2017 – 2021 Performance Based Regulation

Water and Wastewater Treatment Services

PROVIDING MORE EPCOR

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1 Executive Summary

This report provides an annual update to the City of Edmonton on the operational and financial results for the year ended December 31, 2017 for water services ("In-City Water") and wastewater treatment services ("Wastewater") provided within Edmonton by EPCOR Water Services Inc. ("EWSI"). These services are regulated by the City of Edmonton City Council in accordance with the Performance Based Regulation ("PBR") Plan approved in the EPCOR Water Services and Wastewater Treatment Bylaw No. 17698 (the "Bylaw").

1.1 Financial Performance

In-City Water and Wastewater's net income and return on equity for 2017 are summarized on Tables 1.1-1 and 1.1-2 below[1]:

Table 1.1-1
Net Income Return on Equity
($ millions)

		A	B
	In-City Water	**2017**	
		PBR Forecast	**Actual**
1	Revenue	190.1	187.4
2	Operating expenses	(100.7)	(98.8)
3	Depreciation and amortization	(25.6)	(25.9)
4	Interest	(26.6)	(27.0)
5	**Net Income**	**37.1**	**35.7**
6	Mid-year equity portion of rate base	365.1	364.1
7	**Return on Equity**	**10.175%**	**9.80%**

In 2017, In-City Water realized a 9.80% rate of return on equity, slightly less than its forecast return of 10.175%, as revenues were impacted by lower than forecast consumption and lower than forecast inflation adjustments to rates.

[1] Consistent with the 2017-2021 PBR Application, all financial data in this report, including totals and sub-totals, are rounded to the nearest $0.1 million. This practice ensures continuity of data between tables and between years. However, the sum of the rounded detailed data in certain tables may not be equal to the related rounded total or sub-total.

Table 1.1-2
Net Income and Return on Equity - Wastewater
($ millions)

		A	B
	Wastewater	**2017**	
		PBR Forecast	**Actual**
1	Revenue	94.0	90.8
2	Operating expenses	(54.0)	(47.1)
3	Depreciation and amortization	(13.9)	(14.4)
4	Interest	(10.0)	(10.2)
5	**Net Income**	**16.1**	**19.1**
6	Mid-year equity portion of rate base	158.0	151.9
7	**Return on Equity**	**10.175%**	**12.60%**

Wastewater's revenues were also affected by lower than forecast inflation adjustments and lower than forecast consumption, but lower than forecast operating expenses and a lower than forecast mid-year equity portion of rate base resulted in a return on equity of 12.60%.

The factors affecting In-City Water and Wastewater's 2017 financial performance and financial results are explained in detail in sections 2.3 and 3.3, respectively.

1.2 Capital Expenditures

In-City Water and Wastewater's capital expenditures for 2017 and for the five year term of the PBR Plan (the "2017-2021 PBR term") are summarized in Table 1.2 below:

Table 1.2
Capital Expenditures
($ millions)

		A	B	C	D
		2017		**2017-2021**	
		PBR Forecast	**Actual**	**PBR Forecast**	**Current Projection**
1	In-City Water	108.1	98.1	475.8	563.5
2	Wastewater	54.5	46.8	235.4	238.7

In-City Water's capital expenditures were $10.0 million less than forecast for 2017. Much of this difference relates to EWSI's decision to defer the planned $16.0 million expansion of the Water Distribution and Transmission facility until the completion of an EPCOR-wide real estate review.

EWSI currently forecasts that In-City Water's total capital expenditures over the 2017-2021 PBR term will exceed the PBR forecast by $87.8 million. The increase in capital expenditures, beyond what was in the PBR forecast, consists of: $14.7 million for water main relocations to accommodate LRT expansion; $29.9 million to meet customer and developer requirements for

growth, most of which results from changes to the Private Development Transmission Mains program (additional costs of $13.5 million) and the Water Main Cost Sharing Program (additional costs of $7.7 million); and $10.7 million to address unanticipated needs for reliability and life cycle replacements. Besides these projects and programs, the increase in capital expenditures also includes a significant new project, the $32.4 million E.L. Smith Solar Farm, designed to replace approximately 10% of conventional power with locally produced renewable power. This project is currently funded through rates and does not increase In-City Water's revenue requirements over the 2017-2021 PBR term.

Wastewater's lower ($7.7 million) capital expenditures in 2017 are not attributable to any single project, but reflect changes to project timing and changes in project scope needed to address revised asset condition assessments identified during preliminary engineering, as well as external factors including a longer than anticipated rezoning timeframe for the Mid-Point Operations Centre, a key component of Wastewater's 2017-2021 capital program.

Wastewater's total capital expenditures over the 2017-2021 PBR term are projected to be slightly higher than the PBR forecast ($3.3 million). Although the net change amounts to only 1.4% of Wastewater's capital program, this increase includes additional expenditures of $22.3 million to upgrade and replace sludge lines, $6.5 million to replace clarifier chains and $7.5 million to rehabilitate the concrete within the Diversion Structure. The additional costs of these projects are offset by cost reductions resulting from changes in the scope of projects, such as the Square 1 Gas Room Expansion ($9.0 million) and the Building and Site Rehab program ($7.3 million) and the Structural Rehab Programs ($5.5 million), which were identified during review of design options and value engineering. In addition, the Digester 4 Upgrade project has been deferred providing further reductions of $10.9 million. The remainder of the change in Wastewater's capital program results from reprioritization of reliability and life cycle replacements.

Detailed analysis of actual to forecast differences in capital expenditures for 2017, as well as approved to forecast differences for the 2017-2021 PBR term are provided in section 2.4 for In-City Water and in section 3.4 for Wastewater.

1.3 Operational Performance

In-City Water's operational performance is measured by the results of five indices prescribed in Schedule 3 of Bylaw 17698 with each index consisting of one or more performance measures. Performance under each index is measured independently on a point basis with 100 base points available if the standards for all five 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 2017, In-City Water exceeded the performance standards for all five performance measure indices. Section 2.5 provides detailed discussions of the performance measures making up each of the indices and highlights of Wastewater's operational performance.

Table 1.3-1
2017 Performance Measures
Water System Service Quality

		A	B
	Performance Measure Index - In-City Water	**Index Standard Points**	**Total Points Earned**
1	Water Quality Index	25.0	25.0
2	Customer Service Index	20.0	21.1
3	System Reliability and Optimization Index	25.0	28.5
4	Environmental Index	15.0	16.5
5	Safety Index	15.0	16.5
6	**Aggregate Points Earned**	**100.0**	**107.6**

Wastewater's operational performance is measured on a similar basis to Water's, but with four indices tailored to Wastewater's operations. As with Water, performance under each index is measured independently on a point basis with 100 base points available if the standards for all five 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 2017, Wastewater exceeded the performance standards for all four performance measure indices. Section 3.5 provides detailed discussions of the performance measures making up each of the indices and highlights of Wastewater's operational performance.

Table 1.3-2
2017 Performance Measures
Wastewater Treatment Services Quality

		A	B
	Performance Measure Index - Wastewater	**Index Standard Points**	**Total Points Earned**
1	Water Quality and Environmental Index	55.0	60.5
2	Customer Service Index	15.0	16.5
3	System Reliability and Optimization Index	15.0	16.5
4	Safety Index	15.0	16.5
5	**Aggregate Points Earned**	**100.0**	**110.0**

1.4 Rates and Bill Comparisons

In 2017, EWSI's average residential customer's water bill, based on monthly consumption of 14.6 m^3, was **$36.40,** an increase of 1.6% from 2016, This increase consists of the 0.8% inflation

adjustment discussed in Section 2.3.1 and the special rate adjustments approved in Bylaw 17698 for Environmental Initiatives (0.4%), Accelerated Programs (0.6%) and Rebasing (-0.2%).

The average residential customer's wastewater bill in 2017, again based on monthly consumption of 14.6 m^3, was **$16.54**, an increase of 5.0% from 2016. This increase includes the 0.8% inflation adjustment and special rate adjustments for rebasing of 4.2% needed to support Wastewater's 2017-2021 capital programs.

EWSI undertakes annual bill comparison surveys with various cities and local communities to ensure that the City's water and wastewater treatment rates are reasonable and competitive. Section 2.6 shows that EWSI's residential water rates are lower than most of the cities and communities included in the comparison, with only Vancouver having lower water rates.

Wastewater 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 which influence the level of investment in and approach to flood mitigation. Section 3.6 shows that Edmonton's combined drainage and wastewater treatment rates are competitive with those of other cities and communities with similar geographic and climatic conditions. Commercial bill comparisons for both water and wastewater show similar results to residential water and wastewater bills.

1.5 Non-Routine Adjustments

Non-routine adjustments are defined in Bylaw 17698 as "items which are unusual, significant in size or nature, and beyond the scope of control of EWSI". Bylaw 17698 allows EWSI to request adjustments to In-City Water and Wastewater's rates for non-routine adjustments from the City. These requests are provided to either the City Manager or City Council, depending on the impact of the non-routine adjustment on In-City Water and Wastewater's revenue requirements.

Although EWSI did not identify any non-routine adjustments that met the criteria outlined in Bylaw 17698, Schedule 3, Section 5.0 during review of its 2017 operations, EWSI committed to flow the benefits of any reductions in corporate shared service cost allocations resulting from the transfer of Drainage Services assets to EPCOR to In-City Water and Wastewater customers through a negative non-routine adjustment. EWSI calculated that, over the 2017-2021 PBR term, these reductions would amount to $11.4 million in savings for In-City Water customers and $4.2 million in savings for Wastewater customers. These savings were included in EWSI's request to the City Manager for non-routine adjustments to 2018 water rates.

The City Manager approved EWSI's request on March 13, 2018. The resulting non-routine adjustments have been applied to fixed monthly service charges commencing April 1 2018. The savings to In-City Water customers amount to $0.71 per 15mm (5/8") equivalent meter per month, providing savings of $8.56 for the average residential customer for the period from April

1, 2018 to March 31, 2019, and total savings of $35.28 over the 2017-2021 PBR term. For Wastewater customers, monthly savings amount to $0.31 per customer connection per month, providing savings of $3.72 per customer for the period from April 1, 2018 to March 31, 2019, and total savings of $15.34 over the 2017-2021 PBR term.

2 In-City Water

2.1 Accomplishments and Challenges

In 2017, In-City Water realized a 9.80% return on equity, slightly less than the PBR target of 10.175%, with decreases in In-City revenues largely offset by decreases in operating expenses. Lower than forecast revenues are attributable to lower than forecast consumption in the commercial and multi-residential customer classes, which accounted for $1.6 million of the $3.6 million difference and a lower than forecast inflation adjustment to water rates, which accounted for the remaining $2.0 million. The PBR inflation adjustment (see Table 2.3.1-2) consists of two components: (1) forecast inflation for 2017; and (2) the difference between forecast and actual inflation for 2016. Although forecast inflation for 2017 was 0.24% less than the PBR forecast, actual inflation for 2016 was 0.92% less than forecast, resulting in an inflation adjustment to 2017 rates of 0.84%, instead of the 2.02% PBR forecast adjustment.

Lower than forecast Corporate Shared Services costs accounted for $2.1 million of the $2.8 million difference between forecast and actual operating expenses. The remainder of the difference consists of lower power costs, reflecting both lower than forecast power consumption and lower than forecast wire charges, as well as lower than forecast staff costs and employee benefits resulting from reductions in fringe benefit rates and a one-time refund of long-term disability premiums. These lower than forecast costs were partially offset by higher than forecast chemical costs resulting from an early thaw which necessitated an early conversion from direct filtration to conventional water treatment, requiring much higher than forecast chemical use in the first half of the year.

In-City Water is undertaking an ambitious capital program over the 2017-2021 PBR term to replace existing assets, to lay the foundation for future growth, to meet environmental and health and safety goals, and to achieve improvements in performance and efficiency. EWSI's current projection is that capital expenditures over the 2017-2021 PBR term will exceed the PBR forecast by $87.8 million. This increase includes the $32.4 million E.L. Smith Solar Farm, designed to replace approximately 10% of conventional power with locally produced renewable power, $29.9 million to meet customer and developer requirements for growth, $14.7 million for water main relocations to accommodate LRT expansion, and $10.7 million to address unanticipated needs for reliability and life cycle replacements. These changes and their impacts on In-City Water's capital program are discussed in detail in Section 2.4.

In-City Water's financial performance, capital expenditures programs, and operational performance are discussed in detail in sections 2.2 to 2.5, with comparisons of In-City Water's average bills for residential and commercial customers to water bills in other western Canadian cities and local communities provided in section 2.6.

2.2 Customers and Consumption

In-City Water provides services to three customer classes: Residential; Multi-Residential; and Commercial. These classes are unchanged from the previous PBR term and are described in greater detail in Appendix A. Customer counts, total annual consumption and monthly consumption per customer are shown in Table 2.2 below:

Table 2.2
Customers, Consumption and Consumption per Customer

		A	B
	Customers and Consumption	2017	
		PBR Forecast	Actual
1	Annual Consumption (ML)		
2	Residential	45,057.0	45,477.9
3	Multi-Residential	18,370.0	17,828.8
4	Commercial	28,539.0	27,536.6
5	Total	91,966.1	90,843.2
6	Customers (Average Active Services per Month)		
7	Residential	256,306	259,335
8	Multi-Residential	3,746	3,752
9	Commercial	19,257	19,438
10	Total	279,310	282,524
11	Monthly Consumption per Customer* (m^3 per month)		
12	Residential	14.6	14.6
13	Multi-Residential	408.6	396.0
14	Commercial	123.5	118.1

*Monthly Consumption per Customer = (Annual Consumption x 1000) / (Customers x 12)

Although In-City Water's customer counts were 1.2% greater than forecast, total consumption was 1.2% less than forecast. The factors contributing to these results differ by customer class, as explained below:

- **Residential.** Higher than forecast customer counts in 2017 reflect greater than expected resilience of residential markets. In 2016, when the PBR forecast was prepared, EWSI assumed that economic conditions would limit annual residential customer growth to 1.9% for the 2016 to 2021 period. Actual residential growth in 2016 remained strong at 2.8%, before declining to 2.1% in 2017. Since actual consumption per customer in 2016 was within 0.1 m^3 of forecast, the increase in residential customers resulted in a 0.9% increase in total residential consumption volumes.

- **Multi-Residential.** Although customer counts were within 0.1% of forecast, lower than forecast consumption per customer meant that total consumption was 2.9% less than forecast. The actual to forecast difference in consumption per customer in 2017, while appearing high in absolute terms, is well within the limits of historical variation in

consumption per customer, reflecting factors including weather conditions, vacancy rates, renovation of older buildings, and the number of units in new multi-residential buildings.

- **Commercial.** Consumption in the commercial customer class was 3.5% less than forecast, despite a 0.9% increase in customer counts. These results reflect the lack of homogeneity of commercial customers. This class includes a large number of customers, such as offices and retail stores, that consume very little water and a small number of customers, including businesses in the food and beverage processing industry, large shopping malls and hospitals, with very high levels of consumption. For example, in 2017, 290 (1.3%) of commercial customers accounted for 50% of commercial consumption. Therefore, increases in customer counts, which tend to be low water-consuming small businesses, will not necessarily result in a proportional increase in consumption for the commercial class. These conditions result in considerable year-over-year variation in consumption per customer.

EWSI notes that there were no comparable differences between actual and forecast consumption per customer in the Residential customer class. In response to higher than forecast declines in per customer consumption over the past two PBR terms, EWSI developed a new consumption forecasting model for the 2017-2021 PBR term incorporating time series analysis and weather normalization to better capture long-term trends in residential water consumption. While one year does not make a trend, the results of the residential forecasting model appear promising. Accordingly, EWSI is currently considering how to similarly enhance its forecast methodology for the Multi-Residential and Commercial customer classes.

2.3 Financial Performance

In-City Water's net income is derived from the provision of water services within Edmonton's boundaries. Besides these services, EWSI provides water services to surrounding communities under bulk water supply agreements with regional water service commissions ("Regional Customers"), and fire protection services to the City of Edmonton under a service agreement ("Fire protection").

EWSI's water system is fully integrated, with services jointly provided to In-City Water, Regional Customers and Fire Protection. Therefore, operating costs, depreciation, rate base and capital expenditures are presented and analyzed on a total system basis. In-City Water's share of these expenses, as well as its returns on rate base, are calculated in accordance with a cost of service model developed jointly by EWSI, the regional water service commissions and the City of Edmonton, and are shown as separate line items on each applicable table.

2.3.1 Revenue

In-City Water's rate revenues include fixed monthly services charges which vary by meter size and consumption charges applied to each cubic meter of water consumed. Besides rate

revenue, In-City Water revenues also include other revenue derived from temporary services, connection fees, water permits, late payment charges and other incidental services. Table 2.3.1-1 below provides a comparison of 2017 In-City Water revenues to the PBR forecast:

Table 2.3.1-1
In-City Water Revenue
($ millions)

		A	B
	In-City Water Revenue	**2017**	
		PBR Forecast	**Actual**
1	Fixed Monthly Service Charges		
2	Residential	22.3	22.1
3	Multi-Residential	1.3	1.3
4	Commercial	3.9	4.0
5	Total Fixed Monthly Service Charge Revenue	27.5	27.3
6	Consumption Charges		
7	Residential	93.4	92.0
8	Multi-Residential	28.8	27.8
9	Commercial	35.5	34.5
10	Total Consumption Charge Revenue	157.8	154.3
11	In-City Water Rate Revenue	185.3	181.7
12	Other Revenue	5.0	5.7
13	**Total In-City Water Revenue**	**190.2**	**187.4**

The difference between 2017 actual and forecast rate revenue is attributable to two key factors. First, lower than forecast consumption, partially offset by higher than forecast customer counts, as explained in Section 2.2, accounted for $1.6 million of the $3.6 million difference between actual and forecast rate revenues. The remainder of the difference in revenue is attributable to the lower than forecast annual inflation adjustment to water rates. This adjustment, shown in Table 2.3.1-2, was 0.84%, compared to the PBR forecast rate of 2.02%. This difference is primarily attributable to the 0.92% difference between forecast and actual inflation for 2016, as the Alberta economy grew at a slower than expected rate in 2016.

Table 2.3.1-2
2017 PBR Inflation Adjustment

		A	B
	PBR Inflation Adjustment to 2017 In-City Water and Wastewater Rates	**2017**	
		PBR Forecast	**Actual**
1	2017 Forecast Inflation		
2	CPI	2.20%	2.20%
3	Labour	2.40%	1.70%
4	Weighted Inflation (65% CPI, 35% Labour)	2.27%	2.03%
5	Less: Efficiency Factor	-0.25%	-0.25%
6	2017 Year Forecast Inflation	2.02%	1.78%
7	2016 Actual to Forecast Inflation Adjustment	-	-0.92%
8	**PBR Inflation Adjustment (line 6 x line 7)**	**2.02%**	**0.84%**

Besides rate revenues, In-City Water earned $5.7 million in other revenue in 2017. The forecast to actual difference in 2017 results from a one-time charge of $0.4 million to EPCOR Distribution and Transmission Inc. ("EDTI") for meter reading services as part of the transfer of EPCOR's meter reading function from EDTI to EWSI, and fees of $0.3 million charged to private developers for water main flushing for new developments.

2.3.2 Operating Expenses by Function

Table 2.3.2 below provides a comparison of EWSI's total water system operating expenses for 2017 to the PBR forecast.

Table 2.3.2
Operating Expenses by Function
($ millions)

		A	B
	Function and Sub-function	**2017**	
		PBR Forecast	**Actual**
1	Power, Other Utilities and Chemicals		
2	Power	11.4	10.9
3	Natural Gas	0.6	0.6
4	Power and Other Utilities	12.0	11.6
5	Chemicals	7.2	8.4
6	Power, Other Utilities and Chemicals	19.2	20.0
7	Water Operations		
8	Water Treatment Plants	18.8	17.4
9	Water Distribution and Transmission	24.6	25.7
10	Operational Support Services	7.3	6.8
11	Quality Assurance and Environment	5.4	5.4
12	Capitalized Overhead Costs	(7.1)	(7.1)
13	Water Operations Expenses	49.0	48.3
14	Billing, Meters and Customer Service		
15	Billing and Collections	7.8	7.8
16	Meter Reading, Repairs and Maintenance	3.1	2.7
17	Customer Service	0.8	0.6
18	Billing, Meters and Customer Service Expenses	11.7	11.2
19	EWSI Shared Services		
20	EWSI Shared Services	9.8	10.0
21	Incentive and Other Compensation	3.1	2.8
22	EWSI Shared Services Expenses	12.9	12.8
23			
24	Corporate Shared Services	15.0	12.9
25			
26	Franchise Fees and Property Taxes		
27	Franchise Fees	14.5	14.3
28	Property Taxes	0.4	0.2
29	Franchise Fees and Property Taxes	15.0	14.6
30	**Total Operating Expenses by Function**	**122.6**	**119.8**
31	In-City Water Share - %	82.1%	82.4%
32	**In-City Water Share - $**	**100.7**	**98.8**

Overall, total operating expenses for 2017 were $2.8 million lower than the PBR forecast. Key factors contributing to this difference include:

- **Power and Other Utilities** ($0.5 million less than forecast). Over 90% of EWSI power costs relate to the costs of pumping water from the North Saskatchewan River to its water treatment plants and from the plants though the distribution network to its customers. In 2017, the favourable variance in power costs is attributable to lower than forecast wire charges and lower than forecast power requirements.

- **Chemicals** ($1.2 million greater than forecast). EWSI incurs a large portion of its chemical costs to mitigate turbidity, odour and colour during spring run-off. An unusual thaw in February 2017 resulted in EWSI experiencing two spring run-off events in 2017, requiring EWSI to stop direct filtration in February, rather than in March or April, and extending the use of chemicals (carbon, alum and caustic soda) in the water treatment process. After the second spring run-off event, EWSI maintained chemical usage at more normal levels and, in the fall, was able to reduce chemical usage through early conversion to direct filtration.

- **Water Treatment Plants** ($1.4 million less than forecast). This function includes the operation, maintenance and repair of reservoirs and water treatment plants. Lower than forecast costs in 2017 are attributable to several factors, including: a higher than forecast proportion of internal labour on capital projects, which increased capital recoveries ($0.5 million); reductions in fringe benefit costs, primarily associated with lower pension contribution rates, which provided additional savings in salary costs ($0.3 million); and capitalization of filter media costs, which had previously been considered an operating expense ($0.2 million). The remainder of the forecast to actual difference is made up of numerous small items, none of which exceed $0.1 million.

- **Water Distribution and Transmission** ($1.1 million greater than forecast). This function includes operations, repairs, maintenance and management of the distribution network. Although Water Distribution and Transmission also benefitted from the reduction in fringe benefit rates, the freeze thaw cycles in the spring of 2017 led to a high volume of emergency repairs, contributing to increased overtime costs of $0.4 million and higher levels of contractor costs of $0.7 million.

- **Operational Support Services** ($0.4 million less than forecast). The variance in this function, which includes Project and Asset Management, Supply Chain Management, and Water Operations Management, reflects lower Staff Costs and Employee Benefit expenses, resulting from lower fringe benefit costs and delays in filling unanticipated staff vacancies in Project and Asset Management.

- **Meter Reading, Repairs and Maintenance** ($0.4 million less than forecast). Staff Costs and Employee Benefit expenses, related to the decrease in fringe benefit rates, were $0.3 million lower than forecast for this function. The remainder of the forecast to actual difference is made up of numerous small items, none of which exceed $0.1 million.

- **Corporate Shared Services ($2.1 million less than forecast).** This difference is attributable to several factors, including: reductions in corporate cost allocations of $1.0 million resulting from the transfer of Drainage Services from the City of Edmonton to EPCOR Utilities Inc.; lower than forecast allocation factors; and decreases in corporate rent, higher staff vacancies and lower incentive costs**.** As noted in Section 1.5, the reductions to corporate shared services costs arising from the transfer of Drainage Services will be returned to In-City water customers through a non-routine adjustment to 2018 water rates.

- **Franchise Fees and Property Taxes** ($0.4 Million less than forecast). EWSI pays a franchise fee to the City of Edmonton of 8% of its rate revenues. Therefore, lower than forecast result resulted in a $0.2 million reduction in franchise fees. Lower than forecast property taxes relate to the deferral of the Distribution and Transmission facility which had been expected to increase Water Services' property taxes by $0.2 million annually commencing in 2017.

Variances in other operating expense functions and sub-functions are not significant, either individually or in aggregate.

In 2017, In-City Water's share of operating expenses was $98.8 million, compared to $100.7 million in the PBR forecast. This result reflects both lower total operating expenses for Edmonton Water Services, as explained above, partially offset by In-City Water's 0.2% higher share of operating expenses determined through the cost of service model.

2.3.3 Operating Expenses by Cost Category

Table 2.3.3 below shows operating expenses by cost category for Water Operations, Billing Meters and Customer Service, and EWSI Shared Services, where cost categories differ from the sub-functions in Section 2.3.2.

Table 2.3.3
Operating Expenses by Cost Category
($ millions)

		A	B
	Cost Category	2017	
		PBR Forecast	Actual
1	Water Operations		
2	Staff Costs and Employee Benefits	33.5	32.1
3	Contractors and Consultants	6.7	7.1
4	Vehicles	1.5	1.4
5	Materials and Supplies	3.0	3.3
6	Other	4.3	4.5
7	Water Operations Expenses	49.0	48.3
8	Billing, Meters and Customer Service		
9	CUS Charges	7.8	7.8
10	Staff Costs and Employee Benefits	6.6	6.3
11	Contractors and Consultants	0.5	0.4
12	Vehicles	0.3	0.3
13	Other	0.5	0.3
14	Meter Reading Services (Recoveries)	(4.1)	(3.9)
15	Billing, Meters and Customer Service Expenses	11.7	11.2
16	EWSI Shared Services		
17	EWSI Shared Services Allocation	9.8	9.6
18	Staff Costs and Employee Benefits	3.2	3.4
19	Contractors and Consultants	0.2	0.1
20	Other	(0.3)	(0.2)
21	EWSI Shared Services Expenses	12.9	12.8

The information presented in this table supports the explanations of differences between 2017 actual and forecast expenses provided in Section 2.3.2. Accordingly, no additional explanations are considered necessary.

2.3.4 Depreciation and Amortization

EWSI total system depreciation expense and amortization of contributed assets for 2017 are shown in Table 2.3.4 below:

Table 2.3.4
Depreciation and Amortization
($ millions)

		A	B
	Depreciation and Amortization	**2017**	
		PBR Forecast	**Actual**
1	Provision for depreciation	42.2	43.1
4	Gains (losses) on disposal of property, plant and equipment	-	(0.1)
3	Depreciation expense	42.2	42.9
2	Amortization of contributions	(9.7)	(10.3)
5	**Depreciation and Amortization**	**32.5**	**32.6**
6	In-City Water Share - %	78.9%	79.1%
7	**In-City Water Share - $**	**25.6**	**25.9**

Depreciation expense and amortization of contributions are both higher than forecast reflecting higher than forecast levels of developer-funded assets, explained in section 2.3.5 below. These impacts are offsetting, so actual depreciation expense, net of amortization, is within $0.1 million of forecast.

In-City Water's share of 2017 depreciation expense is 0.2% higher than forecast. The proportion of depreciation and amortization expense allocated to In-City Water through the cost of service model varies in proportion to demands on the total water system. The 0.2% difference in 2017 is consistent with actual to forecast differences in the base and max day peaking factors used to allocate depreciation expense in functional cost categories to In-City customer classes versus that charged to the RWCG.

2.3.5 Rate Base

In 2017, EWSI's total water system rate base, shown in Table 2.3.5 below, was $1.2 million less than forecast, with the higher than forecast gross rate base offset by higher than forecast contributions.

Table 2.3.5
Mid-Year Rate Base
($ millions)

		A	B
	Components of Mid-Year Rate Base	**2017**	
		PBR Forecast	**Actual**
1	Plant in Service		
2	Balance, beginning of year	2,148.1	2,192.3
3	Additions - EPCOR-funded	103.6	90.3
4	Additions - Developer-funded	6.0	22.7
5	Retirements and adjustments	-	(5.5)
6	Balance, end of year	2,257.4	2,299.8
7	Mid-Year Plant in service (= (line 1 + line 6)/2)	2,202.7	2,246.1
8	Accumulated Depreciation		
9	Balance, beginning of year	518.7	525.0
10	Depreciation expense	42.2	43.1
11	Retirements and adjustments	-	(5.4)
12	Balance, end of year	560.9	562.7
13	Mid-Year Accumulated Depreciation(= (line 8 + line 12)/2)	539.8	543.8
14	Other Rate Base Items		
15	Working Capital	20.5	20.2
16	Materials and Supplies	2.9	3.3
17	**Gross Mid-Year Rate Base** (= line 7 + line 13 + line 15 + line 16)	**1,686.3**	**1.725.8**
19	Contributions		
20	Balance, beginning of year	674.6	707.6
21	Contributions in aid of construction	6.0	22.7
23	Balance, end of year	680.6	730.2
24	Mid-Year Contributions (= (line 20 + line 23)/2)	677.6	718.9
25	Accumulated Amortization		
26	Balance, beginning of year	148.6	148.9
27	Amortization of contributions	9.7	10.3
28	Balance, end of year	158.3	159.2
29	Mid-Year Accumulated Amortization (= (line 26 + line 28)/2)	153.5	154.0
30	**Mid-Year Contributions** (= line 24 + line 29)	**524.1**	**564.9**
31	**Net Mid-Year Rate Base (= line 17 + line 30)**	**1,162.1**	**1,160.9**

The gross rate base reflects higher than forecast levels of developer-funded assets, both in 2016, which increased the opening balance of plant in service, as well as in 2017, offsetting lower than forecast EPCOR-funded capital additions, as discussed in Section 2.4.

Developers are responsible for construction of distribution infrastructure in new subdivisions. When these assets are placed into service, ownership of the assets is transferred to EWSI, where the assets, together with offsetting contributions in aid of construction, are added to the rate base. Therefore, in 2017, since higher than forecast developer-funded asset additions were fully offset by a corresponding increase in contributions, the net rate base remained within 0.1% of the PBR forecast.

2.3.6 Return on Rate Base

In-City Water's returns on rate base are based on its share of the total water system rate base, its deemed capital structure and its costs of debt and equity. Returns on rate base are summarized on Table 2.3.6-1 below:

Table 2.3.6-1
Return on In-City Water Share of Mid-Year Rate Base
($ millions)

		A	B
	Return on Rate Base	**2017**	
		PBR Forecast	**Actual**
1	Net Mid-Year Rate Base	1,162.1	1,160.9
2	In-City Water Share - %	78.5%	78.4%
3	In-City Water Share - $	912.6	910.3
4	Deemed Capital Structure		
5	Debt	60.00%	60.00%
6	Equity	40.00%	40.00%
7	Total	100.00%	100.00%
8	Cost Rates		
9	Debt	4.87%	4.95%
10	Equity	10.18%	9.80%
11	Weighted Average Cost of Capital (WACC)	6.99%	6.89%
12	Return on Rate Base		
13	Debt	26.6	27.0
14	Equity	37.1	35.7
15	**Total Return on In-City Water Rate Base**	**63.8**	**62.7**

In-City Water's share of the total system net mid-year rate base is 0.1% less than forecast, which is consistent with the change in In-City Water's demands on water system relative to that of Regional Customers. When combined with a total system rate base that was also very close to forecast, the In-City Water net mid-year rate base is within 0.1% of the amount forecast.

Returns on rate base are 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 2.3.6-2 below:

Table 2.3.6-2
Interest Expense and Cost of Debt
($ millions)

		A	B
	Interest Expense and Cost of Debt	**2017**	
		PBR Forecast	**Actual**
1	Interest expense		
2	Interest on short-term debt	1.0	1.3
3	Interest on City of Edmonton debentures	0.9	0.9
4	Interest on intercompany debentures	31.5	31.2
5	Total interest expense	33.3	33.4
6	Mid-year debt and other long-term liabilities		
7	Mid-Year Short-term debt	36.3	27.9
8	Mid-Year Long-term debt	644.1	644.1
9	Mid-Year Other Long-term liabilities	4.0	2.1
10	Total mid-year debt and other long-term liabilities	684.4	674.1
11	**Embedded Cost of Debt**	**4.87%**	**4.95%**

The embedded cost of debt is slightly higher than forecast, reflecting a lower than forecast mid-year balance of short-term debt and, therefore, a higher proportion of higher cost long-term debt.

In-City's actual rate of return on equity, calculated as regulated net income in Section 1.1, is 0.3% less than approved ROE, reflecting EWSI's actions to control operating costs in response to the lower than forecast inflation component of 2017 rate increases.

2.3.7 Transactions with Affiliates

In-City Water derives a significant proportion of its revenue and expenses from transactions with affiliates, including the City of Edmonton, EPCOR Utilities Inc. and its subsidiaries, and other EWSI business units. Table 2.3.7 provides a summary of In-City Water's 2017 actual and forecast transactions with affiliates, together with references to the schedules in this report where these transactions are reported.

Table 2.3.7
Transactions with Affiliates
($ millions)

		A	B
	Affiliate and Service	2017 PBR Forecast	2017 Actual
1	**Revenues from the provision of services to the City of Edmonton**		
2	Public Fire Protection	10.8	11.1
3	Water sales (Table 2.3.1-1, lines 4 and 9)	3.2	3.3
4	Other (Table 2.3.1-1, line 12)	0.2	0.1
5	Total	14.2	14.4
6	**Services provided by (recovered from):**		
7	**City of Edmonton**		
8	Franchise Fees (Table 2.3.2, line 27)	14.5	14.3
9	Property Taxes (Table 2.3.2, line 28)	0.4	0.2
10	Interest on City of Edmonton Debentures (Table 2.3.6-2, line 3)	0.9	0.9
11	Mobile equipment services (Table 2.3.3, lines 4 and 12)	1.8	2.2
12	Other services (Table 2.3.3, lines 6, 13 and 20)	1.3	0.7
13	Meter Reading Recoveries (Table 2.3.3, line 14)	-	(1.4)
14	Total	19.0	17.0
15	**EPCOR Utilities Inc.**		
16	Corporate Shared Service Costs (Table 2.3.2, line 24)	15.0	12.9
17	Interest on Intercompany Debentures (Table 2.3.6-2, line 4)	31.5	31.2
18	Interest on Short-term debt (Table 2.3.6-2, line 2)	1.0	1.3
19	Total	47.4	45.4
20	**EPCOR Distribution and Transmission Inc.**		
21	Meter Reading Service Revenue (Table 2.3.1-1, line 12)	-	(0.4)
22	Other services (Table 2.3.3, line 13)	0.1	-
23	Total	0.1	(0.4)
24	**EPCOR Technologies Inc.**		
25	Hydrovac Charges and Space Rentals (Table 2.3.3, line 3)	0.9	1.2
26	**EPCOR Energy Alberta LP**		
27	Customer Billing and Collection Services (Table 2.3.3, line 9)	7.8	7.8
28	**Other EWSI Business Units**		
29	EWSI Shared Services Allocation (Table 2.3.3, line 19)	9.8	9.6
30	Water Sales to Wastewater (Table 2.3.1-1, lines 4 and 9)	(0.4)	(0.5)
31	Meter Reading Recoveries from Wastewater (Table 2.3.3, line 14)	(2.1)	(2.1)
32	Meter Reading Recoveries from Drainage Services (Table 2.3.3, line 14)	(2.1)	(0.4)
33	Customer Service Fees from Drainage Services (Table 2.3.3, line 13)	-	0.1
34	Total	5.4	6.7
35	**Expenditures on capital projects arising from services provided by:**		
36	City of Edmonton	3.0	1.5
37	EPCOR Technologies Inc.	3.8	4.7
38	EPCOR Utilities Inc.	-	0.7
39	EPCOR Drainage Services	-	0.8
40	EPCOR Distribution and Transmission Inc.	0.1	0.4
41	Total	6.9	8.2

2.4 Capital Programs – In City Water

In-City Water's approved capital program for the 2017-2021 PBR term amounts to $475.8 million and includes over 200 projects in six major project categories. Over the course of the PBR term, changes to the capital program will be required in response to changes in regulatory or operational requirements, customer demands or other unforeseen circumstances. These changes are coordinated through EWSI's Project Management Office and are reviewed and approved by EWSI's Capital Project Steering Committee, EUI's Financial Review Council, or EPCOR's Board of Directors, depending on the significance of the change.

2.4.1 Capital Expenditures

Table 2.4.1 compares approved capital expenditures from the PBR forecast to actual capital expenditures for 2017 for each project with approved capital expenditures in excess of $5.0 million over the 2017-2021 PBR term, as well as for each project category. Table 2.4.1 also provides a comparison of total 2017-2021 approved capital expenditures to EWSI's current capital forecast.

Although capital expenditures for In-City water were $10.0 million less than the amounts approved for 2017, EWSI estimates that, over the 2017-2021 PBR term, the total cost of EWSI's capital program, including the cost of new projects, and the cost of changes in scope for existing projects, will exceed PBR approved amounts by $87.8 million. These changes are explained in detail below Table 2.4.1.

Table 2.4.1
Capital Expenditures
($ millions)

		A	B	C	D	E	F	
		2017			2017-2021			
		PBR Forecast	Actual	Increase (Decrease)	PBR Forecast	Current Projection	Increase (Decrease)	
1	**Regulatory**							
2	Water Services Replace/Refurbish	1.9	1.9	(0.1)	10.2	10.1	-	
3	Projects < $5 Million	0.3	0.6	0.3	1.5	2.3	0.8	
4	Subtotal	2.2	2.5	0.2	11.6	12.3	0.8	
5	**Growth/Customer Requirements**							
6	Water Services Connections	4.0	5.0	1.0	23.6	24.8	1.2	
7	PD Construction Coordination	2.7	2.7	-	15.4	14.1	(1.3)	
8	Network PD Transmission Mains	3.5	6.8	3.3	14.4	27.9	13.5	1
9	New Meter Purchase/Installation	2.1	2.0	(0.1)	13.2	12.9	(0.2)	
10	LRT Relocates	5.5	5.3	(0.3)	10.4	25.1	14.7	2
11	New Water Distribution Mains	1.7	1.6	(0.1)	8.8	10.1	1.3	
12	Distribution System Modifications	1.4	1.3	(0.1)	6.0	5.1	(0.9)	
13	Water Main Cost Sharing Program	0.8	0.8		3.0	10.8	7.7	3
14	Projects < $5 Million	1.6	3.2	1.6	2.6	8.2	5.6	4
15	Subtotal	23.4	28.8	5.4	97.5	139.1	41.6	
16	**Health, Safety & Environment**							
17	E.L. Smith - Deep Bed Filtration	-	-	-	22.3	22.6	0.3	
18	Projects < $5 Million	0.7	0.8	-	4.3	4.5	0.2	
19	Subtotal	0.7	0.8	-	26.6	27.1	0.4	
20	**Reliability & Life Cycle Improvements**							
21	Water Main Reactive Renewal	8.4	9.6	1.2	54.7	52.3	(2.3)	5
22	Meter Change Outs	2.6	2.9	0.3	25.6	17.3	(8.4)	6
23	Water Main Proactive Renewal	3.4	3.7	0.2	18.0	18.0	(0.0)	
24	Transmission Mains Replace/Refurbish	2.4	2.8	0.3	13.3	13.7	0.4	
25	Vehicle & Fleet Additions	3.7	3.7	-	11.8	11.9	0.1	
26	E.L. Smith - Bypass (Ring) Main	-	-	-	7.0	7.3	0.3	
27	Cell/Pumphouse Roof Replacement	2.7	1.5	(1.2)	6.3	2.9	(3.4)	7
28	SCADA System Upgrade Program	2.3	0.9	(1.4)	5.7	4.0	(1.7)	
29	Network Valve Chamber Refurbishment	1.1	1.2	0.1	5.6	5.7	0.2	
37	Electrical Upgrades - Reservoirs	1.1	0.4	(0.7)	5.3	4.3	(1.0)	
38	Electrical Upgrades -- Rossdale	0.6	0.6	(0.6)	5.2	5.3	0.1	
30	Obsolete Hydrants	0.8	1.3	0.4	4.4	7.4	3.0	8

		A	B	C	D	E	F	
		2017			2017-2021			
		PBR Forecast	Actual	Increase (Decrease)	PBR Forecast	Current Projection	Increase (Decrease)	
31	Obsolete Valves	0.8	1.5	0.7	4.1	7.6	3.5	9
32	Rossdale Filter Underdrains	1.1	2.2	1.0	4.7	8.1	3.4	10
33	Rossdale Clarifier C1-2 Upgrade	3.0	1.2	(1.7)	4.3	6.2	1.8	
34	ELS Mechanical Upgrades Program	1.2	1.1	(0.2)	4.9	6.2	1.3	
35	ELS Chemfeed Upgrades Program	0.8	1.2	0.4	4.0	5.2	1.2	
36	Rossdale Chemfeed Upgrades Program	0.9	1.9	1.0	4.0	5.5	1.5	
39	Projects < $5 Million	16.5	14.3	(1.5)	73.4	86.7	13.3	11
40	Subtotal	53.6	52.0	(1.6)	262.4	275.6	13.2	
41	**Performance Efficiency & Improvement**							
42	Water Main Cathodic Protection	4.0	3.8	(0.2)	21.0	19.4	(1.7)	
43	Water D&T Facility Expansion	16.0	-	(16.0)	16.0	16.0	(0.0)	12
44	Projects < $5 Million	1.4	1.0	(0.3)	7.1	6.4	(0.7)	
45	Subtotal	21.4	4.8	(16.6)	44.1	41.7	(2.4)	
46	**Accelerated**							
47	Accelerated Water Main Renewal	9.9	9.7	(0.2)	51.9	54.5	2.6	13
48	Accelerated Fire Protection	2.9	3.7	0.8	15.9	12.0	(3.9)	14
49	Subtotal	12.8	13.4	0.6	67.8	66.5	(1.3)	
50								
51	**E.L Smith Solar Farm**	-	1.5	1.5	-	32.5	32.5	15
52								
53	**Capital Expenditures before contributions**	**114.1**	**103.7**	(10.4)	**510.1**	**594.9**	84.8	
54								
55	**Contributions**							
56	Water Services Connections	(4.0)	(3.9)	0.1	(23.6)	(19.7)	3.9	16
57	New Water Distribution Mains	(1.7)	(1.4)	0.3	(8.8)	(9.4)	(0.6)	
58	Other contributions	(0.3)	(0.3)	0.0	(1.9)	(2.2)	(0.3)	
59	Subtotal	**(6.0)**	**(5.6)**	0.4	**(34.3)**	**(31.3)**	2.9	
60	**Capital Expenditures**	**108.1**	**98.1**	**(10.0)**	**475.8**	**563.5**	**87.8**	

Explanations for differences between PBR forecast capital expenditures for 2017 to 2021 and EWSI's current projection in excess of $2.0 million or 20% on individual projects with total costs in excess of $5.0 million, as well as for project categories in aggregate include:

1. **Network Private Development Transmission Mains** –$13.5 million (93.9%) greater than forecast. This program includes the costs of developer-constructed transmission mains (450mm in diameter and larger), with developers determining both the timing of projects and the areas to be developed. Therefore, changes to the projected cost of this program result from changes to developers' plans,

   EWSI's current projection of the costs of this program are based on transmission mains anticipated in upcoming development areas, and incorporate approved neighborhood structure plans, submitted drawings and discussions with the development community. Significant additions to this program include transmission main projects for Ellerslie Road, east of 127 St, scheduled for construction in 2019, and the Horse Hills industrial area scheduled for construction in 2020.

2. **LRT Relocates** – $14.7 million (141.2%) greater than forecast. This category includes the costs of moving infrastructure to accommodate LRT expansion. The costs approved in the PBR application were based on EWSI's understanding of track alignment and project timing at the time the PBR application was prepared. Subsequent changes to both the Southeast and West lines have resulted in significantly increases to projected costs. As these changes were beyond EWSI's control, EWSI believes that they meet the criteria for a non-routine adjustment. Once the associated costs are more fully known, EWSI will review the applicability of a non-routine adjustment with City Administration.

3. **Water Main Cost Sharing Program** - $7.7 million (255.5%) greater than forecast. This program is driven by developer activity. The increase in the cost of this program results from higher than forecast increases in developer activity.

4. **Growth and Customer Requirements less than $5.0 million** – $5.6 million (217.8%) greater than forecast. The projected increase in this category results from a new booster station project needed to address development in a high elevation area ($1.4 million); additional costs to acquire water mains from a regional water commission following city expansion ($2.4 million) and changes to projected costs for other growth projects amounting to $1.8 million.

5. **Water Main Reactive Renewal** - $2.3 million (4.3%) less than forecast. In this program, water mains are replaced if they meet criteria around main break frequency, materials, age and other pertinent factors. The forecast decrease in project costs results from a lower than forecast number of water mains qualifying for replacement.

6. **Meter Change-Outs** - $8.4 million (32.9%) less than forecast. The decrease in the projected cost of this program results from an increase in the expected lives of water meters, resulting

from improvements to manufacturing processes for the batteries used in the meters. Accordingly, the forecast costs of this program have been reduced, since fewer meters are expected to require replacement.

7. **Cell/Pumphouse Roof Replacement -** $3.4 million (53.8%) less than forecast. This decrease reflects lower costing from contractors, as well as consolidation of this project with the Reservoir Structural Upgrades Program to enhance project management and project coordination, and to achieve delivery efficiencies.

8. **Obsolete Hydrants** - $3.0 million (67.5%) greater than forecast. EWSI has adjusted its hydrant replacement schedule due to higher than expected rates of deterioration, so that backlogs are reduced and fire protection service levels maintained.

9. **Obsolete Valves** - $3.5 million (84.4%) greater than approved. As with Obsolete Hydrants, higher than expected rates of deterioration have led to increased backlog, requiring adjustments to valve replacement schedules. Although the projected cost of this program has increased substantially, improving overall valve operability in the system reduces isolation time, lessens the potential for property damage and mitigates customer impacts during emergency main break response.

10. **Rossdale Filter Underdrain Upgrades** - $3.4 million (71.9%) greater than forecast. Both the scope and cost of this project have increased following close inspection of the filter underdrain system that identified that each filter would require unforeseen upgrades to air scour systems.

11. **Reliability and Life Cycle Improvements less than $5.0 million** – $13.3 million (18.1%) greater than forecast. Unexpected asset failures and updated asset condition assessments have resulted in increases to both the scope and cost of work needed to complete rehabilitation projects and life cycle replacements.

12. **Water D&T Facility Expansion.** Although the projected cost of this project has not changed, this $16.0 million project has been deferred from 2017 to 2019 pending completion of EPCOR's corporate wide real estate review, which was initiated following the transfer of Drainage Services to EPCOR.

13. **Accelerated Water Main Renewal Program** - $2.6 million (5.0%) greater than forecast. EWSI has identified an increased number of sub-projects that meet the criteria for accelerated renewal, especially to accommodate water main replacement in conjunction with the City of Edmonton's Alley Paving program. The increase in costs for this program will be entirely offset by lower than approved expenditures on Accelerated Fire Protection.

14. **Accelerated Fire Protection Program** - $3.9 million (24.5%) less than forecast. Although 2017 expenditures were higher than approved, EWSI expects that expenditures over the

remainder of the 2017-2021 PBR term will be less than approved amounts, due to a smaller number of potential sub-projects meeting the Accelerated Fire Protection Program criteria.

15. **E.L. Smith Solar Farm** - $32.5 million (new project). The special rate adjustment for environmental initiatives includes a proposal to replace 10% of EWSI's conventional power with locally produced renewable energy at an annual cost of $1.9 million. After assessing a number of alternatives, rather than purchasing local green power, EWSI has initiated a new project to construct a solar farm on land adjacent to the E.L. Smith Water Treatment Plant reserved for future treatment plant expansion.

16. **Water Services Connections Contributions** - $3.9 million (16.3%) less than forecast. EWSI has revised its contributions forecast to align more closely with actual cost recoveries from prior years. Contributions for individual service installations are based on set service application rates and are intended to cover the full construction cost of an individual service installation. However, EWSI has found that after accounting for all program costs, including variations in construction costs, program administration, and service removals, contributions only account for 72.5% of the costs of individual service installations. Accordingly, current projections have been revised to reflect EWSI's actual experience.

2.4.2 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) in the year, the capital expenditures on that project remain in Construction Work in Progress and are excluded from the rate base. In 2017, as shown on Table 2.4.2, the balance in Construction Work in Progress was $6.6 million greater than forecast, of which $3.5 million was attributable to higher than forecast carry-over projects from 2016, with the remainder attributable to carry-over projects for 2017.

Table 2.4.2
Construction Work in Progress
($ millions)

		A	B
		2017	
	Construction Work in Progress	PBR Forecast	Actual
1	Balance, beginning of year	0.3	3.8
2	Capital Expenditures	108.1	98.1
4	Capital Additions	(103.3)	(90.3)
7	**Balance, end of year**	**5.0**	**11.6**

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 2017, AFUDC included in capital expenditures on eligible projects amounted to $0.3 million, compared to the PBR forecast amount of $0.1 million.

2.5 Operational Performance

Water System Service Quality is measured by the results of five indices prescribed in Bylaw 17698. Performance under each index is measured independently on a point basis with 100 base points available if the standards for all five 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. The performance measurement process for the 2017-2021 PBR term is similar to that of previous PBR term, with enhancements made to:

- Align metrics with the City of Edmonton's The Way We Green/Grow strategies, including the introduction of energy efficiency, water conservation, solids residual management, and other environmentally-focused metrics;
- Revise scoring, so that below-standard performance for Water Quality and Wastewater Quality cannot be offset with bonus points earned on other measures;
- Eliminate metrics within EPCOR's control (e.g. safety meetings); and
- Update targets to 10 year historic average (with a few exceptions).

2.5.1 Water Quality Index

The Water Quality index is calculated as the percentage of water quality test results that meet EPCOR's internal water standards. Water quality standards are established by both the federal and provincial governments and are incorporated into EWSI's Approval to Operate from Alberta Environment and Parks. In some cases, EWSI sets even stricter limits for critical parameters that are identified in EWSI Quality Standards, to provide early warnings of potential water quality problems; so that corrective actions can be taken before external standards are not met.

Table 2.5.1
Water Quality Index

Index Component	PBR Performance Measure	Standard	Actual Score	Index
Water Quality Index	The percentage of the total number of water quality tests taken in the period that do not yield suspect results	99.7%	99.8%	1.001
			Average Index	1.001
			Index Standard Points	25.0
			Total Actual Points	25.0
			Maximum Available Points Including Bonus Points	25.5
			Total Points Earned	**25.0**

2017 Highlights

- EWSI met all Guidelines for the Canadian Drinking Water Quality health-based limits and AEP Approval water quality testing requirements. Additionally, EPCOR's internal targets were not met in only 94 of 59,915 tests conducted on treated water.

- EWSI's efforts in improving the water quality in areas with cast iron piping and low flow due to low water use resulted in an improvement in failed distribution system tests for low chlorine and/or high turbidity from 154 in 2016 to 84 in 2017.

2017 Areas for Improvement

- EWSI's Process Development Team will continue to work on identifying cold weather treatment factors related to the removal of *Cryptosporidium* and *Giardia* during direct filtration operation. This project will be completed in early 2018.

- Turbidity and Chlorine in the distribution system have been identified for future water quality opportunities. There continue to be localized areas in the distribution system that experience high turbidity or low chlorine at times, and result in water quality complaints. These are typically in older areas with cast iron piping and dead end flow. These will be addressed in the short term by actively investigating complaints and flushing where required, and in the longer term by identifying priority areas for water main renewals or lining.

2.5.2 Customer Service Index

The customer service index is a composite measure of the customers' perception of satisfaction with EWSI service, the aesthetic quality of water and speed of response to customer issues.

Table 2.5.2
Customer Service Index

Index Component	PBR Performance Measure	Standard	Actual Score	Index
Post Service Audit Factor	The percentage of the customers responding as "completely" or "very satisfied" in the level of service received from the EWSI Emergency group.	74.9%	72.5%	0.968
Home Sniffing Factor	The percentage result of customer satisfaction for the home sniffing survey.	94.4%	94.5%	1.001
Response Time Factor	The average number of minutes needed to confirm a water main break from the time a call is received at EWSI's dispatch office.	25	18.3	1.268
Planned Construction Impact Factor	The percentage of the total planned construction events where EWSI complies with required construction notification procedures.	95.8%	93.3%	0.974
			Average Index	1.053
			Index Standard Points	20.0
			Total Actual Points	21.1
			Maximum Available Points Including Bonus Points	23.0
			Total Points Earned	**21.1**

2017 Highlights/

- **Home Sniffing Factor.** EWSI has increased water quality monitoring and laboratory-scale treatment testing to help optimize powdered activated carbon dose and remove odour causing compounds during the spring runoff period. EWSI has also initiated a research program for 2018 with University of Waterloo to characterize the organic content of the river water. This program is intended to increase EWSI's understanding of the complex chemistry that results in odour in the treated water during spring run-off and lead to better operational strategies at the water treatment plants.

2017 Areas for Improvement

- **Post Service Audit Factor**. This factor is very dependent on timely and effective responses to customers. For 2018, the Water Call Centre has developed internal tracking systems to provide more timely analysis of Call Centre data and to identify upcoming issues earlier and has implemented customer service training programs to improve customer experience

- **Planned Construction Impact Factor**. EWSI has provided training to all project teams to ensure appropriate notification timelines are followed for work in 2018. Additional improvements include implementation of proactive construction communication plans and enhancements to field systems to improve real-time tracking of construction dates and project completion progress.

2.5.3 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.

Table 2.5.3
System Reliability and Optimization Index

Index Component	PBR Performance Measure	Standard	Actual Score	Index
Water Main Break Factor	The number of water main breaks that occurred in the reporting period.	419	256	1.389
Water Main Break Repair Duration Factor	The percentage of water main breaks repaired and confirmed by EWSI within 24 hours from the time that the flow of water is shut off, excluding main breaks on arterial or collector roads	93.7%	95.7%	1.022
Water Loss Factor	The Infrastructure Leakage Index, a performance indicator quantifying how well a water distribution system is managed for the control of "real" water losses (i.e. leakage).	2.0	1.06	1.470
System Energy Efficiency Factor	The energy used at all water facilities in kWh divided by the average annual water production per residential customer account (ML/kWh/customer).	309	263	1.175
			Average index	1.264
			Index Standard Points	25.0
			Total Actual Points	31.6
			Maximum Available Points Including Bonus Points	28.5
			Total Points Earned	**28.5**

2017 Highlights

- **Water Loss Factor (ILI).** EWSI's ILI of 1.06 significantly exceeded the PBR standard and is near the theoretical lowest level of leakage expected given the water supply system characteristics. An AWWA Water Audit Validation exercise is being considered to provide additional understanding of the system and identification of potential opportunities for further system improvement.

2.5.4 Environment Index

The environmental index measures the success of programs and policies designed to mitigate and report adverse environmental impacts.

Table 2.5.4
Environmental Index

Index Component	PBR Performance Measure	Standard	Actual Score	Index
Water Conservation Factor	The actual 10 year rolling average monthly Edmonton residential consumption per household	17.2	16.1	1.068
Environment Incident Factor	The number of reportable and preventable environmental incidents	6	3	2.000
Solids Residual Management Factor	The average number of days that the Rossdale and E.L. Smith water treatment plants are operating in direct filtration mode.	120	129	1.077
			Average index	1.382
			Index Standard Points	15.0
			Total Actual Points	20.7
			Maximum Available Points Including Bonus Points	16.5
			Total Points Earned	**16.5**

2017 Highlights

- **Environment Incidents.** Procedures to identify chlorinated waste streams have been improved and have resulted in fewer releases to the river and the drainage system. In addition, operations are now applying additional controls for dechlorination of smaller waste streams which has resulted in fewer incidents. The Water Distribution and Transmission system achieved registration of their Environmental Management System to the international standard ISO14001. Now the entire Edmonton Water System is registered to ISO14001. This will help lead to further improvements environmental performance.
- **Solids Residual Management Factor.** Despite the operational challenges of an early spring run-off in February, high colour in the fall, and customer demand, the water treatment plants were still able to achieve 129 days in direct filtration operation. Increased use of direct filtration reduced total solids discharged to the North Saskatchewan River by 25% during the months of January to February and November to December 2017, compared to baseline conventional operation. This result was a significant improvement over 2016 when the reduction was limited to 11.5% during these months.

2017 Areas for Improvement

- **Solids Residual Management Factor,** EWSI continues to trial different types of polymer and to investigate different strategies for dosing during transition from conventional treatment

to direct filtration at its water treatment plants in an effort to extend the number of days in direct filtration and reduce solids discharged to the North Saskatchewan River.

2.5.5 Safety Index

The safety index is a measure of the success of programs and the application of policies that maximizes the safety of employees and the public.

Table 2.5.5
Safety Index

Index Component	PBR Performance Measure	Standard	Actual Score	Index
Near Miss Reporting Factor	The number of near miss reports entered in the ESS system.	550	1,119	2.035
Work Site Inspections and Observations Factor	Number of Work Site Inspections and observations completed per year.	1,032	2,036	1.973
Lost Time Frequency Factor	The actual lost time frequency rate.	0.57	0.38	1.500
All Injury Frequency Factor	The actual all injury frequency rate	1.54	1.33	1.158
			Average index	1.666
			Index Standard Points	15.0
			Total Actual Points	25.0
			Maximum Available Points Including Bonus Points	16.5
			Total Points Earned	**16.5**

2017 Highlights

- **Near Miss Reporting Factor.** Near Miss reporting effectively assisted employees with identification and mitigation of hazards that had potential to become incidents. Continued focus on near miss reporting in 2018 is expected to further assist employees in identifying and mitigating hazards that have the potential to become incidents.

- **Work Site Inspections and Observations.** These leading indicators assisted employees in identifying changes needed to improve existing processes and procedures.

2017 Areas for Improvement

- **All Injury Frequency Factor**. Although EWSI achieved better than standard results for this factor, EWSI will be introducing a new program in 2018 to prevent musculoskeletal injuries. This program will encourage employees to engage in specific pre and periodic stretching exercises throughout their work day.

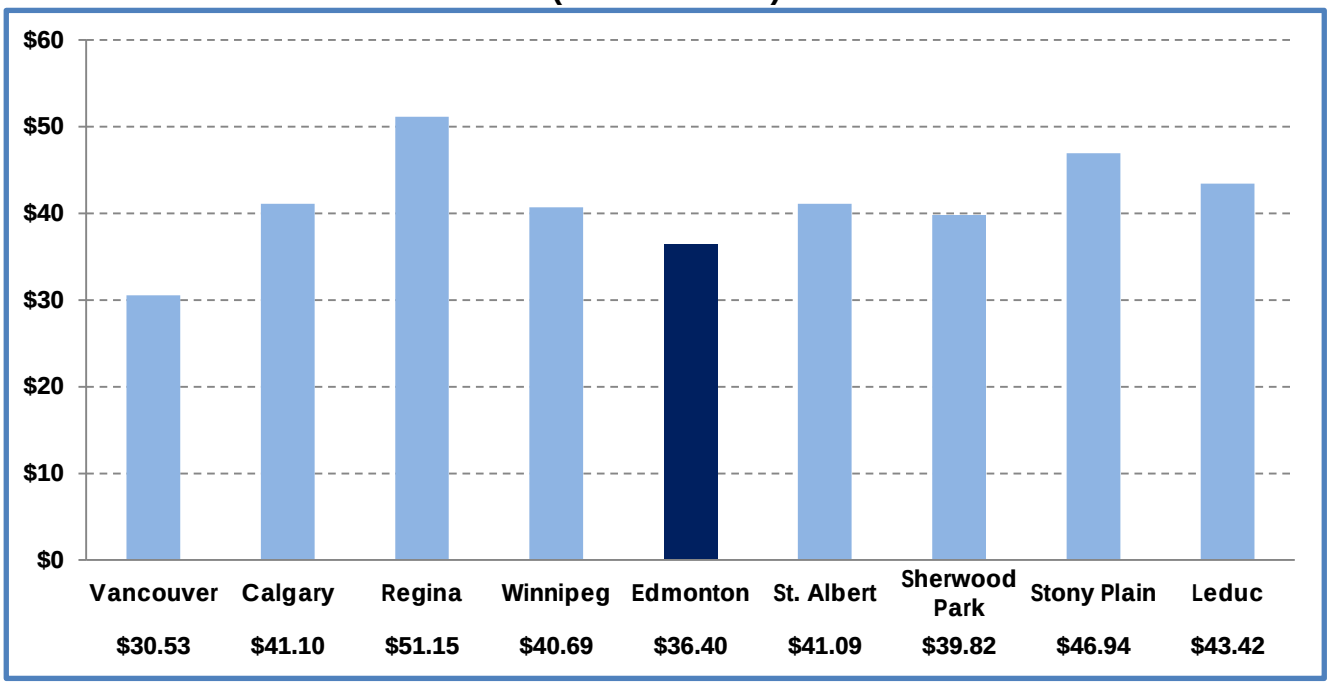
2.6 Rates and Bill Comparisons

Water bill comparisons for 2017 are based on the published water rates for Calgary, Vancouver, Winnipeg and Regina, as well as four local communities. These bill comparisons represent the total cost to the customer and include fixed charges, consumption charges and any other applicable surcharges.

2.6.1 Residential Water Bills

Figure 2.6.1 provides a comparison of residential household water bills for residential household consumption of 14.6 m^3 per month, the average residential customer consumption per month in Edmonton in 2017. Comparison of residential water bills shows that Edmonton's water bills are lower than all of the cities and local communities surveyed, except for Vancouver. This result is not unexpected; Vancouver has an excellent raw water source and, therefore, has lower needs for water treatment than Edmonton.

Figure 2.6.1
2017 Monthly Residential Water Bill Comparison
(14.6 m^3/month)



2.6.2 Commercial Water Bills

Table 2.6.2 provides a comparison of the water bills for commercial customer of various sizes. This table shows that water bills for EWSI's commercial customers are lower than all of the other surrounding communities and other major cities in western Canada, except for higher volume customers in Vancouver.

Table 2.6.2
Commercial Monthly Water Bill Comparison
($ per month)

		A	B	C	D
	Monthly Bill - $ per month	**Small**	**Medium**	**Large**	**Extra Large**
1	**Monthly Consumption** - m^3	**10**	**250**	**1,000**	**5,000**
2	Vancouver	25.79	272.86	1,135	5,406
3	Calgary	41.92	381.67	1,279	6,570
4	Regina	42.50	503.30	2,141	10,087
5	Winnipeg	32.50	461.80	1,846	9,059
6	**Edmonton**	**24.44**	**358.55**	**1,409**	**5,918**
7	St. Albert	33.64	422.44	1,637	8,117
8	Sherwood Park	28.96	595.36	2,365	11,805
9	Stony Plain	37.22	544.18	2,128	10,578
10	Leduc	30.84	547.20	2,284	10,826

3 Wastewater

3.1 Accomplishments and Challenges

Wastewater realized a 12.60% return on equity, compared to the 10.175% return on equity forecast for the 2017-2021 PBR Plan. Wastewater's return on equity reflects both higher net income, largely attributable to lower than forecast operating expenses, which more than offset lower than forecast revenues, as well as a lower than forecast equity portion of the rate base. Wastewater also benefitted from reductions in corporate shared services cost allocations following the transfer of Drainage Services from the City of Edmonton to EPCOR, reductions in fringe benefit rates, a one-time refund of long-term disability premiums, and increases in capital transfers and capitalized overhead associated with a higher than forecast proportion of internal labour on capital projects. Since most of the reductions in operating expenses are non-recurring, EWSI expects that returns over the remainder of the 2017-2021 PBR term will align more closely with the PBR forecast.

