



Appendix O1

EPCOR WATER SERVICES INC.

**Water Services
Lead-Lag Study**

February 16, 2021

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1.0 INTRODUCTION

1. This lead-lag study has been undertaken to support the necessary working capital allowance for EPCOR Water Services Inc. (EWSI) for the 2022 to 2026 PBR filing with the City of Edmonton. A lead-lag study recognizes the timing differences between EWSI's provision of a service and payment, (revenue lag), and the timing differences between when an expense is incurred and subsequently paid, (expense lag). The net lag for an expense category is the difference between the associated revenue lag and the expense lag.

2. Lags are derived from analysis of each revenue and expenses stream and are broken down into their individual components in order to more precisely determine the total lag. EWSI's revenues are derived from fixed and metered charges for residential, multi-residential, commercial and regional customers, and other sources. Since revenue cycles and the lead periods for each are not significantly different, they are considered together. Operating expenses are broken down into labour, salary and benefits, incentives, general expenses, property taxes, parent charges and franchise fees. An overall operating expense lag is then calculated on a weighted average and netted against the appropriate revenues. Net lags are also calculated for GST and individual capital expenses including debt interest, retained earnings, dividends, and depreciation.

3. The working capital ratio (net lag/365) is then applied against the corresponding expense amount in order to determine the portion of necessary working capital related to each component.

4. Lags are made up of two general components: consumption and payment.

- Consumption lag is the lag between when a service is provided or good consumed and the end of a consumption period. For example, if a service is billed on a weekly basis, the consumption period is a week and the consumption lag would vary between zero and seven days, depending on when the service was provided. As it is generally assumed that consumption occurs evenly over the consumption period, the mid-point of a consumption period is used to determine the consumption lag. In a weekly consumption period, the consumption lag would be 3.5 days (7/2) or in a monthly consumption period with 30 days the consumption lag would be 15 days (30/2).
- Payment lag is the time between the end of the consumption period and the receipt of cash. The payment lag sometimes includes a processing lag, which is time required

to receive, process, and issue the order to proceed, however this is not always considered separately from the payment lag. The payment lag is also measured in days and is the length between the last day of the consumption period and payment issue.

5. The lead-lag methodology used in this report is consistent with public lead-lag studies completed for Hydro One Networks Inc., AltaLink, and Atco Gas among others. In addition, despite some changes in the assumptions, the underlying methodology is consistent with the principles applied in EDTI's 2020-2022 Transmission General Tariff Application with respect to necessary working capital. See further discussion in the Study Results section.

2.0 EXECUTIVE SUMMARY

6. The overall impact of the lead-lag study using 2019, 2018, 2017 and 2016 actual financial results are shown in Table 2.0-1.

Table 2.0-1
Summary of Necessary Working Capital
(\$ thousands)

	2019			2018			2017			2016		
	A Actual	B Ratio	C Working Cap	D Actual	E Ratio	F Working Cap	G Actual	H Ratio	I Working Cap	J Actual	K Ratio	L Working Cap
1 Operating Expense, net of revenue offsets	115,792	5.0 %	5,844	112,592	4.9 %	5,570	113,273	5.5 %	6,258	110,858	5.0 %	5,553
2 Depreciation	36,162	13.9 %	5,044	34,236	13.6 %	4,654	32,610	14.3 %	4,669	27,911	14.1 %	3,948
3 Retained Earnings	43,369	13.9 %	6,049	49,947	13.6 %	6,790	45,248	14.3 %	6,479	46,558	14.1 %	6,585
4 Dividends	15,000	(50.0 %)	(7,500)	20,000	(50.0 %)	(10,000)	20,000	(50.0 %)	(10,000)	31,500	(50.1 %)	(15,793)
5 Interest Expense	34,671	9.3 %	3,239	33,477	10.0 %	3,364	32,021	12.0 %	3,847	31,070	12.9 %	4,008
6 GST Collection	62	1.4 %	1	50	1.1 %	1	45	1.8 %	1	27	1.6 %	0
7 GST Input Tax Credit	6,835	5.8 %	393	5,935	5.8 %	341	6,114	5.8 %	352	5,537	5.8 %	319
8 Necessary Working Capital			13,070			10,721			11,606			4,619

7. The ratios used to determine EWSI's necessary working capital requirements reflect the revenue and expense lags as shown in Tables 2.0-2 to 2.0-5.

Table 2.0-2
Summary of Lags and Working Capital Ratio – 2019
(days)

	A	B	C	D
	Revenue	Expense	Net	Ratio
1 Metered	50.9	32.5	18.4	5.0 %
2 Fixed	50.9	32.5	18.4	5.0 %
3 Regional	50.9	32.5	18.4	5.0 %
4 Fire & Miscellaneous	50.9	32.5	18.4	5.0 %
5 GST Collection	50.9	45.6	5.3	1.4 %
6 GST Input Tax Credit	66.6	45.6	21.0	5.8 %
Capital Expenses	Revenue	Expense	Net	Ratio
7 Debt interest	50.9	16.8	34.1	9.3 %
8 Retained Earnings	50.9	-	50.9	13.9 %
9 Dividends	-	182.5	(182.5)	(50.0 %)
10 Depreciation	50.9	-	50.9	13.9 %

Table 2.0-3
Summary of Lags and Working Capital Ratio – 2018
(days)

	A	B	C	D
	Revenue	Expense	Net	Ratio
1 Metered	49.6	31.6	18.1	4.9 %
2 Fixed	49.6	31.6	18.1	4.9 %
3 Regional	49.6	31.6	18.1	4.9 %
4 Fire & Miscellaneous	49.6	31.6	18.1	4.9 %
5 GST Collection	49.6	45.6	4.0	1.1 %
6 GST Input Tax Credit	66.6	45.6	21.0	5.8 %
Capital Expenses	Revenue	Expense	Net	Ratio
7 Debt interest	49.6	12.9	36.7	10.0 %
8 Retained Earnings	49.6	-	49.6	13.6 %
9 Dividends	-	182.5	(182.5)	(50.0 %)
10 Depreciation	49.6	-	49.6	13.6 %

Table 2.0-4
Summary of Lags and Working Capital Ratio – 2017
(days)

	A	B	C	D
	Revenue	Expense	Net	Ratio
1 Metered	52.3	32.1	20.2	5.5 %
2 Fixed	52.3	32.1	20.2	5.5 %
3 Regional	52.3	32.1	20.2	5.5 %
4 Fire & Miscellaneous	52.3	32.1	20.2	5.5 %
5 GST Collection	52.3	45.6	6.6	1.8 %
6 GST Input Tax Credit	66.6	45.6	21.0	5.8 %
Capital Expenses	Revenue	Expense	Net	Ratio
7 Debt interest	52.3	8.4	43.9	12.0 %
8 Retained Earnings	52.3	-	52.3	14.3 %
9 Dividends	-	182.5	(182.5)	(50.0 %)
10 Depreciation	52.3	-	52.3	14.3 %

Table 2.0-5
Summary of Lags and Working Capital Ratio – 2016
(days)

	A	B	C	D
	Revenue	Expense	Net	Ratio
1 Metered	51.6	33.3	18.3	5.0 %
2 Fixed	51.6	33.3	18.3	5.0 %
3 Regional	51.6	33.3	18.3	5.0 %
4 Fire & Miscellaneous	51.6	33.3	18.3	5.0 %
5 GST Collection	51.6	45.8	5.9	1.6 %
6 GST Input Tax Credit	66.8	45.8	21.0	5.8 %
Capital Expenses	Revenue	Expense	Net	Ratio
7 Debt interest	51.6	4.5	47.1	12.9 %
8 Retained Earnings	51.6	-	51.6	14.1 %
9 Dividends	-	183.0	(183.0)	(50.1 %)
10 Depreciation	51.6	-	51.6	14.1 %

8. Working capital lags between 2016 and 2019 have remained relatively consistent, with the changes in revenue lags attributable to changes in customer payment lag (account receivable balance). Changes in expense lags are primarily attributable to changes in the levels of incentives, which are paid annually in arrears, and decreases in the net lag for debt interest, reflecting debt issuances in the latter part of each year and interest payments shifting to mid-year, decreasing the overall debt interest expense lag.

3.0 REVENUE

9. The revenue lag is the measure of time from consumption or provision of a service by EWSI to the receipt of payment from the customer. All of EWSI's revenue streams, including:

metered, fixed and regional water revenues; fire protection and other revenues derived from water connections, water permits, temporary water services, service charges and various miscellaneous revenues, are subject to the same billing and payment cycles. Therefore, since these revenues are all billed in the same manner and are based on the same payment and consumption schedules, the lag period is similar for each revenue function and will not be considered separately for purposes of this report.

10. The revenue lag calculation considers several key components. Each has been broken down for clarity in understanding.

3.1 Average Consumption Period Lag

11. In order to determine the average lag for each consumption period, an average consumption period between meter readings must be determined. Each site is billed once per month, or 12 times per year. Given 365 days in 1 year, the average consumption period billed is calculated to be 30.42 days (365 divided by 12). EWSI has used the mid-point of the average consumption period billed as the consumption period lag. (30.4 days divided by 2 = 15.2 days).

3.2 Average Tariff Bill File Publish Lag and Invoice Lag

12. EWSI publishes each billing cycle exactly 6 business days after the scheduled reading date. This is in accordance with performance requirements as specified in section 2.14 of the Tariff Billing Code. Due to the fact that meter reading operations and billing cycles are performed on a business day schedule, the actual calendar day lag is 8 days for 4 (Tuesday – Friday) of the 5 cycles billed in a week and 10 days for the tariff files published on Mondays due to an extra weekend coming into play. These dates are summarized in Table 3.2-1.

Table 3.2-1
Tariff Bill File Publish Lag and Invoice Lag
(days)

	A	B	C	D	E	
Bill Cycle	Meter Reading	Tariff Bill File Publish	Billing	TBF Lag	Invoice Lag	
1	1	Friday	Monday	Wednesday	10.0	2.0
2	2	Monday	Tuesday	Thursday	8.0	2.0
3	3	Tuesday	Wednesday	Friday	8.0	2.0
4	4	Wednesday	Thursday	Monday	8.0	4.0
5	5	Thursday	Friday	Tuesday	8.0	4.0
6			Average	8.4	2.8	

13. These lags are unchanged from EWSI's 2016 Lead-Lag Study, which is as expected since the billing schedule is also unchanged.

3.3 Customer Payment Lags

14. Payment is due from customer 21 days after the invoice date. Analysis of year end accounts receivable showed collections lags of 25.2 days in 2016, 25.9 days in 2017, 23.2 days in 2018 and 24.5 days in 2019.

15. The overall revenue lags for EWSI revenues are summarized in Table 3.3-1.

Table 3.3-1
Revenue Lag Summary
(days)

	A	B	C	D
	2019	2018	2017	2016
1 Consumption period mid-point	15.21	15.21	15.21	15.25
2 TBF Publish lag	8.40	8.40	8.40	8.40
3 Invoicing lag	2.80	2.80	2.80	2.80
4 Customer payment	24.50	23.21	25.85	25.17
5 Total	50.91	49.62	52.26	51.62

16. As most expense lags are netted against these revenue lags to determine the corresponding working capital ratios and requirements, revenue lags play a significant role in the determination of EWSI's overall working capital requirement.

4.0 EXPENSES

17. EWSI examined operating expenses by breaking them down into the categories of labour, salary and benefits, incentive, property taxes, franchise fees, parent charges (inter-company allocations) and general operating expenses. The total operating expense lag is calculated by taking the weighted average of these components on a yearly basis.

4.1 Labour, Salary and Benefits

18. Labour expense is comprised of salary and benefits, including remittances to CRA, Sun Life and other employee benefit and withholding categories. The total labour and benefits lag is calculated using the weighted average of all expenses types (incentive is calculated separately). Contractor fees are included in general operating expense as they are paid through the general accounts payable cheque runs.

19. The individual labour and benefit lag for EWSI was essentially unchanged between 2016 and 2019, which is as expected. The overall lag remained relatively flat from the 2016 lead lag study.

20. Components of the labour lag other than salaries, overtime and wages are based on lag times and weightings calculated by EUI's Payroll department for EPCOR as a whole. These weighting reflect the fact that these payments are processed centrally for all EPCOR subsidiaries, so the lag times will not differ between the various EPCOR subsidiaries, including EWSI. In addition, the weighting of categories within labour and benefits is comparable between areas.

4.2 Incentive Payments

21. Employee incentives are categorized separately from other operating costs as they have a longer payment lag of approximately 290 days compared to 46 days for other operating costs and only 16-17 days for other labour costs. Employee incentives are paid annually in the second pay period of April for the previous fiscal year, resulting in a consumption lag of 182 days and a payment lag of 111 days in 2016, 110 days in 2017, and 108 days in 2018, and 2019. Total lags for incentives were 293.5 days in 2016, 292 days in 2017 and 290 days for 2018 and 2019.

4.3 Property and Business Taxes

22. Property taxes are due June 30 for the current fiscal year, halfway through the consumption period. Accordingly, the property tax lead is 1 day for 2016 and 1.5 days for 2017 to 2019. Business taxes are paid March 31, so the expense lag for business taxes is 92.0 days for 2016 and 92.5 days for 2017 to 2019. Total weighted lead for property and business taxes are 4.0 days 2016, 4.5 days in 2017, 4.7 days in 2015 and 3.8 days in 2019.

4.4 Franchise Fees

23. Franchise fees are paid monthly to municipalities; EPCOR pays these bills in the same fashion as the general operating expenses discussed below. It is therefore assumed that the lag period is the same as general operating expenses of 45.8 days in 2016 and 45.6 days in 2017, 2018, and 2019.

4.5 Parent Charges

24. EPCOR Corporate or "Parent" charges are categorized separately from other operating costs such as material costs and contractor costs as they have a shorter payment lag. Parent

charges are allocated from corporate on a monthly basis therefore the lag is the average monthly consumption period of 15.0 days compared to 45.6 days for other operating costs.

4.6 General Operating Expenses

25. A majority of EPCOR's general operating expenses are paid within 30 days of receiving the invoice; therefore, assuming expenses are incurred evenly over a month, the average consumption period is approximately 15 days. Assuming all expenses incurred in the month are paid at the end of the next month, the total lag for general operating expenses is 45.8 days in 2016, and 45.6 days in each of 2017, 2018, and 2019.

