April 28, 2021

EPCOR Water Services Inc.
2022-2024 and 2022-2026 PBR Applications
(Utility Advisor) UA-EWSI-1

Question: **UA-EWSI-1**

Topic: **Performance Ratings**

Reference: **Reader's Guide Page 10 Table 1**

Request: Please confirm that the revised performance ratings for Drainage are incorrect (apparent double counting of Environment factor) and provide a revised table.

EWSI RESPONSE:

Confirmed - For Drainage and Wastewater Treatment, the indices for water quality and environmental are combined. Table 1 in the Readers Guide incorrectly included Quality and Environment as separate indices resulting in a double count of the weighting. They should have been combined into a single measure. In addition, this table also included Safety at 10% while the correct number is 15%. The correct information, as detailed in Table 14.1.2-1 of the Drainage application, is as follows:

Table 14.1.2-1
UA-EWSI-1-1
Drainage Performance Measures Indices and Penalties

	Performance Category	A 2020-2021 Weighting	B 2022-2024 Weighting	C 2022-2024 Maximum Penalty
1	Environmental Index	40%	35%	$350,000
2	Customer Services Index	20%	20%	$200,000
3	System Reliability/Optimization Index	25%	30%	$300,000
4	Safety Index	15%	15%	$150,000
5	Total	100%	100%	$1,000,000

April 28, 2021

EPCOR Water Services Inc.
2022-2024 and 2022-2026 PBR Applications
(Utility Advisor) UA-EWSI-2

Question: **UA-EWSI-2**

Topic: **Green Power**

Reference: **Readers Guide Page 19**
Drainage Page 81
Waste Water Page 46
Water Services Page 46
EPCOR Corporate Climate Leadership Page 4

Request: Please provide the historical basis for the decision to reduce EPCOR's GHG footprint within the city by 70% from 2012 levels by 2025. Describe in detail any orders provided by your regulator to achieve such a goal.

EWSI RESPONSE:

The decision to reduce EPCOR's GHG footprint within the city by 70% was an environmental leadership decision reached internally. Environmental leadership is an expectation that the City of Edmonton has of EPCOR, both as a shareholder and as a regulator.

A material portion of this work has been undertaken with the direction and approval of the City as regulator. In its 2016 approval of EWSI's 2017-2021 PBR Plan, City Council approved $1.9 million per year in funding for EWSI's green power initiative which would replace 10% of its total power volumes with green energy. This initiative was proposed by EWSI to align with the City's *Community Energy Transition Strategy* objectives at the time of generating 10% of Edmonton's electricity locally, to reduce greenhouse gas emissions in Edmonton by 35% from 2005 levels by 2035 and to align with the *City's the Way We Green: Environmental Strategic Plan*.

The City of Edmonton also approved an expansion to the Non-Routine Adjustment criteria to "include the ability for EWSI to apply to recover costs associated with capital investments that have a demonstrable positive environmental impact or address the impact of climate change and are aligned with the goals and objectives of the City of Edmonton's The Way Ahead and The Way We Green strategies." (Paragraph 36 of the 2017-2021 Water Application)

Additionally, the City of Edmonton's GHG Management Plan for Civic Operations (2019-2030) [1] provides EPCOR with the following direction:

- *"EPCOR will establish a GHG Management Plan with associated policy, procedures, action plans, reduction targets, and performance metrics. The reduction targets and performance metrics associated with Water, Wastewater, and Drainage in the City of Edmonton will be brought forward to City Council for approval as part of the Performance Based Rates ("PBR") application process. Capital projects and operating activities required to achieve the reduction targets will be brought forward in PBR applications or potentially as a Non-Routine Adjustment ("NRA") when significant reduction opportunities are identified outside the PBR cycle.*
- *Incorporate GHG performance metrics in 2022-2026 Wastewater Performance Based Rate (PBR) Application – 2021*
- *Incorporate GHG performance metrics in 2022-2026 Drainage PBR Application – 2021.*

This is an EPCOR initiative crossing business units regulated by different regulators as well as non-regulated business units. Although Appendix J to EWSI's PBR Applications was produced in compliance with the Corporate Climate Leaders program, work had already been underway on the actions prior to EPCOR joining that program. The 70% was based on a bottom-up calculation of cost effective opportunities to reduce or offset EPCOR's emissions. As explained further in the IR COE-EWSI-15(c), EPCOR has been successful at procuring Renewable Energy Certificates for the Green Power Initiative at low cost, ensuring an appropriate balance between environmental leadership and affordability for customers.

[1] https://www.gov.edmonton.ab.ca/city_government/documents/PDF/GHGManagementPlan-CityOperations.PDF

April 28, 2021

EPCOR Water Services Inc.
2022-2024 and 2022-2026 PBR Applications
(Utility Advisor) UA-EWSI-3

Question: **UA-EWSI-3**

Topic: **Annual Adjustment of Service Charges**

Reference: **Appendix A Page 5**

Request: Please clarify if the proposed annual adjustment to service charges will be based solely on inflation, or if it will be based on inflation minus productivity. If solely based on inflation, please explain the rationale for excluding productivity.

EWSI RESPONSE:

The proposed annual adjustments to service charges will be based on inflation less the productivity factor. In other words, the increase in service charges will align with the manner in which other rate increases are determined and will be similarly included in the Annual Rate Filing submitted to the City Manager for approval.

April 28, 2021

EPCOR Water Services Inc.
2022-2024 and 2022-2026 PBR Applications
(Utility Advisor) UA-EWSI-4

Question: **UA-EWSI-4**

Topic: **Non-Routine Adjustment for Unanticipated Asset Failures**

Reference: **Drainage Page 13**
Wastewater Page 10
Water Page 11

Request: The applications propose to make Unanticipated Asset Failures eligible for Non-Routine Adjustments.

i) Please provide the applicants' definition of an unanticipated asset failure which would be used to initiate a non-routine adjustment.

ii) What incentive does management have to identify impending asset failures, and include the costs associated with such a failure in a PBR application?

iii) Should a non-routine adjustment associated with unanticipated asset failure be subject to greater scrutiny than other non-routine adjustments to ensure that management acted prudently in not identifying an impending failure?

iv) If the applicant incurs an unanticipated asset failure during a PBR, the financial impact of such a situation is the shareowner's responsibility until the next rebasing. What is the rational for shifting this risk to customers?

EWSI RESPONSE:

i) In defining the eligibility criteria for non-routine adjustments, the bylaws have historically contained a clause defining "Deterioration of the Waterworks System" as within scope. Specifically, the bylaw clause is defined as follows:

Deterioration of Waterworks System

If there is significant deterioration to the Waterworks System, beyond reasonable projections, remediation costs will be considered as non-routine.

For the 2022-2024/2026 bylaws, EWSI has proposed the following addition to this existing clause:

> Without limiting the foregoing, these circumstances may include unanticipated asset failure or deterioration requiring immediate repair or remediation.

This additional definition is intended to provide clarity to the types of situations where this clause would be used to support a non-routine adjustment. EWSI does not believe this is an expansion of the original clause or its intent. If an unanticipated asset failure of sufficient size and scope had occurred in the past, EWSI would have applied for a non-routine adjustment based on the "Deterioration of the Waterworks System" clause. The proposed addition was made to foster the recognition that the drainage assets, in particular, are potentially subject to unanticipated asset failure given their current state. Moreover, given the type of assets where this occurs, immediate repairs or remediation is required in order to maintain the system.

As noted in Section 2 of the application, Drainage had initiated an increase in the inspections performed on the sanitary system prior to the transfer, and EWSI has continued to increase the number of assets inspected and assigned an asset condition rating. The CORe Strategy also includes projects to install access shafts to parts of the system where inspections have not been possible due to a lack of access points.

EWSI's inspections have shown that many of the sanitary trunk assets that were previously not accessible for inspection in the Drainage system are in poor or very poor condition. Several large asset failures have occurred in the pipes within the sanitary and combined sewer network, in the membranes separating the sanitary from the storm sections of "double barrel" pipes, in the pump stations that keep the sewage moving through the system, and in control structures such as gates. Failures within sanitary and combined sewer pipes have resulted in the formation of voids, and all failures require a response from operational resources, road closures, bypass pumping, and unplanned capital projects. Inspections have also found several places with excessive solids build-up in the sanitary system, requiring extensive specialized cleaning

Until all inspections are complete and general asset conditions improves, the infrastructure will be subject to unanticipated asset failure.

ii) There are a number of incentives that operate to ensure that the costs associated with asset failures are included in any PBR application. First, and perhaps, most importantly, justification for a non-routine adjustment entails meeting both the qualifying criteria as well as a financial threshold. As detailed bylaw, non-routine adjustments are, by their nature unusual, significant in size or nature and beyond the scope of control of EWSI. Even when the criteria are met, any non-routine adjustment must also exceed a $500,000 annual revenue requirement impact. Depending on the assets involved and the associated depreciation rate, a capital expenditure of approx. $15 to $23 million is required to achieve that level of revenue requirement. Any costs under that level do not qualify for a non-routine adjustment and are borne entirely by EWSI. Further, the bylaw also indicates that City Council can review the projected RoE of EWSI as part of determining approval. In effect, a non-routine adjustment can be refused if EWSI's projected RoE is above the approved level.

The PBR metrics programs also contain financial penalties if the overall standard of performance is not maintained. Depending on the nature and extent of an asset failure, it is possible that EWSI could incur a financial penalty if an asset failure impacted the metrics to a significant enough degree. Moreover, there are additional incentives from the reputational and customer service aspects that EWSI strives to uphold.

Overall, there are considerable incentives for EWSI to include asset failures in the PBR application. In fact, there are numerous program across all three utilities included in the PBR applications designed specifically to maintain assets and prevent their failure. However, as noted above, unanticipated asset failures resulting from the historic level of inspections and asset management practices will likely occur until inspections are complete and the general asset condition improves.

iii) No - All non-routine adjustments are subject to approval of either the City Manager or City Council (depending on the level of expenditure). If either approval level believes a non-routine adjustment is not warranted, they can refuse approval. It is incumbent upon EWSI to present the justification of why the non-routine adjustment qualifies. Based on the very limited number of times EWSI has applied for a non-routine adjustment in the past several PBR terms,

additional criteria is not warranted as each situation was unique and presented a different basis for approval.

iv) As noted in the response to question i), EWSI believes unanticipated asset failures have always been part of the non-routine justification criteria and, therefore, the additional proposed wording provides clarity, but not an expansion of the clause. As such, ratepayers do not bear any more risk than they did under the prior bylaw.

EPCOR Water Services Inc.
2022-2024 and 2022-2026 PBR Applications
(Utility Advisor) UA-EWSI-5

Question: **UA-EWSI-5**

Topic: **Drainage 10% Capital Efficiency**

Reference: **Drainage Page 36**

Request: It appears that the claim of having exceeded this commitment are based on comparison of recent forecasts of expensed versus older forecasts. Does Drainage have any examples of comparing pre-transfer actual project costs to similar post-transfer actual project costs?

EWSI RESPONSE:

With the inclusion of the LRT, SIRP and CORe programs, the number of emergency projects from assets in very poor conditions that were not identified in the 2018 City's long term plan forecast for Drainage Services (e.g. emergency work on Trestles[1] or large trunk failures[2] that resulted in subsidence), the capital program has changed substantially from what was originally planned by the City. Because of these numerous changes, based on the limited level of details available in the pre-transfer information, and with the scope of each project being specific, attempting to match the current plan one-to-one with pre-transfer information results in an apples and oranges comparison.

In section 2.3.6 of the Drainage Application, EWSI provides explanations of how its capital plan will achieve 10% capital efficiency through the savings achieved through its SIRP Strategy and by lowering engineering and design costs for routine projects, improvements in procurement processes and in project management. EWSI expands on these explanations by providing some examples to further substantiate the information presented in section 2.3.6.

Internal Efficiencies

[1] Refer to paragraphs 126, 185 and 423 of the Drainage Application.

[2] Refer to paragraphs 127-129, 401, 408, 423 and 439 of the Drainage Application.

