of the Neighbourhood Renewal Program, Local Sewer Rehabilitation Program, Arterial and Collector Roadway Renewal Coordination Program, SIRP Proactive Pipe Relining Program, Proactive Service Renewal Program and CORe Large Trunk Rehabilitation Program. Sewer renewal and relining are proactive maintenance activities. In 2022, the PBR target was not met due to increased focus on higher risk trunk line renewals which result in less length of sewer renewed for the cost required to complete the renewal.

- **Infrastructure Condition Rating Level Factor** (actual 90.1% vs target 90.0%), defined as the percentage of infrastructure at or above the minimum level of condition rating. In 2022, Drainage Services expanded infrastructure condition assessment to additional

asset categories, including: storage pipes and tanks; gates and real-time control; permanent flow monitors; and SCADA components.

- **Full Property Flood Proofing Inspections Factor** (actual 1,077 vs target 750), calculated as the number of full flood proofing inspections completed that include an inspection report provided to the property owner. In 2022, Drainage Services updated the Full Property Flood Proofing Inspections metric to include multi-family property inspections, as well as single family inspections. Drainage Services also implemented a new inspection form to better align inspection elements with the home flood protection education program.

Areas for Improvement

- **Blocked Sewers Factor**: In 2023, Drainage Services will implement enhancements to plugged main reporting and investigative follow-up to better determine patterns of plugged mains. Drainage Services will also explore development of an operational and maintenance program for the small diameter sanitary and combined sewers that directly contribute up to 95% of blockages.

- **Sewer Renewal Factor**: For 2023, Drainage Services will continue to focus on higher risk sewer infrastructure renewal to proactively reduce future emergency repair and rehabilitation and will be assessing this measure for future PBR submission to ensure it reflects the focus on higher risk renewal of aging infrastructure

- **Infrastructure Condition Rating Level Factor**: For 2023, infrastructure assessment will be further expanded to include manholes, catch-basins and catch-basin leads. Drainage Services will also focus on proactive inspection of poor and very poor condition assets to ensure that the worst condition assets are rehabilitated and thereby improve the asset condition.

- **Full Property Flood Proofing Inspections Factor**: For 2023, EWSI will continue outreach to properties within high risk flood basins and will re-engage with previously inspected properties to assess and evaluate customer engagement and completion of recommended actions.

3.3.4 Safety Index

The safety index is a measure of the success of programs and the application of policies that maximize the safety of employees and the public. The performance measures comprising this index include:

- **Near Miss Reporting Factor** (actual 1,721 vs target 750), calculated as the number of near miss reports completed each year. During 2022, two actions contributed to higher

than target performance. First, Drainage Services stressed the importance of near miss reporting to its workforce, encouraging prompt reporting. Second, Drainage Services analyzed trends of reported near misses to reinforce the contribution of near miss reporting in reducing workplace injuries.

- **Work Site Inspections / Observations Factor** (actual 2,262 vs target 1,300), calculated as the number of Work Site Inspections and Observations completed each year. In 2022, Drainage Services analyzed trends from near miss reporting to focus on inspections and observations to further drive injury elimination and reduction.

- **Lost Time Frequency Rate Factor** (actual 0.18 vs target 0.75) calculated as the frequency of disability injuries and illnesses an**d All Injury Frequency Rate Factor** (actual 1.23 vs target 4.00) calculated as the frequency of disability injuries and medical aid injuries. These factors are key measures for assessing the effectiveness of safety programs. In 2022, Drainage Services introduced a field-based ergonomics assessment process, which directly reduced the number of musculoskeletal injuries related to tasks involving manual handling.

Areas for Improvement

- **Near Miss Reporting Factor**: In 2023, Drainage Services will focus on identifying and mitigating hazards associated with everyday tasks to further reinforce the contribution of near miss reporting in reducing and/or eliminating workplace injuries.

- **Work Site Inspections / Observations Factor**: For 2023, trending analysis will be used to encourage completion of inspections & observations.