26. Net lags for revenues and expenses are summarized in Tables 4.6-1 to 4.6-4.

Table 4.6-1
Net Lag (Lead) for Revenues and Expenses – 2019
(\$ thousands)

	A	B	C	D
	Amount	Percentage	Lag days	Weighted Days
REVENUE				
1 Metered	159,262	67.3%	50.9	34.2
2 Fixed	26,588	11.2%	50.9	5.7
3 Regional	31,616	13.4%	50.9	6.8
4 Fire & Miscellaneous	19,301	8.2%	50.9	4.2
5 Subtotal	236,767	100%		50.9
6 NET REVENUE LAG				50.9
EXPENDITURES				
7 Labour, salaries & benefits	45,448	37.5%	16.6	6.2
8 Incentive	2,323	1.9%	290.0	5.6
9 Other operating expenses	46,051	38.0%	45.6	17.3
10 Parent charges	12,504	10.3%	15.0	1.5
11 Property tax	241	0.2%	(3.8)	(0.0)
12 Franchise fees	14,663	12.1%	15.2	1.8
13 Subtotal	121,230	100%		32.5
14 NET EXPENSE LAG				32.5
15 Net Lag (Lead) For Receipts & Payments 2019				18.4

Table 4.6-2
Net Lag (Lead) for Revenues and Expenses – 2018
(\$ thousands)

	A	B	C	D
	Amount	Percentage	Lag days	Weighted Days
REVENUE				
1 Metered	160,770	67.8%	49.6	33.7
2 Fixed	26,394	11.1%	49.6	5.5
3 Regional	30,927	13.0%	49.6	6.5
4 Fire & Miscellaneous	18,942	8.0%	49.6	4.0
5 Subtotal	237,034	100%		49.6
6 NET REVENUE LAG				49.6
EXPENDITURES				
7 Labour, salaries & benefits	45,445	38.5%	16.7	6.4
8 Incentive	2,045	1.7%	290.0	5.0
9 Other operating expenses	43,040	36.5%	45.6	16.6
10 Parent charges	12,427	10.5%	15.0	1.6
11 Property tax	241	0.2%	(4.7)	(0.0)
12 Franchise fees	14,770	12.5%	15.2	1.9
13 Subtotal	117,969	100%		31.6
14 NET EXPENSE LAG				31.6
15 Net Lag (Lead) For Receipts & Payments 2018				18.1

Table 4.6-3
Net Lag (Lead) for Revenues and Expenses – 2017
(\$ thousands)

	A	B	C	D
	Amount	Percentage	Lag days	Weighted Days
REVENUE				
1 Metered	154,498	67.0%	52.3	35.0
2 Fixed	27,349	11.9%	52.3	6.2
3 Regional	30,038	13.0%	52.3	6.8
4 Fire & Miscellaneous	18,860	8.2%	52.3	4.3
5 Subtotal	230,744	100%		52.3
6 NET REVENUE LAG				52.3
EXPENDITURES				
7 Labour, salaries & benefits	44,508	37.5%	16.7	6.3
8 Incentive	2,214	1.9%	292.0	5.4
9 Other operating expenses	43,839	36.9%	45.6	16.8
10 Parent charges	13,703	11.5%	15.0	1.7
11 Property tax	230	0.2%	(4.5)	(0.0)
12 Franchise fees	14,349	12.1%	15.2	1.8
13 Subtotal	118,842	100%		32.1
14 NET EXPENSE LAG				32.1
15 Net Lag (Lead) For Receipts & Payments 2017				20.2

Table 4.6-4
Net Lag (Lead) for Revenues and Expenses – 2016
(\$ thousands)

	A	B	C	D
	Amount	Percentage	Lag days	Weighted Days
REVENUE				
1 Metered	149,618	67.2%	51.6	34.7
2 Fixed	26,137	11.7%	51.6	6.1
3 Regional	28,794	12.9%	51.6	6.7
4 Fire & Miscellaneous	18,039	8.1%	51.6	4.2
5 Subtotal	222,588	100%		51.6
6 NET REVENUE LAG				51.6
EXPENDITURES				
7 Labour, salaries & benefits	38,325	33.3%	16.7	5.6
8 Incentive	2,282	2.0%	293.5	5.8
9 Other operating expenses	45,920	39.9%	45.8	18.2
10 Parent charges	14,509	12.6%	15.0	1.9
11 Property tax	212	0.2%	(4.0)	(0.0)
12 Franchise fees	13,868	12.0%	15.3	1.8
13 Subtotal	115,116	100%		33.3
14 NET EXPENSE LAG				33.3
15 Net Lag (Lead) For Receipts & Payments 2016				18.3

27. Overall for EWSI, the net lags for receipts and payments are 18.3 days in 2016, 20.2 days in 2017, 18.1 days in 2018, and 18.4 days in 2019. The changes in net lag times between 2016 and 2019 are primarily due to changes in customer payment lag each year. These values are based on actual costs for 2016, 2017, 2018, and 2019. The working capital ratios of 5.0% in 2016, 5.5% in 2017, 4.9% in 2018, and 5.0% in 2019 are calculated from the expense net lags (18.3/365, 20.2/365 and 18.1/365, 18.4/365) and then applied to the overall operating expenses, net of revenue offsets, to provide the appropriate necessary working capital for this component (see Table 2.0-1).

5.0 GST

28. GST is not applicable to water sales, so EWSI only collects GST on a small proportion of its revenues, mainly for surplus sales, facility revenues and miscellaneous fees. Accordingly, EWSI is always in a refund position with the CRA. GST returns are filed monthly (usually on the last business day of the following month). Per discussions with EPCOR tax group, input credits are normally received from the CRA within 2-4 weeks of filing. Calculation of the GST remittance lag is shown in Appendix 5.

**Table 5.0-1
GST Impact on Working Capital
(\$ thousands)**

	A	B 2019	C 2018	D 2017	E 2016
REVENUE					
1 Net Receipts applicable to GST		1,244	990	890	548
2 GST rate		5.00%	5.00%	5.00%	5.00%
3 GST collected	(a)	62	50	45	27
4 Day factor - revenue lag		50.9	49.6	52.3	51.6
5 Day factor - GST remittance		45.6	45.6	45.6	45.8
6 Net	(b)	5.3	4.0	6.6	5.9
7 Impact on Working Capital	(a)*(b)/365	1	1	1	0
EXPENDITURES					
8 Other operating costs		46,051	43,040	43,839	45,920
9 Capital expenditures excluding labour		90,645	75,667	78,434	64,816
10 Net costs applicable to GST		136,696	118,707	122,274	110,736
11 GST rate		5.00%	5.00%	5.00%	5.00%
12 GST remitted	(d)	6,835	5,935	6,114	5,537
13 Day factor- GST refund lag		66.6	66.6	66.6	66.8
14 Day factor - GST applicable expense lag		45.6	45.6	45.6	45.8
15 Net	(e)	21.0	21.0	21.0	21.0
16 Impact on Working Capital	(d)*(e)/365	393	341	352	319
17 Net GST impact on Working Capital		394	342	353	319

29. GST collected by EWSI is based on analysis of 2016-2019 revenues, with input tax credits based on total operating expenses less labour, salaries, benefits and incentives and property taxes plus capital expenditures excluding labour components.

30. The day factor on GST applicable expenses is based on lead-lag days for general operating expenses, since capital expenditures (excluding labour) are assumed to be on the same payment schedule as all other operating costs.

31. As shown in Table 5.0-1, the impact of GST on working capital is negligible; resulting in an increase to necessary working capital of \$0.32 million in 2016, \$0.35 million in 2017, \$0.34 million in 2018, and \$0.39 million in 2019.

6.0 CAPITAL EXPENSES

32. Capital expenses include four categories: interest, retained earnings, common dividends and depreciation. As EWSI had not consistently issued a common dividend in the past, dividends were not included in the 2016 lead lag study. However, EWSI has issued a dividend annually over the 2016 to 2019 period and is forecast to continue annual dividends over the 2022 to 2026

period. As a result, common dividends have been included in the current lead lag study. Table 6.0-1 provides the capital expense lags for 2016 to 2019.

Table 6.0-1
Capital Expense Lags for 2016, 2017, 2018, and 2019
(\$ thousands)

Expense	2019		2018		2017		2016	
	A Lag Days	B Expense	C Lag Days	D Expense	E Lag Days	F Expense	G Lag Days	H Expense
1 Interest	16.8	34,671	12.9	33,477	8.4	32,021	4.5	31,070
2 Retained Earnings	-	43,369	-	49,947	-	45,248	-	46,558
3 Dividends	182.5	15,000	182.5	20,000	182.5	20,000	183.0	31,500
4 Depreciation	-	36,162	-	34,236	-	32,610	-	27,911

6.1 Retained Earnings and Depreciation

33. Consistent with accepted practice for lead-lag studies, retained earnings and depreciation both have expense lags equivalent to zero days.

6.2 Interest on Long Term Debt

34. EWSI pays interest on inter-company long term debt issued by EPCOR Utilities Inc. (EUI) as well as interest on the City of Edmonton Debentures (COE debt). Both the COE debt and inter-company notes are paid at various times throughout the year. All interest is paid on a semi-annual basis. The midpoint of the consumption period for long term interest is 182.5 days, or July 2. The overall lag (lead) for interest expense is calculated as the weighted average lag (lead) of each individual debt issue.

35. Tables 6.2-1 to 6.2-4 show the calculation of long term debt lag (lead) days. The interest expense lag was 4.5 days in 2016, the lag increased to 8.4 days in 2017, 12.9 days in 2018, and 16.8 days in 2019. The change in the net lag for long term debt are attributable to new debt issuances in the latter part of each year, with interest payments shifting back to mid-year, decreasing the overall long term debt expense lag.

**Table 6.2-1
Long Term Debt Lag (Lead) – 2019**

Description	A Interest Rate	B Face Value	C Interest Expense	Payment Dates			Payment Lags			J Weight	K Weighted Total Lag
				D First	E Second	F Mid- Year	G First	H Second	I Average		
1				3-May	3-Nov	1-Jul	(59.5)	124.5	32.5	7.8%	2.5
2 IC-EUI-80-0013	6.06%	50,400	3,054	2-May	2-Nov	1-Jul	(60.5)	123.5	31.5	8.8%	2.8
3 IC-EUI-80-0014	5.60%	40,000	1,073	31-Mar	30-Sep	1-Jul	(92.5)	90.5	(1.0)	3.1%	(0.0)
4 IC-EUI-80-0016	5.60%	15,000	402	31-Mar	30-Sep	1-Jul	(92.5)	90.5	(1.0)	1.2%	(0.0)
5 IC-EUI-80-0017	5.38%	30,000	825	1-Jun	1-Dec	1-Jul	(30.5)	152.5	61.0	2.4%	1.5
6 IC-EUI-80-0032	5.96%	100,000	3,310	1-Jan	1-Jul	1-Jul	(181.5)	(0.5)	(91.0)	9.5%	(8.7)
7 IC-EUI-80-0036	6.75%	30,000	1,239	1-Apr	1-Oct	1-Jul	(91.5)	91.5	-	3.6%	-
8 IC-EUI-80-0042	5.85%	30,000	1,178	1-Jun	1-Dec	1-Jul	(30.5)	152.5	61.0	3.4%	2.1
9 IC-EUI-80-0046	5.20%	30,000	1,089	1-May	1-Nov	1-Jul	(61.5)	122.5	30.5	3.1%	1.0
10 IC-EUI-80-0047	4.88%	30,000	1,081	1-Jun	1-Dec	1-Jul	(30.5)	152.5	61.0	3.1%	1.9
11 IC-EUI-80-0070	4.62%	110,000	5,077	1-Feb	1-Aug	1-Jul	(150.5)	30.5	(60.0)	14.6%	(8.8)
12 IC-EUI-80-0075	4.73%	60,000	2,838	1-Jun	1-Dec	1-Jul	(30.5)	152.5	61.0	8.2%	5.0
13 IC-EUI-80-0076	4.12%	40,000	1,647	1-Jun	1-Dec	1-Jul	(30.5)	152.5	61.0	4.8%	2.9
14 IC-EUI-80-0082	4.41%	45,000	1,985	1-Jun	1-Dec	1-Jul	(30.5)	152.5	61.0	5.7%	3.5
15 IC-EUIC-80-2016	4.01%	45,000	1,805	1-Jun	1-Dec	1-Jul	(30.5)	152.5	61.0	5.2%	3.2
16 IC-EUIC-80-2017	3.72%	65,000	2,418	1-Jun	1-Dec	1-Jul	(30.5)	152.5	61.0	7.0%	4.3
17 IC-EUIC-80-2018	4.16%	55,000	2,289	3-Jun	3-Dec	1-Jul	(28.5)	154.5	63.0	6.6%	4.2
18 IC-EUIC-80-2019	3.23%	80,000	108		31-Dec	1-Jul		182.5	182.5	0.3%	0.6
19 11247 A	7.25%	10,000	168	15-Jan	15-Jul	1-Jul	(167.5)	13.5	(77.0)	0.5%	(0.4)
20 11317 A	7.25%	16,000	269	15-Jan	15-Jul	1-Jul	(167.5)	13.5	(77.0)	0.8%	(0.6)
21 11247 B	6.38%	429	7	3-May	3-Nov	1-Jul	(59.5)	124.5	32.5	0.0%	0.0
22 11496 A	6.38%	4,866	83	3-May	3-Nov	1-Jul	(59.5)	124.5	32.5	0.2%	0.1
23 11317 B	5.75%	261	4	2-Feb	2-Aug	1-Jul	(149.5)	31.5	(59.0)	0.0%	(0.0)
24 11664 A	5.75%	620	11	2-Feb	2-Aug	1-Jul	(149.5)	31.5	(59.0)	0.0%	(0.0)
25 11724 A	5.75%	533	9	2-Feb	2-Aug	1-Jul	(149.5)	31.5	(59.0)	0.0%	(0.0)
26 11664 B	5.75%	62	1	15-Jun	15-Dec	1-Jul	(16.5)	166.5	75.0	0.0%	0.0
27 11724 B	5.75%	800	15	15-Jun	15-Dec	1-Jul	(16.5)	166.5	75.0	0.0%	0.0
28			34,671							100.0%	16.8

**Table 6.2-2
Long Term Debt Lag (Lead) – 2018**

Description	A Interest Rate	B Face Value	C Interest Expense	Payment Dates			Payment Lags			J Weight	K Weighted Total Lag
				D First	E Second	F Mid- Year	G First	H Second	I Average		
1 IC-EUI-80-0012				3-May	3-Nov	1-Jul	(59.5)	124.5	32.5	8.0%	2.6
2 IC-EUI-80-0013	6.06%	50,400	3,054	2-May	2-Nov	1-Jul	(60.5)	123.5	31.5	9.1%	2.9
3 IC-EUI-80-0014	5.60%	40,000	1,195	31-Mar	30-Sep	1-Jul	(92.5)	90.5	(1.0)	3.6%	(0.0)
4 IC-EUI-80-0016	5.60%	15,000	448	31-Mar	30-Sep	1-Jul	(92.5)	90.5	(1.0)	1.3%	(0.0)
5 IC-EUI-80-0017	5.38%	30,000	910	1-Jun	1-Dec	1-Jul	(30.5)	152.5	61.0	2.7%	1.7
6 IC-EUI-80-0032	5.96%	100,000	3,613	1-Jan	1-Jul	1-Jul	(181.5)	(0.5)	(91.0)	10.8%	(9.8)
7 IC-EUI-80-0036	6.75%	30,000	1,336	1-Apr	1-Oct	1-Jul	(91.5)	91.5	-	4.0%	-
8 IC-EUI-80-0042	5.85%	30,000	1,255	1-Jun	1-Dec	1-Jul	(30.5)	152.5	61.0	3.7%	2.3
9 IC-EUI-80-0046	5.20%	30,000	1,156	1-May	1-Nov	1-Jul	(61.5)	122.5	30.5	3.5%	1.1
10 IC-EUI-80-0047	4.88%	30,000	1,142	2-Jun	1-Dec	1-Jul	(29.5)	152.5	61.5	3.4%	2.1
11 IC-EUI-80-0070	4.62%	110,000	5,077	1-Feb	1-Aug	1-Jul	(150.5)	30.5	(60.0)	15.2%	(9.1)
12 IC-EUI-80-0075	4.73%	60,000	2,838	1-Jun	1-Dec	1-Jul	(30.5)	152.5	61.0	8.5%	5.2
13 IC-EUI-80-0076	4.12%	40,000	1,647	1-Jun	1-Dec	1-Jul	(30.5)	152.5	61.0	4.9%	3.0
14 IC-EUI-80-0082	4.41%	45,000	1,985	1-Jun	1-Dec	1-Jul	(30.5)	152.5	61.0	5.9%	3.6
15 IC-EUIC-80-2016	4.01%	45,000	1,805	1-Jun	1-Dec	1-Jul	(30.5)	152.5	61.0	5.4%	3.3
16 IC-EUIC-80-2017	3.72%	65,000	2,418	1-Jun	1-Dec	1-Jul	(30.5)	152.5	61.0	7.2%	4.4
17 IC-EUIC-80-2018	4.16%	55,000	191		31-Dec	1-Jul		182.5	182.5	0.6%	1.0
18 11247 A	7.25%	10,000	216	15-Jan	15-Jul	1-Jul	(167.5)	13.5	(77.0)	0.6%	(0.5)
19 11317 A	7.25%	16,000	346	15-Jan	15-Jul	1-Jul	(167.5)	13.5	(77.0)	1.0%	(0.8)
20 11247 B	6.38%	429	9	3-May	3-Nov	1-Jul	(59.5)	124.5	32.5	0.0%	0.0
21 11496 A	6.38%	4,866	102	3-May	3-Nov	1-Jul	(59.5)	124.5	32.5	0.3%	0.1
22 11317 B	5.75%	261	5	2-Feb	2-Aug	1-Jul	(149.5)	31.5	(59.0)	0.0%	(0.0)
23 11664 A	5.75%	620	13	2-Feb	2-Aug	1-Jul	(149.5)	31.5	(59.0)	0.0%	(0.0)
24 11724 A	5.75%	533	11	2-Feb	2-Aug	1-Jul	(149.5)	31.5	(59.0)	0.0%	(0.0)
25 11664 B	5.75%	62	1	15-Jun	15-Dec	1-Jul	(16.5)	166.5	75.0	0.0%	0.0
26 11724 B	5.75%	800	17	15-Jun	15-Dec	1-Jul	(16.5)	166.5	75.0	0.1%	0.0
27			33,477							100.0%	12.9