EPCOR Water Services Inc.
2022-2024 and 2022-2026 PBR Applications
(Utility Advisor) UA-EWSI-5

Although project delivery costs are not linear and the scope, type and quantity of projects will impact results, looking at the amount of capital dollars delivered per employee can help demonstrate the trend. In this case, the number of employees reflects the total number of Drainage employees whose role is dedicated to delivering capital (engineering, project management and inspectors, the "Capital Delivery Team"). One has to be careful in using these numbers for analysis as they are the result of multiple factors. They are presented here to help substantiate the impact of the structure changes, process improvements and cost-reduction initiatives that EWSI has been working on since the transfer.

Table UA-EWSI-05-1 shows the number of employees dedicated to delivering capital projects (row 1) relative to actual/forecast Drainage capital expenditures delivered by the Capital Delivery Team during the period 2018-2022. For purposes of this analysis, Drainage capital expenditures have been adjusted to remove those capital expenditures for projects that are delivered by other areas such as Drainage Operations, Construction or IT. As indicated in the Table, improvement in the cost of project delivery by the Capital Delivery Team is reflected by a forecast 115% increase in capital dollars delivered per employee between 2018 and 2021.

Table UA-EWSI-05-1
Estimated Capital Delivered per Capital Delivery Team Employee
($million/employee)
2018-2022

		A **2018**	B **2019**	C **2020**	D **2021**	E **2022**
1	Capital Delivery Team Headcount	64	69	80	90	85
2	Capital Expenditures Delivered by Team ($million)	93	132	199	282	230
3	$million Capex per Employee	1.5	1.9	2.5	3.1	2.7
4	**% increase in $million Capex per Employee over 2018**		**31%**	**71%**	**115%**	**85%**

As mentioned, some of the results depend on the nature and costs of the projects being delivered. As EWSI continues to reduce project costs and find lower-cost alternatives such as delivering many smaller LID projects to replace more expensive, but sometimes simpler to manage, underground pipes projects, the quantity of capital dollars per employee is forecast to go down slightly in 2022. Through the review and adjustments of its delivery process, structure and by improving tools, training and governance, the Capital Delivery Team has become substantially more efficient in a short period while project costs are also coming down. It is also

relevant to note that some of the employee additions over this time period relate to improving the Drainage engineering team, which is allowing EWSI to substantially reduce its reliance on consultants, further reducing project costs and timelines. EWSI has seen significant reductions in design and engineering costs for projects which complete these functions in-house compared to similar projects that use external consultants. An example of this is seen in comparing the Trestle 3 (emergency) project, which relied on consultants, compared with the Trestle 7 project, which used in-house engineering and design.

Example Projects

For reasons noted above, there are only a few projects with pre-transfer forecast costs are available to be used as an example for comparison between their forecast and the project actual or forecast costs. EWSI has identified three significant projects where sufficient detail was provided in the City long-term plan to compare on a project by project basis with EWSI's planned completion of these same projects: the 105 Avenue Sewer Lateral / Servicing for Downtown Project; Malcolm Tweddle Edith Rogers (MTER) Pond Project and the Tweddle Place Pond Project

The 105 Avenue Sewer Lateral / Servicing for Downtown Project was discussed in the Drainage Application[3]. This project initially required a deep trunk line at a high cost of $17.7 million. Upon further evaluation of the Project, EWSI determined that it could incorporate LID as part of the solution, which would allow for re-routing of the trunk line to facilitate shallow trench alternative at a much lower cost of $11.5 million.

Forecast costs comparing the City's long-term plan (LTP) with EWSI's current forecast, are provided for the MTER and Tweddle Place Projects in Table UA-EWSI-05-2 below. The comparison indicates EWSI anticipates capital cost savings of $14 million for each project. Both of these projects are currently under construction.

[3] Refer to paragraph 401 of the Drainage Application.

EPCOR Water Services Inc.
2022-2024 and 2022-2026 PBR Applications
(Utility Advisor) UA-EWSI-5

Table UA-EWSI-05-2
Large Dry Pond Project Capital Expenditures Forecast – City LTP vs. EWSI
($millions)

		A **Tweddle Place**	B **MTER**
1	City LTP Cost Forecast	57	78
2	EWSI Forecast	43	64
3	Variance	14	14
4	**% Change**	**(25%)**	**(18%)**

The Tweddle Place Project involves the design and construction of storm and sanitary sewer upgrades, sanitary storage pipes, an expanded dry pond and overland drainage swales. The project was executed in five phases, with the first four being completed. The remaining work is contracted and expected to be completed by the end of 2021.

The MTER project objective is to reduce flooding risk in the Tweddle Place, Michaels Park, Lee Ridge and Richfield neighbourhoods by constructing a 99,000 m3 dry pond with two cells and approximately 3,300 m of storm and sanitary sewer upgrades up to 3.0 m in diameter in the neighbourhoods. The pond work has been completed, and the sanitary sewer upgrades are contracted and ongoing.

EWSI has undertaken a number of strategies which have effectively reduced capital costs for these and other projects. These strategies are discussed in section 2.3.6 of the Drainage Application and include improvement in the engineering work package preparation to enable strategic procurement approaches, breaking down the work packages to minimize uncertainties associated with construction and get the most cost-efficient result leveraging the project team's strategic sourcing experience. Other key strategies include detailed risk assessment for construction activities with mitigations clearly identified, selection of the most sound and cost effective bids, and closely monitoring construction status and progress to solve any issue as they arise and reduce change order potential. Drainage has also established standard project management processes and templates that are utilized for all projects, which has allowed the project management group to significantly increase the amount of capital managed per project manager. Appropriate change management controls and processes have also been established with an appropriate governance level. EWSI continues to work on identifying cost saving opportunities for every project planned in its capital portfolio.

April 28, 2021

EPCOR Water Services Inc.
2022-2024 and 2022-2026 PBR Applications
(Utility Advisor) UA-EWSI-6

Question: **UA-EWSI-6**

Topic: **PBR Period Starting Rates**

Reference: **Drainage Page 12**
Waste Water Page 9
Water Services Page 10

Request: The applicants propose to set 2022 rates base on actual rates contained in their applications rather than a formulaic adjustment of 2021 rates. Please provide tables identifying the 2022 rates based on a formulaic adjustment of 2021 rates compared to the rates contained in the applications.

EWSI RESPONSE:

As shown in Table UA-EWSI-6-1 to UA-EWSI-6-3 EWSI has used a formulaic approach (R_P X (1 + I_D) X (1 + I_F – 0.25%) + R_S + Z) to determine the 2022 rates set in the PBR Applications and corresponding Bylaws.

R_P means the rate that was in effect for a customer class during the 12 months immediately preceding April 1 of the Current Year, before any non-routine adjustments are applied,

I_D means the difference between the forecast rate of inflation and the actual rate of inflation for the calendar year immediately preceding the Current Year,

I_F means the forecast rate of inflation for the Current Year,

R_S means the rate for a special rate adjustment as described in Sections 2.3 and 2.4 of this Schedule 3.

Z means a non-routine adjustment as described in Section 4.0 of this Schedule 3.

2021 rates are based on a forecast inflation factor as actual inflation for 2021 is not available at this time. By setting the 2022 rates in the Bylaws it would eliminate the true up between 2021 forecast and actual inflation when calculating 2022 rates, which protects both the utility and customers from the 2021 inflation forecast risk.

Table UA-EWSI-6-1
2022 Water Service Rate Calculation
($)

		A	B	C	D	E	F	G
					Special Rate Adjustments			A+B+C+D+E+F
		2021F Rates R_P	**2021 Inflation True Up** [1] $R_P \times I_D$	**2022F Inflation** $R_P \times (I_F - 0.25\%)$	**Rebasing** R_S	**Increase Service Connection Fee** R_S	**90 Day Deferral** R_S	**2022 Rates in Application**
	Fixed Monthly Charge per Meter							
1	5/8" (15 mm)	7.81	-	0.16	0.22	4.04	0.30	**12.53**
2	3/4" (20 mm)	11.71	-	0.24	0.34	6.06	0.45	**18.79**
3	1" (25 mm)	19.52	-	0.40	0.56	10.10	0.74	**31.32**
4	1.5" (40 mm)	39.04	-	0.80	1.12	20.19	1.48	**62.64**
5	2" (50 mm)	62.47	-	1.29	1.80	32.31	2.37	**100.23**
6	3" (75 mm)	117.12	-	2.41	3.37	60.58	4.45	**187.93**
7	4" (100 mm)	195.20	-	4.02	5.61	100.96	7.42	**313.22**
8	6" (150 mm)	390.41	-	8.04	11.22	201.92	14.84	**626.43**
9	8" (200 mm)	624.65	-	12.87	17.95	323.08	23.74	**1,002.29**
10	10" (250 mm)	897.94	-	18.50	25.81	464.42	34.13	**1,440.79**
11	12" (300 mm)	1,318.02	-	27.15	37.88	681.69	50.09	**2,114.84**
	Consumption Charge per m^3							
	Residential							
12	0 m^3 - 10.0 m^3	2.1809	-	0.0449	0.0627	(0.2291)	-	2.0594
13	10.1 m^3 - 35.0 m^3	2.3826	-	0.0491	0.0685	(0.2503)	-	2.2499
14	> 35.0 m^3	3.0113	-	0.0620	0.0865	(0.3164)	-	2.8435
	Multi-Residential							
15	0 m^3 - 100.0 m^3	2.0589	-	0.0424	0.0592	(0.2163)	-	1.9442
16	100.1 m^3 - 1000.0 m^3	1.7225	-	0.0355	0.0495	(0.1810)	-	1.6264
17	Over 1000.0 m^3	1.4235	-	0.0293	0.0409	(0.1496)	-	1.3442
	Commercial							
18	0 m^3 - 25.0 m^3	1.7162	-	0.0354	0.0493	(0.1803)	-	1.6205
19	25.1 m^3 - 100.0 m^3	1.7162	-	0.0354	0.0493	(0.1803)	-	1.6205
20	100.1 m^3 - 1000.0 m^3	1.5826	-	0.0326	0.0455	(0.1663)	-	1.4944
21	1000.1 m^3 – 5000.0 m^3	1.2528	-	0.0258	0.0360	(0.1316)	-	1.1830
22	Over 5000 m^3	1.0083	-	0.0208	0.0290	(0.1059)	-	0.9521

[1] 2021 actual inflation is not available until February 2022.

Table UA-EWSI-6-2
2022 Wastewater Treatment
Rate Calculation
($)

		A	B	C	D	E	F
					Special Rate Adjustments		A+B+C+D+E
		2021F Rates R_P	2021 Inflation True Up [1] $R_P \times I_D$	2022F Inflation $R_P \times (I_F - 0.25\%)$	Rebasing R_S	90 Day Deferral R_S	2022 Rates in Application
1	**Fixed Monthly Service Charge**	5.09	-	0.10	0.90	0.15	**6.25**
	Consumption Charge (per m^3)						
	Residential						
2	All consumption	1.0349	-	0.02080	0.1834		**1.2391**
	Multi-Residential						
3	All consumption	1.0349	-	0.02080	0.1834		**1.2391**
	Commercial						
4	0 - 10,000 m^3	1.0349	-	0.02080	0.1834		**1.2391**
5	10,000.1 - 100,000 m^3	0.8006	-	0.01609	0.1419		**0.9586**
6	Over 100,000 m^3	0.4178	-	0.00840	0.0740		**0.5002**
	Wastewater Overstrength Surcharge						
7	Biochemical Oxygen Demand (BOD) >300 mg/L	0.6478	-	0.01533	0.1148		**0.7779**
8	Chemical Oxygen Demand (COD) >600 mg/L	0.6478	-	0.01533	0.1148		**0.7779**
9	Oil and grease >100 mg/L	0.5663	-	0.01340	0.1004		**0.6801**
10	Phosphorous >10mg/L	5.3900	-	0.12754	0.9553		**6.4728**
11	Suspended solids >300 mg/L	0.5880	-	0.01391	0.1042		**0.7061**
12	Total Kjeldahl nitrogen (TKN) >50 mg/L	1.3758	-	0.03256	0.2438		**1.6522**
	Wastewater Additional Overstrength Surcharge						
13	Biochemical Oxygen Demand (BOD) >3000 mg/L	0.6478	-	0.01533	0.1148		**0.7779**
14	Chemical Oxygen Demand (COD) >6000 mg/L	0.6478	-	0.01533	0.1148		**0.7779**
15	Oil and grease >400 mg/L	0.5663	-	0.01340	0.1004		**0.6801**
16	Phosphorous >75mg/L	5.3900	-	0.12754	0.9553		**6.4728**
17	Suspended solids >3000 mg/L	0.5880	-	0.01391	0.1042		**0.7061**
18	Total Kjeldahl nitrogen (TKN) >200 mg/L	1.3758	-	0.03256	0.2438		**1.6522**

[1] 2021 actual inflation is not available until February 2022.