- **Lost Time Frequency and All Injury Frequency Rates**: For 2023, Drainage Services will focus on field ergonomic assessments on areas indicated by trend analysis and other areas targeted by management. Causal investigation methodology will also be implemented to improve root cause identification and to prevent re-occurrence of workplace injuries.

4 Rates and Bill Comparisons

Residential water and wastewater bill comparisons for 2022 are based on the published water, wastewater treatment, sanitary and stormwater rates for Calgary, Vancouver, Saskatoon, Winnipeg and Regina, as well as three surrounding municipalities (St. Albert, Sherwood Park and Leduc). These bill comparisons represent the total cost to the customer and include fixed charges, consumption charges and any other applicable surcharges based on readily available data from cities and municipalities.

Figure 4-1 provides a comparison of residential water bills with consumption of 14.0 m^3 per month, the average monthly water consumption for a residential customer in Edmonton in 2022. Edmonton is the only city in this comparison where fire protection charges are included in water rates. Therefore, Edmonton's average monthly residential bill of $41.90 which includes fire protection charge of $2.54 has been normalized to $39.36 for this comparison. Figure 4-1 shows that Edmonton's water bills are competitive with most of the cities and local communities surveyed. Vancouver and Calgary continue to have the lowest rates due to its excellent raw water source and, therefore, lower needs for water treatment than Edmonton, which has a naturally high variable water source in the North Saskatchewan River.

Figure 4-1
2022 Average Residential Water Bills
(14.0 m^3/month)

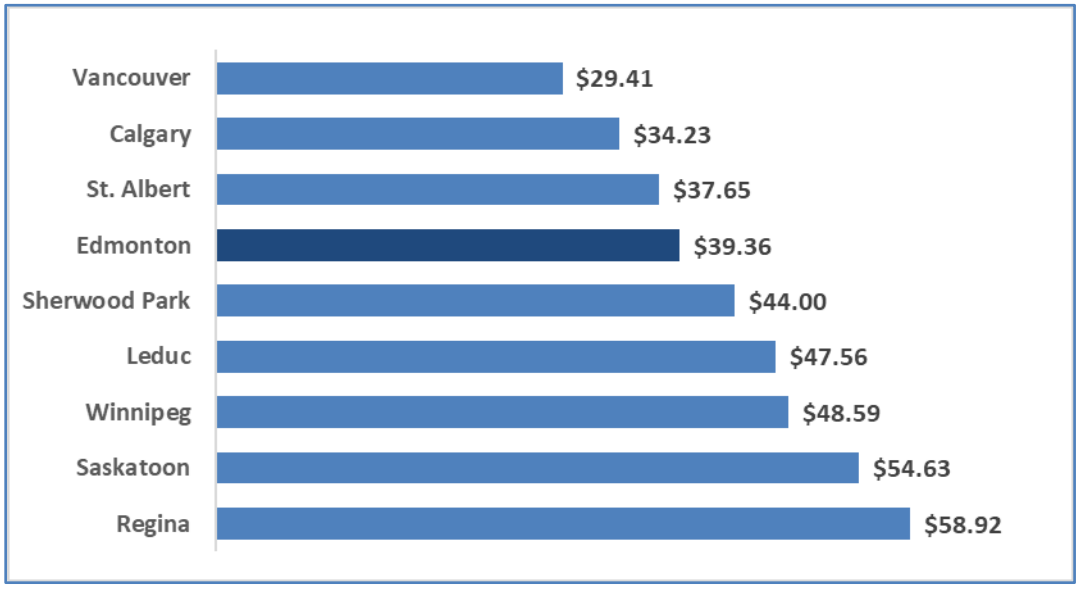


Figure 4-2 provides a comparison of average residential sanitary drainage and wastewater treatment bills with consumption of 14.0 m^3 per month, the average monthly water consumption for a residential customer in Edmonton in 2022. These bill comparisons

represent the total cost to the customer and include fixed charges, consumption charges and any other applicable surcharges for wastewater treatment.