Wastewater's capital program for the 2017-2021 PBR term focuses on projects and programs needed to address reliability and rehabilitation issues at the Gold Bar Wastewater Treatment Plant. Wastewater's 2017-2021 capital program is currently forecast to be $238.7 million, an increase of $3.3 million (1.4%) from the PBR forecast. Although the net change amounts is relatively small, the current projection includes additional expenditures of $22.3 million to upgrade and replace sludge lines, $6.5 million to replace clarifier chains, and $7.5 million to rehabilitate the concrete within the Diversion Structure. Review of design options and value engineering enabled Wastewater to identify cost reductions to offset most of the additional costs. These cost reductions included changes to the scope of projects, such as the Square 1 Gas Room Expansion ($9.0 million), the Building and Site Rehab program ($7.3 million) and the Structural Rehab Program ($5.5 million), as well as deferral of the Digester 4 Upgrade project, providing further reductions of $10.9 million over the 2017-2021 PBR term. The remainder of the change in Wastewater's capital program results from reprioritization of reliability and life cycle replacements.

Wastewater's financial performance, capital expenditures programs, and operational performance are discussed in detail in sections 3.2 to 3.5, with comparisons of Wastewater's average bills for residential and commercial customers to water bills in other western Canadian cities and local communities provided in section 3.6.

3.2 Consumption and Customers

Wastewater's customer counts, consumption and consumption per customer are similar to those of In-City Water. Differences in customer counts, which are almost entirely within the commercial customer class, are attributable to "water-only" customers who are not tied into

the City's drainage system, such as 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 3.2 below provides a comparison of 2017 forecast to actual customer counts and consumption per customer.

Table 3.2
Consumption, Customer Counts and Consumption per Customer

		A	B
	Customers and Consumption	2017	
		PBR Forecast	Actual
1	Annual Consumption - ML		
2	Residential	45,035.7	45,368.7
3	Multi-Residential	18,378.1	17,794.9
4	Commercial	24,775.0	23,798.3
5	Total	88,188.8	86,961.9
6	Customers (Average Active Services per Month)		
7	Residential	256,191	259,237
8	Multi-Residential	3,746	3,752
9	Commercial	16,537	16,629
10	Total	276,474	279,617
11	Monthly Consumption per Customer* (m^3 per month)		
12	Residential	14.6	14.6
13	Multi-Residential	408.8	395.2
14	Commercial	124.8	119.3

*Monthly Consumption per Customer = (Annual Consumption x 1000) / (Customers x 12)

Actual to forecast differences in Wastewater's customer counts and consumption are attributable to the same factors discussed in Section 2.2.

3.3 Financial Performance

3.3.1 Revenue

Wastewater's rate revenues 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 also has a relatively small amount of other revenue. Table 3.3.1 below provides a comparison of Wastewater's 2017 actual and forecast revenue.

Table 3.3.1
Wastewater Revenue
($ millions)

		A	B
	Wastewater Revenue	**2017**	
		PBR Forecast	**Actual**
1	Fixed Monthly Service Charges		
2	Residential	13.4	13.3
3	Multi-Residential	0.2	0.2
4	Commercial	0.9	0.9
5	Total Fixed Monthly Service Charge Revenue	14.4	14.3
6	Consumption Charges		
7	Residential	37.4	37.1
8	Multi-Residential	15.3	14.6
9	Commercial	19.5	18.6
10	Total Consumption Charge Revenue	72.2	70.3
11	Wastewater Rate Revenue	86.6	84.6
12	Other Revenue	6.2	6.2
13	**Total Wastewater Revenue**	**92.8**	**90.8**

In 2017, Wastewater's rate revenues were $2.0 million less than forecast. This difference is attributable to the factors discussed in Section 2.3.1, including lower than forecast per customer consumption ($1.2 million) and lower than forecast inflation ($0.8 million). About one-half of Wastewater's other revenues, which were equal to the PBR forecast, are derived from overstrength surcharges to commercial customers with high concentrations of certain constituent components of wastewater. The remainder of Wastewater's other revenues are incidental revenues derived from sales of by-products, treatment of effluent from the Alberta Capital Regional Wastewater Commission, late payment fees and miscellaneous charges.

3.3.2 Operating Expenses by Function

Wastewater's operating expenses are presented and analyzed on both functional and cost category bases. Actual and forecast operating expenses by function are shown in Table 3.3.2 below:

Table 3.3.2
Operating Costs by Operational Function
($ millions)

		A	B
	Function and Sub-function	2017	
		PBR Forecast	Actual
1	Power, Other Utilities and Chemicals		
2	Power and Other Utilities	5.2	4.7
3	Chemicals	1.6	1.0
4	Power, Other Utilities and Chemicals	6.8	5.8
6	Wastewater Treatment		
7	Wastewater Treatment Plant	18.4	17.2
8	Operations Support Services	7.9	6.5
9	Capitalized Overhead	(2.3)	(3.1)
10	Wastewater Treatment Expenses	24.0	20.6
12	Billing, Meters and Customer Service		
13	Billing and collections	3.2	3.3
14	Meter reading	2.3	2.1
15	Regulatory Services	1.0	1.0
16	Billing, Meters and Customer Service Expenses	6.5	6.4
18	EWSI Shared Services		
19	EWSI Shared Services	3.3	3.2
20	Incentive and Other Compensation	1.1	(0.1)
21	EWSI Shared Services Expenses	4.4	3.2
22			
23	Corporate Shared Services	4.8	4.0
24			
25	Franchise Fees and Property Taxes		
26	Franchise Fees	6.8	6.6
27	Property Taxes	0.6	0.6
28	Franchise Fees and Property Taxes	7.4	7.2
29	**Total Operating Expenses by Function**	**54.0**	**47.1**

Overall, Wastewater's operating expenses were $6.9 million less than forecast. Key factors contributing to this difference include:

- **Power** ($0.5 million less than forecast). Lower than forecast power costs are almost entirely attributable to lower power prices obtained in Wastewater's new power contract. The benefits of lower than forecast power prices are expected to continue for the remainder of the 2017-2021 PBR term.

- **Chemicals** ($0.5 million less than forecast). Lower than forecast chemical costs are attributable to two factors. First, the initialization; development and optimization of the Ostara nutrient removal process, resulted in lower chemical usage throughout most of 2017. Second, Wastewater achieved significant reductions in alum usage from process and dosing optimization.

- **Wastewater Treatment Plant** ($1.2 million less than forecast). Lower than forecast costs reflect a higher than forecast proportion of internal labour on capital projects ($0.7 million), resulting from adjustments to the capital program (see section 2.4), where projects with a high component of contractor costs were replaced by capital maintenance and repair projects completed by Wastewater personnel. Staff costs and employee benefit costs were also affected by savings from lower than forecast fringe benefit rates ($0.3 million), primarily associated with pension contributions, and lower than forecast overtime costs ($0.1 million) resulting from decreases in breakdown call outs.

- **Operations Support Services** ($1.4 million less than forecast). As with Wastewater Treatment Plants, lower than forecast costs reflect a higher than forecast proportion of internal labour on capital projects ($0.4 million) and lower than forecast fringe benefit rates ($0.1 million). The favourable variance is also attributable to delays in filling vacancies in Wastewater's engineering areas, which further reduced Staff Costs and Employee Benefits expenses ($0.2 million). The remainder of the actual to forecast difference is made up of numerous small items, none of which exceed $0.1 million.

- **Capitalized Overhead** ($0.8 million greater than forecast). This function includes a portion of the salaries and benefits for managers and administrators in areas where staff work on both operational and capital projects. Higher than forecast capitalized overheads is consistent with the higher than forecast levels of internal labour on capital projects noted in both the Wastewater Treatment Plant and Operations Support Services functions.

- **EWSI Shared Services** ($1.3 million less than forecast). This function includes Wastewater's share of the costs of centrally-provided services, including: Information Services; Finance; Health, Safety and Environment; Technical Training; Regulatory Services; EWSI Executive Administration. To maintain employee confidentiality, this function also includes costs, such as incentives, termination payments and long-term disability.

  Lower than forecast costs in this category result from two adjustments to long-term disability, including a $0.6 million one-time premium refund, and a $0.4 million annual true-up, related to the low number of staff receiving long-term disability support. Besides these adjustments, the allocation of EWSI Shared Services costs to Wastewater was $0.3 million less than forecast due to the transfer of Drainage Services to EPCOR.

- **Corporate Shared Services** ($0.8 million less than forecast). This difference reflects both the reduction in corporate cost allocations resulting from the transfer of Drainage Services from

the City of Edmonton to EPCOR Utilities Inc., as well as cost savings in corporate functions. As with In-City Water, the cost reductions arising from the transfer of Drainage Services will be returned to Wastewater customers through a non-routine adjustment to 2018 water rates.

- **Franchise Fees and Property Taxes** ($0.2 million less than forecast). As with water, lower than forecast franchise fees reflect lower than forecast revenues.

3.3.3 Operating Expenses by Cost Category

Table 3.3.3 shows operating expenses by cost category for Wastewater Treatment Plant Operations, Billing Meters and Customer Service, and EWSI Shared Services, where cost categories differ from the sub-functions in Section 3.3.2.

Table 3.3.3
Operating Costs by Cost Category
($ millions)

		A	B
	Cost Category	2017	
		PBR Forecast	Actual
1	Wastewater Treatment		
2	Staff Costs and Employee Benefits	17.2	14.2
3	Contractors and Consultants	3.9	3.9
4	Materials and Supplies	2.0	2.4
5	Other	1.0	0.1
6	Wastewater Treatment Expenses	24.0	20.6
7	Billing, Meters and Customer Service		
8	CUS Charges	3.2	3.3
9	Contractors and Consultants	3.3	3.1
10	Billings, Meters and Customer Services Expenses	6.5	6.4
11	EWSI Shared Services		
12	EWSI Shared Services Allocation	3.1	2.8
13	Staff Costs and Employee Benefits	1.2	0.3
14	Other	0.1	0.1
15	EWSI Shared Services Expenses	4.4	3.2

The information presented in this table supports the explanations of differences between 2017 actual and forecast expenses provided in Section 3.3.3. Accordingly, no additional explanations are considered necessary.

3.3.4 Depreciation Expense

Wastewater's depreciation expense and amortization of contributed assets for 2017 are shown in Tables 3.3.4 below:

Table 3.3.4
Depreciation and Amortization
($ millions)

		A	B
	Depreciation and Amortization	**2017**	
		PBR Forecast	**Actual**
1	Gross depreciation expense	14.9	15.3
2	Amortization of contributions	(0.9)	(0.9)
3	**Depreciation, net**	**13.9**	**14.4**

Wastewater's 2017 depreciation expense was $0.5 million greater than forecast, even though plant in service (see Table 3.3.5 below) was less than forecast. This result is attributable to two factors:

- Depreciation on asset overhauls completed in 2017 ($0.2 million). In 2017, Wastewater completed approximately 30 asset overhauls at an average cost of $0.2 million per overhaul. Since asset overhauls only add to the useful life of an existing asset, capital additions related to asset overhauls have higher effective depreciation rates than capital additions related to new assets. In the PBR forecast, depreciation expense was calculated as if all asset additions were new assets, rather than overhauls of existing assets; and

- Additional depreciation on Grit Tanks 4 & 5 ($0.2 million). In the PBR forecast, depreciation expense on this project was calculated as a single asset with a 44 year useful life. When this project was completed in 2016, the actual costs of the project were broken down into asset components, some of which had much shorter useful lives, reducing the average life of Grit Tanks 4 & 5 and, therefore, increasing annual depreciation expense.

3.3.5 Rate Base

Wastewater's 2017 mid-year rate base, shown in Table 3.3.5 below, was $15.5 million less than forecast, reflecting lower opening balances of plant in service and accumulated depreciation, as well as lower than forecast capital additions. Differences in opening balances result from lower than forecast capital expenditures in 2016, as well as a higher balance of carry-in projects in construction work in progress (see Table 3.4.2, line 1). Lower than forecast capital additions reflect lower than forecast capital expenditures and delays in completing projects, and the adjustments to the capital program discussed in Section 3.4.1.

Table 3.3.5
Mid-Year Rate Base
($ millions)

		A	B
		2017	
	Components of Mid-Year Rate Base, net of Contributions	PBR Forecast	Actual
1	Plant in Service		
2	Balance, beginning of year	526.1	512.8
3	Capital additions	61.0	44.4
5	Retirements and adjustments	-	(9.4)
6	Balance, end of year	587.1	547.8
7	Mid-Year Plant in service	556.6	530.3
8	Accumulated Depreciation		
9	Balance, beginning of year	(136.3)	(130.2)
10	Depreciation expense	(14.9)	(15.3)
11	Retirements and adjustments	-	9.4
12	Balance, end of year	(151.2)	(136.2)
13	Mid-Year Accumulated Depreciation	(143.7)	(133.2)
14	Other Rate Base Items		
15	Working Capital	5.2	5.5
16	Materials and Supplies	1.9	1.9
17	**Gross Mid-Year Rate Base**	**420.0**	**404.5**
19	Contributions		
20	Balance, beginning of year	(41.0)	(41.0)
21	Contributions in aid of construction	-	-
23	Balance, end of year	(41.0)	(41.0)
24	Mid-Year Contributions	(41.0)	(41.0)
25	Accumulated Amortization		
26	Balance, beginning of year	15.6	15.6
27	Amortization of contributions	0.9	0.9
29	Balance, end of year	16.5	16.5
30	Mid-Year Accumulated Amortization	16.1	16.1
31	**Mid-Year Contributions**	**(24.9)**	**(24.9)**
32	**Mid-Year Rate Base**	**395.1**	**379.6**

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 rate payers. The cost of operating these assets, as well as any related revenues are also excluded from Wastewater's financial results.

3.3.6 Return on Rate Base

Wastewater's returns on rate base are its deemed capital structure and its costs of debt and equity. Returns on rate base are summarized on Table 3.3.6-1 below. As with In-City Water, returns on rate base are calculated separately for the debt-financed and equity-financed portions of Wastewater's rate base.

Table 3.3.6-1
Return on Rate Base
($ millions)

		A	B
	Return on Rate Base	2017	
		PBR Forecast	Actual
1	Mid-year Rate Base	395.1	379.6
2	Capital Structure		
3	Debt (%)	60.00%	60.00%
4	Equity (%)	40.00%	40.00%
5	Total	100.00%	100.00%
6	Cost of Capital		
7	Cost of Debt	4.23%	4.46%
8	Cost of Equity	10.175%	12.60%
9	Weighted Average Cost of Capital	6.61%	7.71%
10	Return on Mid-Year Rate Base		
11	Return on Rate Base Financed by Debt	10.0	10.2
12	Return on Rate Base Financed by Equity	16.1	19.1
13	Return on Mid-year Rate Base	**26.1**	**29.3**

The rate of return on debt is equal to the embedded cost of debt, as calculated in Table 3.3.6-2 below. Wastewater's embedded cost of debt is 0.23% higher than forecast, reflecting a lower than forecast mid-year balance of short-term debt, related to lower than forecast operating expenses and lower than forecast capital expenditures. The result of this decrease is that, even with a $10.0 million reduction in long-term debt issuances, Wastewater had greater reliance on higher cost long-term debt, resulting in higher embedded cost of debt.

Table 3.3.6-2
Interest Expense and Cost of Debt
($ millions)

		A	B
	Interest Expense and Cost of Debt	2017	
		PBR Forecast	Actual
1	Interest Expense		
2	Interest on short-term debt	1.0	1.1
3	Interest on City of Edmonton debentures	3.4	3.4
4	Interest on intercompany debentures	6.0	5.8
5	Total Interest expense	10.4	10.3
6	Mid-year debt and other long-term liabilities		
7	Mid-Year Short-term debt	35.0	26.0
8	Mid-Year Long-term debt	209.3	204.3
9	Mid-Year Other Long-term liabilities	0.5	0.5
10	Total Mid-year debt and other long-term liabilities	244.8	230.9
11	**Embedded cost of Debt**	**4.23%**	**4.46%**

In 2017, Wastewater's actual return on equity was $3.0 million greater than forecast. Higher than forecast net income, combined with a lower than forecast rate base, enabled Wastewater to earn a 12.60% return on equity in 2017, significantly greater than its forecast

return on 10.175%. Wastewater's returns on equity are expected to decrease over the remainder of the 2017-2021 PBR term as Wastewater accelerates work on its capital program.

3.3.7 Transactions with Affiliates

Wastewater derives a significant proportion of its revenue and expenses from transactions with affiliates, including the City of Edmonton, EPCOR Utilities Inc. and its subsidiaries, and other EPCOR Water Services Inc. business units. Table 3.3.7 provides a summary of Water Services 2017 actual and forecast transactions with affiliates, together with references to the schedules in this report where these transactions are presented.

Table 3.3.7
Transactions with Affiliates
($ millions)

		A	B
	Affiliate and Service	**2017**	
		PBR Forecast	**Actual**
1	**Revenues from the provision of services to the City of Edmonton**		
2	Wastewater Treatment Services (Table 3.3.1, lines 4 and 9)	1.0	1.1
3	Other Services (Table 3.3.1, line 12)	0.2	0.3
4	Total	1.2	1.3
5	**Services provided by (recovered from):**		
6	**City of Edmonton**		
7	Franchise Fees (Table 3.3.2, line 26)	6.8	6.6
8	Property Taxes (Table 3.3.2, line 27)	0.6	0.6
9	Interest on Long Term Debt (Table 3.3.6-2, line 3)	3.4	3.4
10	Regulatory Services (Table 3.3.2, line 15)	1.0	0.7
11	Other Services (Table 3.3.3, lines 5)	0.2	0.2
12	Total	11.9	11.4
13	**EPCOR Utilities Inc.**		
14	Corporate Shared Service Costs (Table 3.3.2, line 23)	4.8	4.0
15	Interest on Intercompany Loans (Table 3.3.6-2, line 4)	6.0	5.8
16	Interest on Short-term debt (Table 3.3.6-2, line 2)	1.0	1.1
17	Total	11.8	10.9
18	**EPCOR Distribution and Transmission Inc.**		
19	Maintenance and other services (Table 3.3.3, line 3)	0.1	0.2
20	**EPCOR Technologies Inc.**		
21	Hydrovac Charges (Table 3.3.3, line 3)	-	0.1
22	**EPCOR Energy Alberta LP**		
23	Billing and Collection Services (Table 3.3.3, line 9)	2.9	2.9
24	**Other EWSI Business Units**		
25	EWSI Shared Services Allocation (Table 3.3.3, line 13)	3.1	2.8
26	Meter reading services from In-City Water (Table 3.3.2, line 14)	2.3	2.1
27	Water purchases from In-City Water (Table 3.3.2, line 2)	0.4	0.4
28	Regulatory services from Drainage Services (Table 3.3.2, line 15)	2.9	0.4
29	Project engineering recoveries from Drainage Services (Table 3.3.2, line 8)		(0.8)
30	Laboratory services recoveries from Drainage Services (Table 3.3.2, line 8)		(0.1)
31	Total	8.6	4.7

3.4 Capital Expenditures - Wastewater

Wastewater's approved capital program for the 2017-2021 PBR term amounts to $235.4 million and includes over 50 projects in six major project categories. As part of the 2017-2021 PBR application, EWSI provided the City Utility Committee with comprehensive business cases for all capital projects greater than $5.0 million. The Gold Bar Wastewater Treatment Plant's aging infrastructure poses challenges to capital planning, since is often difficult to accurately assess asset condition and the scope of rehabilitation needed before commencing work on a project. Therefore, over the course of the PBR term, changes to the program may be required in response to address unforeseen needs for repairs or rehabilitation. Changes may also be required to changes in regulatory or operational requirements, customer demands or other external factors. These changes are coordinated through EWSI's Project Management Office and are reviewed and approved by EWSI's Capital Project Steering Committee, EUI's Financial Review Council, or EPCOR's Board of Directors, depending on the significance of the change.

3.4.1 Capital Expenditures

Overall, Wastewater's 2017 actual capital expenditures were $7.7 million less than the PBR-forecast. This shortfall is primarily a result of lower than planned costs to complete the Hydrovac Sanitary Grit Recovery Facility and delays in the Operations Centre at Mid-Point Entrance project.

EWSI's current projection is that, over the 2017-2021 PBR term, the total cost of Wastewater's capital program, including the cost of new projects, as well as the cost of changes in scope for existing projects, will exceed the PBR forecast by $3.3 million. Although EWSI's current projected costs are not significantly different from the PBR forecast, the Gold Bar Wastewater Treatment Plant's aging infrastructure poses challenges to capital planning, since, in many cases, it is difficult to accurately assess asset condition and the scope of rehabilitation work needed to ensure the high level of performance and reliability needed to safely and effectively treat wastewater.

Table 3.4.1 compares approved capital expenditures from the PBR forecast to actual capital expenditures for 2017 for each project with approved capital expenditures in excess of $5.0 million over the 2017-2021 PBR term, as well as for each project category. Table 3.4.1 also provides a comparison of total 2017-2021 approved capital expenditures to EWSI's current capital forecast.

Table 3.4.1
Capital Expenditures
($ millions)

		A	B	C		D	E	F	
		PBR Forecast	Actual	Increase (Decrease)		Forecast	Current Projection	Increase (Decrease)	
1	**Reliability and Life Cycle Improvements**								
2	Site Ventilation Rehabilitation	3.0	4.5	1.4		31.5	29.6	(1.9)	
3	Ops Centre at Mid-Point Entrance	4.0	0.5	(3.5)		19.4	16.0	(3.4)	1
4	Structural Rehab Secondaries 1-8	3.3	4.3	1.0		17.6	18.4	0.9	
5	Mechanical Rehab Program	3.5	5.1	1.6		15.6	15.4	(0.2)	
6	Square 1 Gas Room Expansion	-	-	-		15.6	6.6	(9.0)	2
7	Utility Hot Water System Rehab	1.3	0.3	(1.0)		13.9	13.8	(0.1)	
8	Buildings and Site Rehab	1.1	1.0	(0.1)		12.8	5.4	(7.3)	3
9	Digester 4 Upgrades	-	1.0	1.0		12.0	1.1	(10.9)	4
10	Digester 3 Upgrades	6.9	5.1	(1.8)		11.3	10.9	(0.4)	
11	Structural Rehab Program	1.5	0.7	(0.8)		7.7	2.2	(5.5)	5
12	Electrical Rehab Program	2.8	1.1	(1.7)		7.2	5.0	(2.1)	6
13	Headworks & Primary Upgrades	0.6	0.1	(0.5)		6.7	3.8	(2.9)	7
14	Replace 2.5 km of Sludge lines	-	0.2	0.2		-	14.7	14.7	8
15	Sludge Line Upgrades	1.1	3.0	1.9		3.4	11.0	7.6	9
16	Clarifier Chain Replacement	1.2	1.3	0.1		4.1	10.6	6.5	10
17	Diversion Structure Structural Rehab	-	-	-		-	7.5	7.5	11
18	Projects < $5 million	10.2	8.9	(1.3)		25.0	34.7	9.8	12
19	Subtotal	40.5	36.9	(3.6)		203.4	206.8	3.4	
20									
21	**Hydrovac Sanitary Grit Facility**	8.4	6.7	(1.8)		8.4	7.2	(1.2)	
22									
23	**Performance Efficiency & Improvement**								
24	Projects < $5 million	3.3	2.3	(1.0)		17.6	16.0	(1.6)	
25									
26	**Growth/Customer Requirements**								
27	Projects < $5 million	1.5	-	(1.5)		1.5	1.5	-	
28									
29	**Health, Safety and Environment**								
30	Projects < $5 million	0.8	1.0	0.2		4.5	7.2	2.7	13
31	**Capital Expenditures, net**	**54.5**	**46.8**	**(7.7)**		**235.4**	**238.7**	**3.3**	

Explanations for differences between PBR forecast capital expenditures for 2017 to 2021 and EWSI's current projection in excess of $2.0 million or 20% on individual projects with total costs in excess of $5.0 million, as well as for project categories in aggregate include:

1. **Operations Centre at Mid-Point Entrance** - $3.4 million (57.8%) less than forecast. This project has been delayed due to additional design reviews and scope adjustments as well as significantly higher public consultation efforts than originally expected...

2. **Square 1 Gas Room Expansion** - $9.0 million (57.8%) less than forecast. Review of design options and value engineering resulted in reductions to the scope of this project and significant reductions in projected costs.

3. **Buildings and Site Rehab** - $7.4 million (57.5%) less than forecast. The variance reflects reductions in the scope of this program. An updated asset condition assessment determined that some of the sub-projects included in this program were of lower priority than originally believed and, therefore, could be safely deferred, allowing resources to be focused on unanticipated, higher-priority projects.

4. **Digester 4 Upgrades** - $10.9 million less than forecast. Upgrades to Digester 4 have been delayed as a result of necessary design reviews and the successful rehabilitation of Digester 3, which has provided sufficient capacity to delay upgrades to Digester 4.

5. **Structural Rehab Program** - $5.5 million (71.8%) less than forecast. Similar to Building and Site Rehab, the decrease in the projected costs of this program reflect reprioritization of identified projects against new unanticipated projects allowing resources to be focused on unanticipated, higher-priority projects.

6. **Electrical Rehab Program** - $2.2 million (29.8%) greater than forecast. The main reason for the overage is due to higher cost than planned for the Standby Generator project and an unidentified MCC (motor control centre) in the Blower building requiring immediate replacement.

7. **Headworks & Primary Upgrades** - $2.9 million (43.1%) less than forecast. The variance is due to timing change to allow additional time for review of various options before a final design was selected. This led to a projected reduction of $3 million in the total cost of the project.

8. **Replace 2.5 km of Sludge lines** - $ 14.7 million (new). This project provides for replacement of 2.5 km of sludge pipeline. This section of the sludge pipelines was found to be in such poor condition that repairs and/or rehabilitation was not financially viable.

9. **Sludge Line Upgrades** - $7.6 million (227.3%) greater than forecast. This project included the costs of cleaning and inspecting the sludge lines, with only minimal costs forecast for

repairs. Inspections have since shown that the sludge lines are in poor condition and require significant expenditures to ensure that they can continue to operate with minimal risk of leakage.

10. **Clarifier Chain Replacement** - $6.5 million (160.5%) greater than forecast. Wastewater has experienced premature failure of stainless steel clarifier chains due to unexpected localized corrosion. These chains are being replaced with plastic and loop chains which have a better record of performance at Gold Bar. Is this not 4.9??

11. **Diversion Structure Structural Rehab** $7.5 million (new). This new project is required to rehabilitate the concrete within the Diversion Structure. Inspection of the concrete structure was recently completed and the condition of the concrete found to be very poor with structural failure possible within two to five years.

12. **Reliability and Life Cycle Improvement Projects < $5 million** - $9.7 million (39.2%) greater than forecast. The large variance is attributable to greater than anticipated rehabilitation and replacement requirements, particularly for Channel work and Odour Control Projects.

13. **Health, Safety and Environment Projects < $5 million** - $2.7 million (59.6%) greater than forecast. The variance is attributable to two unplanned safety-related projects, including projects to modify biogas systems and install safety and equipment davits to further minimize risks of injury.

3.4.2 Construction Work in Progress

Wastewater's rate base consists of plant in service. If a capital project is not completed (i.e. not placed into service) in the year, the capital expenditures on that project remain in Construction Work in Progress and are excluded from the rate base. The 2017 year-end balance of Wastewater's Construction Work in Progress is $12.3 million greater than forecast, of which $3.4 million is attributable to higher than forecast carry-over project from 2016, with the remainder attributable to projects which were not completed in 2017 and, therefore, remained in Construction Work in Progress.

Table 3.4.2
Construction Work in Progress
($ millions)

		A	B
		2017	
	Construction Work in Progress	PBR Forecast	Actual
1	Balance, beginning of year	19.2	22.6
2	Capital Expenditures	54.5	46.8
4	Capital Additions	(61.0)	(44.4)
7	**Balance, end of year**	**12.7**	**25.0**

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 2017, AFUDC included in capital expenditures on eligible projects amounted to $1.7 million, compared to the PBR forecast amount of $1.3 million.

3.5 Operational Performance

Wastewater System Service Quality is measured by the results of four indices prescribed in Bylaw 17698. Performance under each index is measured independently on a point basis with 100 base points available if the standards for all five 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.

The performance measurement process for the 2017-2021 PBR term is similar to that of previous PBR term, with enhancements made to combine the Water Quality and Environment categories into a single index to recognize that the environment and the quality of water (or effluent) returned to the river are directly linked. As well, the System Reliability index has been expanded to include Operational Optimization metrics to more clearly align this category with the City of Edmonton's *The Way Ahead* strategies by adding metrics for energy utilization to track decreasing energy demands through conservation and efficiency programs.

In 2017, Wastewater had strong operational performance, exceeding standards for each performance measure in each of its four indices and earning maximum bonus points.

3.5.1 Water Quality and Environmental Index

The Water Quality and Environmental index is a composite measure intended to assess EWSI's impact on the environment through the quality of the wastewater effluent returned back to the North Saskatchewan River and the effectiveness of environmental management programs.

Table 3.5.1
Water Quality and Environmental Index

Index Component	PBR Performance Measure	Standard	Actual Score	Index
Water Quality Factor	The value of the Wastewater Effluent Limit Performance, which measure the percentage of the discharge limit for five parameters in the Gold Bar wastewater treatment plant's final effluent.	28.0%	22.0%	1.270
Environmental Incident Factor	The actual number of environmental incidents that are both reportable and preventable	10	3	3.333
			Average Index	2.302
			Index Standard Points	55.0
			Total Actual Points	126.6
			Maximum Available Points Including Bonus Points	60.5
			Total Points Earned	**60.5**

2017 Highlights

- **Wastewater Effluent Limit Performance Index.** This index was negatively impacted by significant snow melt and rain early in the year during the months of February to April. However, sustained focus on BNR operations allowed the plant to recover and improve its performance through the remainder of the year.

- **Environment Incident Management.** Root cause investigations of three events (release from a transfer line, a secondary bypass and sampling timing) provided information that resulted in improved operating procedures.

2017 Areas for Improvement

- **Wastewater Effluent Limit Performance Index.** Studies to assess ammonia side stream treatment at Clover Bar with the objective of reducing ammonia loading to the plant and in turn improving over-all treatment effective are already underway.

3.5.2 Customer Service Index

Wastewater's customer service index for the 2017-2021 PBR term includes three equally weighted odour metrics. These metrics recognize that Wastewater's customer interactions typically relate to odour concerns from customers located close to the Gold Bar Wastewater Treatment Plant.

Table 3.5.2
Customer Service Index

Index Component	PBR Performance Measure	Standard	Actual Score	Index
H_2S - 1 Hour Exceedance Factor	The average of the number of exceedances of the 1 hour limit registered at the Gold Bar and Beverly air quality monitoring stations.	6	1	6.000
H_2S - 24 Hour Exceedance Factor	The average of the number of exceedances of the 24 hour limit registered at the Gold Bar and Beverly air quality monitoring stations.	2	0	1.000
Scrubber Uptime Factor	The percentage of time that the scrubbers are on line.	90%	97.4%	1.082
			Average Index	2.694
			Index Standard Points	15.0
			Total Actual Points	40.4
			Maximum Available Points Including Bonus Points	16.5
			Total Points Earned	**16.5**

2017 Highlights

- **H2S - 1 and 24 Hour Exceedance Factor.** Success in meeting the targets set for these two measures was accomplished through close attention to contributing operating factors such as housekeeping (keeping doors closed to contain foul air so that it could be directed to the scrubbers) and regular sampling which ensured optimal chemical application to the foul air scrubbers.

- **Scrubber Uptime Factor.** Scrubber uptime was maximized by scheduling multiple capital upgrades and maintenance simultaneously and by performing corrective maintenance on a priority basis to minimize downtime.

2017 Areas for Improvement

- Capital projects intended to address operational issues have been initiated to address the following issues:

  - Improving foul air collection from process areas through air balancing;
  - Improving scrubber reliability by providing redundant chemical injection pumps; and
  - Improving EPT source capture of foul air to maximize scrubbing operations.

3.5.3 System Reliability and Optimization Index

The system reliability and optimization index is a measure of the performance of the Gold Bar Wastewater Treatment Plant and the degree to which the wastewater treatment system is optimized to minimize its impact on the environment.

Table 3.5.3
System Reliability and Optimization Index

Index Component	PBR Performance Measure	Standard	Actual Score	Index
Enhanced Primary Treatment Factor	The percentage of time that the enhanced primary treatment facility ran during wet weather events where the influent flow rate exceeded the EPT event threshold.	80.0%	100.0%	1.250
Biogas Utilization Factor	The percentage of biogas utilized, calculated as the volume of biogas produced less the volume flared divided by the volume produced.	60.0%	84.2%	1.403
Energy Efficiency Factor	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.	514	497	1.034
			Average Index	1.229
			Index Standard Points	15.0
			Total Actual Points	18.4
			Maximum Available Points Including Bonus Points	16.5
			Total Points Earned	**16.5**

2017 Highlights

- **Enhanced Primary Treatment (EPT).** EPT clarifiers are now operated year round and maintenance is only performed on two of the four clarifiers at any given time. This ensures maximum availability of the clarifiers during wet weather events.
- **Biogas Utilization Factor.** Wastewater achieved a significant increase in the use of biogas for heating needs relative to natural gas usage.
- **Energy Efficiency Factor.** Wastewater achieved reductions in energy consumption in two processes that consume a significant portion of energy at the site (blowers sending foul air to the scrubbers and UV disinfection operations).

2017 Areas for Improvement

- **Enhanced Primary Treatment (EPT).** In 2018, covers will be installed to cover the EPT clarifiers to more effectively direct that foul air to the scrubbers. The objective will be to further minimize both odour and H2S issues originating in the building.
- **Biogas Utilization Factor.** Operations will continue to maximize biogas utilization to run boilers used for system heating demand.
- **Energy Efficiency Factor.** Operations will optimize the UV disinfection dose set point which is expected to reduce energy consumption.

3.5.4 Safety Index

EPCOR and EWSI are committed to a safe, healthy lifestyle and demonstrate this through care and concern for people. The safety index is a measure of the success of programs and the application of policies that maximizes the safety of employees and the public

Table 3.5.4
Safety Index

Index Component	PBR Performance Measure	Standard	Actual Score	Index
Near Miss Reporting Factor	The number of near miss reports entered in the ESS system.	220	327	1.486
Work Site Inspection Factor	Number of Work Site Inspections and observations completed per year.	919	1,088	1.184
Lost Time Frequency Factor	The actual lost time frequency rate.	0.75	0.00	1.000
All Injury Frequency Factor	The actual all injury frequency rate	1.50	1.92	0.781
			Average Index	1.113
			Index Standard Points	15.0
			Total Actual Points	16.7
			Maximum Available Points Including Bonus Points	16.5
			Total Points Earned	**16.5**

2017 Highlights

- **Near Miss Reporting Factor.** Near Miss reporting effectively assisted employees with identification and mitigation of hazards that had potential to become incidents. Continued focus on near miss reporting in 2018 is expected to further assist employees in identifying and mitigating hazards that have the potential to become incidents.

- **Work Site Inspections and Observations.** These leading indicators assisted employees in identifying changes needed to improve existing processes and procedures.

2017 Areas for Improvement

- **All Injury Frequency Factor**. EWSI will be introducing a new program in 2018 to prevent musculoskeletal injuries. This program will encourage employees to engage in specific pre and periodic stretching exercises throughout their work day.

3.6 Rates and Bill Comparisons

Wastewater bill comparisons for 2017 are based on the published drainage and wastewater treatment rates for Calgary, Vancouver Winnipeg and Regina, as well as four local

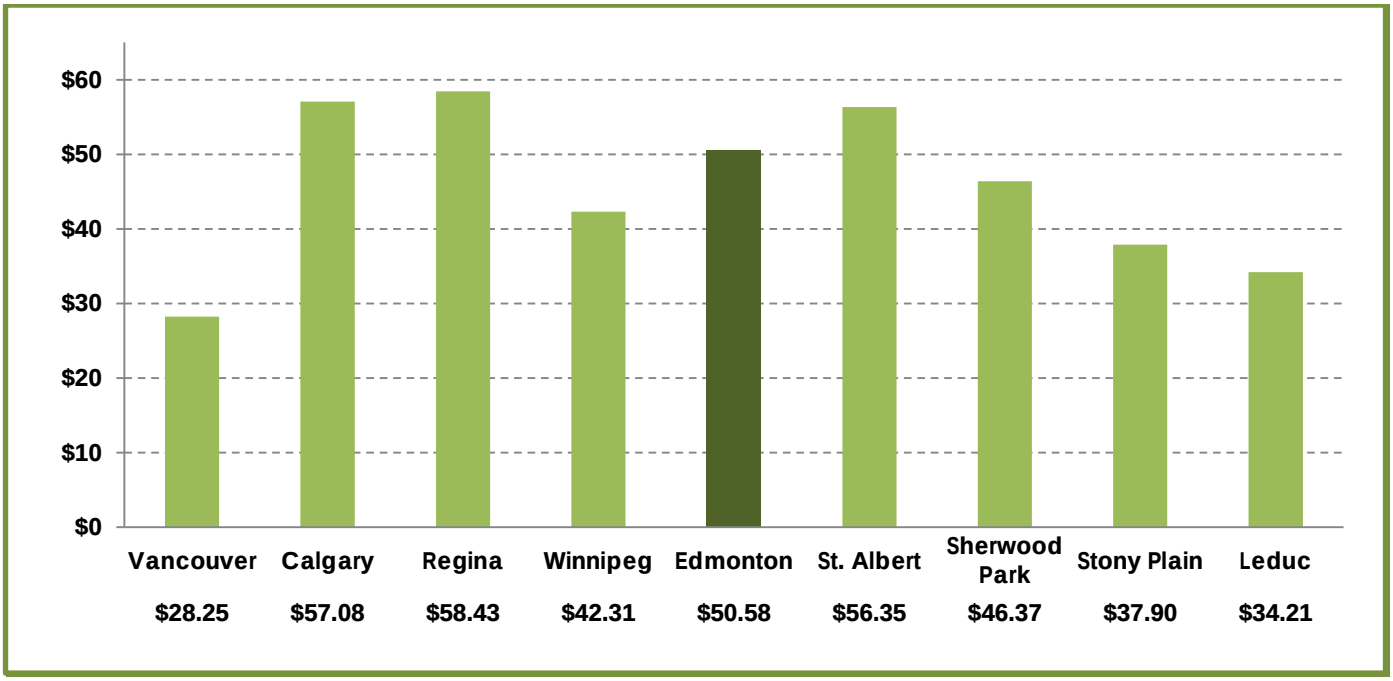
communities. These bill comparisons represent the total cost to the customer and include fixed charges, consumption charges and any other applicable surcharges.

Unlike most cities, where wastewater treatment services and drainage services are combined, Wastewater is only responsible for wastewater treatment; the operations and maintenance of sanitary, storm and combined sewer systems are provided through EPCOR Drainage Services. Accordingly, wastewater bill comparisons are based on blended EWSI wastewater treatment and City drainage rates.

3.6.1 Residential Wastewater Bills

Figure 3.6.1 provides a comparison of residential household wastewater bills for residential household consumption of 14.6 m^3 per month, the average residential customer consumption per month in Edmonton in 2017.

Figure 3.6.1
2017 Monthly Residential Drainage and Wastewater Comparison
(14.6 m^3/month)



Unlike water services which are relatively consistent among cities and communities, the nature and extent of wastewater treatment and drainage services vary significantly because of differences in the extent of wastewater treatment between different cities and municipalities, the inclusion of certain services in property taxes, and geographic and climatic factors which affect the level of investment in and approach to flood mitigation and storm water services.

Edmonton's $50.58 average monthly bill from Figure 3.6.1 includes Wastewater charges of $16.54 and Drainage Services charges of $34.03. While the total bill is higher than Vancouver and Winnipeg, it is lower than Calgary and Regina, the two cities where drainage and wastewater treatments are most comparable to Edmonton.

3.6.2 Commercial Wastewater Bills

Table 3.6.2 provides a comparison of the wastewater bills for commercial customers of various sizes. This table shows that combined wastewater and drainage bills for commercial customers are competitive with surrounding communities and with major cities in western Canada, although Edmonton's relative ranking varies with the size of the customers with larger customers receiving relatively high monthly bills. These results reflect differences in rate structures between cities and municipalities, as well as differences in the extent of wastewater treatment and drainage services provided.

Table 3.6.2
Commercial Monthly Wastewater Bill Comparison
($ per month)

		A	B	C	D
	Monthly Bill - $ per month	**Small**	**Medium**	**Large**	**Extra Large**
1	**Monthly Consumption** - m^3	**10**	**250**	**1,000**	**5,000**
2	Vancouver	24	234	978	4,624
3	Calgary	52	371	1,369	6,688
4	Regina	51	461	1,913	9,087
5	Winnipeg	26	638	2,550	12,750
6	**Edmonton**	**42**	**487**	**1,964**	**10,311**
7	St. Albert	75	483	1,758	8,558
8	Sherwood Park	39	432	1,659	8,204
9	Stony Plain	31	414	1,611	7,994
10	Leduc	27	380	1,483	7,363

Appendix A: PBR Plan 2017-2021

A.1 PBR Framework

EWSI's In-City Water and Wastewater rates for the 2017-2021 PBR term are regulated in accordance with the PBR Plan approved in Bylaw 17698. This plan encompasses rates, performance measures, and return on equity. The relationships between these components, discussed below, 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 and wastewater treatments system.

- **PBR Rates.** Annual changes to In-City Water and Wastewater rates are limited to inflation, less an efficiency factor, plus special rate adjustments and, in rare cases, non-routine adjustments. The determination of PBR rates is described in Schedule 3, Sections 1, 2 and 5 of the bylaw. The use of a formulaic approach for calculating and setting utility rates acts as a "price cap" providing ratepayers with stable and predictable rates. The efficiency factor, set at 0.25% for the 2017-2021 PBR term, requires EWSI to increase productivity and achieve efficiencies in excess of inflation if it is to meet it targeted return on equity.

- **Performance Measures.** EWSI's PBR framework includes performance measures for water and wastewater treatment system service quality as described in Schedule 3, Sections 3 and 4 of the bylaw. EWSI faces financial penalties if it does not meet or exceed performance measure standards, providing assurance to customers that water and wastewater treatment system service quality will not be sacrificed to keep rates low or increase returns to EWSI. EWSI's performance measures are audited annually by an independent accounting firm.

- **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 2017-2021 PBR term, returns on equity are based on a deemed capital structure of 60% debt and 40% equity and a 10.175% rate of return on equity, a decrease of 0.7% from the 10.875% rate of return on equity approved for the 2012-2016 PBR term.

A.2 Risks and Incentives

The PBR framework provides incentives for EWSI to improve operational performance while achieving cost savings through process improvements and other means. Under this framework, EWSI also assumes the risks associated with water consumption, operating costs, financing costs and capital costs, ensuring that customers are provided with stable and predictable rate increases. These risks and EWSI's strategies to mitigate them include:

- **Water Consumption Risk.** Under PBR, EWSI bears all of the risks associated with weather-related fluctuations in water consumption and water quality, as well as the longer-term risks associated with declining consumption per customer. While EWSI expects the impacts of short-term weather-related volatility to even out over the five year PBR term, longer term declines are of greater concern. In the 2012-2016 PBR term, per customer consumption was significantly lower than forecast, resulting in substantial revenue shortfalls. Accordingly, EWSI revised its consumption forecast methodology for its 2017–2021 PBR forecast to better capture long term trends in water consumption.

- **Operating Cost Risk**. EWSI actively works to minimize fluctuations in input prices through long-term power contracts, chemical optimization processes, and continuous efforts to implement cost reduction strategies in all areas of its operations.

- **Interest Risk.** Fluctuations in short-term interest rates, long-term debt issue costs and in the level of capitalized interest have significant impacts on EWSI's net income and return on equity. EWSI mitigates interest risk through timing of long-term debt issuances and optimizing working capital.

- **Capital Cost Risk.** In-City Water and Wastewater's operations are capital intensive. Over the 2012-2016 period, EWSI found that a much higher than forecast level of capital replacements was required at the Gold Bar Wastewater Treatment Plant to maintain plant reliability. EWSI seeks to minimize these risks through comprehensive capital project and asset management programs, ensuring that new projects or changes to existing projects are justified and that there is an appropriate level of management, senior management and executive oversight over capital spending.

A.3 In-City Water

A.3.1 In-City Water Customer Classes

In-City Water rates consist of fixed monthly service charges that vary with meter size and variable charges applied to each cubic metre of water consumed. Consumption charges differ for each of In-City Water's customer classes. These classes and their rate structures include:

- **Residential Customer Class.** Residential customers are charged based on an inclining rate structure with three consumption blocks. The inclining rate structure is intended to promote water conservation and provide incentives for residential customers to use water efficiently.

- **Multi-Residential Customer Class.** Multi-residential customers are charged based on a declining rate structure with three consumption blocks. EWSI has found that the cost of providing water to individual multi-residential customers declines as the size of the multi-residential building increases. As well, there is a wide range of consumption volumes for multi-residential customers. Accordingly, a declining rate structure best reflects the cost characteristics of this customer class.

- **Commercial Customer Class.** Similar to multi-residential customers, commercial customers are charged based on a declining rate structure, but with five consumption blocks to recognize the wide range of average consumption volumes within this customer class.

A.3.3 In-City Water Special Rate Adjustments

The 2017-2021 PBR Plan includes three special rate adjustments for In-City Water:

- **Special Rate Adjustment for Rebasing**. The In-City Water revenue requirement was rebased at the beginning of the 2017-2021 PBR term. The resulting rebasing adjustment to rates includes the on-going benefits to rate-payers of efficiency gains realized in the 2012-2016 PBR term, the impacts of higher than forecast capital expenditures during the 2012-2016 PBR term; and increases in the capital expenditure programs for the 2017-2021 PBR term (discussed in section 3.4). Also included in the rebasing adjustments is the impact of EWSI's cost of service study which has resulted in redistribution of revenue requirements from the Residential and Multi-Residential customer classes to the Commercial customer class.

- **Special Rate Adjustment for Accelerated Programs.** These special rate adjustments support the acceleration of the replacement of water mains as part of the City of Edmonton's neighbourhood renewal program and the upgrade of water mains to increase fire protection capacity in neighbourhoods experiencing increased densities as a result of infill development.

- **Special Rate Adjustments for Environmental Programs.** EWSI is undertaking two significant environmental initiatives during the 2017-2021 PBR term. The first initiative is an extensive River Monitoring Project to regularly monitor, evaluate and report on a number of water quality variables from several sampling sites in the river for 2018-2021. This program is forecast to have annual costs of $1.0 million starting in 2018. The second initiative, which aligns with the City's *"The Way We Green"* strategy, is a Green Power Initiative to replace approximately 10% of EWSI's total power volumes with energy from locally produced renewable sources starting in 2018. This initiative is forecast to cost $1.9 million annually commencing in 2018.

A.4 Wastewater

A.4.1 Wastewater Customer Classes

Wastewater treatment rates consist of fixed monthly service charges that are applied equally to each customer and variable charges applied to each cubic meter of water consumed. Wastewater has two customer classes:

- **Residential Customer Class.** Unlike In-City Water, there are no separate rates for multi-residential customers. Instead, customers who would be 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 very similar for 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 that there are 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 Section 4 of Schedule 1 to Bylaw 17698.

A.4.2 Wastewater Special Rate Adjustments

The 2017-2021 PBR Plan includes a single special rate adjustment for rebasing. Similar to In-City Water, Wastewater's revenue requirement was rebased at the beginning of the 2017-2021 PBR term to reflect efficiency gains realized in the 2012-2016 PBR term, as well as the substantial increases in capital spending needed to deal with the challenges of the aging infrastructure at the Gold Bar Wastewater Treatment Plant.

2017 – 2021 Performance Based Regulation

Water Services, Wastewater Treatment Services and Drainage Services

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1 Executive Summary

This report provides an annual update to the City of Edmonton on the operational and financial results for the year ended December 31, 2018 for water services ("In-City Water"), wastewater treatment services ("Wastewater"), and, for the first time, sanitary and storm water sewer services ("Drainage") provided within Edmonton by EPCOR Water Services Inc. ("EWSI"). The City of Edmonton City Council regulates In-City Water and Wastewater in accordance with the Performance Based Regulation ("PBR") Plan approved in the EPCOR Water Services and Wastewater Treatment Bylaw No. 17698 ("Bylaw 17698") and Drainage in accordance with the PBR Plan approved in EPCOR Drainage Services Bylaw No. 18100 ("Bylaw 18100").

1.1 Financial Performance

In-City Water, Wastewater and Drainage's financial performance for 2018 are summarized in Table 1.1 below[1]:

Table 1.1
Revenue and Return on Equity
($ millions)

		A	B	C	D
	Revenue and Return on Equity	2018		2017-2018	
		PBR Forecast	Actual	PBR Forecast	Actual
	In-City Water				
1	Revenue	197.8	192.5	388.1	380.0
2	Return on Equity	39.1	40.2	76.3	75.9
3	Rate of Return on Equity	10.18%	10.51%	10.18%	10.17%
	Wastewater				
4	Revenue	99.0	96.0	191.9	186.8
5	Return on Equity	17.8	20.0	33.9	39.2
6	Rate of Return on Equity	10.18%	12.14%	10.18%	12.37%
	Drainage				
7	Revenue	196.6	194.7	196.6	194.7
8	Return on Equity	36.2	32.9	36.2	32.9
9	Rate of Return on Equity	6.48%	5.68%	6.48%	5.68%

In 2018, In-City Water achieved a 10.51% rate of return on equity (10.17% for 2017-2018), compared to its forecast rate of return of 10.175%. These returns were achieved through reductions in operating expenses, offsetting the effects of lower than forecast consumption, lower than forecast inflation adjustments to rates, and a negative non-routine adjustment to 2018 rates related to the transfer of Drainage to EPCOR.

[1] Consistent with the 2017-2021 PBR Application, all financial data in this report, including totals and sub-totals, are rounded to the nearest $0.1 million. This practice ensures continuity of data between tables and between years. However, the sum of the rounded detailed data in certain tables may not be equal to the related rounded total or sub-total.

Wastewater's revenues have been affected by the same factors as In-City Water, with lower than forecast operating expenses, combined with a lower than forecast rate base, enabling Wastewater to achieve a 12.14% rate of return in 2018 (12.37% for 2017-2018), compared to its forecast rate of return of 10.175%.

In 2018, Drainage realized a 5.68% rate of return on equity, 0.80% less than its forecast rate of return. This difference is attributable to both lower revenues, resulting from lower than forecast consumption, and higher than forecast operating expenses. Since Drainage does not have a City of Edmonton-approved PBR forecast, Drainage's actual financial performance for 2018 has been compared to its EPCOR budget, adjusted (1) to remove one-time costs related to the transition of Drainage to EPCOR, and (2) from IFRS to a regulatory accounting basis. The adjusted budget, escalated at an appropriate inflation rate, will serve as the basis for comparison of actual to forecast financial results for the remainder of the 2017-2021 PBR term.

Detailed analyses of In-City Water, Wastewater and Drainage's financial performance for 2018 and for the 2017-2018 period are provided in sections 2.3, 3.3 and 4.3, respectively.

1.2 Capital Expenditures

In-City Water, Wastewater and Drainage's capital expenditures for 2018 and for the five year term of the PBR Plan (the "2017-2021 PBR term") are summarized in Table 1.2 below:

Table 1.2
Capital Expenditures
($ millions)

		A	B	C	D
Capital Expenditures		**2018**		**2017-2021**	
		PBR Forecast	**Actual**	**PBR Forecast**	**Current Projection**
1	In-City Water	81.2	96.4	475.8	614.8
2	Wastewater	57.9	52.5	235.4	236.3
3	Drainage	122.6	103.8	642.9	878.5

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 Project Management Office and are authorized by EWSI's Capital Project Steering Committee, EUI's 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 to the Utility Committee throughout the year.

1. **In-City Water's** 2017-2021 projected capital expenditures of $614.8 million are $139.0 million (29%) greater than the PBR forecast. Significant projects contributing to this variance include: the E.L. Smith Solar Farm ($33.1 million), which is funded through the special rate adjustment for Environmental Initiatives; Plant Flood Protection ($7.4 million), which has been advanced to recognize the vulnerability of the plants and to maximize available grant funding opportunities; and changes to the scope of the Water D&T Facility Expansion, which adds an additional $11.9 million to its cost. Besides these projects, there are three projects that EWSI has submitted to the City for consideration as non-

routine adjustments, including: (i) an enhanced Lead Mitigation Program ($21.5 million) needed to conform to new Health Canada Guidelines; (ii) additional costs of LRT Relocations ($14.7 million) needed to realign distribution network infrastructure; and (iii) the purchase of the Discovery Park Reservoir ($7.8 million), following the City of Edmonton's annexation of land in Leduc County. The remainder of the increase in capital expenditures results from additional expenditures on projects and programs needed to accommodate growth ($28.4 million) and additional expenditures on rehabilitation and repairs ($14.3 million).

- **Wastewater's** 2017-2021 projected capital expenditures of $236.3 million are $0.9 million (0.4%) greater than the PBR forecast. The Gold Bar Wastewater Treatment Plant's aging infrastructure poses challenges to capital planning. Since the plant cannot be shut-down for maintenance it is often difficult to accurately assess asset condition and the scope of rehabilitation needed before commencing work on a project. During preliminary engineering in 2017 and 2018, EWSI identified significant needs for repairs to critical infrastructure that had not been anticipated in the PBR forecast. EWSI reviewed design options and employed value engineering to reprioritize reliability and life cycle replacements. These efforts have ensured that current projections of the total cost of the 2017-2021 capital expenditures program remains essentially unchanged from the PBR forecast.

- **Drainage's** 2017-2021 projected capital expenditures of $878.5 million are $235.6 million (39%) greater than its long term plan. This increase includes three programs which EWSI will submit to the City for consideration as non-routine adjustments (see Section 1.5), including: LRT Relocations ($57.4 million); the Stormwater Integrated Resource Plan ($97.6 Million); and Odour Mitigation ($50.7 million). Besides these programs, this increase also includes a joint EPCOR Water and Drainage real estate initiative ($50.0 million), as well higher capital expenditures in Drainage System Rehabilitation to address asset condition, mitigate the risk of failure, and maintain required service levels.

Detailed explanations for differences between capital expenditures in PBR forecast and EWSI's current projections are provided in Sections 2.4, 3.4 and 4.4.

1.3 Operational Performance

In-City Water's and Wastewater's operational performance is measured by the results of indices prescribed in Schedule 3 of Bylaw 17698 with each index consisting of one or more performance measures. Performance under each index is measured independently on a point 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 2018, In-City Water exceeded the performance standards for all five performance of its measure indices and Wastewater exceeded the performance standards for all four of its performance measure indices. Detailed discussions of the performance measures making up each of the indices and operational performance highlights are provided in Section 2.5 for In-City Water and Section 3.5 for Wastewater.

Table 1.3-1

2018 Performance Measures

		A	B	C	D
Performance Index		**In-City Water**		**Wastewater**	
		Standard	**Actual Score**	**Standard**	**Actual Score**
1	Water Quality Index[1]	25.0	25.0	55.0	60.5
2	Customer Service Index	20.0	20.6	15.0	16.5
3	System Reliability and Optimization Index	25.0	28.5	15.0	16.5
4	Environmental Index[1]	15.0	16.5	n/a	n/a
5	Safety Index	15.0	16.5	15.0	16.5
6	**Aggregate Points Earned**	**100.0**	**107.1**	**100.0**	**110.0**

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

Drainage's operational performance is measured by the results of four indices prescribed in Schedule 3 of Bylaw 18100 with each index consisting of one or more performance measures. These performance measures are patterned after previous Drainage Utility service quality metrics and do not include a scoring system similar to those of In-City Water and Wastewater. Pursuant to Bylaw 18100, EWSI will report on these metrics until December 31, 2019, when new performance metrics with a scoring system will be defined for the remainder of the 2018-2022 PBR period.

In 2018, Drainage met or exceeded performance standards for eleven of fourteen performance measures included in the four performance measure indices. Detailed discussions of the performance measures making up each of index and highlights of Drainage's operational performance are provided in Section 4.5.

1.4 Rates and Bill Comparisons

In 2018, the average monthly bill for In-City Water customers, based on 2018 average monthly consumption per residential customer of 14.4 m^3, was **$36.15,** an increase of 0.5% from 2017. This increase consists of the 1.1% inflation adjustment discussed in Section 2.3.1, and special rate adjustments approved in Bylaw 17698 for Environmental Initiatives (0.3%), Accelerated Programs (0.4%) and Rebasing (0.6%), less a 1.9% negative non-routine rate adjustment approved by the City Manager in March 2018, related to lower corporate allocations associated with the transfer of Drainage assets to EPCOR.

The average residential customer's wastewater treatment bill in 2018, also based on monthly consumption of 14.4 m^3, was **$16.96**, an increase of 3.5% from 2018. This increase includes the 1.1% inflation adjustment, the special rate adjustment for rebasing of 4.3% needed to support Wastewater's 2017-2021 capital programs, and the 1.9% negative non-routine rate adjustment related to lower corporate allocations associated with the transfer of Drainage assets to EPCOR.

The average residential customer's drainage bill in 2018, again based on monthly consumption of 14.4 m^3, was **$34.89**, an increase of 3.0% from 2017. Drainage rates from January 1, 2018 to March 31, 2022 have been set in Bylaw 18100, which, except for Non-Routine Adjustments (Section 1.5), limits average annual bill increases to 3.0%.

EWSI undertakes annual bill comparison surveys with various cities and local communities. Section 2.6 shows that EWSI's residential water rates are lower than most of the cities and communities included in the comparison, with only Vancouver having lower water rates. Drainage and Wastewater 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 which influence the level of investment in and approach to flood mitigation. Section 3.6 shows that Edmonton's combined Drainage and Wastewater treatment rates are competitive with those of other cities and communities with similar geographic and climatic conditions. Commercial bill comparisons for both water and wastewater show similar results to residential water and wastewater bills.

1.5 Non-Routine Adjustments

Non-routine adjustments for In-City Water and Wastewater are defined in Bylaw 17698, and for Drainage in Bylaw 18100, as "items which are unusual, significant in size or nature, and beyond the scope of control of EWSI". Bylaws 17698 and 18100 allow EWSI to request adjustments to In-City Water, Wastewater and Drainage rates for non-routine adjustments from the City Manager or City Council, depending on the impact of the non-routine adjustment on In-City Water, Wastewater or Drainage's revenue requirements.

During its review of 2018 operations, EWSI identified the following projects that it believes meet the criteria for non-routine adjustments outlined in Bylaw 17698, Schedule 3, Section 5.0 for Water and Wastewater, or for Drainage, in Bylaw 18100, Schedule 3 Section 4.1. Accordingly, EWSI has requested non-routine adjustments to rates to offset the incremental revenue requirements arising from these projects. If approved, these non-routine adjustments will be included in Drainage rates commencing January 1, 2020 and in January 1, 2021 and will be included in In-City Water rates commencing April 1, 2020 and escalating by inflation less productivity factor in April 1, 2021.

- **Lead Mitigation (In-City Water)** – On March 22, 2019, EWSI presented a new lead mitigation strategy to the Utility Committee. This strategy is designed to meet new Health Canada Guidelines that reduce the maximum concentration of lead in drinking water at the tap from 10 parts per billion to 5 parts per billion. EWSI has applied for non-routine adjustments to water rates commencing April 1, 2020 to recover the costs of implementing this strategy. The additional cost to an average Residential In-City Water customer is forecast to be $0.40 per month commencing April 1, 2020 ($9.77 over the remainder of the 2017-2021 PBR term).

- **Stormwater Integrated Resource Plan (Drainage)** – On May 10, 2019, EWSI presented its Stormwater Integrated Resource Plan alternatives to the Utility Committee, recommending a 20 year focus for implementation, commencing in 2019, with investments incorporated into future PBR rate applications. EWSI intends to apply for approval of a non-routine adjustment to stormwater rates beginning January 1, 2020 to recover the increase in its stormwater revenue requirements from the beginning of the implementation until March 31, 2022. The additional cost to the average Residential Drainage customer is forecast to be $0.56 per month commencing January 1, 2020 and $0.56 per month commencing January 1, 2021 ($15.12 over the remainder of the 2018-2021 PBR term).

- **LRT Relocations (In-City Water and Drainage)** – EWSI has identified the work needed to accommodate water main, hydrant and sewer relocations for the West Valley Line and Metro Line

Northwest Phase I LRT projects. EWSI will be requesting that non-routine adjustments be applied to water rates for In-City Water customers commencing April 1, 2020 and to sanitary utility and storm water utility rates for Drainage customers commencing January 1, 2020. The additional cost to the average Residential In-City Water customer is $0.17 per month commencing April 1, 2020 ($4.19 over the remainder of the PBR term). The average monthly bill increase for Residential Drainage customers is forecast to be $0.15 per month commencing January 1, 2020 and $0.52 per month commencing in January 1, 2021 ($9.70 over the remainder of the 2018-2021 PBR term).

- **Odour Mitigation (Drainage)** – EWSI has developed a new odour mitigation strategy to address long-standing concerns regarding sewer odours. The first phase of this strategy, commencing in 2019 and continuing to 2026, is to implement sewer odour mitigation projects in neighbourhoods where the processes causing persistent sewer odour issues are well understood and where the proposed mitigation efforts will have a known long-term beneficial effect. The proposed strategy also includes comprehensive monitoring and sewer characterization to support continued odour mitigation assessments across the city and identify locations where operational improvements can be rapidly applied for beneficial downstream reductions in odour intensity. The additional cost to the average Residential Drainage customer is forecast to be $0.58 per month commencing January 1, 2020 and $0.90 per month commencing in January 1, 2021 ($20.52 over the remainder of the PBR term).

- **South Annexation (In-City Water)** – On November 27 2018, the Government of Alberta approved the City of Edmonton's annexation of 8,260 hectares from Leduc County. As part of the annexation, EWSI will acquire the existing water infrastructure within the annexed area, including a reservoir, pump house and booster station, as well as transmission mains and a small distribution system, at a cost of $9.5 million which is comprised of $7.8 million for the Discovery Park reservoir and the remainder for a pipeline and booster station. EWSI plans to apply for a non-routine adjustment to water rates on June 28, 2019. The additional cost to the average Residential In-City Water customer is forecast to be approximately $0.26 per month commencing April 1, 2020 ($6.38 over the remainder of the PBR term).