**Table 6.2-3
Long Term Debt Lag (Lead) – 2017**

Description	A Interest Rate	B Face Value	C Interest Expense	Payment Dates			Payment Lags			J Weight	K Weighted Total Lag
				D First	E Second	F Mid- Year	G First	H Second	I Average		
1 IC-EUI-80-0012				3-May	3-Nov	1-Jul	(59.5)	124.5	32.5	8.4%	2.7
2 IC-EUI-80-0013	6.06%	50,400	3,054	2-May	2-Nov	1-Jul	(60.5)	123.5	31.5	9.5%	3.0
3 IC-EUI-80-0014	5.60%	40,000	1,311	31-Mar	30-Sep	1-Jul	(92.5)	90.5	(1.0)	4.1%	(0.0)
4 IC-EUI-80-0016	5.60%	15,000	492	31-Mar	30-Sep	1-Jul	(92.5)	90.5	(1.0)	1.5%	(0.0)
5 IC-EUI-80-0017	5.38%	30,000	990	1-Jun	1-Dec	1-Jul	(30.5)	152.5	61.0	3.1%	1.9
6 IC-EUI-80-0032	5.96%	100,000	3,899	1-Jan	1-Jul	1-Jul	(181.5)	(0.5)	(91.0)	12.2%	(11.1)
7 IC-EUI-80-0036	6.75%	30,000	1,427	1-Apr	1-Oct	1-Jul	(91.5)	91.5	-	4.5%	-
8 IC-EUI-80-0042	5.85%	30,000	1,329	1-Jun	1-Dec	1-Jul	(30.5)	152.5	61.0	4.1%	2.5
9 IC-EUI-80-0046	5.20%	30,000	1,220	1-May	1-Nov	1-Jul	(61.5)	122.5	30.5	3.8%	1.2
10 IC-EUI-80-0047	4.88%	30,000	1,199	3-Jun	2-Dec	1-Jul	(28.5)	153.5	62.5	3.7%	2.3
11 IC-EUI-80-0070	4.62%	110,000	5,077	1-Feb	1-Aug	1-Jul	(150.5)	30.5	(60.0)	15.9%	(9.5)
12 IC-EUI-80-0075	4.73%	60,000	2,838	1-Jun	1-Dec	1-Jul	(30.5)	152.5	61.0	8.9%	5.4
13 IC-EUI-80-0076	4.12%	40,000	1,647	1-Jun	1-Dec	1-Jul	(30.5)	152.5	61.0	5.1%	3.1
14 IC-EUI-80-0082	4.41%	45,000	1,985	1-Jun	1-Dec	1-Jul	(30.5)	152.5	61.0	6.2%	3.8
15 IC-EUIC-80-2016	4.01%	45,000	1,805	1-Jun	1-Dec	1-Jul	(30.5)	152.5	61.0	5.6%	3.4
16 IC-EUIC-80-2017	3.72%	65,000	202		31-Dec	1-Jul		182.5	182.5	0.6%	1.1
17 11247 A	7.25%	10,000	260	15-Jan	15-Jul	1-Jul	(167.5)	13.5	(77.0)	0.8%	(0.6)
18 11317 A	7.25%	16,000	416	15-Jan	15-Jul	1-Jul	(167.5)	13.5	(77.0)	1.3%	(1.0)
19 11247 B	6.38%	429	11	3-May	3-Nov	1-Jul	(59.5)	124.5	32.5	0.0%	0.0
20 11496 A	6.38%	4,866	119	3-May	3-Nov	1-Jul	(59.5)	124.5	32.5	0.4%	0.1
21 11317 B	5.75%	261	6	2-Feb	2-Aug	1-Jul	(149.5)	31.5	(59.0)	0.0%	(0.0)
22 11664 A	5.75%	620	14	2-Feb	2-Aug	1-Jul	(149.5)	31.5	(59.0)	0.0%	(0.0)
23 11724 A	5.75%	533	12	2-Feb	2-Aug	1-Jul	(149.5)	31.5	(59.0)	0.0%	(0.0)
24 11664 B	5.75%	62	2	15-Jun	15-Dec	1-Jul	(16.5)	166.5	75.0	0.0%	0.0
25 11724 B	5.75%	800	20	15-Jun	15-Dec	1-Jul	(16.5)	166.5	75.0	0.1%	0.0
26			32,021							100.0%	8.4

**Table 6.2-4
Long Term Debt Lag (Lead) – 2016**

Description	A Interest Rate	B Face Value	C Interest Expense	Payment Dates			Payment Lags			J Weight	K Weighted Total Lag
				D First	E Second	F Mid- Year	G First	H Second	I Average		
1 IC-EUI-80-0012	6.72%	40,000	2,688	3-May	3-Nov	1-Jul	(59.0)	125.0	33.0	8.7%	2.9
2 IC-EUI-80-0013	6.06%	50,400	3,054	2-May	2-Nov	1-Jul	(60.0)	124.0	32.0	9.8%	3.1
3 IC-EUI-80-0014	5.60%	40,000	1,421	31-Mar	30-Sep	1-Jul	(92.0)	91.0	(0.5)	4.6%	(0.0)
4 IC-EUI-80-0016	5.60%	15,000	533	31-Mar	30-Sep	1-Jul	(92.0)	91.0	(0.5)	1.7%	(0.0)
5 IC-EUI-80-0017	5.38%	30,000	1,066	1-Jun	1-Dec	1-Jul	(30.0)	153.0	61.5	3.4%	2.1
6 IC-EUI-80-0032	5.96%	100,000	4,169	1-Jan	1-Jul	1-Jul	(182.0)	-	(91.0)	13.4%	(12.2)
7 IC-EUI-80-0036	6.75%	30,000	1,513	1-Apr	1-Oct	1-Jul	(91.0)	92.0	0.5	4.9%	0.0
8 IC-EUI-80-0042	5.85%	30,000	1,398	1-Jun	1-Dec	1-Jul	(30.0)	153.0	61.5	4.5%	2.8
9 IC-EUI-80-0046	5.20%	30,000	1,281	1-May	1-Nov	1-Jul	(61.0)	123.0	31.0	4.1%	1.3
10 IC-EUI-80-0047	4.88%	30,000	1,254	1-Jun	3-Dec	1-Jul	(30.0)	155.0	62.5	4.0%	2.5
11 IC-EUI-80-0070	4.62%	110,000	5,077	1-Feb	1-Aug	1-Jul	(151.0)	31.0	(60.0)	16.3%	(9.8)
12 IC-EUI-80-0075	4.73%	60,000	2,838	1-Jun	1-Dec	1-Jul	(30.0)	153.0	61.5	9.1%	5.6
13 IC-EUI-80-0076	4.12%	40,000	1,647	1-Jun	1-Dec	1-Jul	(30.0)	153.0	61.5	5.3%	3.3
14 IC-EUI-80-0082	4.41%	45,000	1,985	1-Jun	1-Dec	1-Jul	(30.0)	153.0	61.5	6.4%	3.9
15 IC-EUIC-80-2016	4.01%	45,000	150		31-Dec	1-Jul		183.0	183.0	0.5%	0.9
16 11247 A	7.25%	10,000	303	15-Jan	15-Jul	1-Jul	(168.0)	14.0	(77.0)	1.0%	(0.8)
17 11317 A	7.25%	16,000	485	15-Jan	15-Jul	1-Jul	(168.0)	14.0	(77.0)	1.6%	(1.2)
18 11247 B	6.38%	429	12	3-May	3-Nov	1-Jul	(59.0)	125.0	33.0	0.0%	0.0
19 11496 A	6.38%	4,866	136	3-May	3-Nov	1-Jul	(59.0)	125.0	33.0	0.4%	0.1
20 11317 B	5.75%	261	7	2-Feb	2-Aug	1-Jul	(150.0)	32.0	(59.0)	0.0%	(0.0)
21 11664 A	5.75%	620	16	2-Feb	2-Aug	1-Jul	(150.0)	32.0	(59.0)	0.1%	(0.0)
22 11724 A	5.75%	533	14	2-Feb	2-Aug	1-Jul	(150.0)	32.0	(59.0)	0.0%	(0.0)
23 11664 B	5.75%	62	2	15-Jun	15-Dec	1-Jul	(16.0)	167.0	75.5	0.0%	0.0
24 11724 B	5.75%	800	22	15-Jun	15-Dec	1-Jul	(16.0)	167.0	75.5	0.1%	0.1
25			31,070							100.0%	4.5

6.3 Common Dividends

36. EWSI issues common dividends on December 31 for the current fiscal year, at the end of the consumption period. Accordingly, the common dividend lag is 182.5 days (365/2) for 2016, 2017, 2018, and 2019.

7.0 STUDY RESULTS

37. For the 2022-2026 PBR Term EWSI is proposing the lead lag ratios and days provided in Table 7.0-1 (columns E and F).

**Table 7.0-1
Summary of 2016-2019
Lead Lag Ratios**

	A	B	C	D	E	F
	2019	2018	2017	2016	Average	Lead/(Lag) Days
1 Water Service Expenses	5.0 %	4.9 %	5.5 %	5.0 %	5.1 %	18.6
2 Depreciation	13.9 %	13.6 %	14.3 %	14.1 %	14.0 %	51.1
3 Retained Earnings	13.9 %	13.6 %	14.3 %	14.1 %	14.0 %	51.1
4 Dividend	(50.0 %)	(50.0 %)	(50.0 %)	(50.1 %)	(50.0 %)	(182.5)
5 Interest Expense	9.3 %	10.0 %	12.0 %	12.9 %	11.1 %	40.5
6 GST Collection	1.4 %	1.1 %	1.8 %	1.6 %	1.5 %	5.5
7 GST Input Tax Credit	5.8 %	5.8 %	5.8 %	5.8 %	5.8 %	21.0

38. Comparison of EWSI's Lead Lag Study with those of other Canadian regulated entities shows that both the items included in the lead lag study and the resulting working capital ratios are consistent with those of other Canadian regulated entities.

39. Table 7.0-2 compares working capital ratios among other regulated entities. Review of the calculation of these ratios shows a high degree of consistency in study methodology among regulated entities.

**Table 7.0-2
Comparative Study Working Capital Ratios**

	Comparative Studies					F Low	Range		I Avg
	A EDTI Tran ¹	B ATCO Gas ²	C Enmax Tran ³	D AltaLink ⁴	E Hydro One ⁵		G High	H Avg	
1 O&M Expenses	3.8 %	1.5 %	0.8 %	9.5 %	7.3 %	0.8 %	9.5 %	4.6 %	5.1 %
2 Income Tax Installments	N/A	4.8 %	N/A	(0.1)%	10.5 %	(0.1)%	10.5 %	5.0 %	N/A
3 Other Taxes	-	(6.7)%	(8.2)%	(4.4)%	9.4 %	(8.2)%	9.4 %	(2.0)%	7.2 %
4 Long Term Debt Interest	(37.8)%	4.1 %	8.2 %	(12.7)%	14.7 %	(37.8)%	14.7 %	(4.7)%	11.1 %
5 Common Dividends	(0.2)%	(15.0)%	-	-	N/A	(15.0)%	-	(3.8)%	(50.0)%
6 Retained Earnings	12.2 %	8.5 %	12.4 %	12.1 %	N/A	8.5 %	12.4 %	11.3 %	14.0 %
7 Depreciation Expense	12.2 %	8.5 %	12.4 %	12.1 %	N/A	8.5 %	12.4 %	11.3 %	14.0 %

40. Comparison of EWSI's working capital ratios to those of the other companies included in Table 7.0-2 shows the following:

- EWSI's working capital ratios for O&M Expenses and Other Taxes are well within the range of the other companies included in the comparison;
- Since EWSI is not subject to income taxes this category does not apply to it;
- EWSI's working capital ratios for retained earnings and depreciation are higher than those of the other companies included in Table 7.0-2. These ratios are based on revenue lag days. Since all of EWSI's revenues are derived from retail customers, rather than settlement with AESO or other system operators, EWSI's collection periods are longer than those of the other companies in the comparison. Accordingly, EWSI's ratios are reasonable;
- EWSI's long term debt interest ratios are slightly higher than those of the other companies in Table 7.0-2. These ratios are based on the difference between revenue lag days and interest expense lag days. EWSI based its calculation of interest expense lag days on the actual dates of interest paid during the year, a methodology also used by ENMAX, HydroOne, and AltaLink. This methodology provides a representative view of actual cash flows throughout the year. Accordingly, EWSI's long term debt interest ratio is reasonable;

¹ EDTI 2020-2022 TFO Tariff Application, MFR Schedules, Schedule 11-3.

² ATCO Gas GRA Filing 2011-2012, December 2010.

³ EPC 2018-2020 Transmission General Tariff Application, Appendix Q - EPC Lead Lag Study (Chymko).

⁴ AltaLink Management Ltd. 2019 - 2021 General Tariff Application, Table 11.2-1.

⁵ Hydro 1 EB-2017-0049, GTA Exhibit D1, Tab 1, Schedule 3, 2018 Test Year, March 03, 2017.

41. The differences in the ratios between EWSI and these companies are primarily caused by the timing of interest payments, with EWSI making interest payments towards the end of the year because of November and December debt issues, rather than towards mid-year. EWSI's higher revenue lag days also serve to increase its long term debt interest ratio, but to a lesser extent.

42. EDTI and EWSI have significantly different long term debt interest ratios. EDTI used a simplified methodology to calculate interest expense lag days. EDTI assumed that interest is paid twice annually, resulting in a consumption period of 182.5 days ($365/2$). Subtracting this lag from EDTI's revenue lag of 44.5 days, yields an interest expense lag 138 days (37.8%).