Table UA-EWSI-6-3
2022 Drainage Services
Rate Calculation
($)

		A	B	C	D	E	F
				Special Rate Adjustments			A+B+C+D+E
		2022 Rates Jan-Mar[(1)] R_P	**2022F Inflation** $R_P \times (I_F - 0.25\%)$	**Rebasing** R_S	**90 Day Deferral** R_S	**SIRP & CORe** R_S	**2022 Rates in Application**
1	**Stormwater Utility Rate**	0.049718	0.001034	(0.002902)	0.000358	0.008727	0.056935
	Sanitary Utility Flat Monthly Service Charges						
2	5/8" (15 mm)	10.84	0.23	(0.63)	0.23	-	10.66
3	3/4" (20 mm)	19.50	0.42	(1.14)	0.41	-	19.19
4	1" (25 mm)	30.34	0.64	(1.77)	0.64	-	29.85
5	1.5" (40 mm)	58.50	1.25	(3.42)	1.23	-	57.56
6	2" (50 mm)	80.16	1.72	(4.68)	1.68	-	78.88
7	3" (75 mm)	165.75	3.44	(9.67)	3.47	-	162.99
8	4" (100 mm)	308.76	6.38	(18.02)	6.47	-	303.59
9	6" (150 mm)	583.93	12.17	(34.08)	12.23	-	574.25
10	8" (200 mm)	931.69	19.39	(54.38)	19.52	-	916.22
11	10" (250 mm)	2,311.88	48.39	(134.95)	48.44	-	2,273.75
12	12 (300 mm)	2,311.88	48.39	(134.95)	48.44	-	2,273.75
13	16" (400mm)	2,529.23	53.46	(147.67)	53.01	-	2,488.02
14	20" (500mm)	2,724.11	56.64	(159.00)	57.07	-	2,678.83
	Sanitary Utility Variable Monthly Charges						
15	All premises (except large wholesale)	1.0805	0.0225	(0.0631)	-	0.2100	1.2499
16	Large Wholesale with Collection System	0.60508	0.01259	(0.03532)	-	0.11762	0.7000

(1) Rates for January 2022 to March 2022, excluding approved SIRP and CORe non-routine adjustments. As rates are currently set in the Drainage Bylaw 2022 rates would not require a true up for 2021 inflation.

April 28, 2021

EPCOR Water Services Inc.
2022-2024 and 2022-2026 PBR Applications
(Utility Advisor) UA-EWSI-7

Question: **UA-EWSI-7**

Topic: **Incentive Compensation**

Reference: **Drainage Page 133**
Waste Water Page 85
Water Services Page 88

Request:

i) Please identify if the revenue requirement included in the applications assumes that all incentive compensation identified is awarded to employees.

ii) If all of the incentive compensation is not awarded to employees, does the un-rewarded compensation accrue to shareowners, or is it proposed to be returned to customers?

EWSI RESPONSE:

i) The In-City revenue requirement included in the applications assumes that all identified incentive compensation is awarded to employees.

ii) The incentive compensation is awarded based on specified financial, safety, customer, operational and individual performance targets, similar to the categories in the PBR Performance Metrics. If the targets are not met in any period then the level of the incentive compensation awarded is adjusted. Any difference between the approved revenue requirement and the actual revenue requirement, as a result of changes to the incentive compensation awarded, accrues to the shareholder in the current PBR Term. If the performance targets are exceeded and the incentive awarded is higher than target, the shareholder pays for the additional compensation to employees. Likewise, if performance targets are not achieved and incentive awarded is lower than target, the shareholder receives the savings from lower employee compensation awards. This is consistent with other costs under EWSI's PBR framework in that the utility bears the risk of increases or decreases during the PBR period.

April 28, 2021

EPCOR Water Services Inc.
2022-2024 and 2022-2026 PBR Applications
(Utility Advisor) UA-EWSI-8

Question: **UA-EWSI-8**

Topic: **Water Services Rate Design**

Reference: **Water Services Page 169**

Preamble: *The applicant proposes to increase the monthly service connection fee to recover 31% of revenue compared to the current 19%. This reduces the risk of revenue variance associated with variations in customer consumption.*

Request: Please confirm that no adjustment to ROE is proposed to reflect this reduction in risk, and if confirmed, provide the rationale for not considering a reduction if ROE.

EWSI RESPONSE:

Confirmed. EWSI is not proposing to adjust the proposed return on equity to reflect this reduction in risk. EWSI is proposing to increase the monthly charges to increase the percentage of fixed revenue that EWSI collects form customers from 15% to 25%.[1]

Over the 2017-2021 PBR term, EWSI would have collected an additional $2.8 million in water revenues if its fixed charge had been increased to recover 25% of its revenues. This additional $2.8 million in revenue reflects a potential 1% increase in net income over a five year period. Given the magnitude of this impact on net income, EWSI determined the potential adjustment to the proposed return on equity (ROE) would be minimal.

While arguments could be made to adjust EWSI's risk premium (relative to the AUC generic cost of capital) slightly downward from the 1.83% set out in the 2016 Grant Thornton Report to reflect lower risk associated with the proposed changes in the fixed and variable components of the water revenues, EWSI considers there are much greater risks to EWSI associated with the addition of Drainage operations in 2017. EWSI has not proposed to adjust the risk premium from the 1.83% for either the proposed changes in the fixed/variable charges or for the addition of the Drainage utility.

[1] Paragraph 544, Water PBR Application.

As stated in Appendix D[2], the Drainage business has a longer capital recovery period, a greater proportion of non-productive contributed assets (i.e., not paid for by rate payers) and higher operating leverage (cash operating costs to total revenue) than the Water and Wastewater businesses. Thus, the addition of the Drainage business to the EWSI portfolio increases EWSI's overall business risk profile. The inclusion of the Drainage business in the 2022-2024 PBR with the same 40% equity ratio as the Water and Wastewater businesses implies that EWSI's investment risks are higher today than they were in 2016. Thus, the appropriate risk premium over the generic cost of capital is no less than 1.83% today.

[2] Paragraph 67, Appendix D to the PBR Applications.

Question: **UA-EWSI-9**

Topic: **Water Services AMI Deployment Project Business Case**

Reference: **Appendix F3 Page 20**

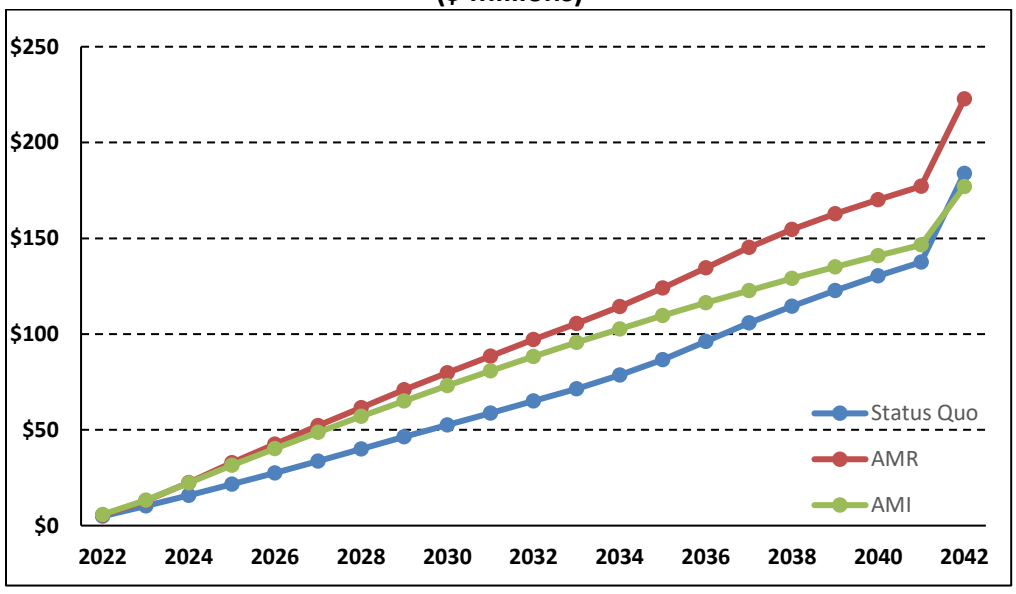
Preamble: *When evaluating the NPV of alternatives, it helps to identify the profile of the NPV by year curve. Alternatives with higher NPV in the short term, but lower NPV in the long term can have different risk profiles.*

Request: Please provide a graph of cumulative NPV by year for the three alternatives in this business case.

EWSI RESPONSE:

The cumulative NPV by year for the three alternatives are shown on the Chart UA-EWSI-9-1 below As discussed Section 4.2 of the AMI Deployment Project Business Case, the AMI option has the lowest NPV of the three alternatives.

Chart UA-EWSI-9-1
AMI Deployment Project
Cumulative NPV of EWSI Revenue Requirement for each Alternative
($ millions)



Note that the steepening of the curve between 2041 and 2042 reflects the terminal value of the metering assets at the end of the study period.

April 28, 2021

EPCOR Water Services Inc.
2022-2024 and 2022-2026 PBR Applications
(Utility Advisor) UA-EWSI-9

Question: **UA-EWSI-10**

Topic: **E. L. Smith New Power Feed Project Business Case**

Reference: **Appendix F6 Page 5**

Request:
i) What is the peak electrical demand to be met by the power feed to E. L. Smith?

ii) Was installation of onsite backup power generation (diesel or natural gas) considered as an option?

iii) If not, why not. If it was, why was it not included in the business case?

EWSI RESPONSE:

i) Peak electrical demand for the E.L. Smith plant is 9MW.

ii) No. Installation of onsite backup power generation is not a viable alternative as it would not meet the objectives of this project. Backup power generation is appropriate for short term power outages, whereas the E.L. Smith New Power Feed Project addresses the risk of long term power outages. The E.L. Smith plant already has a limited supply of back-up power from generators to power critical assets during short plant shutdowns. These generators are not designed to run plant operations for production of water. There will be a new solar farm and battery storage system to help in the future to manage shutdowns of short durations.

iii) The purpose of the new Riverview power feed is not to provide back-up power, but to provide a redundant power feed from the Alberta electrical grid. The water treatment plant currently has two feeders from the Petrolia substation. Both cables run from the Petrolia Substation under the North Saskatchewan River in a tunnel to the water treatment plant. One of these cables is at the end of its service life and must be replaced. The proposed replacement cable is the feed from the new Riverview Substation to provide complete redundancy needed to power the E.L. Smith plant, which supplies 65% of the water to the Edmonton region. This new feed will eliminate the risk of a longer-term power supply interruption from the Petrolia Substation. The existing power feeder from Petrolia substation will be decommissioned once the new feeder from Riverview

substation is commissioned, resulting in E.L. Smith having the electrical redundancy required for the plant.

April 28, 2021

EPCOR Water Services Inc.
2022-2024 and 2022-2026 PBR Applications
(Utility Advisor) UA-EWSI-11

Question: **UA-EWSI-11**

Topic: **Franchise Agreement Relocates Program Business Case**

Reference: **Appendix F9 Paragraph #3**

Request: The applicant states that "Because the scope of this program is driven by requests from the city of Edmonton, it is not within the control of EWSI." Why is the applicant including forecast capital costs for projects not within its control when the Non-Routine Adjustment Application is specifically designed to deal with such instances?