2 In-City Water Services

2.1 Accomplishments and Challenges

In 2018, In-City had significant accomplishments, including:

- Developing a new Lead Mitigation Strategy to meet new Health Canada Guidelines for Canadian Drinking Water Quality. This new strategy is intended to reduce lead levels in over 4,400 homes with lead service lines and over 23,000 homes with high lead levels related to lead plumbing and plumbing fixtures, ensuring that EWSI provides safe drinking water to the citizens of Edmonton;
- Launching a new North Saskatchewan River Monitoring program in conjunction with Alberta Environment and Parks. This program utilizes a network of monitoring stations and sampling points from the river's headwaters to the Saskatchewan border to provide EWSI with a better understanding of the non-point sources of loading in the watershed, to determine linkages between land use, land cover and water quality, to understand the health of the aquatic community, and to capture peak runoff events. In 2018, EWSI completed the scientific and technical design of the monitoring system, purchased equipment for all monitoring stations, upgraded nine existing monitoring stations, and identified locations for eight new stations that will be installed in early 2019 to complete the monitoring network
- Obtaining AUC approval, subject to the requirement for EWSI to file a compliance plan, for the E.L. Smith Solar Farm, designed to replace over 20% of conventional power with locally produced renewable power, far greater than the 10% commitment in the 2017-2021 PBR application;
- Successfully obtaining over $10 million in federal and provincial grant funding for a battery storage system to support the E.L. Smith Solar Farm;
- In conjunction with Infill developers and City Administration, developing a cost sharing mechanism for infill infrastructure (hydrants, services, etc.). Currently, infill developers are obligated to pay for all system upgrades resulting from their development, including those that benefit the surrounding residents and community. The revised approach will limit developer's costs to those directly related to their projects with the broader system improvement being paid by either the rate payer or through the Fire Services Contract. The program will be presented to Urban Planning committee June 25, 2019 (CR_6170). Assuming approval, the initial two year "trial" period of the program will be funded with a reallocation of $2.4 million from an existing program (Accelerated Fire Hydrant Replacement) already approved under the PBR;
- Successfully negotiating new 20 year water supply agreements with the Regional Water Customer Group (RWCG). This customer group represents approximately 27% of the consumption from the overall water system; and
- Creating cross-functional teams within Water and Drainage to begin the process of identifying and developing efficiencies between the two businesses.

2.2 Customers and Consumption

In-City Water provides services to three customer classes: Residential; Multi-Residential; and Commercial (see Appendix A). These classes are unchanged from the previous PBR term and are described in greater detail in Appendix A. Customer counts, total annual consumption and monthly consumption per customer are shown in Table 2.2 below:

Table 2.2
Customers, Consumption and Consumption per Customer

		A	B	C	D
	Customers and Consumption	2018		2017-2018	
		PBR Forecast	Actual	PBR Forecast	Actual
	Customers				
1	Residential	261,176	264,485	258,741	261,910
2	Multi-Residential	3,791	3,765	3,769	3,758
3	Commercial	19,508	19.680	19,382	19,559
4	**Total**	**284,475**	**287,930**	**281,892**	**285,227**
	Consumption per Customer (m^3 per month)				
5	Residential	14.4	14.4	14.5	14.5
6	Multi-Residential	408.6	390.4	408.6	393.2
7	Commercial	121.9	115.3	122.7	116.7
	Annual Consumption (ML)				
8	Residential	45,133.9	45,832.1	90,191.0	91,309.9
9	Multi-Residential	18,590.5	17,638.9	36,960.5	35,467.7
10	Commercial	28,534.2	27,227.9	57,073.2	54,764.5
11	**Total**	**92,258.6**	**90,698.9**	**184,224.6**	**181,542.1**

The factors contributing to actual to forecast differences for 2018 and for 2017-2018 differ by customer class, as explained below:

- **Residential.** Customer counts in 2018 are 1.2% greater than forecast, primarily because of higher than expected actual customer counts at the beginning of the 2017-2021 PBR term. Actual consumption per customer is essentially equal to the PBR forecast, confirming the robust residential forecasting methodology developed for the 2017-2021 PBR forecast. The combined effect of these factors is that total residential consumption for 2018 is 1.5% greater than forecast (1.2% greater for 2017-2018).
- **Multi-Residential.** Although multi-residential customer counts were within 0.7% of forecast, lower than forecast consumption per customer meant that total consumption was 5.1% less than forecast. Lower than forecast consumption per customer is not attributable to a specific cause, but reflects a variety of factors, including: vacancy rates, renovations of older buildings; and the number of units in new multi-residential buildings.
- **Commercial.** Consumption in the commercial customer class was 4.6% less than forecast, despite a 0.9% increase in customer counts. This class includes a large number of customers that use very little water and a small number of customers with very high levels of consumption. In 2018, EWSI's billing system data showed that 220 (1.1%) of commercial customers accounted for 50% of commercial consumption. Therefore, the loss of a large customer can cause large shifts in consumption per customer for the entire class. As well, since new customers tend to be low water

consumers, increases in customer counts may not have significant effects on consumption for the commercial customer class. Accordingly, EWSI is exploring opportunities to expand the application of the forecasting methodology developed for the residential class to the commercial and multi-residential customer classes.

2.3 Financial Performance

In-City Water's net income is derived from the provision of water services within Edmonton's boundaries. Besides these services, EWSI provides water services to surrounding communities under bulk water supply agreements with regional water service commissions ("RWCG" or "Regional Customers"), and fire protection services to the City of Edmonton under a service agreement ("Fire Protection").

EWSI's water system is fully integrated, with services jointly provided to In-City Water, Regional Customers and Fire Protection. Therefore, in sections 2.3.1 to 2.3.7, operating costs, depreciation, rate base and capital expenditures are presented and analyzed on a total system basis. In-City Water's share of these expenses, as well as its returns on rate base, are calculated in accordance with a cost of service model developed jointly by EWSI, the regional water service commissions and the City of Edmonton, and are shown as separate line items on each applicable table. In-City Water's total revenue and revenue requirements are summarized in Table 2.3 below:

Table 2.3
In-City Water Revenue Requirements
($ millions)

		A	B	C	D
	Summary of Revenue Requirements	**2018**		**2017-2018**	
		PBR Forecast	**Actual**	**PBR Forecast**	**Actual**
1	In-City Water Rate Revenue[1]	192.9	187.1	378.2	368.7
2	In-City Water Revenue Requirement				
3	Operating expenses	106.0	97.2	206.7	196.0
4	Other revenue	(4.9)	(5.5)	(9.9)	(11.2)
5	Depreciation and amortization	27.1	27.1	52.7	53.0
6	Return on rate base financed by debt	28.3	28.1	54.9	55.1
7	Return on rate base financed by equity	39.1	40.2	76.3	75.9
8	In-City Water Revenue Requirement*	195.6	187.1	380.7	368.7
9	**Return on Rate Base Financed by Equity**	**10.18%**	**10.51%**	**10.18%**	**10.17%**

[1] In the PBR forecast, rebasing and other special rate adjustments have been smoothed over the PBR term. Therefore, although forecast revenue is equal to the revenue requirement over the 2017-2021 PBR term, in any year within the PBR term, forecast revenue may be greater or less than the revenue requirement.

2.3.1 Revenue

In-City Water's rate revenues include fixed monthly services charges which vary by meter size and consumption charges applied to each cubic meter of water consumed. Besides rate revenue, In-City Water revenues also include other revenue derived from temporary services, connection fees, water permits, late payment charges and other incidental services. Table 2.3.1-1 below provides a comparison of 2018 In-City Water revenues to the PBR forecast:

Table 2.3.1-1
In-City Water Revenue
($ millions)

		A	B	C	D
	In-City Water Revenue	2018		2017-2018	
		PBR Forecast	Actual	PBR Forecast	Actual
1	Fixed Monthly Service Charges				
2	Residential	23.1	21.0	45.3	43.1
3	Multi-Residential	1.5	1.3	2.8	2.7
4	Commercial	4.3	4.0	8.3	8.0
5	Fixed Monthly Service Charges	28.9	26.4	56.4	53.7
6	Consumption Charges				
7	Residential	97.0	96.5	190.4	188.5
8	Multi-Residential	30.0	28.4	58.9	56.1
9	Commercial	37.0	35.9	72.5	70.4
10	Consumption Charges	164.0	160.7	321.8	315.0
11	In-City Water Rate Revenue	192.9	187.1	378.2	368.7
12	Other Revenue	4.9	5.5	9.9	11.2
13	**Total In-City Water Revenue**	**197.8**	**192.5**	**388.1**	**380.0**

In-City rate revenues were $5.8 million less than forecast in 2018, and $9.5 million less than forecast over the 2017-2018 PBR period. This difference is attributable to the following factors:

- Lower than forecast inflation - $1.2 million in 2018 ($3.2 million for 2017-2018). The PBR plan limits Water and Wastewater's annual routine rate adjustments to inflation less an efficiency factor (see Appendix A.1). As shown in Table 2.3.1-2, actual PBR inflation adjustments for 2018 and 2017-2018 are significantly less than forecast. The effect of lower than forecast inflation in 2017 and 2018 will continue to impact revenues throughout the remainder of the 2017-2021 PBR term;

Table 2.3.1-2
2018 PBR Inflation Adjustment

		A	B	C	D
	PBR Inflation Adjustment to In-City Water and Wastewater Rates	2018		2017-2018	
		PBR Forecast	Actual	PBR Forecast	Actual
1	Forecast Inflation				
2	CPI	2.20%	1.90%	4.45%	4.14%
3	Labour	2.40%	1.70%	4.86%	3.43%
4	Weighted Inflation (65% CPI, 35% Labour)	2.27%	1.83%	4.59%	3.89%
5	Less: Efficiency Factor	-0.25%	-0.25%	-0.50%	-0.50%
6	Forecast Inflation	2.02%	1.58%	4.08%	3.39%
7	Actual to Forecast Inflation Adjustment	-	-0.46%	-	-1.43%
8	**PBR Inflation Adjustment**	**2.02%**	**1.11%**	**4.08%**	**1.96%**

- Lower than forecast consumption (see section 2.2) resulted in a $2.8 million decrease in 2018 revenues ($4.7 million for 2017-2018). These decreases were partially offset by slight increases in customer counts which resulted in a $0.4 million increase in revenue in 2018 ($0.7 million for 2017-2018; and
- A negative non-routine adjustment to 2018 water rates decreased revenues by $2.2 million in 2018. As described in the 2017 PBR Progress Report, this non-routine adjustment fulfills EPCOR's commitment to the City to flow the benefits of any reductions in corporate shared service cost

allocations resulting from the transfer of Drainage Services assets to EPCOR to In-City Water and Wastewater customers through a negative non-routine adjustment.

Besides rate revenues, In-City Water earned $5.5 million in other revenue in 2018, $0.6 million greater than forecast ($1.3 million greater for 2017-2018). This increase includes $0.3 million in fees charged to private developers for water main flushing for new developments ($0.6 million for 2017 to 2018), and $0.3 million in additional customer service revenue ($0.7 million for 2017 to 2018).

2.3.2 Operating Expenses by Function

Table 2.3.2 below provides a comparison of EWSI's total water system operating expenses for 2018 to the PBR forecast.

Table 2.3.2
Operating Expenses by Function
($ millions)

		A	B	C	D
	Function and Sub-function	**2018**		**2017-2018**	
		PBR Forecast	**Actual**	**PBR Forecast**	**Actual**
1	Power, Other Utilities and Chemicals				
2	Power and Other Utilities	14.1	10.0	26.0	21.6
3	Chemicals	7.3	7.9	14.5	16.3
4	Power, Other Utilities and Chemicals	21.4	17.9	40.5	37.9
5	Water Operations				
6	Water Treatment Plants	19.2	19.1	38.0	36.5
7	Water Distribution and Transmission	25.1	26.7	49.7	52.4
8	Operational Support Services	7.4	7.1	14.7	13.9
9	Quality Assurance and Environment	6.5	6.7	11.8	12.1
10	Capitalized Overhead Costs	(7.3)	(7.5)	(14.3)	(14.6)
11	Water Operations	50.9	51.9	99.9	100.3
12	Billing, Meters and Customer Service				
13	Billing and Collections	8.1	7.9	15.9	15.7
14	Meter Reading, Repairs and Maintenance	3.1	1.3	6.2	4.0
15	Customer Service	0.7	0.7	1.5	1.3
16	Billing, Meters and Customer Service	12.0	9.9	23.6	21.0
17	EWSI Shared Services				
18	EWSI Shared Services	10.0	8.8	19.8	18.8
19	Incentive and Other Compensation	3.2	3.3	6.3	6.1
20	EWSI Shared Services	13.2	12.1	26.1	25.0
21	Corporate Shared Services	15.3	12.0	30.3	24.9
22	Franchise Fees and Property Taxes				
23	Franchise Fees	15.4	14.8	29.9	29.1
24	Property Taxes	0.4	0.2	0.9	0.5
25	Franchise Fees and Property Taxes	15.8	15.0	30.8	29.6
26	**Total Operating Expenses by Function**	**128.5**	**118.8**	**251.2**	**238.6**
27	In-City Water Share - %	82.5%	81.8%	82.3%	82.1%
28	**In-City Water Share - $**	**106.0**	**97.2**	**206.7**	**196.0**

Overall, total operating expenses for 2018 were $9.7 million lower than the PBR forecast, and $12.5 million lower over the 2017-2018 PRB period. Key factors contributing to this difference include:

- **Power and Other Utilities** – $4.1 million less than forecast in 2018 ($4.5 million less for 2017-2018) due to lower than forecast power prices ($2.2 million in 2018 and $2.6 million for 2017-2018) and

$1.9 million related to the purchase of locally produced renewable energy. The PBR forecast included annual renewable power purchases of $1.9 million annually, starting in 2018. Rather than purchasing locally produced renewable energy, EWSI plans to construct a solar farm on land adjacent to the E.L. Smith water treatment plant. Therefore, after the solar farm is completed, the savings in green power purchases will be offset by higher operations, maintenance, depreciation and returns on EWSI's investment in the solar farm project.

- **Chemicals** – $0.6 million greater than forecast in 2018 ($1.9 million greater than forecast for 2017-2018). In 2018, higher than forecast costs are attributable to unusually high colour in the river in the fall causing a delay in conversion to direct filtration and extending the use of chemicals (alum and caustic soda) in the water treatment process. Higher than forecast costs for the 2017-2018 PBR period are also attributable to unexpected changes in river water quality, including early spring run offs and high colour in the fall.
- **Water Treatment Plants** – $0.1 million less than forecast in 2018 ($1.5 million less than forecast for 2017-2018). Lower than forecast costs for 2017-2018 are attributable to several factors, including: a higher than forecast proportion of internal labour on capital projects, which increased capital recoveries by $0.5 million, reductions in fringe benefit costs, primarily lower pension contribution rates, which provided savings of $0.3 million; and capitalization of filter media costs, which had previously been considered an operating expense of $0.2 million. The remainder of the actual to forecast difference consists of numerous small items, none of which are individually significant.
- **Water Distribution and Transmission** – $1.6 million greater than forecast in 2018 ($2.7 million greater for 2017-2018). Seasonal freeze-thaw cycles resulted in higher than normal volumes of emergency repairs (main breaks and frozen services) in both 2017 and 2018, resulting in increased overtime costs of $0.9 million ($1.4 million for 2017 to 2018), higher contractor costs of $1.2 million ($1.7 million for 2017-2018), and additional material costs of $0.6 million ($1.1 million for 2017 to 2018). These increases were partially offset by reductions in fringe benefit costs of $0.8 million in 2018 ($1.5 million for 2017-2018).
- **Operational Support Services** – $0.1 million less than forecast in 2018 ($0.5 million less for 2017-2018). The 2017-2018 variance in this function is primarily due to lower than forecast legal costs of $0.4 million, as less external legal support was required.
- **Meter Reading, Repairs and Maintenance** – $2.1 million less than forecast in 2018 ($2.6 million less for 2017-2018). Meter reading process improvements provided cost savings in staff costs of $1.2 million ($1.6 million for 2017-2018), and $0.3 million in vehicle expenses ($0.5 million for 2017-2018). Higher than forecast recoveries from Wastewater and Drainage provided a further reduction of $0.4 million in 2018 ($0.2 million for 2017-2018). The remainder of the actual to forecast difference consists of numerous small items, none of which are individually significant.
- **EWSI Shared Services** – $1.1 million less than forecast in 2018 ($1.1 million less than forecast for 2017-2018). The favorable variance in this category reflects EWSI's continuing efforts to manage shared services costs, with savings of $0.6 million arising from delays in filling vacant positions in Regulatory Services, a $0.3 million decrease in technical training charges from EPCOR Distribution and Transmission Inc., and $0.3 million of recoveries from Drainage, as organization changes are gradually consolidating functions from each of EWSI's business units into a single EWSI's shared services area.

- **Corporate Shared Services** – $3.3 million less than forecast in 2018 ($5.4 million less than forecast for 2017-2018). These differences reflect both the reduction in corporate shared services cost allocations resulting from the transfer of Drainage from the City of Edmonton to EPCOR, which are fully offset by the non-routine adjustment to rates described in Section 2.1.1, as well as cost savings in EPCOR Utilities Inc.'s corporate functions**.**
- **Franchise Fees and Property Taxes** – $0.8 million less than forecast in 2018 ($1.2 million less than forecast for 2017-2018). Lower than forecast revenue resulted in a $0.6 million reduction in franchise fees in 2018 ($0.8 million for 2017-2018). Lower than forecast property taxes relate to the deferral of the Distribution and Transmission facility which had been expected to increase Water Services property taxes by $0.2 million annually commencing in 2017.

Variances in other operating expense functions and sub-functions are not significant, either individually or in aggregate.

In 2018, In-City Water's share of operating expenses was $97.2 million (81.8%), compared to $106.0 million (82.5%) in the PBR forecast. This result reflects both lower total operating expenses for EWSI's total water system and a 0.7% decreases in In-City Water's share of operating expenses determined through the cost of service model.

2.3.3 Operating Expenses by Cost Category

Table 2.3.3 below shows operating expenses by cost category for Water Operations, Billing Meters and Customer Service, and EWSI Shared Services, where cost categories differ from the sub-functions in Section 2.3.2.

Table 2.3.3
Operating Expenses by Cost Category
($ millions)

		A	B	C	D
	Cost Category	2018		2017-2018	
		PBR Forecast	Actual	PBR Forecast	Actual
1	Water Operations				
2	Staff Costs and Employee Benefits	41.4	40.6	82.0	79.7
3	Contractors and Consultants	7.8	9.4	14.5	16.5
4	Vehicles	1.5	1.2	3.0	2.5
5	Materials and Supplies	3.1	3.9	6.1	7.2
6	Other	4.3	4.4	8.6	8.9
6	Capitalized Overhead Costs	(7.3)	(7.5)	(14.3)	(14.6)
7	Water Operations	50.9	51.9	99.9	100.3
8	Billing, Meters and Customer Service				
9	CUS Charges	8.1	7.9	15.9	15.7
10	Staff Costs and Employee Benefits	6.7	5.6	13.3	11.9
11	Contractors and Consultants	0.5	0.4	1.0	0.8
12	Vehicles	0.3	0.1	0.6	0.4
13	Other	0.5	0.4	1.0	0.7
14	Meter Reading Services (Recoveries)	(4.2)	(4.6)	(8.3)	(8.5)
15	Billing, Meters and Customer Service	12.0	9.9	23.6	21.0
16	EWSI Shared Services				
17	EWSI Shared Services Allocation	10.0	9.2	19.9	18.8

		A	B	C	D
Cost Category		2018		2017-2018	
		PBR Forecast	Actual	PBR Forecast	Actual
18	Staff Costs and Employee Benefits	3.2	3.1	6.4	6.4
19	Contractors and Consultants	0.2	0.1	0.4	0.3
20	Other	(0.3)	(0.3)	(0.5)	(0.5)
21	EWSI Shared Services	13.2	12.1	26.1	25.0

The information presented in this table supports the explanations of differences between 2018 actual and forecast expenses provided in Section 2.3.2. Accordingly, no additional explanations are considered necessary.

2.3.4 Depreciation and Amortization

EWSI total system depreciation expense and amortization of contributed assets for 2018 are shown in Table 2.3.4 below:

Table 2.3.4
Depreciation and Amortization
($ millions)

		A	B	C	D
Depreciation and Amortization		2018		2017-2018	
		PBR Forecast	Actual	PBR Forecast	Actual
1	Gross depreciation expense	44.1	44.2	86.3	87.3
2	Amortization of contributions	(9.8)	(9.9)	(19.5)	(20.2)
3	**Depreciation, net**	**34.3**	**34.3**	**66.8**	**67.1**
4	In-City Water Share - %	78.8%	79.0%	78.8%	79.2%
5	**In-City Water Share - $**	**27.1**	**27.1**	**52.7**	**53.0**

Depreciation expense and amortization of contributions are both slightly higher than forecast reflecting higher than forecast levels of developer-funded assets, explained in section 2.3.5 below. These impacts are offsetting, so actual depreciation expense, net of amortization, is within $0.1 million of forecast.

In-City Water's share of 2018 depreciation expense is 0.2% higher than forecast. The 0.2% difference is consistent with actual to forecast differences in the base and max day peaking factors used to allocate depreciation expense in functional cost categories to In-City customer classes versus that charged to the RWCG.

2.3.5 Rate Base

In 2018, EWSI's total water system rate base, shown in Table 2.3.5 below, was $1.7 million less than forecast, with the higher than forecast gross rate base offset by higher than forecast contributions.

Table 2.3.5
Mid-Year Rate Base
($ millions)

		A	B
	Components of Mid-Year Rate Base	**2018**	
		PBR Forecast	**Actual**
1	Plant in Service		
2	Balance, beginning of year	2,257.4	2,299.8
3	Additions - EPCOR-funded	83.1	94.9
4	Additions - Developer-funded	6.4	29.9
5	Retirements and adjustments	-	(11.4)
6	Balance, end of year	2,346.9	2,413.1
7	Mid-Year Plant in service	2,302.1	2,356.5
8	Accumulated Depreciation		
9	Balance, beginning of year	560.9	562.7
10	Depreciation expense	44.1	44.2
11	Retirements and adjustments	-	(11.4)
12	Balance, end of year	605.1	595.5
13	Mid-Year Accumulated Depreciation	583.0	579.1
14	Other Rate Base Items		
15	Working Capital	21.3	21.2
16	Materials and Supplies	2.9	3.5
17	**Gross Mid-Year Rate Base**	**1,743.3**	**1,802.1**
19	Contributions		
20	Balance, beginning of year	680.6	730.2
21	Contributions in aid of construction	6.4	29.9
23	Balance, end of year	687.1	760.2
24	Mid-Year Contributions	683.8	745.2
25	Accumulated Amortization		
26	Balance, beginning of year	158.3	159.2
27	Amortization of contributions	9.8	9.9
28	Balance, end of year	168.1	169.1
29	Mid-Year Accumulated Amortization	163.2	164.1
30	**Mid-Year Contributions**	**520.6**	**581.1**
31	**Net Mid-Year Rate Base**	**1,222.7**	**1,221.0**

The gross rate base reflects significantly higher than forecast levels of developer-funded assets over the 2016 to 2018 period. Developers are responsible for construction of distribution infrastructure in new subdivisions. When these assets are placed into service, ownership of the assets is transferred to EWSI, where the assets, together with offsetting contributions in aid of construction, are added to the rate base. Therefore, in 2018, since higher than forecast developer-funded asset additions were fully offset by a corresponding increase in contributions, the net rate base remained within 0.1% of the PBR forecast.

2.3.6 Return on Rate Base

In 2018, In-City Water's return on equity was $3.7 million (0.3%) greater than forecast and $0.4 million (0.0%) less for 2017-2018. In 2018, this increase was almost entirely attributable to higher than forecast net income, reflecting EWSI's actions to control operating costs in response to lower than forecast revenue.

Table 2.3.6-1
Return on In-City Water Share of Mid-Year Rate Base
($ millions)

		A	B	C	D
	Return on Rate Base	2018		2017-2018	
		PBR Forecast	Actual	PBR Forecast	Actual
1	Net Mid-Year Rate Base	1,222.7	1,221.0	2,384.8	2,381.9
2	In-City Water Share - %	78.7%	78.3%	78.6%	78.3%
3	In-City Water Share - $	961.7	955.6	1,874.4	1,865.9
4	Deemed Capital Structure				
5	Debt	60.00%	60.00%	60.00%	60.00%
6	Equity	40.00%	40.00%	40.00%	40.00%
7	Total	100.00%	100.00%	100.00%	100.00%
8	Cost Rates				
9	Debt	4.91%	4.90%	4.88%	4.92%
10	Equity	10.18%	10.51%	10.18%	10.17%
11	Weighted Average Cost of Capital (WACC)	7.01%	7.14%	7.00%	7.02%
12	Return on Rate Base				
13	Debt	28.3	28.1	54.9	55.1
14	Equity	39.1	40.2	76.3	75.9
15	**Total Return on In-City Water Rate Base**	**67.4**	**68.3**	**131.2**	**131.0**

In-City Water's share of the total system net mid-year rate base is 0.4% less than forecast, which is consistent with the change in In-City Water's demands on water system relative to that of Regional Customers. When combined with a total system rate base that was also very close to forecast, the In-City Water net mid-year rate base is within 0.6% of the forecast amount.

Returns on rate base are 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 2.3.6-2 below:

Table 2.3.6-2
Interest Expense and Cost of Debt
($ millions)

		A	B		
	Interest Expense and Cost of Debt	2018		2017-2018	
		PBR Forecast	Actual	PBR Forecast	Actual
1	Interest expense				
2	Interest on short-term debt	1.0	1.2	2.0	2.5
3	Interest on City of Edmonton debentures	0.7	0.7	1.6	1.6
4	Interest on intercompany debentures	33.7	32.8	65.2	64.0
5	Total interest expense	35.5	34.7	68.8	68.0
6	Mid-year debt and other long-term liabilities				
7	Mid-Year Short-term debt	38.1	17.7		
8	Mid-Year Long-term debt	683.0	688.0		
9	Mid-Year Other Long-term liabilities	1.8	2.3		
10	Total mid-year debt and other long-term liabilities	722.8	708.0		
11	**Embedded Cost of Debt**	**4.91%**	**4.90%**	**4.89%**	**4.92%**

The embedded cost of debt is slightly lower than forecast. Although, EWSI issued more long term debt than forecast, which is more expensive that short term debt, due to favorable economic conditions EWSI was able to issue the long term debt at lower than forecast rates in both 2017 and 2018.

2.3.7 Transactions with Affiliates

In-City Water derives a significant proportion of its revenue and expenses from transactions with affiliates, including the City of Edmonton, EPCOR Utilities Inc. and its subsidiaries, and other EWSI business units. Table 2.3.7 provides a summary of In-City Water's 2018 actual and forecast transactions with affiliates.

Table 2.3.7
Transactions with Affiliates
($ millions)

		A	B	C	D
	Affiliate and Service	2018		2017-2018	
		PBR Forecast	Actual	PBR Forecast	Actual
1	**Revenues from the provision of services to the City of Edmonton**				
2	Public Fire Protection	11.4	11.3	22.2	22.3
3	Water sales	3.2	3.5	6.4	6.9
4	Other	0.2	0.0	0.4	0.1
5	Total	14.9	14.8	29.0	29.3
6	**Services provided by (recovered from):**				
7	**City of Edmonton**				
8	Franchise Fees	15.4	14.8	29.9	29.1
9	Property Taxes	0.4	0.2	0.9	0.5
10	Interest on City of Edmonton Debentures	0.7	0.7	1.6	1.6
11	Mobile equipment services	1.9	2.3	3.7	4.5
12	Other services	1.3	0.7	2.6	1.4
13	Meter Reading Recoveries	-	-	-	(1.4)
14	Total	19.7	18.7	38.7	35.6
15	**EPCOR Utilities Inc**.				
16	Corporate Shared Service Costs	15.3	12.0	30.3	24.9
17	Interest on Intercompany Debentures	33.7	32.8	65.2	64.0
18	Interest on Short-term debt	1.0	1.2	2.0	2.5
19	Total	50.0	46.0	97.5	91.4
20	**EPCOR Distribution and Transmission Inc.**				
21	Meter Reading Service Revenue	-	(0.0)	-	(0.5)
22	Other services	0.1	0.0	0.3	0.0
23	Total	0.1	(0.0)	0.3	(0.5)
24	**EPCOR Technologies Inc.**				
25	Hydrovac Charges and Space Rentals	0.9	1.7	1.8	2.9
26	**EPCOR Energy Alberta LP**				
27	Customer Billing and Collection Services	8.1	8.1	15.9	16.0
28	**EPCOR Power Development**				
29	Other Services (Recoveries)	-	(0.1)	-	(0.1)
30	**EPCOR Commercial Services**				
31	Commercial Services Rent Recoveries	-	(0.3)	-	(0.3)
32	**Other EWSI Business Units**				
33	EWSI Shared Services Allocation	10.0	9.2	19.9	18.8
34	Water Sales to Wastewater	(0.4)	(0.4)	(0.7)	(0.8)
35	Meter Reading Recoveries from Wastewater	(2.1)	(2.4)	(4.2)	(4.5)
36	Meter Reading Recoveries from Drainage Services	(2.1)	(2.4)	(4.2)	(2.8)

	Affiliate and Service	A	B	C	D
		2018		2017-2018	
		PBR Forecast	Actual	PBR Forecast	Actual
37	Customer Service Fees from Drainage Services	-	0.4	-	0.5
38	Quality Assurance Lab Testing and Other Services from Other EWSI Business Units	-	0.2	-	0.2
39	Total	5.5	4.6	10.8	11.4
40	**Expenditures on capital projects arising from services provided by:**				
41	City of Edmonton	3.1	0.4	6.1	1.9
42	EPCOR Technologies Inc.	3.9	4.0	7.7	8.7
43	EPCOR Utilities Inc.	-	0.9	-	1.6
44	EPCOR Drainage Services	-	3.3	-	4.2
45	EPCOR Distribution and Transmission Inc.	0.1	0.3	0.2	0.7
40	Other EPCOR Business Units	-	0.1	-	0.1
41	Total	7.0	8.9	14.1	17.2

2.4 Capital Programs

2.4.1 Capital Expenditures

Table 2.4.1 compares approved capital expenditures from the PBR forecast to actual capital expenditures for 2018 for each project with approved capital expenditures in excess of $5.0 million over the 2017-2021 PBR term, as well as for each project category. Table 2.4.1 also provides a comparison of total 2017-2021 approved capital expenditures to EWSI's current capital forecast.

Table 2.4.1
Capital Expenditures
($ millions)

		A	B	C	D	E	F	
		2018			2017 to 2021			
		PBR Forecast	Actual	Increase (Decrease)	PBR Forecast	Current Projection	Increase (Decrease)	
1	**Regulatory**							
2	Water Services Replace/Refurbish	2.0	1.8	(0.2)	10.2	9.6	(0.6)	
3	Projects < $5 Million	0.3	0.4	0.1	1.5	2.1	0.7	
4	Subtotal	2.3	2.2	(0.1)	11.6	11.7	0.1	
5	**Growth/Customer Requirements**							
6	LRT Relocates (NRA)	0.3	1.7	1.4	10.4	25.1	14.7	1
7	Network PD Transmission Mains	2.3	2.3	(0.1)	14.4	28.6	14.2	2
8	Discovery Park Reservoir (NRA)	-	0.0	0.0	-	7.8	7.8	3
9	Water Services Connections	4.4	7.2	2.8	23.6	27.5	3.9	4
10	Water Main Cost Sharing Program	0.5	1.7	1.2	3.0	5.8	2.8	5
11	New Water Distribution Mains	1.7	2.7	1.0	8.8	10.7	1.9	
12	New Meter Purchase/Installation	2.1	2.4	0.2	13.2	12.9	(0.3)	
13	Distribution System Modifications	1.5	0.7	(0.8)	6.0	4.9	(1.1)	
14	PD Construction Coordination	2.8	2.5	(0.3)	15.4	13.6	(1.9)	
15	Projects < $5 Million	0.2	3.0	2.8	2.6	9.1	6.6	6
16	Subtotal	15.8	24.2	8.4	97.5	146.0	48.5	
17	**Health, Safety & Environment**							
18	Accelerated Lead Service Replacement (NRA)	-	-	-	-	12.2	12.2	7
19	Phosphoric Injection for Lead Control (NRA)	-	0.1	0.1	-	9.3	9.3	7
20	E.L. Smith - Deep Bed Filtration	-	0.3	0.3	22.3	0.3	(22.0)	8
21	Projects < $5 Million	0.7	0.5	(0.3)	4.3	6.7	2.4	9
22	Subtotal	0.7	0.9	0.1	26.6	28.5	1.9	
23	**Reliability & Life Cycle Improvements**							
24	Structural Rehab Program - E.L. Smith	-	0.3	0.3	2.0	20.0	18.0	8
23	Plant Flood Protection (net)	-	0.0	0.0	-	7.4	7.4	10
26	Distribution Mains Obsolete Valve Replacement	0.8	1.3	0.5	4.1	9.7	5.6	11
27	Structural Upgrades - Reservoir	-	0.7	0.7	1.7	6.0	4.3	12
28	Electrical Upgrades – E.L Smith	-	0.7	0.7	4.7	8.9	4.2	13
29	Obsolete Hydrants Replacement Program	0.9	1.8	1.0	4.4	8.3	4.0	14
30	Chemfeed Upgrades – E.L Smith	1.0	1.1	0.0	4.0	7.4	3.4	15
31	Rossdale Filter Underdrain Upgrades	1.2	3.5	2.3	4.7	8.0	3.2	16
32	Transmission Mains Replacement/Refurbish	2.5	3.2	0.6	13.3	16.1	2.8	17
33	Chemfeed Upgrades - Rossdale	0.9	0.8	(0.1)	4.0	6.8	2.7	18
34	Mechanical Upgrades – E.L Smith	1.2	1.9	0.7	4.9	6.6	1.7	

		A	B	C	D	E	F	
		2018			2017 to 2021			
		PBR Forecast	Actual	Increase (Decrease)	PBR Forecast	Current Projection	Increase (Decrease)	
35	E.L. Smith - Bypass (Ring) Main	0.3	0.2	(0.1)	7.0	8.6	1.6	
36	Rossdale Clarifier C1-2 Upgrade	1.4	4.2	2.8	4.3	5.5	1.1	
37	Network Valve Chamber Refurbishment	1.1	1.2	0.1	5.6	5.9	0.3	
38	Water Main Reactive Renewal	9.6	12.0	2.4	54.7	54.7	0.1	
39	Water Main Proactive Renewal	3.5	3.8	0.3	18.0	18.0	(0.0)	
40	Vehicle & Fleet Additions	1.4	0.4	(1.0)	11.8	11.8	(0.0)	
41	Electrical Upgrades - Reservoirs	1.2	1.2	(0.0)	5.3	4.2	(1.1)	
42	Electrical Upgrades - Rossdale	0.9	0.9	(0.1)	5.2	3.7	(1.5)	
43	SCADA System Upgrade Program	1.1	1.2	0.1	5.7	4.0	(1.7)	
44	Cell/Pumphouse Roof Replacement	-	0.0	0.0	6.3	3.4	(2.9)	10
45	Water Meter Change Out Program	3.0	3.0	(0.0)	25.6	17.5	(8.2)	19
46	Projects < $5 Million	15.1	15.5	0.4	65.0	66.8	1.8	
47	Subtotal	47.2	58.9	11.6	262.4	309.2	46.9	
48	**Performance Efficiency & Improvement**							
49	Water D&T Facility Expansion	-	-	-	16.0	27.9	11.9	20
50	Water Main Cathodic Protection	4.1	3.2	(0.9)	21.0	18.6	(2.4)	21
51	Projects < $5 Million	3.3	0.7	(2.6)	7.1	6.9	(0.2)	
52	Subtotal	7.4	3.9	(3.5)	44.1	53.4	9.3	
53	**Accelerated**							
54	Accelerated Water Main Renewal	10.1	9.9	(0.3)	51.9	54.4	2.5	22
55	Accelerated Fire Protection	4.1	1.7	(2.4)	15.9	10.5	(5.5)	23
56	Subtotal	14.2	11.5	(2.7)	67.8	64.9	(3.0)	
57								
58	**E.L. Smith Solar Farm and Battery Storage (net)**	-	2.2	2.2	-	33.1	33.1	24
59	**Capital Expenditures before contributions**	87.7	103.8	16.1	510.1	646.8	136.7	
60	**Contributions**							
61	Water Services Connections	(1.7)	(4.3)	(2.5)	(23.6)	(20.6)	2.9	4
62	New Water Distribution Mains	(0.3)	(2.8)	(2.4)	(8.8)	(9.6)	(0.8)	
63	Other contributions	(4.4)	(0.3)	4.1	(1.9)	(1.7)	0.2	
64	Subtotal	(6.4)	(7.4)	(0.9)	(34.3)	(32.0)	2.3	
65	**Capital Expenditures**	**81.2**	**96.4**	**15.2**	**475.8**	**614.8**	**139.0**	

Explanations for differences between PBR forecast capital expenditures for 2017 to 2021 and EWSI's current projection in excess of $2.0 million on individual projects with total costs in excess of $5.0 million, as well as for project categories in aggregate include:

1. **LRT Relocates (NRA)** – $14.7 million (141%) greater than forecast. Changes to track alignments, as well as the accelerated construction schedule for the West Valley Line LRT project have resulted in increases to the projected costs of utility relocations. As noted in Section 1.5, EWSI plans to request a non-routine adjustment to rates to offset the revenue requirement impacts of the additional work needed to accommodate water main, hydrant and sewer relocations for this project
2. **Network PD Transmission Mains** – $14.2 million (100%) greater than forecast. Since developers determine both the timing of projects and the areas to be developed, expenditures on this program have proven difficult to forecast. Significant additions to this program include transmission main projects for Ellerslie Road, 28th Avenue SW, and the Horse Hills/Marquis industrial area.
3. **Discovery Park Reservoir (NRA)** – $7.8 million (new project). This project includes the cost of infrastructure (reservoir, pump house and transmission mains) in land annexed by the City of Edmonton. As noted in Section 1.5, EWSI plans to request a non-routine adjustment to rates to offset the revenue requirement impacts of this project.
4. **Water Services Connections (net of contributions)** – $6.8 (100%) million greater than forecast. Contributions from private developers are meant to recover 100% of the cost of for new water service connections. In 2018, EWSI found that after accounting for all program costs, its service application rates provided for recovery of less than 75% of the cost of new services. EWSI is currently reviewing the program to determine if modifications to the program are required.
5. **Water Main Cost Sharing Program** – $2.8 million (92%) greater than forecast. Similar to Network PD Transmission Mains, the costs of this program are driven by developer activity. The increase in the costs of this program result from higher than forecast increases in developer activity.
6. **Growth and Customer Requirements < $5.0 million** – $6.6 million (256%) greater than forecast. The projected increase in this category results from a new booster station project needed to address development in a high elevation area ($1.7 million); additional costs to acquire water mains from regional water commissions following city expansion ($4.6 million); and changes to projected costs for other growth projects amounting to $0.3 million.
7. **Accelerated Lead Service Replacement & Phosphoric Injection for Lead Control (NRA)** – $21.5 million (new projects). These projects are required to implement EWSI's lead mitigation strategy, including introducing orthophosphate into drinking water to inhibit corrosion and accelerating the replacement of lead service lines in high priority homes. As noted in Section 1.5, in April 2018, EWSI submitted a request for a non-routine adjustment to rates to offset the revenue requirement impacts of these projects.
8. **E.L. Smith - Deep Bed Filtration** – $22.0 million (99%) less than forecast and **Structural Rehab Program - E.L. Smith** – $18.0 million (895%) greater than forecast. During engineering inspections in 2018, EWSI identified immediate needs for structural rehabilitation of the E.L. Smith filter chambers. Accordingly, the conversion to deep bed has been postponed until after the end of the current PBR term, so that the required structural rehabilitation and upgrades can be completed.
9. **Health, Safety and Environment < $5.0 million** – $2.4 million (55%) more than forecast. This increase is largely attributable to a new low lift pump house chlorinated waste cross connection

project at EL Smith ($2.7 million). This project will reduce the likelihood of chlorinated water being released into the river during screen flushing.

10. **Plant Flood Protection (net)** – $7.4 million (new project). This program is designed to improve the water treatment plants' resiliency in the event of a flood, so that the plants are protected from catastrophic damage, and that water treatment can be resumed as quickly as possible after a flood event. Forecast costs are net of anticipated funding from the Alberta Community Resilience Program and the Disaster Mitigation and Adaptation Fund. The timing of this project has been advanced from future periods both to recognize the vulnerability of the water treatment plants and to maximize available grant funding.
11. **Distribution Mains Obsolete Valve Replacement** – $5.6 million (136%) greater than forecast. Higher than expected rates of deterioration have led to increased backlog, requiring adjustments to valve replacement schedules. Although the projected cost of this program has increased substantially, improving overall valve operability in the system reduces isolation time, lessens the potential for property damage and mitigates customer impacts during emergency main break response.
12. **Structural Upgrades - Reservoir** – $4.3 million (251%) greater than forecast and **Cell and Pumphouse Roof Replacement** – $2.9 million (46%) less than forecast. These differences are largely due to changes to the scope of these programs which have resulted in reclassifying reservoir roof replacement projects to structural upgrades. This change allows for more efficient project delivery and improvements to project management and coordination.
13. **Electrical Upgrades – E.L Smith** – $4.2 million (90%) greater than forecast. This increase is due to an anticipated need to construct a new electrical room to allow for replacement of end-of-life electrical equipment.
14. **Obsolete Hydrant Replacement Program** – $4.0 million (91%) greater than forecast. Similar to the obsolete valve replacement program, higher than expected rates of deterioration have led to increased backlogs. EWSI has adjusted its hydrant replacement schedule to clear backlogs and ensure fire protection service levels maintained.
15. **Chemfeed Upgrades – E.L Smith** – $3.4 million (84%) greater than forecast. Higher than estimated costs for a large fluoride room upgrade to replace end-of-life equipment, and unanticipated upgrades to the sodium hypochlorite room, including new generation cells, are the primary factors contributing to increases in the cost of this program.
16. **Rossdale Filter Underdrain Upgrades** – $3.2 million (69%) greater than forecast. Both the scope and cost of this project have increased following an inspection of the filter underdrain system that identified unforeseen needs for upgrades to air scour systems.
17. **Transmission Mains Replacement/Refurbishment** – $2.8 million (21%) greater than forecast. Construction costs have been higher than originally anticipated due to adverse conditions in the field and increased complexity of the work needed to refurbish aging transmission mains.
18. **Chemfeed Upgrades - Rossdale** – $2.7 million (68%) greater than forecast. EWSI identified significant health, safety and environmental needs, requiring extensive upgrades to the sodium bisulphite room.

19. **Water Meter Change out Program** – $8.2 million (32%) less than forecast. The decrease in the projected cost of this program results from an improvement in the expected lives of the batteries used in the meters. As a result, fewer meters are expected to require replacement.
20. **Water D&T Facility Expansion** – $11.9 million (74%) greater than forecast. Completion of the D&T Facility was originally planned for 2017. This project has been re-scoped following the transfer of Drainage to EPCOR and the completion of an EPCOR-wide real estate review. Instead of a stand-alone Water D&T facility, the review concluded that a consolidated solution for Water and Drainage would provide long-term synergies and operational efficiencies that would outweigh its additional capital costs. Design of the consolidated facility is currently underway and construction is forecast to be substantially complete in 2021.
21. **Water Main Cathodic Protection** – $2.4 million (12%) less than forecast. The reduction in the project costs of the program result from adoption of more efficient anode installation processes.
22. **Accelerated Water Main Renewal** – $2.5 million (5%) greater than forecast. EWSI has identified an increased number of sub-projects that meet the criteria for accelerated renewal, especially to accommodate water main replacement in conjunction with the City of Edmonton's Alley Paving program. The increase in costs for this program will be entirely offset by lower than approved expenditures on Accelerated Fire Protection.
23. **Accelerated Fire Protection** – $5.5 million (34%) less than forecast. EWSI expects that expenditures over the remainder of the 2017-2021 PBR term will be less than approved amounts, due to a smaller number of potential sub-projects meeting the Accelerated Fire Protection Program criteria.
24. **E.L. Smith Solar Farm and Battery Storage (net of contributions)** – $32.6 million (new project). As noted in section 2.3.2, instead of purchasing locally produced renewable power at an annual cost of $1.9 million, EWSI plans to construct a solar farm at E.L. Smith. Current plans for the solar farm include a battery storage system that would be almost entirely grant-funded.

2.4.2 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) in the year, the capital expenditures on that project remain in Construction Work in Progress and are excluded from the rate base. In 2018, as shown on Table 2.4.2, the balance in Construction Work in Progress was $10.1 million greater than forecast, of which $1.7 million was attributable to higher than forecast carry-over projects from 2017, $3.7 million was attributable to the E.L. Smith solar project, with the remainder attributable to carry-over projects for 2018.

Table 2.4.2
Construction Work in Progress
($ millions)

		A	B	C	D
Construction Work in Progress		**2018**		**2017-2018**	
		PBR Forecast	**Actual**	**PBR Forecast**	**Actual**
1	Balance, beginning of period	5.0	11.7	0.3	3.8
2	Capital Expenditures	81.2	96.4	189.2	194.5
3	Capital Additions	(83.1)	(94.9)	(186.4)	(185.1)
4	**Balance, end of period**	**3.1**	**13.2**	**3.1**	**13.2**

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 2018, AFUDC included in capital expenditures on eligible projects amounted to $0.6 million, compared to the PBR forecast amount of $0.2 million.

2.5 Operational Performance

2.5.1 Water Quality Index

The Water Quality index is calculated as the percentage of water quality test results that meet EWSI's internal water standards. Water quality standards are established by both the federal and provincial governments and are incorporated into EWSI's Approval to Operate from Alberta Environment and Parks (AEP). In some cases, EWSI sets even stricter limits for critical parameters that are identified in EWSI Quality Standards, to provide early warnings of potential water quality problems; so that corrective actions can be taken before external standards are not met.

Table 2.5.1
Water Quality Index

Index Component	PBR Performance Measure	Standard	Actual Score	Index
Water Quality Index	The percentage of the total number of water quality tests taken in the period that do not yield suspect results	> 99.7%	99.8%	1.001
			Average Index	1.001
			Index Standard Points	25.0
			Total Actual Points	25.0
			Maximum Available Points Including Bonus Points	25.5
			Total Points Earned	**25.0**

2018 Highlights

- EWSI met all Health Canada Drinking Water Quality Guidelines and AEP water quality testing requirements in 2018. EWSI collected 60,610 samples of treated drinking water in 2018. Of those samples only 114 (0.2%) did not meet EWSI internal water quality standards.

- The majority of variances from EWSI internal water quality standards in 2018 were related to temporary increases in turbidity and/or decreases in chlorine concentrations in samples collected from the distribution system following main break repairs and other maintenance work.

2019 Areas for Improvement

- EWSI is developing a rapid-field test for ensuring the microbial quality of water levels related to distribution main flushing activities. This test will support required Total Coliforms (TC) and *E. coli* (EC) testing while ensuring effective flushing. The new test is expected to reduce the number of variances in EC/TC testing and decrease the time of water outages.

2.5.2 Customer Service Index

The customer service index is a composite measure of the customers' perception of satisfaction with EWSI service, the aesthetic quality of water and speed of response to customer issues.

Table 2.5.2
Customer Service Index

Index Component	PBR Performance Measure	Standard	Actual Score	Index
Post Service Audit Factor	The percentage of the customers responding as "completely" or "very satisfied" in the level of service received from the EWSI Emergency group.	> 74.9%	71.3%	0.952
Home Sniffing Factor	The percentage result of customer satisfaction for the home sniffing survey.	> 94.4%	92.8%	0.983
Response Time Factor	The average number of minutes needed to confirm a water main break from the time a call is received at EWSI's dispatch office.	< 25	20.7	1.171
Planned Construction Impact Factor	The percentage of the total planned construction events where EWSI complies with required construction notification procedures.	> 95.8%	96.2%	1.004
			Average Index	1.028
			Index Standard Points	20.0
			Total Actual Points	20.6
			Maximum Available Points Including Bonus Points	23.0
			Total Points Earned	**20.6**

2018 Highlights

- **Planned Construction Impact Factor**. In 2018, EWSI introduced process improvements, including: providing training to project teams to ensure that appropriate notification timelines are followed; streamlining the notification process between in-house crews and contractors; implementing proactive construction communication plans; and enhancing field systems to improve real-time tracking of construction dates and project completion progress. Additional improvements are planned for 2019 to improve construction timelines and maintain customer service as a priority.

2019 Areas for Improvement

- **Post Service Audit Factor**. After a decline in results in 2017, EWSI conducted a root cause analysis that identified a need to create a customer service culture with a focus on quality reviews and coaching. Process improvements designed to improve the customer experience were implemented in 2018, with survey results improving during the latter part of the year. In 2019, EWSI will pursue further improvements in the areas of timely response and first call resolution, and will continue its comprehensive review of processes and procedures related to customer interactions, and how employees interact with customers on a daily basis.
- **Home Sniffing Factor.** In 2018 the Home Sniffing Factor was significantly challenged. The Home Sniffing program is designed to measure the impact of spring run-off in the river and the effectiveness of water treatment during the run-off period at mitigating spring-run off related odours at the tap. For reasons that are still unknown, a small number of the approximately 100 customers that participated in the survey responded negatively to odours in their water in March, well before the occurrence of spring run-off in April. This resulted in a reduction in the overall % satisfaction score and inability to meet the target for the three month campaign. This performance measure at the target of 94.4% is sensitive to the responses of a relatively small number of customers. In 2019, EWSI will be doubling the size of the home sniffing panel to increase the statistical robustness of the calculated performance measure.

2.5.3 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.

Table 2.5.3
System Reliability and Optimization Index

Index Component	PBR Performance Measure	Standard	Actual Score	Index
Water Main Break Factor	The number of water main breaks that occurred in the reporting period.	< 419	345	1.177
Water Main Break Repair Duration Factor	The percentage of water main breaks repaired and confirmed by EWSI within 24 hours from the time that the flow of water is shut off, excluding main breaks on arterial or collector roads	> 93.7%	96.0%	1.024
Water Loss Factor	The Infrastructure Leakage Index, a performance indicator quantifying how well a water distribution system is managed for the control of “real” water losses (i.e. leakage).	< 2.0	0.90	1.550
System Energy Efficiency Factor	The energy used at all water facilities in kWh divided by the average annual water production per residential customer account (ML/kWh/customer).	< 309	257	1.203
			Average index	1.238
			Index Standard Points	25.0
			Total Actual Points	30.9
			Maximum Available Points Including Bonus Points	28.5

Index Component	PBR Performance Measure	Standard	Actual Score	Index
			Total Points Earned	28.5

2018 Highlights

- **Water Main Break Factor.** EWSI experienced 345 water main breaks in 2018, 74 less than the PBR standard of 419. This result highlights the effectiveness of EWSI's water main replacement programs, which are expected to further reduce the number of main breaks in future years.
- **Water Main Break Repair Duration Factor.** In 2018, 98.3% of main breaks were repaired within 24 hours, exceeding the PBR standard of 96%. When a water main break repair approaches 20 hours in duration EWSI has a triage process that includes providing additional communication to affected customers. If required. EWSI also aims to provide temporary water supply support via water tanks, hose hook ups or delivery of water jugs to affected customers.
- **Water Loss Factor (ILI).** EWSI's ILI of 0.90 significantly exceeded the PBR standard and is near the theoretical lowest level of leakage expected given the water supply system characteristics. An AWWA Water Audit Validation exercise was conducted to provide additional understanding of the system and identification of potential opportunities for further system improvement.
- **System Energy Efficiency Factor.** EWSI's major energy efficiency initiatives focused on three main aspects: continue to improve building envelops for higher energy efficiency and GHG emission reduction; implement operational changes to assist in the monitoring of operations and equipment performance; and develop plans for implementing solar generation or green energy for operations.

2.5.4 Environment Index

The environmental index measures the success of programs and policies designed to mitigate and report adverse environmental impacts.

Table 2.5.4
Environmental Index

Index Component	PBR Performance Measure	Standard	Actual Score	Index
Water Conservation Factor	The actual 10 year rolling average monthly Edmonton residential consumption per household	<17.2	15.8	1.089
Environment Incident Factor	The number of reportable and preventable environmental incidents	<6	4	1.463
Solids Residual Management Factor	The average number of days that the Rossdale and E.L. Smith water treatment plants are operating in direct filtration mode.	> 120	95.8	0.799
			Average index	1.117
			Index Standard Points	15.0
			Total Actual Points	16.8
			Maximum Available Points Including Bonus Points	16.5
			Total Points Earned	**16.5**

2018 Highlights

- **Environment Incidents.** The Environmental Compliance Assurance Program (ECAP) was implemented at EPCOR Water in late 2017 and included elements such as tracking of compliance obligations, approvals and permits, and project reviews. With ECAP in place, only four environmental incidents, that met the preventable criteria, were reported in 2018. All four incidents were investigated to determine root causes and corrective actions were assigned.

2019 Areas for Improvement

- **Solids Residual Management Factor.** In 2018, the water treatment plants were only able to achieve 96 days in direct filtration operation relative to the target of 120 days, due to naturally occurring high colour in the river during the fall and early winter. In 2019, EWSI will continue to trial different types of polymer and investigate strategies for dosing during transition from conventional treatment to direct filtration in an effort to extend the number of days in direct filtration and further reduce solids discharged to the North Saskatchewan River from the water treatment plants.

2.5.5 Safety Index

The safety index is a measure of the success of programs and the application of policies that maximizes the safety of employees and the public.

Table 2.5.5
Safety Index

Index Component	PBR Performance Measure	Standard	Actual Score	Index
Near Miss Reporting Factor	The number of near miss reports entered in the ESS system.	>550	855	1.555
Work Site Inspections and Observations Factor	Number of Work Site Inspections and observations completed per year.	>1,032	2,720	2.636
Lost Time Frequency Factor	The actual lost time frequency rate.	<0.57	0.38	1.500
All Injury Frequency Factor	The actual all injury frequency rate	< 1.54	1.72	0.895
			Average index	1.646
			Index Standard Points	15.0
			Total Actual Points	24.7
			Maximum Available Points Including Bonus Points	16.5
			Total Points Earned	**16.5**

2018 Highlights

- EWSI's continued focus on safety has enabled In-City Water to earn maximum points on the safety index, with EWSI experiencing only two lost time injury events: a reaction to an insect bite; and a slip and fall. Even so, the all injury frequency rate ended higher than target, with In-City Water. Internal investigation showed that these injuries were the result of lower risk situational hazards. In 2019, In-City Water will focus on improving safe work planning to incorporate situational awareness and focusing on low risk hazards when going to and from the job.

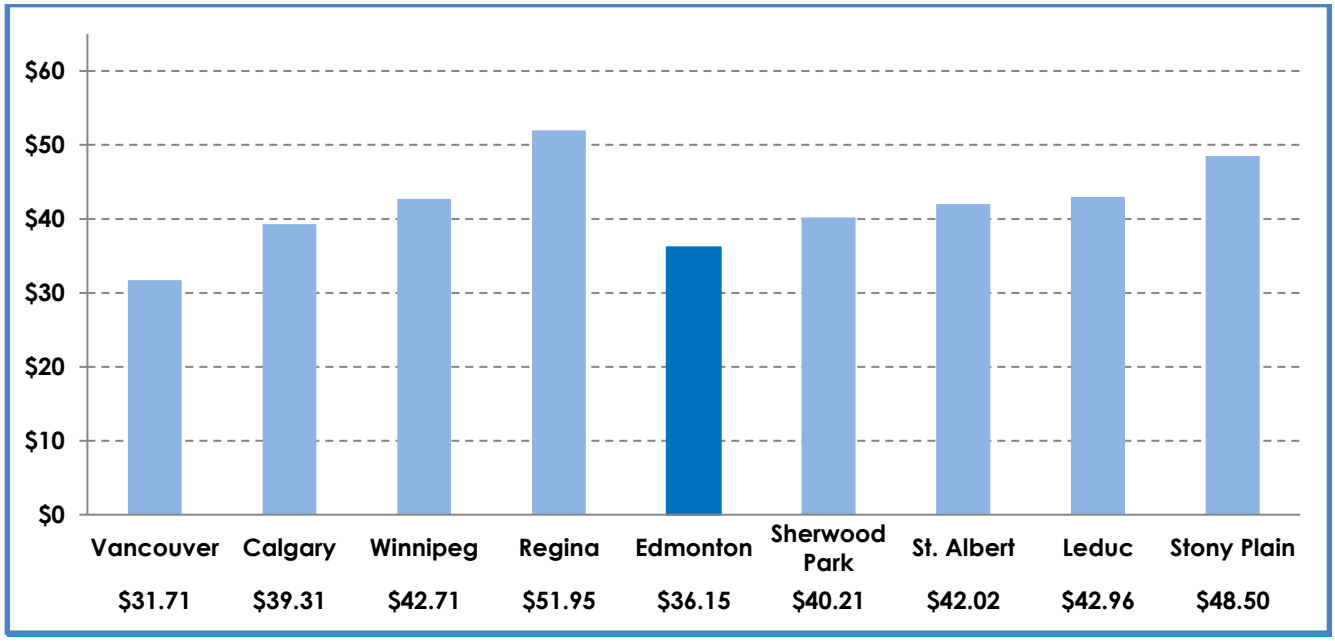
2.6 Rates and Bill Comparisons

Water bill comparisons for 2018 are based on the published water rates for Calgary, Vancouver, Winnipeg and Regina, as well as four local communities. These bill comparisons represent the total cost to the customer and include fixed charges, consumption charges and any other applicable surcharges.

2.6.1 Residential Water Bills

Figure 2.6.1 provides a comparison of residential household water bills for residential household consumption of 14.4 m^3 per month, the average residential customer consumption per month in Edmonton in 2018. Comparison of residential water bills shows that Edmonton's water bills are lower than all of the cities and local communities surveyed, except for Vancouver. This result is not unexpected; Vancouver has an excellent raw water source and, therefore, has lower needs for water treatment than Edmonton which has a naturally highly variable water source in the North Saskatchewan River.

Figure 2.6.1
2018 Monthly Residential Water Bill Comparison
(14.4 m^3/month)



2.6.2 Commercial Water Bills

Table 2.6.2 provides a comparison of the water bills for commercial customer of various sizes. This table shows that water bills for EWSI's commercial customers are lower than all of the other surrounding communities and other major cities in western Canada, except for higher volume customers in Vancouver and mid sized customers in Calgary.

Table 2.6.2
Commercial Monthly Water Bill Comparison
($ per month)

		A	B	C	D
	Monthly Bill - $ per month	**Small**	**Medium**	**Large**	**Extra Large**
1	**Monthly Consumption** - m^3	**10**	**250**	**1,000**	**5,000**
2	Vancouver	26.91	288.78	1,199	5,720
3	Calgary	44.54	389.65	1,471	7,545
4	Regina	43.50	513.90	2,187	10,305
5	Winnipeg	34.70	473.60	1,892	9,271
6	**Edmonton**	**25.40**	**390.34**	**1,557**	**6,562**
7	St. Albert	34.67	435.47	1,688	8,368
8	Sherwood Park	29.56	610.36	2,425	12,105
9	Stony Plain	37.22	544.18	2,128	10,578
10	Leduc	32.84	597.20	2,484	11,826

3 Wastewater Treatment Services

3.1 Accomplishments and Challenges

In 2018, Wastewater's key accomplishments included:

- Undertaking a detailed review and update of Wastewater's long term Integrated Resource Plan (IRP). Wastewater's IRP encompasses: customer growth; changes to provincial regulatory frameworks; technology; asset management; and health, safety and environmental considerations. The IRP provides a roadmap for enabling Wastewater to meet Edmonton's future growth demands and potential future effluent quality standards, within the existing footprint of the plant;
- Enhancing planning and design of the Gold Bar Operations Centre, including: mitigating safety concerns by relocating non-process functions from the center of the plant, alleviating congestion on site, providing proper hygiene facilities for employees; and incorporating feedback received during public consultation;
- Initiating an assessment of opportunities to increase biogas utilization. Currently, Wastewater is able to use only 30% to 70% of the biogas produced on site for heating. Wastewater is exploring opportunities to capture, clean and inject unutilized biogas into ATCO's natural gas distribution system, offsetting the use of non-renewable natural gas, and almost entirely eliminating flaring of biogas; and
- Continuing to focus on internal labour to deliver capital projects has allowed Wastewater to leverage in house expertise, reduce reliance on external contractors, thereby providing significant cost saving in engineering and maintenance functions.

3.2 Customers and Consumption

Wastewater's customer counts, consumption and consumption per customer are similar to those of In-City Water. 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, such as 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 3.2 below provides a comparison of 2018 and 2017-2018 forecast to actual customer counts and consumption per customer.

Table 3.2
Customers, Consumption and Consumption per Customer

		A	B	C	D
	Customers and Consumption	2018		2017-2018	
		PBR Forecast	Actual	PBR Forecast	Actual
	Customers				
1	Residential	261,058	264,381	258,624	261,809
2	Multi-Residential	3,791	3,765	3,769	3,758
3	Commercial	16,752	16,846	16,644	16,738
4	Total	281,601	284,992	279,037	282,305

	Customers and Consumption	A 2018 PBR Forecast	B 2018 Actual	C 2017-2018 PBR Forecast	D 2017-2018 Actual
	Monthly Consumption per Customer				
5	Residential	14.4	14.5	14.5	14.5
6	Multi-Residential	408.8	391.3	408.8	393.3
7	Commercial	122.9	117.1	123.8	118.2
	Annual Consumption - ML				
8	Residential	45,112.6	45,900.9	90,148.3	91,269.6
9	Multi-Residential	18,598.6	17,679.2	36,976.7	35,474.1
10	Commercial	24,695.5	23,675.1	49,470.4	47,473.4
11	Total	88,406.7	87,255.2	176,595.5	174,217.1

Actual to forecast differences in Wastewater's customer counts and consumption are attributable to the same factors discussed in Section 2.2.

3.3 Financial Performance

Wastewater's revenue requirements are summarized on Table 3.3 below.