Although Edmonton's sanitary drainage and wastewater treatment bills appear higher relative to the comparison communities, the comparison does not reflect the impact of historical spending decisions by each community. For example, EWSI is expending significant resources on the CORe program to address corrosion issues and to remediate long-running odour issues in its sanitary sewers. In 2022, Edmonton residential bills included a special rate adjustment of $2.94 per month for the CORe program.

Figure 4.2
2022 Residential Sanitary Drainage and Wastewater Treatment Bills
(14.0 m^3/month)

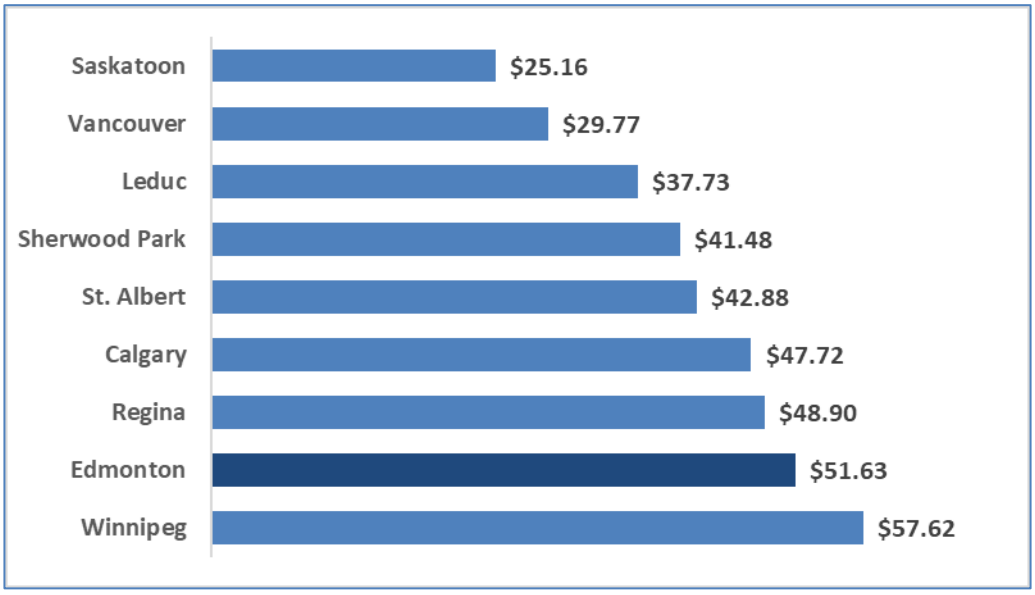
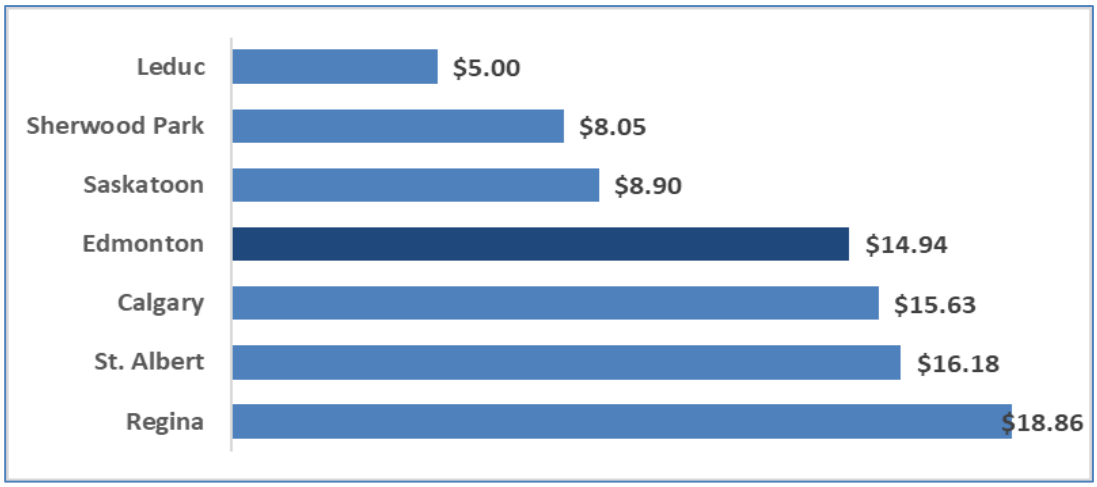