EWSI RESPONSE:

Non-Routine Adjustments may be appropriate to address large costs that EWSI was not able to anticipate at the time of preparing its PBR Applications and are generally outside management's control. Some costs can be difficult to predict such as relocations of water utility infrastructure to facilitate the City's LRT projects which EWSI is required to complete in accordance with the Franchise Agreement. If these "City-driven" projects, are not anticipated in the development of a PBR application, they may qualify for a Non-Routine Adjustment if they exceed the financial threshold.

However, if these City-driven projects are anticipated during the development of the PBR application, then they are accordingly included in the capital forecast for the PBR Application. This is consistent with standard practice in previous PBR terms. The Franchise relocates are related to on-going City roadways rehabilitation projects that occur annually as roads are rehabilitated, widened and or realigned. This includes moving of hydrants and catchbasins and realignment of pipes due to changes in road depths.

April 28, 2021

EPCOR Water Services Inc.
2022-2024 and 2022-2026 PBR Applications
(Utility Advisor) UA-EWSI-12

Question: **UA-EWSI-12**

Topic: **Transmission Mains and Appurtenances Program Business Case**

Reference: **Appendix F22 Page 7**

Preamble: *The applicant concludes that "The scope of this program was selected because it (sic) the lowest cost option that achieves the required objectives of maintaining the transmission system integrity and service to customers."*

Request: i) Which of the four alternatives has been selected?

ii) Why is there no economic evaluation of the alternatives?

EWSI RESPONSE:

i) The recommended option is described in Section 3.0 of the business case (Reference Appendix F-22 Transmission Mains and Appurtenances Program). The alternatives shown in Section 4.0 do not include the base recommendation summarized previously in Section 3.0. Section 4.0 is intended to show four alternative approaches to the recommendation.

ii) An economic analysis for Alternative 1 is of limited usefulness as it relies on assumptions regarding the frequency, location and extent of breaks. It is possible to have zero breaks on a transmission main over a five year period, in which case there would be no costs. However, a single break on a critical main could cost millions of dollars and disrupt service to thousands of customers. This option is eliminated because the risks are too high; it does not achieve the reliability objectives of the program.

As stated in paragraphs 27 and 29 of the business case, the costs of Alternatives 2 and 4 are too high. Alternative 2 involves the same approach as the recommended option, but with an increased scope. Alternative 4 involves full-scale replacement of entire transmission mains, rather than spot replacement of high risk sections. A formal economic evaluation is not necessary to determine that each of these alternatives comes with a higher cost than the recommended approach. For additional context, the cost of installing new transmission mains starts at around $3,000/m for a 600 mm main and increase in cost drastically as the size increases (most of the critical mains in the system

are larger than 600 mm). Most transmission mains range in length from 5 to 20 km, and with 510 km of total transmission main in the system, replacing/rebuilding a single km of main could cost $3 million. Another important consideration is that all the pipe in that 1 km of main may not be in bad condition and some of that capital would be spent replacing "good pipe". By utilizing spot repairs on existing mains, bad pipe can be replaced at a much lower cost than full replacement/new build (spot replacement is around 200k per section) while still maintaining the same level of system integrity.

Alternative 3 involves abandonment of high risk transmission mains, and is simply not viable. Transmission mains are the backbone of the water delivery system; without them customers would be left with reduced service or without service at all.

April 28, 2021

EPCOR Water Services Inc.
2022-2024 and 2022-2026 PBR Applications
(Utility Advisor) UA-EWSI-13

Question: **UA-EWSI-13**

Topic: **Dewatering Facility Project Business Case**

Reference: **Appendix G4 Page 5**

Preamble: *The business case states that several dewatering technologies were assessed, and that centrifuge dewatering was selected as the optimal solution.*

Request:

i) The alternatives presented (Do Nothing, EWSI Dewatering Facility, Temporary Skid Mounted Dewatering Facility) lead to an obvious conclusion to construct a dewatering facility. Why is there no analysis of the different technologies considered and a business case justifying the technology chosen?

ii) Please provide a complete business case which will justify the technology chosen.

EWSI RESPONSE:

i) EWSI performed a qualitative assessment of the dewatering technologies during the conceptual design stage of the project. In an attempt to provide a succinct business case to support the capital project, EWSI focused the alternative analysis on the type of facility, and omitted to provide the analysis of the technology alternatives.

ii) EWSI has provided an updated business case to support the Dewatering Facility Project UA-EWSI-13_Attachment1ii, which includes a justification of the dewatering technology chosen for this project. This updated business case replaces the version in Appendix G-4 of the PBR Application.

EPCOR Water Services Inc.

2022-2024 and 2022-2026 PBR Applications

UA-EWSI-13

Attachment 1

Appendix G4

EPCOR WATER SERVICES INC.

Wastewater Treatment Dewatering Facility Project Business Case

February 16, 2021

Table of Contents

1.0 OVERVIEW

1. The Dewatering Facility Project will construct a new dewatering facility at the Clover Bar Biosolids Recycling Facility (CBBRF).

2. The facility will process biosolids produced in the wastewater treatment process. These biosolids are piped from the Gold Bar Wastewater Treatment Plant (WWTP) and sent on truck from the Alberta Capital Region Wastewater Treatment Plant (ACRWWTP) to the lagoons to be thickened and then onto the dewatering facility. Dewatering is an essential requirement for the management and disposal of biosolids.

3. The new dewatering facility is necessary because the existing City of Edmonton dewatering facility is being demolished in the near future along with the City of Edmonton composter facility. This closure has expedited EPCOR's Biosolids Management Program and planning for a new dewatering facility in order to manage biosolids in the City of Edmonton.

4. The City of Edmonton has requested that EPCOR finance and operate their own dewatering facility for future operational needs at the CBBRF.

5. This project falls in to the Reliability/Lifecycle category.

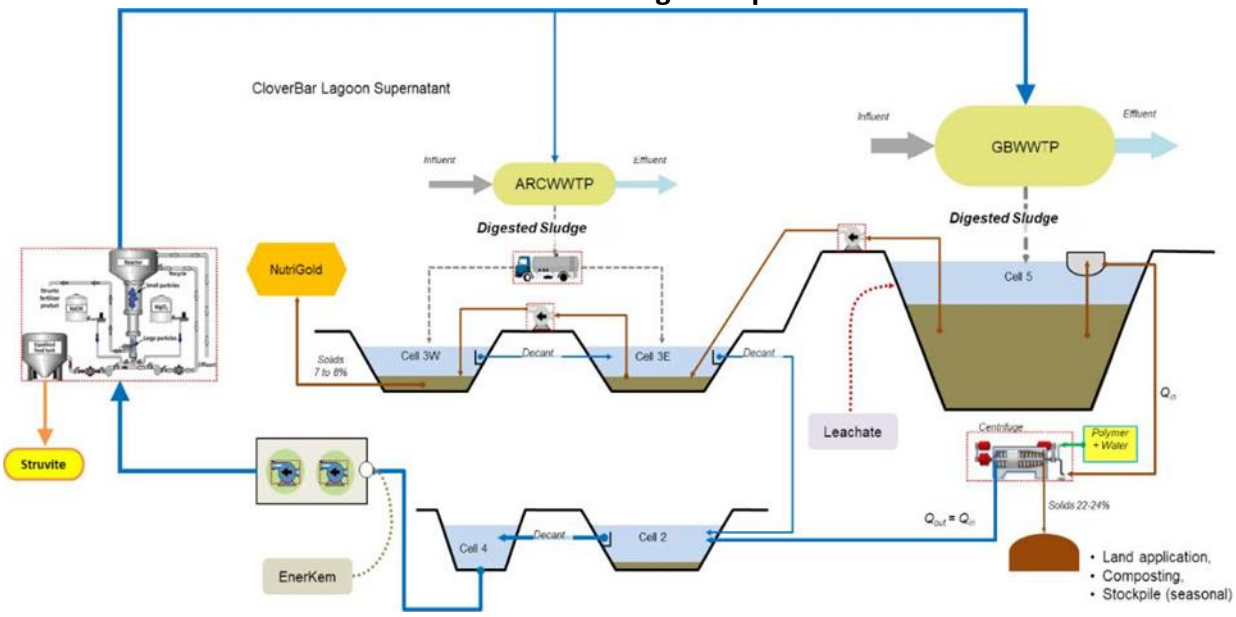
6. The project was initiated in 2020 and the project will be completed in 2024.

2.0 BACKGROUND AND JUSTIFICATION

7. Treatment of wastewater at the Gold Bar WWTP produces digested sludge that must be disposed of or land applied. At present, Gold Bar WWTP produces approximately 20,000 dry metric tonnes (DMT) of sludge per year on average, with an additional 8,000 DMT contributed by ACRWWTP. Wet weather events can result in additional sludge being produced.

8. The digested sludge, commonly referred to as biosolids, is pumped to a holding pond (Cell #5) located at the CBBRF. A number of pipelines between Gold Bar WWTP and CBBRF are used to transport digested sludge from Gold Bar WWTP to CBBRF. By agreement, sludge is also trucked from the ACRWWTP to the CBBRF. After treatment at CBBRF, the supernatant (a liquid separated from the thickened sludge) is pumped back to Gold Bar WWTP and ACRWWTP. See Figure 2.0-1.

Figure 2.0-1
Normal Clover Bar Lagoon Operations



9. In Cell #5, the biosolids are gravity-separated into the settled (or thickened) sludge and the supernatant (the remaining liquid). The thickened sludge is pumped to the existing City of Edmonton dewatering facility located in the northwest corner of the Edmonton Waste Management Centre.

10. In the existing dewatering facility, more liquid is separated from the biosolids (dewatered) in centrifuges with polymer added to achieve a solids concentration in the range of 22-24% solids. Three centrifuges are available for dewatering with a combined output of approximately 40,000 dry tonnes per year.

11. The dewatered solids from CBBRF were used for either composting at the Edmonton Composting Facility (ECF) or hauled by trucks to various sites for land application, either agricultural or non-agricultural (mine reclamation).

12. There are two limiting factors in this process, primarily driven by weather conditions. The season for land application is limited by favourable weather, and during inclement conditions, especially below -30°C, the dewatered biosolids cannot be hauled away and used for land application. It is therefore necessary to have temporary storage of biosolids, currently in Cell #5 at the CBBRF.

13. In 2017, the City of Edmonton Composting Facility (ECF) was shut down temporarily due to structural issues.

14. By 2024, it is expected that the current City of Edmonton Dewatering Facility will cease operations as a result of the ECF closure. EWSI was verbally informed of the permanent ECF closure in May 2019, and the closure publicly announced at the end of May 2019.

15. In 2019, in response to the uncertain future of the City of Edmonton compost facility, EWSI developed a Biosolids Management Program and investigated conceptually the development of a separate dewatering facility.

16. The Biosolids Management Program determined that a replacement dewatering facility was required to be in operation in early 2024.

17. This project focuses on constructing a new biosolids dewatering facility to replace the City of Edmonton facility. EWSI plans to own and operate the new biosolids dewatering facility.

18. It is anticipated that by 2024, the cost to operate the existing dewatering facility will have risen to $450/DMT. In contrast, the direct operating cost of dewatering at the proposed new dewatering facility is currently estimated to be less than $300/DMT in the first year of operation. These costs are based on consideration of staff or contractor labour to operate a 20,000 DMT facility, utilities costs, chemical consumption costs, and average annual costs to maintain the facility (e.g. snow clearing, road maintenance, etc.).

3.0 PROJECT DESCRIPTION

19. The scope for the Dewatering Facility project is to build a new dewatering facility, located at the Clover Bar site.

20. During the conceptual design stage of the project, the various dewatering technologies were assessed on a qualitative basis. A summary of this assessment is provided in Table 3.0-1.