Table 3.3
Wastewater Revenue Requirements
($ millions)

	Summary of Revenue Requirements	A 2018 PBR Forecast	B 2018 Actual	C 2017-2018 PBR Forecast	D 2017-2018 Actual
1	Wastewater Rate Revenue*	92.5	89.8	179.2	174.4
	Wastewater Revenue Requirement				
2	Operating expenses	55.6	49.1	109.6	96.2
3	Other revenue	(6.5)	(6.2)	(12.7)	(12.4)
4	Depreciation and amortization	15.7	16.0	29.6	30.4
5	Return on rate base financed by debt	11.5	10.9	21.5	21
6	Return on rate base financed by equity	17.8	20.0	33.9	39.2
7	Wastewater Revenue Requirement*	94.1	89.8	181.9	174.4
8	**Return on Rate Base Financed by Equity**	**10.18%**	**12.14%**	**10.18%**	**12.37%**

* In the PBR forecast, rebasing and other special rate adjustments have been smoothed over the PBR term. Therefore, although forecast revenue is equal to the revenue requirement over the 2017-2021 PBR term, in any year within the PBR term, forecast revenue may be greater or less than the revenue requirement

Detailed explanations for forecast to actual variances for each of the elements of the revenue requirement are provided in sections 3.3.1 to 3.3.6.

3.3.1 Revenue

Wastewater's rate revenues 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 also has a relatively small amount of other revenue, about 60% of which relates to

overstrength surcharges that are subject to the same rate adjustment mechanism as Wastewater's rate revenue. Table 3.3.1 below provides a comparison of Wastewater's 2018 actual and forecast revenue.

Table 3.3.1
Wastewater Revenue
($ millions)

		A	B	C	D
	Wastewater Revenue	**2018**		**2017-2018**	
		PBR Forecast	**Actual**	**PBR Forecast**	**Actual**
	Fixed Monthly Service Charges				
1	Residential	14.5	13.5	27.8	26.8
2	Multi-Residential	0.2	0.2	0.4	0.4
3	Commercial	0.9	0.9	1.8	1.7
4	Fixed Monthly Service Charges	15.6	14.6	30.0	28.9
	Consumption Charges				
5	Residential	39.9	40.2	77.3	77.3
6	Multi-Residential	16.4	15.4	31.7	30.0
7	Commercial	20.7	19.7	40.1	38.2
8	Consumption Charges	76.9	75.2	149.2	145.5
9	Wastewater Rate Revenue	92.5	89.8	179.2	174.4
10	Other Revenue	6.5	6.2	12.7	12.4
11	**Total Wastewater Revenue**	**99.0**	**96.0**	**191.9**	**186.8**

Wastewater's revenues were $3.0 million less than forecast in 2018, and $4.7 million less than forecast over the 2017-2018 PBR period. This difference is attributable to three factors:

- Lower than forecast inflation resulted in a $1.0 million decrease in revenue in 2018 ($1.9 million for 2017-2018). Since rate increases are capped at inflation less the efficiency factor ("i-x"), lower than forecast inflation in 2017 and 2018 will continue to impact revenues throughout the remainder of the 2017-2021 PBR term;
- Lower than forecast consumption (2018 - $1.2 million, 2017-2018 $2.4 million). As with Water, while residential consumption per customer is unchanged from the PBR forecast, unexpected decreases in per customer consumption in the commercial and multi-residential customer classes continue to be a source of concern. Accordingly, EWSI is working to enhance consumption forecasting processes for the commercial and multi-residential customer classes; and
- The non-routine adjustment related to the transfer of Drainage Services to EPCOR (see Section 1.5) has reduced revenues by $0.8 million in 2018 (also $0.8 million in 2017-2018).

3.3.2 Operating Expenses by Function

Wastewater's operating expenses are presented and analyzed on both functional and cost category bases. Actual and forecast operating expenses by function are shown in Table 3.3.2 below:

Table 3.3.2
Operating Expenses by Function
($ millions)

		A	B	C	D
	Function and Sub-function	2018		2017-2018	
		PBR Forecast	Actual	PBR Forecast	Actual
	Power, Other Utilities and Chemicals				
1	Power and Other Utilities	5.3	4.7	10.6	9.4
2	Chemicals	1.6	1.2	3.2	2.2
3	Power, Other Utilities and Chemicals	6.9	5.9	13.7	11.6
	Wastewater Treatment				
4	Wastewater Treatment Plant	18.8	17.7	37.2	34.9
5	Operations Support Services	8.2	6.3	16.1	12.8
6	Capitalized Overhead	(2.4)	(2.9)	(4.7)	(6.0)
7	Wastewater Treatment	24.6	21.1	48.6	41.7
	Billing, Meters and Customer Service				
8	Billing and collections	3.3	3.1	6.5	6.4
9	Meter reading	2.4	2.4	4.7	4.5
10	Regulatory Services	1.0	1.4	2.0	2.4
11	Billing, Meters and Customer Service	6.7	6.9	13.2	13.4
	EWSI Shared Services				
12	EWSI Shared Services	3.4	3.1	6.7	6.3
13	Incentive and Other Compensation	1.1	0.8	2.3	0.8
14	EWSI Shared Services	4.5	3.9	9.0	7.0
15	Corporate Shared Services	5.0	3.8	9.8	7.9
	Franchise Fees and Property Taxes				
16	Franchise Fees	7.1	7.0	14.0	13.6
17	Property Taxes	0.8	0.6	1.4	1.2
18	Franchise Fees and Property Taxes	8.0	7.6	15.3	14.8
19	**Total Operating Expenses by Function**	**55.7**	**49.1**	**109.7**	**96.3**

Overall, Wastewater's operating expenses for 2018 were $6.5 million less than forecast ($13.3 million less for 2017-2018). Key factors contributing to this difference include:

- **Power and Other Utilities** - $0.6 million less than forecast in 2018, ($1.2 million less for 2017-2018), due to lower than forecast power prices.
- **Chemicals -** $0.4 million less than forecast in 2018 ($1.0 million less for 2017-2018), primarily attributable to two factors. First, the Ostara nutrient removal facility was offline more than expected, resulting in lower chemical usage throughout 2017 and 2018. Second, process and dosing optimization enabled Wastewater to achieve significant reductions in alum usage in both 2017 and 2018.
- **Wastewater Treatment** - $3.5 million less than forecast in 2018 ($6.9 million less for 2017-2018). The favourable variance is primarily attributable to adjustments to the capital program, where projects with a high component of contractor costs have been replaced by capital maintenance and repair projects completed by Wastewater personnel. These changes have led to capitalization of an additional $2.0 million of internal labour costs that would otherwise have been expensed ($3.9 million for 2017-2018) and additional capitalized overheads of $0.5 million in 2018 ($1.3 million for 2017-2018). Besides these changes, the favourable variance also reflects lower than forecast fringe benefits costs of $0.5 million in 2018 ($0.9 million for 2017-2018) related to lower pension

contributions, and $0.6 million in savings in contractor costs ($0.7 million for 2017-2018) resulting from dissolution of the Centre for Excellence. The remainder of the variance results from numerous small items, none of which are individually significant.

- **EWSI Shared Services** - $0.7 million less than forecast in 2018 ($1.9 million less for 2017-2018). Lower than forecast costs in this category reflect a $0.4 million reduction in business unit allocations related to the transfer of Drainage Services to EPCOR ($0.7 for 2017-2018), and $0.2 million of savings in long term disability premiums ($0.6 million for 2017-2018). The remainder of the variance results from numerous small items, none of which are individually significant.
- **Corporate Shared Services** - $1.1 million less than forecast in 2018 ($1.9 million less for 2017-2018). These differences reflects both the reduction in corporate cost allocations resulting from the transfer of Drainage from the City of Edmonton to EPCOR Utilities Inc., as well as cost savings in corporate functions. As with In-City Water, the cost reductions arising from the transfer of Drainage Services have been returned to Wastewater customers through a non-routine adjustment to 2018 water rates.
- **Franchise Fees and Property Taxes** - $0.4 million less than forecast in 2018 ($0.6 million less for 2017-2018). As with water, lower than forecast franchise fees reflect lower than forecast revenues.

3.3.3 Operating Expenses by Cost Category

Table 3.3.3 shows operating expenses by cost category for Wastewater Treatment Plant Operations, Billing Meters and Customer Service, and EWSI Shared Services, where cost categories differ from the sub-functions in Section 3.3.2.

Table 3.3.3
Operating Costs by Cost Category
($ millions)

		A	B	C	D
	Cost Category	2018		2017-2018	
		PBR Forecast	Actual	PBR Forecast	Actual
	Wastewater Treatment				
1	Staff Costs and Employee Benefits	17.5	15.0	34.6	29.2
2	Contractors and Consultants	4.1	3.6	8.0	7.5
3	Materials and Supplies	2.0	2.0	4.0	4.4
4	Other	1.0	0.5	2.0	0.6
5	Wastewater Treatment Expenses	24.6	21.1	48.6	41.7
	Billing, Meters and Customer Service				
6	CUS Charges	3.3	3.1	6.5	6.4
7	Contractors and Consultants	3.4	3.8	6.7	6.9
8	Billings, Meters and Customer Services Expenses	6.7	6.9	13.2	13.4
	EWSI Shared Services				
9	EWSI Shared Services Allocation	3.1	2.7	6.2	5.5
10	Staff Costs and Employee Benefits	1.3	1.1	2.5	1.4
11	Other	0.1	0.1	0.2	0.1
12	EWSI Shared Services Expenses	4.5	3.9	9.0	7.0

The information presented in this table supports the explanations of differences between 2017 actual and forecast expenses provided in Section 3.3.3. Accordingly, no additional explanations are considered necessary.

3.3.4 Depreciation and Amortization

Wastewater's depreciation expense and amortization of contributed assets for 2018 are shown in Tables 3.3.4 below:

Table 3.3.4
Depreciation and Amortization
($ millions)

		A	B	C	D
	Depreciation and Amortization	**2018**		**2017-2018**	
		PBR Forecast	**Actual**	**PBR Forecast**	**Actual**
1	Gross depreciation expense	16.6	17.0	31.5	32.3
2	Amortization of contributions	(0.9)	(0.9)	(1.9)	(1.9)
3	**Depreciation, net**	**15.7**	**16.0**	**29.6**	**30.8**

Wastewater's 2018 depreciation expense was $0.4 million greater than forecast ($0.8 million greater for 2017-2018), even though plant in service was $47.4 million (8%) less than forecast at December 31, 2018 (Table 3.3.5, line 4). This difference results from adjustments to Wastewater's capital program where asset replacement projects were replaced with capital maintenance and repair projects, which have higher effective depreciation rates than asset replacements. In the PBR forecast depreciation expense was calculated as if all asset additions related to new assets, rather than repair or to overhauls of existing assets. EWSI expects that the effect of higher than forecast depreciation rates will continue through the remainder of the 2017-2021 PBR term.

3.3.5 Rate Base

Wastewater's 2018 mid-year rate base, shown in Table 3.3.5 below, was $24.1 million less than forecast, reflecting lower than forecast capital additions in 2017 resulting from project deferrals and the other adjustments to the capital program described in Section 3.4.1.

Table 3.3.5
Mid-Year Rate Base
($ millions)

		A	B
	Components of Mid-Year Rate Base, net of Contributions	**2018**	
		PBR Forecast	**Actual**
	Plant in Service		
1	Balance, beginning of year	587.1	547.8
2	Capital additions	52.3	52.1
3	Retirements and adjustments	-	(8.0)
4	Balance, end of year	639.4	592.0
5	Mid-Year Plant in service	613.3	569.9
	Accumulated Depreciation		

		A	B
		2018	
	Components of Mid-Year Rate Base, net of Contributions	PBR Forecast	Actual
6	Balance, beginning of year	151.2	136.2
7	Depreciation expense	16.6	17.0
8	Retirements and adjustments	-	(8.0)
9	Balance, end of year	167.8	145.1
10	Mid-Year Accumulated Depreciation	159.5	140.6
	Other Rate Base Items		
11	Working Capital	5.7	5.9
12	Materials and Supplies	1.7	1.7
13	**Gross Mid-Year Rate Base**	**461.2**	**436.8**
	Contributions		
14	Balance, beginning of year	41.0	41.0
15	Contributions in aid of construction	-	-
16	Balance, end of year	41.0	41.0
17	Mid-Year Contributions	41.0	41.0
18	Accumulated Amortization	16.5	16.5
19	Balance, beginning of year	0.9	0.9
20	Amortization of contributions	17.5	17.5
21	Balance, end of year	17.0	17.0
22	Mid-Year Accumulated Amortization	16.5	16.5
23	**Mid-Year Contributions**	**24.0**	24.0
24	**Mid-Year Rate Base**	**437.3**	**412.8**

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 rate payers. The cost of operating these assets, as well as any related revenues are also excluded from Wastewater's financial results.

3.3.6 Return on Rate Base

In 2018, Wastewater's return on equity was $2.2 million (1.86%) greater than forecast and $5.3 million (2.19%) greater for 2017-2018. In 2018, higher than forecast net income accounted for 1.36% of this increase (1.68% for 2017-2018), with a lower than forecast rate base accounting for the remainder. EWSI expects that operating cost savings (see section 3.3.2) will continue to drive higher than forecast returns on equity for the remainder of the 2017-2021 PBR term.

Table 3.3.6-1
Return on Rate Base
($ millions)

	Return on Rate Base	2018		2017-2018	
		PBR Forecast	Actual	PBR Forecast	Actual
1	Mid-year Rate Base	437.3	412.8	832.3	792.4
	Capital Structure				
2	Debt (%)	60.00%	60.00%	60.00%	60.00%
3	Equity (%)	40.00%	40.00%	40.00%	40.00%
	Cost of Capital				
4	Cost of Debt	4.37%	4.38%	4.30%	4.42%
5	Cost of Equity	10.18%	12.14%	10.18%	12.37%
6	Weighted Average Cost of Capital	6.69%	7.48%	6.65%	7.60%
	Return on Mid-Year Rate Base				
7	Return on Rate Base Financed by Debt	11.5	10.9	21.5	21.0
8	Return on Rate Base Financed by Equity	17.8	20.0	33.9	39.2
9	**Return on Mid-year Rate Base**	**29.3**	**30.9**	**55.4**	**60.2**

Wastewater's weighted average cost of debt calculation, shown in Table 3.3.6-2 below, yields average debt costs that are very close to forecast, as Wastewater has reduced issuances of new long-term debt in response to lower than forecast capital expenditures. Accordingly, lower than forecast interest expense is attributable to lower than forecast debt issuances.

Table 3.3.6-2
Interest Expense and Cost of Debt
($ millions)

		A	B	C	D
	Interest Expense and Cost of Debt	2018		2017-2018	
		PBR Forecast	Actual	PBR Forecast	Actual
	Interest Expense				
1	Interest on short-term debt	0.9	1.0	1.8	2.1
2	Interest on City of Edmonton debentures	3.1	2.8	6.4	6.2
3	Interest on intercompany debentures	7.9	7.2	13.9	13.0
4	Total Interest expense	11.8	10.9	22.1	21.2
	Mid-year debt and other long-term liabilities				
5	Mid-Year Short-term debt	31.1	23.8		
6	Mid-Year Long-term debt	238.2	225.7		
7	Mid-Year Other Long-term liabilities	0.5	0.2		
8	Total Mid-year debt and other long-term liabilities	269.8	249.7		
9	**Embedded cost of Debt**	**4.37%**	**4.38%**	**4.30%**	**4.42%**

3.3.7 Transactions with Affiliates

Wastewater derives a significant proportion of its revenue and expenses from transactions with affiliates, including the City of Edmonton, EPCOR Utilities Inc. and its subsidiaries, and other EPCOR Water Services Inc. business units. Table 3.3.7 summarizes Wastewater's transactions with affiliates.

Table 3.3.7
Transactions with Affiliates
($ millions)

	Affiliate and Service	A	B	C	D
		2018		2017-2018	
		PBR Forecast	Actual	PBR Forecast	Actual
1	**Revenues from the provision of services to the City of Edmonton**				
2	Wastewater Treatment Services	1.0	1.2	2.0	2.3
3	Other Services	0.2	0.0	0.5	0.3
4	Total	1.2	1.3	2.5	2.6
5	**Services provided by (recovered from):**				
6	**City of Edmonton**				
7	Franchise Fees	7.1	7.0	14.0	13.6
8	Property Taxes	0.8	0.6	1.4	1.2
9	Interest on Long Term Debt	3.1	2.8	6.4	6.2
10	Regulatory Services	1.0	-	2.0	0.7
11	Other Services	0.2	0.2	0.4	0.4
12	Total	12.2	10.6	24.1	22.0
13	**EPCOR Utilities Inc.**				
14	Corporate Shared Service Costs	5.0	3.8	9.8	7.9
15	Interest on Intercompany Loans	7.9	7.2	13.9	13.0
16	Interest on Short-term debt	0.9	1.0	1.8	2.1
17	Total	13.7	12.0	25.5	22.9
18	**EPCOR Distribution and Transmission Inc.**				
19	Maintenance and other services	0.1	0.0	0.1	0.2
20	**EPCOR Technologies Inc.**				
21	Hydrovac Charges	-	0.1	-	0.2
22	**EPCOR Energy Alberta LP**				
23	Billing and Collection Services	3.0	2.8	5.8	5.7
24	**Other EWSI Business Units**				
25	EWSI Shared Services Allocation	3.1	2.7	6.2	5.5
26	Meter reading services from In-City Water	2.4	2.4	4.7	4.5
27	Water purchases from In-City Water	0.4	0.4	0.7	0.8
28	Regulatory services from Drainage Services	3.0	1.4	5.8	1.8
29	Project engineering recoveries from Drainage	-	(0.3)	-	(1.2)
30	Laboratory services recoveries from Drainage	-	(0.3)	-	(0.4)
31	Total	8.9	6.3	17.5	11.0
32	**Expenditures on capital projects arising from services provided by:**				
33	EPCOR Technologies Inc.	-	0.2	-	0.2
34	EPCOR Utilities Inc.	-	0.2	-	0.2
35	Total	-	0.4	-	0.4

3.4 Capital Programs

3.4.1 Capital Expenditures

Table 3.4.1 compares approved capital expenditures from the PBR forecast to actual capital expenditures for 2018 for each project with approved capital expenditures in excess of $5.0 million over the 2017-2021 PBR term, as well as for each project category. Table 3.4.1 also provides a comparison of total 2017-2021 approved capital expenditures to EWSI's current capital forecast.

Table 3.4.1
Capital Expenditures
($ millions)

		A	B	C	D	E	F	
		2018			2017-2021			
		PBR Forecast	Actual	Increase (Decrease)	PBR Forecast	Current Projection	Increase (Decrease)	
1	**Reliability and Life Cycle Improvements**							
2	GB - Sludge Line Upgrades	1.1	3.8	2.7	3.4	8.1	4.7	1
3	GB - Replace 2.5km of Sludge Line	-	1.1	1.1	-	7.5	7.5	2
4	GB - Clarifier Chain Replacement	0.4	3.6	3.2	4.1	9.9	5.8	3
5	GB - Structural Rehab Program	1.5	1.8	0.3	7.7	12.7	5.0	4
6	GB - Build Pipe Racks	-	0.0	0.0	-	5.0	5.0	5
7	GB - Structural Rehab Secondaries 1-8	3.4	4.0	0.6	17.6	21.5	3.9	6
8	GB - Electrical Rehab Program	0.5	1.7	1.3	7.2	10.7	3.6	7
9	GB - Mechanical Rehab Program	4.1	6.9	2.8	15.6	18.9	3.3	8
10	GB - Distribution Chamber Reconstruction	2.7	2.6	(0.0)	3.8	6.5	2.7	9
11	GB - Utility Hot Water System Rehabilitation	5.9	4.2	(1.8)	13.9	13.9	0.0	
12	GB - Operations Center at Mid-Point Entrance	4.6	0.5	(4.1)	19.4	8.4	(10.9)	10
13	GB - Digester 4 Upgrades	-	0.2	0.2	12.0	1.2	(10.7)	11
14	GB - Site Ventilation Rehabilitation	8.9	4.9	(4.0)	31.5	24.8	(6.7)	12
15	GB - Headworks and Primary Aeration System Upgrades	5.5	0.1	(5.4)	6.7	1.3	(5.4)	13
16	GB - Buildings and Site Rehab	4.6	1.1	(3.4)	12.8	7.9	(4.9)	14
17	GB - Digester 3 Upgrades	4.4	4.6	0.2	11.3	11.0	(0.3)	
18	GB - Square 1 Gas Room Expansion	-	0.0	0.0	15.6	15.6	(0.0)	
19	Projects < $5 million	3.7	6.6	2.8	21.2	22.8	1.6	
20	Subtotal	51.3	47.8	(3.4)	203.4	207.6	4.3	
21	**Hydrovac Sanitary Grit**							
22	GB - Hydrovac Sanitary Grit Treatment Facility	-	0.6	0.6	8.4	7.3	(1.1)	
23	**Performance Efficiency and Improvement**							
24	Projects < $5 million	5.0	3.6	(1.4)	17.6	18.0	0.4	
25	**Growth/Customer Requirements**							
26	Projects < $5 million	-	0.0	0.0	1.5	0.2	(1.3)	
27	**Health, Safety and Environment**							
28	Projects < $5 million	1.6	0.5	(1.2)	4.5	3.2	(1.3)	
29	**Capital Expenditures, net of Contributions**	**57.9**	**52.5**	**(5.4)**	**235.4**	**236.3**	**0.9**	

Explanations for differences between PBR forecast capital expenditures for 2017 to 2021 and EWSI's current projection in excess of $2.0 million include:

1. **Sludge Line Upgrades** – $4.7 million (140%) greater than forecast. The forecast cost of this project included only the costs of cleaning and inspecting the sludge lines between Gold Bar and the Clover Bar lagoons. Inspections have since shown that the sludge lines are in poor condition and require significant expenditures to ensure that they can continue to operate with minimal risk of leakage.
2. **Replace 2.5 km of Sludge lines** – $7.5 million (new project). This project provides for replacement of a 2.5 km section of the sludge line between the Clover Bar lagoons at the NSR. This section of the sludge line was found to be in such poor condition that repairs and/or rehabilitation was not financially viable.
3. **Clarifier Chain Replacement** – $5.8 million (143%) greater than forecast. The costs of this project have increased significantly following the premature failure of stainless steel clarifier chains due to unexpected localized corrosion. These chains are being replaced with plastic loop chains which have a better record of performance at Gold Bar.
4. **Structural Rehabilitation Program** – $5.0 million (66%) greater than forecast, primarily due to the costs of addressing severe concrete deterioration at the Gold Bar Diversion Structure caused by long-term H2S gas exposure ($9.0 million). This increase has been partially offset by deferral of lower priority structural rehabilitation sub-projects.
5. **Build Pipe Racks** – $5.0 million (new project). This project provides for construction of an above-ground pipe rack network to allow the relocation of biogas piping, glycol heating lines and electrical circuits out of underground tunnels. Moving these utilities above ground will reduce tunnel ventilation upgrade costs, enable future expansion of process piping and facilitate compliance with building and fire codes.
6. **Structural Rehabilitation Secondaries 1-8** – $3.9 million (22%) greater than forecast. Following the rehabilitation of the clarifier, EWSI updated the forecast costs of this project to reflect current expectation of asset condition and the cost of required repairs. These revised cost estimates have been applied to all remaining in-scope Secondaries and Bioreactors.
7. **Electrical Rehabilitation Program** – $3.6 million (50%) greater than forecast, reflecting the costs of constructing a new West Scrubber electrical building to isolate electrical equipment from corrosive environment ($2.0 million), and evaluating, rehabilitating and upgrading biogas flow meters ($1.0 million).
8. **Mechanical Rehabilitation Program** – $3.3 million (21%) greater than forecast, reflecting expenditures on emergency repairs. The most significant repairs included repair of a leaking glycol heating line ($1.9 million), and replacement of six aluminum gates on Screens 4 – 6 ($1.0 million) to allow tank isolation and maintenance.
9. **Distribution Chamber Reconstruction** – $2.7 million (72%) greater than forecast. The increase in the forecast cost of this project results from higher than expected competitive bids from contractors, as well as higher than expected costs to demolish the distribution chamber and to construct the lift station tie-ins.
10. **Operations Centre at Mid-Point Entrance** – $10.9 million (57%) less than forecast. Changes to the costs and timing of this project reflect design reviews and scope adjustments incorporating the results

of public consultation and on-going negotiations with the City of Edmonton regarding a "land swap" in Gold Bar Park.

11. **Digester 4 Upgrades** – $10.7 million (90%) less than forecast, as lower than expected increases in solids loading to the plant have provided sufficient capacity to delay upgrades to Digester 4.

12. **Site Ventilation Rehabilitation Program** – $6.7 million (21%) less than forecast, primarily due to changes to the design of the ventilation of the EPT Building.

13. **Headworks and Primary Aeration System Upgrades** – $5.4 million (81%) less than forecast, reflecting a reduction in the scope of this project following EWSI's determination that restoring aeration in the main influent channels was not required.

14. **Buildings and Site Rehabilitation Program** – $4.9 million (38%) less than forecast. The scope of this project was reduced following an internal review which concluded that certain sub-projects could be safely deferred, allowing resources to be focused on unanticipated, higher-priority projects.

3.4.2 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 2018 year-end balance of Wastewater's Construction Work in Progress is $7.1 million greater than forecast, reflecting changes in the timing of project completion.

Table 3.4.2
Construction Work in Progress
($ millions)

		A	B	C	D
Construction Work in Progress		**2018**		**2017-2018**	
		PBR Forecast	**Actual**	**PBR Forecast**	**Actual**
1	Balance, beginning of period	12.7	25.0	19.2	22.6
2	Capital Expenditures	57.9	52.5	112.3	99.3
4	Capital Additions	(52.3)	(52.1)	(113.3)	(96.5)
7	**Balance, end of period**	**18.3**	**25.4**	**18.2**	**25.4**

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 2018, because of the higher average balance of Construction Work in Progress, AFUDC included in capital expenditures on eligible projects amounted to $1.7 million, compared to the PBR forecast amount of $0.9 million.

3.5 Operational Performance

3.5.1 Water Quality and Environmental Index

The Water Quality and Environmental index is a composite measure intended to assess EWSI's impact on the environment through the quality of the wastewater effluent returned back to the North Saskatchewan River and the effectiveness of environmental management programs.

Table 3.5.1
Water Quality and Environmental Index

Index Component	PBR Performance Measure	Standard	Actual Score	Index
Water Quality Factor	The value of the Wastewater Effluent Limit Performance, which aggregates measures of the percentage of the discharge limit for five parameters in the Gold Bar wastewater treatment plant's final effluent.	> 28.0%	27.2%	1.029
Environmental Incident Factor	The actual number of environmental incidents that are both reportable and preventable	< 10	2	5.000
			Average Index	3.014
			Index Standard Points	55.0
			Total Actual Points	165.8
			Maximum Available Points Including Bonus Points	60.5
			Total Points Earned	**60.5**

2018 Highlights

- **Wastewater Effluent Limit Performance Index.** Sustained focus on Biological Nutrient Removal ("BNR") operations enabled Wastewater to maintain performance throughout the year, even when the clarifiers were offline for unplanned maintenance. Continuous improvement of preventative maintenance programs, including inspections of chains and drive mechanisms in secondary clarifiers, are expected to further reduce unplanned downtime over the remaining years of the 2017-2021 PBR term.
- **Environment Incident Management.** Root cause investigations were carried out on three reportable events (wastewater release from a digested sludge line, partial failure of the ultra violet disinfection system operation and an underground glycol leak). Two of these events were determined to preventable after review (partial failure of UV disinfection, glycol leak). These investigations provided information that resulted in improvements to operating, maintenance and asset management practices.

3.5.2 Customer Service Index

Wastewater's customer service index for the 2017-2021 PBR term includes three equally weighted odour metrics. These metrics recognize that Wastewater's customer interactions typically relate to odour concerns from customers located close to the Gold Bar Wastewater Treatment Plant.

Table 3.5.2
Customer Service Index

Index Component	PBR Performance Measure	Standard	Actual Score	Index
H_2S - 1 Hour Exceedance Factor	The average of the number of exceedances of the 1 hour limit registered at the Gold Bar and Beverly air quality monitoring stations.	< 6	2	3.000
H_2S - 24 Hour Exceedance Factor	The average of the number of exceedances of the 24 hour limit registered at the Gold Bar and Beverly air quality monitoring stations.	< 2	0	2.000
Scrubber Uptime Factor	The percentage of time that the scrubbers are on line.	> 90%	90.8%	1.009
			Average Index	2.003
			Index Standard Points	15.0
			Total Actual Points	30.04
			Maximum Available Points Including Bonus Points	16.5
			Total Points Earned	**16.5**

2018 Highlights

- **H_2S - 1 and 24 Hour Exceedance Factor.** Improved odour monitoring tools, such as fence line H_2S monitoring, and processes enabled timely identification of process abnormalities, allowing operators to intervene and avoid exceedances. Fugitive emission odours were also reduced by covering the Enhanced Primary Clarifiers and improving ventilation through the facility. Scrubber uptime was also improved.
- **Scrubber Uptime Factor.** Redundant scrubber chemical feed pumps and instrumentation were added in 2018 to three of the four scrubbers on-site, improving reliability and performance scrubber operations.

3.5.3 System Reliability and Optimization Index

The system reliability and optimization index is a measure of the performance of the Gold Bar Wastewater Treatment Plant and the degree to which the wastewater treatment system is optimized to minimize its impact on the environment.

Table 3.5.3
System Reliability and Optimization Index

Index Component	PBR Performance Measure	Standard	Actual Score	Index
Enhanced Primary Treatment Factor	The percentage of time that the enhanced primary treatment facility ran during wet weather events where the influent flow rate exceeded the EPT event threshold.	> 80.0%	98.7	1.234
Biogas Utilization Factor	The percentage of biogas utilized, calculated as the volume of biogas produced less the volume flared divided by the volume produced.	> 60.0%	75.6%	1.260
Energy Efficiency Factor	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.	< 514	503.6	1.021
			Average Index	1.272
			Index Standard Points	15.0
			Total Actual Points	17.6
			Maximum Available Points Including Bonus Points	16.5
			Total Points Earned	**16.5**

2018 Highlights

- **Enhanced Primary Treatment (EPT).** Proactive planning of maintenance activities related to EPT processes have minimized downtime and maximized availability.
- **Biogas Utilization Factor.** Optimization of flare and boiler set points increased biogas utilization in the boilers and heating loops throughout 2018. Further optimization is planned for 2019.
- **Energy Efficiency Factor.** New operating software improved operating efficiency of the UV disinfection system in 2018. Operations will continue to optimize the UV disinfection dose set points in 2019 to further reduce energy consumption while still meeting wastewater disinfection targets.

3.5.4 Safety Index

EPCOR and EWSI are committed to a safe, healthy lifestyle and demonstrate this through care and concern for people. The safety index is a measure of the success of programs and the application of policies that maximizes the safety of employees and the public

Table 3.5.4
Safety Index

Index Component	PBR Performance Measure	Standard	Actual Score	Index
Near Miss Reporting Factor	The number of near miss reports entered in the ESS system.	>220	241	1.095
Work Site Inspection Factor	Number of Work Site Inspections and observations completed per year.	>919	971	1.057
Lost Time Frequency Factor	The actual lost time frequency rate.	<0.75	0.00	2.000

Index Component	PBR Performance Measure	Standard	Actual Score	Index
All Injury Frequency Factor	The actual all injury frequency rate	<1.50	0.00	2.000
			Average Index	1.538
			Index Standard Points	15.0
			Total Actual Points	23.1
			Maximum Available Points Including Bonus Points	16.5
			Total Points Earned	**16.5**

2018 Highlights

- **Lost Time Frequency Factor** and **All Injury Frequency Factor.** Wastewater had no lost time events since 2011 and no injuries requiring medical treatment since 2016. Wastewater will continue to build on this success in 2019, focusing on improving safe work planning to incorporate situational awareness; and focusing on low risk hazards when going to and from the job.

3.6 Rates and Bill Comparisons

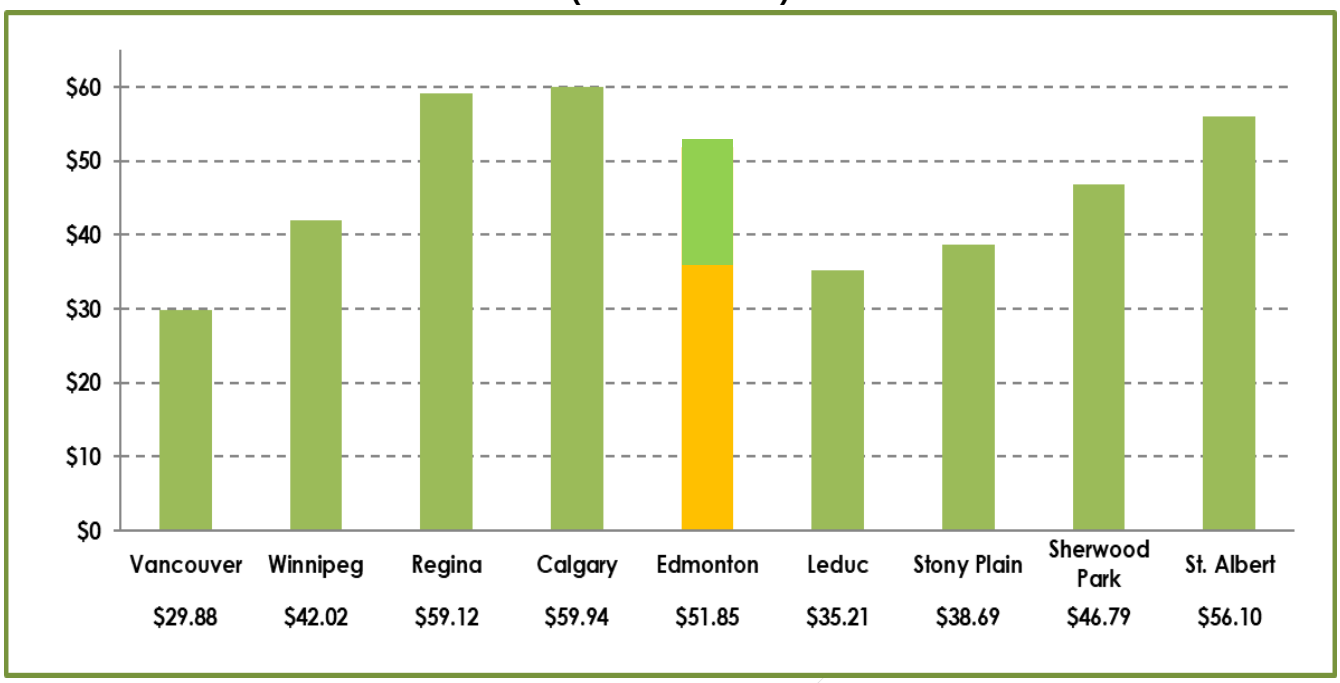
Wastewater and Drainage bill comparisons for 2018 are based on the published drainage and wastewater treatment rates for Calgary, Vancouver Winnipeg and Regina, as well as four local communities. These bill comparisons represent the total cost to the customer and include fixed charges, consumption charges and any other applicable surcharges.

Unlike most cities, where wastewater treatment services and drainage services are combined, Wastewater is only responsible for wastewater treatment; the operations and maintenance of sanitary, storm and combined sewer systems are provided through EPCOR Drainage Services. Accordingly, wastewater bill comparisons are based on blended EWSI wastewater treatment and drainage rates.

3.6.1 Residential Wastewater and Drainage Bills

Figure 3.6.1 provides a comparison of residential household wastewater and drainage bills for residential household consumption of 14.4 m^3 per month, the average residential customer consumption per month in Edmonton in 2018.

Figure 3.6.1
2018 Monthly Residential Wastewater and Drainage Bill Comparison
(14.4 m^3/month)



Unlike water services which are relatively consistent among cities and communities, the nature and extent of wastewater treatment and drainage services vary significantly between cities and communities, because of differences in wastewater treatment processes, the inclusion of certain services in property taxes, and geographic and climatic factors which affect the level of investment in and approach to flood mitigation and storm water services.

Edmonton's $51.85 average monthly bill from Figure 3.6.1 includes Wastewater charges of $16.96 and Drainage Services charges of $34.89. While the total bill is higher than Vancouver and Winnipeg, it is lower than Calgary and Regina, the two cities where drainage and wastewater treatments are most comparable to Edmonton. EWSI notes that cities across Canada are experiencing increased flooding related to climate change and that substantial investments are needed to assess and address climate change-related flood mitigation.

3.6.2 Commercial Wastewater and Drainage Bills

Table 3.6.2 provides a comparison of the wastewater bills for commercial customers of various sizes. This table shows that combined wastewater and drainage bills for commercial customers are competitive with surrounding communities and with major cities in western Canada, although Edmonton's relative ranking varies with the size of the customers with larger customers receiving relatively high monthly bills. These results reflect differences in rate structures between cities and municipalities, as well as differences in the extent of wastewater treatment and drainage services provided.

Table 3.6.2
2018 Monthly Commercial Wastewater and Drainage Bill Comparison
($ per month)

		A	B	C	D
	Monthly Bill - $ per month	**Small**	**Medium**	**Large**	**Extra Large**
1	**Monthly Consumption** - m^3	**10**	**250**	**1,000**	**5,000**
2	Vancouver	25.64	256.93	1,071	5,083
3	Calgary	54.74	390.66	1,440	7,039
4	Regina	51.30	462.00	1,916	9,098
5	Winnipeg	29.18	729.50	2,918	14,590
6	**Edmonton**	**44.20**	**514.75**	**2,106**	**10,502**
7	St. Albert	75.38	495.38	1,808	8,808
8	Sherwood Park	39.36	444.48	1,710	8,462
9	Stony Plain	30.56	413.58	1,611	7,994
10	Leduc	28.35	402.75	1,573	7,813

4 Drainage Services

4.1 Accomplishments and Challenges

On September 1, 2017, the City of Edmonton transferred Drainage to EPCOR. The principles governing the transfer are documented in a Letter of Intent developed by City Administration and EPCOR, and presented to City Council on April 11, 2017. In 2018, EPCOR focused on integrating Drainage with its other business units, laying the foundation for future efficiency gains. This work included: establishing new organizational structures, clarifying accountabilities and implementing EPCOR systems and processes. Significant accomplishments in 2018 included:

- Establishing a Project Management Office and a Capital Steering Committee, similar to those in Water and Wastewater, to monitor compliance to processes for capital project delivery, to track project progress, to identify schedule or budget variances, and to address challenges impacting project completion;
- Developing an Odour Mitigation Strategy and a Stormwater Integrated Resource Plan to address key challenges facing EPCOR's rate payers. The business case for the Stormwater Integrated Resource Plan was presented to the Utility Committee on May 10, 2019, with the Odour Mitigation Strategy presentation scheduled for June 28, 2019. As noted in Section 1.5, EWSI plans to submit requests for non-routine adjustments for both programs to the City Manager later in 2019;
- Merging Water and Drainage's Private Development inspection teams, so that rather than having separate Water and Drainage inspectors, only a single inspector is needed at a new developments:
- Creating a single point of contact within Drainage for managing infill applications for both Water and Drainage;
- Forming an Environmental Management Committee and achieving ISO 14001 certification, providing the framework and requirements needed for an effective environmental management system; and
- Completing the transfer of Drainage's Approval to Operate from the City of Edmonton in May 2018.

Drainage was included in EPCOR's 2018 Employee Engagement Survey and, despite the challenges inherent in large-sale organizational change, achieved an employee engagement score of 82%, with an overall positive rating across all functional areas. These results have been communicated to all employees and cross-functional teams have been created to create action plans on key engagement drivers to further improve the level of engagement.

4.2 Operating and Capital Cost Efficiencies

As part of the commitments made by EPCOR leading to the transfer of Drainage from the City of Edmonton, Operating Cost Efficiencies and Capital Cost Efficiencies were identified. As noted in the Grant Thornton Report "City of Edmonton 2016 EPCOR Proposal for the Drainage Transfer Analysis" these were defined as:

- Operating Cost Efficiencies: EPCOR assumes that it will be able to generate operating cost efficiencies: 1% reduction in 2017, growing by 1% annually to a maximum of 5% for the duration of the forecast year (approximately $5 million by 2021).
- Capital Cost Efficiencies: EPCOR assumes that it will be able to generate at least 10% cost efficiency on new, utility financed capital beginning immediately in 2017.

4.2.1 Operating Cost Efficiencies

The 2016 Grant Thornton report estimated operating cost efficiencies based on the City of Edmonton drainage budget that was current at the time. As illustrated in Table 4.2.1-1, by the end of 2022, the total drainage operations cost was projected to be $102.7 million versus an original City budget of $108.1 million or a total cost saving of $5.4 million.

Table 4.2.1-1
Grant Thornton Report 2016 –Operating Cost Efficiencies
($ millions)

		A	B	C	D	E	F
	Initial Estimate Cost Efficiencies	**2017 A**	**2018 A**	**2019 F**	**2020 F**	**2021 F**	**2022 F**
1	City OPEX Budget (Including Local Access fee)	96.3	98.5	101.1	103.4	105.7	108.1
2	Target OPEX Savings %	1.0%	2.0%	3.00%	4.0%	5.0%	5.0%
3	Target OPEX Savings S	1.0	2.0	3.0	4.1	5.3	5.4
4	EPCOR Target OPEX (including Local Access Fee)	95.3	96.5	98.1	99.3	100.4	102.7

Since the transfer has been completed, EPCOR has determined that a number of accounting differences between City accounting standards and EPCOR's leads to difficulty in performing an "apples to apples" comparison. These differences include large differences in whether costs are categorized as being capital or operating expenses. As part of the PBR submission these costs will be categorized into true costs differences versus those caused by differences in accounting policies.

A significant amount of work has been directed toward identification of cost efficiency opportunities in order to address the target. These range from smaller "quick wins" which have already been executed to larger opportunities that will require a substantial realignment of work responsibilities and methods. The largest opportunities, and the ones that will yield the greatest cost savings, are in alignment of work planning and execution with water services. Several additional operational opportunities have also been identified and are currently being explored including capital execution processes, engineering, etc. The two foundational requirements to exploit these opportunities are a real estate strategy that would see co-location of water and drainage functions/personnel and a common information systems platform for the identification and management of work assignments. Both of these requirements are currently in process and are anticipated to be completed over the next two years.

To date, $3.9 million of operating efficiencies have been identified. These efficiencies are from a number of operational improvements and synergies gained both within Drainage Services and from coordination with water services. These include reductions in facilities maintenance costs from outsourcing (contractor), reduction in contractor costs in planning, reduction in communication costs, biosolids savings and combining water and drainage resources for real estate and inspections. Recently (early 2019), Training and Development and Public and Government Affairs (communications) has been

consolidated into a common reporting stream in order to foster additional synergies and remove redundancies. Similarly, drainage's Supply Chain (procurement, inventory management and stores) have been consolidated with water services in order to develop common processes and approaches and drive cost savings.

As Drainage is currently finalizing plans to meet the cost efficiency target, it is also noted that additional costs were required to address immediate issues post transfer. Specifically, additional safety and technical training resources were added in order to address the need to improve safety performance for both staff and the public. Staff compensation also saw adjustments through both collective agreement alignment and the addition of incentive plans to align drainage services with other EPCOR business units. Additional finance, purchasing and consultation resources were added in 2017 to support the transition to EPCOR but now those positions are being rationalized through the water drainage synergies initiative. Drainage is committing to finding efficiencies to achieve a net savings of 5%, so any costs added to address immediate issues will be offset with additional efficiencies.

From a customer's rates perspective, the achievement of operational cost efficiencies is an important component of the rebase adjustment moving into the next PBR term. That is, as the current drainage rate structure has been fixed at an average 3% increase, not achieving the planned cost savings in the initial years of the term does not impact customer rates. It is only at the transition to the next PBR term where these costs would be incorporated into customer rates as part of a special rate adjustment for rebasing. It is therefore incumbent on Drainage Services to continue to identify cost saving opportunities and ensure that the planned target is reached before the next PBR application. All cost efficiencies will be fully identified in the PBR application.

4.2.2 Capital Cost Efficiencies

Capital Cost Efficiencies identified in the Grant Thornton report were predicated on delivering the 10 year forecast Capital Program at a 10% lower cost which equated to $193.4 million over the 10 year forecast period. To date, a number of capital cost efficiencies have been enacted. These include:

- Master Agreements – the majority of capital procurement is completed under master agreements where suppliers provide fixed pricing in exchange for preferred status. This approach generally results in lower product and services acquisition costs and lower administration costs. Since the transition of drainage to EPCOR, all master agreements under renewal have included the requirements for both drainage and water. Overtime, further consolidation of the combined spend will result in greater efficiencies.
- Project Management Methodology Review – a comprehensive review and realignment of project management processes is currently underway in order to streamline project execution while ensuring consistency of approaches and toolsets while maintaining appropriate governance. This initiative will encompass water services in order to drive addition efficiencies across all capital projects.
- Capital Execution Synergies – as with operational cost efficiency opportunities, a number of larger capital execution synergies have been identified particularly through greater coordination with water services. These opportunities start with coordinated capital planning to reduce duplication of work and extend to include common crews and other delivery mechanisms. These

opportunities are currently being more fully developed but, like the significant operational synergies, are generally contingent on co-location of teams through the real estate strategy and a common information systems platform. It is anticipated that the capital opportunities will be executed over the next two years.

While the more significant capital efficiency opportunities will evolve overtime, capital efficiency savings have been achieved to date, particularly with the Stormwater Integration Resource Plan. Drainage Services has developed an approach to address stormwater flooding not previously considered and as result, is projected to complete the underlying projects for $1.6 billion. In comparison to previous approaches, which ranged for $2.2 to $4.5 billion, the Drainage Services approach represents a direct cost saving of between $0.6 billion to $2.9 billion.

4.3 Customers and Consumption

Drainage provides services to the same customers served by Wastewater. Therefore, actual customer counts, consumption per customer and total consumption are the same as those of Wastewater and actual to forecast differences in Drainage's customer counts and consumption are attributable to the same factors.

4.4 Financial Basis of Comparison

Although a PBR forecast will be developed as part of Drainage's upcoming 2022-2026 PBR application, currently Drainage does not have a City of Edmonton-approved PBR forecast to serve as the basis of comparison for financial performance. Therefore, Drainage's 2018 EPCOR drainage budget (adjusted) is used as a proxy for a PBR forecast and is the basis upon which 2018 actual financial performance has been assessed. The 2018 budget has been adjusted to a regulated basis (from IFRS) and to remove one time costs related to the transition of drainage to EPCOR. The adjusted 2018 budget, escalated at an appropriate inflation rate, will serve as the basis of comparison of actual to forecast financial results for the remainder of the 2017-2021 PBR term.

4.5 Financial Performance

Drainage's revenue requirements are summarized on Table 4.5 below. Explanations of forecast to actual variances are provided in sections 4.5.1 to 4.5.6.

Table 4.5
Drainage Revenue Requirements
($ millions)

		A	B
Summary of Revenue Requirements		**2018**	
		Budget	**Actual**
1	Drainage Rate Revenue	188.3	184.6
	Drainage Revenue Requirement		
2	Operating expenses	110.4	111.0
3	Other Revenue	(8.3)	(10.1)
4	Depreciation and amortization	29.1	32.0
5	Return on rate base financed by debt	20.8	18.7
6	Return on rate base financed by equity	36.2	32.9
7	Drainage Revenue Requirement	188.3	184.6
8	**Return on Rate Base Financed by Equity**	**6.48%**	**5.68%**

4.5.1 Revenue

Drainage's rate revenues are derived from both sanitary utility and stormwater utility services. Sanitary utility revenues are comprised of variable monthly charges based on monthly metered water consumption and flat monthly service charges based on the meter size. Stormwater utility revenues are based on area, development intensity, and zoning for individual land parcels. Rates for both sanitary and stormwater utility services from January 1, 2018 to March 31, 2022 are prescribed in Bylaw 18100 and incorporate an average annual rate increases of 3%.

Table 4.5.1 below provides a comparison of 2018 Drainage revenues to the budget:

Table 4.5.1
Drainage Revenue
($ millions)

		A	B
	Drainage Revenue	2018	
		Budget	Actual
1	Sanitary Utility		
2	Flat Monthly Service Charges		
3	Residential	35.5	31.1
4	Multi-Residential	0.5	2.1
5	Commercial	2.7	5.4
6	Flat Monthly Service Charges	38.7	38.6
7	Variable Monthly Charges		
8	Residential	45.3	44.5
9	Multi-Residential	17.7	17.0
10	Commercial	23.9	22.0
11	Variable Monthly Charges	86.9	83.5
12	Sanitary Utility Revenue	125.6	122.1
13	Storm Water Utility		
14	Residential	33.1	34.0
15	Multi-Residential	3.2	3.5
16	Commercial	26.4	25.0
17	Storm Water Utility Revenue	62.7	62.5
18	Drainage Rate Revenue	188.3	184.6
19	Other Revenue	8.3	10.1
20	**Total Drainage Revenue**	**196.6**	**194.7**

In 2018, Drainage's rate revenues were $3.9 million less than budget. This difference is primarily attributable to lower than budget consumption as discussed in section 2.3.1. This decrease is partially offset by higher than budget Other Revenues of $1.9 million reflecting increases in project cost recoveries and charges to Wastewater for compliance monitoring services.

Besides rate revenues, Drainage has Other Revenue derived from application and connection fees, wastewater transfer station services, late payment fees, miscellaneous fees pursuant to third party agreements, and other incidental services.

4.5.2 Operating Expenses by Function

Table 4.5.2 below compares Drainage's 2018 actual operating expenses to its budget:

Table 4.5.2
Operating Expenses by Function
($ millions)

		A	B
	Function and Sub-function	2018	
		Budget	Actual
1	Drainage Operations		
2	Maintenance	27.5	27.6
3	Biosolids	15.9	13.3
4	Monitoring and Compliance	4.8	4.9
5	Operations Administration	2.2	2.6
6	Drainage Operations	50.4	48.4

	Function and Sub-function	A	B
		2018	
		Budget	Actual
7	Planning and Project Support		
8	Planning	12.2	9.2
9	Project Support	0.6	3.5
10	Planning and Project Support	12.8	12.7
11	Billing and Meter Reading		
12	Meter Reading	5.9	6.3
13	CUS Charges	0.4	1.3
14	Billing and Meter Reading	6.3	7.6
15	Drainage Services Administration		
16	Shared Services	12.8	15.0
17	Incentive and Other Compensation	2.1	1.4
18	Drainage Services Administration	14.9	16.4
19	Corporate Shared Services	15.8	16.1
20	Franchise Fees and Property Taxes		
21	Franchise Fees	10.2	8.9
22	Property Taxes	0.0	0.9
23	Franchise Fees and Property Taxes	10.2	9.8
24	**Total Operating Expenses by Function**	**110.4**	**111.0**

Total operating expenses for 2018 were $0.6 million higher than budget. Key factors contributing to this difference include:

- **Maintenance -** $0.1 million greater than budget. This function includes pipeline, pumping and general maintenance. The higher than budgeted expenses reflect a lower than planned vacancy factor of $1.8 million, which is partially offset by the capitalization of $1.7 million of staff costs and materials for pump well, catch basin and manhole maintenance projects, which had been budgeted as operating expenses.
- **Biosolids** - $2.6 million less than budget. This function includes the storage and management of biosolids generated by the Gold Bar and Alberta Capital Regional wastewater treatment plants. The lower than budgeted expenses were due to lower contractor costs of $ 1.5 million due to lower activity as a result of the composter outage, and an additional $1.1 million in reduced costs was realized due to lower than planned processed biosolids volumes and improved operating efficiencies.
- **Operations Administration** - $0.4 million greater than budget. This function includes the costs of management and administration support for Drainage Operations. The higher than budget expenses of $0.5 million reflects the increased quantity of locates requested.
- **Planning -** $3.0 million less than budget. This function includes infrastructure, system and administration planning, as well as costs of surveying and engineering inspections. The lower than budget expenses includes savings of $1.7 million related to lower than anticipated contractor costs, the capitalization of staff costs of $1.4 million that were budgeted as operating costs, and savings of $0.9 million as a result of transferring lot grading inspection services back to the City of Edmonton. The lot grading inspection cost savings were offset with a proportionate decrease in associated revenues. The above noted cost savings were partially offset by additional costs of $0.6 million for administration of the Stormwater Integrated Resource Plan, as well as $0.4 million for lower than planned vacancy factor.

- **Project Support -** $2.9 million greater than budget. This function includes engineering (conceptual, preliminary design or detailed design), project management, in-house construction, and emergency repairs. The higher than budget expenses were mainly due to higher design and construction costs of $4.0 million that were recorded as operating expenses and had been budgeted as capital expenditures. These costs were partially offset by higher equipment utilization in operations, resulting in an improved cost recovery on equipment of $1.5 million.

  The remainder of the actual to budget difference was made up of numerous minor variances related to staff and contractor costs.

- **Billing and Meter Reading -** $1.3 million greater than budget. Actual costs are higher than budget due to higher than budgeted metering and customer service support costs, as well as unbudgeted call centre support costs from the City of Edmonton.

- **Drainage Services Administration -** $2.2 million greater than budget. This function includes costs for Finance and Administration, Human Resources and Training, Business Process, Supply Chain Management, and Health, Safety and Environment. The higher than forecast costs include $2.0 million related to the delay in realizing planned operating cost efficiencies as discussed in Section 4.2.1 and noted in Table 4.2.1-3.

  The remainder of the actual to budget difference is made up of minor variances related to lower staff costs, offset by higher than planned rent, utilities and rebranding costs.

- **Incentive and Other Compensation -** $0.7 million less than budget. The lower than budget expenses is mainly due to the capitalization of incentive payments; partially offset by higher than anticipated employee benefit costs.

- **Franchise Fees and Property Taxes -** $0.4 million less than budget. As with Water and Wastewater, lower than forecast franchise fees reflect lower than forecast revenues. This is partially offset by higher property taxes, which were not included in the budget as no accurate cost estimate was available at the time of budget preparation.

Variances in other operating expense functions and sub-functions are not significant, either individually or in aggregate.

4.5.3 Operating Expenses by Cost Category

Table 4.5.3 below shows operating expenses by cost category for Drainage Operations, Planning, Project Support Costs and Drainage Services Administration, where cost categories differ from the sub-functions in Section 4.5.2.

Table 4.5.3
Operating Expenses by Cost Category
($ millions)

		A	B
	Cost Category	2018	
		Budget	Actual
1	Drainage Operations		
2	Staff Costs and Employee Benefits	23.8	26.3
3	Contractors and Consultants	19.2	15.5
4	Materials and Supplies	0.2	0.1
5	Other	7.2	6.5
6	Drainage Operations	50.4	48.4
7	Planning and Project Support		
8	Staff Costs and Employee Benefits	3.2	7.9
9	Contractors and Consultants	10.2	6.2
10	Other	(0.6)	(1.4)
11	Planning	12.8	12.7
12	Drainage Shared Services		
13	Staff Costs and Employee Benefits	10.5	9.9
14	Contractors and Consultants	4.9	3.7
15	Other	(0.5)	2.8
16	Drainage Shared Services	14.9	16.4

The information presented in this table supports the explanations of differences between 2018 actual and budget expenses provided in Section 4.5.2. Accordingly, no additional explanations are considered necessary.

4.5.4 Depreciation and Amortization

Drainage's depreciation expense and amortization of contributed assets for 2018 are shown in Table 4.5.4 below:

Table 4.5.4
Depreciation and Amortization
($ millions)

		A	B
	Depreciation and Amortization	2018	
		Budget	Actual
1	Provision for depreciation	64.4	69.5
2	Amortization of contributions	(35.3)	(37.5)
3	**Depreciation, net**	**29.1**	**32.0**

Drainage's net depreciation expense is $2.9 million greater than budget. At the time the 2018 budget was prepared, Drainage had not completely finalized asset componentization and other adjustments needed for its regulated accounting. As a result, during 2018, Drainage found that actual deprecation rates, averaging 1.5%, were slightly higher than the average budget rate of 1.4%. Higher depreciation and amortization also reflect higher opening balances of property plant and equipment, as well as higher than forecast contributed and developer-funded assets, explained in section 4.5.5 below.

4.5.5 Rate Base

Drainage's mid-year rate base, shown in Table 4.5.5 below, was $21.8 million is less than budget, reflecting lower than forecast capital additions in 2018 as discussed in in Section 4.6.1.

Table 4.5.5
Mid-Year Rate Base
($ millions)

		A	B
	Components of Mid-Year Rate Base	**2018**	
		Budget	**Actual**
1	Plant in Service		
2	Balance, beginning of year	4,386.6	4,386.6
3	Additions - EPCOR-funded	124.5	84.4
4	Additions - Contributed	117.5	202.4
5	Retirements (vehicle fleet) and adjustments	0.0	(0.3)
6	Balance, end of year	4,628.6	4,673.1
7	Mid-Year Plant in service	4,507.6	4,529.9
8	Accumulated Depreciation		
9	Balance, beginning of year	853.7	853.7
10	Depreciation expense	64.4	69.5
11	Retirements (vehicle fleet) and adjustments	0.0	(0.3)
12	Balance, end of year	918.1	922.9
13	Mid-Year Accumulated Depreciation	885.9	888.3
14	Other Rate Base Items		
15	Working Capital	15.3	14.7
16	Materials and Supplies	1.4	1.7
17	**Gross Mid-Year Rate Base**	**3,638.4**	**3,657.9**
18	Contributions		
19	Balance, beginning of year	(2,887.2)	(2,887.2)
20	Contributions in aid of construction	(117.5)	(202.4)
21	Balance, end of year	(3,004.7)	(3,089.7)
22	Mid-Year Contributions	(2,946.0)	(2,988.5)
23	Accumulated Amortization		
24	Balance, beginning of year	(459.4)	(459.4)
25	Amortization of contributions	(35.3)	(37.5)
26	Balance, end of year	(494.7)	(496.8)
27	Mid-Year Accumulated Amortization	(477.0)	(478.1)
28	**Mid-Year Contributions**	**(2,469.0)**	**(2,510.4)**
29	**Net Mid-Year Rate Base**	**1,169.4**	**1,147.6**

Although the gross rate base is higher than budget, lower than forecast EPCOR-funded capital additions (see Section 4.6) and higher than budget contributed (developer-funded) capital additions, resulted in a lower than budget rate base. The value of contributed assets is difficult to forecast since developers are responsible for construction of distribution infrastructure in new subdivisions and the pace of construction can vary significantly. As well, EWSI receives contribution funding from the Sanitary Servicing Strategy Fund ("SSSF") to support drainage development throughout the City of Edmonton. The amount of SSSF funding also varies significantly in response to the level of developer activity on SSSF-eligible projects.

4.5.6 Return on Rate Base

In 2018, Drainage's return on equity was $3.3 million (0.79%) less than forecast. Lower than forecast net income accounted for 0.56% of this decrease, with a lower then budget debt to equity capital structure, and lower than forecast rate base accounting for the remainder of the difference.

Table 4.5.6-1
Return on Mid-Year Rate Base
($ millions)

		A	B
	Return on Rate Base	**2018**	
		Budget	**Actual**
1	Net Mid-Year Rate Base	1,169.4	1,147.6
2	Deemed Capital Structure		
3	Debt	52.24%	49.52%
4	Equity	47.76%	50.48%
5	Total	100.00%	100.00%
6	Cost Rates		
7	Debt	3.41%	3.29%
8	Equity	6.48%	5.55%
9	Weighted Average Cost of Capital (WACC)	4.87%	4.43%
10	Return on Rate Base		
11	Debt	20.8	18.7
12	Equity	36.2	32.9
13	**Total Return on Drainage Rate Base**	**57.0**	**51.6**

Returns on rate base are calculated separately for the debt-financed and equity-financed portions of Drainage's net rate base. The rate of return on debt is equal to the embedded cost of debt for Drainage, as calculated in Table 4.5.6-2 below:

Table 4.5.6-2
Interest Expense and Cost of Debt
($ millions)

		A	B
	Interest Expense and Cost of Debt	**2018**	
		Budget	**Actual**
1	Interest expense		
2	Interest on short-term debt	1.1	0.7
3	Interest on City of Edmonton debentures	19.2	16.4
4	Interest on intercompany debentures	-	1.7
5	Total interest expense	20.3	18.8
6	Mid-year debt and other long-term liabilities		
7	Mid-Year Short-term debt	25.2	(12.6)
8	Mid-Year Long-term debt	569.3	584.2
9	Mid-Year Other Long-term liabilities	-	-
10	Total mid-year debt and other long-term liabilities	594.5	571.6
11	**Embedded Cost of Debt**	**3.41%**	**3.29%**

4.5.7 Transactions with Affiliates

Drainage derives a portion of its revenues and expenses from transactions with affiliates, including the City of Edmonton, EPCOR Utilities Inc. and its subsidiaries. Table 4.5.7 provides a summary of Drainage's 2018 actual transactions with affiliates.

Table 4.5.7
Transactions with Affiliates
($ millions)

		A	B
	Affiliate and Service	**2018**	
		Budget	**Actual**
1	**Revenues from the provision of services to the City of Edmonton**		
2	Regulated Revenue	2.9	2.9
3	Other	0.9	1.5
4	Total	3.8	4.4
5	**Services provided by (recovered from):**		
6	**City of Edmonton**		
7	Franchise Fees	10.2	8.9
8	Property Taxes	-	0.9
9	Interest on City of Edmonton debentures	19.2	16.4
10	Other services	9.2	13.1
11	Total	38.6	39.3
12	**EPCOR Utilities Inc**.		
13	Corporate Shared Service Costs	15.7	16.0
14	Interest on short-term debt and intercompany debentures	1.1	2.4
15	Total	16.8	18.4
16	**EPCOR Energy Alberta LP**		
17	Customer Billing and Collection Services	3.9	3.9
18	Other services	-	0.3
19	Total	3.9	4.2
20	**EPCOR Distribution and Transmission Inc.**		
21	Technical Training	0.9	0.8
22	**EPCOR Commercial Services Inc**.		
23	Stormwater Planning Strategies	-	0.4
24	**Other EWSI Business Units**		
25	Customer Billing and Collection Services	2.0	2.4
26	Other services	-	0.9
27	Total	2.0	3.3
28	**Expenditures on capital projects arising from services provided by:**		
29	City of Edmonton	(33.1)	(22.3)
30	EPCOR Technologies Inc.	-	2.8
31	EPCOR Utilities Inc.	0.6	0.6
32	EPCOR Energy Services	0.3	0.3
33	EPCOR Distribution and Transmission Inc.	-	0.1
34	EPCOR Water Services Inc.	(3.2)	(3.2)
35	Total	(35.4)	(21.7)

4.6 Capital Programs

4.6.1 Capital Expenditures

Drainage's capital program is based on the long term plan for 2018 to 2021 that was used in the independent third party report assessing the transition of the Utility to EPCOR (Grant Thornton report CR_8300). Table 4.6.1 compares forecast to actual capital expenditures for 2018 for each project with approved capital expenditures in excess of $10.0 million over the 2018-2021 term, as well as for each project category. Table 4.6.1 also provides a comparison of total forecast capital expenditures for 2018 to 2021 from the long term plan to EWSI's current capital projection.