7.1 Appendix 1: Salary, Overtime and Wage Lag details

Table A1-1
Salary Lag
Year Ending December 31, 2019
(days)

	A	B	C	D	E	F	G	H	
Period start date	Mid Period	Period End	Processing	Payment Date	Consumption Lag	Processing Lag	Payment Lag	Total Lag	
1	23-Dec-18	29-Dec-18	05-Jan-19	07-Jan-19	11-Jan-19	7.00	2.00	4.00	13.00
2	06-Jan-19	12-Jan-19	19-Jan-19	21-Jan-19	25-Jan-19	7.00	2.00	4.00	13.00
3	20-Jan-19	26-Jan-19	02-Feb-19	04-Feb-19	08-Feb-19	7.00	2.00	4.00	13.00
4	03-Feb-19	09-Feb-19	16-Feb-19	18-Feb-19	22-Feb-19	7.00	2.00	4.00	13.00
5	17-Feb-19	23-Feb-19	02-Mar-19	04-Mar-19	08-Mar-19	7.00	2.00	4.00	13.00
6	03-Mar-19	09-Mar-19	16-Mar-19	18-Mar-19	22-Mar-19	7.00	2.00	4.00	13.00
7	17-Mar-19	23-Mar-19	30-Mar-19	01-Apr-19	05-Apr-19	7.00	2.00	4.00	13.00
8	31-Mar-19	06-Apr-19	13-Apr-19	15-Apr-19	18-Apr-19	7.00	2.00	3.00	12.00
9	14-Apr-19	20-Apr-19	27-Apr-19	29-Apr-19	03-May-19	7.00	2.00	4.00	13.00
10	28-Apr-19	04-May-19	11-May-19	13-May-19	17-May-19	7.00	2.00	4.00	13.00
11	12-May-19	18-May-19	25-May-19	27-May-19	31-May-19	7.00	2.00	4.00	13.00
12	26-May-19	01-Jun-19	08-Jun-19	10-Jun-19	14-Jun-19	7.00	2.00	4.00	13.00
13	09-Jun-19	15-Jun-19	22-Jun-19	24-Jun-19	28-Jun-19	7.00	2.00	4.00	13.00
14	23-Jun-19	29-Jun-19	06-Jul-19	08-Jul-19	12-Jul-19	7.00	2.00	4.00	13.00
15	07-Jul-19	13-Jul-19	20-Jul-19	22-Jul-19	26-Jul-19	7.00	2.00	4.00	13.00
16	21-Jul-19	27-Jul-19	03-Aug-19	05-Aug-19	09-Aug-19	7.00	2.00	4.00	13.00
17	04-Aug-19	10-Aug-19	17-Aug-19	19-Aug-19	23-Aug-19	7.00	2.00	4.00	13.00
18	18-Aug-19	24-Aug-19	31-Aug-19	02-Sep-19	06-Sep-19	7.00	2.00	4.00	13.00
19	01-Sep-19	07-Sep-19	14-Sep-19	16-Sep-19	20-Sep-19	7.00	2.00	4.00	13.00
20	15-Sep-19	21-Sep-19	28-Sep-19	30-Sep-19	04-Oct-19	7.00	2.00	4.00	13.00
21	29-Sep-19	05-Oct-19	12-Oct-19	14-Oct-19	18-Oct-19	7.00	2.00	4.00	13.00
22	13-Oct-19	19-Oct-19	26-Oct-19	28-Oct-19	01-Nov-19	7.00	2.00	4.00	13.00
23	27-Oct-19	02-Nov-19	09-Nov-19	11-Nov-19	15-Nov-19	7.00	2.00	4.00	13.00
24	10-Nov-19	16-Nov-19	23-Nov-19	25-Nov-19	29-Nov-19	7.00	2.00	4.00	13.00
25	24-Nov-19	30-Nov-19	07-Dec-19	09-Dec-19	13-Dec-19	7.00	2.00	4.00	13.00
26	08-Dec-19	14-Dec-19	21-Dec-19	23-Dec-19	27-Dec-19	7.00	2.00	4.00	13.00
27	Average Salary Lag					7.00	2.00	3.96	12.96

Table A1-2
Salary Lag
Year Ending December 31, 2018
(days)

		A	B	C	D	E	F	G	H
	Period start date	Mid Period	Period End	Processing	Payment Date	Consumption Lag	Processing Lag	Payment Lag	Total Lag
1	24-Dec-17	30-Dec-17	06-Jan-18	08-Jan-18	12-Jan-18	7.00	2.00	4.00	13.00
2	07-Jan-18	13-Jan-18	20-Jan-18	22-Jan-18	26-Jan-18	7.00	2.00	4.00	13.00
3	21-Jan-18	27-Jan-18	03-Feb-18	05-Feb-18	09-Feb-18	7.00	2.00	4.00	13.00
4	04-Feb-18	10-Feb-18	17-Feb-18	19-Feb-18	23-Feb-18	7.00	2.00	4.00	13.00
5	18-Feb-18	24-Feb-18	03-Mar-18	05-Mar-18	09-Mar-18	7.00	2.00	4.00	13.00
6	04-Mar-18	10-Mar-18	17-Mar-18	19-Mar-18	23-Mar-18	7.00	2.00	4.00	13.00
7	18-Mar-18	24-Mar-18	31-Mar-18	02-Apr-18	06-Apr-18	7.00	2.00	4.00	13.00
8	01-Apr-18	07-Apr-18	14-Apr-18	16-Apr-18	20-Apr-18	7.00	2.00	4.00	13.00
9	15-Apr-18	21-Apr-18	28-Apr-18	30-Apr-18	04-May-18	7.00	2.00	4.00	13.00
10	29-Apr-18	05-May-18	12-May-18	14-May-18	18-May-18	7.00	2.00	4.00	13.00
11	13-May-18	19-May-18	26-May-18	28-May-18	01-Jun-18	7.00	2.00	4.00	13.00
12	27-May-18	02-Jun-18	09-Jun-18	11-Jun-18	15-Jun-18	7.00	2.00	4.00	13.00
13	10-Jun-18	16-Jun-18	23-Jun-18	25-Jun-18	29-Jun-18	7.00	2.00	4.00	13.00
14	24-Jun-18	30-Jun-18	07-Jul-18	09-Jul-18	13-Jul-18	7.00	2.00	4.00	13.00
15	08-Jul-18	14-Jul-18	21-Jul-18	23-Jul-18	27-Jul-18	7.00	2.00	4.00	13.00
16	22-Jul-18	28-Jul-18	04-Aug-18	06-Aug-18	10-Aug-18	7.00	2.00	4.00	13.00
17	05-Aug-18	11-Aug-18	18-Aug-18	20-Aug-18	24-Aug-18	7.00	2.00	4.00	13.00
18	19-Aug-18	25-Aug-18	01-Sep-18	03-Sep-18	07-Sep-18	7.00	2.00	4.00	13.00
19	02-Sep-18	08-Sep-18	15-Sep-18	17-Sep-18	21-Sep-18	7.00	2.00	4.00	13.00
20	16-Sep-18	22-Sep-18	29-Sep-18	01-Oct-18	05-Oct-18	7.00	2.00	4.00	13.00
21	30-Sep-18	06-Oct-18	13-Oct-18	15-Oct-18	19-Oct-18	7.00	2.00	4.00	13.00
22	14-Oct-18	20-Oct-18	27-Oct-18	29-Oct-18	02-Nov-18	7.00	2.00	4.00	13.00
23	28-Oct-18	03-Nov-18	10-Nov-18	12-Nov-18	16-Nov-18	7.00	2.00	4.00	13.00
24	11-Nov-18	17-Nov-18	24-Nov-18	26-Nov-18	30-Nov-18	7.00	2.00	4.00	13.00
25	25-Nov-18	01-Dec-18	08-Dec-18	10-Dec-18	14-Dec-18	7.00	2.00	4.00	13.00
26	09-Dec-18	15-Dec-18	22-Dec-18	24-Dec-18	28-Dec-18	7.00	2.00	4.00	13.00
27	Average Salary Lag					7.00	2.00	4.00	13.00

Table A1-3
Salary Lag
Year Ending December 31, 2017
(days)

		A	B	C	D	E	F	G	H
	Period start date	Mid Period	Period End	Processing	Payment Date	Consumption Lag	Processing Lag	Payment Lag	Total Lag
1	25-Dec-16	31-Dec-16	07-Jan-17	09-Jan-17	13-Jan-17	7.00	2.00	4.00	13.00
2	08-Jan-17	14-Jan-17	21-Jan-17	23-Jan-17	27-Jan-17	7.00	2.00	4.00	13.00
3	22-Jan-17	28-Jan-17	04-Feb-17	06-Feb-17	10-Feb-17	7.00	2.00	4.00	13.00
4	05-Feb-17	11-Feb-17	18-Feb-17	20-Feb-17	24-Feb-17	7.00	2.00	4.00	13.00
5	19-Feb-17	25-Feb-17	04-Mar-17	06-Mar-17	10-Mar-17	7.00	2.00	4.00	13.00
6	05-Mar-17	11-Mar-17	18-Mar-17	20-Mar-17	24-Mar-17	7.00	2.00	4.00	13.00
7	19-Mar-17	25-Mar-17	01-Apr-17	03-Apr-17	07-Apr-17	7.00	2.00	4.00	13.00
8	02-Apr-17	08-Apr-17	15-Apr-17	17-Apr-17	21-Apr-17	7.00	2.00	4.00	13.00
9	16-Apr-17	22-Apr-17	29-Apr-17	01-May-17	05-May-17	7.00	2.00	4.00	13.00
10	30-Apr-17	06-May-17	13-May-17	15-May-17	19-May-17	7.00	2.00	4.00	13.00
11	14-May-17	20-May-17	27-May-17	29-May-17	02-Jun-17	7.00	2.00	4.00	13.00
12	28-May-17	03-Jun-17	10-Jun-17	12-Jun-17	16-Jun-17	7.00	2.00	4.00	13.00
13	11-Jun-17	17-Jun-17	24-Jun-17	26-Jun-17	30-Jun-17	7.00	2.00	4.00	13.00
14	25-Jun-17	01-Jul-17	08-Jul-17	10-Jul-17	14-Jul-17	7.00	2.00	4.00	13.00
15	09-Jul-17	15-Jul-17	22-Jul-17	24-Jul-17	28-Jul-17	7.00	2.00	4.00	13.00
16	23-Jul-17	29-Jul-17	05-Aug-17	07-Aug-17	11-Aug-17	7.00	2.00	4.00	13.00
17	06-Aug-17	12-Aug-17	19-Aug-17	21-Aug-17	25-Aug-17	7.00	2.00	4.00	13.00
18	20-Aug-17	26-Aug-17	02-Sep-17	04-Sep-17	08-Sep-17	7.00	2.00	4.00	13.00
19	03-Sep-17	09-Sep-17	16-Sep-17	18-Sep-17	22-Sep-17	7.00	2.00	4.00	13.00
20	17-Sep-17	23-Sep-17	30-Sep-17	02-Oct-17	06-Oct-17	7.00	2.00	4.00	13.00
21	01-Oct-17	07-Oct-17	14-Oct-17	16-Oct-17	20-Oct-17	7.00	2.00	4.00	13.00
22	15-Oct-17	21-Oct-17	28-Oct-17	30-Oct-17	03-Nov-17	7.00	2.00	4.00	13.00
23	29-Oct-17	04-Nov-17	11-Nov-17	13-Nov-17	17-Nov-17	7.00	2.00	4.00	13.00
24	12-Nov-17	18-Nov-17	25-Nov-17	27-Nov-17	01-Dec-17	7.00	2.00	4.00	13.00
25	26-Nov-17	02-Dec-17	09-Dec-17	11-Dec-17	15-Dec-17	7.00	2.00	4.00	13.00
26	10-Dec-17	16-Dec-17	23-Dec-17	25-Dec-17	29-Dec-17	7.00	2.00	4.00	13.00
27	Average Salary Lag					7.00	2.00	4.00	13.00

Table A1-4
Salary Lag
Year Ending December 31, 2016
(days)

		A	B	C	D	E	F	G	H
	Period start date	Mid Period	Period End	Processing	Payment Date	Consumption Lag	Processing Lag	Payment Lag	Total Lag
1	27-Dec-15	02-Jan-16	09-Jan-16	11-Jan-16	15-Jan-16	7.00	2.00	4.00	13.00
2	10-Jan-16	16-Jan-16	23-Jan-16	25-Jan-16	29-Jan-16	7.00	2.00	4.00	13.00
3	24-Jan-16	30-Jan-16	06-Feb-16	08-Feb-16	12-Feb-16	7.00	2.00	4.00	13.00
4	07-Feb-16	13-Feb-16	20-Feb-16	22-Feb-16	26-Feb-16	7.00	2.00	4.00	13.00
5	21-Feb-16	27-Feb-16	05-Mar-16	07-Mar-16	11-Mar-16	7.00	2.00	4.00	13.00
6	06-Mar-16	12-Mar-16	19-Mar-16	21-Mar-16	24-Mar-16	7.00	2.00	3.00	12.00
7	20-Mar-16	26-Mar-16	02-Apr-16	04-Apr-16	08-Apr-16	7.00	2.00	4.00	13.00
8	03-Apr-16	09-Apr-16	16-Apr-16	18-Apr-16	22-Apr-16	7.00	2.00	4.00	13.00
9	17-Apr-16	23-Apr-16	30-Apr-16	02-May-16	06-May-16	7.00	2.00	4.00	13.00
10	01-May-16	07-May-16	14-May-16	16-May-16	20-May-16	7.00	2.00	4.00	13.00
11	15-May-16	21-May-16	28-May-16	30-May-16	03-Jun-16	7.00	2.00	4.00	13.00
12	29-May-16	04-Jun-16	11-Jun-16	13-Jun-16	17-Jun-16	7.00	2.00	4.00	13.00
13	12-Jun-16	18-Jun-16	25-Jun-16	27-Jun-16	30-Jun-16	7.00	2.00	3.00	12.00
14	26-Jun-16	02-Jul-16	09-Jul-16	11-Jul-16	15-Jul-16	7.00	2.00	4.00	13.00
15	10-Jul-16	16-Jul-16	23-Jul-16	25-Jul-16	29-Jul-16	7.00	2.00	4.00	13.00
16	24-Jul-16	30-Jul-16	06-Aug-16	08-Aug-16	12-Aug-16	7.00	2.00	4.00	13.00
17	07-Aug-16	13-Aug-16	20-Aug-16	22-Aug-16	26-Aug-16	7.00	2.00	4.00	13.00
18	21-Aug-16	27-Aug-16	03-Sep-16	05-Sep-16	09-Sep-16	7.00	2.00	4.00	13.00
19	04-Sep-16	10-Sep-16	17-Sep-16	19-Sep-16	23-Sep-16	7.00	2.00	4.00	13.00
20	18-Sep-16	24-Sep-16	01-Oct-16	03-Oct-16	07-Oct-16	7.00	2.00	4.00	13.00
21	02-Oct-16	08-Oct-16	15-Oct-16	17-Oct-16	21-Oct-16	7.00	2.00	4.00	13.00
22	16-Oct-16	22-Oct-16	29-Oct-16	31-Oct-16	04-Nov-16	7.00	2.00	4.00	13.00
23	30-Oct-16	05-Nov-16	12-Nov-16	14-Nov-16	18-Nov-16	7.00	2.00	4.00	13.00
24	13-Nov-16	19-Nov-16	26-Nov-16	28-Nov-16	02-Dec-16	7.00	2.00	4.00	13.00
25	27-Nov-16	03-Dec-16	10-Dec-16	12-Dec-16	16-Dec-16	7.00	2.00	4.00	13.00
26	11-Dec-16	17-Dec-16	24-Dec-16	26-Dec-16	30-Dec-16	7.00	2.00	4.00	13.00
27	Average Salary Lag					7.00	2.00	3.92	12.92

7.2 Appendix 2: Labour and Benefit Summary Lag details

Table A2-1
Salary and Benefit Lag
Year ending December 31, 2019
(days)

Component	A Period Midpoint	B Processing Lag	C Payment Lag	D Total	E Actual Payroll ⁶	F Weight	G Weighted Days
1 Salaries, Overtime & Wages	7.0	2.0	4.0	13.0	28,512	62.74%	8.1
2 CRA	7.0	6.0	7.6	20.6	8,503	18.71%	3.9
3 Sun Life Benefits	7.0	6.0	3.0	16.0	1,609	3.54%	0.6
4 Sun Life Savings Plan	7.0	6.0	3.0	16.0	64	0.14%	0.0
5 Local Authorities Pension	7.0	6.0	15.0	28.0	5,219	11.48%	3.2
6 Union Dues	7.0	6.0	3.0	16.0	194	0.43%	0.1
7 EPCOR Social Club & Donations	7.0	6.0	3.0	16.0	44	0.10%	0.0
8 Employee Garnishes	7.0	6.0	3.0	16.0	6	0.01%	0.0
9 Employee Savings Plan	7.0	6.0	3.0	16.0	875	1.93%	0.3
10 Wellness Personal Spending Account	15.0	0.0	15.0	30.0	66	0.14%	0.0
11 Health Services			45.6	45.6	209	0.46%	0.2
12 WCB			45.6	45.6	147	0.32%	0.1
13 Average Withholding Lag						100.00%	16.6

Table A2-2
Salary and Benefit Lag
Year ending December 31, 2018
(days)

Component	A Period Midpoint	B Processing Lag	C Payment Lag	D Total	E Actual Payroll ⁶	F Weight	G Weighted Days
1 Salaries, Overtime & Wages	7.0	2.0	4.0	13.0	28,467	62.64%	8.1
2 CRA	7.0	6.0	7.6	20.6	8,310	18.29%	3.8
3 Sun Life Benefits	7.0	6.0	3.0	16.0	1,554	3.42%	0.5
4 Sun Life Savings Plan	7.0	6.0	3.0	16.0	76	0.17%	0.0
5 Local Authorities Pension	7.0	6.0	15.0	28.0	5,529	12.17%	3.4
6 Union Dues	7.0	6.0	3.0	16.0	199	0.44%	0.1
7 EPCOR Social Club & Donations	7.0	6.0	3.0	16.0	44	0.10%	0.0
8 Employee Garnishes	7.0	6.0	3.0	16.0	9	0.02%	0.0
9 Employee Savings Plan	7.0	6.0	3.0	16.0	867	1.91%	0.3
10 Wellness Personal Spending Account	15.0	0.0	15.0	30.0	72	0.16%	0.0
11 Health Services			45.6	45.6	171	0.38%	0.2
12 WCB			45.6	45.6	148	0.33%	0.1
13 Average Withholding Lag						100.00%	16.7

⁶ \$ thousands.