Figure 4-3 provides a comparison of average monthly residential stormwater bills for 2022. The nature and extent of stormwater drainage services varies among municipalities, due to geography and climatic conditions, with different cities facing different risks from storms, overland flooding and sea level. In addition, in some municipalities, flood mitigation and stormwater drainage charges are included in property taxes which makes this bill comparison challenging. Stormwater charges embedded in property taxes for Vancouver and Winnipeg were not readily accessible and therefore not reflected in the figure below. EWSI has been proactive in addressing the increased risk of flooding related to climate change and is making substantial investments through its SIRP program to assess and mitigate these risks. EWSI's 2022 average stormwater bills are comparable to cities that have started addressing risks related to climate change such as Calgary, St. Albert and Regina.

Figure 4-3
2022 Average Monthly Residential Stormwater Bills



Appendix A: PBR Framework

In 2021, Edmonton City Council approved EPCOR Water Services Bylaw 19626 and EPCOR Drainage Services and Wastewater Treatment Bylaw 19627. Bylaw 19626 provides for continuation of performance-based regulation ("PBR") for In-City Water Services for a five-year term from April 1, 2022 to March 31, 2027, while Bylaw 19627 provides for continuation of PBR for Wastewater Treatment and Drainage Services' Sanitary and Stormwater Utilities for a three-year term from April 1, 2022 to March 31, 2025.

A. Overview

The PBR framework encompass rates, performance measures, and return on equity. The relationships between these components are designed to ensure that capital and operating cost decisions provide a balance between operational performance, rates, and return on equity, while safeguarding system reliability and service quality, providing fair, stable, predictable rates to rate payers, and providing a basis for the future development of the water, wastewater treatment, and drainage systems. Several key changes were introduced for the 2022-2024/2026 PBR term, including:

1. **Introduction of a Consumption Deferral Account**: EWSI was directed to introduce a water consumption deferral account for each of Water, Wastewater Treatment and Drainage Services with the intent of capturing and accumulating variances related to consumption over the 2022-2024/2026 PBR terms and subsequently collecting or refunding the accumulated consumption variances through customer rates in future PBR terms. In the past, revenue risk related to consumption was borne by EWSI. The introduction of deferral account reduces EWSI's exposure to revenue risk resulting from volatile consumption patterns however, this risk and volatility is now borne by customers.
2. **Reduction in Return on Equity (ROE)**: Return on equity for Water and Wastewater Treatment was reduced from 10.175% to 9.89%, with a further 0.25% reduction to 9.64% to offset the reduction in risk associated with the introduction of a consumption deferral account. Return on equity for Drainage Services was reduced from 9.64% to 5.50% in 2022. Drainage Service ROE is approved to be "ramped up" by 1.1% per year to achieve a fair rate of return of 9.64% by 2026.
3. **Drainage Efficiency Factor**: Efficiency factor for Drainage Services was increased from 0.25% to 0.50% for the 2022-2024 PBR term.
4. **Introduction of Fire Protection Charge**: EWSI was directed to include recovery of the public fire protection revenue requirement through water rates over the 2022-2026 PBR term instead of the past practice of recovering fire protection revenue requirement through City's property taxes.

B. PBR Rates

Annual changes to In-City water, wastewater treatment and sanitary and stormwater utility rates consist of routine rate adjustments and, occasionally, non-routine adjustments.