Table 4.6.1
Capital Expenditures
($ millions)

	Capital Project or Program	A	B	C	D	E	F	
		2018			2018-2021			
		Budget	Actual	Increase (Decrease)	Long Term Plan	Current Projection	Increase (Decrease)	
1	Drainage Neighbourhood Renewal	15.0	25.9	10.9	119.8	109.8	(10.0)	1
2	Drainage System Expansion	14.3	19.1	4.8	84.7	77.8	(6.9)	
3	Drainage System Rehabilitation	51.1	44.0	(7.1)	261.7	291.7	30.0	2
4	Environmental Quality Enhancement	16.4	6.6	(9.8)	33.2	24.6	(8.6)	3
5	Flood Mitigation	25.8	13.2	(12.6)	161.4	139.6	(21.8)	4
6	SSSF Projects	28.1	23.4	(4.7)	131.4	121.8	(9.6)	5
7	Real Estate	-	-	-	-	50.0	(50.0)	6
8	**Capital Expenditures before contributions**	**150.7**	**132.2**	**(18.5)**	**792.1**	**815.3**	**23.2**	
9	**Contributions**							
10	Drainage System Expansion	-	(7.5)	(7.5)	(25.0)	(26.3)	(1.3)	
11	Sanitary Servicing Strategy Fund Projects	(28.1)	(20.9)	7.2	(124.2)	(116.2)	8.0	
12	Subtotal	(28.1)	(28.4)	(0.3)	(149.2)	(142.5)	6.7	7
13	**Capital Expenditures**	**122.6**	**103.8**	**(18.8)**	**642.9**	**672.8**	**29.9**	
14	**Non-Routine Adjustments**							
15	Stormwater Integrated Resource Plan	-	-	-	-	97.6	97.6	
16	LRT Relocates	-	-	-	-	57.4	57.4	
17	Sanitary Odour Mitigation	-	-	-	-	50.7	50.7	
18	Subtotal	-	-	-	-	205.7	205.7	8
19	**Total Capital Expenditures**	**122.6**	**103.8**	**(18.8)**	**642.9**	**878.5**	**235.6**	

Explanations for differences between the Drainage's long term plan and the current projections are as follows:

1. **Drainage Neighbourhood Renewal** – $55.1 million (31.3%) lower than long-term plan. This category includes the costs of neighbourhood drainage asset renewal to align with the City of Edmonton's Building Great Neighbourhoods program. Lower projected costs are due to the timing of capital expenditures, as many of the projects that had been included in this category have been deferred based on anticipated renewal and replacement of sanitary and storm sewers, which will continue to align with the City of Edmonton's current programs.
2. **Drainage System Rehabilitation** – $198.0 million (166.1%) higher than long-term plan. This category includes all work required to complete rehabilitation and life cycle replacements to address asset condition. The higher projected costs are to mitigate the risk of failure and maintain service levels. Significant projects in this category includes the rehabilitation of 151 Street and 99 Avenue Sanitary Trunk, Groat Road, and Large Trunk Rehabilitation – Area S-1 and S-2a, where some projects span to the next PBR term.
3. **Environmental Quality Enhancement** – $71.3 million (70.7%) lower than long-term plan. This category includes capital expenditures that mitigate the impacts of the drainage system on the environment, such as sewer overflows, river loading, and beneficial reuse of biosolids. The lower projected costs are due to the timing of capital expenditures, as certain projects included in this category span into the next PBR term. Note that Sanitary Odour Mitigation is included as part of the Non-Routine Adjustments projects category.
4. **Flood Mitigation** – $154.4 million (62.4%) lower than long-term plan. This category includes development of drainage infrastructure and program improvements to decrease flood risks. Major projects in this category include: the Malcolm Tweddle, Edith Rogers, Lauderdale West, Newton and Kenilworth Dry Ponds; as well as the Tweddle Place sewer separations. Lower projected costs are due to timing of the capital expenditures and the inclusion of the Stormwater Integrated Resource Plan in the Non-Routine Adjustments project category
5. **Sanitary Servicing Strategy Fund (SSSF) Projects** – $16.0 million (11.6%) lower than long-term plan. The SSSF finances major sanitary trunk construction to service new development areas. EWSI works with the SSSF Management Committee to coordinate design, construction, schedules and budgets for various projects. EWSI's current forecast aligns with the SSSF Management Committee's five year construction plan (2018-2022) to support orderly, cost effective development based on population and employment projections, as well input from the development industry. Lower projected costs are due to the timing of capital expenditures on large multi-year projects.
6. **Real Estate** – $50.0 million (new project). Following the transfer of Drainage to EPCOR, an EPCOR-wide real estate review was initiated to evaluate the number of physical locations currently occupied by Water and Drainage and identify how locations could be consolidated to contribute to the cost reduction and efficiency commitments made as part for the Drainage transfer. Several options are currently under consideration and the project scope will be refined and adjusted as further information becomes available and key decisions are made.
7. **Contributions** – $55.4 million (28.0%) lower than long-term plan. Drainage has revised its contributions forecast to align with actual cost recoveries from prior years. Accordingly, current projections have been reduced to reflect Drainage's actual experience.

8. **Non Routine Adjustments** – $252.7 million (new projects). As discussed in section 1.5, Drainage expects to file three requests for non-routine adjustments to rates with the City Manager or City Council for three capital expenditures programs, including: LRT Relocations; Sanitary Odour Mitigation; and Stormwater Integrated Resource Plan. Projected capital expenditures for each of these programs represent EWSI's current estimates of capital required in the 20158-2021 PBR term. Additional spending requirements will be included in the future PBR applications.

4.6.2 Construction Work in Progress

Drainage's rate base consists of plant in service. If a capital project is not completed (i.e. not placed into service) in the year, the capital expenditures on that project remain in Construction Work in Progress and are excluded from the rate base.

Table 4.6.2
Construction Work in Progress
($ millions)

		A	B
Construction Work in Progress		**2018**	
		Budget	**Actual**
1	Balance, beginning of year	32.8	32.8
2	Capital Expenditures	122.6	104.5
3	Cancelled costs/Write-offs	0.0	(0.7)
4	Capital Additions	(124.5)	(84.4)
5	**Balance, end of year**	**30.9**	**52.2**

The PBR allows Drainage to capitalize the costs of financing certain projects remaining in Construction Work in Progress, using an allowance for funds utilized during construction ("AFUDC"). In 2018, AFUDC included in capital expenditures on eligible projects amounted to $1.7 million.

4.7 Operational Performance

4.7.1 Water Quality and Environmental Index

One of EPCOR's core commitments is to prevent pollution and reduce our environmental impacts, including those contributing to climate change and affecting the ecosystems in which we operate. Drainage Services' approvals with Alberta Environment and Parks for the collection system and associated regulatory requirements to develop and implement environmental strategies to reduce the impact of the drainage systems on the North Saskatchewan River is one way this core commitment is demonstrated. Continuous monitoring and quantification of discharges is integral to evaluating the environmental performance of Drainage strategies. The Edmonton Watershed Contaminant Reduction Index and the Total Suspended Solids Total Loading are two metrics used to quantify the discharges from the City of Edmonton.

Table 4.7.1
Water Quality and Environmental Index

Index Metric		Measure	Target	Actual
1	Edmonton Watershed Contaminant Reduction Index Score	Index score that measures contaminants released to the North Saskatchewan River from the City of Edmonton.	> 6.9	7.5
2	Total Loading – Total Suspended Solids	Total suspended solids loading (kg/d) contributed to the North Saskatchewan River from the storm sewer system, combined sewer system, and Gold Bar Wastewater Treatment Plant.	< 50,000	45,900

2018 Highlights

- The 2018 Edmonton Watershed Contaminant Reduction Index score is 7.5. The rainfall that Edmonton experienced in 2018 was quite moderate with no large, intense rainfall events contributing to large loading levels. This index uses a 5-year rolling average in the calculation. 2013 was one of the highest load years on record and no longer influences the 5-year average starting in 2018. Implementation of Combined Sewer Overflow controls is continuously improving the capture and treatment of wet weather flows. 2019 will be the final year of reporting the EWCRI.

- The Total Suspended Solids Total Loading for 2018 (5-yr average) was 45,900 kg/d. This was lower than the target 50,000 kg/d and can be largely attributed to the rainfall events that fell on Edmonton in 2018. There were no large, intense rainfall events in 2018 to cause large loading events. Also, the 5-year rolling average used in the calculation dropped off 2013, one of the highest load years on record. Implementation of Combined Sewer Overflow controls is continuously improving the capture and treatment of wet weather flows.

4.7.2 Customer Service Index

The customer service index is a composite measure of the customers' perception of satisfaction with EWSI service, the speed of response and quality service level to customer issues.

Table 4.7.2
Customer Service Index

Index Metric		Measure	Target	Actual
1	Emergencies Responded to Within Two hours	The efficiency in responding to customer reports or complaints that require an emergency response. The emergency repair crew is given 2 hours to respond and be on site from the time the report is received.	> 87.0%	N/A Data not available
2	Number of Blocked Mainline Sewers	The number of blockages in the mainline per 100km of pipe.	< 2.1	1.3
3	Mature Neighbourhoods at 1:100	The percentage of neighbourhoods	> 16.0%	15.0%

Index Metric		Measure	Target	Actual
	Service Level	that are protected against a 100 year storm flood out of the 157 identified at-risk mature neighbourhoods.		
4	Odour Complaints	The number of odour complaint received from customers.	< 647	723

2018 Highlights

- The percent of mature neighbourhoods at a 1:100 service level metric is 1.0% below target. As PBR metrics for 2020 are identified, EWSI plans to introduce new performance measures focusing on the number of sub-basins protected, rather than mature neighbourhoods.
- Although the number of odour complaints increased by 76 from 2017, these results include all general odour complaints, not just those attributable to sewer odour. EWSI plans to address sewer odour issues through the new Odour Mitigation Strategy discussed in Section 1.5.

4.7.3 Reliability and Optimization Index

The System Reliability Index is a measure of the confidence that customers can place in the reliability of the drainage sanitary and stormwater systems.

Table 4.7.3
Reliability and Optimization Index

Index Metric		Measure	Target	Actual
1	Pipe Capacity Rating - Sanitary	The percentage of linear infrastructure assessed as having a hydraulic condition rating of 2 (or B) or better. Measured separately for sanitary, storm, and combined sewer infrastructure. Measures the number of blockages in the mainline per 100km of pipe.	96.0%	96.0%
2	Pipe Capacity Rating - Storm		50.0%	50.0%
3	Pipe Capacity Rating - Combined Sewer Overflow		80.0%	80.0%
4	Infrastructure at or Above the Minimum Level of Condition Rating	The percentage of all infrastructure (including non-linear) assessed at or above the minimum level of condition rating.	90.0%	90.4%
5	Capital (as rehabilitation) Re-invested Compared to Total System Replacement	The percentage of investment dollars spent on renewal/rehabilitation work on aging drainage infrastructure compared to the total system replacement value.	0.81%	0.37%

2018 Highlights

- Although the percentage of capital reinvested compared to the total system replacement value is 0.44% below target, 2018 results only account for the rehabilitation of existing infrastructure and do

not include system upgrades. EWSI is currently developing a more representative performance measure for network reliability.

4.7.4 Safety Index

The safety index is a measure of the success of programs and the application of policies that maximizes the safety of employees and the public.

Table 4.7.4
Safety Index

	Index Metric	Measure	Target	Actual
1	Employee Engagement (survey every 2 years)	The level of employee engagement within Drainage Services as a percentage.	70.0%	82.0%
2	Employee Turnover (excluding retirements)	The percentage of employees leaving Drainage Services compared to the overall headcount. This excludes retirements. This includes voluntary, involuntary departures, and transfers to other business areas.	6.0%	4.2%
3	Lost Time Frequency Factor	The number of lost time hours resulting from a workplace injury related to the total number of hours worked (200,000 hr) in a specific time period.	0.50	0.49

2018 Highlights

- The employee engagement survey results reported favourable rating of 82.0% for Drainage. The results in each individual operational are also exceeded the 2018 target, and Drainage's overall results exceed the overall EPCOR engagement score of 78%.
- The employee turnover rate is lower than target by 1.8%.
- The lost time frequency index metric meets target for the year. Continued safety focus will contribute to continued improvement in this index metric in future years.

4.8 Rates and Bill Comparisons

Unlike most cities, where wastewater treatment services and drainage services are combined, EWSI currently has separate bills for wastewater treatment services and for drainage services. Accordingly, in order to provide a better basis for comparison with other cities and communities, bill comparisons in Section 3.6 utilize EWSI's blended wastewater and drainage bills.

5 2018 Annual Operating Plans

5.1 Water Services and Wastewater Treatment Services

Water Services presented the 2018 Annual Operational plan to Utility Committee on April 23, 2018. The purpose of that document was to provide Edmonton City Council, Utility Committee and stakeholders a high level perspective of the major activities and initiatives that Water Services was undertaking to meet its overarching goal of providing customers with safe and reliable water and wastewater treatment services while meeting or exceeding all environmental requirements, delivering value and achieving a fair return. The initiatives planned for 2018 are organized within six strategic focus areas:

- IMPROVE OPERATIONAL PERFORMANCE
- SERVE CUSTOMERS BETTER
- MAKE SAFETY A PRIORITY IN ALL THINGS
- PROTECT PUBLIC HEALTH AND THE ENVIRONMENT
- PLAN FOR THE FUTURE
- DEVELOP A KNOWLEDGEABLE, CAPABLE AND ENGAGED TEAM.

A comprehensive update of progress on the various initiatives was provided to Utility Committee on October 25, 2018. As most of the initiatives were still in progress at that time, the focus of the report was on activities completed to date, next steps and a description of any variation from the original intentions. Some of the larger, more complex initiatives, such as the Lead Mitigation Strategy and the E.L. Smith Solar project, warranted a separate report and presentation to Utility Committee which was completed.

In keeping with the Utility Committee Reporting Framework (presented to Utility Committee February 23, 2018), this Progress Report presents the final update on the 2018 Operational Plan. Given that the mid-year update was presented late in the year, the update herein is intended to be higher level. All initiatives have been described as either: 1) Completed, indicating that the activities are finished and the initiative is closed, 2) In-progress, indicating that work continues and the initiatives has been continued in the 2019 Operational Plan (as many initiatives are multi–year), or 3) On-going, indicating that the initiatives will never be formally completed as business requirements continue to change (e.g. operational improvement).

INITIATIVE	Year End Status
IMPROVE OPERATIONAL PERFORMANCE	
1 ASSET RELIABILITY	
Asset Management Framework and Plans - methodology and processes to ensure accurate and comprehensive information about assets – particularly the costs and risks associated with operating and maintaining those assets	• In progress – significant progress has been made in developing the overall framework and methodology. Current activities are intended to “operationalize” the approach across all areas of water services to determine future capital spending requirements in preparation of the upcoming PBR application.

INITIATIVE	Year End Status
Water Treatment Plant & Transmission System Reliability - achieve increasing water treatment plant and transmission system reliability.	• Complete - A Master plan for water treatment plants has been completed. The next steps outlined in the plan, which include more detailed studies of specific topics such as residuals treatment and a long-term capital plan to tactically build towards the future scenarios described in the Master Plan are in process. • In progress – Master Plan for Transmission and Distribution system is in development. Plan will review immediate reliability issues (pipe condition and materials) in addition to a longer term outlook based on projected growth.
2 OPERATIONAL PROCESS OPTIMIZATION	
Coordination with City of Edmonton - explore opportunities to better align and coordinate between Water D&T, City of Edmonton and EPCOR Drainage priorities and planned work.	• On-going - initiatives to improve coordination with CoE have commenced and will continue to be optimized – examples include Roadways, LRT planning and charging for water infrastructure in infill development. New requirements will evolve as both organization introduce new processes.
Fleet Management System - improvement in the safety of drivers and efficiency of the fleet through the telematics fleet management system to monitor vehicle operation.	• Complete – fleet management system has been fully implemented and reporting of performance has commenced.
Truck Fill Decommissioning - plan to assess the decommissioning of some or all of the truck fills.	• In progress – truck fill strategy presented to Utility Committee on May 10, 2019 – strategy currently being implemented.
Innovation Strategy – development of a consistent and sustainable framework for applying innovative thinking.	• Complete - innovation tool kit rolled out to all staff, all managers attended a session of fostering innovative ideas within their teams
3 ADMINISTRATIVE AND MANAGEMENT PROCESS IMPROVEMENT	
Financial Review of Efficiency and Effectiveness Project & Chart of Accounts (COA) Review and Variance Reporting - improve cost effectiveness of the finance function and improve reporting through better process and a revised Chart of Account (COA)	• Complete – Finance effectiveness review resulted in the implementation of the Adaptive financial system to facilitate improved automated financial reporting • Complete – Chart of Accounts project – revised chart of accounts developed and implemented across all areas – allows greater visibility and consistency of financial reporting
Laboratory Process Improvements – develop a systematic approach to process improvement	• In-progress – initial six sigma training completed. Internal courses to broaden the

INITIATIVE	Year End Status
to improve efficiency for Analytical Operations (i.e. analytical testing, consultation, interpretation, technical resources, etc.)	knowledge in improvement techniques underway. Initial process improvement initiatives have commenced.
Trade Agreement Compliance – ensure compliance with CETA (Comprehensive Economic Trade Agreement) and CFTA (Canadian Free Trade Agreement).	• Completed – education sessions completed to ensure awareness of requirements. Internal processes re-aligned to support compliance.
4 CAPITAL PROJECT EXECUTION PROCESSES	
Contractor Performance Program - establish a formal mechanism to manage contract performance on a consolidated, comprehensive basis across all of Water Services.	• Complete – vendor performance criteria and measurement approach developed and implemented. Reviews conducted on a "trial" basis before expanding to all major contractors.
SERVE CUSTOMERS BETTER	
Customer Centric Strategy - improve customer service and reduce customer escalations by identifying recurring issues and develop escalation and process improvements through a Customer Insights Panel**.**	• In progress – initial scope of customer insights panel completed and research firm identified. 2019 Operational plan will see the formation of the plan and development of improvement opportunities.
Community Engagement – develop an engagement approach that aligns with the City of Edmonton's new Public Engagement Policy in order to improve relationships with the community and gain insight on expectations.	• Complete – EPCOR Stakeholder Engagement Strategy presented to Utility Committee June 8, 2018. This strategy is consistent across all of water services and drainage and has formed the framework on which all stakeholder engagement is based.
MAKE SAFETY A PRIORITY IN ALL THINGS	
1 SAFETY CULTURE	
Safety Culture Action Plan – develop a health and safety culture that has evolved to include proactive measures to address hazards and minimize incidents.	• On-going – safety awareness and communication continues to be fostered through regular safety summits, incident reviews, email summaries of incidents and general safety awareness campaigns.
2 **SAFETY SYSTEMS**	
Health, Safety & Environment Management Systems - Edmonton Water Treatment Plants, Distribution and Transmission and Gold Bar will maintain certification for their health and safety management system to OHSAS 18001:2007 and environmental management system ISO 14001:2015.	• In-progress – Water Treatment plants will register for ISO 45001 in 2019, Distribution and Transmission will conduct its next surveillance audit in 2019 and full re-registration audit in 2020. Gold Bar completed certification in 2018.
Ergonomics Plan – support employee wellness through education on how to incorporate healthy movement into everyday tasks in both field and	• Complete – all water services employees have been trained on the EPCOR Athletes program to improve ergonomic wellness.

INITIATIVE	Year End Status
office environments. Also, update existing Job Demands Analysis (JDA's).	Regular daily stretching now incorporated in most area's daily activities. • On-going – regular update of JDAs will continue as requirements evolve
Event Reporting System (ERS) Implementation – implement an Event Reporting System as the means to capture health and safety, environment, security, public health incidents and near miss data.	• Complete - ERS system has been installed and is operational across all EPCOR business units. Employees have been trained on the new application and understand how to operate ERS and track health and safety incidents and near miss reporting.
Contractor Safety Performance – ensure contractors maintain the same level of accountability and follow the same safety standards and procedures as employees.	• On-going – Contractor safety meetings completed to convey expectations. Regular on-going discussions with contractors particularly if performance does not meets expectations. In 2018 contractors achieved an all injury frequency incident rate of 0.37 versus a target of 2.15.
PROTECT PUBLIC HEALTH AND THE ENVIRONMENT	
Climate Change Strategy – develop a climate change adaption plan to ensure reliable drinking water supply for several decades into the future.	• In progress – A comprehensive climate change strategy has been completed. The strategy addresses anticipated and unanticipated changes in the source water quantity and quality and ranked areas of greatest risk – with flooding being the highest. The strategy is now being operationalized through a number of initiatives and capital plans for the facilities.
Flood Plan - WTP assets are at risk from flooding and can be impacted at flood levels below a 1:100 year event. A detailed flood protection plan will be completed and capital projects for flood protection of assets will be identified	• In progress – the Climate Change Strategy identified flooding as the highest risk. Plans are currently being developed to mitigate flood risks at the plants. Grant funding has been awarded to offset a portion of the associated costs.
1 ENVIRONMENTAL PROGRAMS	
Environmental Compliance Assurance Program - improve environmental performance across Water Services by ensuring compliance to environmental legal requirements and demonstrating environmental due diligence.	• On-going – An environmental compliance obligations registry and environmental incident reporting processes were developed in 2017. 2018 activities were focused on ensuring all capital projects aligned with these expectations and in developing compliance audit plans for the various facilities. Ensuring water services remains aligned with compliance expectations will be continual initiative given changing operational requirements, capital projects and regulatory expectations.

INITIATIVE	Year End Status
Environmental Management Systems 14001 - Environmental Management Systems (EMS) are required at facilities and treatment systems across Water Services. Those facilities/systems with an Environmental Management Systems built to meet the old standard are required to transition and conform to the new ISO 14001:2015.	• Complete – all Water Service facilities operate under a common Environmental Management system. This will be sustained on an on-going basis through maintenance of 14001 registration.
Residuals Management – develop a strategy for the continued reduction of residuals loading to the North Saskatchewan River and elimination of chlorinated discharges to the river. The main strategy for meeting this commitment is to maximize the time that the treatment plants operate in Direction Filtration (DF) mode.	• In-progress - initial scoping for the initiative has been completed. It has been determined that a triple bottom line (social, environmental and financial) review should be completed in order to provide a comprehensive assessment. Currently in progress.
Lead Program – develop a proactive means of reducing public health risks to customers from lead and to ensure compliance with the new guidelines for lead in drinking water.	• In-progress – Lead Mitigation Strategy developed and presented to Utility Committee March 22, 2019. Program detailed a targeted proactive lead service line replacement program and the addition of orthophosphate corrosion control to reduce lead concentrations from all sources. Programs are currently in the design and implementation phase.
River Monitoring - develop and execute a comprehensive, integrated and sustained monitoring program for the North Saskatchewan River for a four year period starting in 2018. The program will enable the determination of loading rates of various contaminants into the river and to link contaminant concentrations to land uses and facility discharges.	• In-progress – 18 of 22 planned monitoring stations have been installed in time to collect spring run-off water samples throughout the basin. Compilation of data planned for mid-2019 to determine initial results. Planned presentation to Utility Committee later in 2019 on status of the monitoring system, some initial results and long-term plan,
2 INCIDENT MANAGEMENT	
Release Response Plan – develop a response plan based on the 2017 report that assessed the impact of exposures to the Edmonton water systems from upstream (hydrocarbon) spills. Evaluate the treatability and response preparedness to these events.	• Complete – Release response plan has been updated to provide guidance for longer duration spills. Testing completed to determine effectiveness of treatment process on contaminated water. Alternative sources of potable water have been investigated and provisional sourcing contracts established.
PLANNING FOR THE FUTURE	
Master Plan/Integrated Resource Plan Updates – develop a comprehensive 40 year plan for all water facilities to ensure that longer	• In-progress – As noted above, water treatment plants and distribution and transmission are developing master plans that address longer term requirements within their respective

INITIATIVE	Year End Status
term population and other trends as well as new technologies are appropriately assessed.	areas. These will then be consolidated into a larger IRP that addresses long term growth and operational/service requirements on a more holistic basis. The plan includes a comprehensive review of technology and treatment processes. The Gold Bar master plan will also be combined within longer term drainage plans to ensure a consolidated approach as well.
Integrated Water Research Initiative - articulate the future research direction of Water Services from 2019 to 2021 as well as to prioritize and coordinate Water Services core funding with other collaborative investment approaches.	• In Progress – an integrated water research strategy is being developed that will allow for a coordinated approach for understanding and addressing public health, environmental and corporate priorities through a multi-faceted approach to facilitate knowledge transfer.
Annexation Plan for City of Edmonton: transition of water and drainage assets located in the lands annexed from Leduc County from the City of Edmonton.	• In-progress – a number of different initiatives have been identified and each is proceeding. Includes: acquisition of pipeline and booster station from Capital Region Southwest Water Commission and Discovery Park Reservoir from Remington Development. Additional initiatives include the customer transition and transfer of sanitary assets. Presentation to Utility Committee on June 28, 2019 to review fill scope of requirements.
Green Energy Projects - investment in two key green energy projects: • **Water Treatment Solar Energy Projects -** install solar energy at E.L. Smith. • **Gold Bar Biogas Project** - install a biogas cogeneration project at the Gold Bar wastewater treatment plant. .	• In-progress – the E.L. Smith Solar project has completed AUC and other required government approvals. Utility Committee has received a number of updates as the project has progressed. Re-zoning application to be presented to City Council in mid-2019. • In progress – project review revealed better opportunities to develop renewable natural gas instead of a co-generation project. Project in initial stages of development.
Drainage Coordination/Integration – identify synergies to drive operating and capital efficiencies realized in both water services and drainage services.	• In-progress – several short term opportunities for synergies have been identified and implemented. Detailed analysis has been completed to address larger opportunities to move towards a more consolidated approach across water and drainage. The central drivers to maximizing these opportunities are a real estate strategy and development common information systems platforms. These initiatives are in development and will be rolled–out over the next 2-3 years
DEVELOP A KNOWLEDGEABLE, CAPABLE & ENGAGED TEAM	

INITIATIVE	Year End Status
Onboarding Program for New Employees - develop and implement an Onboarding Program for new employees to foster engagement from the start of employment.	• In-progress – Review of current on-boarding program and associated improvement opportunities has been completed. Proposal outlining changes required to current process approved and currently being rolled out across the company.
Engagement Survey Action Plan - deliver a bi-annual engagement survey – develop action plan to address the top key drivers and opportunities identified in the engagement survey results.	• Complete – Engagement survey completed with water services maintaining overall high level of engagement. Water Service as a whole and each functional areas individually have developed actions plans to identified noted areas of improvement - currently being implemented.
Water Services Training Mandate Implementation - ensure Water Services improves its operational efficiencies and cross-department synergies related to training - support developing a knowledgeable, capable, and engaged team.	• Complete – all identified opportunities to ensure efficiencies and cross department synergies have been completed. Training and development has recently been consolidated with other training areas from across the company to drive even greater level of efficiencies and consistency.
Succession Planning Framework - development succession paths through competency identification and personal assessments through the Professional Growth Initiative as the basis for an integrated succession planning process.	• In-Progress – Professional Growth Initiative has been rolled out through successive levels of management starting at the top. Currently being implemented at the Manager level. Development plans completed for majority of staff.

5.2 Drainage Services

Drainage Services also presented a 2018 Annual Operational plan to Utility Committee on April 23, 2018. The purpose of that document was the same as Water Services. The drainage initiatives planned for 2018 were organized within six strategic focus areas:

- OPERATIONAL EXCELLENCE
- CUSTOMERS AND STAKEHOLDERS
- HEALTH AND SAFETY
- ENVIRONMENT
- PEOPLE
- SHAREHOLDER VALUE

A comprehensive update of progress on the various initiatives was provided to Utility Committee on October 25, 2018. As most of the initiatives were still in progress at that time, the focus of the report was on activities completed to date, next steps and a description of any variation for the original intentions. Some of the larger, more complex initiatives, such as the Odour Mitigation Strategy and the Stormwater Integrated Resource Plan (SIRP) warranted separate reports and presentations to Utility Committee which have been completed.

The following update is intended to be at a high level as a comprehensive mid-year update was provided to Utility Committee at the same time as Water Services. All initiatives below have been described as either: 1) Completed, indicating that the activities are finished and the initiative is closed, 2) In-progress, indicating that work continues and the initiatives has been continued in the 2019 Operational Plan (as many initiatives are multi–year), or 3) On-going, indicating that the initiatives will never be formally completed as business requirements continue to change (e.g. operational improvement).

Initiatives and Objectives	Year End Status
OPERATIONAL EXCELLENCE	
Develop rigorous project planning, delivery, and reporting to support completing capital projects on time and on budget.	
i) Develop rigorous project planning, delivery and reporting. Complete projected capital projects on time and on budget.	• Complete – project financial reporting. • In-progress – comprehensive capital project management and delivery process review underway. Will incorporate water as it evolves. • Complete - Capital Construction Strategy – currently being implemented
ii) Develop a longer term plan to achieve allowed return.	• In-progress – water/drainage synergies plan is being implemented - planned roll- out over 2 years. Foundational elements include a real estate and technology strategy in addition to immediate opportunities already implemented.
iii) Pursue technology improvements.	• In-progress – project to align drainage and water geo-spatial /technical platforms underway. Planned completion: drainage - 2019, water - 2020.
iv) Improve asset management practices.	• In-progress – asset condition focused capital plans in development - will continue over the next 2 years and beyond in order to provide basis for 2022-2026 PBR capital plans and future PBR capital plans.
v) Continue to work effectively with the City as a stakeholder.	• On-going – initiatives to improve coordination with CoE have commenced and will continue to be optimized. New requirements will evolve as both organization introduce new processes.
CUSTOMERS AND STAKEHOLDERS	
Develop the Stormwater Integrated Resource Plan and the Odour Control Strategy. Improve customer service and stakeholder communication.	
i) Develop the Stormwater Integrated Resource Plan and the Odour Control Plan as committed during transfer discussions.	• Complete – Final Stormwater Integrated Resource Plan presented to Utility Committee May 10, 2019

Initiatives and Objectives	Year End Status
	• Complete – Final odour Control plan to be presented to Utility Committee June 28, 2019
ii) Improve service to customers through lower service connection times, efficient project delivery and streamlined customer processes.	• On-going – service connection process reviewed to strengthen accountabilities and clarify roles and responsibilities with the result being an increase in overall performance. This initiative will continue as customer needs and internal processes continue to evolve.
iii) Improve customer and stakeholder communications and relationships.	• Complete – Public Engagement strategy developed and presented to Utility Committee June 8, 2018. Strategy now forms the basis for all on-going customer and stakeholder engagements.
HEALTH AND SAFETY	
Create a proactive safety culture by providing employees with the training, processes and systems to reduce injuries and to ensure public safety.	
i) Experience fewer injuries each year, moving towards safety performance similar to other EPCOR business units for both employees and contractors.	• On-going – metrics indicate an improvement in safety awareness/performance: • Near miss: 1611 versus target of 750 • All Injury Frequency of 3.8
ii) Create a proactive safety culture where employees feel supported and participate fully in safety improvements.	• On-going – several initiatives completed to develop a strong safety culture including training, revision of process, near miss and other reporting metrics as well as programs to increase general awareness. These programs will continue indefinitely to ensure the safety culture continues to build.
iii) Provide all employees with training and documentation to support safe work.	• On-going – a significant amount of safety and other training was completed for all drainage staff. Compliance course (i.e. legislated) completion achieved 93.5%, while conformance (EPCOR initiated) achieved 88.7%. Refreshers and new courses will be completed as requirements dictate.
iv) Implement a safety management system and develop and maintain associated processes.	• Complete – EPCOR Health Safety and Environment system roll-out. Provides a consistent approach to management safety incidents across all EPCOR business units.
v) Implement strategies to ensure public safety.	• On-going – greater public awareness was achieved through a number of public education programs such as Stormwater Ice Safety and stormwater facilities safety programs at schools. Phase 1 and 2 of Stormwater Facility Safety review resulted in

Initiatives and Objectives	Year End Status
	a number of recommendations for design standards, signage, and customer engagement initiatives that are currently underway.
ENVIRONMENT	
Implement the required environmental approvals and management systems while demonstrating environmental leadership through innovation.	
i) Implement required environmental approvals and management systems.	• Complete - Approval to Operate moved to EPCOR May, 2018 • Complete – Implementation of Environmental Management System and associated processes – aligned with other EPCOR business units • Complete – ISO 14001-2015 registration
ii) Maintain environmental leadership through innovative improvements to environmental programs.	• On-going – Total Loading Strategy – includes a review/update of existing 10 year loading strategy – planned completion Q3 2019 • In Progress – Climate Change Strategy - in addition the Stormwater Integrated Resource Plan, additional initiatives are being developed in conjunction with the CoE Climate Change Adaption plan
PEOPLE	
Support Drainage employees through role clarification, leadership development, workforce planning and implementing processes for people management.	
i) Clarify roles, accountabilities, and processes related to people.	• On-going – accountabilities, authorities and position descriptions clarified and review with staff starting at senior levels. This review will continue as the business requirements and underlying processes evolve and are further integrated with EPCOR operations.
ii) Improve leadership skills.	• On-going – Professional Growth Initiative (PGI) being roll-out to allow individuals to assess their current leadership skills and form development plans. PGI will continue to be implemented at successive levels of management over the next 2 years and will become a continuing cycle.
iii) Implement workforce planning across the business.	• Complete – Classification allocations for all union position to align with EPCOR Collective Agreements. • In progress – Initiatives to identify workforce synergies with Water Services – planned completion over the next 2-3 years.

Initiatives and Objectives	Year End Status
iv) Implement supporting processes for people management.	• Complete – Employee Engagement Survey revealed very high level of engagement. Programs to enhance engagement being implemented and will roll-out over the next year.
SHAREHOLDER VALUE	
Pursue efficiencies and processes related to cost, regulatory process and operations as they relate to Performance Based Rates (PBR).	
i) Pursue cost efficiencies as committed to during the transfer discussions with City Council.	• Completed – transitioned several areas to a combined model with water services/corporate to gain efficiencies including: Procurement, Inventory, Public and Government Affairs, Land Administration and Inspectors. • In progress – development and implementation of a comprehensive plan to combine operational areas with water services – conditional upon the real estate and technology strategies. Planned roll-out over the next 2-3 years.
ii) Add rigor and structure to regulatory process.	• Completed – in conjunction with water services, presented a Utility Committee reporting framework to Utility Committee in Feb., 2018. Regular reporting on initiatives and progress aligned with that framework. • Completed – established various governance groups to ensure progress and compliance - including Capital Project Steering Committee and Operational Excellence Council
iii) Adapt business processes to operate efficiently and effectively within a PBR.	• In progress – PBR Metrics program aligned with the approach used in water services including scoring system and financial penalties to be presented to Utility Committee in Sept. 2019.

Appendix A: PBR Plan 2017-2021

A.1 In-City Water and Wastewater

A.1.1 PBR Framework

EWSI's In-City Water and Wastewater rates for the 2017-2021 PBR term are regulated by Edmonton City Council in accordance with the PBR Plan approved in Bylaw 17698. This plan encompasses 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 and wastewater treatments system.

- **PBR Rates.** Annual changes to In-City Water and Wastewater rates are limited to inflation, less an efficiency factor, plus special rate adjustments and, in rare cases, non-routine adjustments. The use of a formulaic approach for calculating and setting utility rates acts as a "price cap" providing ratepayers with stable and predictable rates. The efficiency factor, set at 0.25% for the 2017-2021 PBR term, requires EWSI to increase productivity and achieve efficiencies in excess of inflation if it is to meet it targeted return on equity.

- **Performance Measures.** EWSI's PBR framework includes performance measures for water and wastewater treatment system service quality as described in Schedule 3, Sections 3 and 4 of the bylaw. EWSI faces financial penalties if it does not meet or exceed performance measure standards, providing assurance to customers that water and wastewater treatment system service quality will not be sacrificed to keep rates low or increase returns to EWSI. EWSI's performance measures are audited annually by an independent accounting firm.

- **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 2017-2021 PBR term, returns on equity are based on a deemed capital structure of 60% debt and 40% equity and a 10.175% rate of return on equity.

A.1.2 Risks and Incentives

The PBR framework provides incentives for EWSI to improve operational performance while achieving cost savings through process improvements and other means. Under this framework, EWSI also assumes the risks associated with water consumption, operating costs, financing costs and capital costs,

ensuring that customers are provided with stable and predictable rate increases. These risks and EWSI's strategies to mitigate them include:

- **Water Consumption Risk.** Under PBR, EWSI bears all of the risks associated with weather-related fluctuations in water consumption and water quality, as well as the longer-term risks associated with declining consumption per customer. EWSI seeks to mitigate consumption risk through the use of robust forecasting methodologies incorporating long term trends in water consumption.

- **Operating Cost Risk**. EWSI actively works to minimize fluctuations in input prices through long-term power contracts, chemical optimization processes, and continuous efforts to implement cost reduction strategies in all areas of its operations.

- **Interest Risk**. Fluctuations in short-term interest rates, long-term debt issue costs and in the level of capitalized interest have significant impacts on EWSI's net income and return on equity. EWSI mitigates interest risk through timing of long-term debt issuances and optimizing working capital.

- **Capital Cost Risk.** In-City Water and Wastewater's operations are capital intensive and it is often difficult to forecast required levels of capital replacements, both at the plants and in the water distribution and transmission network. EWSI seeks to minimize these risks through comprehensive capital project and asset management programs, ensuring that new projects or changes to existing projects are justified and that there is an appropriate level of management, senior management and executive oversight over capital spending.

A.1.3 Customer Classes and Rate Structure

A.1.3.1 In-City Water

In-City Water rates consist of fixed monthly service charges that vary with meter size and variable charges applied to each cubic metre of water consumed. Consumption charges differ for each of In-City Water's customer classes. These classes and their rate structures include:

- **Residential Customer Class.** Residential customers are charged based on an inclining rate structure with three consumption blocks. The inclining rate structure is intended to promote water conservation and provide incentives for residential customers to use water efficiently.

- **Multi-Residential Customer Class.** Multi-residential customers are charged based on a declining rate structure with three consumption blocks. EWSI has found that the cost of providing water to individual multi-residential customers declines as the size of the multi-residential building increases. As well, there is a wide range of consumption volumes for multi-residential customers. Accordingly, a declining rate structure best reflects the cost characteristics of this customer class.

- **Commercial Customer Class.** Similar to multi-residential customers, commercial customers are charged based on a declining rate structure, but with five consumption blocks to recognize the wide range of average consumption volumes within this customer class.

The 2017-2021 PBR Plan includes three special rate adjustments for In-City Water:

- **Special Rate Adjustment for Rebasing**. The In-City Water revenue requirement was rebased at the beginning of the 2017-2021 PBR term. The resulting rebasing adjustment to rates includes the on-going benefits to rate-payers of efficiency gains realized in the 2012-2016 PBR term, the impacts of higher than forecast capital expenditures during the 2012-2016 PBR term; and increases in the capital expenditure programs for the 2017-2021 PBR term. Also included in the rebasing adjustments is the impact of EWSI's cost of service study which has resulted in redistribution of revenue requirements from the Residential and Multi-Residential customer classes to the Commercial customer class.

- **Special Rate Adjustment for Accelerated Programs.** These special rate adjustments support the acceleration of the replacement of water mains as part of the City of Edmonton's neighbourhood renewal program and the upgrade of water mains to increase fire protection capacity in neighbourhoods experiencing increased densities as a result of infill development.
- **Special Rate Adjustments for Environmental Programs.** EWSI is undertaking two significant environmental initiatives during the 2017-2021 PBR term. The first initiative is an extensive River Monitoring Project to regularly monitor, evaluate and report on a number of water quality variables from several sampling sites in the river for 2018-2021. This program is forecast to have annual costs of $1.0 million starting in 2018. The second initiative, which aligns with the City's *"The Way We Green"* strategy, is a Green Power Initiative to replace approximately 10% of EWSI's total power volumes with energy from locally produced renewable sources starting in 2018. This initiative is forecast to cost $1.9 million annually commencing in 2018.

A.1.3.2 Wastewater

Wastewater treatment rates consist of fixed monthly service charges that are applied equally to each customer and variable charges applied to each cubic meter of water consumed. Wastewater has two customer classes:

- **Residential Customer Class.** Unlike In-City Water, there are no separate rates for multi-residential customers. Instead, customers who would be 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 very similar for 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 that there are 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 Section 4 of Schedule 1 to Bylaw 17698.

The 2017-2021 PBR Plan includes a single special rate adjustment for rebasing. Similar to In-City Water, Wastewater's revenue requirement was rebased at the beginning of the 2017-2021 PBR term to reflect efficiency gains realized in the 2012-2016 PBR term, as well as the substantial increases in capital spending needed to deal with the challenges of the aging infrastructure at the Gold Bar Wastewater Treatment Plant.

A.2 Drainage

A.2.1 PBR Framework

EWSI's Drainage rates for the 2018-2022 PBR term are regulated by Edmonton City Council in accordance with the PBR Plan approved in the EPCOR Drainage Services Bylaw 18100. Similar to In-City Water and Wastewater, Drainage's 2018-2022 PBR plan encompasses rates and performance measures, but the mechanisms used to achieve a balance between rates and operational performance differ in important respects, as follows:

- **PBR Rates.** Bylaw 18100 prescribes drainage fees and charges for the period from January 1, 2018 to March 31, 2022. These fees and charges reflect EWSI's commitment to limit average annual rate increases to 3%. Besides these scheduled rate increases, Bylaw 18100 also includes a mechanism for non-routine adjustments to rates related to emergent City-directed needs.

- **Performance Measures.** Bylaw 18100 requires Drainage to measure operational performance for the period from January 1, 2018 to December 31, 2019 using performance measures for drainage system service quality modeled after previous City Drainage Services quality metrics. After that time, for the remainder of the 2018-2021 PBR term, Drainage's operational performance will be measured against new performance measures that will be developed jointly by Drainage and approved by the Utility Committee. Similar to Water and Wastewater, the new performance measures will have a scoring system with financial penalties applied if Drainage does not meet or exceed performance standards. As with Water and Wastewater, the performance measures scorecard will be audited annually by an independent accounting firm. The performance measure results, together with Drainage's commentary on highlights and areas for improvements

A.2.2 Customer Classes and Rate Structure

Drainage has Residential, Multi-Residential and Commercial Customer classes, using the same customer definitions as Water. Drainage'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. Drainage has a simple rate structure, with flat monthly service charges varying only by meter size regardless of customer class and the same monthly variable rate per cubic meter applicable to all customers, regardless of customer class, except for the U of A which has a unique rate, intended to recognize its lower servicing cost.
- Stormwater Utility revenues are based on the area of the customer's property, development intensity, and zoning, also with common rates regardless of customer class.

2017 – 2021 Performance Based Regulation

Water Services,
Wastewater Treatment Services,
and Drainage Services

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1 Executive Summary

This report provides an annual update to the City of Edmonton on the operational and financial results for the year ended December 31, 2019 for water services ("In-City Water"), wastewater treatment services ("Wastewater"), and, sanitary and storm water sewer services ("Drainage") provided within Edmonton by EPCOR Water Services Inc. ("EWSI"). The City of Edmonton City Council regulates In-City Water and Wastewater in accordance with the Performance Based Regulation ("PBR") Plan approved in the EPCOR Water Services and Wastewater Treatment Bylaw No. 17698 ("Bylaw 17698") and Drainage in accordance with the PBR Plan approved in EPCOR Drainage Services Bylaw No. 18100 ("Bylaw 18100").

1.1 Financial Performance

In-City Water, Wastewater and Drainage's financial performance for 2019 are summarized in Table 1.1 below[1]:

Table 1.1
Revenue and Return on Equity
($ millions)

		A	B	C	D
	Revenue and Return on Equity	2019		2017-2019	
		PBR Forecast	Actual	PBR Forecast	Actual
1	**In-City Water**				
2	Revenue	205.8	191.3	593.9	571.2
3	Return on Equity	40.8	34.4	117.1	110.2
4	Rate of Return on Equity	10.18%	8.56%	10.18%	9.61%
5	**Wastewater**				
6	Revenue	105.6	99.1	297.4	286.0
7	Return on Equity	19.2	19.3	53.0	58.5
8	Rate of Return on Equity	10.18%	10.93%	10.18%	11.84%
9	**Drainage**				
10	Revenue	202.4	199.0	399.0	393.6
11	Return on Equity	22.8	28.5	58.9	61.4
12	Rate of Return on Equity	3.98%	4.76%	5.21%	5.21%

In 2019, In-City Water achieved an 8.56% rate of return on equity (9.61% for 2017-2019), compared to its forecast rate of return of 10.175%. In-City Water returns were challenged by lower than forecast revenue driven by lower than forecast inflation adjustments to rates, and lower than forecast consumption, partially attributable to higher than average precipitation over the summer months. Operating expense reductions achieved by In-City Water ($8.9 million) were unable to fully offset reductions to revenue.

[1] Consistent with the 2017-2021 PBR Application, all financial data in this report, including totals and sub-totals, are rounded to the nearest $0.1 million. This practice ensures continuity of data between tables and between years. However, the sum of the rounded detailed data in certain tables may not be equal to the related rounded total or sub-total.

Wastewater's revenues have been affected by the same factors as In-City Water, with lower than forecast operating expenses, combined with a lower than forecast rate base, enabled Wastewater to achieve a 10.93% rate of return in 2019 (11.84% for 2017-2019), compared to its forecast rate of return of 10.175%.

In 2019, Drainage realized a 4.76% rate of return on equity, 0.78% greater than its forecast rate of return. Lower revenues resulting from lower than forecast consumption was offset by lower than forecast operating expenses and lower than forecast rate base. Since Drainage does not have a City of Edmonton-approved PBR forecast, Drainage's actual financial performance for 2018 has been compared to its EPCOR budget, adjusted (1) to remove one-time costs related to the transition of Drainage to EPCOR, and (2) from IFRS to a regulatory accounting basis. The adjusted budget, escalated at an appropriate inflation rate, will serve as the basis for comparison of actual to forecast financial results for the remainder of the 2017-2021 PBR term.

Detailed analyses of In-City Water, Wastewater and Drainage's financial performance for 2019 and for the 2017-2019 period are provided in sections 2.3, 3.3, and 4.3, respectively.

1.2 Capital Expenditures

In-City Water, Wastewater and Drainage's capital expenditures for 2019 and for the five-year term of the PBR Plan (the "2017-2021 PBR term") are summarized in Table 1.2 below:

Table 1.2
Capital Expenditures
($ millions)

		A	B	C	D	E	F
Capital Expenditures		**2019**		**2017-2019***		**2017-2021**	
		PBR Forecast	**Actual**	**PBR Forecast**	**Actual**	**PBR Forecast**	**Current Projection**
1	In-City Water	87.0	113.0	276.4	307.6	475.8	574.1
2	Wastewater	53.3	49.3	165.6	148.5	235.4	238.6
3	Drainage	169.1	141.9	291.7	250.9	667.4	711.6

* Drainage Forecast and Actual results only include 2018-2019, 2018 is the first full year of Drainage operation following the transfer to EPCOR in September 2017.

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 Project Management Office and are authorized by EWSI's Capital Project Steering Committee, EUI's 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 to the Utility Committee throughout the year.

1. **In-City Water's** 2017-2021 projected capital expenditures of $574.1 million are $98.4 million (20.7%) greater than the PBR forecast. Significant projects contributing to this variance includes the E.L. Smith Solar Farm ($35.3 million), which is funded through the special rate adjustment for Environmental Initiatives; changes to the scope of the Water D&T Facility Expansion, which adds an additional $8.8 million to its cost. Besides these projects, there are three projects that the City has approved as non-

routine adjustments, including: (i) an enhanced Lead Mitigation Program ($25.3 million) needed to conform to new Health Canada Guidelines; (ii) additional costs of LRT Relocations ($12.2 million) needed to realign distribution network infrastructure; and (iii) the acquisition of the Discovery Park Reservoir and Capital Region Southwest Water Services Commission (CRSWSC) Water Pipeline ($9.5 million), following the City of Edmonton's annexation of land in Leduc County. Compared to the prior year forecast, the 2017-2021 projected capital expenditures have decreased by $40.7 million. This reduction reflects the preliminary impacts of the ongoing COVID-19 pandemic on In-City Water's capital program.

- **Wastewater's** 2017-2021 projected capital expenditures of $238.6 million are $3.2 million (1.4%) greater than the PBR forecast. The Gold Bar Wastewater Treatment Plant's aging infrastructure poses challenges to capital planning. Since the plant cannot be shutdown for maintenance, it is often difficult to accurately assess asset condition and the scope of rehabilitation needed before commencing work on a project. During preliminary engineering in 2017 and 2018, EWSI identified significant needs for repairs to critical infrastructure that had not been anticipated in the PBR forecast. EWSI reviewed design options and employed value engineering to reprioritize reliability and life cycle replacements. These efforts have ensured that changes to projections of the total cost of the 2017-2021 capital expenditures program have resulted in only a slight increase from the PBR forecast.

- **Drainage's** 2018-2021 projected capital expenditures of $667.4 million are $44.2 million (7%) greater than its long-term plan. This increase includes a $37.3 real estate initiative (a combined water and drainage facility – also referenced in water's capital expenditure section above), as well as substantial shifts of projected costs between programs as drainage continues to refine and reprioritize its overall capital expenditures program to address asset condition, mitigate the risk of failure, and maintain required service levels**.**

Detailed explanations for differences between capital expenditures in PBR forecast and EWSI's current projections are provided in Sections 2.4, 3.4 and 4.4.

1.3 Operational Performance

In-City Water's and Wastewater's operational performance is measured by the results of indices prescribed in Schedule 3 of Bylaw 17698 with each index consisting of one or more performance measures. Performance under each index is measured independently on a point 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 2019, In-City Water exceeded the performance standards for all five of its performance measure indices and Wastewater exceeded the performance standards for all four of its performance measure indices. Detailed discussions of the performance measures making up each of the indices and operational performance highlights are provided in Section 2.5 for In-City Water and Section 3.5 for Wastewater.

Table 1.3-1
2019 Performance Measures

		A	B	C	D
	Performance Index	In-City Water		Wastewater	
		Standard	Actual Score	Standard	Actual Score
1	Water Quality Index[1]	25.0	25.0	55.0	60.5
2	Customer Service Index	20.0	21.0	15.0	16.5
3	System Reliability and Optimization Index	25.0	28.5	15.0	16.5
4	Environmental Index[1]	15.0	16.5	n/a	n/a
5	Safety Index	15.0	16.5	15.0	16.5
6	**Aggregate Points Earned**	**100.0**	**107.5**	**100.0**	**110.0**

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

Drainage's operational performance is measured by the results of four indices prescribed in Schedule 3 of Bylaw 18100 with each index consisting of one or more performance measures. These performance measures are patterned after previous Drainage Utility service quality metrics and do not include a scoring system similar to those of In-City Water and Wastewater.

In 2019, Drainage met or exceeded performance standards for ten of thirteen performance measures included in the four performance measure indices. Detailed discussions of the performance measures making up each of index and highlights of Drainage's operational performance are provided in Section 4.5.

2019 is the last year Drainage Services will be reporting on these performance measures. Pursuant to City Council's approval of amendments to Bylaw 18100 on February 19, 2020, EWSI introduced new PBR performance metrics, scoring and penalties beginning in 2020. The new proposed PBR metrics program is effective for the remainder of the PBR term (2020 and 2021), and is patterned after the water and wastewater PBR metrics and meets the requirements of the Letter of Intent developed for the transition of Drainage Services from the City to EPCOR.

1.4 Rates and Bill Comparisons

In 2019, the average monthly bill for In-City Water customers, based on 2019 average monthly consumption per residential customer of 13.8 m^3, was **$36.15,** an increase of 2.8% from 2018. This increase consists of the 1.2% inflation adjustment discussed in Section 2.3.1, and special rate adjustments approved in Bylaw 17698 for Environmental Initiatives (0.3%), Accelerated Programs (0.5%) and Rebasing (0.8%).

The average residential customer's wastewater treatment bill in 2019, also based on monthly consumption of 13.8 m^3, was **$17.33**, an increase of 5.5% from 2018. This increase includes the 1.2% inflation adjustment, and the special rate adjustment for rebasing of 4.3% needed to support Wastewater's 2017-2021 capital programs.

The average residential customer's drainage bill in 2019, again based on monthly consumption of 13.8 m^3, was **$34.55**, an increase of 3.0% from 2018. Drainage rates from January 1, 2018 to March 31, 2022

have been set in Bylaw 18100, which, except for Non-Routine Adjustments (Section 1.5), limits average annual bill increases to 3.0%.

EWSI undertakes annual bill comparison surveys with various cities and local communities. Section 2.6 shows that EWSI's residential water rates are lower than most of the cities and communities included in the comparison, with only Vancouver having lower water rates. Drainage and Wastewater 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 which influence the level of investment in and approach to flood mitigation. Section 3.6 shows that Edmonton's combined Drainage and Wastewater treatment rates are competitive with those of other cities and communities with similar geographic and climatic conditions. Commercial bill comparisons for both water and wastewater show similar results to residential water and wastewater bills.

1.5 Non-Routine Adjustments

Non-routine adjustments for In-City Water and Wastewater are defined in Bylaw 17698, and for Drainage in Bylaw 18100, as "items which are unusual, significant in size or nature, and beyond the scope of control of EWSI". Bylaws 17698 and 18100 allow EWSI to request adjustments to In-City Water, Wastewater and Drainage rates for non-routine adjustments from the City Manager or City Council, depending on the impact of the non-routine adjustment on In-City Water, Wastewater or Drainage's revenue requirements.

In 2019, EWSI received approval to increase In-City Water and Drainage rates for the following projects that qualified as non-routine adjustments outlined in Bylaw 17698, Schedule 3, Section 5.0 for Water and Wastewater, or in Bylaw 18100, Schedule 3 Section 4.1 for Drainage. These non-routine adjustments will be included in Drainage rates commencing January 1, 2020, January 1, 2021, and January 1, 2022, and will be included in In-City Water rates commencing April 1, 2020 and escalating by inflation less the productivity factor in April 1, 2021.

- **Lead Mitigation Strategy (In-City Water)** – On March 22, 2019, EWSI presented a new lead mitigation strategy to the Utility Committee. This strategy is designed to meet new Health Canada Guidelines that reduce the maximum concentration of lead in drinking water at the tap from 10 parts per billion to 5 parts per billion. On July 16, 2019, EWSI received approval to apply the non-routine adjustments to In-City water rates commencing April 1, 2020 to recover the costs of implementing this strategy. The additional cost to an average Residential In-City Water customer will be $0.40 per month commencing April 1, 2020 (or a total of $10.91 over the remainder of the 2017-2021 PBR term).

- **Leduc County Annexation (In-City Water)** – On November 27 2018, the Government of Alberta approved the City of Edmonton's annexation of 8,260 hectares from Leduc County. As part of the annexation, EWSI will acquire the existing water infrastructure within or required to service the annexed area, including a reservoir, pump house and booster station, as well as transmission mains and a small distribution system, at a cost of $9.5 million which is comprised of $7.8 million for the Discovery Park reservoir and the remainder for a pipeline and booster station. On November 7, 2019, EWSI received approval to apply the non-routine adjustments to In-City water rates commencing April 1, 2020 to recover the costs related to the annexation. The additional cost to the average Residential

In-City Water customer will be $0.26 per month commencing April 1, 2020 ($7.09 over the remainder of the PBR term).

- **LRT Relocations (In-City Water and Drainage)** – EWSI has identified work needed to accommodate water main, hydrant and sewer relocations for the West Valley Line and Metro Line Northwest Phase I LRT projects. On November 7, 2019, (Drainage) and December 23, 2019 (In-City Water) EWSI received approvals to apply the non-routine adjustments to water rates for In-City Water customers commencing April 1, 2020 and to sanitary utility and storm water utility rates for Drainage customers commencing January 1, 2020. The additional cost to the average Residential In-City Water customer is $0.17 per month commencing April 1, 2020 ($4.64 over the remainder of the PBR term). The average monthly bill increase for Residential Drainage customers is $0.14 per month commencing January 1, 2020, an additional $0.37 per month commencing in January 1, 2021, and an additional $0.31 per month commencing on January 1, 2022 (or a total of $10.26 over the remainder of the 2018-2021 PBR term).

- **Stormwater Integrated Resource Plan (Drainage)** – On May 10, 2019, EWSI presented its Stormwater Integrated Resource Plan (SIRP) alternatives to the Utility Committee. The plan includes a mix of capital and operational program investments to mitigate flood risks across the City using a mix of grey and green infrastructure components installed within the public right-of-way or within City or EPCOR owned parcels. The SIRP approach allows for a lower overall capital investment than seen with traditional engineering approaches through the inclusion of operational programs that support the overall community in responding to flooding events. On December 2, 2019, EWSI received approval to apply the non-routine adjustments to storm water utility rates commencing January 1, 2020. The additional cost to the average Residential Drainage customer is $0.51 per month commencing January 1, 2020, an additional $0.15 per month commencing January 1, 2021, and an additional $0.03 commencing January 1, 2022 (or a total of $16.11 over the remainder of the 2018-2021 PBR term).

- **Corrosion and Odour Reduction Strategy (Drainage)** – On June 28 2019, EWSI presented its Corrosion and Odour Reduction Strategy to the Utility Committee. The Corrosion and Odour Reduction Strategy was developed using similar principles and approaches to EWSI's SIRP to determine an optimized mix of operational and capital solutions to reduce corrosion and odour. The strategy expands the previous plan by focusing on preventing the formation of hydrogen sulphide gas, which will reduce community odour impacts and lengthen the life of sewer network assets. Areas of focus within the strategy include: prevent the formation of hydrogen sulphide gas in the sewer system, control the release of air from the sewer system, and adapt the system using real-time monitoring technologies and improved inspection data. On December 2, 2019, EWSI received approval to apply the non-routine adjustments to sanitary utility rates commencing January 1, 2020. The additional cost to the average Residential Drainage customer is $0.53 per month commencing January 1, 2020, an additional $0.42 per month commencing January 1, 2021, and an additional $0.06 per month commencing January 1, 2022 (or a total of $20.79 over the remainder of the PBR term).

Table 1.5 summarizes the average Residential customer monthly bill impact for all non-routine adjustment that have been approved over the 2017-2021 PBR term. These non-routine adjustments include the five non-routine adjustments detailed above, plus the negative non-routine adjustment approved in 2018, passing on

reductions in corporate shared service cost allocations resulting from the transfer of Drainage Services assets to EPCOR to In-City Water and Wastewater customers.

Table 1.5
Non-Routine Adjustments
Monthly Residential Bill Impacts
($)

		A	B	C
	Non-Routine Adjustment	**2020**	**2021**	**2022* (Jan to Mar)**
1	Corporate Cost Reduction (Drainage Transfer)	(1.04)	(1.05)	(1.05)
2	Lead Mitigation Strategy	0.40	0.41	0.41
3	Leduc County Annexation	0.26	0.26	0.26
4	LRT Relocations	0.31	0.68	0.99
5	Corrosion and Odour Reduction Strategy	0.53	0.95	1.01
6	Stormwater Integrated Resource Plan	0.51	0.66	0.69
7	**Total Monthly Bill Impact**	**0.97**	**1.91**	**2.31**

* EWSI's current bylaws expire on March 31, 2022. New bylaws with updated rates would be in effect for the remainder of 2022.

2 In-City Water Services

2.1 Accomplishments and Challenges

In 2019, In-City water had significant accomplishments, including:

- In June, at the American Water Works Association's (AWWA) Annual Conference and Exposition Edmonton's tap water was named the People's Choice Winner of AWWA Tap Water Taste Test, as voted by thousands of water experts who attended the AWWA conference;
- In partnership with Alberta Environment and Parks, the City of Edmonton and the North Saskatchewan Watershed Alliance, The WaterSHED (Water: Saskatchewan Headwaters, Edmonton and Downstream) Monitoring Program was launched. In 2019 installation and upgrades were completed on a network of 19 monitoring stations along the North Saskatchewan River, from its headwaters in the Columbia Icefields to the Saskatchewan border. As Alberta's most extensive water quality monitoring and sampling program, it will improve understanding of how the river functions, how it is being impacted by land-use decisions and actions, and how it may change in the future;
- In February, Edmonton experienced one of the coldest months in nearly 40 years. This colder than average temperate resulted in a significant increase in the number of frozen services in 2019. EWSI's D&T crews identified innovative methods to quickly and cost effectively thaw frozen service lines, and restore service to affected customers;
- In early 2019, EWSI received approval, from the City of Edmonton Utility Committee, to proceed with its comprehensive Lead Mitigation Strategy to meet new Health Canada Guidelines for Canadian Drinking Water Quality. This strategy is intended to reduce lead levels in over 4,400 homes with lead service lines and over 23,000 homes with high lead levels related to lead plumbing and plumbing fixtures ensuring that EWSI provides safe drinking water to the citizens of Edmonton;
- Additional accomplishments are included in the 2019 Operating Plan below.

2.2 Customers and Consumption

In-City Water provides services to three customer classes: Residential; Multi-Residential; and Commercial (see Appendix A). These classes are unchanged from the previous PBR term and are described in detail in Appendix A. Customer counts, total annual consumption and monthly consumption per customer are shown in Table 2.2 below:

Table 2.2
Customers, Consumption and Consumption per Customer

		A	B	C	D
	Customers and Consumption	2019		2017-2019	
		PBR Forecast	Actual	PBR Forecast	Actual
	Customers				
1	Residential	266,138	269,842	261,207	264,554
2	Multi-Residential	3,837	3,779	3,792	3,765
3	Commercial	19,761	19,918	19,509	19,679
4	**Total**	**289,736**	**293,539**	**284,507**	**287,998**
	Consumption per Customer (m^3 per month)				
5	Residential	14.2	13.8	14.4	14.3
6	Multi-Residential	408.6	391.8	408.6	392.7
7	Commercial	120.3	109.3	121.9	114.2
	Annual Consumption (ML)				
8	Residential	45,215.1	44,603.1	135,406.1	135,913.0
9	Multi-Residential	18,813.6	17,766.6	55,774.0	53,234.2
10	Commercial	28,529.4	26,133.3	85,602.5	80,897.8
11	**Total**	**92,558.0**	**88,502.9**	**276,782.7**	**270,045.0**

The factors contributing to actual to forecast differences for 2019 and for 2017-2019 differ by customer class, as explained below:

- **Residential.** Customer counts in 2019 are 1.4% greater than forecast, primarily because of higher than expected actual customer counts at the beginning of the 2017-2021 PBR term. In 2019, consumption per customer was 2.7% lower than forecast, primarily attributable to higher than average precipitation over the summer months. Over the 2017-2019 period actual consumption per customer is slightly lower then the PBR forecast, confirming the robust residential forecasting methodology developed for the 2017-2021 PBR forecast. The combined effect of these factors is that total residential consumption for 2019 is 1.4% lower than forecast (0.4% greater for 2017-2019).

- **Multi-Residential.** Growth in the multi-residential customer counts continue to be lower than forecast, in 2019 customer counts decreased to 1.5% lower than forecast (from 0.7%). Lower than forecast consumption per customer, combined with lower customer counts, meant that total consumption was 5.6% less than forecast. Lower than forecast consumption per customer is not attributable to a specific cause, but reflects a variety of factors, including: vacancy rates, renovations of older buildings; and the number of units in new multi-residential buildings.