Table A2-3
Salary and Benefit Lag
Year ending December 31, 2017
(days)

Component	A Period Midpoint	B Processing Lag	C Payment Lag	D Total	E Actual Payroll ⁶	F Weight	G Weighted Days
1 Salaries, Overtime & Wages	7.0	2.0	4.0	13.0	27,799	62.46%	8.1
2 CRA	7.0	6.0	7.6	20.6	7,988	17.95%	3.7
3 Sun Life Benefits	7.0	6.0	3.0	16.0	1,424	3.20%	0.5
4 Sun Life Savings Plan	7.0	6.0	3.0	16.0	68	0.15%	0.0
5 Local Authorities Pension	7.0	6.0	15.0	28.0	5,770	12.96%	3.6
6 Union Dues	7.0	6.0	3.0	16.0	188	0.42%	0.1
7 EPCOR Social Club & Donations	7.0	6.0	3.0	16.0	43	0.10%	0.0
8 Employee Garnishes	7.0	6.0	3.0	16.0	9	0.02%	0.0
9 Employee Savings Plan	7.0	6.0	3.0	16.0	839	1.89%	0.3
10 Wellness Personal Spending Account	15.0	0.0	15.0	30.0	56	0.13%	0.0
11 Health Services			45.6	45.6	169	0.38%	0.2
12 WCB			45.6	45.6	155	0.35%	0.2
13 Average Withholding Lag						100.00%	16.7

Table A2-4
Salary and Benefit Lag
Year ending December 31, 2018
(days)

Component	A Period Midpoint	B Processing Lag	C Payment Lag	D Total	E Actual Payroll ⁶	F Weight	G Weighted Days
1 Salaries, Overtime & Wages	7.0	2.0	3.9	12.9	23,927	62.43%	8.1
2 CRA	7.0	6.0	7.6	20.6	7,129	18.60%	3.8
3 Sun Life Benefits	7.0	6.0	3.0	16.0	1,114	2.91%	0.5
4 Sun Life Savings Plan	7.0	6.0	3.0	16.0	68	0.18%	0.0
5 Local Authorities Pension	7.0	6.0	15.0	28.0	4,871	12.71%	3.6
6 Union Dues	7.0	6.0	3.0	16.0	153	0.40%	0.1
7 EPCOR Social Club & Donations	7.0	6.0	3.0	16.0	34	0.09%	0.0
8 Employee Garnishes	7.0	6.0	3.0	16.0	6	0.02%	0.0
9 Employee Savings Plan	7.0	6.0	3.0	16.0	716	1.87%	0.3
10 Wellness Personal Spending Account	15.0	0.0	15.0	30.0	54	0.14%	0.0
11 Health Services			45.6	45.6	130	0.34%	0.2
12 WCB			45.8	45.8	123	0.32%	0.1
13 Average Withholding Lag						100.00%	16.7

7.3 Appendix 3: General Expense Lag details

Table A3-1
Operating Expense Lag
Years ended December 31, 2017, 2018, and 2019
(days)

	Period Start	A Midpoint	B Period End	C Payment Date	D Consumption Lag Days	E Payment Lag Days	F Total Lag Days
1	1-Jan	16-Jan	31-Jan	28-Feb	15.5	28.0	43.5
2	1-Feb	14-Feb	28-Feb	31-Mar	14.0	31.0	45.0
3	1-Mar	16-Mar	31-Mar	30-Apr	15.5	30.0	45.5
4	1-Apr	15-Apr	30-Apr	31-May	15.0	31.0	46.0
5	1-May	16-May	31-May	30-Jun	15.5	30.0	45.5
6	1-Jun	15-Jun	30-Jun	31-Jul	15.0	31.0	46.0
7	1-Jul	16-Jul	31-Jul	31-Aug	15.5	31.0	46.5
8	1-Aug	16-Aug	31-Aug	30-Sep	15.5	30.0	45.5
9	1-Sep	15-Sep	30-Sep	31-Oct	15.0	31.0	46.0
10	1-Oct	16-Oct	31-Oct	30-Nov	15.5	30.0	45.5
11	1-Nov	15-Nov	30-Nov	31-Dec	15.0	31.0	46.0
12	1-Dec	16-Dec	31-Dec	31-Jan	15.5	31.0	46.5
13	Total Operating Expenses Remittance Lag						45.6

Table A3-2
Operating Expense Lag
Year ended December 31, 2016
(days)

	Period Start	A Midpoint	B Period End	C Payment Date	D Consumption Lag Days	E Payment Lag Days	F Total Lag Days
1	1-Jan	16-Jan	31-Jan	29-Feb	15.5	29.0	44.5
2	1-Feb	15-Feb	29-Feb	31-Mar	14.0	30.0	44.5
3	1-Mar	16-Mar	31-Mar	30-Apr	15.5	30.0	45.5
4	1-Apr	15-Apr	30-Apr	31-May	15.0	31.0	46.0
5	1-May	16-May	31-May	30-Jun	15.5	30.0	45.5
6	1-Jun	15-Jun	30-Jun	31-Jul	15.0	31.0	46.0
7	1-Jul	16-Jul	31-Jul	31-Aug	15.5	31.0	46.5
8	1-Aug	16-Aug	31-Aug	30-Sep	15.5	30.0	45.5
9	1-Sep	15-Sep	30-Sep	31-Oct	15.0	31.0	46.0
10	1-Oct	16-Oct	31-Oct	30-Nov	15.5	30.0	45.5
11	1-Nov	15-Nov	30-Nov	31-Dec	15.0	31.0	46.0
12	1-Dec	16-Dec	31-Dec	31-Jan	15.5	31.0	46.5
13	Total Operating Expenses Remittance Lag						45.8

7.4 Appendix 4: GST Lag calculations

Table A4-1
GST Lag
Years ended December 31, 2017, 2018, and 2019
(days)

	Period Start	A Midpoint	B Period End	C Filing Date	D Consumption Lag	E Remittance Lag	F GST Filing Lag	G Payment Lag	H Total Lag Days
1	1-Jan	16-Jan	31-Jan	28-Feb	15.5	28.0	43.5	64.5	108.0
2	1-Feb	14-Feb	28-Feb	31-Mar	14.0	31.0	45.0	66.0	111.0
3	1-Mar	16-Mar	31-Mar	30-Apr	15.5	30.0	45.5	66.5	112.0
4	1-Apr	15-Apr	30-Apr	31-May	15.0	31.0	46.0	67.0	113.0
5	1-May	16-May	31-May	30-Jun	15.5	30.0	45.5	66.5	112.0
6	1-Jun	15-Jun	30-Jun	31-Jul	15.0	31.0	46.0	67.0	113.0
7	1-Jul	16-Jul	31-Jul	31-Aug	15.5	31.0	46.5	67.5	114.0
8	1-Aug	16-Aug	31-Aug	30-Sep	15.5	30.0	45.5	66.5	112.0
9	1-Sep	15-Sep	30-Sep	31-Oct	15.0	31.0	46.0	67.0	113.0
10	1-Oct	16-Oct	31-Oct	30-Nov	15.5	30.0	45.5	66.5	112.0
11	1-Nov	15-Nov	30-Nov	31-Dec	15.0	31.0	46.0	67.0	113.0
12	1-Dec	16-Dec	31-Dec	31-Jan	15.5	31.0	46.5	67.5	114.0
13	Total GST Lag						45.6	66.6	112.3

Table A4-2
GST Lag
Years ended December 31, 2016
(days)

	Period Start	A Midpoint	B Period End	C Filing Date	D Consumption Lag	E Remittance Lag	F GST Filing Lag	G Payment Lag	H Total Lag Days
1	1-Jan	16-Jan	31-Jan	29-Feb	15.5	29.0	44.5	65.5	110.0
2	1-Feb	15-Feb	29-Feb	31-Mar	14.5	30.0	44.5	66.5	112.0
3	1-Mar	16-Mar	31-Mar	30-Apr	15.5	30.0	45.5	66.5	112.0
4	1-Apr	15-Apr	30-Apr	31-May	15.0	31.0	46.0	67.0	113.0
5	1-May	16-May	31-May	30-Jun	15.5	30.0	45.5	66.5	112.0
6	1-Jun	15-Jun	30-Jun	31-Jul	15.0	31.0	46.0	67.0	113.0
7	1-Jul	16-Jul	31-Jul	31-Aug	15.5	31.0	46.5	67.5	114.0
8	1-Aug	16-Aug	31-Aug	30-Sep	15.5	30.0	45.5	66.5	112.0
9	1-Sep	15-Sep	30-Sep	31-Oct	15.0	31.0	46.0	67.0	113.0
10	1-Oct	16-Oct	31-Oct	30-Nov	15.5	30.0	45.5	66.5	112.0
11	1-Nov	15-Nov	30-Nov	31-Dec	15.0	31.0	46.0	67.0	113.0
12	1-Dec	16-Dec	31-Dec	31-Jan	15.5	32.0	47.5	67.5	114.0
13	Total GST Lag						45.8	66.8	112.5



Appendix O2

EPCOR WATER SERVICES INC.

Wastewater Treatment Lead Lag Study

February 16, 2021

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1.0 INTRODUCTION

1. This lead-lag study has been undertaken to support the necessary working capital allowance for EPCOR Water Services Inc. (EWSI) for the 2022 to 2024 PBR filing with the City of Edmonton. A lead-lag study recognizes the timing differences between EWSI's provision of a service and payment, (revenue lag), and the timing differences between when an expense is incurred and subsequently paid, (expense lag). The net lag for an expense category is the difference between the associated revenue lag and the expense lag.

2. Lags are derived from analysis of each revenue and expenses stream and are broken down into their individual components in order to more precisely determine the total lag. EWSI's revenues are derived from fixed and metered charges for residential, multi-residential, commercial customers, and other sources. Since revenue cycles and the lead periods for each are not significantly different, they are considered together. Operating expenses are broken down into labour, salary and benefits, incentives, general expenses, property taxes, parent charges and franchise fees. An overall operating expense lag is then calculated on a weighted average and netted against the appropriate revenues. Net lags are also calculated for GST and individual capital expenses including debt interest, retained earnings, dividends, and depreciation.

3. The working capital ratio (net lag/365) is then applied against the corresponding expense amount in order to determine the portion of necessary working capital related to each component.

4. Lags are made up of two general components: consumption and payment.

- Consumption lag is the lag between when a service is provided or good consumed and the end of a consumption period. For example, if a service is billed on a weekly basis, the consumption period is a week and the consumption lag would vary between zero and seven days, depending on when the service was provided. As it is generally assumed that consumption occurs evenly over the consumption period, the mid-point of a consumption period is used to determine the consumption lag. In a weekly consumption period, the consumption lag would be 3.5 days (7/2) or in a monthly consumption period with 30 days the consumption lag would be 15 days (30/2).
- Payment lag is the time between the end of the consumption period and the receipt of cash. The payment lag sometimes includes a processing lag, which is time required to receive, process, and issue the order to proceed, however this is not always

considered separately from the payment lag. The payment lag is also measured in days and is the length between the last day of the consumption period and payment issue.

5. The lead-lag methodology used in this report is consistent with public lead-lag studies done for Hydro One Networks Inc., AltaLink, and Atco Gas among others. In addition, despite some changes in the assumptions, the underlying methodology is consistent with the principles applied in EDTI's 2020-2022 Transmission General Tariff Application with respect to necessary working capital. See further discussion in the Study Results section.

2.0 EXECUTIVE SUMMARY

6. The overall impact of the lead-lag study using 2019, 2018, 2017 and 2016 actual financial results are shown in Table 2.0-1.

**Table 2.0-1
Summary of Necessary Working Capital
(\$ thousands)**

	A	B	C	D	E	F	G	H	I	J	K	L
	2019			2018			2017			2016		
	Actual	Ratio	Working Cap	Actual	Ratio	Working Cap	Actual	Ratio	Working Cap	Actual	Ratio	Working Cap
1 Operating Expense, net of revenue offsets	43,709	4.3 %	1,870	43,045	4.6 %	1,996	41,187	5.8 %	2,382	41,845	4.9 %	2,043
2 Depreciation	18,033	13.4 %	2,411	16,436	13.5 %	2,219	14,404	14.7 %	2,119	13,053	14.0 %	1,831
3 Retained Earnings	20,871	13.4 %	2,790	21,192	13.5 %	2,861	20,586	14.7 %	3,029	15,575	14.0 %	2,184
4 Dividends	10,000	(50.0 %)	(5,000)	10,000	(50.0 %)	(5,000)	-	(50.0 %)	-	-	(50.1 %)	-
5 Interest Expense	10,692	(2.7 %)	(290)	9,971	(2.7 %)	(270)	9,187	(1.7 %)	(157)	8,510	(2.8 %)	(236)
6 GST Collection	130	0.9 %	1	96	1.0 %	1	89	2.2 %	2	74	1.5 %	1
7 GST Input Tax Credit	2,852	5.8 %	164	3,054	5.8 %	176	2,878	5.8 %	166	2,869	5.8 %	165
8 Necessary Working Capital			1,945			1,982			7,540			5,989

7. The ratios used to determine EWSI's necessary working capital requirements reflect the revenue and expense lags as shown in Tables 2.0-2 to 2.0-5.