I) Routine Rate Adjustments

Routine rate adjustments are limited to inflation, defined as a weighted inflation metric consisting of both CPI and labour components, less an efficiency factor, plus special rate adjustments approved by City Council as part of the 2022-2024/2026 PBR Applications. The use of a formulaic approach for calculating and setting utility rates act as a “price cap” providing ratepayers with stable and predictable rates. The efficiency factor for In-City water and wastewater treatment is set at 0.25%, while for sanitary and stormwater, the efficiency factor is at 0.50%. The efficiency factor incents EWSI to increase productivity and achieve efficiencies in excess of inflation in order to meet its targeted return on equity. The Special Rates Adjustments (SRA) approved for the 2022-2024/2026 PBR term, include:

1. **SRA for Re-basing** (In-City Water, Wastewater and Drainage Services): The SRA for re-basing accounts for the difference between EWSI’s revenue requirement forecast for the 2022-2026 PBR term and the revenue that would be realized by limiting annual rate increases to PBR inflation. The resulting revenue requirement difference (shortfall or surplus) gets collected from or refunded to ratepayers over the current PBR term through a SRA for re-basing.
2. **SRA to Increase Monthly Service Connection Fees (**In-City Water): The SRA to increase monthly service connection fee adjusts EWSI’s rate structure to generate higher portions of revenue from fixed service charges, with a corresponding decrease in variable rates in order to help minimize the impact of declining rate revenue due to declining consumption over the 2022-2026 PBR term.
3. **SRA for 90 Day Deferral Program basing** (In-City Water, Wastewater and Drainage Services): Alberta’s Utility Payment Deferral Program Act was introduced in 2020 by the provincial government for electricity and gas utility customers in order to provide temporary financial relief to Albertans who were experiencing financial hardship due to COVID-19. City Council directed EWSI to implement a similar program to allow its customers to defer their water, wastewater treatment and drainage utility bill payments, without interest or penalty, for a 90-day period from March 18, 2020, to June 18, 2020. The program ended on June 18, 2020, and customers had one-year (June 18, 2021) to repay the entirety of their deferred payments. For the 2022-2024/2026 PBR Applications, EWSI received approval for a SRA to recover the forecasted bad debt expense, administration and carrying costs associated with the 90-day deferral program. The SRA was approved as a one-time increase to 2022 rates, which is removed from 2023 rates to ensure that the SRA does not generate any incremental revenue over the PBR term.

Furthermore, the approval included 2023 incremental bill adjustments to true up actual incurred costs.

4. **SRA for Public Fire Protection** (In-City Water): Prior to April 1, 2022, EWSI recovered the public fire protection revenue requirement through the Fire Hydrant Service Agreement with the City of Edmonton Fire Rescue Services Department, which was funded through the City's property tax levy. Edmonton City Council directed EWSI to include the recovery of the public fire protection revenue requirement through water rates over the 2022-2026 PBR term by way of a special rate adjustment that is added to fixed monthly service charges.
5. **SRA for SIRP and CORe** (Drainage Services): These special rates adjustments provide funding for two critical Drainage Services strategic initiatives:
   a) The SIRP strategy is a $1.6 billion system wide integrated approach, which is expected to be completed over the next 20 to 30 years to mitigate flood risk. The SIRP strategy includes investments to mitigate flood risks across the City of Edmonton by using a mix of grey (SIRP – MOVE trunks and tunnels) and green (SIRP – SLOW dry ponds and low impact developments (LID)) infrastructure installed in public right-of-way, City-owned land or EPCOR owned land. Implementation of the SIRP program began in 2019 and recovery of the SIRP program costs during the 2022-2024 PBR term is funded through a SRA to stormwater rates.
   b) The CORe strategy focuses on preventing the formation of hydrogen sulphide (H_2S) gas, which will help reduce community odour impacts and lengthen the life of sewer network assets. Implementation of the CORe program began in 2019 and is expected to be completed by 2026. Recovery of the CORe program costs during the 2022-2024 PBR term is funded through a SRA to sanitary rates.

II) Non-Routine Rate Adjustments (NRA)

The PBR framework facilitates rate adjustments for events or activities that are unusual, significant in size or nature and beyond the scope of control of EWSI. Non-routine adjustment criteria defined per Schedule 3 of Bylaw 19626 and Bylaw 19627 must be met in order for the NRA to be approved.