Table 3.0-1
Dewatering Technology Analysis

	A **Advantages**	B **Disadvantages**
Centrifuge technology uses forces from rapid rotation in a circular motion to separate solids from liquids.	• Less operator attention • Easy to automate • Dry cake and high solids content achievable • Self-contained process, which minimizes housekeeping and odour potential	• Energy intensive • Major maintenance occurs off site • Support structures need to be designed to handle vibrations

	• Operation staff familiar with equipment, because this is the technology currently used • Easier process control to improve process performance by adjusting equipment setpoints • Widely used at large WWTPs – ease of knowledge sharing, and obtaining supports if required	
Belt Filter Press uses a system of belts, rollers and bearings to apply pressure to biosolids to squeeze out liquid. Biosolids are sandwiched between two porous belts as the belts are passed over rollers of decreasing diameter.	• Low energy consumption • Straightforward operation • Moderate capital & O&M costs	• Significant housekeeping requirements • Higher potential for odours • Variable efficiency • High water consumption for belt washing, resulting in high volumes of filtrate requiring treatment • Produces aerosol in work area • High operator attention required
Rotary Presses – biosolids are fed to a channel containing rotating filter screens. Pressure and friction of the biosolids against the screens allow liquids to pass through the screens as the biosolids travel through the channel.	• Completely enclosed – odours contained • Less footprint required than belt presses • Low noise and vibration levels • Uses less energy than belt presses and centrifuges	• Screen clogging potential • Relatively high capital cost • Limited performance with secondary solids • Low throughput compared to other mechanical dewatering processes • Limited application at other WWTPs (relatively new technology)
Screw Press – biosolids travel along an inclined rotating screw encased in a permeable cylinder. Liquids are removed through gravity drainage, as the biosolids are squeezed against the permeable cylinder while travelling up the inclined screw.	• Low energy consumption • Containment of odours & aerosols • Simple operation, low requirement for operator attention • Low maintenance & noise	• Requires continuous wash water (lower requirement than belt filter • Low solids content w/no primary sludge • Low solids capture rate • Larger footprint requirement

21. Dewatering centrifuges were identified as the preferred and selected technology due to their ability to achieve high dewatered solids concentration with less maintenance and operator attention compared to other technologies.

22. In addition, since this is the same technology currently utilized for dewatering, there is operational benefit because plant staff are familiar with the operational and maintenance needs of the equipment.

23. Based on the selection of centrifuge technology, the conceptual design provides the basis for current estimates.

24. A more detailed design for the facility is being prepared in order to develop a capital and operating and maintenance (O&M) expenditure opinion of probable cost that will provide EWSI with further certainty of the level of effort to construct this facility.

25. The key is to keep the facility design as simple as possible to maximize its utility, cost-effectiveness and reliable operations.

26. The new dewatering facility will be located at the CBBRF. The exact location will be finalized through detailed design and consider total costs including capital, operating and financing and other logistical requirements.

27. The current method for removing dewatered biosolids and feeding the silos to load the product on to hauling trucks for land application is challenging. The new facility will provide a better method and configuration to load the dewatered biosolids onto trucks for land application.

28. The conceptual design report provided recommendations that will be reviewed and incorporated in the next design stage of this project, including:

- The facility will be designed to enable expansion in the future if needed.
- Project costs include design and construction to dewater 20,000 DMT per year.
- A sludge-holding tank will be designed to buffer peaks or fluctuations of incoming biosolids and load, for better performance of centrifuge dewatering. The exact location and configuration of the sludge holding tank is to be determined during the design phase.
- Final technology selections for the dewatering facility components will be developed as part of the design phase.

29. The project will be initiated in 2020, with detailed design through 2021. Construction will be performed through the 2021 to 2023 period, and the dewatering facility will go in to service in 2024.

4.0 PROJECT ALTERNATIVE ANALYSIS

30. There are three main alternatives:

1. Do Nothing (Status Quo).
2. EWSI Construct a new Dewatering Facility.
3. Temporary Skid Mounted Dewatering Facility.

31. Status Quo is not feasible since the City of Edmonton is expected to cease operations in 2024, resulting in removal of the current dewatering facility. Therefore, this alternative is rejected.

32. Alternative two would mean that EWSI is responsible for constructing (and operating) a new dewatering facility, similar to the existing City of Edmonton facility, based on a 20,000 DMT annual capacity.

33. The engineering design considered several dewatering technologies. These technologies were assessed during the preliminary design, considering operational impacts, energy consumption, odour and costs. Centrifuge dewatering was selected as the optimal solution.

34. This alternative involves a capital investment of $42 million, and associated operating and maintenance costs.

35. This alternative can be delivered on site at the CBBRF, in close proximity to the lagoons.

36. Alternative three means that EWSI sets up a temporary, likely skid mounted, dewatering facility. This arrangement would be akin to a turnkey contract operation.

37. The operating window for this alternative is six months, from May to October each year, as this type of facility operates open to the elements (i.e., is not housed in a building or insulated from cold temperatures). The temporary facility would be removed by the contractor each winter, resulting in mobilization and demobilization effort and costs.

38. The shorter, six month operating window means that the facility needs to process 20,000 DMT in six months to achieve the same annual output as the permanent facility alternative. EPCOR would handle biosolids transport and application. An all-weather haul and stockpile location is required, preferably directly off the highway, to match dewatered material production. A typical agricultural site can be forced to shut down because of wet fields and soft gravel roads, so the dewatered biosolids cannot be applied in these conditions.

39. The space requirement for the temporary facility is significant since it requires space for the dewatering equipment, temporary storage and the truck-turning radius. There is some doubt

as to whether a sufficient space currently exists at the CBBRF, and civil work to prepare the ground may be necessary for the required footprint.

40. There are other concerns with proceeding with a temporary facility, including the requirement for available water capacity. There is a potential for additional costs to be incurred to upsize the existing water supply. The shortened dewatering season places more pressure on the biosolids program to move material. Since the program can be highly weather dependent with wet fields preventing agricultural land application, there is a greater need for space for stockpiling during the growing season, which is a challenge. With a permanent constructed facility, excess dewatered material can be stored over-winter on the fields without adverse impacts to the farmers' ability to work their fields, and the material can be immediately applied in the spring, resulting in efficiencies for the farmer. A temporary facility's operating window overlaps with the agricultural season, and this same space would not be available for stockpiling material, so alternatives would need to be found, likely at additional cost.

41. Based on a review of the advantages and disadvantages of the alternatives, the decision was made to proceed with constructing a dewatering facility (alternative two). The drawbacks of the temporary facility, coupled with the space issues at CBBRF, were too significant to proceed with alternative three.

5.0 COST FORECAST

42. The project cost forecast is based on estimates developed in the conceptual validation stage, plus an assessment of EWSI overheads, internal costs and risk allowances.

43. A contingency of 17% is included in the cost forecast. This is to cover the cost of unknowns that cannot be identified or anticipated during the current preliminary design phase. These challenges may include for example:

- Changes in the scope of the project;
- Delay in the delivery of long-lead equipment;
- Completing construction work in a live plant (CBBRF) can interrupt day-to-day activities or cause constraints for construction;
- Unexpected site conditions; and
- COVID-related constraints and complications.

44. Projected costs for this project are shown in Table 5.0-1

Table 5.0-1
Dewatering Facility Project
($ millions)

		A **Pre-2022**	B **2022**	C **2023**	D **2024**	E **Total**
	Direct Costs					
1	Contractors	2.97	12.26	12.88	0.28	28.39
2	Internal Labour	0.67	0.43	0.63	0.18	1.91
3	Contingency	0.00	1.00	4.00	1.00	6.00
4	**Sub-total Direct Costs**	**3.64**	**13.69**	**17.51**	**1.46**	**36.30**
5	Indirect Costs	0.00	0.94	2.14	2.62	5.70
6	**Total Capital Expenditures**	**3.64**	**14.63**	**19.65**	**4.08**	**42.00**

45. The project is expected to go in to service in 2024.

46. EWSI takes a number of steps to minimize the level of these capital expenditures. These include:

- EWSI has taken advantage of longer-term relationships with consultants, contractors and suppliers to effectively manage the quality of design, supply, and construction of required upgrades.
- All activities related to project management, construction coordination and inspection will be undertaken internally by EWSI, eliminating the need for external project management services. The delivery of major equipment is procured with direct contract with suppliers thus eliminating additional cost of contractors' premium.
- Construction coordinators will be on-site at Gold Bar WWTP to manage the day to day activities of contractors and ensure the project safely stays on time and to specifications.
- Contracted services are performed by qualified external contractors and done on a competitive unit price basis.
- The installations will be consistent with EWSI's construction standards, which will minimize stock requirements and speed up design and construction.
- Where possible, work will be coordinated with other projects or maintenance activities to minimize costs.
- Every requested project is evaluated individually to prioritize projects; based on the highest risk and synergies with other projects (e.g. using a common shut down). Construction methods will be used to meet requirements at the lowest cost.

- Every project scope is evaluated to improve economy of scale and to eliminate future throw-away of infrastructure.

6.0 RISKS AND MITIGATION PLANS

47. Table 6.0-1 provides key risks and mitigation plans associated with this program.

Table 6.0-1
Key Risks and Risk Mitigations

	Risk	A Mitigation Plan
1	Completing construction work in a live plant (CBBRF) can interrupt regular day to day activities or cause constraints on construction.	This risk will be managed with appropriate planning and communication between all parties involved.
2	Changes in the scope of the project.	Detailed discussions with project stakeholders to optimize project solutions.
3	Delay in the delivery of long-lead equipment.	Signing direct contracts with manufacturers of major equipment, scheduling participation in Factory Acceptance Tests. Timing ordering of equipment so delivery is not the critical path in the construction, and applying contingencies in the construction schedule.
4	Unexpected site conditions.	Detailed site investigations were completed as part of Preliminary design and will be completed later at the Detailed design stage. A risk allowance will also be maintained in the project cost estimate.

April 28, 2021

EPCOR Water Services Inc.
2022-2024 and 2022-2026 PBR Applications
(Utility Advisor) UA-EWSI-14

Question: **UA-EWSI-14**

Topic: **Secondary Aeration Blower Upgrades Project Business Case**

Reference: **Appendix G11 Page 6**

Preamble: *From the description of alternatives, it appears that alternative three is feasible, but was rejected because construction costs would be higher. However it is not possible to conclude that this option should be rejected in favour of alternative four without an analysis of lifecycle costs. For instance, if the operating and maintenance costs associated with alternative three are lower than those for alternative four, alternative 3 might be the preferred option.*

Request:

i) Why was an economic analysis of NPV for alternatives three and four not prepared and presented?

ii) Please prepare and present an economic analysis of NPV for alternative three and four.

EWSI RESPONSE:

i) An NPV for comparing alternatives three and four was not prepared because alternative three was deemed non-viable based on practical factors. In addition the anticipated project capital cost was materially in excess of potential operational savings.

In order for alternative three to be operable EWSI would require an additional two blower units rather than one blower unit required in alternative four. Installing two blowers (alternative three) would require the foundations of the Blower Building to be extended and modified. Given space restrictions at the Gold Bar Wastewater Treatment Plant site this was not deemed a practical or prudent approach. If space was available and was not a deciding factor, there are additional capital costs that would need to be considered, such as construction costs associated with foundation work which are typically very costly. Also, the use of turbo blowers would require further electrical modifications, including a transformer for step-down purposes. Finally, the cost of the turbo blower units in alternative three was

more expensive from a supply perspective than alternative four. Hence in considering the space at site and the financials being significantly higher (blower units, construction and electrical modifications), for only an approximate $18 thousand annual saving in power costs between these two alternatives, alternative three was ruled out. Other maintenance costs were anticipated to be approximately the same between the alternatives.

ii) In order to prepare an NPV comparison of alternatives three and four, EWSI would require further design work. Spend on design for a non-viable alternative is not considered to be a prudent investment of funds when the solution has been determined based on other factors. On this basis, and coupled with the deciding factors described in i above, EWSI proposes that no further NPV of alternatives three and four be provided.

April 28, 2021

EPCOR Water Services Inc.
2022-2024 and 2022-2026 PBR Applications
(Utility Advisor) UA-EWSI-15

Question: **UA-EWSI-15**

Topic: **Secondary inDENSE Upgrade Project Business Case**

Reference: **Appendix G12 Page 7**

Request: Do the NPV calculations in Column B include the economic value of deferring the MBR for the number of years identified in column C?

EWSI RESPONSE:

EWSI can confirm that the NPV calculations in Column B include the economic value of implementing the MBR in the term identified in Column C. This is subject to the NPV being presented on a 25-year basis. Hence any MBR implementation costs beyond the 25 years is not included for NPV calculation purposes.