**Table 2.0-2
Summary of Lags and Working Capital Ratio – 2019
(days)**

	A	B	C	D
	Revenue	Expense	Net	Ratio
1 Metered	48.8	33.2	15.6	4.3 %
2 Fixed	48.8	33.2	15.6	4.3 %
3 Miscellaneous	48.8	33.2	15.6	4.3 %
4 GST Collection	48.8	45.6	3.2	0.9 %
5 GST Input Tax Credit	66.6	45.6	21.0	5.8 %
Capital Expenses	Revenue	Expense	Net	Ratio
6 Debt interest	48.8	58.7	(9.9)	(2.7 %)
7 Retained Earnings	48.8	-	48.8	13.4 %
8 Dividends	-	182.5	(182.5)	(50.0 %)
9 Depreciation	48.8	-	48.8	13.4 %

**Table 2.0-3
Summary of Lags and Working Capital Ratio – 2018
(days)**

	A	B	C	D
	Revenue	Expense	Net	Ratio
1 Metered	49.3	32.3	16.9	4.6 %
2 Fixed	49.3	32.3	16.9	4.6 %
3 Miscellaneous	49.3	32.3	16.9	4.6 %
4 GST Collection	49.3	45.6	3.6	1.0 %
5 GST Input Tax Credit	66.6	45.6	21.0	5.8 %
Capital Expenses	Revenue	Expense	Net	Ratio
6 Debt interest	49.3	59.2	(9.9)	(2.7 %)
7 Retained Earnings	49.3	-	49.3	13.5 %
8 Dividends	-	182.5	(182.5)	(50.0 %)
9 Depreciation	49.3	-	49.3	13.5 %

Table 2.0-4
Summary of Lags and Working Capital Ratio – 2017
(days)

	A	B	C	D
	Revenue	Expense	Net	Ratio
1 Metered	53.7	32.6	21.1	5.8 %
2 Fixed	53.7	32.6	21.1	5.8 %
3 Miscellaneous	53.7	32.6	21.1	5.8 %
4 GST Collection	53.7	45.6	8.1	2.2 %
5 GST Input Tax Credit	66.6	45.6	21.0	5.8 %
Capital Expenses	Revenue	Expense	Net	Ratio
6 Debt interest	53.7	59.9	(6.2)	(1.7 %)
7 Retained Earnings	53.7	-	53.7	14.7 %
8 Dividends	-	182.5	(182.5)	(50.0 %)
9 Depreciation	53.7	-	53.7	14.7 %

Table 2.0-5
Summary of Lags and Working Capital Ratio – 2016
(days)

	A	B	C	D
	Revenue	Expense	Net	Ratio
1 Metered	51.2	33.4	17.8	4.9 %
2 Fixed	51.2	33.4	17.8	4.9 %
3 Miscellaneous	51.2	33.4	17.8	4.9 %
4 GST Collection	51.2	45.8	5.4	1.5 %
5 GST Input Tax Credit	66.8	45.8	21.0	5.8 %
Capital Expenses	Revenue	Expense	Net	Ratio
6 Debt interest	51.2	61.3	(10.1)	(2.8 %)
7 Retained Earnings	51.2	-	51.2	14.0 %
8 Dividends	-	183.0	(183.0)	(50.1 %)
9 Depreciation	51.2	-	51.2	14.0 %

8. Working capital lags between 2016 and 2019 have remained relatively consistent, with the changes in revenue lags attributable to changes in customer payment lag (account receivable balance). While changes in expense lags are primarily attributable to changes in the levels of incentives, which are paid annually in arrears, and decreases in the net lag for debt interest, reflecting debt issuances in the latter part of each year, and interest payments shifting to mid-year, decreasing the overall debt interest expense lag.

3.0 REVENUE

9. The revenue lag is the measure of time from consumption or provision of a service by EWSI to the receipt of payment from the customer. All of EWSI's revenue streams, including: metered, fixed, overstrength surcharges, and miscellaneous revenues, are subject to similar billing and payment cycles. Therefore, since these revenues are all billed in the same manner and are based on the same payment and consumption schedules, the lag period is similar for each revenue function and will not be considered separately for purposes of this report.

10. The revenue lag calculation considers several key components. Each has been broken down for clarity in understanding.

3.1 Average Consumption Period Lag

11. In order to determine the average lag for each consumption period, an average consumption period between meter readings must be determined. Each site is billed once per month, or 12 times per year. Given 365 days in 1 year, the average consumption period billed is calculated to be 30.42 days (365 divided by 12). EWSI has used the mid-point of the average consumption period billed as the consumption period lag. (30.4 days divided by 2 = 15.2 days).

3.2 Average Tariff Bill File Publish Lag and Invoice Lag

12. EWSI publishes each billing cycle exactly 6 business days after the scheduled reading date. This is in accordance with performance requirements as specified in section 2.14 of the Tariff Billing Code. Due to the fact that meter reading operations and billing cycles are performed on a business day schedule, the actual calendar day lag is 8 days for 4 (Tuesday – Friday) of the 5 cycles billed in a week and 10 days for the tariff files published on Mondays due to an extra weekend coming into play. These dates are summarized in Table 3.2-1.

Table 3.2-1
Tariff Bill File Publish Lag and Invoice Lag
(days)

Bill Cycle		A Meter Reading	B Tariff Bill File Publish	C Billing	D TBF Lag	E Invoice Lag
1	1	Friday	Monday	Wednesday	10.0	2.0
2	2	Monday	Tuesday	Thursday	8.0	2.0
3	3	Tuesday	Wednesday	Friday	8.0	2.0
4	4	Wednesday	Thursday	Monday	8.0	4.0
5	5	Thursday	Friday	Tuesday	8.0	4.0
6				Average	8.4	2.8

13. These lags are unchanged from EWSI's 2016 Lead-Lag Study, which is as expected since the billing schedule is also unchanged.

3.3 Customer Payment Lags

14. Payment is due from customer 21 days after the invoice date. Analysis of year end accounts receivable showed collections lags of 24.7 days in 2016, 27.3 days in 2017, 22.9 days in 2018 and 22.4 days in 2019.

15. The overall revenue lags for EWSI revenues are summarized in Table 3.3-1.

Table 3.3-1
Revenue Lag Summary
(days)

		A 2019	B 2018	C 2017	D 2016
1	Consumption period mid-point	15.21	15.21	15.21	15.25
2	TBF Publish lag	8.40	8.40	8.40	8.40
3	Invoicing lag	2.80	2.80	2.80	2.80
4	Customer payment	22.39	22.86	27.29	24.74
5	Total	48.80	49.27	53.70	51.19

16. As most expense lags are netted against these revenue lags to determine the corresponding working capital ratios and requirements, revenue lags play a significant role in the determination of EWSI's overall working capital requirement.

4.0 EXPENSES

17. EWSI examined operating expenses by breaking them down into the categories of labour, salary and benefits, incentive, property taxes, franchise fees, parent charges (inter-company

allocations) and general operating expenses. The total operating expense lag is calculated by taking the weighted average of these components on a yearly basis.

4.1 Labour, Salary and Benefits

18. Labour expense is comprised of salary and benefits, including remittances to CRA, Sun Life and other employee benefit and withholding categories. The total labour and benefits lag is calculated using the weighted average of all expenses types (incentive is calculated separately). Contractor fees are included in general operating expense as they are paid through the general accounts payable cheque runs.

19. The individual labour and benefit lag for EWSI was essentially unchanged between 2016 and 2019, which is as expected. The overall lag remained relatively flat from the 2016 lead lag study.

20. Components of the labour lag other than salaries, overtime and wages are based on lag times and weightings calculated by EUI's Payroll department for EPCOR as a whole. These weighting reflect the fact that these payments are processed centrally for all EPCOR subsidiaries, so the lag times will not differ between the various EPCOR subsidiaries, including EWSI. In addition, the weighting of categories within labour and benefits is comparable between areas.

4.2 Incentive Payments

21. Employee incentives are categorized separately from other operating costs as they have a longer payment lag of approximately 290 days compared to 46 days for other operating costs and only 16-17 days for other labour costs. Employee incentives are paid annual in the second pay period of April for the previous fiscal year, resulting in a consumption lag of 182 days and a payment lag of 111 days in 2016, 110 days in 2017, and 108 days in 2018, and 2019. Total lags for incentives were 293.5 days in 2016, 292 days in 2017 and 290 days for 2018 and 2019.

4.3 Property and Business Taxes

22. Property taxes are due June 30 for the current fiscal year, halfway through the consumption period. Accordingly, the property tax lead is 1 day for 2016 and 1.5 days for 2017 to 2019. Business taxes are paid March 31, so the expense lag for business taxes is 92.0 days for 2016 and 92.5 days for 2017 to 2019. Total weighted lead for property and business taxes are 1.0 days 2016, 1.5 days in 2017, 2018, and 2019

4.4 Franchise Fees

23. Franchise fees are paid monthly to municipalities; EPCOR pays these bills in the same fashion as the general operating expenses discussed below. It is therefore assumed that the lag period is the same as general operating expenses of 45.8 days in 2016 and 45.6 days in 2017, 2018, and 2019.

4.5 Parent Charges

24. EPCOR Corporate or “Parent” charges are categorized separately from other operating costs such as material costs and contractor costs as they have a shorter payment lag. Parent charges are allocated from corporate on a monthly basis therefore the lag is the average monthly consumption period of 15.0 days compared to 45.6 days for other operating costs.

4.6 General Operating Expenses

25. A majority of EPCOR’s general operating expenses are paid within 30 days of receiving the invoice; therefore, assuming expenses are incurred evenly over a month, the average consumption period is approximately 15 days. Assuming all expenses incurred in the month are paid at the end of the next month, the total lag for general operating expenses is 45.8 days in 2016, and 45.6 days in each of 2017, 2018, and 2019.

26. Net lags for revenues and expenses are summarized in Tables 4.6-1 to 4.6-4.

Table 4.6-1
Net Lag (Lead) for Revenues and Expenses – 2019
(\$ thousands)

	A	B	C	D
	Amount	Percentage	Lag Days	Weighted Days
REVENUE				
1 Metered	76,815	77.5%	48.8	37.8
2 Fixed	15,459	15.6%	48.8	7.6
3 Miscellaneous	6,871	6.9%	48.8	3.4
4 Subtotal	99,145	100%		48.8
5 NET REVENUE LAG				48.8
EXPENDITURES				
6 Labour, salaries & benefits	16,605	32.8%	16.6	5.4
7 Incentive	949	1.9%	290.0	5.4
8 Other operating expenses	20,919	41.4%	45.6	18.9
9 Parent charges	4,301	8.5%	15.0	1.3
10 Property tax	588	1.2%	(1.5)	(0.0)
11 Franchise fees	7,219	14.3%	15.2	2.2
12 Subtotal	50,580	100%		33.2
13 NET EXPENSE LAG				33.2
14 Net Lag (Lead) For Receipts & Payments 2019				15.6

Table 4.6-2
Net Lag (Lead) for Revenues and Expenses – 2018
(\$ thousands)

	A	B	C	D
	Amount	Percentage	Lag Days	Weighted Days
REVENUE				
1 Metered	75,236	78.4%	49.3	38.6
2 Fixed	14,583	15.2%	49.3	7.5
3 Miscellaneous	6,195	6.5%	49.3	3.2
4 Subtotal	96,014	100%		49.3
5 NET REVENUE LAG				49.3
EXPENDITURES				
6 Labour, salaries & benefits	17,274	35.1%	16.7	5.8
7 Incentive	868	1.8%	290.0	5.1
8 Other operating expenses	19,429	39.5%	45.6	18.0
9 Parent charges	4,079	8.3%	15.0	1.2
10 Property tax	587	1.2%	(1.5)	(0.0)
11 Franchise fees	7,002	14.2%	15.2	2.2
12 Subtotal	49,240	100%		32.3
13 NET EXPENSE LAG				32.3
14 Net Lag (Lead) For Receipts & Payments 2018				16.9

Table 4.6-3
Net Lag (Lead) for Revenues and Expenses – 2017
(\$ thousands)

	A	B	C	D
	Amount	Percentage	Lag Days	Weighted Days
REVENUE				
1 Metered	70,297	77.4%	53.7	41.6
2 Fixed	14,310	15.8%	53.7	8.5
3 Miscellaneous	6,193	6.8%	53.7	3.7
4 Subtotal	90,800	100%		53.7
5 NET REVENUE LAG				53.7
EXPENDITURES				
6 Labour, salaries & benefits	16,506	34.8%	16.7	5.8
7 Incentive	910	1.9%	292.0	5.6
8 Other operating expenses	18,308	38.6%	45.6	17.6
9 Parent charges	4,454	9.4%	15.0	1.4
10 Property tax	581	1.2%	(1.5)	(0.0)
11 Franchise fees	6,620	14.0%	15.2	2.1
12 Subtotal	47,380	100%		32.6
13 NET EXPENSE LAG				32.6
14 Net Lag (Lead) For Receipts & Payments 2017				21.1

Table 4.6-4
Net Lag (Lead) for Revenues and Expenses – 2016
(\$ thousands)

	A	B	C	D
	Amount	Percentage	Lag Days	Weighted Days
REVENUE				
1 Metered	64,993	77.7%	51.2	39.8
2 Fixed	13,258	15.8%	51.2	8.1
3 Miscellaneous	5,424	6.5%	51.2	3.3
4 Subtotal	83,674	100%		51.2
5 NET REVENUE LAG				51.2
EXPENDITURES				
6 Labour, salaries & benefits	15,985	33.8%	16.7	5.6
7 Incentive	953	2.0%	293.5	5.9
8 Other operating expenses	18,956	40.1%	45.8	18.3
9 Parent charges	4,736	10.0%	15.0	1.5
10 Property tax	521	1.1%	(1.0)	(0.0)
11 Franchise fees	6,119	12.9%	15.3	2.0
12 Subtotal	47,269	100%		33.4
13 NET EXPENSE LAG				33.4
14 Net Lag (Lead) For Receipts & Payments 2016				17.8

27. Overall for EWSI, the net lags for receipts and payments are 17.8 days in 2016, 21.1 days in 2017, 16.9 days in 2018, and 15.6 days in 2019. The changes in net lag times between 2016 and 2019 are primarily due to changes in customer payment lag each year. These values are based on actual costs for 2016, 2017, 2018, and 2019. The working capital ratios of 4.9% in 2016, 5.8% in 2017, 4.6% in 2018, and 4.3% in 2019 are calculated from the expense net lags (17.8/365, 21.1/365 and 16.9/365, 15.6/365) are then applied to the overall operating expense, net of revenue offsets, to provide the appropriate necessary working capital for this component (see Table 2.0-1).

5.0 GST

28. GST is not applicable to water sales, so EWSI only collects GST on a small proportion of its revenues, mainly for surplus sales, facility revenues and miscellaneous fees. Accordingly, EWSI is always in a refund position with the CRA. GST returns are filed monthly (usually on the last business day of the following month). Per discussions with EPCOR tax group, input credits are normally received from the CRA within 2-4 week of filing. Calculation of the GST remittance lag is shown in Appendix 5.

Table 5.0-1
GST Impact on Working Capital
(\$ thousands)

	A	B 2019	C 2018	D 2017	E 2016
REVENUE					
1 Net Receipts applicable to GST		2,598	1,914	1,784	1,486
2 GST rate		5.00%	5.00%	5.00%	5.00%
3 GST collected	(a)	130	96	89	74
4 Day factor - revenue lag		48.8	49.3	53.7	51.2
5 Day factor - GST remittance		45.6	45.6	45.6	45.8
6 Net	(b)	3.2	3.6	8.1	5.4
7 Impact on Working Capital	(a)*(b)/365	1	1	2	1
EXPENDITURES					
8 Other operating costs		20,919	19,429	18,308	18,956
9 Capital expenditures excluding labour		36,127	41,652	39,261	38,429
10 Net costs applicable to GST		57,046	61,081	57,569	57,385
11 GST rate		5.00%	5.00%	5.00%	5.00%
12 GST remitted	(d)	2,852	3,054	2,878	2,869
13 Day factor- GST refund lag		66.6	66.6	66.6	66.8
14 Day factor - GST applicable expense lag		45.6	45.6	45.6	45.8
15 Net	(e)	21.0	21.0	21.0	21.0
16 Impact on Working Capital	(d)*(e)/365	164	176	166	165
17 Net GST impact on Working Capital		165	177	168	166

29. GST collected by EWSI is based on analysis of 2016-2019 revenues, with input tax credits based on total operating expenses less labour, salaries, benefits and incentives and property taxes plus capital expenditures excluding labour components.

30. The day factor on GST applicable expenses is based on lead-lag days for general operating expenses, since capital expenditures (excluding labour) are assumed to be on the same payment schedule as all other operating costs.