- **Commercial.** Consumption in the commercial customer class was 8.4% less than forecast, despite a 0.8% increase in customer counts. This class includes a large number of customers that use very little water (offices, convenience stores, etc.) and a small number of customers with very high levels of consumption (food and beverage producers, malls, etc.). In 2019, EWSI's billing system data showed that 217 (1.1%) of commercial customers accounted for 50% of commercial consumption. Therefore, the loss of a large customer can cause significant shifts in consumption per customer for the entire class. As well, since new customers tend to be low water consumers, increases in customer counts may not have significant effects on overall consumption for the commercial customer class. Accordingly, EWSI is exploring opportunities to expand the application of the forecasting methodology developed for the residential class to the commercial and multi-residential customer classes for future PBR periods.

2.3 Financial Performance

In-City Water's net income is derived from the provision of water services within Edmonton's boundaries. Besides these services, EWSI provides water services to surrounding communities under bulk water supply agreements with regional water service commissions ("RWCG" or "Regional Customers"), and fire protection services to the City of Edmonton under a service agreement ("Fire Protection").

EWSI's water system is fully integrated, with services jointly provided to In-City Water, Regional Customers and Fire Protection. Therefore, in sections 2.3.1 to 2.3.7, operating costs, depreciation, rate base and capital expenditures are presented and analyzed on a total system basis. In-City Water's share of these expenses, as well as its returns on rate base, are calculated in accordance with a cost of service model developed jointly by EWSI, the regional water service commissions and the City of Edmonton, and are shown as separate line items on each applicable table. In-City Water's total revenue and revenue requirements are summarized in Table 2.3 below:

Table 2.3
In-City Water Revenue Requirements
($ millions)

		A	B	C	D
	Summary of Revenue Requirements	**2019**		**2017-2019**	
		PBR Forecast	**Actual**	**PBR Forecast**	**Actual**
1	In-City Water Rate Revenue[(1)]	200.8	185.8	579.0	554.5
2	In-City Water Revenue Requirement				
3	Operating expenses	108.1	99.5	314.8	295.5
4	Other revenue	(5.0)	(5.5)	(14.9)	(16.8)
5	Depreciation and amortization	28.4	28.4	81.1	81.3
6	Return on rate base financed by debt	29.4	29.0	84.3	84.2
7	Return on rate base financed by equity	40.8	34.4	117.1	110.2
8	In-City Water Revenue Requirement*	201.6	185.8	582.4	554.5
9	**Return on Rate Base Financed by Equity**	**10.18%**	**8.56%**	**10.18%**	**9.61%**

[1] In the PBR forecast, rebasing and other special rate adjustments have been smoothed over the PBR term. Therefore, although forecast revenue is equal to the revenue requirement over the 2017-2021 PBR term, in any year within the PBR term, forecast revenue may be greater or less than the revenue requirement.

2.3.1 Revenue

In-City Water's rate revenues include fixed monthly services charges which vary by meter size and consumption charges applied to each cubic meter of water consumed. Besides rate revenue, In-City Water revenues also include other revenue derived from temporary services, connection fees, water permits, late payment charges and other incidental services. Table 2.3.1-1 below provides a comparison of 2019 In-City Water revenues to the PBR forecast:

Table 2.3.1-1
In-City Water Revenue
($ millions)

		A	B	C	D
	In-City Water Revenue	2019		2017-2019	
		PBR Forecast	Actual	PBR Forecast	Actual
1	Fixed Monthly Service Charges				
2	Residential	24.2	21.4	69.6	64.5
3	Multi-Residential	1.5	1.4	4.3	4.0
4	Commercial	4.5	3.9	12.8	11.9
5	Fixed Monthly Service Charges	30.3	26.6	86.7	80.3
6	Consumption Charges				
7	Residential	100.6	95.2	291.1	283.7
8	Multi-Residential	31.5	29.1	90.4	85.3
9	Commercial	38.4	34.8	110.9	105.2
10	Consumption Charges	170.5	159.2	492.3	474.2
11	In-City Water Rate Revenue	200.8	185.8	579.0	554.5
12	Other Revenue	5.0	5.5	14.9	16.8
13	**Total In-City Water Revenue**	**205.8**	**191.3**	**593.9**	**571.2**

In-City rate revenues were $15.0 million less than forecast in 2019, and $24.5 million less than forecast over the 2017-2019 PBR period. This difference is attributable to the following factors:

- Lower than forecast inflation resulted in a $6.1 million decrease in 2019 ($11.0 million for 2017-2019). The PBR plan limits Water and Wastewater's annual routine rate adjustments to inflation less an efficiency factor (see Appendix A.1). As shown in Table 2.3.1-2, actual PBR inflation adjustments for 2019 and 2017-2019 are significantly less than forecast. The effect of lower than forecast inflation from 2016 to 2019 will continue to impact revenues throughout the remainder of the 2017-2021 PBR term.

Table 2.3.1-2
2018 PBR Inflation Adjustment

		A	B	C	D
	PBR Inflation Adjustment to In-City Water and Wastewater Rates	2019		2017-2019	
		PBR Forecast	Actual	PBR Forecast	Actual
1	Forecast Inflation				
2	CPI	2.20%	2.10%	6.75%	6.33%
3	Labour	2.40%	1.20%	7.37%	4.67%
4	Weighted Inflation (65% CPI, 35% Labour)	2.27%	1.79%	6.97%	5.75%
5	Less: Efficiency Factor	-0.25%	-0.25%	-0.75%	-0.75%
6	Forecast Inflation	2.02%	1.54%	4.08%	3.39%
7	Actual to Forecast Inflation Adjustment	-	-0.35%	-	-1.72%
8	**PBR Inflation Adjustment**	**2.02%**	**1.18%**	**4.08%**	**1.96%**

- Lower than forecast consumption (see section 2.2) resulted in a $6.3 million decrease in 2019 revenues ($9.3 million for 2017-2019). These decreases were partially offset by slight increases in customer counts which resulted in a $0.4 million increase in revenue in 2019 ($1.0 million for 2017-2019; and
- A negative non-routine adjustment to 2018 water rates decreased revenues by $3.0 million in 2019 ($5.1 million for 2017-2019). This non-routine adjustment fulfills EPCOR's commitment to the City to

flow the benefits of any reductions in corporate shared service cost allocations resulting from the transfer of Drainage Services assets to EPCOR to In-City Water and Wastewater customers through a negative non-routine adjustment.

Besides rate revenues, In-City Water earned $5.5 million in other revenue in 2019, $0.5 million greater than forecast ($1.8 million greater for 2017-2019). This increase includes $0.2 million in fees charged to private developers for water main flushing for new developments ($0.8 million for 2017-2019), and $0.3 million in additional customer service revenue ($1.0 million for 2017-2019).

2.3.2 Operating Expenses by Function

Table 2.3.2 below provides a comparison of EWSI's total water system operating expenses for 2019 to the PBR forecast.

Table 2.3.2
Operating Expenses by Function
($ millions)

		A	B	C	D
	Function and Sub-function	**2019**		**2017-2019**	
		PBR Forecast	**Actual**	**PBR Forecast**	**Actual**
1	Power, Other Utilities and Chemicals				
2	Power and Other Utilities	14.4	10.3	40.4	31.8
3	Chemicals	7.4	11.7	21.9	28.0
4	Power, Other Utilities and Chemicals	21.8	22.0	62.3	59.9
5	Water Operations				
6	Water Treatment Plants	19.6	18.9	57.6	55.4
7	Water Distribution and Transmission	25.6	26.5	75.3	78.9
8	Operational Support Services	7.6	6.9	22.2	20.8
9	Quality Assurance and Environment	6.6	6.8	18.5	18.9
10	Capitalized Overhead Costs	(7.4)	(8.3)	(21.8)	(22.9)
11	Water Operations	52.0	50.9	151.9	151.2
12	Billing, Meters and Customer Service				
13	Billing and Collections	8.4	7.8	24.3	23.6
14	Meter Reading, Repairs and Maintenance	2.8	2.2	9.0	6.2
15	Customer Service	0.9	0.4	2.3	1.7
16	Billing, Meters and Customer Service	12.1	10.4	35.7	31.4
17	EWSI Shared Services				
18	EWSI Shared Services	10.2	9.1	29.9	27.9
19	Incentive and Other Compensation	3.3	2.9	9.6	9.0
20	EWSI Shared Services	13.4	12.0	39.6	36.9
21	Corporate Shared Services	15.6	12.1	45.9	37.0
22	Franchise Fees and Property Taxes				
23	Franchise Fees	15.8	14.7	45.7	43.8
24	Property Taxes	0.4	0.2	1.3	0.7
25	Franchise Fees and Property Taxes	16.3	14.9	47.1	44.5
26	**Total Operating Expenses by Function**	**131.2**	**122.3**	**382.4**	**361.0**
27	In-City Water Share - %	82.4%	81.4%	82.3%	81.9%
28	**In-City Water Share - $**	**108.1**	**99.5**	**314.8**	**295.5**

Overall, total operating expenses for 2019 were $8.9 million lower than the PBR forecast, and $21.4 million lower over the 2017-2019 PRB period. Key factors contributing to this difference include:

- **Power and Other Utilities** – $4.1 million less than forecast in 2019 ($8.6 million less for 2017-2019) due to lower than forecast power prices ($2.2 million in 2019 and $4.8 million for 2017-2019) and $1.9 million in savings associated with the green energy premium ($3.8 million for 2017-2019) that was included in the PBR forecast. The PBR forecast included annual renewable (green energy) power purchases of $1.9 million annually, starting in 2018. Rather than purchasing locally produced renewable energy, EWSI plans to construct a solar farm on land adjacent to the E.L. Smith water treatment plant.
- **Chemicals** – $4.3 million greater than forecast in 2019 ($6.1 million greater than forecast for 2017-2019). In 2019, higher than average precipitation (surface run off) resulted in unusually high colour in the river over the summer months requiring the use of more chemicals (alum and caustic soda) in the water treatment process. The unusually high colour continued into the fall causing a significant delay in the conversion to direct filtration and extending the use of chemicals in the water treatment process. Higher than forecast costs for the 2017-2019 PBR period are also attributable to unexpected changes in river water quality, including early spring run offs and high colour in the fall.
- **Water Treatment Plants** – $0.7 million less than forecast in 2019 ($2.2 million less than forecast for 2017-2019). Lower than forecast costs for 2017-2019 are attributable to several factors, including: a higher than forecast proportion of internal labour working on capital projects, which increased capital recoveries by $2.0 million, reductions in fringe benefit costs, primarily due to lower pension contribution rates, which provided savings of $0.6 million; capitalization of filter media costs, which had previously been considered an operating expense of $0.2 million; which is partially offset by higher salary costs of $1.0 million attributable to an increase in head count. The remainder of the actual to forecast difference consists of numerous small items, none of which are individually significant.
- **Water Distribution and Transmission** – $0.9 million greater than forecast in 2019 ($3.6 million greater for 2017-2019). Seasonal freeze-thaw cycles in 2017 and 2018 combined with a colder than average winter in 2019 resulted in higher than normal volumes of emergency repairs (main breaks and frozen services) over the 2017 to 2019 period, resulting in increased overtime costs of $0.7 million ($2.1 million for 2017-2019), higher contractor costs of $1.8 million ($3.5 million for 2017-2019), and additional material costs of $0.6 million ($1.7 million for 2017-2019). These increases were partially offset by reductions in fringe benefit costs of $1.0 million in 2019 ($2.5 million for 2017-2019), and an increase in the recovery of fleet costs attributable to an increase in capital work of $0.6 million in 2019 ($0.7 million for 2017-2019) The remainder of the actual to forecast difference consists of numerous small items, none of which are individually significant.
- **Operational Support Services** – $0.7 million less than forecast in 2019 ($1.4 million less for 2017-2019). The 2017-2019 variance in this function is primarily attributable to lower staff costs of $0.9 million related to vacant positions within the Project and Asset Management functions and a transfer of the Knowledge Management function to Corporate Shared Service in 2019, combined with lower than forecast legal costs of $0.4 million, as less external legal support was required.
- **Billing, Meters, and Customer Service** – $1.7 million less than forecast in 2019 ($4.3 million less for 2017-2019). Meter reading process improvements provided cost savings in staff costs of $1.0 million ($2.6 million for 2017-2019), $0.3 million in vehicle expenses ($0.7 million for 2017-2019), and $0.6 million in lower billing and customer service charges from EPCOR Energy Alberta LP ($0.7

million for 2017-2019). The remainder of the actual to forecast difference consists of numerous small items, none of which are individually significant.

- **EWSI Shared Services** – $1.4 million less than forecast in 2019 ($2.7 million less than forecast for 2017-2019). The 2019 favorable variance in this category reflects EWSI's continuing efforts to manage shared services costs, with savings of $0.3 million arising from delays in filling vacant positions in Regulatory Services, a $0.5 million decrease in technical training charges from EPCOR Distribution and Transmission Inc. (training functions consolidated to Corporate Shared Service in 2019), and $0.4 million of recoveries from Drainage, as the organization is gradually consolidating functions from each of EWSI's business units into a single EWSI's shared services area.
- **Corporate Shared Services** – $3.5 million less than forecast in 2019 ($8.9 million less than forecast for 2017-2019). These differences reflect both the reduction in corporate shared services cost allocations resulting from the transfer of Drainage from the City of Edmonton to EPCOR, which are fully offset by the non-routine adjustment to rates described in Section 2.1.1, as well as cost savings in EPCOR Utilities Inc.'s corporate functions**.**
- **Franchise Fees and Property Taxes** – $1.4 million less than forecast in 2019 ($2.6 million less than forecast for 2017-2019). Lower than forecast revenue resulted in a $1.2 million reduction in franchise fees in 2019 ($2.0 million for 2017-2019). Lower than forecast property taxes relate to the deferral of the Distribution and Transmission facility which had been expected to increase Water Services property taxes by $0.2 million annually commencing in 2017.

Variances in other operating expense functions and sub-functions are not significant, either individually or in aggregate.

In 2019, In-City Water's share of operating expenses was $99.5 million (81.4%), compared to $108.1 million (82.4%) in the PBR forecast. This result reflects both lower total operating expenses for EWSI's total water system and a 1.0% decrease in In-City Water's share of operating expenses determined through the cost of service model.

2.3.3 Operating Expenses by Cost Category

Table 2.3.3 below shows operating expenses by cost category for Water Operations, Billing Meters and Customer Service, and EWSI Shared Services, where cost categories differ from the sub-functions in Section 2.3.2.

Table 2.3.3
Operating Expenses by Cost Category
($ millions)

		A	B	C	D
	Cost Category	2019		2017-2019	
		PBR Forecast	Actual	PBR Forecast	Actual
1	Water Operations				
2	Staff Costs and Employee Benefits	42.2	40.6	124.2	120.3
3	Contractors and Consultants	8.0	9.3	22.5	25.8
4	Vehicles	1.5	1.1	4.5	3.6
5	Materials and Supplies	3.2	3.9	9.3	11.1
6	Other	4.5	4.3	13.1	13.2
6	Capitalized Overhead Costs	(7.4)	(8.3)	(21.8)	(22.9)
7	Water Operations	52.0	50.9	151.9	151.2
8	Billing, Meters and Customer Service				
9	CUS Charges	8.4	7.8	24.3	23.6
10	Staff Costs and Employee Benefits	7.0	6.0	20.4	17.9
11	Contractors and Consultants	0.5	0.4	1.6	1.2
12	Vehicles	0.3	0.1	0.9	0.6
13	Other	0.6	0.7	1.6	1.4
14	Meter Reading Services (Recoveries)	(4.8)	(4.6)	(13.1)	(13.1)
15	Billing, Meters and Customer Service	12.1	10.4	35.7	31.4
16	EWSI Shared Services				
17	EWSI Shared Services Allocation	10.2	9.4	30.1	28.1
18	Staff Costs and Employee Benefits	3.3	2.8	9.6	9.2
19	Contractors and Consultants	0.2	0.1	0.6	0.4
20	Other	(0.3)	(0.3)	(0.8)	(0.8)
21	EWSI Shared Services	13.4	12.0	39.6	36.9

The information presented in this table supports the explanations of differences between 2019 actual and forecast expenses provided in Section 2.3.2. Accordingly, no additional explanations are considered necessary.

2.3.4 Depreciation and Amortization

EWSI total system depreciation expense and amortization of contributed assets for 2019 are shown in Table 2.3.4 below:

Table 2.3.4
Depreciation and Amortization
($ millions)

		A	B	C	D
	Depreciation and Amortization	2019		2017-2019	
		PBR Forecast	Actual	PBR Forecast	Actual
1	Gross depreciation expense	45.8	47.2	132.2	134.2
2	Amortization of contributions	(9.9)	(11.0)	(29.4)	(31.2)
3	**Depreciation, net**	**35.9**	**36.2**	**102.8**	**103.0**
4	In-City Water Share - %	78.9%	78.4%	78.9%	78.9%
5	**In-City Water Share - $**	**28.4**	**28.4**	**81.1**	**81.3**

Depreciation expense and amortization of contributions are both slightly higher than forecast reflecting higher than forecast levels of developer-funded assets, explained in section 2.3.5 below. These impacts are offsetting, so actual depreciation expense, net of amortization, is within $0.2 million of forecast.

In-City Water's share of 2019 depreciation expense is 0.5% lower than forecast, 0.7% of this difference is attributable to higher than forecast assets additions for fire protection related assets (hydrants). The remaining 0.2% difference is consistent with actual to forecast differences in the base and max day peaking factors used to allocate depreciation expense between In-City customer classes versus that charged to the RWCG.

2.3.5 Rate Base

In 2019, EWSI's total water system rate base, shown in Table 2.3.5 below, was $12.8 million more than forecast, with the higher than forecast gross rate base offset by higher than forecast contributions.

Table 2.3.5
Mid-Year Rate Base
($ millions)

		A	B
	Components of Mid-Year Rate Base	**2019**	
		PBR Forecast	**Actual**
1	Plant in Service		
2	Balance, beginning of year	2,346.9	2,413.1
3	Additions - EPCOR-funded	85.5	105.4
4	Additions - Developer-funded	6.9	35.8
5	Retirements and adjustments	-	(9.0)
6	Balance, end of year	2,439.3	2,545.4
7	Mid-Year Plant in service	2,393.1	2,479.3
8	Accumulated Depreciation		
9	Balance, beginning of year	605.1	595.5
10	Depreciation expense	45.8	47.2
11	Retirements and adjustments	-	(8.9)
12	Balance, end of year	650.9	633.8
13	Mid-Year Accumulated Depreciation	628.0	614.7
14	Other Rate Base Items		
15	Working Capital	22.3	21.0
16	Materials and Supplies	2.9	3.6
17	**Gross Mid-Year Rate Base**	**1,790.3**	**1,889.1**
19	Contributions		
20	Balance, beginning of year	687.1	760.2
21	Contributions in aid of construction	6.9	35.8
23	Balance, end of year	693.9	795.9
24	Mid-Year Contributions	690.5	778.0
25	Accumulated Amortization		
26	Balance, beginning of year	168.1	169.1
27	Amortization of contributions	9.9	11.0
28	Balance, end of year	178.0	180.1
29	Mid-Year Accumulated Amortization	173.1	174.6
30	**Mid-Year Contributions**	**517.4**	**603.5**
31	**Net Mid-Year Rate Base**	**1,272.9**	**1,285.7**

The gross rate base reflects significantly higher than forecast levels of developer-funded assets over the 2016 to 2019 period. Developers are responsible for construction of distribution infrastructure in new subdivisions. When these assets are placed into service, ownership of the assets is transferred to EWSI, where the assets, together with offsetting contributions in aid of construction, are added to the rate base.

In 2019, the net mid-year rate base is $12.8 million or 1.0% more than forecast. This increase in rate base is driven by higher than forecast capital expenditures as discussed in section 2.4.1.

2.3.6 Return on Rate Base

In 2019, In-City Water's return on equity was $5.6 million (1.6%) less than forecast and $6.9 million (0.6%) less for 2017-2019. In 2019, this decrease was attributable to lower than forecast net income, reflecting a significant decline in revenue which is partially offset by EWSI's actions to control operating costs.

Table 2.3.6-1
Return on In-City Water Share of Mid-Year Rate Base
($ millions)

		A	B	C	D
	Return on Rate Base	**2019**		**2017-2019**	
		PBR Forecast	**Actual**	**PBR Forecast**	**Actual**
1	Net Mid-Year Rate Base	1,272.9	1,285.7		
2	In-City Water Share - %	78.8%	78.0%		
3	In-City Water Share - $	1,003.0	1,002.8		
4	Deemed Capital Structure				
5	Debt	60.00%	60.00%		
6	Equity	40.00%	40.00%		
7	Total	100.00%	100.00%		
8	Cost Rates				
9	Debt	4.88%	4.83%	4.88%	4.89%
10	Equity	10.18%	8.56%	10.18%	9.61%
11	Weighted Average Cost of Capital (WACC)	7.00%	6.32%	7.00%	6.77%
12	Return on Rate Base				
13	Debt	29.4	29.0	84.3	84.2
14	Equity	40.8	34.3	117.1	110.2
15	**Total Return on In-City Water Rate Base**	**70.2**	**63.3**	**201.4**	**194.4**

In-City Water's share of the total system net mid-year rate base is 0.8% less than forecast, of this difference 1.1% is attributable to higher than forecast asset additions for fire protection related assets (hydrants). The remaining 0.3% difference is consistent with the change in In-City Water's demands on water system relative to that of Regional Customers. When combined with a total system rate base the In-City Water net mid-year rate base is within 0.02% of the forecast amount.

Returns on rate base are 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 2.3.6-2 below:

Table 2.3.6-2
Interest Expense and Cost of Debt
($ millions)

		A	B	C	D
	Interest Expense and Cost of Debt	2019		2017-2019	
		PBR Forecast	Actual	PBR Forecast	Actual
1	Interest expense				
2	Interest on short-term debt	0.9	1.2	3.0	3.7
3	Interest on City of Edmonton debentures	0.6	0.6	2.1	2.1
4	Interest on intercompany debentures	35.0	34.1	100.2	98.1
5	Total interest expense	36.5	35.9	105.3	103.9
6	Mid-year debt and other long-term liabilities				
7	Mid-Year Short-term debt	33.9	2.9		
8	Mid-Year Long-term debt	713.5	738.5		
9	Mid-Year Other Long-term liabilities	1.8	2.0		
10	Total mid-year debt and other long-term liabilities	749.1	743.4		
11	**Embedded Cost of Debt**	**4.88%**	**4.83%**	**4.88%**	**4.89%**

The embedded cost of debt is slightly lower than forecast in 2019. Although, EWSI issued more long term debt than forecast, which is more expensive that short term debt, due to favorable economic conditions EWSI was able to issue the long term debt at lower than forecast rates over the 2017 to 2019 period.

2.3.7 Transactions with Affiliates

In-City Water derives a significant proportion of its revenue and expenses from transactions with affiliates, including the City of Edmonton, EPCOR Utilities Inc. and its subsidiaries, and other EWSI business units. Table 2.3.7 provides a summary of In-City Water's 2019 actual and forecast transactions with affiliates.

Table 2.3.7
Transactions with Affiliates
($ millions)

		A	B	C	D
	Affiliate and Service	2019		2017-2019	
		PBR Forecast	Actual	PBR Forecast	Actual
1	**Revenues from the provision of services to the City of Edmonton**				
2	Public Fire Protection	11.8	11.5	34.0	33.8
3	Water sales	3.3	3.3	9.7	10.2
4	Other	0.2	-	0.7	0.1
5	Total	15.3	14.9	44.3	44.2
6	**Services provided by (recovered from):**				
7	**City of Edmonton**				
8	Franchise Fees	15.8	14.7	45.7	43.8
9	Property Taxes	0.4	0.2	1.3	0.7
10	Interest on City of Edmonton Debentures	0.6	0.6	2.1	2.1
11	Mobile equipment services	1.9	2.3	5.7	6.8
12	Other services	1.4	0.6	4.0	2.0
13	Meter Reading Recoveries	-	-	-	(1.4)
14	Total	20.2	18.4	58.9	54.1
15	**EPCOR Utilities Inc**.				

	Affiliate and Service	A	B	C	D
		2019		2017-2019	
		PBR Forecast	Actual	PBR Forecast	Actual
16	Corporate Shared Service Costs	15.6	12.1	45.9	37.0
17	Interest on Intercompany Debentures	35.0	34.1	100.2	98.1
18	Interest on Short-term debt	0.9	1.2	3.0	3.7
19	Other Services	-	0.3	-	0.3
20	Total	51.5	47.7	149.0	139.1
21	**EPCOR Distribution and Transmission Inc.**				
22	Meter Reading Service Revenue	-	-	-	(0.5)
23	Other services	0.1	-	0.4	-
24	Total	0.1	-	0.4	(0.5)
25	**EPCOR Technologies Inc.**				
26	Hydrovac Charges and Space Rentals	0.9	1.8	2.7	4.8
27	Other Services (Recoveries)	-	(0.1)	-	(0.1)
28	Total	0.9	1.7	2.7	4.6
29	**EPCOR Energy Alberta LP**				
30	Customer Billing and Collection Services	8.4	7.8	24.3	23.6
31	Meter Data Management	-	0.3	-	0.5
32	Trouble Call Support Services	-	0.3	-	0.3
33	Total	8.4	8.4	24.3	24.4
34	**EPCOR Power Development**				
35	Other Services (Recoveries)	-	(0.3)	-	(0.4)
36	**EPCOR Commercial Services**				
37	Commercial Services Rent Recoveries	-	(0.3)	-	(0.6)
38	**Other EWSI Business Units**				
39	EWSI Shared Services Allocation	10.2	9.4	30.1	28.1
40	Water Sales to Wastewater	(0.4)	(0.4)	(1.1)	(1.3)
41	Meter Reading Recoveries from Wastewater	(2.4)	(2.4)	(6.6)	(6.9)
42	Meter Reading Recoveries from Drainage Services	(2.4)	(2.4)	(6.6)	(5.2)
43	Customer Service Fees from Drainage Services	-	0.4	-	0.9
44	Other Services provided to Drainage Services	-	(0.2)	-	(0.2)
45	Meter Reading Recoveries from Other EWSI Business Units	-	-	-	(0.1)
46	Quality Assurance Lab Testing and Other Services from Other EWSI Business Units	-	-	-	0.2
47	Total	5.1	4.1	15.9	15.5
48	**Expenditures on capital projects arising from services provided by:**				
49	City of Edmonton	3.2	0.6	9.3	2.4
50	EPCOR Technologies Inc.	4.0	4.2	11.7	12.8
51	EPCOR Utilities Inc.	-	1.2	-	2.8
52	EPCOR Drainage Services	-	2.3	-	6.5
53	EPCOR Distribution and Transmission Inc.	0.1	0.3	0.4	1.0
54	Other EPCOR Business Units	-	0.1	-	0.2
55	Total	7.1	8.6	21.3	25.8

2.4 Capital Programs

2.4.1 Capital Expenditures

Table 2.4.1 compares approved capital expenditures from the PBR forecast to actual capital expenditures for 2019 for each project with approved or forecast capital expenditures in excess of $5.0 million over the

2017-2021 PBR term, as well as for each project category. Table 2.4.1 also provides a comparison of total 2017-2021 approved capital expenditures to EWSI's current capital forecast.

Table 2.4.1
Capital Expenditures
($ millions)

		A	B	C	D	E	F	G	H	I	
		2019			2017-2019			2017-2021			
		PBR Forecast	Actual	Difference	PBR Forecast	Actual	Difference	PBR Forecast	Current Projection	Difference	
1	**Regulatory**										
2	Water Services Replace/Refurbish	0.3	0.5	0.2	0.9	1.5	0.7	1.5	2.2	0.7	
3	Projects < $5 Million	2.0	2.4	0.4	6.0	6.0	0.1	10.2	9.4	(0.8)	
4	**Subtotal**	**2.3**	**2.9**	**0.6**	**6.8**	**7.6**	**0.7**	**11.6**	**11.6**	**(0.1)**	
5	**Growth/Customer Requirements**										
6	LRT Relocates (NRA)	0.2	6.4	6.2	6.1	13.4	7.4	10.4	22.6	12.2	1
7	Network PD Transmission Mains	2.2	8.5	6.3	8.1	17.6	9.5	14.4	24.2	9.8	2
8	Discovery Park Reservoir & CRSWSC Pipe Line (NRA)	-	0.3	0.3	-	0.3	0.3	-	9.5	9.5	3
9	Water Services Connections	4.8	5.1	0.4	13.1	17.3	4.2	23.6	27.8	4.3	4
10	Water Main Cost Sharing Program	0.5	1.6	1.2	1.7	4.2	2.5	3.0	6.2	3.2	5
11	New Water Distribution Mains	1.8	2.6	0.8	5.2	6.9	1.7	8.8	10.6	1.7	
12	Distribution System Modifications	1.1	1.6	0.5	4.0	3.6	(0.4)	6.0	7.0	1.0	
13	New Meter Purchase/Installation	2.9	2.5	(0.4)	7.1	6.8	(0.2)	13.2	12.1	(1.1)	
14	PD Construction Coordination	2.8	2.7	(0.2)	8.3	7.9	(0.4)	15.4	13.5	(2.0)	
15	Projects < $5 Million	0.2	0.3	0.0	2.1	6.5	4.4	2.6	8.6	6.1	6
16	**Subtotal**	**16.4**	**31.6**	**15.1**	**55.6**	**84.5**	**28.9**	**97.5**	**142.1**	**44.6**	
17	**Health, Safety & Environment**										
18	Phosphoric Injection for Lead Control (NRA)	-	1.2	1.2	-	1.3	1.3	-	16.3	16.3	7
19	Accelerated Lead Services Replacement (NRA)	-	-	-	-	-	-	-	9.0	9.0	7
20	Deep Bed Filtration Conversion – E.L. Smith	1.3	0.0	(1.3)	1.3	0.3	(0.9)	22.3	0.3	(22.0)	8
21	Projects < $5 Million	0.8	1.0	0.2	2.3	2.3	(0.0)	4.3	3.3	(1.0)	
22	**Subtotal**	**2.1**	**2.2**	**0.1**	**3.6**	**3.9**	**0.3**	**26.6**	**29.0**	**2.3**	
23	**Reliability & Life Cycle Improvements**										
24	Structural Rehab Program – E.L. Smith	0.4	0.8	0.3	1.1	1.5	0.4	2.0	10.0	8.0	8
25	Chemfeed Upgrades – Rossdale	1.0	3.3	2.3	2.9	6.0	3.1	4.0	9.1	5.1	9
26	Bypass (Ring) Main – E.L. Smith	1.5	0.4	(1.1)	1.8	0.6	(1.2)	7.0	11.9	4.8	10
27	Obsolete Hydrants Replacement Program	0.9	2.1	1.2	2.6	5.2	2.6	4.4	8.9	4.6	11
28	Obsolete Valve Replacement Program	0.8	1.9	1.1	2.4	4.7	2.3	4.1	8.3	4.2	12
29	Chemfeed Upgrades – E.L Smith	1.3	2.0	0.7	3.1	4.3	1.1	4.0	7.5	3.5	13
30	Filter Underdrain Upgrades – Rossdale	1.2	2.4	1.2	3.5	8.0	4.5	4.7	8.2	3.5	14
31	Structural Upgrades – Reservoirs	0.5	0.5	0.0	1.1	2.3	1.3	1.7	4.2	2.5	15
32	HVAC Upgrades – E.L Smith	0.6	3.8	3.2	2.2	4.8	2.6	3.4	5.0	1.7	
33	Mechanical Upgrades – E.L Smith	0.9	1.7	0.8	3.4	4.7	1.4	4.9	6.0	1.2	
34	Clarifier C1-2 Upgrade – Rossdale	-	-	-	4.3	5.5	1.1	4.3	5.5	1.1	
35	Network Valve Chamber Refurbishment	1.1	1.1	0.0	3.3	3.6	0.3	5.6	5.4	(0.2)	
36	Water Main Proactive Renewal	3.6	3.8	0.2	10.5	11.3	0.7	18.0	17.4	(0.6)	
37	Vehicle & Fleet Additions	2.8	1.7	(1.0)	7.9	5.8	(2.1)	11.8	11.0	(0.8)	

		A	B	C	D	E	F	G	H	I	
		2019			2017-2019			2017-2021			
		PBR Forecast	Actual	Difference	PBR Forecast	Actual	Difference	PBR Forecast	Current Projection	Difference	
38	Transmission Mains Replacement/Refurbish	2.7	2.6	(0.0)	7.7	8.6	1.0	13.3	12.4	(0.9)	
39	Electrical Upgrades – Rossdale	1.0	1.7	0.7	2.6	3.2	0.6	5.2	4.3	(0.9)	
40	SCADA System Upgrade Program	0.9	0.8	(0.1)	4.3	2.8	(1.4)	5.7	4.5	(1.2)	
41	Electrical Upgrades – Reservoirs	1.0	0.6	(0.4)	3.3	2.2	(1.0)	5.3	2.7	(2.6)	16
42	Cell/Pumphouse Roof Replacement	2.2	-	(2.2)	4.9	1.5	(3.4)	6.3	3.2	(3.1)	15
43	Water Main Reactive Renewal	10.9	12.8	2.0	28.9	34.5	5.6	54.7	50.3	(4.4)	17
44	Water Meter Change Out Program	6.4	2.9	(3.5)	12.1	8.8	(3.3)	25.6	13.8	(11.9)	18
45	Projects < $5 Million	12.9	16.1	3.2	41.6	44.1	2.5	66.3	69.9	3.5	19
46	**Subtotal**	**54.5**	**63.1**	**8.7**	**155.4**	**174.1**	**18.7**	**262.4**	**279.4**	**17.0**	
47	**Performance Efficiency & Improvement**										
48	Water D&T Facility Expansion	-	0.0	0.0	16.0	0.0	(16.0)	16.0	24.8	8.8	20
49	Water Main Cathodic Protection	4.2	3.0	(1.2)	12.3	10.0	(2.4)	21.0	15.9	(5.1)	21
50	Projects < $5 Million	1.4	1.2	(0.2)	6.1	3.0	(3.1)	7.1	6.2	(0.9)	
51	**Subtotal**	**5.6**	**4.2**	**(1.4)**	**34.4**	**13.0**	**(21.4)**	**44.1**	**46.9**	**2.7**	
52	**Accelerated**										
53	Accelerated Water Main Renewal	10.4	11.0	0.6	30.4	30.5	0.1	51.9	48.1	(3.8)	22
54	Accelerated Fire Protection	2.5	2.1	(0.4)	9.5	7.5	(2.0)	15.9	9.9	(6.0)	23
55	**Subtotal**	**12.9**	**13.1**	**0.2**	**39.9**	**38.0**	**(1.9)**	**67.8**	**58.0**	**(9.8)**	
56											
57	**E.L. Smith Solar Farm and Battery Storage (net)**	-	0.7	0.7	-	4.4	4.4	-	35.3	35.3	24
58	**Capital Expenditures before contributions**	**93.9**	**117.9**	**24.0**	**295.7**	**325.4**	**29.7**	**510.1**	**602.2**	**92.2**	
59	**Contributions**										
60	Water Services Connections	(4.8)	(2.7)	2.0	(13.1)	(10.9)	2.3	(23.6)	(17.4)	6.1	4
61	Private Development Contributions	(0.3)	(0.1)	0.2	(1.0)	(0.8)	0.2	(1.9)	(1.4)	0.5	
62	New Water Distribution Mains	(1.8)	(2.0)	(0.3)	(5.2)	(6.2)	(1.0)	(8.8)	(9.3)	(0.5)	
63	**Subtotal**	**(6.9)**	**(4.9)**	**1.9**	**(19.3)**	**(17.8)**	**1.5**	**(34.3)**	**(28.1)**	**6.2**	
64	**Capital Expenditures**	**87.0**	**113.0**	**26.0**	**276.4**	**307.6**	**31.2**	**475.8**	**574.1**	**98.4**	

Explanations for differences between PBR forecast capital expenditures for 2017 to 2021 and EWSI's current projection in excess of $2.0 million on individual projects with total costs in excess of $5.0 million, as well as for project categories in aggregate include:

1. **LRT Relocates (NRA)** – $12.2 million (117%) greater than forecast. Changes to track alignments, as well as the accelerated construction schedule for the West Valley Line LRT project have resulted in increases to the projected costs of utility relocations. In 2019, the City of Edmonton approved a non-routine adjustment to increase rates to offset the revenue requirement impacts of a $14.5 million increase in capital expenditures for this project.
2. **Network PD Transmission Mains** – $9.8 million (68%) greater than forecast. Since developers determine both the timing of projects and the areas to be developed, expenditures on this program have proven difficult to forecast. Significant additions to this program include transmission main projects for Ellerslie Road Arterial Twinning Project, 28th Avenue SW/Whitemud Creek Crossing, the Horse Hills Creek/Meridian Street Crossing, 199th Street from 23rd Avenue to 35th Avenue, and Aurum Road 9th Street to 17th Street.
3. **Discovery Park Reservoir and CRSWSC Water Pipeline Acquisition (NRA)** – $9.5 million (new project). This project includes the cost of infrastructure (reservoir, pump house, transmission mains and booster station) located in, or required to service, land annexed by the City of Edmonton. In 2019, the City of Edmonton approved a non-routine adjustment to increase rates to offset the revenue requirement impacts of a $9.2 million increase in capital expenditures for these projects.
4. **Water Services Connections (net of contributions)** – $10.4 million (100%) greater than forecast. Contributions from private developers were forecast to recover 100% of the construction costs for new water service connections. EWSI found that after accounting for all program costs, its service application rates provide for recovery of less than 75% of the total program costs. EWSI is currently reviewing the program to determine if modifications to the program and rates are required.
5. **Water Main Cost Sharing Program** – $3.2 million (105%) greater than forecast. Similar to Network PD Transmission Mains, the costs of this program are driven by developer activity. The increase in the costs of this program result from higher than forecast developer activity during the PBR period.
6. **Growth and Customer Requirements < $5.0 million** – $6.1 million (236%) greater than forecast. The projected increase in this category results primarily from a new booster station project needed to address development in a high elevation area (Laurel neighborhood, southeast Edmonton) ($1.7 million); additional costs to acquire water mains from the Capital Region Northeast Water Service Commission following city expansion ($2.7 million); and changes to projected costs for other growth projects amounting to $1.7 million.
7. **Phosphoric Injection for Lead Control and Accelerated Lead Services Replacement (NRA)** – $25.3 million (new projects). These projects are required to implement EWSI's lead mitigation strategy, including introducing orthophosphate into drinking water to inhibit corrosion, and accelerating the replacement of lead service lines in high priority homes. In 2019, the City of Edmonton approved a non-routine adjustment to increase rates to offset the revenue requirement impacts of a $15.6 million increase in capital expenditures for these projects.
8. **Deep Bed Filtration Conversion – E.L Smith** – $22.0 million (99%) less than forecast and **Structural Rehabilitation Program – E.L Smith** – $8.0 million (398%) greater than forecast. During engineering inspections in 2018, EWSI identified immediate needs for structural rehabilitation of the

E.L. Smith Stage 1 and Stage 2 filter plenums (12 filters in total). Accordingly, the conversion to deep bed filters has been postponed until after the end of the current PBR term, so that the required structural rehabilitation repairs and upgrades can be completed to both Stage 1 and Stage 2 Filters.

9. **Chemfeed Upgrades – Rossdale** – $5.1 million (128%) greater than forecast. EWSI identified significant health, safety and environmental needs, requiring extensive upgrades to the sodium bisulphite room.
10. **Bypass Main (Ring Main) – E.L Smith** – $4.8 million (69%) greater than forecast. In 2019, a historical resource impact assessment confirmed the presence of cultural materials within the proposed construction area, requiring archaeological mitigation and increasing total project costs. Further design also identified the requirement for additional manual isolation valves to improve operational flexibility and redundancy.
11. **Obsolete Hydrant Replacement Program** – $4.6 million (104%) greater than forecast. Higher than expected rates of deterioration have led to increased backlog, requiring adjustments to hydrant replacement schedules. EWSI has adjusted its hydrant replacement schedule to clear backlogs and ensure fire protection service levels are maintained.
12. **Obsolete Valve Replacement Program** – $4.2 million (102%) greater than forecast. Similar to the obsolete hydrant replacement program, higher than expected rates of deterioration have led to increased backlog, requiring adjustments to valve replacement schedules. Although the projected cost of this program has increased substantially, improving overall valve operability in the system reduces isolation time, lessens the potential for property damage and mitigates customer impacts during emergency main break response.
13. **Chemfeed Upgrades – E.L Smith** – $3.5 million (87%) greater than forecast. Higher than estimated costs for a significant fluoride room upgrade to replace end-of-life equipment, and unanticipated upgrades to the sodium hypochlorite room, including new generation cells, are the primary factors contributing to the increase in the costs of this program.
14. **Filter Underdrain Upgrades – Rossdale** – $3.5 million (73%) greater than forecast. Both the scope and cost of this project have increased following an inspection of the filter underdrain system that identified unforeseen needs for upgrades to air scour systems, combined with an unexpected increase in the price of steel.
15. **Structural Upgrades – Reservoirs** – $ $2.5 million (145%) greater than forecast and Reservoir Cell and Pumphouse Roof Replacement – $3.1 million (50%) less than forecast. Due to shutdown requirements, roof replacement work and interior structural work needed to happen at the same time. As a result, the scope from the roof replacement program was added to the structural upgrades program. This change allows for more efficient project delivery and improvements to project management and coordination.
16. **Electrical Upgrades Program – Reservoirs** – $2.6 million (49%) less than forecast due to the deferral of lower priority electrical upgrades to a future PBR period.
17. **Water Main Reactive Renewal Program** – $4.4 million (8%) less than forecast. The decrease is primarily attributable to the ongoing COVID-19 pandemic, which is expected to result in the deferral of lower priority renewals to the next PBR period.

18. **Water Meter Change out Program** – $11.9 million (46%) less than forecast. The decrease in the projected cost of this program results from an improvement in the expected lives of the batteries used in the meters. As a result, fewer meters are expected to require replacement during the current PBR period.

19. **Reliability and Life Cycle Improvements < $5.0 million** – $3.5 million (5%) greater than forecast. The projected increase in this category results primarily from the combination of the increased scope of the Rossdale stilling basin upgrade project ($3.0 million); unanticipated Rossdale ring main rehabilitation requirements ($1.8 million); net flood protection capital expenditures not covered by provincial and federal funding ($1.6 million); and the new Transmission Main Inspection program ($1.2 million). These increases were offset by the deferral of lower priority Rossdale roof replacements ($2.0 million) and a significant portion of the E.L. Smith High Level Pump #5 upgrades to the next PBR period ($2.5 million)

20. **Water D&T Facility Expansion** – $8.8 million (55%) greater than forecast. Completion of the D&T Facility was originally planned for 2017. This project has been re-scoped following the transfer of Drainage to EPCOR and the completion of an EPCOR-wide real estate review. The review concluded that a consolidated solution for Water and Drainage would provide long-term synergies and operational efficiencies that would outweigh the additional capital costs.

21. **Water Main Cathodic Protection** – $5.1 million (24%) less than forecast. The reduction in the costs of the program result from adoption of more efficient anode installation processes combined with delays attributable to the ongoing COVID-19 pandemic.

22. **Accelerated Water Main Renewal** – $3.8 million (7%) less than forecast. The reduction is primarily attributable to the ongoing COVID-19 pandemic, which is expected to result in the deferral of lower priority accelerated renewals to the next PBR period.

23. **Accelerated Fire Protection** – $6.0 million (38%) less than forecast. EWSI expects that expenditures over the remainder of the 2017-2021 PBR term will be less than approved amounts, due to a smaller number of potential sub-projects meeting the Accelerated Fire Protection Program criteria. EWSI has allocated a portion of the additional funding towards the Infill funding program that was introduced in the past year. This is a trail program that offsets the costs of infrastructure upgrades in infill areas and was developed in conjunction with IDEA and the City of Edmonton. Additionally, funding has also been directed to critical work which has been identified in areas such as Distribution System Modifications (for City-driven relocates) and Transmission Main inspection work where capital expenditures are expected to exceed levels in the PBR forecast.

24. **E.L. Smith Solar Farm and Battery Storage (net of contributions)** – $35.3 million (new projects). As noted in section 2.3.2, instead of purchasing locally produced renewable power at an annual cost of $1.9 million, EWSI plans to construct a solar farm at E.L. Smith. Current plans for the solar farm include a battery storage system that would be almost entirely grant-funded.

2.4.2 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) in the year, the capital expenditures on that project remain in Construction Work in Progress and are excluded from the rate base. In 2019, as shown on Table 2.4.2, the balance in Construction Work in Progress was $16.0 million greater than forecast, of which $4.9 million was attributable to the E.L.

Smith solar project, with the remainder primarily attributable to carry-over projects at the Water Treatment Plants including the Rossdale sodium bisulfate room upgrade (de-chlorination), the E.L. Smith fluoride room upgrade, E.L. Smith high lift pump house surge protection, and the orthophosphate system (Lead Mitigation Strategy).

Table 2.4.2
Construction Work in Progress
($ millions)

		A	B	C	D
Construction Work in Progress		**2019**		**2017-2019**	
		PBR Forecast	**Actual**	**PBR Forecast**	**Actual**
1	Balance, beginning of period	3.3	13.2	0.3	3.8
2	Capital Expenditures	87.0	113.0	276.4	307.5
3	Capital Additions	(85.5)	(105.4)	(271.9)	(290.6)
4	**Balance, end of period**	**4.7**	**20.7**	**4.7**	**20.7**

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 2019, AFUDC included in capital expenditures on eligible projects amounted to $0.9 million, compared to the PBR forecast amount of $0.3 million.

2.5 Operational Performance

2.5.1 Water Quality Index

The Water Quality index is calculated as the percentage of water quality test results that meet EWSI's internal water standards. Water quality standards are established by both the federal and provincial governments and are incorporated into EWSI's Approval to Operate from Alberta Environment and Parks (AEP). In some cases, EWSI sets even stricter limits for critical parameters that are identified in EWSI Quality Standards, to provide early warnings of potential water quality problems; so that corrective actions can be taken before external standards are not met.

Table 2.5.1
Water Quality Index

Index Component	PBR Performance Measure	Standard	Actual Score	Index
Water Quality Index	The percentage of the total number of water quality tests taken in the period that do not yield suspect results	> 99.7%	99.8%	1.001
			Average Index	1.001
			Index Standard Points	25.0
			Total Actual Points	25.0
			Maximum Available Points Including Bonus Points	25.5
			Total Points Earned	**25.0**

2019 Highlights

- **Water Quality Index.** EWSI met all Health Canada Drinking Water Quality Guidelines and AEP water quality testing requirements in 2019. During the year, EWSI collected 62,329 samples of treated drinking water. Of those samples only 114 (0.2%) did not meet internal water quality standards.

  The majority (57%) of variances from internal water quality standards in 2019 were related to temporary increases in turbidity and / or decreases in chlorine concentrations in samples collected from the distribution system. Customer water quality inquires (representing 23% of the overall variances in 2019) were also related to increased turbidity and / or decreased chlorine.

2020 Areas for Improvement

Water Quality Index: EWSI is planning to use a rapid-field test (ATP) for ensuring the microbial quality of water levels related to distribution main flushing activities in 2020. This will continue to support required Total Coliforms (TC) and E. coli (EC) testing while ensuring more effective flushing and a resultant reduction of variances related to low chlorine and high turbidly samples (both observed in customer inquiries and the distribution system).

It should be noted that with the Covid-19 pandemic, challenges can be expected in the collection of samples from customers and public locations.

2.5.2 Customer Service Index

The customer service index is a composite measure of the customers' perception of satisfaction with EWSI service, the aesthetic quality of water and speed of response to customer issues.

Table 2.5.2
Customer Service Index

Index Component	PBR Performance Measure	Standard	Actual Score	Index
Post Service Audit Factor	The percentage of the customers responding as "completely" or "very satisfied" in the level of service received from the EWSI Emergency group.	> 74.9%	74.5%	0.995
Home Sniffing Factor	The percentage result of customer satisfaction for the home sniffing survey.	> 94.4%	95.5%	1.011
Response Time Factor	The average number of minutes needed to confirm a water main break from the time a call is received at EWSI's dispatch office.	< 25	20.4	1.184
Planned Construction Impact Factor	The percentage of the total planned construction events where EWSI complies with required construction notification procedures.	> 95.8%	97.1%	1.013
			Average Index	1.051
			Index Standard Points	20.0
			Total Actual Points	21.0
			Maximum Available Points Including Bonus Points	23.0
			Total Points Earned	**21.0**

2019 Highlights

- **Post Service Audit (PSA) Factor**. In 2019, EWSI focused on enhancing the customer service culture by focusing on customer contact quality reviews and coaching. As a result, EWSI saw improvement to the PSA compared to 2018 and 2017. EWSI also implemented a new telephony system and processes for call handling. Working with EPCOR Drainage and Power, EWSI implemented a joint phone number and new call menu options for customers to call with any water, drainage, or power related emergencies.
- **Home Sniffing Factor**. The Home Sniffing program is designed to measure the impact of spring run-off in the river and the effectiveness of water treatment during this period, particularly in terms of mitigating run-off related odours at the tap. Spring runoff and associated treatment challenges started during the third week of March, and the water treatment plants were well prepared to manage taste and odour concerns effectively.

  EWSI increased recruitment of the number of home sniffers compared to 2018 numbers. This resulted in smoother data trends and increased statistical robustness of the calculated performance measure compared to previous years.

  A major improvement in 2019 was having Home Sniffers' results available online as feedback to water plant operators.

  Following the 3-month customer monitoring period, the calculated 2019 customer satisfaction factor was 95.5%, which exceeded the established target of 94.4%.

2020 Areas for Improvement

- **Post Service Audit (PSA) Factor**. In 2020, EWSI will be focused on continuing to grow the customer service culture by focusing on first call resolution and continuing to build customer service skills.
- **Home Sniffing Factor**. In 2020, EWSI is looking to further improve results by encouraging home sniffers to enter results daily. This will allow more closely represent real-time conditions feedback for water treatment practices to be adjusted accordingly. Weekend updating of online results will also allow for major off-hours changes in treatment.

  EWSI reviews spring run-off performance data and outcomes every year and includes this new information to update water treatment strategy. This provides opportunities to better respond to future run-offs.
- **Response Time Factor.** EWSI continues to focus on maintaining the response time factor.

2.5.3 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.

Table 2.5.3
System Reliability and Optimization Index

Index Component	PBR Performance Measure	Standard	Actual Score	Index
Water Main Break Factor	The number of water main breaks that occurred in the reporting period.	< 419	298	1.289
Water Main Break Repair Duration Factor	The percentage of water main breaks repaired and confirmed by EWSI within 24 hours from the time that the flow of water is shut off, excluding main breaks on arterial or collector roads.	> 93.7%	95.2%	1.016
Water Loss Factor	The Infrastructure Leakage Index, a performance indicator quantifying how well a water distribution system is managed for the control of "real" water losses (i.e. leakage).	< 2.0	1.19	1.405
System Energy Efficiency Factor	The energy used at all water facilities in kWh divided by the average annual water production per residential customer account (ML/kWh/customer).	< 309	250	1.234
			Average index	1.236
			Index Standard Points	25.0
			Total Actual Points	30.9
			Maximum Available Points Including Bonus Points	28.5
			Total Points Earned	**28.5**

2019 Highlights

- **Water Main Break Factor.** EWSI experienced 298 water main breaks in 2019, 121 less than the PBR standard of 419. This result is attributed to the effectiveness of on-going water main replacement programs.
- **Water Main Break Repair Duration Factor.** In 2019, 95.24% of main breaks were repaired within 24-hours, exceeding the PBR standard of 93.7%. When water main break repairs approached 20 hours in duration, EWSI provided additional communication to affected customers and when required, temporary water supply support via water tanks, hose hook ups and / or delivery of water jugs to affected customers.
- **Water Loss Factor (ILI).** In 2019, EWSI's Infrastructure Leak Index (ILI) exceeded the PBR standard. A "real-loss" component analysis was also conducted. This increased understanding of the system's real losses and identification of potential opportunities for further system improvements.
- **System Energy Efficiency Factor.** EWSI continued to focus on energy efficiency improvement and GHG reduction. Projects identified included:
  - Optimization of high-lift pump performance at both Rossdale and EL Smith water treatment plants which included maintaining pumping above 75 MLD at the Rossdale plant
  - Shifting production to the EL Smith WTP to take advantage of energy efficiencies
  - Implementing a 15℃ temperature target at reservoirs when not occupied

2020 Areas for Improvement

- **Water Main Break Factor.** EWSI will be continuing with cast iron replacement programs in 2020.
- **Water Main Break Repair Duration Factor.** EWSI will investigate using 24-hour rolling shifts on specific water outages to facilitate quicker repairs and thereby reduce water service outage times for affected customers.
- **Water Loss Factor (ILI).** EWSI will continue to look for additional areas of water loss that may be monitored and mitigated.
- **System Energy Efficiency Factor.** EWSI will investigate options to improve operational efficiency through automation, data analysis of existing systems and asset management processes.

2.5.4 Environment Index

The environmental index measures the success of programs and policies designed to mitigate and report adverse environmental impacts.

Table 2.5.4
Environmental Index

Index Component	PBR Performance Measure	Standard	Actual Score	Index
Water Conservation Factor	The actual 10 year rolling average monthly Edmonton residential consumption per household.	<17.2	15.3	1.124
Environment Incident Factor	The number of reportable and preventable environmental incidents.	<6	3	2.000
Solids Residual Management Factor	The average number of days that the Rossdale and E.L. Smith water treatment plants are operating in direct filtration mode.	> 120	79	0.659
			Average index	1.261
			Index Standard Points	15.0
			Total Actual Points	18.9
			Maximum Available Points Including Bonus Points	16.5
			Total Points Earned	**16.5**

2019 Highlights

- **Water Conservation Factor.** Residential water consumption per customer continues to decline due to changes in habits and technology. In the past, habits such as turning the tap off while brushing teeth lowered consumption. Currently, technology continues to contribute to declining consumption through increasing use of higher efficiency appliances and low flush toilets. 2019 was also one of the coldest and wettest summers in history. This resulted in very low summer water consumption.
- **Environment Incident Management Factor.** Focus on reducing reportable incidents across EWSI continued through 2019. Three environmental incidents that were both preventable and reportable occurred. All three incidents were investigated to determine root causes. Corrective actions were subsequently assigned and completed. One incident involved a leak of chlorinated water to the North Saskatchewan River during maintenance activities, one involved a late report of a water quality

incident, and one involved a release of water from a transmission repair that resulted in erosion in a ditch.

- **Solids Residual Management Factor.** In 2019, unusually high raw water color in late fall and early winter created challenges for EWSI operations. As a result of these conditions, the treatment plants only achieved 79 days in Direct Filtration. However, total solids discharged to the North Saskatchewan River were still reduced by 15.4% as a result of operating in direct filtration relative to baseline conventional treatment.

2020 Areas for Improvement

- **Water Conservation Factor.** In 2020, COVID-19 is expected to result in higher than usual yearly residential consumption per customer due to people staying home. Based on results to date, the high residential consumption is being partially offset by lower commercial consumption.
- **Environment Incident Management Factor.** Environmental incident investigations will be targeting root cause identification. Enhanced erosion control processes will also be put in place for maintenance activities.
- **Solids Residual Management Factor.** EWSI will continue to investigate polymer and dosing strategies for effective transitioning between conventional treatment and direct filtration. The goal will be to further reduce solids discharged to the North Saskatchewan River.

2.5.5 Safety Index

The safety index is a measure of the success of programs and the application of policies that maximizes the safety of employees and the public.

Table 2.5.5
Safety Index

Index Component	PBR Performance Measure	Standard	Actual Score	Index
Near Miss Reporting Factor	The number of near miss reports entered in the ESS system.	>550	894	1.625
Work Site Inspections and Observations Factor	Number of Work Site Inspections and observations completed per year.	>1,032	3,217	3.117
Lost Time Frequency Factor	The actual lost time frequency rate.	<0.57	0.00	2.000
All Injury Frequency Factor	The actual all injury frequency rate	< 1.54	0.97	1.585
			Average index	2.082
			Index Standard Points	15.0
			Total Actual Points	31.2
			Maximum Available Points Including Bonus Points	16.5
			Total Points Earned	**16.5**

2019 Highlights

- **Near Miss Reporting Factor.** Near miss and hazard identification reporting continued to be an effective means to proactively identify hazards and implement corrective actions to mitigate potential harm to employees, contractors and members of the public.
- **Work Site Inspections / Observations Factor.** Work site inspections and observations continued to be a successful leading indicator that provided leaders the opportunity to engage in field activities, to proactively identify areas of improvement and to verify conformance to EPCOR requirements.
- **Lost Time Frequency Rate Factor.** In 2019, EWSI exceeded the lost time frequency rate factor by having no lost time events.
- **All Injury Frequency Rate Factor.** EWSI had 5 recordable incidents (Medical Treatment). Two involved employees being rear-ended while driving for work, one involved a back strain, one involved dust in an eye and one involved a dog bite.

2020 Areas for Improvement

- **Near Miss Reporting Factor.** With consideration of the impact of COVID-19 pandemic, there will be a heighted focus on the reporting of near miss and hazard identification throughout 2020 to ensure employees keep their mind on task and continue with proactive reporting.
- **Work Site Inspections / Observations Factor.** With consideration of the impact of COVID-19 pandemic, the opportunity to conduct work site inspections might be reduced. EWSI will monitor inspection activities and look for opportunities to conduct proactive field engagements.
- **All Injury Frequency Rate Factor.** EPCOR will be broadening the internal Safety program to capture Significant Incidents or Fatality Potential (SIFP) events. Monitoring for SIFP events is intended to assist in the identification of situations that could have life altering or fatality potential. The objective will be to ensure that root causes are identified and effective actions are established to prevent recurrence.

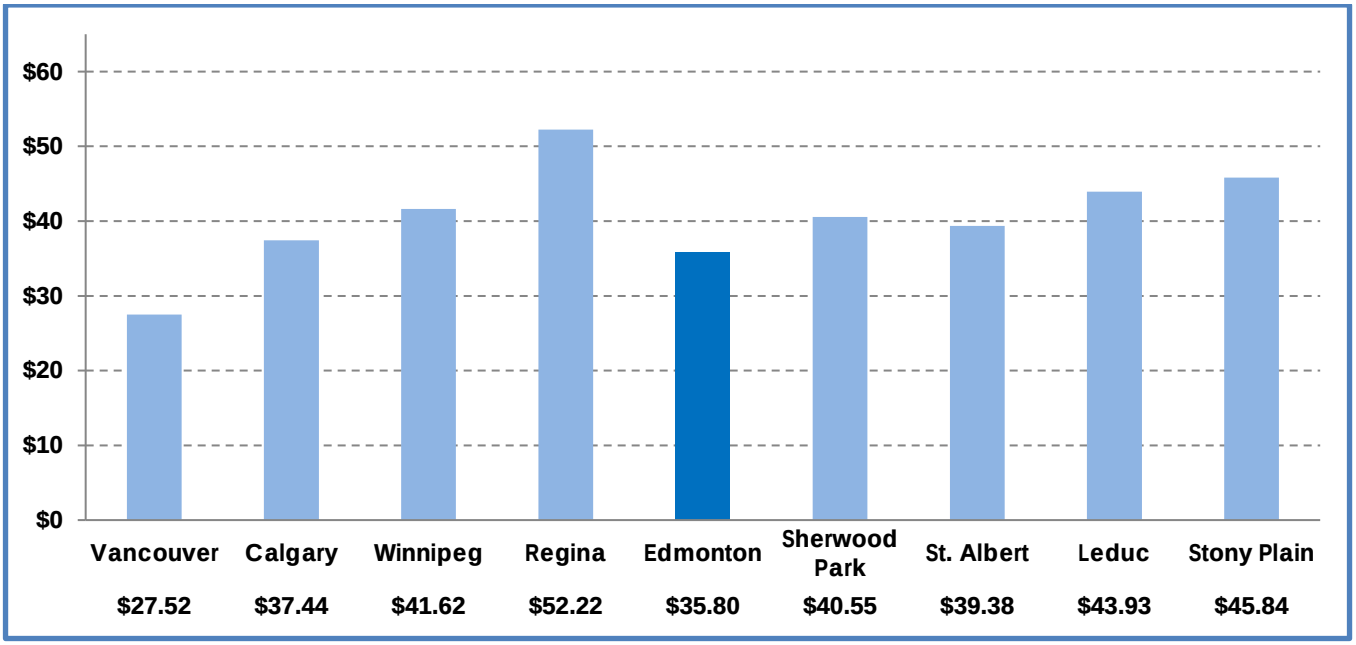
2.6 Rates and Bill Comparisons

Water bill comparisons for 2019 are based on the published water rates for Calgary, Vancouver, Winnipeg and Regina, as well as four local communities. These bill comparisons represent the total cost to the customer and include fixed charges, consumption charges and any other applicable surcharges.

2.6.1 Residential Water Bills

Figure 2.6.1 provides a comparison of residential household water bills for residential household consumption of 13.8 m^3 per month, the average residential customer consumption per month in Edmonton in 2019. Comparison of residential water bills shows that Edmonton's water bills are lower than all of the cities and local communities surveyed, except for Vancouver. This result is not unexpected; Vancouver has an excellent raw water source and, therefore, has lower needs for water treatment than Edmonton which has a naturally highly variable water source in the North Saskatchewan River.

Figure 2.6.1
2019 Monthly Residential Water Bill Comparison
(13.8 m³/month)



2.6.2 Commercial Water Bills

Table 2.6.2 provides a comparison of the water bills for commercial customer of various sizes. This table shows that water bills for EWSI's commercial customers are lower than all of the other surrounding communities and other major cities in western Canada, except for Vancouver and mid sized customers in Calgary.

Table 2.6.2
Commercial Monthly Water Bill Comparison
($ per month)

		A	B	C	D
	Monthly Bill - $ per month	**Small**	**Medium**	**Large**	**Extra Large**
1	**Monthly Consumption** - m³	**10**	**250**	**1,000**	**5,000**
2	Vancouver	22.97	310.20	1,270	6,164
3	Calgary	44.04	382.19	1,577	8,117
4	Regina	44.70	529.80	2,254	10,622
5	Winnipeg	34.70	473.60	1,892	9,271
6	**Edmonton**	**26.09**	**401.89**	**1,603**	**6,753**
7	St. Albert	33.03	433.83	1,686	8,366
8	Sherwood Park	30.86	642.86	2,555	12,755
9	Stony Plain	33.22	830.40	3,322	16,608
10	Leduc	34.54	639.70	2,654	12,676

3 Wastewater Treatment Services

3.1 Accomplishments and Challenges

In 2019, Wastewater's key accomplishments included:

- Completion of Wastewater's long term Integrated Resource Plan (IRP). Wastewater's IRP encompasses: customer growth; changes to provincial regulatory frameworks; technology; asset management; and health, safety and environmental considerations. The IRP provides a roadmap for enabling Wastewater to meet Edmonton's future growth demands and potential future effluent quality standards, within the existing footprint of the plant;
- EWSI entered an agreement with SYLVIS Environmental Service Inc. in which EWSI's biosolids will be used as part of a coal mine reclamation project at the Paintearth Mine near Forestburg, AB;
- The Gold Bar Stakeholder consultation plan was developed and executed through 2019 and provides the public with balanced and objective information to assist them in understanding the problems, alternatives, opportunities and/or solutions at the wastewater treatment plant. Several meetings with stakeholders were held. Shared outcomes and design principles were developed in collaboration with stakeholders that will drive and inform activities at the site. Going forward, the stakeholder engagement program will build upon the success of the work done in 2019
- Additional accomplishments are included in the 2019 Operating Plan below.