C. Performance Measures

Performance measures are an integral part of EWSI's PBR framework, which includes measures and targets for water service quality as described in Schedule 3, Section 3 of Bylaw 19626, and wastewater treatment and drainage service quality as described in Schedule 3, Sections 3 and 4 of Bylaw 19627. Annually, an independent auditor audits EWSI's performance against established measures and targets. These measures ensure the maintenance of a standard level of operational performance and ensures that EWSI does

not compromise system reliability and service quality as it seeks to identify cost saving opportunities during the PBR term. EWSI faces financial penalties ranging from $400,000 up to $2,400,000 if it does not meet or exceed the performance standards established within the PBR, providing assurance to customers that water, wastewater treatment and drainage services system reliability and service quality is not sacrificed to keep rates low or to increase returns to EWSI.

D. Return on Equity

The PBR plan incorporates a forecast rate of return on equity commensurate with consumption, cost and other risks that allows EWSI to finance its operational and capital programs, to provide its customers with high levels of service quality and reliability, and to provide "just and reasonable" returns to its shareholder. Achieving this return is dependent on EWSI achieving operating cost efficiencies, meeting, or exceeding performance standards, and developing the utility infrastructure needed to provide service to its customers. For the current PBR term, return on equity is based on a deemed capital structure of 60% debt and 40% equity with awarded rates of return as follows:

- **Return on Equity for Water and Wastewater Treatment Services**: A return on equity of 9.64% was approved for Water and Wastewater Treatment services for the current PBR term.
- **Return on Equity for Drainage Services**: The return on equity approved for Drainage services during the 2022-2024 PBR term is lower than the fair rate of return of 9.64%. In order to moderate rate increases for Drainage services during the 2022-2024 PBR term, return on equity for Drainage services was reduced from 9.95% to 5.50% in 2022. Beginning in 2023, Drainage return on equity was approved to be "ramped up" by 1.1% per year to achieve a fair rate of return by 2026.

E. PBR Rate Structures

I) In-City Water

In-City Water customers are grouped into three customer classes: residential; multi-residential; and commercial. In-City customers pay a variable consumption charge as well as a fixed monthly service charge. The fixed charge recovers costs that are directly attributable to a customer such as costs of the water meter, customer service and billing whereas variable consumption charge captures all the costs of operations, maintenance, administration and capital investment associated with operating the water treatment, wastewater treatment, sanitary and stormwater drainage utilities.

1. **Residential Customer Class**: Residential customers are charged a monthly service connection fee that varies with the size of the service, plus a variable charge for water consumption. Residential water rates are based on an inclining block structure with three consumption blocks (0 to 10 m^3, 10.1 to 35 m^3 and >35 m^3). A higher consumption charge is applicable to residential customers who use larger volumes of water while consumption charge is lower for residential customers who use less water. The inclining block structure promotes water conservation and incents customers to be efficient with their water usage, either by using water-efficient appliances or behavioral change such as more efficient lawn watering practices.
2. **Multi-Residential Customer Class**: Multi-residential customers are charged a monthly service connection fee that varies with the size of the service, plus a variable charge for water consumption. Multi-residential water rates are based on a declining block structure with three consumption blocks (0 to 100 m^3, 100.1 to 1,000.0 m^3 and >1,000 m^3). Multi-residential customers have less seasonal variability in water consumption and make lower peak demands on the waterworks system than residential customers. At the same time, multi-residential customers do not use the same volume of water or have the same infrastructure requirements as commercial customers. As a result, they have a unique declining block rate structure.
3. **Commercial Customer Class**: Commercial water rates are based on a declining block structure with five consumption blocks (0 to 25 m^3, 25.1 to 100 m^3, 100.1 to 1,000.0 m^3, 1,000.1 to 5,000 m^3 and >5,000 m^3) resulting in a lower per cubic meter rate as the customer uses more water. Commercial and institutional customers tend to have stable consumption patterns, which remain stable throughout the day, and each day of the year. EWSI has set the size of the declining blocks for the commercial rate class based on the results of a statistical study of water usage by the type of customer within the commercial class. This allows EWSI to ensure that similar customers within the commercial class pay a similar water rate and helps promote equity within the commercial rate class.