31. As shown in Table 5.0-1, the impact of GST on working capital is negligible; resulting in an increase to necessary working capital of \$0.17 million in 2016, \$0.17 million in 2017, \$0.18 million in 2018, and \$0.17 million in 2019.

6.0 CAPITAL EXPENSES

32. Capital expenses include four categories: interest, retained earnings, common dividends and depreciation. As EWSI had not consistently issued a common dividend in the past, dividends

were not included in the 2016 lead lag study. However, EWSI has issued a dividend annually in 2018 and 2019 is forecast to continue annual dividends over the 2022 to 2024 period. As result, common dividends have been included in the current lead lag study. Table 6.0-1 provides the capital expense lags for 2016 to 2019.

Table 6.0-1
Capital Expense Lags for 2016, 2017, 2018, and 2019
(\$ thousands)

Expense	2019		2018		2017		2016	
	Lag Days	Expense	Lag Days	Expense	Lag Days	Expense	Lag Days	Expense
1 Interest	58.7	10,692	59.2	9,971	59.9	9,187	61.3	8,510
2 Retained Earnings	-	20,871	-	21,192	-	20,586	-	15,575
3 Dividends	182.5	10,000	182.5	10,000	182.5	-	182.5	-
4 Depreciation	-	18,033	-	16,436	-	14,404	-	13,053

6.1 Retained Earnings and Depreciation

33. Consistent with accepted practice for lead-lag studies, retained earnings and depreciation both have expense lags equivalent to zero days.

6.2 Interest on Long Term Debt

34. EWSI pays interest on inter-company long term debt issued by EPCOR Utilities Inc. (EUI) as well as interest on the City of Edmonton Debentures (COE debt). Both the COE debt and inter-company notes are paid at various times throughout the year. All interest is paid on a semi-annual basis. The midpoint of the consumption period for long term interest is 182.5 days, or July 2. The overall lag (lead) for interest expense is calculated as the weighted average lag (lead) of each individual debt issue.

35. Tables 6.2-1 to 6.2-4 show the calculation of long term debt lag (lead) days. The interest expense lag was 61.3 days in 2016, the lag decreased to 59.9 days in 2017, 59.2 days in 2018, and 58.7 days in 2019. The change in the net lag for long term debt are attributable to new debt issuances in the latter part of each year, with interest payments shifting back to mid-year, decreasing the overall long term debt expense lag.

**Table 6.2-1
Long Term Debt Lag (Lead) – 2019**

Description	A Interest Rate	B Face Value	C Interest Expense	Payment Dates			Payment Lags			J Weight	K Weighted Total Lag
				D First	E Second	F Mid- Year	G First	H Second	I Average		
1 IC-EUI-8B-0048	4.88%	20,000	721	1-Jun	1-Dec	1-Jul	(30.5)	152.5	61.0	6.7%	4.1
2 IC-EUI-8B-0071	4.62%	20,000	923	1-Feb	1-Aug	1-Jul	(150.5)	30.5	(60.0)	8.6%	(5.2)
3 IC-EUI-8B-0076	4.73%	35,000	1,656	1-Jun	1-Dec	1-Jul	(30.5)	152.5	61.0	15.5%	9.4
4 IC-EUI-8B-0078	4.12%	20,000	824	1-Jun	1-Dec	1-Jul	(30.5)	152.5	61.0	7.7%	4.7
5 IC-EUI-8B-0081	4.41%	12,000	529	1-Jun	1-Dec	1-Jul	(30.5)	152.5	61.0	4.9%	3.0
6 IC-EUI-8B-2016	4.01%	25,000	1,003	1-Jun	1-Dec	1-Jul	(30.5)	152.5	61.0	9.4%	5.7
7 IC-EUI-8B-2017	3.72%	30,000	1,116	1-Jun	1-Dec	1-Jul	(30.5)	152.5	61.0	10.4%	6.4
8 IC-EUI-8B-2018	4.16%	25,000	1,040	3-Jun	3-Dec	1-Jul	(28.5)	154.5	63.0	9.7%	6.1
9 IC-EUI-8B-2019	3.23%	40,000	108		31-Dec	1-Jul		182.5	91.3	1.0%	0.9
10 COE - Debt	5.00%	53,194	2,773	30-Jun	31-Dec	1-Jul	(1.5)	182.5	90.5	25.9%	23.5
11			10,692							74.1%	58.7

**Table 6.2-2
Long Term Debt Lag (Lead) – 2018**

Description	A Interest Rate	B Face Value	C Interest Expense	Payment Dates			Payment Lags			J Weight	K Weighted Total Lag
				D First	E Second	F Mid- Year	G First	H Second	I Average		
1 IC-EUI-8B-0048	4.88%	20,000	761	1-Jun	1-Dec	1-Jul	(30.5)	152.5	61.0	7.6%	4.7
2 IC-EUI-8B-0071	4.62%	20,000	923	1-Feb	1-Aug	1-Jul	(150.5)	30.5	(60.0)	9.3%	(5.6)
3 IC-EUI-8B-0076	4.73%	35,000	1,656	1-Jun	1-Dec	1-Jul	(30.5)	152.5	61.0	16.6%	10.1
4 IC-EUI-8B-0078	4.12%	20,000	824	1-Jun	1-Dec	1-Jul	(30.5)	152.5	61.0	8.3%	5.0
5 IC-EUI-8B-0081	4.41%	12,000	529	1-Jun	1-Dec	1-Jul	(30.5)	152.5	61.0	5.3%	3.2
6 IC-EUI-8B-2016	4.01%	25,000	1,003	1-Jun	1-Dec	1-Jul	(30.5)	152.5	61.0	10.1%	6.1
7 IC-EUI-8B-2017	3.72%	30,000	1,116	1-Jun	1-Dec	1-Jul	(30.5)	152.5	61.0	11.2%	6.8
8 IC-EUI-8B-2018	4.16%	25,000	87		31-Dec	1-Jul		182.5	91.3	0.9%	0.8
10 COE - Debt	5.00%	53,194	3,073	30-Jun	31-Dec	1-Jul	(1.5)	182.5	90.5	30.8%	27.9
11			9,971							100.0%	59.2

**Table 6.2-3
Long Term Debt Lag (Lead) – 2017**

Description	A Interest Rate	B Face Value	C Interest Expense	Payment Dates			Payment Lags			J Weight	K Weighted Total Lag
				D First	E Second	F Mid-Year	G First	H Second	I Average		
1 IC-EUI-8B-0048	4.88%	20,000	800	1-Jun	1-Dec	1-Jul	(30.5)	152.5	61.0	8.7%	5.3
2 IC-EUI-8B-0071	4.62%	20,000	923	1-Feb	1-Aug	1-Jul	(150.5)	30.5	(60.0)	10.0%	(6.0)
3 IC-EUI-8B-0076	4.73%	35,000	1,656	1-Jun	1-Dec	1-Jul	(30.5)	152.5	61.0	18.0%	11.0
4 IC-EUI-8B-0078	4.12%	20,000	824	1-Jun	1-Dec	1-Jul	(30.5)	152.5	61.0	9.0%	5.5
5 IC-EUI-8B-0081	4.41%	12,000	529	1-Jun	1-Dec	1-Jul	(30.5)	152.5	61.0	5.8%	3.5
6 IC-EUI-8B-2016	4.01%	25,000	1,003	1-Jun	1-Dec	1-Jul	(30.5)	152.5	61.0	10.9%	6.7
7 IC-EUI-8B-2017	3.72%	30,000	93		31-Dec	1-Jul		182.5	91.3	1.0%	0.9
10 COE - Debt	5.00%	53,194	3,361	30-Jun	31-Dec	1-Jul	(1.5)	182.5	90.5	36.6%	33.1
11			9,187							100.0%	59.9

**Table 6.2-4
Long Term Debt Lag (Lead) – 2016**

Description	A Interest Rate	B Face Value	C Interest Expense	Payment Dates			Payment Lags			J Weight	K Weighted Total Lag
				D First	E Second	F Mid-Year	G First	H Second	I Average		
1 IC-EUI-8B-0048	4.88%	20,000	836	1-Jun	1-Dec	1-Jul	(30.0)	153.0	61.5	9.8%	6.0
2 IC-EUI-8B-0071	4.62%	20,000	923	1-Feb	1-Aug	1-Jul	(151.0)	31.0	(60.0)	10.8%	(6.5)
3 IC-EUI-8B-0076	4.73%	35,000	1,656	1-Jun	1-Dec	1-Jul	(30.0)	153.0	61.5	19.5%	12.0
4 IC-EUI-8B-0078	4.12%	20,000	824	1-Jun	1-Dec	1-Jul	(30.0)	153.0	61.5	9.7%	6.0
5 IC-EUI-8B-0081	4.41%	12,000	529	1-Jun	1-Dec	1-Jul	(30.0)	153.0	61.5	6.2%	3.8
6 IC-EUI-8B-2016	4.01%	25,000	84		31-Dec	1-Jul		183.0	91.5	1.0%	0.9
10 COE - Debt	5.00%	53,194	3,659	30-Jun	31-Dec	1-Jul	(1.0)	183.0	91.0	43.0%	39.1
11			8,510							100.0%	61.3

6.3 Common Dividends

36. EWSI issues common dividends on December 31 for the current fiscal year, at the end of the consumption period. Accordingly, the common dividend lag is 182.5 days (365/2) for 2016, 2017, 2018, and 2019.

7.0 STUDY RESULTS

37. For the 2022-2024 PBR Term EWSI is proposing the lead lag ratios and days provided in Table 7.0-1 (columns E and F).

**Table 7.0-1
Summary of 2016-2019
Lead Lag Ratios**

	A	B	C	D	E	F
	2019	2018	2017	2016	Average	Lead/(Lag) Days
1 Operating Expenses	4.3 %	4.6 %	5.8 %	4.9 %	4.9 %	17.9
2 Depreciation	13.4 %	13.5 %	14.7 %	14.0 %	13.9 %	50.7
3 Retained Earnings	13.4 %	13.5 %	14.7 %	14.0 %	13.9 %	50.7
4 Dividend	(50.0 %)	(50.0 %)	(50.0 %)	(50.1 %)	(50.0 %)	(182.5)
5 Interest Expense	(2.7 %)	(2.7 %)	(1.7 %)	(2.8 %)	(2.5 %)	(9.1)
6 GST Collection	0.9 %	1.0 %	2.2 %	1.5 %	1.4 %	5.1
7 GST Input Tax Credit	5.8 %	5.8 %	5.8 %	5.8 %	5.8 %	21.0

38. Comparison of EWSI's Lead Lag Study with those of other Canadian regulated entities shows that both the items included in the lead lag study and the resulting working capital ratios are consistent with those of other Canadian regulated entities.

39. Table 7.0-2 compares working capital ratios among other regulated entities. Review of the calculation of these ratios shows a high degree of consistency in study methodology among regulated entities.

**Table 7.0-2
Comparative Study Working Capital Ratios**

	Comparative Studies					Range			EWSI
	A	B	C	D	E	F	G	H	I
	EDTI Tran ¹	ATCO Gas ²	Enmax Tran ³	AltaLink ⁴	Hydro One ⁵	Low	High	Avg	Avg
1 O&M Expenses	3.8 %	1.5 %	0.8 %	9.5 %	7.3 %	0.8 %	9.5 %	4.6 %	4.9 %
2 Income Tax Installments	N/A	4.8 %	N/A	(0.1)%	10.5 %	(0.1)%	10.5 %	5.0 %	N/A
3 Other Taxes	-	(6.7)%	(8.2)%	(4.4)%	9.4 %	(8.2)%	9.4 %	(2.0)%	7.1 %
4 Long Term Debt Interest	(37.8)%	4.1 %	8.2 %	(12.7)%	14.7 %	(37.8)%	14.7 %	(4.7)%	(2.5)%
5 Common Dividends	(0.2)%	(15.0)%	-	-	N/A	(15.0)%	-	(3.8)%	(50.0)%
6 Retained Earnings	12.2 %	8.5 %	12.4 %	12.1 %	N/A	8.5 %	12.4 %	11.3 %	13.9 %
7 Depreciation Expense	12.2 %	8.5 %	12.4 %	12.1 %	N/A	8.5 %	12.4 %	11.3 %	13.9 %

40. Comparison of EWSI's working capital ratios to those of the other companies included in Table 7.0-2 shows the following:

- EWSI's working capital ratios for O&M Expenses and Other Taxes are well within the range of the other companies included in the comparison;
- Since EWSI is not subject to income taxes this category does not apply to it;
- EWSI's working capital ratio for Dividends are higher than the other companies. The other companies included in the comparison issue dividends either quarterly or mid-year. EWSI issue its dividend at the end of the year, resulting in a higher working capital lag;
- EWSI's working capital ratios for retained earnings and depreciation are higher than those of the other companies included in Table 7.0-2. These ratios are based on revenue lag days. Since all of EWSI's revenues are derived from retail customers, rather than settlement with AESO or other system operators, EWSI's collection periods are longer than those of the other companies in the comparison. Accordingly, EWSI's ratios are reasonable;
- EWSI's long term debt interest ratios are slightly lower than those of the other companies in Table 7.0-2. These ratios are based on the difference between revenue lag days and interest expense lag days. EWSI based its calculation of interest expense lag days on the actual dates of interest paid during the year, a methodology also used by ENMAX, HydroOne, and AltaLink. This methodology provides a representative

¹ EDTI 2020-2022 TFO Tariff Application, MFR Schedules, Schedule 11-3.

² ATCO Gas GRA Filing 2011-2012, December 2010.

³ EPC 2018-2020 Transmission General Tariff Application, Appendix Q - EPC Lead Lag Study (Chymko).

⁴ AltaLink Management Ltd. 2019 - 2021 General Tariff Application, Table 11.2-1.

⁵ Hydro 1 EB-2017-0049, GTA Exhibit D1, Tab 1, Schedule 3, 2018 Test Year, March 03, 2017.

view of actual cash flows throughout the year. Accordingly, EWSI's long term debt interest ratio is reasonable;

41. EDTI and EWSI have significantly different long term debt interest ratios. EDTI used a simplified methodology to calculate interest expense lag days. EDTI assumed that interest is paid twice annually, resulting in a consumption period of 182.5 days ($365/2$). Subtracting this lag from EDTI's revenue lag of 44.50 days, yields an interest expense lag 138 days (37.8%).