April 28, 2021

EPCOR Water Services Inc.
2022-2024 and 2022-2026 PBR Applications
(Utility Advisor) UA-EWSI-16

Question: **UA-EWSI-16**

Topic: **Digester 3 Upgrade Project PIR**

Reference: **Appendix G13 Page 2**

Request: If the original business case for this project had identified the additional $3.17 million, would the project have been approved?

EWSI RESPONSE:

EWSI can confirm that the original business case for the Digester 3 Upgrade Project would have been included in the 2017-2021 PBR application with an additional $3.17 million spend.

As documented in the 2022-2024 Application Appendix G5 – Digester 4 Upgrades project, the forecast capital cost of $14.58 million, which is equivalent to the final cost of the Digester 3 Upgrade Project, incorporates learnings from the Digester 3 Project.

April 28, 2021

EPCOR Water Services Inc.
2022-2024 and 2022-2026 PBR Applications
(Utility Advisor) UA-EWSI-17

Question: **UA-EWSI-17**

Topic: **Drainage Services Fleet and Vehicles Program Business Case**

Reference: **Appendix H7**

Request: How often does EWSI evaluate lease versus purchase for some or all vehicles?

EWSI RESPONSE:

All Drainage Services vehicle replacements are evaluated using a purchase versus lease assessment. The 5 gate fleet Capital Project Delivery System (described in Section 3.0 of Appendix H7 of the PBR Application) uses gates to assess, procure and deliver each potential vehicle in the program. Gate 1 is a business assessment that includes an evaluation of the cost effectiveness of purchase versus lease and any other standalone third party options on an NPV basis.

April 28, 2021

EPCOR Water Services Inc.
2022-2024 and 2022-2026 PBR Applications
(Utility Advisor) UA-EWSI-18

Question: **UA-EWSI-18**

Topic: **Drainage Business Cases**

Reference: **Appendix H**

Request: Very few of the presented business cases advance to the stage of preparing a financial analysis (NPV of revenue requirements) of viable alternatives. Please explain why there is such a scarcity of viable alternatives.

EWSI RESPONSE:

In its PBR business cases, EWSI presents financial analysis (on a NPV of revenue requirements basis) for any capital projects where the evaluation of the alternatives is dependent on costs. Of the 17 Drainage business cases included in the Drainage PBR Application, only one is for a capital project and the remaining 16 are for capital programs.

The one capital project is the CORe Duggan Tunnel Project. The business case for this project includes an NVP analysis as part of the financial evaluation of the alternatives (refer to section 4.2 of Appendix H-4 to the PBR Applications).

For capital programs, EWSI does not provide NPV analysis as part of the business cases as program costs are determined based on the unique program criteria and various risk assessments. As part of managing the costs within a capital program, EWSI may conduct NPV analysis of the various sub-projects within a capital program if required to determine the most cost-effective alternative sub-project.

Question: **UA-EWSI-19**

Topic: **Health and Environmental Regulations Risk**

Reference: **Appendix D Page 7**

Preamble: *EWSI states that it is faced with increasingly stringent health and/or environmental standards, resulting in additional capital investment in addition to process and reporting changes. As a regulated utility, EWSI is routinely granted approval to include the impact of additional capital costs and operating costs in revenue requirement. Unexpected health and/or environmental regulation changes are eligible for non routine adjustments. If EWSI follows good utility operating practice, the risk of breaching health and/or environmental standards is low.*

Request: What difficulty does EWSI experience regarding increased pressure on cash flow?

EWSI RESPONSE:

The central premise of the overall risk discussion in Appendix D is that EWSI experiences greater inherent risk compared to gas and electric utilities. As EWSI operates both drinking water and wastewaters systems, there is a need to meet both public health (drinking water quality) and environmental (air and water discharges) regulations. EWSI holds approvals under AEP in Alberta and is also regulated by Environment and Climate Change Canada. Increasingly stringent health or environmental standards was one of the risk factors noted as underlying this difference. It was also noted that this risk overlapped with that of the water as a consumable commodity risk. Gas and electric utilities' products are not consumable and therefore do not have the same level of risk as water, and correspondingly, the same level of regulatory oversight. As a result, a water utility has greater risk from these factors, as there is greater potential for unexpected changes irrespective of whether that risk is ultimately realized.

EWSI agrees that costs related to changes in health or environmental regulations can be incorporated into the revenue requirement, provided that they are known at the time of the application. This is not always the case. Further, EWSI also agrees that costs associated with unexpected health and/or environmental regulation are eligible for non-routine adjustment (if timing does not allow them to be included in a PBR application). However, there is not a reduced

financial threshold for these type of non-routine adjustments as they still must exceed $500,000 in annual revenue requirement impact. Depending on the type of assets and the associated depreciation rate, this financial threshold requires a capital expenditure of generally $15-23 million dollars in order to reach that revenue requirement. If that level is not reached, the expenditure does not qualify and EWSI must bear the cost of meeting the new health and environmental legislation without compensation (at least until the next PBR term).

Changes in environmental and health legislations not known at the time of the PBR application have been borne by EWSI at least until the next PBR application in the past (with the exception of the lead mitigation program whose financial requirements allowed a non-routine adjustment). Example of instances where EWSI has borne the cost, at least partially, include the following:

- AEP Edmonton water approval required the development and implementation of a wastewater treatment plant waste stream monitoring program. This program will require installation of monitoring equipment and requires a capital investment of $200 to $300 thousand (based on initial estimates).
- In the past several years EWSI has spent operating and capital dollars on management of odours at the Gold Bar WWTP. This is relatively new expectation on the part of the AEP as they have added air emissions clauses to the wastewater approval.
- Environment and Climate Change Canada enforcement of the federal fisheries act over the last 10 years has resulted in EWSI investing in dechlorination systems at Rossdale and EL Smith WTPs and additional operating costs for field dechlorination during planned and unplanned releases.
- On the wastewater side, EWSI is anticipating that it will need to meet total loading requirements set by the AEP Industrial Heartland Water Management framework at some point in the future. This may require EWSI to upgrade the WWTP or Drainage facilities. Timing is uncertain at this time, but will be post 2025.
- Also on the wastewater side, EWSI anticipates that AEP will add a total nitrogen limit on the Gold Bar effluent discharge. That may require a plant process upgrade.
- There is also a steady flow of emerging issues that might eventually result in regulation at some point that will have a financial impact. This includes the ever growing contamination list that includes things like pharmaceuticals and personal care products, endocrine disrupters, perfluoroalkyl substances (PFAS) and microplastics.

Each of these has, or will, impact EWSI's cash flow.

April 28, 2021

EPCOR Water Services Inc.
2022-2024 and 2022-2026 PBR Applications
(Utility Advisor) UA-EWSI-20

Question: **UA-EWSI-20**

Topic: **Revenue Risk**

Reference: **Appendix D Page 8**

Request: Why doesn't EWSI adjust their rates (fixed versus variable) to more closely reflect the cost of service, and therefore reduce revenue risk?

EWSI RESPONSE:

As stated in Appendix D, the appropriate rate structure is determined based on several considerations and is not simply based on the utility's cost of service. While rates are established to recover the utility's costs to provide services, the rate structure and design also achieves additional aims beyond simply collecting money. The principles and objectives of rate setting are set out in the following listing from the American Water Works Association M1 Principles of Water Rates, Fees and Charges, 7th Edition, page 4):

> *While recovery of the full revenue requirement in a fair and equitable manner is a key objective of a utility using a cost-of-service rate-making process, it is often not the only objective. The following list contains the typical objectives in establishing cost-based rates (Bonbright, Danielsen, and Kamerschen 1988):*
>
> - *Effectiveness in yielding total revenue requirements (full cost recovery)*
> - *Revenue stability and predictability*
> - *Stability and predictability of the rates themselves from unexpected or adverse changes*
> - *Promotion of efficient resource use (conservation and efficient use)*
> - *Fairness in the apportionment of total costs of service among the different ratepayers*
> - *Avoidance of undue discrimination (subsidies) within the rates*
> - *Dynamic efficiency in responding to changing supply-and-demand patterns*

- *Freedom from controversies as to proper interpretation of the rates*
- *Simple and easy to understand*
- *Simple to administer*
- *Legal and defendable*

EWSI continues to aim to balance all of these objectives. For example, there is a need to balance the somewhat conflicting goals of revenue stability achieved by having higher fixed rates with water conservation goals achieved by having lower fixed rates. The Stakeholder Engagement Report (page 20, Appendix K to the PBR Applications) indicates that water conservation is a key concern for EWSI's customers, with 49% of residential and 54% of commercial customers indicating they are "very concerned". Water conservation ranked 3rd in terms of highest customer concerns, behind concerns with flooding risk and with sewer backup. In 2007-2011 PBR, EWSI implemented a three tier inclining block structure for residential customer class to provide the price signals to further incent water conservation. EWSI's proposal to implement AMI meter reading may further promote water conservation.

Adjusting the rate structure to reflect EWSI's cost of service would mean shifting to approximately 80% fixed charges and 20% variable charges. This would remove any price signal for conservation based rates. This type of structure would also be well outside the range of fixed charge proportions of other water utilities based on EWSI's survey of ten communities in western Canada. The range of portion of fixed charges for these ten communities ranges from 0% to 46%. This survey was presented in Table 6 of EWSI's Report to Utility Committee "Performance Based Regulation Renewal Fixed/Variable Rate Analysis", dated December 3, 2020 (UA-EWSI-20_Attachment1).

While there is significant revenue risk to EWSI associated with having a very high portion of volumetric rates, EWSI considers that the proposed 9.95% return on equity provides fair compensation for this risk. As noted in Appendix D, the Alberta electric and gas utilities have a much higher portion of revenues from fixed charges (averaging 72% over the 2014-2019 period). Therefore, this additional revenue risk born by EWSI represents another additional risk factor that justifies the EWSI's proposed 1.83% equity risk premium over the AUC's generic cost of capital.

EPCOR Water Services Inc.

2022-2024 and 2022-2026 PBR Applications

UA-EWSI-20

Attachment 1

Report to Utility Committee
December 3, 2020

EPCOR WATER SERVICES INC.

Performance Based Regulation Renewal
Fixed/Variable Rate Analysis

TABLE OF CONTENTS

1.0 OVERVIEW

Since the approval of the 2017-2021 PBR application for EWSI (EPCOR Water Services Inc. - Water and Wastewater), Utility Committee has provided a number of motions and directions for items to be addressed either prior to, or within, the next application. In terms of the rate structure and design, the following was identified

> "That Administration work with EPCOR on the following: Possible changes to rate structures to deal with changes in volume."

Volume changes result both from the general long-term decline in water consumption driven by changes in technology and increased awareness of conservation as well as by weather related seasonal fluctuations. These volume changes can have a direct impact on the utility's revenue stability in both the short term by year over year weather related variances as well as over the longer term by the continued decline in water consumption. Ultimately, the longer-term financial performance of the utility can be challenged because the utility's costs are largely (over 80%) fixed and do not vary with consumption.

Most utilities across North America have addressed declining consumption with adjustments to the fixed/variable components of their rate structure as part of an overall rate strategy. While rates are primarily intended to recover the revenue requirement, rates structure and design are typically used to achieve additional aims beyond simply collecting money. There is a need to balance the somewhat conflicting goals of fixed and variable rates, in addition to other considerations. Higher levels of fixed rates provide an increased level of revenue stability for the utility and support its longer-term financial viability. Conversely, higher levels of variable charges are often used to incent conservation, particularly when combined with an inclining block structure to provide ratepayers an adequate price signal.

This paper will address one means to address consumption variability for EWSI's Water and Wastewater businesses and assess the associated impact on revenue stability and rates. The focus of the assessment will be confined to the fixed/ variable components of the rate structure and will ultimately conclude with changes that are contemplated for the upcoming PBR submission. Other mechanisms to address volume changes have not been addressed as they are seen as outside the overarching goals of the PBR structure. Specifically, deferral accounts can be used to pass all of the risk of consumption fluctuations to customers. This would result in annual rate adjustments for differences between actual and forecast consumption volumes. EWSI does not believe customers would support such a change in approach. Rate stability and predictability should continue to be maintained as they are key principles of the PBR as set out in the Water & Wastewater Bylaw.