II) Wastewater Treatment Rate Structure

Wastewater treatment customers are classified into the same category as water service customers (i.e., residential, multi-residential and commercial) and each class of water service customers also qualify as a wastewater treatment customer for that class.

1. **Residential and Multi-Residential Customer Class**: Wastewater treatment charges are based on a flat rate structure with a single wastewater treatment rate applied to each cubic meter of water consumed. Residential and multi-residential customers are charged a monthly service connection fee, plus a variable charge for wastewater treatment based on their water consumption.
2. **Commercial Customer Class**: Commercial customers are charged the same monthly connection fee as residential and multi-residential customers, but unlike consumption

charges for residential and multi-residential customers, the commercial customer class uses a declining rate structure with three consumption blocks. The first block is for customers consuming less than 10,000 m^3 of water per year (over 95% of commercial customers), the second is for customers consuming 10,000.1 to 100,000 m^3 of water consumption per year and the third block is for customers consuming over 100,000 m^3 per year.

3. **Overstrength Surcharges**: Wastewater treatment services provided to commercial customers include additional monitoring, sampling, and testing of wastewater potentially containing one or more constituents, such as oil and grease, phosphorus, and other compounds considered to be harmful to the environment. Customers who release wastewater into the sewer system that contains these compounds are billed overstrength surcharges for each kilogram of surchargeable matter per cubic metre of wastewater in excess of prescribed concentrations.

III) Drainage Services Rate Structure

Consistent with In-City Water and Wastewater, Drainage Service's sanitary and stormwater utility customers are assigned to residential, multi-residential and commercial customer classes. The customer definitions and other classification criteria are generally consistent among In-City Water, Wastewater and Drainage Services. Therefore, each class of water or wastewater treatment customer also qualifies as a sanitary or stormwater utility customer for that class.

1. **Sanitary Utility Rates**: Sanitary rates are designed to collect the costs associated with wastewater collection services. Sanitary rates consist of a flat monthly charge levied on each customer's premises that varies with the size of the premises' water meter and a variable monthly charge based on a rate per cubic metre of either metered water consumption for the premises, or, if a sewer meter has been installed, the sewer discharge for the premises. The sanitary utility rate design also includes a provision for EWSI, under the conditions of the Utility Credit Programs, to provide a utility credit to discount metered water volumes. In the 2022-2024 PBR plan, there is only one customer, the University of Alberta that receives a utility credit. This credit provides a 44% reduction to the sanitary utility variable rate to recognize that the University of Alberta is a large wholesale customer that owns and operates its own on-campus collection system.
2. **Stormwater Utility Rates**: Stormwater rates are designed to collect the costs associated with the management of stormwater runoff. The current stormwater rate design consists of a single rate applied to the product of:
    a. The area of the property in square metres and, for multiple units sharing a single building, the proportion of the building lot area attributable to each unit;
    b. The development intensity factor, which measures the portion of lot being used for its intended development. The development intensity factor is set at 1.0, except for those

properties where owners demonstrate that they contribute significantly less stormwater runoff per property area to EWSI's land drainage system during rainfalls than other similarly-zone properties through the use of retention/detention ponds or other stormwater best practices. Applications for changes to the development intensity factor are made in accordance with the terms and conditions of the Utility Credit Programs; and

c. The runoff coefficient, which measures the permeability of the lot's surface (i.e., grass versus concrete), based on land zoning. The runoff coefficient ranges from 0.20 (e.g., agricultural zone AG) to 0.95 (e.g., commercial business zone CB2). As point of reference, a single-detached residential home (Zone RF1) has a runoff coefficient of 0.50. The runoff coefficients are included in Schedule 1 of the Drainage Services and Wastewater Treatment Bylaw.