3.2 Customers and Consumption

Wastewater's customer counts, consumption and consumption per customer are similar to those of In-City Water. 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, such as 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 3.2 below provides a comparison of 2019 and 2017-2019 forecast to actual customer counts and consumption per customer.

Table 3.2
Customers, Consumption and Consumption per Customer

		A	B	C	D
	Customers and Consumption	**2019**		**2017-2019**	
		PBR Forecast	**Actual**	**PBR Forecast**	**Actual**
	Customers				
1	Residential	266,018	269,736	261,089	264,451
2	Multi-Residential	3,837	3,779	3,791	3,765
3	Commercial	16,970	17,063	16,753	16,846
4	Total	**286,825**	**290,578**	**281,633**	**285,063**
	Monthly Consumption per Customer				
5	Residential	14.2	13.8	14.4	14.3
6	Multi-Residential	408.8	391.8	408.8	392.8

		A	B	C	D
Customers and Consumption		2019		2017-2019	
		PBR Forecast	Actual	PBR Forecast	Actual
7	Commercial	120.9	112.4	122.8	116.2
	Annual Consumption - ML				
8	Residential	45,193.7	44,579.8	135,342.1	135,849.4
9	Multi-Residential	18,821.8	17,766.8	55,798.5	53,240.9
10	Commercial	24,616.3	23,010.6	74,086.7	70,484.0
11	Total	**88,631.8**	**85,357.2**	**265,227.3**	**259,574.3**

Actual to forecast differences in Wastewater's customer counts and consumption are attributable to the same factors discussed in Section 2.2.

3.3 Financial Performance

Wastewater's revenue requirements are summarized on Table 3.3 below.

Table 3.3
Wastewater Revenue Requirements
($ millions)

		A	B	C	D
Summary of Revenue Requirements		2019		2017-2019	
		PBR Forecast	Actual	PBR Forecast	Actual
1	Wastewater Rate Revenue*	98.8	92.3	278.0	266.7
	Wastewater Revenue Requirement				
2	Operating expenses	57.1	50.3	166.7	146.6
3	Other revenue	(6.8)	(6.9)	(19.5)	(19.3)
4	Depreciation and amortization	17.4	18.0	47.0	48.4
5	Return on rate base financed by debt	12.6	11.5	34.1	32.5
6	Return on rate base financed by equity	19.2	19.3	53.0	58.5
7	Wastewater Revenue Requirement*	99.5	92.3	281.4	266.7
8	**Return on Rate Base Financed by Equity**	**10.18%**	**10.93%**	**10.18%**	**11.84%**

* In the PBR forecast, rebasing and other special rate adjustments have been smoothed over the PBR term. Therefore, although forecast revenue is equal to the revenue requirement over the 2017-2021 PBR term, in any year within the PBR term, forecast revenue may be greater or less than the revenue requirement

Detailed explanations for forecast to actual variances for each of the elements of the revenue requirement are provided in sections 3.3.1 to 3.3.6.

3.3.1 Revenue

Wastewater's rate revenues 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 also has a relatively small amount of other revenue, about 60% of which relates to overstrength surcharges that are subject to the same rate adjustment mechanism as Wastewater's rate revenue. Table 3.3.1 below provides a comparison of Wastewater's 2019 actual and forecast revenue.

Table 3.3.1
Wastewater Revenue
($ millions)

		A	B	C	D
	Wastewater Revenue	2019		2017-2019	
		PBR Forecast	Actual	PBR Forecast	Actual
	Fixed Monthly Service Charges				
1	Residential	15.7	14.3	43.5	41.1
2	Multi-Residential	0.2	0.2	0.6	0.6
3	Commercial	1.0	0.9	2.8	2.6
4	Fixed Monthly Service Charges	16.9	15.5	46.9	44.4
	Consumption Charges				
5	Residential	42.4	40.7	119.7	118.0
6	Multi-Residential	17.7	16.2	49.4	46.2
7	Commercial	21.9	19.9	62.0	58.1
8	Consumption Charges	81.9	76.8	231.1	222.3
9	Wastewater Rate Revenue	98.8	92.3	278.0	266.7
10	Other Revenue	6.8	6.9	19.5	19.3
11	**Total Wastewater Revenue**	**105.6**	**99.1**	**297.4**	**286.0**

Wastewater's revenues were $6.5 million less than forecast in 2019, and $11.3 million less than forecast over the 2017-2019 PBR period. This difference is attributable to three factors:

- Lower than forecast inflation resulted in a $2.7 million decrease in 2019 ($5.0 million for 2017-2019). Since rate increases are capped at inflation less the efficiency factor ("i-x"), lower than forecast inflation from 2016 to 2019 will continue to impact revenues throughout the remainder of the 2017-2021 PBR term;
- Lower than forecast consumption resulted in a $3.0 million decrease in 2019 ($4.9 million for 2017-2019). As with Water, residential consumption per customer was 2.7% lower than the PBR forecast primarily attributable to higher than average precipitation over the summer months. Unexpected decreases in per customer consumption in the commercial and multi-residential customer classes continue to be a source of concern. Accordingly, EWSI is working to enhance consumption forecasting processes for the commercial and multi-residential customer classes; and
- The non-routine adjustment related to the transfer of Drainage Services to EPCOR (see Section 1.5) has reduced revenues by $1.1 million in 2019 ($1.9 million for 2017-2019).

3.3.2 Operating Expenses by Function

Wastewater's operating expenses are presented and analyzed on both functional and cost category bases. Actual and forecast operating expenses by function are shown in Table 3.3.2 below:

Table 3.3.2
Operating Expenses by Function
($ millions)

		A	B	C	D
	Function and Sub-function	2019		2017-2019	
		PBR Forecast	Actual	PBR Forecast	Actual
	Power, Other Utilities and Chemicals				
1	Power and Other Utilities	5.4	5.3	16.0	14.7
2	Chemicals	1.6	1.2	4.8	3.5
3	Power, Other Utilities and Chemicals	7.1	6.6	20.8	18.2
	Wastewater Treatment				
4	Wastewater Treatment Plant	19.2	17.3	56.3	52.2
5	Operations Support Services	8.3	6.3	24.4	19.1
6	Capitalized Overhead	(2.4)	(3.1)	(7.1)	(9.1)
7	Wastewater Treatment	25.0	20.5	73.6	62.2
	Billing, Meters and Customer Service				
8	Billing and collections	3.4	3.3	9.9	9.7
9	Meter reading	2.4	2.4	7.2	6.9
10	Regulatory Services	1.0	1.4	3.0	3.9
11	Billing, Meters and Customer Service	6.9	7.1	20.1	20.5
	EWSI Shared Services				
12	EWSI Shared Services	3.5	3.3	10.1	9.6
13	Incentive and Other Compensation	1.2	1.0	3.4	1.8
14	EWSI Shared Services	4.6	4.3	13.6	11.4
15	Corporate Shared Services	5.1	4.0	14.9	11.9
	Franchise Fees and Property Taxes				
16	Franchise Fees	7.5	7.2	21.5	20.8
17	Property Taxes	1.0	0.6	2.4	1.8
18	Franchise Fees and Property Taxes	8.5	7.8	23.9	22.6
19	**Total Operating Expenses by Function**	**57.2**	**50.4**	**166.9**	**146.7**

Overall, Wastewater's operating expenses for 2019 were $6.8 million less than forecast ($20.2 million less for 2017-2019). Key factors contributing to this difference include:

- **Power and Other Utilities** - $0.1 million less than forecast in 2019, ($1.3 million less for 2017-2019), due to lower than forecast power prices.
- **Chemicals -** $0.4 million less than forecast in 2019 ($1.3 million less for 2017-2019), primarily attributable to two factors. First, the Ostara nutrient removal facility was offline more than expected, resulting in lower chemical usage over the 2017 to 2019 period. Second, process and dosing optimization enabled Wastewater to achieve significant reductions in alum usage over the 2017 to 2019 period.
- **Wastewater Treatment** - $4.5 million less than forecast in 2019 ($11.4 million less for 2017-2019). The favourable variance is primarily attributable to adjustments to the capital program, where projects with a high component of contractor costs have been replaced by capital maintenance and repair projects completed by Wastewater personnel. These changes have led to capitalization of an additional $1.7 million of internal labour costs that would otherwise have been expensed ($4.8 million for 2017-2019) and additional capitalized overheads of $0.7 million in 2019 ($2.0 million for 2017-2019). Besides these changes, the favourable variance also reflects lower than forecast fringe benefits costs of $0.8 million in 2019 ($1.8 million for 2017-2019) related to lower pension

contributions, and $1.1 million in savings in contractor costs ($1.4 million for 2017-2019) resulting from dissolution of the Centre for Excellence, lower maintenance costs, and the completion of fewer engineering studies in 2019. The remainder of the variance results from numerous small items, none of which are individually significant.

- **EWSI Shared Services** - $0.3 million less than forecast in 2019 ($2.2 million less for 2017-2019). Lower than forecast costs in this category reflect a $0.3 million reduction in business unit allocations related to the transfer of Drainage Services to EPCOR ($1.0 for 2017-2019). The 2017-2019 variance includes $0.8 million of savings in long term disability premiums, the remainder of the variance results from numerous small items, none of which are individually significant.
- **Corporate Shared Services** - $1.1 million less than forecast in 2019 ($3.0 million less for 2017-2019). These differences reflect both the reduction in corporate cost allocations resulting from the transfer of Drainage from the City of Edmonton to EPCOR Utilities Inc., as well as cost savings in corporate functions. As with In-City Water, the cost reductions arising from the transfer of Drainage Services have been returned to Wastewater customers through a non-routine adjustment to 2018 water rates.
- **Franchise Fees and Property Taxes** - $0.7 million less than forecast in 2019 ($1.3 million less for 2017-2019). Lower than forecast revenue resulted in a $0.3 million reduction in franchise fees in 2019 ($0.7 million for 2017-2019). Lower than forecast property taxes relate to the deferral of capital projects, including the Operations Center at Mid-point Entrance project, which had been forecast to increase property taxes.

3.3.3 Operating Expenses by Cost Category

Table 3.3.3 shows operating expenses by cost category for Wastewater Treatment Plant Operations, Billing Meters and Customer Service, and EWSI Shared Services, where cost categories differ from the sub-functions in Section 3.3.2.

Table 3.3.3
Operating Costs by Cost Category
($ millions)

		A	B	C	D
	Cost Category	2019		2017-2019	
		PBR Forecast	Actual	PBR Forecast	Actual
	Wastewater Treatment				
1	Staff Costs and Employee Benefits	17.8	14.3	52.5	43.5
2	Contractors and Consultants	4.1	2.8	12.1	10.3
3	Materials and Supplies	2.1	2.2	6.0	6.6
4	Other	1.0	1.3	3.0	1.8
5	Wastewater Treatment Expenses	25.0	20.5	73.6	62.2
	Billing, Meters and Customer Service				
6	CUS Charges	3.4	3.3	9.9	9.7
7	Contractors and Consultants	3.5	3.8	10.2	10.8
8	Billings, Meters and Customer Services Expenses	6.9	7.1	20.1	20.5
	EWSI Shared Services				
9	EWSI Shared Services Allocation	3.2	2.9	9.4	8.4

	Cost Category	A 2019 PBR Forecast	B 2019 Actual	C 2017-2019 PBR Forecast	D 2017-2019 Actual
10	Staff Costs and Employee Benefits	1.3	1.3	3.8	2.7
11	Other	0.1	0.1	0.4	0.2
12	EWSI Shared Services Expenses	4.6	4.3	13.6	11.4

The information presented in this table supports the explanations of differences between 2019 actual and forecast expenses provided in Section 3.3.3. Accordingly, no additional explanations are considered necessary.

3.3.4 Depreciation and Amortization

Wastewater's depreciation expense and amortization of contributed assets for 2019 are shown in Tables 3.3.4 below:

Table 3.3.4
Depreciation and Amortization
($ millions)

	Depreciation and Amortization	A 2019 PBR Forecast	B 2019 Actual	C 2017-2019 PBR Forecast	D 2017-2019 Actual
1	Gross depreciation expense	18.3	19.0	49.8	51.2
2	Amortization of contributions	(0.9)	(0.9)	(2.8)	(2.8)
3	**Depreciation, net**	**17.4**	**18.0**	**47.0**	**48.4**

Wastewater's 2019 depreciation expense was $0.7 million greater than forecast ($1.4 million greater for 2017-2019), even though plant in service was $54.9 million (8%) less than forecast at December 31, 2019 (Table 3.3.5, line 4). This difference results from adjustments to Wastewater's capital program where asset replacement projects were replaced with capital maintenance and repair projects, which have higher effective depreciation rates than asset replacements. In the PBR forecast depreciation expense was calculated as if all asset additions related to new assets, rather than repair or to overhauls of existing assets. EWSI expects that the effect of higher than forecast depreciation rates will continue through the remainder of the 2017-2021 PBR term.

3.3.5 Rate Base

Wastewater's 2019 mid-year rate base, shown in Table 3.3.5 below, was $28.3 million less than forecast, reflecting lower than forecast capital additions in 2017 and 2019 resulting from project deferrals and other adjustments to the capital program described in Section 3.4.1.

Table 3.3.5
Mid-Year Rate Base
($ millions)

		A	B
		2019	
	Components of Mid-Year Rate Base, net of Contributions	PBR Forecast	Actual
	Plant in Service		
1	Balance, beginning of year	639.4	592.0
2	Capital additions	47.2	40.8
3	Retirements and adjustments	-	(1.1)
4	Balance, end of year	686.6	631.7
5	Mid-Year Plant in service	663.0	611.8
	Accumulated Depreciation		
6	Balance, beginning of year	167.8	145.1
7	Depreciation expense	18.3	19.0
8	Retirements and adjustments	-	(1.1)
9	Balance, end of year	186.1	163.0
10	Mid-Year Accumulated Depreciation	176.9	154.1
	Other Rate Base Items		
11	Working Capital	6.2	6.0
12	Materials and Supplies	1.6	1.7
13	**Gross Mid-Year Rate Base**	**493.8**	**465.5**
	Contributions		
14	Balance, beginning of year	41.0	41.0
15	Contributions in aid of construction	-	-
16	Balance, end of year	41.0	41.0
17	Mid-Year Contributions	41.0	41.0
18	Accumulated Amortization		
19	Balance, beginning of year	17.5	17.5
20	Amortization of contributions	0.9	0.9
21	Balance, end of year	18.4	18.4
22	Mid-Year Accumulated Amortization	17.9	17.9
23	**Mid-Year Contributions**	**23.0**	**23.0**
24	**Mid-Year Rate Base**	**470.8**	**442.5**

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 rate payers. The cost of operating these assets, as well as any related revenues are also excluded from Wastewater's financial results.

3.3.6 Return on Rate Base

In 2019, Wastewater's return on equity was $0.1 million (0.75%) greater than forecast and $5.5 million (1.66%) greater for 2017-2019. In 2019, higher than forecast net income accounted for 0.10% of this increase (1.10% for 2017-2019), with a lower than forecast rate base accounting for the remainder. EWSI expects that operating cost savings (see section 3.3.2) will continue to offset any reductions in revenue and drive higher than forecast returns on equity for the remainder of the 2017-2021 PBR term.

Table 3.3.6-1
Return on Rate Base
($ millions)

	Return on Rate Base	2019		2017-2019	
		PBR Forecast	Actual	PBR Forecast	Actual
1	Mid-year Rate Base	470.8	442.5		
	Capital Structure				
2	Debt (%)	60.00%	60.00%		
3	Equity (%)	40.00%	40.00%		
	Cost of Capital				
4	Cost of Debt	4.45%	4.32%	4.36%	4.38%
5	Cost of Equity	10.18%	10.93%	10.18%	11.84%
6	Weighted Average Cost of Capital	6.74%	6.96%	6.68%	7.36%
	Return on Mid-Year Rate Base				
7	Return on Rate Base Financed by Debt	12.6	11.5	34.1	32.5
8	Return on Rate Base Financed by Equity	19.2	19.3	53.0	58.5
9	**Return on Mid-year Rate Base**	**31.7**	**30.8**	**87.1**	**90.9**

Wastewater's weighted average cost of debt calculation, shown in Table 3.3.6-2 below, yields average debt costs that are very close to forecast, as Wastewater has reduced issuances of new long-term debt in response to lower than forecast capital expenditures. Accordingly, lower than forecast interest expense over the 2017 to 2019 period is primarily attributable to lower than forecast debt issuances.

Table 3.3.6-2
Interest Expense and Cost of Debt
($ millions)

		A	B	C	D
	Interest Expense and Cost of Debt	2019		2017-2019	
		PBR Forecast	Actual	PBR Forecast	Actual
	Interest Expense				
1	Interest on short-term debt	0.9	1.1	2.7	3.2
2	Interest on City of Edmonton debentures	2.8	-	9.2	6.2
3	Interest on intercompany debentures	9.2	10.7	23.1	23.6
4	Total Interest expense	12.9	11.8	35.1	33.0
	Mid-year debt and other long-term liabilities				
5	Mid-Year Short-term debt	32.8	20.6		
6	Mid-Year Long-term debt	257.6	252.6		
7	Mid-Year Other Long-term liabilities	0.5	0.2		
8	Total Mid-year debt and other long-term liabilities	290.8	273.3		
9	**Embedded cost of Debt**	**4.45%**	**4.32%**	**4.36%**	**4.38%**

3.3.7 Transactions with Affiliates

Wastewater derives a significant proportion of its revenue and expenses from transactions with affiliates, including the City of Edmonton, EPCOR Utilities Inc. and its subsidiaries, and other EPCOR Water Services Inc. business units. Table 3.3.7 summarizes Wastewater's transactions with affiliates.

Table 3.3.7
Transactions with Affiliates
($ millions)

	Affiliate and Service	A	B	C	D
		2019		2017-2019	
		PBR Forecast	Actual	PBR Forecast	Actual
1	**Revenues from the provision of services to the City of Edmonton**				
2	Wastewater Treatment Services	1.0	1.3	3.1	3.6
3	Other Services	0.2	-	0.7	0.3
4	Total	1.3	1.3	3.7	3.9
5	**Services provided by (recovered from):**				
6	**City of Edmonton**				
7	Franchise Fees	7.5	7.2	21.5	20.8
8	Property Taxes	1.0	0.6	2.4	1.8
9	Interest on Long Term Debt	2.8	-	9.2	6.2
10	Regulatory Services	1.0	-	3.0	0.7
11	Biosolids Contractor Service	-	4.6	-	4.6
12	Other Services	0.2	0.2	0.5	0.6
13	Total	12.6	12.6	36.7	34.6
14	**EPCOR Utilities Inc.**				
15	Corporate Shared Service Costs	5.1	4.0	14.9	11.9
16	Interest on Intercompany Loans	9.2	10.7	23.1	23.6
17	Interest on Short-term debt	0.9	1.1	2.7	3.2
18	Other Services	-	0.1	-	0.1
19	Total	15.2	15.9	40.7	38.8
20	**EPCOR Distribution and Transmission Inc.**				
21	Maintenance and other services	0.1	-	0.2	0.2
22	**EPCOR Technologies Inc.**				
23	Hydrovac Charges	-	-	-	0.2
24	**EPCOR Energy Alberta LP**				
25	Billing and Collection Services	3.1	2.9	8.9	8.6
26	**Other EWSI Business Units**				
27	EWSI Shared Services Allocation	3.2	2.9	9.4	8.4
28	Meter reading services from In-City Water	2.4	2.4	7.2	6.9
29	Water purchases from In-City Water	0.4	0.5	1.1	1.3
30	Regulatory services from Drainage Services	3.1	1.4	8.9	3.2
31	Project engineering recoveries from Drainage	-	-	-	(1.2)
32	Laboratory services recoveries from Drainage	-	(0.4)	-	(0.8)
33	Total	9.1	6.8	26.6	17.8
34	**Expenditures on capital projects arising from services provided by:**				
35	EPCOR Technologies Inc.	-	-	-	0.3
36	EPCOR Utilities Inc.	-	0.1	-	0.3
37	Total	-	0.1	-	0.6

3.4 Capital Programs

3.4.1 Capital Expenditures

Table 3.4.1 compares approved capital expenditures from the PBR forecast to actual capital expenditures for 2019 for each project with approved capital expenditures in excess of $5.0 million over the 2017-2021

PBR term, as well as for each project category. Table 3.4.1 also provides a comparison of total 2017-2021 approved capital expenditures to EWSI's current capital forecast.

Table 3.4.1
Capital Expenditures
($ millions)

		A	B	C	A	B	C	D	E	F
		2019			2017 to 2019			2017 to 2021		
		PBR Forecast	Actual	Difference	PBR Forecast	Actual	Difference	PBR Forecast	Current Projection	Difference
1	**Reliability and Life Cycle Improvements**									
2	Build Pipe Racks	-	2.1	2.1	-	2.1	2.1	-	9.7	9.7
3	Replace 2.5km of Sludge Line	-	5.9	5.9	-	7.1	7.1	-	7.5	7.5
4	Clarifier Chain Replacement	1.2	2.2	1.0	2.8	7.1	4.4	4.1	9.9	5.8
5	Sludge Line Upgrades	1.1	0.2	(0.9)	3.4	7.9	4.6	3.4	8.0	4.7
6	Mechanical Rehab Program	3.7	4.2	0.5	11.3	15.2	4.0	15.6	19.6	4.0
7	Structural Rehab Program	1.5	3.2	1.7	4.5	5.6	1.1	7.7	11.4	3.7
8	Distribution Chamber Reconstruction	0.5	2.5	2.0	3.8	6.8	3.0	3.8	6.8	3.0
9	Digester 3 Upgrades	-	1.6	1.6	11.3	11.4	0.0	11.3	13.6	2.3
10	Electrical Rehab Program	0.5	2.0	1.5	3.7	5.1	1.3	7.2	8.6	1.4
11	Structural Rehab Secondaries 1-8	3.7	5.1	1.5	10.4	13.4	3.1	17.6	18.8	1.3
12	Operations Center at Mid-Point Entrance	8.8	0.1	(8.7)	17.4	1.1	(16.3)	19.4	6.9	(12.5)
13	Digester 4 Upgrades	5.4	0.1	(5.3)	5.4	1.3	(4.0)	12.0	1.3	(10.7)
14	Headworks and Primary Aeration System Upgrades	0.6	1.1	0.5	6.7	1.3	(5.4)	6.7	1.4	(5.3)
15	Buildings and Site Rehab	4.7	1.9	(2.8)	10.4	4.0	(6.3)	12.8	8.5	(4.3)
16	Square 1 Gas Room Replacement	1.0	0.4	(0.6)	1.0	0.4	(0.6)	15.6	11.3	(4.3)
17	Utility Hot Water System Rehabilitation	4.7	2.3	(2.4)	11.9	6.7	(5.2)	13.9	10.1	(3.8)
18	Site Ventilation Rehabilitation	8.8	4.7	(4.0)	20.7	14.2	(6.6)	31.5	28.2	(3.3)
19	Projects < $5 million	2.9	3.3	0.4	16.2	16.8	0.7	21.2	24.7	3.6
20	**Subtotal**	49.0	43.0	(6.0)	140.7	127.7	(13.0)	203.4	206.3	2.9
21	**Hydrovac Sanitary Grit**									
22	Hydrovac Sanitary Grit Treatment Facility	-	(0.0)	(0.0)	8.4	7.3	(1.1)	8.4	7.3	(1.1)
23	**Performance Efficiency and Improvement**									
24	Plant Improvements*	2.6	2.6	0.0	6.9	7.6	0.7	10.6	12.3	1.7
25	Projects < $5 million	0.8	2.2	1.5	4.7	3.3	(1.4)	7.0	4.7	(2.3)
26	**Subtotal**	**3.4**	**4.9**	**1.5**	**11.6**	**10.9**	**(0.8)**	**17.6**	**17.0**	**(0.6)**
27	**Growth/Customer Requirements**									
28	Projects < $5 million	-	1.0	1.0	1.5	1.0	(0.5)	1.5	1.6	0.0
29	**Health, Safety and Environment**									
30	Projects < $5 million	0.9	0.5	(0.4)	3.4	1.7	(1.7)	4.5	5.0	0.5
31	**Regulatory**									
32	Projects < $5 million	-	-	-	-	-	-	-	1.5	1.5
33	**Capital Expenditures, net of Contributions**	**53.3**	**49.3**	**(4.0)**	**165.6**	**148.5**	**(17.1)**	**235.4**	**238.6**	**3.2**

* Plant Improvements project is a consolidation of the individual plant improvements ($2.9M), control system upgrades ($1.0M), control system operational improvements program ($2.6M), and instrumentation upgrades ($4.1M) projects approved in the 2017 to 2021 PBR.

Explanations for differences between PBR forecast capital expenditures for 2017 to 2021 and EWSI's current projection in excess of $2.0 million include:

1. **Build Pipe Racks** – $9.7 million (new project). This project provides for construction of an above-ground pipe rack network to allow the relocation of biogas piping, glycol heating lines and electrical circuits out of underground tunnels at the Gold Bar Plant. Moving these utilities above ground will reduce tunnel ventilation upgrade costs, enable future expansion of process piping, facilitate compliance with building and fire codes, and provide a safer working environment.
2. **Replace 2.5 km of Sludge lines** – $7.5 million (new project). This project provides for replacement of a 2.5 km section of the sludge line between the Clover Bar lagoons and the North Saskatchewan River. Upon inspection this section of the sludge line was found to be in such poor condition that repairs and/or rehabilitation was not financially viable and full replacement was required.
3. **Clarifier Chain Replacement** – $5.8 million (144%) greater than forecast. The costs of this project have increased significantly following the premature failure of stainless steel clarifier chains due to unexpected localized corrosion. These chains are being replaced with plastic loop chains which have a better performance record at Gold Bar.
4. **Sludge Line Upgrades** – $4.7 million (139%) greater than forecast. The PBR forecast only included the costs of cleaning and inspecting the sludge lines between Gold Bar WWTP and the Clover Bar Lagoons. Inspections on older sections showed that the sludge lines were in poor condition and required significant additional capital expenditure under this project for rehabilitation/replacement to ensure that these pipelines can continue to operate with minimal risk of leakage.
5. **Mechanical Rehabilitation Program** – $4.0 million (26%) greater than forecast, reflecting expenditures on emergency repairs. The most significant repairs included repair of a leaking glycol heating line ($1.9 million), and replacement of six aluminum gates on Screens 4 – 6 ($1.0 million) to allow tank isolation and maintenance.
6. **Structural Rehabilitation Program** – $3.7 million (49%) greater than forecast, primarily attributable to the costs of addressing greater than expected concrete deterioration at the Gold Bar Diversion Structure caused by long-term H2S gas exposure ($9.0 million). This increase has been partially offset by deferral of lower priority structural rehabilitation sub-projects.
7. **Distribution Chamber Reconstruction** – $3.0 million (79%) greater than forecast. The increase in the forecast cost of this project results from higher than expected competitive bids from contractors, as well as higher than expected costs to demolish the distribution chamber and to construct the lift station tie-ins.
8. **Digester 3 Upgrades** – $2.3 million (20%) greater than forecast, which are primarily due to the costs associated with addressing unanticipated leakage from the structure identified during commissioning tests.
9. **Operations Centre at Mid-Point Entrance** – $12.5 million (64%) less than forecast. Changes to the costs and timing of this project reflect design reviews and scope adjustments incorporating the results of significant public consultation.
10. **Digester 4 Upgrades** – $10.7 million (89%) less than forecast. Revised solids loading forecasts suggest sufficient digestion capacity at the current time, which allows for the deferral of upgrades to Digester 4 to future PBR periods.

11. **Headworks and Primary Aeration System Upgrades** – $5.3 million (80%) less than forecast, reflecting a reduction in the scope of this project following EWSI's determination that restoring aeration in the main influent channels was not required.
12. **Buildings and Site Rehabilitation Program** – $4.3 million (34%) less than forecast. The scope of this project was reduced following an internal review which concluded that certain sub-projects could be safely deferred, allowing resources to be focused on unanticipated, higher-priority projects.
13. **Square 1 Gas Room Replacement** – $4.3 million (27%) less than forecast, reflecting scope and design changes that are expected to more efficiently resolve the identified process safety risks, at a lower total cost.
14. **Utility Hot Water System Rehabilitation** – $ 3.8 million (27%) less than forecast. The decrease is primarily due to the ongoing COVID-19 pandemic, which is expected to result in the deferral of additional significant portions of the Loop 5 and 7 upgrades ($2.1 million) to the next PBR period. The remaining decrease relates to the deferral of other utility hot water system rehabilitation and upgrade work to a future PBR period, allowing resources to be focused on unanticipated, higher-priority projects.
15. **Site Ventilation Rehabilitation Program** – $3.3 million (11%) less than forecast, primarily due to changes to the design of the ventilation of the EPT Building, along with the deferral of lower priority projects to future years as a result of the COVID-19 pandemic.
16. **Reliability and Life Cycle Improvements < $5.0 million** – $3.6 million (24%) greater than forecast. The projected increase in this category results primarily from the purchase and installation of new onsite emergency back up power generation ($2.0 million); unanticipated preliminary scope and design costs associated with a new Dewatering Facility ($2.9 million); and changes to projected costs for other growth projects amounting to a $1.3 million reduction in costs.
17. **Performance Efficiency and Improvement < $5.0 million** - $2.3 million (33%) less than forecast. The projected decrease in this category results primarily from the cancellation of the channel access improvements program ($2.1 million).

3.4.2 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 2019 year-end balance of Wastewater's Construction Work in Progress is $9.5 million greater than forecast, reflecting changes in the timing of project completion.

Table 3.4.2
Construction Work in Progress
($ millions)

		A	B	C	D
Construction Work in Progress		**2019**		**2017-2019**	
		PBR Forecast	**Actual**	**PBR Forecast**	**Actual**
1	Balance, beginning of period	18.2	25.4	19.2	22.6
2	Capital Expenditures	53.3	49.3	165.6	148.6
3	Capital Additions	(47.2)	(40.8)	(160.5)	(137.3)
4	**Balance, end of period**	**24.3**	**33.8**	**24.3**	**33.8**

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 2019, because of the higher average balance of Construction Work in Progress, AFUDC included in capital expenditures on eligible projects amounted to $1.9 million, compared to the PBR forecast amount of $1.1 million.

3.5 Operational Performance

3.5.1 Water Quality and Environmental Index

The Water Quality and Environmental index is a composite measure intended to assess EWSI's impact on the environment through the quality of the wastewater effluent returned back to the North Saskatchewan River and the effectiveness of environmental management programs.

Table 3.5.1
Water Quality and Environmental Index

Index Component	PBR Performance Measure	Standard	Actual Score	Index
Water Quality Factor	The value of the Wastewater Effluent Limit Performance, which aggregates measures of the percentage of the discharge limit for five parameters in the Gold Bar wastewater treatment plant's final effluent.	< 28.0%	25.3%	1.108
Environmental Incident Factor	The actual number of environmental incidents that are both reportable and preventable	< 10	3	3.333
			Average Index	2.220
			Index Standard Points	55.0
			Total Actual Points	122.1
			Maximum Available Points Including Bonus Points	60.5
			Total Points Earned	**60.5**

2019 Highlights

- **Wastewater Effluent Limit Performance Index.** Ongoing maintenance of secondary clarifier chains and drive mechanisms continued through 2019. Although there was a short setback due to elevated

solids loading in May when two clarifiers were undergoing maintenance, the plant recovered within a few days and maintained improved performance for the remainder of 2019.

- **Environment Incident Management.** There were three reportable and preventable incidents attributed to Gold Bar operations in 2019. However, none of these incidents were the result of poor effluent quality and none had any effect on the North Saskatchewan River.

  One incident involved a missed fence line odour sample, one involved a bio-solids application spill from a contractor's truck and the third resulted from a mechanical failure that resulted in some overflow to soil at a park next to the Gold Bar plant.

2020 Areas for Improvement

- **Wastewater Effluent Limit Performance Index.** There will be a continued focus on preventative maintenance programs to limit unplanned downtime through 2020.
- **Environment Incident Management.** Quality assurance and quality control procedures for daily manual air quality samples will be reviewed to improve data analysis for incident reviews.

3.5.2 Customer Service Index

Wastewater's customer service index for the 2017-2021 PBR term includes three equally weighted odour metrics. These metrics recognize that Wastewater's customer interactions typically relate to odour concerns from customers located close to the Gold Bar Wastewater Treatment Plant.

Table 3.5.2
Customer Service Index

Index Component	PBR Performance Measure	Standard	Actual Score	Index
H_2S - 1 Hour Exceedance Factor	The average of the number of exceedances of the 1 hour limit registered at the Gold Bar and Beverly air quality monitoring stations.	< 6	0	2.000
H_2S - 24 Hour Exceedance Factor	The average of the number of exceedances of the 24 hour limit registered at the Gold Bar and Beverly air quality monitoring stations.	< 2	0	2.000
Scrubber Uptime Factor	The percentage of time that the scrubbers are on line.	> 90%	98.8%	1.098
			Average Index	1.699
			Index Standard Points	15.0
			Total Actual Points	25.5
			Maximum Available Points Including Bonus Points	16.5
			Total Points Earned	**16.5**

2019 Highlights

- **H_2S - 1 and 24 Hour Exceedance Factor.** Fence line H_2S monitoring continued through 2019. This enhanced monitoring ability for Gold Bar operations to intervene prior to elevated levels of H_2S and thereby avoid exceedances.

- **Scrubber Uptime Factor.** Redundant chemical feed pumps and instrumentation were added in 2018. This improved scrubber uptime for 2019 which, in turn, minimized H_2S exceedances.

2020 Areas for Improvement

- **H_2S - 1 and 24 Hour Exceedance Factor.** Recently installed odour modelling software will be configured in 2020 to provide alerts for odour plumes that could result in H_2S exceedances. These alerts are expected to permit early intervention to avoid potential exceedances.

  Two new localized scrubbers at the grit and screening buildings will be commissioned during 2020.

  Design of an air quality monitoring station at Gold Bar will continue through 2020 with expected installation in 2021.

- **Scrubber Uptime Factor.** The preventative maintenance program will be continued and can be expected to further limit unplanned scrubber downtime.

3.5.3 System Reliability and Optimization Index

The system reliability and optimization index is a measure of the performance of the Gold Bar Wastewater Treatment Plant and the degree to which the wastewater treatment system is optimized to minimize its impact on the environment.

Table 3.5.3
System Reliability and Optimization Index

Index Component	PBR Performance Measure	Standard	Actual Score	Index
Enhanced Primary Treatment Factor	The percentage of time that the enhanced primary treatment facility ran during wet weather events where the influent flow rate exceeded the EPT event threshold.	> 80.0%	100.0%	1.250
Biogas Utilization Factor	The percentage of biogas utilized, calculated as the volume of biogas produced less the volume flared divided by the volume produced.	> 60.0%	84.2%	1.403
Energy Efficiency Factor	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.	< 514	500	1.028
			Average Index	1.227
			Index Standard Points	15.0
			Total Actual Points	18.4
			Maximum Available Points Including Bonus Points	16.5
			Total Points Earned	**16.5**

2019 Highlights

- **Enhanced Primary Treatment (EPT) Factor.** EPT clarifiers were proactively cleaned and inspected in 2019. This minimized clarifier downtime and maximized availability for primary treatment.

- **Biogas Utilization Factor.** Improvements to the glycol heat recirculation system resulted in more consistent boiler supply and return temperature control.
- **Energy Efficiency Factor.** Even though energy consumption was at a peak in 2019, higher effluent flow rates during wet weather resulted in an improved efficiency factor.

2020 Areas for Improvement

- **Enhanced Primary Treatment (EPT) Factor.** The EPT asset management plan will be reviewed to identify assets nearing end of life. This will result in reduced unplanned downtime.
- **Biogas Utilization Factor.** Boiler operations will be reviewed to further optimize boiler utilization.
- **Energy Efficiency Factor.** Blower upgrades and process air systems are to be reviewed for optimization opportunities.

3.5.4 Safety Index

EPCOR and EWSI are committed to a safe, healthy lifestyle and demonstrate this through care and concern for people. The safety index is a measure of the success of programs and the application of policies that maximizes the safety of employees and the public

Table 3.5.4
Safety Index

Index Component	PBR Performance Measure	Standard	Actual Score	Index
Near Miss Reporting Factor	The number of near miss reports entered in the ESS system.	>220	241	1.095
Work Site Inspection Factor	Number of Work Site Inspections and observations completed per year.	>919	1061	1.155
Lost Time Frequency Factor	The actual lost time frequency rate.	<0.75	0.00	2.000
All Injury Frequency Factor	The actual all injury frequency rate	<1.50	0.63	2.388
			Average Index	1.659
			Index Standard Points	15.0
			Total Actual Points	24.9
			Maximum Available Points Including Bonus Points	16.5
			Total Points Earned	**16.5**

2019 Highlights

- **Near Miss Reporting Factor.** Near miss and hazard identification reporting continued to be an effective means to proactively identify hazards and implement corrective actions to mitigate potential harm to employees, contractors and members of the public.
- **Work Site Inspections / Observations Factor.** Work site inspections and observations continued to be a successful leading indicator that provided leaders the opportunity to engage in field activities, to proactively identify areas of improvement and to verify conformance to EPCOR requirements.

- **Lost Time Frequency Rate Factor.** In 2019, Gold Bar exceeded the lost time frequency expectation by having no lost time events.
- **All Injury Frequency Rate Factor.** Gold Bar had 1 recordable incident (Medical Treatment) when a worker caught their finger in a belt on a fan.

2020 Areas for Improvement

- **Near Miss Reporting Factor.** With consideration of the impact of COVID-19 pandemic, there will be a heighted focus on the reporting of near miss and hazard identification throughout 2020 to ensure employees keep their mind on task and continue with proactive reporting.
- **Work Site Inspections / Observations Factor.** With consideration of the impact of COVID-19 pandemic, the opportunity to conduct work site inspections might be reduced. EWSI will monitor inspection activities and look for opportunities to conduct proactive field engagements.
- **All Injury Frequency Rate Factor.** EPCOR will be broadening the internal Safety program to capture Significant Incidents or Fatality Potential (SIFP) events. Monitoring for SIFP events is intended to assist in the identification of situations that could have life altering or fatality potential. The objective will be to ensure that root causes are identified and effective actions are established to prevent recurrence.

3.6 Rates and Bill Comparisons

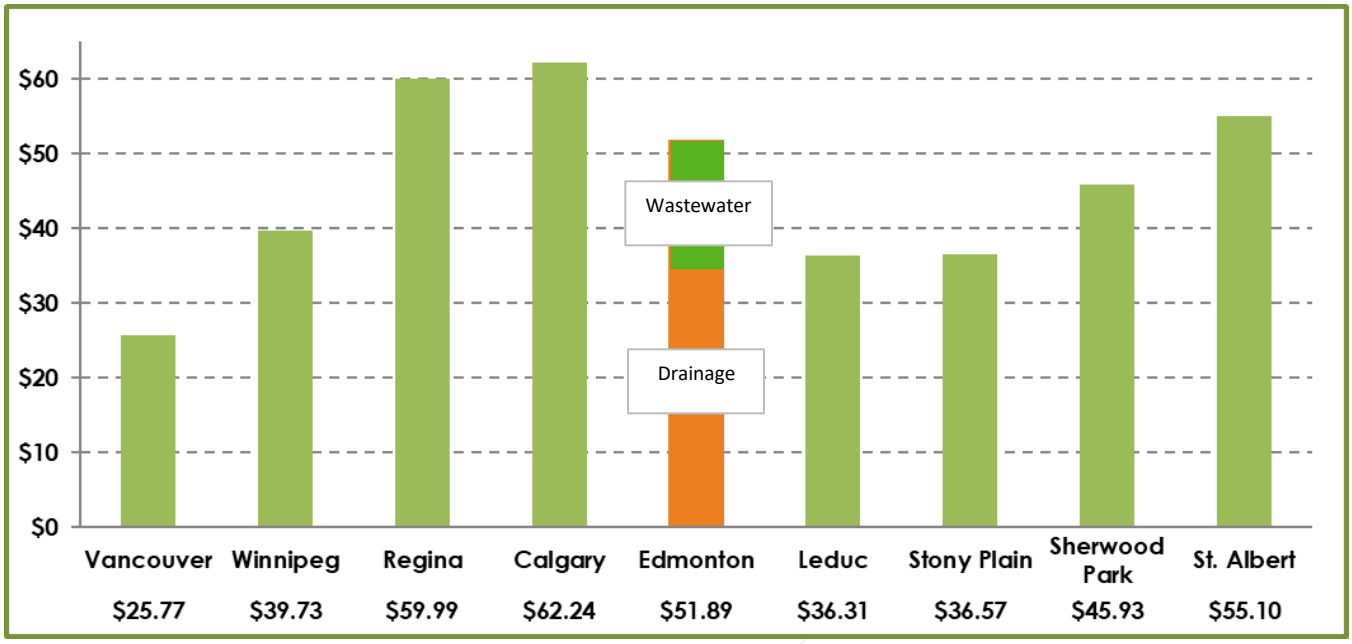
Wastewater and Drainage bill comparisons for 2019 are based on the published drainage and wastewater treatment rates for Calgary, Vancouver, Winnipeg and Regina, as well as four local communities. These bill comparisons represent the total cost to the customer and include fixed charges, consumption charges and any other applicable surcharges.

Unlike most cities, where wastewater treatment services and drainage services are combined, Wastewater is only responsible for wastewater treatment; the operations and maintenance of sanitary, storm and combined sewer systems are provided through EPCOR Drainage Services. Accordingly, wastewater bill comparisons are based on blended EWSI wastewater treatment and drainage rates.

3.6.1 Residential Wastewater and Drainage Bills

Figure 3.6.1 provides a comparison of residential household wastewater and drainage bills for residential household consumption of 13.8 m^3 per month, the average residential customer consumption per month in Edmonton in 2019.

Figure 3.6.1
2019 Monthly Residential Wastewater and Drainage Bill Comparison
(13.8 m^3/month)



Unlike water services which are relatively consistent among cities and communities, the nature and extent of wastewater treatment and drainage services vary significantly between cities and communities, because of differences in wastewater treatment processes, the inclusion of certain services in property taxes, and geographic and climatic factors which affect the level of investment in and approach to flood mitigation and storm water services. In particular, stormwater charges are often included as a component of taxes.

Edmonton's $51.89 average monthly bill from Figure 3.6.1 includes Wastewater charges of $17.34 and Drainage Services charges of $34.55 (inclusive of both sanitary and storm charges). While the total bill is higher than Vancouver and Winnipeg, it is lower than Calgary and Regina, the two cities where drainage and wastewater treatments are most comparable to Edmonton. EWSI notes that cities across Canada are experiencing increased risk of flooding related to climate change and that substantial investments are needed to assess and address climate change-related flood mitigation.

3.6.2 Commercial Wastewater and Drainage Bills

Table 3.6.2 provides a comparison of the wastewater bills for commercial customers of various sizes. This table shows that combined wastewater and drainage bills for commercial customers are competitive with surrounding communities and with major cities in western Canada, although Edmonton's relative ranking varies with the size of the customers with larger customers receiving relatively high monthly bills. These results reflect differences in rate structures between cities and municipalities, as well as differences in the extent of wastewater treatment and drainage services provided.

Table 3.6.2
2019 Monthly Commercial Wastewater and Drainage Bill Comparison
($ per month)

		A	B	C	D
	Monthly Bill - $ per month	**Small**	**Medium**	**Large**	**Extra Large**
1	**Monthly Consumption** - m^3	**10**	**250**	**1,000**	**5,000**
2	Vancouver	21.70	278.51	1,143	5,530
3	Calgary	58.28	448.59	1,668	8,173
4	Regina	53.30	483.50	2,004	9,522
5	Winnipeg	28.79	719.67	2,879	14,393
6	**Edmonton**	**44.69**	**525.77**	**2,148**	**10,718**
7	St. Albert	75.32	502.52	1,838	8,958
8	Sherwood Park	39.28	459.28	1,772	8,772
9	Stony Plain	26.50	662.50	2,650	13,250
10	Leduc	30.00	428.40	1,673	8,313

4 Drainage Services

4.1 Accomplishments and Challenges

In 2019, Drainage Services a number of had significant accomplishments, including:

- Developing a Corrosion and Odour Reduction Strategy and a Stormwater Integrated Resource Plan to address key challenges facing EPCOR's rate payers. The business case for the Stormwater Integrated Resource Plan was presented to the Utility Committee on May 10, 2019, and Corrosion and Odour Reduction Strategy presentation on June 28, 2019. Both these programs entailed considerable technical planning and stakeholder engagement. Both programs received non-routine adjustments which were approved by in 2019.
- Project Management Methodology Review (known as OPM – Organizational Project Management) – a comprehensive, EPCOR wide, review and realignment of project management processes is currently underway. The intent is to streamline project execution while ensuring consistency of approaches and toolsets while maintaining appropriate governance. This initiative will encompass water services in order to drive additional efficiencies across all capital projects. This initiative is a key component in facilitating the integration of Drainage with other EPCOR business units.
- Metrics Program - Drainage services introduced a PBR style metrics program in 2019. This program is aligned with similar programs in water and wastewater treatment and features the same metrics framework, points system to assess performance and financial penalties for performance below the defined standards. The need for such a program was defined with the transfer letter of intent and was approved by City Council through a bylaw amendment.

- Continued identification of Operational and Capital Cost Savings - As part of the commitments made by EPCOR leading to the transfer of Drainage from the City of Edmonton, Operating Cost Efficiencies and Capital Cost Efficiencies were identified for realization after transfer. A significant amount of work continues to be directed toward the realization of cost efficiency opportunities as follows (note - a number of other accomplishments are detailed in the 2019 Operating Plan review is a subsequent section):

    - ***Operating Cost Efficiencies:***

      Smaller operational efficiency "quick wins" continue to be identified and are generally implemented in a relatively short time period upon identification. More substantial opportunities that require a realignment of work responsibilities and methods have been identified, but generally take considerably longer to implement. These opportunities, and in particular the ones that will yield the greatest cost savings, are in the alignment of work planning and execution with water services. Several additional operational opportunities specific to drainage services have also been identified and are currently being explored including capital execution processes, engineering, etc. The two foundational requirements to exploit many of these opportunities are a real estate strategy that would see co-location of water and drainage functions/personnel and a common information systems platform for the identification and management of work

assignments. Both of these requirements are currently in process and are anticipated to be completed over the next two years.

A more complete review of these cost savings will be included in the upcoming PBR application including a financial reconciliation to the targets noted in the Grant Thornton Report "City of Edmonton 2016 EPCOR Proposal for the Drainage Transfer Analysis." In that report, operating cost efficiencies estimated at approximately $5 million by 2022 were identified based on an annual 1% reduction from the 2017 City of Edmonton Drainage budget (i.e. pre-transfer budget). While the total quantum of cost efficiencies is still seen as reasonable, it must be noted that the reconciliation will include adjustments to the identified total operating cost target, which was similarly based on the City of Edmonton budget. Specifically, the conversion of the financials from the City of Edmonton's format to that of EPCOR revealed accounting treatment differences that must be adjusted for, particularly in relation to differences in approaches to capitalization. These changes, in addition to inconsistences in the treatment of vacant positions, adjustment for revenue leakage and other factors will be fully reconciled in the PBR application.

- ***Capital Cost Efficiencies:***

  The Grant Thornton report also identified that EPCOR will be able to generate at least 10% cost efficiency on new, utility financed capital beginning immediately in 2017. These savings were predicated on delivering the 10-year forecast Capital Program at a 10% lower cost which equated to $193.4 million over the 10-year forecast period. To date, a number of capital cost efficiencies have been enacted including: Master Agreements in conjunction with Water Services, Project Management Methodology Review as noted above, and various smaller capital execution synergies.

  While the more significant capital efficiency opportunities will evolve overtime, capital efficiency savings have been achieved to date, particularly with the Stormwater Integration Resource Plan. Drainage Services has developed an approach to address stormwater flooding not previously considered and as result, is projected to complete the underlying projects for $1.6 billion. In comparison to previous approaches, which ranged for $2.2 to $4.5 billion, the Drainage Services approach represents a direct cost saving of between $0.6 billion to $2.9 billion.

  A number of other accomplishments are detailed in the 2019 Operating Plan review below.

4.2 Customers and Consumption

Drainage provides sanitary services to the same customers served by Wastewater (Drainage storm customer' charges are based on land size and other factors). Therefore, actual customer counts, consumption per customer and total consumption are the same as those of Wastewater and actual to forecast differences in Drainage's customer counts and consumption are attributable to the same factors.

4.3 Financial Performance

Although a PBR forecast will be developed as part of Drainage's upcoming 2022-2026 PBR application, currently Drainage does not have a City of Edmonton-approved PBR forecast to serve as the basis of

comparison for financial performance. Therefore, Drainage's 2018 EPCOR drainage budget (adjusted) is used as a proxy for a PBR forecast and is the basis upon which 2018 actual financial performance has been assessed. The 2019 budget has been adjusted to a regulated basis (from IFRS) and to remove one time costs related to the transition of drainage to EPCOR.

Drainage's revenue requirements are summarized on Table 4.3 below. Explanations of forecast to actual variances are provided in sections 4.3.1 to 4.3.6.

Table 4.3
Drainage Revenue Requirements
($ millions)

		A	B	C	D
	Summary of Revenue Requirements	**2019**		**2018-2019**	
		Budget	**Actual**	**Budget**	**Actual**
1	Drainage Rate Revenue				
2	Sanitary Utility Revenue	129.3	123.5	254.8	245.5
3	Stormwater Utility Revenue	64.6	66.8	127.4	129.4
4	Drainage Rate Revenue	193.9	190.4	382.2	374.9
5	Drainage Revenue Requirement				
6	Operating expenses	118.7	116.5	229.1	227.5
7	Other Revenue	(8.5)	(8.6)	(16.8)	(18.7)
8	Depreciation and amortization	34.6	32.7	63.7	64.7
9	Return on rate base financed by debt	26.4	21.3	47.3	40.0
10	Return on rate base financed by equity	22.8	28.5	58.9	61.4
11	Drainage Revenue Requirement	193.9	190.4	382.2	374.9
12	**Return on Rate Base Financed by Equity**	**3.98%**	**4.76%**	**5.21%**	**5.21%**

4.3.1 Revenue

Drainage's rate revenues are derived from both sanitary utility and stormwater utility services. Sanitary utility revenues are comprised of variable monthly charges based on monthly metered water consumption and flat monthly service charges based on the meter size. Stormwater utility revenues are based on area, development intensity, and run-off coefficients based on the zoning of individual land parcels. Rates for both sanitary and stormwater utility services from January 1, 2018 to March 31, 2022 are prescribed in Bylaw 18100 and incorporate an average annual rate increases of 3%.

Table 4.3.1 below provides a comparison of 2019 and 2018-2019 Drainage revenues to the budget:

Table 4.3.1
Drainage Revenue
($ millions)

		A	B	C	D
	Drainage Revenue	2019		2018-2019	
		Budget	Actual	Budget	Actual
1	Sanitary Utility				
2	Flat Monthly Service Charges				
3	Residential	36.5	32.3	72.0	63.4
4	Multi-Residential	0.5	2.2	1.0	4.3
5	Commercial	2.7	5.5	5.4	10.9
6	Flat Monthly Service Charges	39.8	40.0	78.5	78.5
7	Variable Monthly Charges				
8	Residential	46.6	44.1	91.9	88.6
9	Multi-Residential	18.3	17.6	38.4	34.6
10	Commercial	24.6	21.8	46.1	43.8
11	Variable Monthly Charges	89.5	83.5	176.4	167.0
12	Sanitary Utility Revenue	129.3	123.5	254.8	245.5
13	Stormwater Utility				
14	Residential	34.1	36.0	67.2	70.0
15	Multi-Residential	3.3	3.8	6.5	7.4
16	Commercial	27.3	27.0	53.6	52.0
17	Stormwater Utility Revenue	64.6	66.8	127.4	129.4
18	**Drainage Rate Revenue**	**193.9**	**190.4**	**382.2**	**374.9**
19	Other Revenue	8.5	8.6	16.8	18.7
20	**Total Drainage Revenue**	**202.4**	**198.9**	**399.0**	**393.6**

In 2019, Drainage's rate revenues were $3.5 million less than budget ($7.3 million less for 2018-2019). This difference is attributable to lower than budget consumption as discussed in section 2.3.1., partially offset by an increase in stormwater utility revenues. Besides rate revenues, Drainage has Other Revenue derived from biosolids management services provided to the Alberta Capital Region Wastewater Treatment Commission, application and connection fees, wastewater transfer station services, late payment fees, miscellaneous fees pursuant to third party agreements, and other incidental services.

4.3.2 Operating Expenses by Function

Table 4.3.2 below compares Drainage's 2019 actual operating expenses to its budget:

Table 4.3.2
Operating Expenses by Function
($ millions)

		A	B	C	D
	Function and Sub-Function	2019		2018-2019	
		Budget	Actual	Budget	Actual
1	Drainage Operations				
2	Maintenance	30.6	30.1	58.1	57.7
3	Biosolids	16.7	14.0	32.6	27.4
4	Monitoring and Compliance	4.2	3.7	9.0	8.6
5	Other	0.5	0.5	2.7	3.2
6	Drainage Operations	52.0	48.4	102.4	97.0
7	Planning and Project Support				

	Function and Sub-Function	A	B	C	D
		2019		2018-2019	
		Budget	Actual	Budget	Actual
8	Planning	10.2	8.1	22.5	17.2
9	Project Support	4.6	8.6	5.3	12.1
10	Planning and Project Support	14.9	16.6	27.7	29.2
11	Billing and Meter Reading				
12	Meter Reading	6.5	6.4	12.5	12.7
13	CUS Charges	0.6	0.7	1.0	2.0
14	Billing and Meter Reading	7.1	7.1	13.5	14.7
15	Drainage Services Administration				
16	Drainage Shared Services	15.9	15.1	28.6	30.1
17	Incentive and Other Compensation	2.1	2.3	4.3	3.6
18	Drainage Services Administration	18.0	17.4	32.9	33.7
19	Corporate Shared Services	16.3	16.9	32.0	33.0
20	Franchise Fees and Property Taxes				
21	Franchise Fees	9.3	9.2	19.5	18.2
22	Property Taxes	1.0	0.8	1.0	1.7
23	Franchise Fees and Property Taxes	10.4	10.0	20.6	19.8
24	**Total Operating Expenses by Function**	**118.7**	**116.5**	**229.1**	**227.5**

Total operating expenses for 2019 were $2.2 million less than budget ($1.6 million less for 2018-2019). Key factors contributing to this difference include:

- **Biosolids** - $2.7 million less than budget ($5.2 million less for 2018-2019). This function includes the storage and management of biosolids generated by the Gold Bar and Alberta Capital Regional wastewater treatment plants. As in 2018, lower than budgeted expenses are primarily attributable to lower than planned activity and lower processed volumes resulting from the composter outage. In addition, in 2019, EWSI capitalized $1.0 million of costs related to storage cell relining.
- **Planning -** $2.1 million less than budget ($5.3 million less for 2018-2019). This function includes infrastructure, system and administration planning. Lower than budget expenses reflect lower than anticipated contractor costs of $1.5 million ($3.2 million for 2018-2019) and capitalization of a higher than anticipated portion of staff costs of $0.6 million ($1.1 million for 2018-2019) in association with capital projects. The 2018-2019 variance also includes savings of $0.9 million related to the transfer of lot grading inspection services back to the City of Edmonton in 2018. The lot grading inspection cost savings were offset with a proportionate decrease in associated revenues.
- **Project Support -** $4.0 million greater than budget ($6.8 million greater for 2018-2019). This function includes surveying and engineering (conceptual, preliminary design or detailed design), project management, in-house construction, and emergency repairs. Higher than budgeted expenses include: $3.4 million of additional salary costs ($7.1 million for 2018-2019) related to design and construction work that had originally been budgeted as capital expenditures; and $0.5 million of higher than anticipated contractor costs ($1.2 million for 2018-2019), primarily related to project management. The 2018-2019 variance also includes $1.5 million of cost recoveries resulting from higher equipment utilization in operations in 2018. This category of costs illustrates the impact of the differences in accounting treatment between the City of Edmonton and EPCOR. Specifically, the PBR budget was prepared using Drainage's capitalization policies which included capitalizing preliminary design costs (i.e. the costs incurred before there was a specific project). The actual results reflect EWSI capitalization policies, where most preliminary design costs are expensed, but also where

additional costs – capital overhead, higher salary burden, major inspections, abandonments, etc., are capitalized.

- **Billing and Meter Reading -** $1.2 million greater than budget for 2018-2019. Although these costs were on budget for 2019, the 2018-2019 variance includes higher than budgeted metering and customer service support costs from EPCOR Energy Services and unbudgeted call centre support costs from the City of Edmonton.

1) **Franchise Fees and Property Taxes -** $0.4 million less than budget ($0.8 million less for 2018-2019). As with Water and Wastewater, lower than forecast franchise fees reflect lower than forecast revenues. This is partially offset by higher property taxes, which were not included in the budget as no accurate cost estimate was available at the time of budget preparation.

Variances in other operating expense functions and sub-functions are not significant, either individually or in aggregate.

4.3.3 Operating Expenses by Cost Category

Table 4.3.3 below shows operating expenses by cost category for Drainage Operations, Planning, Project Support Costs and Drainage Services Administration, where cost categories differ from the sub-functions in Section 4.3.2.

Table 4.3.3
Operating Expenses by Cost Category
($ millions)

		A	B	C	D
	Cost Category	2019		2018-2019	
		Budget	Actual	Budget	Actual
1	Drainage Operations				
2	Staff Costs and Employee Benefits	26.3	25.1	50.0	49.4
3	Contractors and Consultants	21.2	18.6	40.4	36.3
4	Materials and Supplies	0.2	0.2	0.4	0.3
5	Other	4.3	4.5	11.6	11.0
6	Drainage Operations	52.0	48.4	102.4	97.0
7	Planning and Project Support				
8	Contractors and Consultants	9.2	12.3	13.5	19.3
9	Staff Costs and Employee Benefits	6.4	6.2	15.6	13.2
10	Other	(0.7)	(1.8)	(1.3)	(3.2)
11	Planning and Project Support	14.9	16.6	27.7	29.2
12	Drainage Shared Services				
13	Staff Costs and Employee Benefits	11.5	11.9	22.0	21.7
14	Contractors and Consultants	4.7	4.8	9.6	8.5
15	Other	1.8	0.7	1.3	3.5
16	Drainage Shared Services	18.0	17.4	32.9	33.7

The information presented in this table supports the explanations of differences between 2019 actual and budget expenses provided in Section 4.3.2. Accordingly, no additional explanations are considered necessary.

4.3.4 Depreciation and Amortization

Drainage's depreciation expense and amortization of contributed assets for 2019 are shown in Table 4.3.4 below:

Table 4.3.4
Depreciation and Amortization
($ millions)

		A	B	C	D
Depreciation and Amortization		**2019**		**2018-2019**	
		Budget	**Actual**	**Budget**	**Actual**
1	Provision for depreciation	73.4	73.0	137.8	142.5
2	Amortization of contributions	(38.8)	(40.3)	(74.1)	(77.8)
3	**Depreciation, net**	**34.6**	**32.7**	**63.7**	**64.7**

Drainage's net depreciation expense is $1.9 million less than budget ($1.0 million greater for 2018-2019). The difference in 2019 is almost entirely applicable to higher than budgeted contributed assets. The 2018-2019 difference also includes a $1.5 million variance related to changes in depreciation rates in 2018. At the time the 2018 budget was prepared, Drainage had not completely finalized asset componentization and other adjustments needed for its regulated accounting. As a result, during 2018, Drainage found that actual depreciation rates, averaging 1.5%, were slightly higher than the average budget rate of 1.4%, resulting in higher-than-budgeted deprecation expense in 2018. The revised rates are reflected in the budget amounts for 2019 and future years.

4.3.5 Rate Base

Drainage's mid-year rate base, shown in Table 4.3.5 below, is $41.6 million less than forecast, reflecting lower than forecast capital additions in 2019 as discussed in in Section 4.3.1.

Table 4.3.5
Mid-Year Rate Base
($ millions)

		A	B
Mid-Year Rate Base		**2019**	
		Budget	**Actual**
1	Plant in Service		
2	Balance, beginning of year	4,628.6	4,673.1
3	Additions - EPCOR-funded	145.8	145.5
4	Additions - Contributed	138.2	199.6
5	Retirements and adjustments	-	(8.2)
6	Balance, end of year	4,912.7	5,010.1
7	Mid-Year Plant in service	4,770.6	4,841.6
8	Accumulated Depreciation		
9	Balance, beginning of year	(918.1)	(922.9)
10	Depreciation expense	(73.4)	(73.0)
11	Retirements and adjustments	-	8.0
12	Balance, end of year	(991.5)	(987.9)
13	Mid-Year Accumulated Depreciation	(954.8)	(955.4)
14	Other Rate Base Items		
15	Working Capital	14.1	14.8

	Mid-Year Rate Base	A	B
		2019	
		Budget	Actual
16	Materials and Supplies	1.5	1.6
17	Other Rate Base Items	15.6	16.4
18	**Gross Mid-Year Rate Base**	**3,831.4**	**3.902.6**
29	Contributions		
20	Balance, beginning of year	(3,004.7)	(3,089.7)
21	Contributions in aid of construction	(138.2)	(199.6)
22	Balance, end of year	(3,142.8)	(3,289.3)
23	Mid-Year Contributions	(3,073.8)	(3,189.5)
24	Accumulated Amortization		
25	Balance, beginning of year	494.6	496.8
26	Amortization of contributions	38.8	40.3
27	Balance, end of year	533.5	537.0
28	Mid-Year Accumulated Amortization	514.0	516.9
39	**Mid-Year Contributions**	**(2,559.8)**	**(2,672.6)**
30	**Net Mid-Year Rate Base**	**1,271.6**	**1,230.0**

Although the gross rate base is higher than budget, higher than budget contributed (developer-funded) capital additions result in a lower than budget net rate base. The value of contributed assets is difficult to forecast since developers are responsible for construction of distribution infrastructure in new subdivisions and the pace of construction can vary significantly. As well, EWSI receives contribution funding from the Sanitary Servicing Strategy Fund ("SSSF") to support drainage development throughout the City of Edmonton. The amount of SSSF funding also varies significantly in response to the level of developer activity on SSSF-eligible projects.