Additional broader changes to the rate structures are also not currently planned for either Water or Wastewater (or Drainage) in the upcoming applications. As the total revenue requirement remains the same under any rate design scenario, alterations in rate structures and design typically entails forecasting consumption under alternative constructs such as customer classes or class sub-divisions, consumption tiers, etc. There are also challenges related to the resulting rate changes to any specific customer class when their ability to pay may be compromised (e.g. charging higher rates to the

commercial class), particularly in a time of increased rate sensitivity. The changes to historic consumption patterns driven by COVID and the accompanying economic downturn have increased the forecast risk that is borne by the utility, in a time when the forecast risk is already significantly high. In other words, there are already significant challenges in forecasting total revenue within the current customer's classes and rate tiers. That challenge would be increased if the classes were changed or volume tiers adjusted as part of a broad scale rate structured/design revision.

As a result of these considerations, rate structure and design changes are currently planned to be kept to a minimum across all three utilities. This will serve to mitigate some forecast risk in the application with the underlying intent of maintaining revenue forecasting accuracy. The current rate structure and design appear to be well accepted by ratepayers, and it is assumed that maintaining the status quo generally will not be met with concerns. Customer engagement research conducted to date bears this out.

2.0 BACKGROUND

EWSI's Fixed-Variable Split

EWSI's current Water and Wastewater fixed charges are designed to recover customer related costs including billing, meter and service related costs. The segregation of these costs to the fixed component of a customer's bill is a common practice across the water industry as these costs are not impacted by changes in the levels of consumption. Based on rates over the 2017 to 2021 PBR term, approximately 15% of Water's revenue is generated from the fixed service charge. Table 1 illustrates the percentage of fixed versus variable revenue by customer class for water.

Table 1
Water - Fixed vs Variable Revenue

Customer Class	Fixed	Variable
Residential	19.0%	81.0%
Multi-Res	4.7%	95.3%
Commercial	10.8%	89.2%
Total	**15.1%**	**84.9%**

Based on rates over the 2017 to 2021 PBR term, approximately 17% of Wastewater's revenue is generated from the fixed service charge as per Table 2. The percentage of fixed versus variable revenue varies significantly by Wastewater customer class. Unlike Water which uses an equivalent meter calculation to charge higher fixed rates to larger customers, Wastewater charges the same fixed charge to all customers which results in a lower fixed revenue percentage for the Multi-Residential and Commercial customer classes.

Table 2
Wastewater – Fixed vs. Variable Revenue*

Customer Class	Fixed	Variable
Residential	25.9%	74.1%
Multi-Res	1.2%	98.8%
Commercial	4.6%	95.4%
Total	**16.9%**	**83.1%**

* Does not include overstrength revenue.

The fixed variable split of revenue within Drainage is markedly different than either Water or Wastewater, owing to both the manner in which rates are determined as well as decisions made to increase the fixed component. As part of the City of Edmonton Drainage Services – 2013 Cost of Services Study prepared by Grant Thornton, the City of Edmonton updated the drainage rate structure to increase the fixed revenue component from 15% to 30%. Figure 1 is taken from the City of Edmonton Drainage Services – 2013 Cost of Services Study and provides some background on the City of Edmonton Drainage rate design.

Figure 1

> The 2011 Rate Study also found that the trend for utilities is to move to a higher fixed fee component, however very few have gone as far as 69% of revenues. Most utilities were targeting between 20% to 30% from fixed rate revenues. Given that the City's Sanitary Utility costs are highly fixed in nature compared to a utility with both conveyance and treatment, the higher end of the range (approximately 30%) was selected to be generated from fixed rate revenues. This represented doubling the 2011 proportion of 15%. Subsequent changes were made to the rate structure to achieve an approximate 30% contribution from fixed rate revenues and 70% from variable rate revenues.

Table 3, 4, and 5 provide a breakdown of fixed vs variable charges for EPCOR Drainage base on 2018-2019 actuals.

Table 3
Sanitary Fixed vs Variable Revenue

Customer Class	Fixed	Variable
Residential	41.7%	58.3%
Multi-Res	11.1%	88.9%
Commercial	19.8%	80.2%
Total	**32.0%**	**68.0%**

Table 4
Storm – Fixed vs Variable Revenue

Customer Class	Fixed	Variable
Residential	100.0%	0.0%
Multi-Res	100.0%	0.0%
Commercial	100.0%	0.0%
Total	**100.0%**	**0.0%**

Table 5
Total Drainage – Fixed vs Variable Revenue

Customer Class	Fixed	Variable
Residential	60.1%	39.9%
Multi-Res	25.3%	74.7%
Commercial	58.9%	41.1%
Total	**55.5%**	**44.5%**

Storm rates are based on fixed factors and do not have any consumption based determinants. As a result, the total drainage fixed percentage is 56%. Sanitary rates, which are determined by both fixed and consumption based determinants generate fixed revenue at approximately double the level seen in either Water or Wastewater.

Bill Comparison

Table 6 provides a comparison of residential water bills for 10 communities in western Canada. Bills have been calculated using each community's 2019 water rates and 15m^3 of consumption. All communities with the exception of Spruce Grove and Sherwood Park have a higher fixed service charge percentage than EWSI's Water utility. On average, for communities with a higher fixed service charge than EWSI's Water utility, the fixed service charges make up 37% of their bills versus 17% for EWSI. Overall, the average fixed portion for all communities is 30%.

Table 6
2019 Average Residential Comparison (15m^3)

Municipality	Fixed	Variable	Total Bill	Fixed Percentage
Spruce Grove	-	51.53	51.53	0%
Sherwood Park	5.36	38.25	43.61	12%
Edmonton	**6.63**	**31.87**	**38.50**	**17%**
Vancouver	8.25	17.98	26.23	31%
Sturgeon County	21.00	45.75	66.75	31%
Saskatoon	11.89	23.18	35.07	34%
Winnipeg	16.50	27.30	43.80	38%
Calgary	15.36	24.00	39.36	39%
St Albert	16.33	25.05	41.38	39%
Regina	24.90	29.70	54.60	46%

Bill comparisons for Wastewater have not been developed as they are not informative. Unlike water services which are relatively consistent among cities and communities, the nature and extent of wastewater treatment vary significantly across cities and communities. Differences in wastewater treatment processes, the inclusion of certain services in property taxes, and geographic and climatic factors impact the comparability of rates.

Revenue Stability

Higher fixed rates are often introduced to address issues of revenue stability. Most utilities who do so are seeking to address the impact of declining water use and seasonal driven fluctuations in water demand on their financial stability. Increasing the fixed service charge helps to reduce the impact of both consumption and customer count variance on revenue.

EWSI Water is forecasting a revenue variance of approximately $50M in the current 2017-2021 PBR term, as illustrated in Table 7.

Table 7
Water PBR Revenue by Customer Class ($ Millions)

Driver	Residential	Multi-Res	Commercial	Total
Non-Routine Adjustments	(4.1)	(0.3)	(0.8)	(5.1)
Inflation	(15.5)	(3.9)	(4.6)	(23.9)
Consumption/Count	6.2	(7.3)	(19.3)	(20.4)
Total	**(13.4)**	**(11.4)**	**(24.6)**	**(49.4)**

EWSI Wastewater is forecasting a revenue variance of approximately $26M in the current PBR term as seen in Table 8.

Table 8
Wastewater PBR Revenue by Customer Class ($ Millions)

Driver	Residential	Multi-Res	Commercial	Total
Non-Routine Adjustments	(3.86)	(0.06)	(0.25)	(4.16)
Inflation	(6.40)	(1.85)	(2.20)	(10.45)
Consumption/Count	4.04	(4.62)	(11.12)	(11.69)
Total	**(6.22)**	**(6.52)**	**(13.57)**	**(26.31)**

Theses variances are largely attributable to lower than forecast inflation adjustments and lower than forecast consumption. The long-term declines in water consumption are forecast as part of the PBR application, so these variances do not contribute significantly to the variances illustrated above (except for variances from the initial forecast). A large portion of the consumption variance noted in these tables is likely attributable to seasonal fluctuations. As noted in the PBR Performance reports, residential consumption in 2019 has been negatively impacted by high precipitation in the summer months. A similar trend has also impacted 2020, in addition to the changes in consumption driven by COVID.

Revenue Requirement Composition

The ability of a utility (or any business) to absorb revenue variations is dependent upon the degree to which the underlying costs can be adjusted to offset changes in revenue. As capital-intensive businesses with high level of fixed costs, most utilities cannot adequately adjust their costs to meet revenue variations, at least in the short tem.

Not unlike other utilities, EWSI's Water and Wastewater revenue requirements are comprised of predominantly fixed components in the respect that they do not increase or decrease with the volume of water produced/treated in a year. Tables 9 and 10 below are based on the recent 2019 PBR Progress Report and detail the major components of the respective revenue requirements. As noted, of Water's $186 million revenue requirement, 85% or $158 million is fixed. For Wastewater treatment 86% or $80 million is fixed of the $92 million revenue requirement,

Table 9
Water 2019 Revenue Requirement ($ Millions)

Item	$		%
Fixed			
Operating Expenses (Total System)			
Staff, Contractors, Vehicles & Supplies	50.90		
Billing, Meters and Customer Service	10.40		
EWSI Shared Services	12.00		
Corporate Shared Services	12.10		
Franchise Fees Fixed & Property Taxes	2.40		
Total Operating Expenses	87.80		
In City Share at 81.4%		71.47	38.5%
Other Revenue		-5.50	-3.0%
Depreciation and Amortization		28.40	15.3%
Return on Rate Base Financed by Equity		34.40	18.5%
Return on Rate Base Financed by Debt		29.00	15.6%
Total		157.77	84.9%
Variable - Total System			
Power and Other Utilities	10.30		
Chemicals	11.70		
Franchise Fees Variable	12.50		
Total	34.50		
In City Share at81.4%		28.08	15.1%
In-City Total		185.85	100.0%

Table 10
Wastewater 2019 Revenue Requirement ($ Millions)

Item	$	%
Fixed		
Operating Expenses (Total System)		
Staff, Contractors, Vehicles & Supplies	20.50	
Billing, Meters and Customer Service	7.10	
EWSI Shared Services	4.30	
Corporate Shared Services	4.00	
Franchise Fees Fixed & Property Taxes	1.82	
Total Operating Expenses	37.72	41.0%
Other Revenue	-6.90	-7.5%
Depreciation and Amortization	18.00	19.5%
Return on Rate Base Financed by Equity	11.50	12.5%
Return on Rate Base Financed by Debt	19.30	21.0%
Total	79.62	86.4%
Variable - Total System		
Power and Other Utilities	5.30	
Chemicals	1.20	
Franchise Fees Variable	5.98	
Total	12.48	13.6%
In-City Total	92.10	100.0%

The high level of fixed costs is attributable to both the high level of capital assets in each business (seen in the revenue requirements as depreciation, amortization, interest and return on equity) as well as a high level of staff related costs in the O&M expenses. Water's revenue requirement contains a limited number of major cost categories that vary based on the amount of water produced:

- Power - Based on historical data the number of Mega Watt hours (MWH) consumed in a given year can vary up to 5,000 MWH between a year with high and low production (pumping costs). Under Water's current power contract, this increase in consumption can increase costs by approximately $0.5M in a given year.

- Franchise Fee – Franchise fees are calculated based on a percentage of revenue Water (and Wastewater) earns within the City of Edmonton. As the majority of the revenue is variable (consumption based), approximately 85% of franchise fees can be considered variable.

- Chemicals – The costs for chemical used in the water treatment process are normally assumed to vary with the volume of water treated and are categorized as variable in the analysis above. However, based on high-level observations it appears this may not always be the case. Over the 2007 to 2019 period, the average chemical costs are actually higher in years with lower consumption. Lower consumption is directly related to increased precipitation, which also causes increased run-off into the river. Ultimately, higher use of chemicals is required to

address the lower river quality that results when this occurs. Chemicals are also impacted by changes in the commodity prices as well as foreign exchange as many are sourced from the US. The combination of these factors complicate attributing chemical price changes to a single source.

From a wastewater perspective, power is the largest variable cost as it is required to operate the plant. Chemicals have a lower impact given there are fewer chemicals required in the wastewater treatment process.

Overall, EWSI's Water and Wastewater business are predominantly fixed and the cost structure vary little with changes in revenue.

3.0 ANALYSIS

The preceding background illustrates that EWSI's Water and Wastewater percentage of revenue generated by fixed charges is out of alignment with both drainage and the majority of surrounding communities. Moreover, as EWSI is experiencing issues with revenue stability, and argument can be made that the fixed charges should be increased. The following analysis identifies the impact on the ratepayers and the utility's revenue if fixed charges were to be increased. This analysis has been completed based on two scenarios:

1. **20% Fixed Revenue** – In this scenario, the fixed fee for all classes were increased uniformly until Water and Wastewater's fixed revenue averages 20.0% across the customer classes. This scenario requires a 35% increase to the fixed service charges for Water ratepayers and a 19% increase for Wastewater ratepayers for all customer classes. There was also a corresponding decrease in variable charges.

2. **25% Fixed Revenue** – In this scenario, the fixed fee for all classes were increased uniformly until Water and Wastewater fixed revenue averages 25.0% across the customer classes. This scenario requires a 70% increase to the fixed service charge for Water users and a 52% increase for Wastewater uses for all customer classes. There was also a corresponding decrease in variable charges.

Scenario Summary

Table 11 and 12 summarize the changes that were made to the fixed charges for Water under the two scenarios that were analyzed.

Table 11
Water - Fixed Revenue by Class

Customer Class	Current Rates	Scenario 1 20% Fixed	Scenario 2 25% Fixed
Residential	19.5%	25.8%	32.2%
Multi-Res	4.6%	6.1%	7.6%
Commercial	10.4%	13.9%	17.4%
Total	**15.1%**	**20.0%**	**25.0%**

Table 12
Water - Fixed Rate Increases

Customer Class	Current Rates	Scenario 1 20% Fixed	Scenario 2 25% Fixed
Residential	N/A	35.0%	70.0%
Multi-Res	N/A	35.0%	70.0%
Commercial	N/A	35.0%	70.0%

Table 13 and 14 present the same information except for Wastewater Treatment.

Table 13
Wastewater - Fixed Revenue by Class

	Current Rates	Scenario 1 20% Fixed	Scenario 2 25% Fixed
Residential	25.9%	29.9%	36.4%
Multi-Res	1.2%	1.5%	2.0%
Commercial	4.6%	5.6%	7.3%
Total	16.9%	20.0%	25.0%

Table 14
Wastewater - Fixed Rate Increase

	Current Rates	Scenario 1 20% Fixed	Scenario 2 25% Fixed
Residential	N/A	19.0%	52.0%
Multi-Res	N/A	19.0%	52.0%
Commercial	N/A	19.0%	52.0%

Assumptions

The following assumption were used in the analysis:

- The analysis was based on the 2017-2021 PBR application using both actual/forecast results.
- The increase to the fixed service charge was applied as a onetime increase to 2017 rates.
- Any increase to the fixed service charge results in a decrease to variable rates.

- Using the original 2017 to 2021 PBR rates model, 2017 variable rates were reduced to ensure the total revenue collected by customer class over the PBR term did not change. (Residential $621.8 million, Multi-Residential $165.3Million, Commercial $213.5 Million)

Results - Revenue Stability

Tables 15 and 16 summarize the consumption and customer count variance in the current PBR term for each of the scenarios for water and wastewater respectively. Increasing the fixed service charge would slightly decrease the impact that seasonal variability has on EWSI's revenue. Over the 2017 to 2021 PBR, EWSI would have collected between $1.4 to $2.8 million more revenue in water and $0.5 to $1.5 million more in wastewater if the fixed service charge had been increased as per the scenarios.

Table 15
Water - Fixed Revenue Increase

	Current Rates	Scenario 1 20% Fixed	Scenario 2 25% Fixed
Residential	6.2	6.1	6.0
Multi-Res	(7.3)	(7.1)	(6.9)
Commercial	(19.3)	(18.0)	(16.7)
Total Variance	**(20.4)**	**(19.0)**	**(17.6)**
Additional Revenue	**-**	**1.4**	**2.8**

Table 16
Wastewater - Fixed Revenue Increase

	Current Rates	Scenario 1 20% Fixed	Scenario 2 25% Fixed
Residential	4.0	3.9	3.7
Multi-Res	(4.6)	(4.4)	(4.0)
Commercial	(11.1)	(10.7)	(9.9)
Total Variance	**(11.7)**	**(11.1)**	**(10.2)**
Additional Revenue	**-**	**0.5**	**1.5**

Increasing the fixed charge would also have an impact on the rebasing adjustment. Effectively, an increase in fixed charges decreases the rebased adjustment as the effects of declining consumption are offset, at least partially.

Results - Residential Bill Impact

Table 17 summarizes the average monthly residential bill impacts for the two scenarios analyzed for Water. A negative amount represents a reduction in the average bill. Increasing the fixed service charge would have had minimal impact to average consumption customer (14m^3 to 16m^3), but the fixed increase would have increase the average bill of lower consumption users and decrease the average bill of high volume users.

Table 17
Water - Monthly Residential Bill Impact (15mm Meter)
($)

Consumption	Current Rates	Scenario 1 20% Fixed	Scenario 2 25% Fixed
Low (5m^3)	N/A	1.71	3.42
Medium (15m^3)	N/A	0.01	0.02
High (40m^3)	N/A	(4.66)	(9.33)
Fixed Portion of 15m^3 Bill	18%	25%	31%

Table 18 summarizes the average monthly residential bill impacts for the two scenarios analyzed for Wastewater. The results demonstrate the same general trends as with Water but with a slightly lower rate increase.

Table 18
Wastewater - Monthly Residential Bill Impact (15mm Meter)
($)

Consumption	Current Rates	Scenario 1 20% Fixed	Scenario 2 25% Fixed
Low (5m^3)	N/A	0.70	1.87
Medium (15m^3)	N/A	0.35	0.95
High (40m^3)	N/A	(0.50)	(1.35)
Fixed Portion of 15m^3 Bill	24.8%	28.9%	35.5%

Results - Multi-Residential Bill Impact

Table 19 and 20 summarizes the average monthly multi-residential bill impacts for the scenarios for Water and Wastewater respectively.

Table 19
Water - Monthly Multi-Residential Bill Impact (50mm Meter)
($)

	Current Rates	Scenario 1 20% Fixed	Scenario 2 25% Fixed
Low (50m^3)	N/A	18.74	37.47
Medium (500m^3)	N/A	6.84	13.67
Medium (2,000m^3)	N/A	(27.49)	(54.97)
High (4,000m^3)	N/A	(70.25)	(140.51)
Fixed Portion of 500m^3 Bill	6%	8%	11%

Table 20
Wastewater - Monthly Multi-Residential Bill Impact (50mm Meter)
($)

	Current Rates	Scenario 1 20% Fixed	Scenario 2 25% Fixed
Low (50m^3)	N/A	(0.85)	(2.27)
Medium (500m^3)	N/A	(16.29)	(43.65)
Medium (2,000m^3)	N/A	(67.75)	(181.59)
High (4,000m^3)	N/A	(136.36)	(365.50)
Fixed Portion of 500m^3 Bill	1.0%	1.2%	1.6%

Similar to the residential class, increasing the fixed service charge increases the average bill of lower consumption users and decreases the average bill of high volume users. Wastewater uses the same fixed and variable rates for all customer classes. As a result all customers that use more than 25m^3 see a bill reduction and customers that use less 25m^3 see a bill increase. In Table 20, all customers shown use more the 25m^3 resulting in the negative amounts for all customers in the table.

Results - Commercial Bill Impact

Table 21 and 22 summarizes the average monthly commercial bill impacts under the scenarios for water and wastewater respectively.

Table 21
Water - Commercial Bill Impact ($)

Consumption	Meter Size	Current Rates	Scenario 1 20% Fixed	Scenario 2 25% Fixed
10 m^3	15mm	N/A	1.90	3.80
50 m^3	15mm	N/A	(0.59)	(1.18)
50 m^3	25mm	N/A	3.21	6.42
500 m^3	25mm	N/A	(24.82)	(49.64)
100 m^3	40mm	N/A	6.43	12.86
500 m^3	40mm	N/A	(18.48)	(36.96)
500 m^3	80mm	N/A	6.87	13.75
3,000 m^3	80mm	N/A	(110.83)	(221.66)
20,000 m^3	150mm	N/A	(661.97)	(1,323.95)
50,000 m^3	150mm	N/A	(1,759.77)	(3,519.54)

Table 22
Wastewater - Commercial Bill Impact ($)

Consumption	Meter Size	Scenario 1 20% Fixed	Scenario 2 25% Fixed
10 m^3	N/A	0.42	1.13
50 m^3	N/A	(0.68)	(1.82)
100 m^3	N/A	(2.06)	(5.52)
500 m^3	N/A	(13.08)	(35.06)
3,000 m^3	N/A	(81.96)	(219.68)
20,000 m^3	N/A	(487.98)	(1,307.99)
50,000 m^3	N/A	(1,127.46)	(3,022.06)

As with the residential and multi-residential customer class, increasing the fixed service charge would increase the average bill of lower consumption users and decrease the average bill of high volume users. Over the 5 year PBR term smaller commercial customers (approximately 12,000 customers or 61% of the customers) could expect to pay between $115 and $315 more while the largest customers could see savings between $100K and $300K over the 5 year term.

4.0 CONCLUSION

As noted at the outset, there is a need to balance the somewhat conflicting goals of fixed/variable rates splits. Higher levels of fixed rates provide an increased level of revenue stability for the utility and support its longer-term financial viability. Minimizing fixed charges supports the goal of water affordability, particularly for low-income ratepayers. Higher levels of variable charges are also used to incent conservation, particularly when combined with an inclining block structure to provide ratepayers an adequate price signal.

Based on the preceding analysis, EWSI's Water and Wastewater have a lower fixed component of revenue than comparable communities. The planned approach of increasing the fixed service charge to the average 25% level in the upcoming PBR application would decrease the season variability in revenue. This level of increase is seen as having minimal impact to residential medium/average consumption customers (14m^3 to 16m^3) and would decreases variability on customers bills (similar bill month to month). Cost of Service principles would also imply that charging higher fixed charges to the lower volume customers is a better reflection of the cost of providing service to those customers given the large majority of the cost is fixed. Lastly, as both water and wastewater would remain at relatively low fixed rates, the impact on conservation programs is seen as very limited.

April 28, 2021

EPCOR Water Services Inc.
2022-2024 and 2022-2026 PBR Applications
(Utility Advisor) UA-EWSI-21

Question: **UA-EWSI-21**

Topic: **Determination of Return of Equity Risk**

Reference: **Appendix D Page 12**

Preamble: *EWSI states that fixing the rate of return on equity for the duration of a PBR increase risk.*

Request: Would EWSI consider adjusting their rate of return on equity based on the AUC's generic cost of capital proceedings, resulting in lower risk to EWSI?

EWSI RESPONSE:

No.

EWSI considers that it should continue to bear the risk of fluctuations in the cost of equity. As with all other components of the PBR forecasts, with the exception of qualifying Non-Routine Adjustments, EWSI's PBR framework ensures that the forecast risk is borne by EWSI and not its customers. The risks associated with forecasting all components of the revenue requirement, including all operating and capital costs and costs of debt and equity, are borne by EWSI. This approach ensures that rates charged to customers remain stable and predictable throughout the PBR term and do not require annual rate adjustments to pass cost variances to customers. Rate stability and predictability is an important principle of rate setting noted by the American Water Works Association and other rate setting guidelines (AWWA Principles of Water Rate Setting M1 Manual). This PBR framework has been in place for EWSI's water operations since 2002 when the PBR was first established. EWSI considers that this PBR framework provides a reasonable and straightforward approach and has been successful for both EWSI's customers and the utility.

Additional perspective on this question is available in EWSI's Response to COE-EWSI-1d and its response to GT-EWSI-16.