4.3.6 Return on Rate Base

In 2019, Drainage's total return on rate base is $0.6 million greater than budget ($4.8 million less for 2018-2019). These returns reflect lower returns on the portion of the rate base financed by debt, resulting from both the lower than forecast debt portion of Drainage's capital structure and historically low debt issue costs, and higher than forecast equity returns with operational costs savings, lower depreciation and lower finance costs in 2019 offsetting lower than forecast revenue.

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Table 4.3.6-1
Return on Mid-Year Rate Base
($ millions)

	Return on Rate Base	A	B	C	D
		2019		2018-2019	
		Budget	Actual	Budget	Actual
1	Net Mid-Year Rate Base	1,271.6	1,230.0		
2	Capital Structure				
3	Debt	55.00%	51.36%		
4	Equity	45.00%	48.64%		
5	Total	100.00%	100.00%		
6	Cost Rates				
7	Debt	3.78%	3.38%	3.76%	3.48%
8	Equity	3.98%	4.76%	5.03%	5.07%
9	Weighted Average Cost of Capital (WACC)	3.87%	4.05%	4.35%	4.27%
10	Return on Rate Base				

	Return on Rate Base	A	B	C	D
		2019		2018-2019	
		Budget	Actual	Budget	Actual
11	Debt	26.4	21.3	49.3	41.7
12	Equity	22.8	28.5	56.9	59.7
13	**Total Return on Drainage Rate Base**	**49.2**	**49.8**	**106.2**	**101.4**

Returns on rate base are calculated separately for the debt-financed and equity-financed portions of Drainage's net rate base. The rate of return on debt is equal to the average (embedded) cost of debt for Drainage, as calculated in Table 4.3.6-2 below:

Table 4.3.6-2
Interest Expense and Cost of Debt
($ millions)

	Interest Expense and Cost of Debt	A	B	C	D
		2019		2018-2019	
		Budget	Actual	Budget	Actual
1	Interest expense				
2	Interest on short-term debt	2.8	1.5	3.9	2.2
3	Interest on City of Edmonton debentures	-	-	21.1	18.1
4	Interest on intercompany debentures	18.9	20.2	18.9	21.8
5	Total interest expense	21.7	21.7	43.9	42.2
6	Mid-year debt and other long-term liabilities				
7	Mid-Year Short-term debt	25.2	25.7		
8	Mid-Year Long-term debt	546.8	616.6		
9	Total mid-year debt	572.0	642.3		
10	**Embedded Cost of Debt**	**3.78%**	**3.38%**		

In 2019, Drainage's average cost of debt is 0.4% less than budget, reflecting historically low debt issuance costs in 2018 and 2019. In Q4 2018, Drainage's City of Edmonton debentures were replaced with long-term intercompany notes issued by EPCOR Utilities Inc. Interest rates and terms of the loans are substantially the same as the City of Edmonton debentures that they replaced.

4.3.7 Transactions with Affiliates

Drainage derives a portion of its revenues and expenses from transactions with affiliates, including the City of Edmonton, EPCOR Utilities Inc. and its subsidiaries. Table 4.3.7 provides a summary of Drainage's 2019 and 2018-2019 transactions with affiliates.

Table 4.3.7
Transactions with Affiliates
($ millions)

	Affiliate and Service	A	B	C	D
		2019		2018-2019	
		Budget	Actual	Budget	Actual
1	**Revenues from the provision of services to the City of Edmonton**				
2	Utility Services	3.0	3.4	5.9	6.3
3	Other Revenue	0.9	0.1	1.8	1.6
4	Total	3.9	3.5	7.7	7.9

	Affiliate and Service	A	B	C	D
		2019		2018-2019	
		Budget	Actual	Budget	Actual
5	**Services provided by (recovered from):**				
6	**City of Edmonton**				
7	Franchise Fees	9.3	9.2	19.5	18.2
8	Property Taxes	1.0	0.8	1.0	1.7
9	Interest on City of Edmonton debentures	-	-	21.1	18.1
10	Other services	8.0	7.0	15.8	20.1
11	Total	18.4	17.0	57.5	58.1
12	**EPCOR Utilities Inc**.				
13	Corporate Shared Service Costs	16.3	16.9	32.0	33.0
14	Interest on short-term debt	18.9	20.2	18.9	21.8
15	Interest on intercompany debentures	2.8	1.5	3.9	2.2
16	Total	37.9	38.6	54.8	57.1
17	**Other Affiliates**				
18	EPCOR Energy Alberta LP	4.0	4.1	7.9	8.3
19	EPCOR Distribution and Transmission Inc.	0.9	0.1	1.8	0.9
20	EPCOR Technologies Inc.	-	(0.2)	-	(0.2)
21	EPCOR Commercial Services Inc.	-	0.2	-	0.6
22	Other EWSI Business Units	2.0	1.6	4.0	4.9
23	Total	6.9	5.9	13.7	14.5
24	**Expenditures (Contributions) on capital projects arising from services provided by:**				
25	City of Edmonton	(43.1)	(14.6)	(76.1)	(36.9)
26	EPCOR Technologies Inc.	-	4.5	-	7.3
27	EPCOR Utilities Inc.	2.3	2.3	2.9	2.9
28	EPCOR Energy Services	(2.2)	(2.2)	(5.4)	(5.4)
29	EPCOR Distribution and Transmission Inc.	-	0.3	-	0.4
30	EPCOR Water Services Inc.	0.2	0.2	0.5	0.5
31	Total	(42.9)	(9.5)	(78.2)	(31.2)

4.4 Capital Programs

4.4.1 Capital Expenditures

Drainage's capital program is based on the long term plan for 2018 to 2021 that was used in the independent third party report assessing the transition of the Utility to EPCOR (Grant Thornton report CR_8300). Table 4.4.1 compares forecast to actual capital expenditures for 2019 for each project with approved capital expenditures in excess of $10.0 million over the 2018-2021 term, as well as for each project category. Table 4.4.1 also provides a comparison of total forecast capital expenditures for 2018 to 2021 from the long term plan to EWSI's current capital projection.

Table 4.5.1
Capital Expenditures
($ millions)

		A	B	C	D	E	F	G	H	I	
	Capital Project or Program	2019			2018-2019			2018 - 2021			
		Annual Budget	Actual	Difference	Annual Budget	Actual	Difference	LTP	Current Projection	Difference	
1	Drainage Neighbourhood Renewal	29.8	24.6	(5.1)	44.8	50.6	5.8	175.8	115.9	(59.9)	1
2	Drainage System Expansion	12.7	24.2	11.5	27.0	43.3	21.5	84.2	90.6	6.4	2
3	Drainage System Rehabilitation										
4	151S/99A SanTrunk OP-001940-01	0.3	0.7	0.4	0.3	1.1	0.8	-	25.4	25.4	
5	Groat Rd Trunk S OP-001639-01	14.4	15.8	1.4	29.3	21.3	(8.0)	-	33.6	33.6	
6	NewBuenaVista PS OP-002062-01	3.9	0.5	3.5	4.2	0.9	(3.3)		10.0	10.0	
7	Projects under $15 million	68.3	53.8	(14.4)	104.2	91.0	(13.2)	119.2	201.3	82.1	
8	Drainage System Rehabilitation	86.8	70.7	(16.1)	138.0	114.2	(23.8)	119.2	270.4	151.2	3
9	Environmental Quality Enhance										
10	Clover Bar Cell 1-4	6.0	1.5	(4.5)	6.3	1.5	(4.8)	-	18.1	18.1	
11	Kinnard OSS	0.0	0.2	0.2	0.0	0.2	0.2		10.9	10.9	
11	Projects under $15 million	4.9	3.4	(1.6)	21.0	9.9	(11.1)	100.8	30.0	(70.8)	
12	Environmental Quality Enhance	10.9	5.1	(5.9)	27.3	11.7	(15.6)	100.8	48.1	(52.7)	4
13	Flood Mitigation										
13	Tweddle Place OP-001334-01	6.5	4.1	(2.4)	13.7	9.1	(4.6)	-	17.1	17.1	
14	Malcolm Twed & Ed OP-001695-01	5.6	1.8	(3.8)	12.0	1.8	(10.3)	-	10.5	10.4	
15	Projects under $15 million	19.5	8.2	(11.3)	31.6	16.4	(15.2)	247.5	59.9	(187.6)	
16	Flood Mitigation	31.6	14.0	(17.5)	57.4	27.2	(30.1)	247.5	87.4	(160.1)	5
17	SSSF Projects										
18	SESS SW4 OP-001336-01	7.0	3.5	(3.6)	17.6	12.2	(5.5)	-	22.3	22.3	
19	NEST NC2 & NC3 OP-001795-01	13.0	9.0	(4.0)	21.4	17.8	(3.6)	-	35.6	35.6	
20	SESS SA10A CP-002993-01	12.6	8.8	(3.9)	20.3	13.2	(7.1)	-	35.7	35.7	
21	Projects under $15 million	1.6	0.8	(0.8)	3.1	2.3	(0.8)	137.8	10.7	(127.1)	
22	SSSF Projects	34.3	22.1	(12.3)	62.4	45.4	(17.0)	137.8	104.3	(33.5)	6
23	Real Estate	-	-	-	-	-	-	-	37.3	37.3	7
24	NRA-LRT										
25	West Valley LRT	0.7	5.3	4.6	0.7	5.8	4.6	-	42.5	42.5	
23	Metro LRT	-	0.1	0.1	-	0.1	0.1	-	8.7	8.7	
27	NRA-LRT Projects	0.7	5.4	4.7	0.7	5.9	4.7	-	51.2	51.2	8
28	NRA-CORe	-	1.2	1.2	-	1.2	1.2	-	31.8	31.8	8
29	**Total Capital Expenditures**	**206.8**	**167.3**	**(39.4)**	**357.5**	**299.6**	**(52.7)**	**865.3**	**836.8**	**(28.5)**	
30	**Contributions**										
31	**Drainage System Expansion**	**(4.8)**	**(4.8)**	**0.0**	**(4.8)**	**(12.4)**	**(7.5)**	**(60.1)**	**(23.1)**	**37.0**	2
32	**Flood Mitigation**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**(4.7)**	**(4.7)**	5

	Capital Project or Program	A	B	C	D	E	F	G	H	I	
		2019			2018-2019			2018 - 2021			
		Annual Budget	Actual	Difference	Annual Budget	Actual	Difference	LTP	Current Projection	Difference	
33	SSSF Projects										
34	SESS SW4 OP-001336-01	(7.0)	(3.5)	3.6	(17.6)	(12.2)	5.5	-	(22.3)	(22.3)	
35	NEST NC2 & NC3 OP-001795-01	(13.0)	(9.1)	3.9	(21.4)	(17.9)	3.5	-	(35.6)	(35.6)	
36	SESS SA10A CP-002993-01	(12.6)	(8.8)	3.8	(20.3)	(13.2)	7.1	-	(35.7)	(35.7)	
37	Projects under $15 million	(0.1)	0.7	0.9	(1.6)	1.8	3.4	(137.8)	(3.9)	133.9	
38	**SSSF Projects**	**(32.8)**	**(20.6)**	**12.2**	**(60.9)**	**(41.4)**	**19.5**	**(137.8)**	**(97.5)**	**40.3**	**6**
39	**Total Contributions**	**(37.7)**	**(25.4)**	**12.2**	**(65.8)**	**(53.8)**	**12.0**	**(197.9)**	**(125.2)**	**72.7**	
40	**Capital Expenditures, net**	**169.1**	**141.9**	**(27.2)**	**291.7**	**245.8**	**(46.0)**	**667.4**	**711.6**	**44.2**	

The impact of the unusually wet weather in 2019 led to significant delays to capital project execution which led to the deferral of certain projects from 2019 to 2020. In addition to the weather impact, during 2019, Drainage continued to refine and reprioritize its overall 2018 – 2021 capital expenditures program, which now encompass the approved NRA capital spending for LRT and CORe. The current projections for 2020 also include an initial estimate for potential delays and reduction in scope on annual programs following the global outbreak of COVID-19. As changes to processes and project management have become established Drainage has increased its overall capital expenditures year over year by 36% from $103.8 million in 2018 to $141.9 million at the end of 2019 (net of contributions).

Explanations for significant differences between forecast and actual in capital spending in 2019, as well as differences between Drainage's long term plan ("LTP") and its current projections for 2018 to 2021 are as follows:

1) **Drainage Neighbourhood Renewal** – 2019 – $5.1 million less than budget, 2018-2021 - $59.9 million less than LTP. This category includes the costs of neighbourhood drainage asset renewals and is aligned with the timing of the City of Edmonton's Building Great Neighbourhoods program. Therefore, project timing is largely driven by the City of Edmonton's neighbourhood renewal schedules. Accordingly, lower than budget spending in 2019 results from advancement of projects from 2019 to 2018 to align with City of Edmonton neighbourhood renewal schedules and lower than LTP projections are primarily attributable to the timing of capital expenditures, as a number of neighbourhood renewal projects have been deferred to 2022 and later years, partly due to a conservative reflection of the impact of COVID-19. Favourable pricing on open cut and relining contracts also contributes to lower than LTP projected expenditures.
2) **Drainage System Expansion** – 2019 - $11.5 million greater than budget, 2018-2021- $43.4 million greater than long-term plan (net of contributions). Increases in 2019 actual and 2018-2021 projected expenditures in this partially-contributed program are attributable to higher levels of service connections and developer driven inspections. The level of developer contributions to service connection projects has also fallen as fees to developers have not kept pace with cost increases. Additional scope increases on Imagine Jasper and 105 Avenue Streetscape projects to reduce the SIRP rankings have also contributed to the variance compared to the original LTP target. Drainage's current projection for 2018-2021, while greater than the LTP, will continue to be refined and revised in response to COVID-19 impacts on new developments and system expansion.
3) **Drainage System Rehabilitation.** This category includes system replacements, rehabilitation and renewal projects required to mitigate the risk of failure and maintain service levels.
    a) **151S/99A Sanitary Trunk** – projected cost $25.4 million, $0.4 million greater than budget in 2019 as contractor delays in 2018 were caught up in 2019.
    b) **Groat Road Storm Trunk Rehabilitation** – projected cost $33.6 million. $1.4 million greater than budget in 2019. Contractor delays in 2018 were caught up in 2019, combined with earlier than anticipated receipt of pipe and completion of two shafts ahead of schedule.
    c) **New Buena Vista Pump Station** – projected cost $10.0 million, $3.5 million lower than budget in 2019 due to delays in land acquisition.
    d) **Projects < $15 Million** – 2019 - $14.4 million less than budget, 2018-2021 - $82.1M greater than LTP. Major project delays include Clareview Sanitary Trunk ($1.0 million) due to access

restrictions and deferral of relining pending completion of emergency work, Gold Bar Utilidor ($3.0 million) delays due to weather impacting ability to divert flows to ACRWC and needs completion of Clareview project to progress, and Trunk Sewer Rehab ($3.0 million) due to procurement delays have contributed to underspending in 2019. Even so, Drainage's projected expenditures over the 2018-2021 period will exceed the LTP by $92.0 million in order to address significant rehabilitation needs identified by asset condition assessments.

4) **Environmental Quality Enhancement.** This category includes capital expenditures that mitigate the impacts of the drainage system on the environment, including sewer overflows, river loading, and reuse of biosolids.

   a) **Clover Bar Cell 1-4** – 2019 - $4.5 million less than budget, 2018-2021 projected cost $18.1 million. Lower than budget expenditures in 2019 reflect a reduction in the scope of this project to focus on Cell 3E with 2019 activities focussed on site preparation and main relining activities now scheduled for 2020. The remaining cells will be completed by Wastewater within their next PBR application.

   b) **Kinnaird Sewer Separation** – 2019 - $0.2 million greater than budget, 2018 – 2021 projected cost $10.9 million. The increased cost in 2018 – 2021 which now estimate this project over $10 million in the 2018-2021 period reflects a change in scope to microtunnelling along with an increase in costs following bid tendering. This project also supports flood mitigation.

   c) **Project< $15 million** – 2019 - $1.6 million less than budget, 2018-2021 - $70.8 million less than LTP. Projected expenditures in this category have been reduced significantly due to the cancellation of the Mill Creek End of Pipe Facility project and the Steinauer-Duggan Odour projects.

5) **Flood Mitigation.** This category includes development of drainage infrastructure and program improvements to decrease flood risks, including capital expenditures on projects related to the Stormwater Integrated Resource Plan describe in Section 1.5. Major projects in this category include:

   a) **Tweddle Place Sewer Separations** - 2019 – $2.4 million less than budget as weather delays have resulted in deferral of construction until 2020. 2018-2021 projected costs of this multi-year project remain at $17.1 million.

   b) **Malcolm Tweddle Dry Pond** – 2019 - $3.9 million less than budget as delays in finalizing land agreement combined with heavy rainfall have led to deferral of construction. 2018-2021 projected cost of this multi year project remain $10.4 million before contributions.

   c) **Projects < $15 million** – 2019 - $11.3 million less than budget, 2018-2021 - $187.6 million less than original LTP. The updated 2018 – 2021 forecast includes grant recoveries of $8 million received to date from the ACRP and NBCF grants and a projected further $19 million from the new Disaster Mitigation and Adaptation Fund. Lower than budgeted expenditures result from different causes, including: cancelled projects ($6 million); Steinhauer-Ermineksin construction delays ($3 million); delays in receiving designs from consultants for Aldergrove ($2 million); re-evaluation of Hurstwood under SIRP criteria as a wet pond ($2m); and delays in obtaining land agreement for Parkallen ($1 million). Drainage has consolidated management of flood mitigation projects under SIRP and, while the continuing projected underspend is consistent with 2018 reporting, the post-2021 expenditures have been aligned to meet the commitments given in the SIRP projections in the non-routine adjustment approved in 2019.

d) **Contributions** in this category, projected to be $5.2 million over the 2018-2021 period, represent provincial and federal grant funding in respect of flood mitigation projects, primarily ($4.8 million) in respect of the Malcolm Tweddle project.

6) **Sanitary Servicing Strategy Fund (SSSF) Projects.** The SSSF finances major sanitary trunk construction to service new development areas. Drainage works with the SSSF Management Committee to coordinate design, construction, schedules and budgets for various projects. While significantly less than the LTP, Drainage's current projected expenditures align with the SSSF Management Committee's five year construction plan (2018-2022) to support orderly, cost effective development based on population and employment projections, as well input from the development industry. Major projects in this category include:

   a) **SESS SW4 OP-001336-01** – 2019 - $3.6 million less than budget due to delays pending approval of the fiberglass liner by the Board and SSSF oversight committee. Total projected costs of $22.3 million over the 2018-2021 period will be fully funded through the SSSF.

   b) **NEST NC2 & NC3 OP-001795-01** – 2019 - $4.0 less than budget because of flooding caused by the wet weather which prevented tunnelling over the summer combined with lost time due to surveys needed to confirm the tunnel alignment. Total projected costs of $35.6 million over the 2018-2021 period will be fully funded through the SSSF.

   c) **SESS SA10A CP-002993-01** - 2019 - $3.9 million less than budget due to weather delays and a review of safety procedures and switch to contractors due to the switch in use to an earth pressure tunnel boring machine due to the site conditions. Total projected costs of $35.7 million will be fully funded through the SSSF.

   d) **Projects < $15 Million** – 2019 - $0.8 million less than budget. Total projected expenditures of $10.7 million over the 2018-2021 period will be funded through SSSF contributions of $3.9 million, with the $6.8 million difference attributable to SSSF Management fees not originally included in 2018 budget

7) **Real Estate** – $37.3 million (new project). Following the transfer of Drainage to EPCOR, an EPCOR-wide real estate review was undertaken to identify and evaluate alternatives for consolidating the many physical locations occupied by Water and Drainage and to identify the alternative which would maximize the contribution to the cost reduction and efficiency commitments made as part for the Drainage transfer. The projected expenditures for this project are supported by a comprehensive business case prepared prior to the COVID 19. Accordingly, the business case and costs of this project will be refined and adjusted as further information becomes available and key decisions are made.

8) **NRAs.** As discussed in section 1.5, Drainage has received approval for three non-routine adjustments to rates: SIRP, which is considered part of the Flood Mitigation category explained above; LRT relocations; and Corrosion and Odour Reduction (CORe). Projected capital expenditures for these programs represent EWSI's current estimates of capital required in the 2018-2021 PBR term. Additional spending requirements will be included in the future PBR applications.

   a) **LRT** – 2019 - $4.6 million greater than budget due to advancement of work required by the City of Edmonton on Priority Areas 1 and 2, originally planned for 2020. Total projected capital expenditures on LRT projects over the 2018-2021 period amount to $51.2 million, compared to

$53.8 million in the NRA application, primarily because of the deferral of construction on the West Valley Line LRT into 2022 and future years.

b) **CORe** – $1.2 million greater than budget due to advancement of work on the Accelerated Access Manhole project. Total projected capital expenditures over the 2018-2021 period are $31.8 million.

4.4.2 Construction Work in Progress

Drainage's rate base consists of plant in service. If a capital project is not completed (i.e. not placed into service) in the year, the capital expenditures on that project remain in Construction Work in Progress and are excluded from the rate base.

Table 4.4.2
Construction Work in Progress
($ millions)

		A	B
Construction Work in Progress		**2019**	
		Budget	**Actual**
1	Balance, beginning of period	30.9	52.2
2	Capital Expenditures	169.1	141.9
3	Cancelled costs/Write-offs	-	(1.3)
4	Capital Additions	(145.8)	(145.9)
5	**Balance, end of period**	**54.2**	**46.9**

The PBR allows Drainage to capitalize the costs of financing certain projects remaining in Construction Work in Progress, using an allowance for funds utilized during construction ("AFUDC"). In 2019, AFUDC included in capital expenditures on eligible projects amounted to $3.9 million.

4.5 Operational Performance

4.5.1 Water Quality and Environmental Index

One of EPCOR's core commitments is to prevent pollution and reduce its environmental impacts. Drainage Services' collection system approvals from Alberta Environment and Parks include regulatory requirements to develop and implement strategies to reduce the impact of the drainage systems on the North Saskatchewan River. The Edmonton Watershed Contaminant Reduction Index and the Total Suspended Solids Total Loading are two metrics used to quantify discharges to the North Saskatchewan River and assess the environmental performance of Drainage strategies.

	Index Metric	Measure	Target	Actual
1	Edmonton Watershed Contaminant Reduction Index Score	Index score that measures contaminants released to the North Saskatchewan River from the City of Edmonton.	> 6.9	7.6
2	Total Loading – Total Suspended Solids	Total suspended solids loading (kg/d) contributed to the North Saskatchewan River from the storm sewer system, combined sewer system, and Gold Bar Wastewater Treatment Plant.	< 50,000	46,900

2019 Highlights:

- Although Edmonton experienced above average rainfall in 2019, implementation of Combined Sewer Overflow controls helped to ensure that total loadings remained relatively constant, enabling Drainage to exceed performance standards for both Water Quality and Environmental Index metrics.

4.5.2 Customer Service Index

The Customer Service Index is a composite measure of the customers' perception of satisfaction with EWSI service, the speed of response and quality service level to customer issues.

Index Metric		Measure	Target	Actual
1	Emergencies Responded to Within Two hours	The efficiency in responding to customer reports or complaints that require an emergency response. The emergency repair crew is given 2 hours to respond and be on site from the time the report is received.	> 87.0%	94.81%
2	Number of Blocked Mainline Sewers	The number of blockages in the mainline per 100km of pipe.	< 2.2	2.37
3	Mature Neighbourhoods at 1:100 Service Level	The percentage of neighbourhoods that are protected against a 100 year storm flood out of the 157 identified at-risk mature neighbourhoods.	> 16.0%	17.7%
4	Odour Complaints	The number of odour complaint received from customers.	Reduction from Previous Year	519

2019 Highlights:

- The percent of mature neighbourhoods at 1:100 service level metric is 1.7% above target. This is an improvement from 2018 where the results were 1.0% below target.
- The number of odour complaints received from customer has decreased by 204 compared to last year. 723 complaints were received in 2018 compared to 519 in 2019.

4.5.3 Reliability and Optimization Index

The System Reliability Index is a measure of the confidence that customer can place in the reliability of the drainage sanitary and stormwater systems.

Index Metric		Measure	Target	Actual
1	Pipe Capacity Rating - Sanitary	The percentage of linear infrastructure assessed as having a hydraulic condition rating of 2 (or B) or better. Measured	96.0%	96.0%
2	Pipe Capacity Rating -		50.0%	50.0%

	Storm	separately for sanitary, storm, and combined sewer infrastructure. Measures the number of blockages in the mainline per 100km of pipe.		
3	Pipe Capacity Rating – Combined Sewer Overflow		80.0%	80.0%
4	Infrastructure at or Above the Minimum Level of Condition Rating	The percentage of all infrastructure (including non-linear) assessed at or above the minimum level of condition rating.	90.0%	90.6%
5	Capital (as rehabilitation) Re-invested Compared to Total System Replacement	The percentage of investment dollars spent on renewal/rehabilitation work on aging drainage infrastructure compared to the total system replacement value.	0.81%	0.53%

2019 Highlights:

- Although the percentage of capital reinvested compared to the total system replacement value is 0.28% below target, 2019 results only account for the rehabilitation of existing infrastructure and do not include system upgrades. A more representative performance measure for network reliability has been identified for 2020.

4.5.4 Safety Index

The Safety Index is a measure of the success of programs and the application of policies that maximizes the safety of employees and the public.

Index Metric		Measure	Target	Actual
1	Employee Engagement (survey every 2 years)	The level of employee engagement within Drainage Services as a percentage.	N/A	N/A
	Employee Turnover (excluding retirements)	The percentage of employees leaving Drainage Services compared to the overall headcount. This excludes retirements. This includes voluntary, involuntary departures, and transfers to other business areas.	6.0%	6.7%
3	Lost Time Frequency Factor	The number of lost time hours resulting from a workplace injury related to the total number of hours worked (200,000 hr) in a specific time period.	0.50	0.33

2019 Highlights:

- There are no results for the Employee Engagement survey because it is conducted every 2 years. It was last conducted in 2018.

- The Lost Time Frequency Factor is better than target at 0.33. Improvements in hazard assessments, reporting of near misses and hazardous condition, worksite inspections, improved implementation of corrective actions and training all contributed to continued improvements in this metric.

4.6 Rates and Bill Comparisons

Unlike most cities, where wastewater treatment services and drainage services are combined, EWSI currently has separate bills for wastewater treatment services and for drainage services. Accordingly, in order to provide a better basis for comparison with other cities and communities, bill comparisons in Section 3.6 utilize EWSI's blended wastewater and drainage bills.

5 2019 Annual Operating Plans

5.1 Water Services and Wastewater Treatment Services

Water Services presented the 2019 Annual Operational plan to Utility Committee on February 1, 2019. The purpose of that document was to provide Edmonton City Council, Utility Committee and stakeholders a high level perspective of the major activities and initiatives that Water Services was undertaking to meet its overarching goal of providing customers with safe and reliable water and wastewater treatment services while meeting or exceeding all environmental requirements, delivering value and achieving a fair return. The initiatives planned for 2019 are organized within seven strategic focus areas:

- Customer Service
- Public Health and the Environment
- Employee and Public Safety
- Employee Development
- Operational Performance
- Growth
- Financial Performance

This PBR Progress Report provides an update on the 2019 Operational Plan. All initiatives have been described as either: 1) Completed, indicating that the activities are finished and the initiative is closed, 2) In-progress, indicating that work continues and the initiatives has been continued in the 2020 Operational Plan (as many initiatives are multi–year), or 3) On-going, indicating that the initiatives will never be formally completed as business requirements continue to change (e.g. operational improvement).

INITIATIVE	Year End Status
Customer Service	
Improve Customer Service in Edmonton Water – This initiative will create a customer service culture with focus on quality reviews and coaching and improve customer interactions handled by phone, in person and online.	**Ongoing** - In 2019, Water Services worked with the Drainage and Power to streamline processes through implementation of an improved call answering process where simpler calls are handled by a centralized team trained to handle power, water and drainage calls; a new phone system with an updated menu allowing for improved up front customer messaging and functionality and moving emergency calls to a single point of contact.
Improve Development Processes and Coordination with City of Edmonton and UDI/IDEA – Water Services will focus on better coordination with City Roadways, LRT, Development and Planning group for greenfield	**On-Going** - Initiatives to improve coordination with CoE have commenced and will continue to be optimized. Examples include Roadways, LRT planning and infill development. New requirements will evolve as both organization

INITIATIVE	Year End Status
and infill development work as well as local industry associations (UDI, IDEA).	introduce new processes. EWSI worked with the City and IDEA to develop the Infill Cost Sharing Program which is currently being piloted for 2020/2021 to support targeted infill development in Edmonton. Water Services is working with UDI to develop a principles based approach to sharing of utility infrastructure costs to mitigate rate increases, support growth and align to City growth objectives.
Improve Operational Coordination with the Regional Water Customer Group (RWCG) - This initiative will improve communication, planning and coordination of operational activities and unplanned events to ensure an effective and coordinated response to planned or unplanned events.	Ongoing - A secure FTP site has been set up where information such as reservoir levels, pressure data and other important operational information can be easily shared between parties, which will improve Water Services' ability to service the regional customers while providing more up to date information of the status of both systems. Continued coordination with the RWCG provides opportunities to plan work, manage emergent work, and realize cost efficiencies for both parties.
Develop and Implement a Gold Bar Stakeholder Consultation Plan – Water Services will provide the public with balanced and objective information to assist with understanding the problem, alternatives, opportunities and/or solutions and to solicit feedback on Gold Bar's long-term requirements at its site in the river valley.	Complete - The Gold Bar Stakeholder consultation plan was developed and executed through 2019 and provides the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions. Shared outcomes and design principles were developed in collaboration with stakeholders that will drive and inform activities at the site. Going forward, the stakeholder engagement program will build upon the success of the work done in 2019.
Public Health and the Environment	
Develop Climate Change Adaptation – River Flooding Resiliency Plan – Climate Change Strategy identified flooding as the highest risk. Conduct flood hazard analysis and develop a flood mitigation plan for Gold Bar and implement flood mitigation measures at the water treatment plants.	**In progress** – A comprehensive climate change strategy has been completed. The strategy is now being operationalized through a number of initiatives and capital plans for the facilities. Plans are currently being developed to mitigate flood risks at the plants. Grant funding has been awarded to offset a portion of the associated costs.
Develop Drinking Water Emergency Plan (Troubled Waters) - Water Services will finalize	**Ongoing –** EWSI finalized the BCP in 2019. In 2020, focus on sharing results with regional

INITIATIVE	Year End Status
plans for addressing drinking water emergencies and have in place a clear framework and a documented Business Continuity Plan (BCP) that addresses water supply or water quality emergencies.	customers. Completing Five year-plan of annual table top exercises to test the BCP.
Develop Enhanced Lead Management Program – Water Services will develop a proactive means of reducing public health risks to customers from lead and to ensure compliance with the new guidelines for lead in drinking water.	**In-progress** – Lead Mitigation Strategy developed and presented to Utility Committee March 22, 2019 and non-routine adjustment for this program approved by Council. Completing design of orthophosphate dosing systems at the WTPs followed by construction in 2020. Implementing targeted lead service line replacement program.
Move to Adopt ISO 14001 Across All Water Services Sites - Environmental Management Systems (EMS) are required at facilities and treatment systems across Water Services. Those facilities/systems with an Environmental Management Systems built to meet the old standard are required to transition and conform to the new ISO 14001:2015.	**Complete** – all Water Service facilities operate under a common Environmental Management system.
Complete E.L. Smith Solar Project and Smart Grid System - The E.L. Smith Solar Project is planned as a 12 MW solar farm that will provide renewable energy for water treatment plant operations. In conjunction, EWSI has received federal grant funding to build a Smart Grid System including a 4 MW battery energy storage system and micro-grid controls.	**Ongoing** - This project is in the final stages of approval after considerable public and stakeholder consultations. AUC approval was received in 2019 and the project is expected to receive final City approval for rezoning in fall 2020. Construction will commence in 2021 with an expected 2022 in-service date.
Execute Green Energy Purchase Agreement – In addition to the E.L. Smith Solar Project, another key component of Water Services' strategy to reduce its environmental footprint is to explore a competitive procurement for new renewable power from other Alberta sources for the remainder of the grid sourced electricity currently used by water operations.	**Ongoing** - A Request for Proposals (RFP) was issued in 2019 to solicit interest from renewable generation suppliers. Renewable Energy Systems Canada was selected as the successful proponent and will develop, design and construct the Hilda wind farm in south-eastern Alberta, which is expected to be operational by December 31, 2022. Water Services will acquire Renewable Energy Certificates for 20 years at a fixed price under the agreement.

INITIATIVE	Year End Status
Develop a Renewable Natural Gas Project at Gold Bar - The Gold Bar wastewater plant produces biogas as a by-product of the treatment process, which is currently used to heat the facility and any excess is flared. To lessen the environmental impact of this process, Water Services is investigating development of a cogeneration facility that would burn the biogas and produce electricity as well as heating.	**Ongoing -** The project has progressed to the conceptual design phase and would require public consultation as part of the development process if it were to proceed.
Develop a Proactive Residuals Strategy – Develop a strategy for the continued reduction of residuals loading to the North Saskatchewan River and elimination of chlorinated discharges to the river. This strategy will revisit options for the potential diversion of water treatment plants residuals to sanitary sewer, landfill or other solids disposal and will explore opportunities to further reduce solids loading to the river and expanding water plants residual solids management to other seasons. EWSI will study the net environmental benefit of various options.	**In-progress** – A consultant has prepared first draft of a triple bottom line (social, environmental and financial) study. This study will be completed in 2020 and used to develop EWSI's residuals strategy.
Employee and Public Safety	
Develop and Implement Company-wide Standard Operating Procedures for all High Hazard Activities –develop and implement company wide operating procedures for all high Hazard activities to effectively increase layers of protection for people and assets. This includes procedures for fall protection, hazardous energy isolation, confined space and lifting devices.	**On-going** – the initial development has focused on fall protection, hazardous energy isolation, confined space and lifting devices. This initiative is being developed in conjunction with the competency program as described below. Additional modules will be develop over time.
Move to Adopt ISO 45000 Across all Water Services Sites - Water Services has implemented and obtained registration to the OHSAS 18001 safety management system and is progressing to convert to the updated ISO 45001 safety management system to support continued safety performance improvement.	**On-going** – For its core Edmonton operations, Water Services has implemented and obtained registration to the OHSAS 18001 safety management system and is progressing to convert to the updated ISO 45001 safety management system to support continued safety performance improvement.
Review Effectiveness of Safe Work Planning Across All Water Services Sites – Safe work planning includes implementing a field level hazard assessment that effectively identifies	**On-going** - EWSI continues to develop and implement company wide assessments for six of the lifesaving rules and chemicals to effectively review existing procedures to ensure

INITIATIVE	Year End Status
hazards and implements controls to prevent potential injury to employees, contractors and the public. Water Services will review safe work planning for all locations to strengthen hazard assessment and reinforce safety integration into routine and non-routine tasks.	conformance to the EPCOR Standards and provincial legislative requirements
Employee Development	
Develop and Implement Company-Wide Competency Based Training for All High Hazard Activities – Competency training will include fall protection, hazardous energy isolation, confined space and lifting devices.	**On-going** – initial work has commenced on the identified modules. This approach will establish early learnings that will inform the subsequent development of additional modules over time.
Develop and Implement a Company-Wide Employee Rotation Program – To ensure a strong pool of talent now and into the future, this program will identify suitable candidates for job-to-job or project-to-project opportunities and support all aspects of the transition.	**On-going** - In 2019, all managers have completed the Professional Growth Initiative assessment and have development plans in place.
Improve Employee Engagement and Build a Respectful, Inclusive, Collaborative, Safe and Healthy Work Culture – Water Services will deliver a bi-annual engagement survey and interpret the results and implement action plans to address top drivers and opportunities for engagement. We will pursue a variety of activities through the Diversity Council including increasing awareness of diversity and inclusion at EPCOR, incorporating diversity into hiring practices, supporting employee resource groups and working with *Careers: The Next Generation* to provide work opportunities for indigenous youth.	**On-going** - In 2018 a Diversity Council was formed and in 2019, the Council, in concert with leaders across our Business Units, pursued a variety of activities and initiatives to drive this focus such as increasing awareness of diversity and inclusion at EPCOR and supporting employee resource groups.
Operational Performance	
Develop a Process Improvement Program to Support Productivity Increases - This initiative will develop standardized processes or continuous improvement programs to support productivity increases and service quality improvements. The program will encompass methods, techniques and tools and be used to design, control and analyze both business and	**On-going** – a team with six sigma credentials has been formed with the intent of that group both conducting process improvement projects themselves as well as developing educational materials to foster a process improvement orientation across the organization. Several process improvement projects have been identified and are under development. An

INITIATIVE	Year End Status
operational processes. It is critical that any approach chosen involves the people aspect of the process and integrates processes and systems.	educational program is in the final stages of development.
Develop a Standardized Approach to Asset Management Across Water Services by Confirming to ISO 55000 – The Asset Management Framework will be expanded and adapted to allow greater consistency in how it is applied across business units of Water Services by aligning with the international standard for asset management ISO 55000.	**On-going** - The Asset Management Methods Office has expanded and adapted the current Asset Management Framework to allow greater consistency in how it is applied across various Business Units of Water Services by aligning with the international standard for asset management, ISO 55000 including creation of a Strategic Asset Management Plan that outlines how Asset Management is to be approached across the business.
Develop Standardized Project Management Office/Capital Project Management Tools – This initiative will standardized the way project managers plan, execute and monitor their projects and programs. It involves creation of a project management methodology along with several processes, tools and templates.	**On-going** – a cross organizational team has been formed to review project management processes across all business units of EPCOR. The group has identified common process and re-developed many of the supporting documents. More detailed process modelling is currently underway as part of the introduction of the process into the respective business units.
Develop and Implement Strategies for Realizing Synergies between Water and Drainage – EPCOR has committed to a minimum of 1% annual operational efficiency savings for 2018-2022 and capital cost efficiencies of 10% by 2022 for Drainage Services. The initial focus of this initiative has been on integrating Drainage into EPCOR processes. Recent activities have focused on cross functional teams meeting to identify and prioritize efficiency opportunities in the areas of planning, capital and operations.	**On-going** - several short term opportunities for synergies have been identified and implemented. Detailed analysis has been completed to address larger opportunities to move towards a more consolidated approach across water and drainage. The central drivers to maximizing these opportunities may include real estate strategies and development common information systems platforms. These initiatives are in development and will be rolled–out over the next 2-3 years
Optimize Meter Reading Function – Water Services will seek to optimize the meter reading function through an analysis of current routing as well as the implementation of meter reading technologies to determine if they are viable from a cost benefit perspective. Analysis of the costs	**On-going** – Water Services is in the process of completing an analysis of the costs and benefits of introducing AMR and AMI technology and will incorporate the results of this analysis into its upcoming PBR plan.

INITIATIVE	Year End Status
and benefits of introducing Automatic Meter Reading (AMR) and Advanced Metering Infrastructure (AMI) technology will be completed.	
Growth	
Develop and Maintain Master Plans / IRP's for All Sites – Each operational area of Water Services will develop/re-develop long-term plans of utility infrastructure to identify growth and operational service requirements along with review of technology and treatment processes: - Rossdale and E.L. Smith WTPs - Water Distribution and Transmission - Gold Bar	**On-going** –The Gold Bar IRP was presented to Utility Committee in 2019. The Water IRP will be presented to Utility Committee in 2020.
Develop Transfer Plan for Annexation Areas in South Edmonton – The proposed annexation areas south of the City will result in a substantial increase of the geographic area served by Water Services. The transfer of these areas include acquisition of a water pipeline and booster station from the southwest water Service commission and reservoir and related infrastructure in the county of Leduc and Discovery Park.	**Complete** – The acquisitions have been completed and transfer of the infrastructure is in progress. The City approved EWSI's non-routine adjustment for Annexation in late 2019.
Financial Performance	
Prepare for the 2022-2026 Edmonton PBR – The strategy will be developed to align Drainage under the same PBR Framework as Water and Gold Bar. EPCOR is proposing to renew the Water PBR rates for another five year term for the period 2022-2026. To stagger the future renewal periods, EPCOR will file the Gold Bar and Drainage PBR applications for a three-year term 2022-2024.	**On-going** – work is currently underway to determine the capital and operational plans underlying the PBR Applications, conduct stakeholder consultations and cost of service and rate design analysis. EPCOR aims to file the Applications with the City in early 2021 in order to complete the PBR hearing in advance of the 2021 municipal elections.

5.2 Drainage Services

Drainage Services also presented a 2019 Annual Operational plan to Utility Committee on February 1, 2019. The purpose of that document was the same as Water Services. The drainage initiatives planned for 2019 were organized within six strategic focus areas:

1. Safety
2. Environment
3. People
4. Operational Excellence
5. Customer and Stakeholder
6. Shareholder Value

This PBR Progress Report provides an update on the 2019 Operational Plan. All initiatives have been described as either: 1) Completed, indicating that the activities are finished and the initiative is closed, 2) In-progress, indicating that work continues and the initiatives has been continued in the 2020 Operational Plan (as many initiatives are multi–year), or 3) On-going, indicating that the initiatives will never be formally completed as business requirements continue to change (e.g. operational improvement).

Initiatives and Objectives	Year End Status
Safety	
Create a supportive culture where safety is our first priority and everyone has a voice.	
Reduce Tolerance towards safety related risks - Develop customized safe work plans for each unique work area. These will be in place for all groups by the end of 2019 Implement a new Contractor Management Program, including a framework and guidelines for managing prime contractor accountabilities	• **On-going** • Paper based customized safe work plans have been developed for each unique work area. Work is underway to integrate these into a Safe Work Plan App for use in the field. • The Contractor Management Program, including guidelines for managing prime contractor accountabilities and serious incident response plans, was reviewed and updated and rolled out to project managers.
Cultivate a culture of Safety Leadership – Ensure that incidents are reported accurately within our Event Reporting System (ERS), investigations are completed in a timely manner, and learnings are shared with all employees	• **On-going** • Several initiatives were completed to develop a strong safety culture including training, revision of process, near miss and other reporting metrics as well as programs to increase general awareness among staff. These programs will continue to ensure the safety culture continues to build. • For the year, 93% of recordable injuries and significant near misses were reported within 24 hours versus the target of 90%.
Encourage ownership of safety at all levels – This initiative includes: focus on hazard recognition and near miss reporting; training of all people leaders to lead an incident	• **On-going**

Initiatives and Objectives	Year End Status
investigation; developing an observation program to identify workplace hazards and recommend controls; rolling out driver report cards based on telematics; implementing workplace inspections across Drainage Services.	• Training of people leaders to lead incident investigations is underway and will continue into 2020. • The installation of fleet telematics was completed in December 2019. Monthly driver report cards are being produced and reviewed with staff. • Targets for workplace observations and inspections by managers and foremen were developed and are included in the 2020 work plan.
Train Staff for Competency and Confidence – This initiative includes creating and implementing Hazard Registries for all high risk work; establishing competency based assessments for high risk tasks; and implementing "EPCOR Athletes" – a program to learn about body mechanics and how to incorporate healthy movement into everyday tasks for both field works and office workers.	• **On-going** • Training for the EPCOR Athletes program was completed and both field and office staff continue to use the exercises on a daily basis. • The EPCOR Learning and Development team began the development of the formal Competency Assessment Project in 2019. Completion and roll out of the program will occur in 2020. • Hazard registries for all high risk work have been developed as part of the work to prepare ISO 45001 registration.
Roll out a Fully Functional Safety Management System to all Employees – This system will include hazard awareness, incident investigation and safety leadership. We will also focus on redefining critical procedures to ensure consistency, readability and accessibility.	• **Complete** – EPCOR Health Safety and Environment completed the system rollout which provides a consistent approach to management safety incidents across all EPCOR business units.
Environment	
Continuous improvement to meet or exceed societal and stakeholder expectations.	
Know what is important to Stakeholders and understand how we contribute – Drainage services will develop and implement the Odour Mitigation Strategy; expand on tools for environmental controls specific for Operations, Construction and Project Management to ensure proper data collection, and decrease our reliance on assumptions when discussing environmental	• **On-going** • A Water/Drainage Public Engagement strategy was developed and presented to Utility Committee June 8, 2018. This strategy was aligned with the City of Edmonton engagement strategy now forms the basis for all on-going customer and stakeholder engagements.

Initiatives and Objectives	Year End Status
performance; and update the Total Loading Strategy and obtain Alberta Environment and Parks approval through an amended Approval to Operate.	• The Total loading strategy update is on-going and work is underway with EPCOR Water to align this initiative with the residuals management strategies for the water and wastewater treatment plants and water distribution system. Coordinated discussions with Alberta Environment and Parks will occur in the later part of 2020 and any required amendments to the Approval to Operate will be determined in 2021. To support the Total loadings strategy, additional flow monitors have been installed at outfall locations and the SIRP strategy has incorporated high risk outfalls and environmental impacts into the SIRP risk ranking for the subbasins contributing loading to the environment.
Minimize Environmental Impact of Our Operations – This initiative includes updating the Combined Sewer Strategy and setting a CSO reduction target; ensuring that environmental work is aligned with projects in Planning and Engineering; and ensuring that all projects reflect considerations arising from the Stormwater Integrated Resource Plan (SIRP), our Odour Mitigation Strategy, and our goals to reduce flow to the river.	• **In-progress** - The combined sewer strategy goals have been incorporated into the overall SIRP program and are captured as individual flood mitigation projects are proposed. The introduction of low impact development alternatives to capture low flows at the source will reduce volumes reaching the river during low flow events thereby improving overall river water quality.
Adapt to Impact of Climate Change – Drainage Services will identify work that needs to be accomplished to reduce the impact of stormwater flow on Edmonton residents and businesses. We are also participating in the Flood Hazard Identification Program with Alberta Environment and Parks.	• **In progress** • Drainage Services completed the development of the SIRP strategy and is currently working through its implementation along the 5 themes of SLOW, MOVE, SECURE, PREDICT and RESPOND. This is a multi- year program with prioritization based on flooding risks and includes both capital and operational interventions with a particular focus on methods to support the property owner flood proofing their property to limit overall damage during an extreme storm event.

Initiatives and Objectives	Year End Status
	• In addition, the SIRP initiatives are being developed in conjunction with the CoE Climate Change Adaption plan. The focus for 2020 will be to expand the climate risk assessment to include risks due to urban wildfires and ice storm events.
People	
Engaged employees who are capable, confident and work as a team.	
Establish an environment that enables accountability, teamwork and sound business decisions – Drainage Services will facilitate an understanding of accountabilities and authorities at all levels of ensuring that 100% of people leaders have a position description that outlines their role and accountabilities. Drainage Services will create business plans for each unit outlining two year objectives that align with the goals and strategies of the Operational Plan.	• **On-going** – accountabilities, authorities and position descriptions clarified and reviewed with staff starting at senior levels. This review will continue as the business requirements and underlying processes evolve and are further integrated with EPCOR operations.
Create an environment where employees are engaged and their participation is valued – In 2019, this initiative includes communicating the results of the 2018 engagement survey; establishing cross-functional teams to develop and implement action plans on the top engagement drivers determined from the survey; identifying and implementing two diversity initiatives; ensuring that 100% of people leaders complete Mental Health training through the Mental Health Commission of Canada; and deploying necessary technology to ensure system connectivity for all field staff	• **On-going** • Drainage achieved an employee engagement score of 82%, with an overall positive rating across all functional areas. Results were communicated to all employees and cross-functional teams have been created to create action plans on key engagement drivers to further improve the level of engagement. These initiatives are on-going, leading to the next engagement survey in the fall of 2020. • Additionally, mental health training was conducted for all employees and drainage remains an active participant in EPCOR's diversity and inclusion initiatives.
Develop great leaders who embody EPCOR values – In 2019, critical objectives include providing regular feedback and coaching to employees informally and formally through the formal APfR process; rolling out the EPCOR mentorship program.	• **On-going** – Drainage services is now fully integrated into all EPCOR staff management programs including APFR's, mentorship programs and staff development plans. This initiative in on-going as staff and business change necessitate continued focus on developing the leadership pipeline.

Initiatives and Objectives	Year End Status
Facilitate cross-functional collaboration, remove silos, and focus on team outcomes – In 2019, this initiative includes defining clear behavioural expectations for cross functional collaboration by stratum based on EPCOR Values and developing processes and a responsibility matrix for key integration or hand-off points in end-to-end management.	• **On-going** • EPCOR Drainage and Water adopted the concept of One Water Planning late in 2019 and restructured to better align the strategic and active planning functions across both business units. Additional process mapping will occur in 2020 to further improve the overall development processes and prioritization for growth infrastructure aligned with City Plan. • The Organizational Project Management project (OPM) was launched to develop a new project delivery process for Drainage and EPCOR through a multi-disciplinary team. The EPCOR Capital Delivery Model (CDM) was developed through 2019 and a phase roll out will commence in early 2020. • Phase 1 of the Drainage Services Construction Strategy review was completed in 2019 with a decision to exit new tunnel construction following the completion of two remaining in-house projects in 2022. Future work of this nature will be contracted out. Phase 2 of the Construction Strategy will be completed in 2020. This will identify what work is critical and will be completed in-house, what work will be contracted out and also identify opportunities to develop in-house expertise in work that has fewer contractor/marketplace options and low barriers of entry. There will be no lay offs of Drainage Services staff as a result of this strategy review.
Promote development and career growth for every employee – In 2019, initiatives include leveraging relief postings for succession planning, cross functional skill development and knowledge development for in-scope positions and implementing successions planning through a professional growth initiative for out of scope positions.	• **On-going** – The Professional Growth Initiative (PGI) is being roll-out to allow individuals to assess their current leadership skills and form development plans. PGI will continue to be implemented at successive levels of management over the next 2 years and will become a continuing cycle.
Operational Excellence	

Initiatives and Objectives	Year End Status
Perform the right work the right way at the right time with the right resources.	
Develop and optimize end-to-end processes within Drainage – Key objectives include identifying projects that either define or optimize cross-functional processes; deploying telematics to assess vehicle utilization and optimize our fleet; develop a program management model building on the team delivery approach piloted in the control structure program; complete the field technology recommendation that ensures field staff have the platform and connectivity; build an information systems strategy that defines the systems of record and system integration strategy.	• **In progress** – A comprehensive process review program has commenced to identify process improvement opportunities from an "end to end" perspective. The program supports the identification, facilitation and realization of benefits of/from improvement opportunities across the Plan-Design-Build-Operate business cycle in Drainage. There is a particular focus on hand-offs between and within areas as this is when there is the greatest risk of miscommunication, poor transfer of responsibilities, or a breakdown in work continuity.
Build knowledge of industry best practices to support our decision making and program development - ensure employee attendance, participation or committee involvement in industry conferences, seminars, committees and research initiatives.	• **On-going** - EPCOR continues to actively participate in initiatives with the Water Research Foundation and the Canadian Water Network to further enhance the overall community and ensure that the strategies proposed are aligned with industry best practice. In 2019, Drainage in particular participated in a number of research projects in both Canada and the US related to Urban flooding and the SIRP strategy developed by EPCOR has been cited as one of the top strategies in North America in the resulting research papers published.
Identify and manage emerging risks – This initiative includes implementing a knowledge transfer program to mitigate the risk of losing technical expertise as well as addressing findings from internal audits to mitigate operational risks.	• **On-going** – Drainage continues to review and update operating procedures to ensure system knowledge is captured. All findings from the Construction Services Tunneling Construction and TBM Shop Operations internal audit have been addressed. The Operations and Maintenance internal audit was completed in November 2019 and the findings will be address through 2020.
CUSTOMERS AND STAKEHOLDERS	
Customers and Stakeholders trust us and value our services.	
Meet transfer commitments to City Council – Drainage Services committed to implement an Odour Mitigation Plan and a flood mitigation	• **Complete** – Final Stormwater Integrated Resource Plan presented to Utility Committee May 10, 2019.

Initiatives and Objectives	Year End Status
strategy. In 2019, Drainage Services will obtain approval of a Stormwater Integrated Resource Plan (SIRP) that will meet the needs of Edmontonians and reduce the risks associated with climate change and an Odour Mitigation Strategy that will reduce odours, particularly in "hotspot" areas where there are ongoing concentrated odour reports.	• **Complete** • Final Corrosion and Odour Reduction plan presented to Utility Committee June 28, 2019. • Non-routine adjustments to rates approved for these initiatives in late 2019. • Updated PBR Performance Measures for Drainage were approved by City Council in early 2020.
Build relationships with stakeholders to create trust and understanding – In 2019, Drainage Services will implement an approach to measure customer satisfaction build a stakeholder engagement plan that is aligned with the capital plan and review and prioritize public campaigns in order to meet all of strategic goals.	• **On-going** - Drainage Services has developed a stakeholder matrix tool for use with capital projects and other stakeholder oriented initiatives.
Build systems, processes and training to provide consistently good service that feels seamless to the customer - In 2019 we will evaluate sources of customer escalations and implement remedial actions; reduce the number of escalations and reduce customer service connection time.	• **On-going** • Customer escalations were reduced by 19% in 2019 compared to 2018. • Customer service connection completion time for 2019 averaged 4.9 weeks versus the target of 5 weeks.
SHAREHOLDER VALUE	
Improve financial performance to earn allowed return.	
Produce compelling rate applications for approval by the regulator – In 2019 this includes preparing for the 2022 rebase by evaluating rate structures to determine the appropriate balance between consumption and fixed rates; and developing a capital forecast that prioritizes spending to maintain service levels and ensure that any rate increases are affordable and reflect the priorities of Edmontonians.	• **Ongoing** – Drainage Services is in the process of developing its capital and operational plans underlying the 2022-2024 PBR application. Included in the PBR application will be an updated cost of service study and rate design analysis. Drainage Services aims to file the application in early 2021.
Pursue cost efficiencies as committed to during the Drainage transfer discussions with City Council As part of the transfer agreement with the City of Edmonton, EPCOR committed to no layoffs of existing staff,	• **Ongoing** – To the end of 2019, Drainage Services had identified and implemented over $1 M in operational savings. Additional overall operational savings of $18 M have been identified and incorporated into

Initiatives and Objectives	Year End Status
achieving operational savings of $11.9 M and reducing capital costs by 10% or 183 M over a ten year period.	operational budgets out to 2022. On the capital side, work on developing the SIRP program has already exceeded the committed $193.4 M reduction in capital costs, however management will continue to optimize both our capital and operating budgets to ensure the safe and reliable operation of the drainage system. This will all be accomplished with no staff layoffs.
Meet Operational and Capital Budget Targets – develop and execute realistic capital and operational budgets.	• For 2019, Drainage Services achieved a net income of $23.41 M versus a target of $24.61 M and a capital spend of $141.9 M versus the target of $169 M.

Appendix A: PBR Plan 2017-2021

A.1 In-City Water and Wastewater

A.1.1 PBR Framework

EWSI's In-City Water and Wastewater rates for the 2017-2021 PBR term are regulated by Edmonton City Council in accordance with the PBR Plan approved in Bylaw 17698. This plan encompasses 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 and wastewater treatments system.

- **PBR Rates.** Annual changes to In-City Water and Wastewater rates are limited to inflation, less an efficiency factor, plus special rate adjustments and, in rare cases, non-routine adjustments. The use of a formulaic approach for calculating and setting utility rates acts as a "price cap" providing ratepayers with stable and predictable rates. The efficiency factor, set at 0.25% for the 2017-2021 PBR term, requires EWSI to increase productivity and achieve efficiencies in excess of inflation if it is to meet it targeted return on equity.

- **Performance Measures.** EWSI's PBR framework includes performance measures for water and wastewater treatment system service quality as described in Schedule 3, Sections 3 and 4 of the bylaw. EWSI faces financial penalties if it does not meet or exceed performance measure standards, providing assurance to customers that water and wastewater treatment system service quality will not be sacrificed to keep rates low or increase returns to EWSI. EWSI's performance measures are audited annually by an independent accounting firm.

- **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 2017-2021 PBR term, returns on equity are based on a deemed capital structure of 60% debt and 40% equity and a 10.175% rate of return on equity.

A.1.2 Risks and Incentives

The PBR framework provides incentives for EWSI to improve operational performance while achieving cost savings through process improvements and other means. Under this framework, EWSI also assumes the risks associated with water consumption, operating costs, financing costs and capital costs, ensuring that customers are provided with stable and predictable rate increases. These risks and EWSI's strategies to mitigate them include:

- **Water Consumption Risk.** Under PBR, EWSI bears all of the risks associated with weather-related fluctuations in water consumption and water quality, as well as the longer-term risks associated with declining consumption per customer. EWSI seeks to mitigate consumption risk through the use of robust forecasting methodologies incorporating long term trends in water consumption.

- **Operating Cost Risk**. EWSI actively works to minimize fluctuations in input prices through long-term power contracts, chemical optimization processes, and continuous efforts to implement cost reduction strategies in all areas of its operations.

- **Interest Risk**. Fluctuations in short-term interest rates, long-term debt issue costs and in the level of capitalized interest have significant impacts on EWSI's net income and return on equity. EWSI mitigates interest risk through timing of long-term debt issuances and optimizing working capital.

- **Capital Cost Risk.** In-City Water and Wastewater's operations are capital intensive and it is often difficult to forecast required levels of capital replacements, both at the plants and in the water distribution and transmission network. EWSI seeks to minimize these risks through comprehensive capital project and asset management programs, ensuring that new projects or changes to existing projects are justified and that there is an appropriate level of management, senior management and executive oversight over capital spending.

A.1.3 Customer Classes and Rate Structure

A.1.3.1 In-City Water

In-City Water rates consist of fixed monthly service charges that vary with meter size and variable charges applied to each cubic metre of water consumed. Consumption charges differ for each of In-City Water's customer classes. These classes and their rate structures include:

- **Residential Customer Class.** Residential customers are charged based on an inclining rate structure with three consumption blocks. The inclining rate structure is intended to promote water conservation and provide incentives for residential customers to use water efficiently.

- **Multi-Residential Customer Class.** Multi-residential customers are charged based on a declining rate structure with three consumption blocks. EWSI has found that the cost of providing water to individual multi-residential customers declines as the size of the multi-residential building increases. As well, there is a wide range of consumption volumes for multi-residential customers. Accordingly, a declining rate structure best reflects the cost characteristics of this customer class.

- **Commercial Customer Class.** Similar to multi-residential customers, commercial customers are charged based on a declining rate structure, but with five consumption blocks to recognize the wide range of average consumption volumes within this customer class.

The 2017-2021 PBR Plan includes three special rate adjustments for In-City Water:

- **Special Rate Adjustment for Rebasing**. The In-City Water revenue requirement was rebased at the beginning of the 2017-2021 PBR term. The resulting rebasing adjustment to rates includes the on-

going benefits to rate-payers of efficiency gains realized in the 2012-2016 PBR term, the impacts of higher than forecast capital expenditures during the 2012-2016 PBR term; and increases in the capital expenditure programs for the 2017-2021 PBR term. Also included in the rebasing adjustments is the impact of EWSI's cost of service study which has resulted in redistribution of revenue requirements from the Residential and Multi-Residential customer classes to the Commercial customer class.

- **Special Rate Adjustment for Accelerated Programs.** These special rate adjustments support the acceleration of the replacement of water mains as part of the City of Edmonton's neighbourhood renewal program and the upgrade of water mains to increase fire protection capacity in neighbourhoods experiencing increased densities as a result of infill development.
- **Special Rate Adjustments for Environmental Programs.** EWSI is undertaking two significant environmental initiatives during the 2017-2021 PBR term. The first initiative is an extensive River Monitoring Project to regularly monitor, evaluate and report on a number of water quality variables from several sampling sites in the river for 2018-2021. This program is forecast to have annual costs of $1.0 million starting in 2018. The second initiative, which aligns with the City's *"The Way We Green"* strategy, is a Green Power Initiative to replace approximately 10% of EWSI's total power volumes with energy from locally produced renewable sources starting in 2018. This initiative is forecast to cost $1.9 million annually commencing in 2018.

A.1.3.2 Wastewater Treatment

Wastewater treatment rates consist of fixed monthly service charges that are applied equally to each customer and variable charges applied to each cubic meter of water consumed. Wastewater has two customer classes:

- **Residential Customer Class.** Unlike In-City Water, there are no separate rates for multi-residential customers. Instead, customers who would be 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 very similar for 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 that there are 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 Section 4 of Schedule 1 to Bylaw 17698.

The 2017-2021 PBR Plan includes a single special rate adjustment for rebasing. Similar to In-City Water, Wastewater's revenue requirement was rebased at the beginning of the 2017-2021 PBR term to reflect efficiency gains realized in the 2012-2016 PBR term, as well as the substantial increases in capital spending needed to deal with the challenges of the aging infrastructure at the Gold Bar Wastewater Treatment Plant.

A.2 Drainage

A.2.1 PBR Framework

EWSI's Drainage rates for the 2018-2022 PBR term are regulated by Edmonton City Council in accordance with the PBR Plan approved in the EPCOR Drainage Services Bylaw 18100. Similar to In-City Water and Wastewater, Drainage's 2018-2022 PBR plan encompasses rates and performance measures, but the mechanisms used to achieve a balance between rates and operational performance differ in important respects, as follows:

- **PBR Rates.** Bylaw 18100 prescribes drainage fees and charges for the period from January 1, 2018 to March 31, 2022. These fees and charges reflect EWSI's commitment to limit average annual rate increases to 3%. Besides these scheduled rate increases, Bylaw 18100 also includes a mechanism for non-routine adjustments to rates related to emergent City-directed needs.

- **Performance Measures.** Bylaw 18100 requires Drainage to measure operational performance for the period from January 1, 2018 to December 31, 2019 using performance measures for drainage system service quality modeled after previous City Drainage Services quality metrics. After that time, for the remainder of the 2018-2021 PBR term, Drainage's operational performance will be measured against new performance measures that will be developed Drainage and approved by the Utility Committee. Similar to Water and Wastewater, the new performance measures have a scoring system with financial penalties applied if Drainage does not meet or exceed performance standards. As with Water and Wastewater, the performance measures scorecard will be audited annually by an independent accounting firm.

A.2.2 Customer Classes and Rate Structure

Drainage has Residential, Multi-Residential and Commercial Customer classes, using the same customer definitions as Water. Drainage's rate revenues are derived from both Sanitary Utility and Stormwater Utility services.

- Drainage has a simple rate structure, with flat monthly service charges varying only by meter size regardless of customer class and the same monthly variable rate per cubic meter applicable to all customers, regardless of customer class, except for the U of A which has a unique rate, intended to recognize its lower servicing cost.
- Stormwater Utility revenues are based on the area of the customer's property, development intensity, and zoning, also with common rates regardless of customer class.