7.1 Appendix 1: Salary, Overtime and Wage Lag details

Table A1-1
Salary Lag
Year Ending December 31, 2019
(days)

		A	B	C	D	E	F	G	H
	Period Start Date	Mid Period	Period End	Processing	Payment Date	Consumption Lag	Processing Lag	Payment Lag	Total Lag
1	23-Dec-18	29-Dec-18	05-Jan-19	07-Jan-19	11-Jan-19	7.00	2.00	4.00	13.00
2	06-Jan-19	12-Jan-19	19-Jan-19	21-Jan-19	25-Jan-19	7.00	2.00	4.00	13.00
3	20-Jan-19	26-Jan-19	02-Feb-19	04-Feb-19	08-Feb-19	7.00	2.00	4.00	13.00
4	03-Feb-19	09-Feb-19	16-Feb-19	18-Feb-19	22-Feb-19	7.00	2.00	4.00	13.00
5	17-Feb-19	23-Feb-19	02-Mar-19	04-Mar-19	08-Mar-19	7.00	2.00	4.00	13.00
6	03-Mar-19	09-Mar-19	16-Mar-19	18-Mar-19	22-Mar-19	7.00	2.00	4.00	13.00
7	17-Mar-19	23-Mar-19	30-Mar-19	01-Apr-19	05-Apr-19	7.00	2.00	4.00	13.00
8	31-Mar-19	06-Apr-19	13-Apr-19	15-Apr-19	18-Apr-19	7.00	2.00	3.00	12.00
9	14-Apr-19	20-Apr-19	27-Apr-19	29-Apr-19	03-May-19	7.00	2.00	4.00	13.00
10	28-Apr-19	04-May-19	11-May-19	13-May-19	17-May-19	7.00	2.00	4.00	13.00
11	12-May-19	18-May-19	25-May-19	27-May-19	31-May-19	7.00	2.00	4.00	13.00
12	26-May-19	01-Jun-19	08-Jun-19	10-Jun-19	14-Jun-19	7.00	2.00	4.00	13.00
13	09-Jun-19	15-Jun-19	22-Jun-19	24-Jun-19	28-Jun-19	7.00	2.00	4.00	13.00
14	23-Jun-19	29-Jun-19	06-Jul-19	08-Jul-19	12-Jul-19	7.00	2.00	4.00	13.00
15	07-Jul-19	13-Jul-19	20-Jul-19	22-Jul-19	26-Jul-19	7.00	2.00	4.00	13.00
16	21-Jul-19	27-Jul-19	03-Aug-19	05-Aug-19	09-Aug-19	7.00	2.00	4.00	13.00
17	04-Aug-19	10-Aug-19	17-Aug-19	19-Aug-19	23-Aug-19	7.00	2.00	4.00	13.00
18	18-Aug-19	24-Aug-19	31-Aug-19	02-Sep-19	06-Sep-19	7.00	2.00	4.00	13.00
19	01-Sep-19	07-Sep-19	14-Sep-19	16-Sep-19	20-Sep-19	7.00	2.00	4.00	13.00
20	15-Sep-19	21-Sep-19	28-Sep-19	30-Sep-19	04-Oct-19	7.00	2.00	4.00	13.00
21	29-Sep-19	05-Oct-19	12-Oct-19	14-Oct-19	18-Oct-19	7.00	2.00	4.00	13.00
22	13-Oct-19	19-Oct-19	26-Oct-19	28-Oct-19	01-Nov-19	7.00	2.00	4.00	13.00
23	27-Oct-19	02-Nov-19	09-Nov-19	11-Nov-19	15-Nov-19	7.00	2.00	4.00	13.00
24	10-Nov-19	16-Nov-19	23-Nov-19	25-Nov-19	29-Nov-19	7.00	2.00	4.00	13.00
25	24-Nov-19	30-Nov-19	07-Dec-19	09-Dec-19	13-Dec-19	7.00	2.00	4.00	13.00
26	08-Dec-19	14-Dec-19	21-Dec-19	23-Dec-19	27-Dec-19	7.00	2.00	4.00	13.00
27	Average Salary Lag					7.00	2.00	3.96	12.96

Table A1-2
Salary Lag
Year Ending December 31, 2018
(days)

		A	B	C	D	E	F	G	H
	Period Start Date	Mid Period	Period End	Processing	Payment Date	Consumption Lag	Processing Lag	Payment Lag	Total Lag
1	24-Dec-17	30-Dec-17	06-Jan-18	08-Jan-18	12-Jan-18	7.00	2.00	4.00	13.00
2	07-Jan-18	13-Jan-18	20-Jan-18	22-Jan-18	26-Jan-18	7.00	2.00	4.00	13.00
3	21-Jan-18	27-Jan-18	03-Feb-18	05-Feb-18	09-Feb-18	7.00	2.00	4.00	13.00
4	04-Feb-18	10-Feb-18	17-Feb-18	19-Feb-18	23-Feb-18	7.00	2.00	4.00	13.00
5	18-Feb-18	24-Feb-18	03-Mar-18	05-Mar-18	09-Mar-18	7.00	2.00	4.00	13.00
6	04-Mar-18	10-Mar-18	17-Mar-18	19-Mar-18	23-Mar-18	7.00	2.00	4.00	13.00
7	18-Mar-18	24-Mar-18	31-Mar-18	02-Apr-18	06-Apr-18	7.00	2.00	4.00	13.00
8	01-Apr-18	07-Apr-18	14-Apr-18	16-Apr-18	20-Apr-18	7.00	2.00	4.00	13.00
9	15-Apr-18	21-Apr-18	28-Apr-18	30-Apr-18	04-May-18	7.00	2.00	4.00	13.00
10	29-Apr-18	05-May-18	12-May-18	14-May-18	18-May-18	7.00	2.00	4.00	13.00
11	13-May-18	19-May-18	26-May-18	28-May-18	01-Jun-18	7.00	2.00	4.00	13.00
12	27-May-18	02-Jun-18	09-Jun-18	11-Jun-18	15-Jun-18	7.00	2.00	4.00	13.00
13	10-Jun-18	16-Jun-18	23-Jun-18	25-Jun-18	29-Jun-18	7.00	2.00	4.00	13.00
14	24-Jun-18	30-Jun-18	07-Jul-18	09-Jul-18	13-Jul-18	7.00	2.00	4.00	13.00
15	08-Jul-18	14-Jul-18	21-Jul-18	23-Jul-18	27-Jul-18	7.00	2.00	4.00	13.00
16	22-Jul-18	28-Jul-18	04-Aug-18	06-Aug-18	10-Aug-18	7.00	2.00	4.00	13.00
17	05-Aug-18	11-Aug-18	18-Aug-18	20-Aug-18	24-Aug-18	7.00	2.00	4.00	13.00
18	19-Aug-18	25-Aug-18	01-Sep-18	03-Sep-18	07-Sep-18	7.00	2.00	4.00	13.00
19	02-Sep-18	08-Sep-18	15-Sep-18	17-Sep-18	21-Sep-18	7.00	2.00	4.00	13.00
20	16-Sep-18	22-Sep-18	29-Sep-18	01-Oct-18	05-Oct-18	7.00	2.00	4.00	13.00
21	30-Sep-18	06-Oct-18	13-Oct-18	15-Oct-18	19-Oct-18	7.00	2.00	4.00	13.00
22	14-Oct-18	20-Oct-18	27-Oct-18	29-Oct-18	02-Nov-18	7.00	2.00	4.00	13.00
23	28-Oct-18	03-Nov-18	10-Nov-18	12-Nov-18	16-Nov-18	7.00	2.00	4.00	13.00
24	11-Nov-18	17-Nov-18	24-Nov-18	26-Nov-18	30-Nov-18	7.00	2.00	4.00	13.00
25	25-Nov-18	01-Dec-18	08-Dec-18	10-Dec-18	14-Dec-18	7.00	2.00	4.00	13.00
26	09-Dec-18	15-Dec-18	22-Dec-18	24-Dec-18	28-Dec-18	7.00	2.00	4.00	13.00
27	Average Salary Lag					7.00	2.00	4.00	13.00

Table A1-3
Salary Lag
Year Ending December 31, 2017
(days)

		A	B	C	D	E	F	G	H
	Period start date	Mid Period	Period End	C Processing	D Payment Date	E Consumption Lag	F Processing Lag	G Payment Lag	H Total Lag
1	25-Dec-16	31-Dec-16	07-Jan-17	09-Jan-17	13-Jan-17	7.00	2.00	4.00	13.00
2	08-Jan-17	14-Jan-17	21-Jan-17	23-Jan-17	27-Jan-17	7.00	2.00	4.00	13.00
3	22-Jan-17	28-Jan-17	04-Feb-17	06-Feb-17	10-Feb-17	7.00	2.00	4.00	13.00
4	05-Feb-17	11-Feb-17	18-Feb-17	20-Feb-17	24-Feb-17	7.00	2.00	4.00	13.00
5	19-Feb-17	25-Feb-17	04-Mar-17	06-Mar-17	10-Mar-17	7.00	2.00	4.00	13.00
6	05-Mar-17	11-Mar-17	18-Mar-17	20-Mar-17	24-Mar-17	7.00	2.00	4.00	13.00
7	19-Mar-17	25-Mar-17	01-Apr-17	03-Apr-17	07-Apr-17	7.00	2.00	4.00	13.00
8	02-Apr-17	08-Apr-17	15-Apr-17	17-Apr-17	21-Apr-17	7.00	2.00	4.00	13.00
9	16-Apr-17	22-Apr-17	29-Apr-17	01-May-17	05-May-17	7.00	2.00	4.00	13.00
10	30-Apr-17	06-May-17	13-May-17	15-May-17	19-May-17	7.00	2.00	4.00	13.00
11	14-May-17	20-May-17	27-May-17	29-May-17	02-Jun-17	7.00	2.00	4.00	13.00
12	28-May-17	03-Jun-17	10-Jun-17	12-Jun-17	16-Jun-17	7.00	2.00	4.00	13.00
13	11-Jun-17	17-Jun-17	24-Jun-17	26-Jun-17	30-Jun-17	7.00	2.00	4.00	13.00
14	25-Jun-17	01-Jul-17	08-Jul-17	10-Jul-17	14-Jul-17	7.00	2.00	4.00	13.00
15	09-Jul-17	15-Jul-17	22-Jul-17	24-Jul-17	28-Jul-17	7.00	2.00	4.00	13.00
16	23-Jul-17	29-Jul-17	05-Aug-17	07-Aug-17	11-Aug-17	7.00	2.00	4.00	13.00
17	06-Aug-17	12-Aug-17	19-Aug-17	21-Aug-17	25-Aug-17	7.00	2.00	4.00	13.00
18	20-Aug-17	26-Aug-17	02-Sep-17	04-Sep-17	08-Sep-17	7.00	2.00	4.00	13.00
19	03-Sep-17	09-Sep-17	16-Sep-17	18-Sep-17	22-Sep-17	7.00	2.00	4.00	13.00
20	17-Sep-17	23-Sep-17	30-Sep-17	02-Oct-17	06-Oct-17	7.00	2.00	4.00	13.00
21	01-Oct-17	07-Oct-17	14-Oct-17	16-Oct-17	20-Oct-17	7.00	2.00	4.00	13.00
22	15-Oct-17	21-Oct-17	28-Oct-17	30-Oct-17	03-Nov-17	7.00	2.00	4.00	13.00
23	29-Oct-17	04-Nov-17	11-Nov-17	13-Nov-17	17-Nov-17	7.00	2.00	4.00	13.00
24	12-Nov-17	18-Nov-17	25-Nov-17	27-Nov-17	01-Dec-17	7.00	2.00	4.00	13.00
25	26-Nov-17	02-Dec-17	09-Dec-17	11-Dec-17	15-Dec-17	7.00	2.00	4.00	13.00
26	10-Dec-17	16-Dec-17	23-Dec-17	25-Dec-17	29-Dec-17	7.00	2.00	4.00	13.00
27	Average Salary Lag					7.00	2.00	4.00	13.00

Table A1-4
Salary Lag
Year Ending December 31, 2016
(days)

		A	B	C	D	E	F	G	H
	Period start date	Mid Period	Period End	Processing	Payment Date	Consumption Lag	Processing Lag	Payment Lag	Total Lag
1	27-Dec-15	02-Jan-16	09-Jan-16	11-Jan-16	15-Jan-16	7.00	2.00	4.00	13.00
2	10-Jan-16	16-Jan-16	23-Jan-16	25-Jan-16	29-Jan-16	7.00	2.00	4.00	13.00
3	24-Jan-16	30-Jan-16	06-Feb-16	08-Feb-16	12-Feb-16	7.00	2.00	4.00	13.00
4	07-Feb-16	13-Feb-16	20-Feb-16	22-Feb-16	26-Feb-16	7.00	2.00	4.00	13.00
5	21-Feb-16	27-Feb-16	05-Mar-16	07-Mar-16	11-Mar-16	7.00	2.00	4.00	13.00
6	06-Mar-16	12-Mar-16	19-Mar-16	21-Mar-16	24-Mar-16	7.00	2.00	3.00	12.00
7	20-Mar-16	26-Mar-16	02-Apr-16	04-Apr-16	08-Apr-16	7.00	2.00	4.00	13.00
8	03-Apr-16	09-Apr-16	16-Apr-16	18-Apr-16	22-Apr-16	7.00	2.00	4.00	13.00
9	17-Apr-16	23-Apr-16	30-Apr-16	02-May-16	06-May-16	7.00	2.00	4.00	13.00
10	01-May-16	07-May-16	14-May-16	16-May-16	20-May-16	7.00	2.00	4.00	13.00
11	15-May-16	21-May-16	28-May-16	30-May-16	03-Jun-16	7.00	2.00	4.00	13.00
12	29-May-16	04-Jun-16	11-Jun-16	13-Jun-16	17-Jun-16	7.00	2.00	4.00	13.00
13	12-Jun-16	18-Jun-16	25-Jun-16	27-Jun-16	30-Jun-16	7.00	2.00	3.00	12.00
14	26-Jun-16	02-Jul-16	09-Jul-16	11-Jul-16	15-Jul-16	7.00	2.00	4.00	13.00
15	10-Jul-16	16-Jul-16	23-Jul-16	25-Jul-16	29-Jul-16	7.00	2.00	4.00	13.00
16	24-Jul-16	30-Jul-16	06-Aug-16	08-Aug-16	12-Aug-16	7.00	2.00	4.00	13.00
17	07-Aug-16	13-Aug-16	20-Aug-16	22-Aug-16	26-Aug-16	7.00	2.00	4.00	13.00
18	21-Aug-16	27-Aug-16	03-Sep-16	05-Sep-16	09-Sep-16	7.00	2.00	4.00	13.00
19	04-Sep-16	10-Sep-16	17-Sep-16	19-Sep-16	23-Sep-16	7.00	2.00	4.00	13.00
20	18-Sep-16	24-Sep-16	01-Oct-16	03-Oct-16	07-Oct-16	7.00	2.00	4.00	13.00
21	02-Oct-16	08-Oct-16	15-Oct-16	17-Oct-16	21-Oct-16	7.00	2.00	4.00	13.00
22	16-Oct-16	22-Oct-16	29-Oct-16	31-Oct-16	04-Nov-16	7.00	2.00	4.00	13.00
23	30-Oct-16	05-Nov-16	12-Nov-16	14-Nov-16	18-Nov-16	7.00	2.00	4.00	13.00
24	13-Nov-16	19-Nov-16	26-Nov-16	28-Nov-16	02-Dec-16	7.00	2.00	4.00	13.00
25	27-Nov-16	03-Dec-16	10-Dec-16	12-Dec-16	16-Dec-16	7.00	2.00	4.00	13.00
26	11-Dec-16	17-Dec-16	24-Dec-16	26-Dec-16	30-Dec-16	7.00	2.00	4.00	13.00
27	Average Salary Lag					7.00	2.00	3.92	12.92

7.2 Appendix 2: Labour and Benefit Summary Lag details

Table A2-1
Salary and Benefit Lag
Year ending December 31, 2019
(days)

	A	B	C	D	E	F	G
Component	Period Midpoint	Processing Lag	Payment Lag	Total	Actual Payroll⁶	Weight	Weighted Days
1 Salaries, Overtime & Wages	7.0	2.0	4.0	13.0	10,417	62.74%	8.1
2 CRA	7.0	6.0	7.6	20.6	3,107	18.71%	3.9
3 Sun Life Benefits	7.0	6.0	3.0	16.0	588	3.54%	0.6
4 Sun Life Savings Plan	7.0	6.0	3.0	16.0	23	0.14%	0.0
5 Local Authorities Pension	7.0	6.0	15.0	28.0	1,907	11.48%	3.2
6 Union Dues	7.0	6.0	3.0	16.0	71	0.43%	0.1
7 EPCOR Social Club & Donations	7.0	6.0	3.0	16.0	16	0.10%	0.0
8 Employee Garnishes	7.0	6.0	3.0	16.0	2	0.01%	0.0
9 Employee Savings Plan	7.0	6.0	3.0	16.0	320	1.93%	0.3
10 Wellness Personal Spending Account	15.0	0.0	15.0	30.0	24	0.14%	0.0
11 Health Services			45.6	45.6	76	0.46%	0.2
12 WCB			45.6	45.6	54	0.32%	0.1
13 Average Withholding Lag						100.00%	16.6

Table A2-2
Salary and Benefit Lag
Year ending December 31, 2018
(days)

	A	B	C	D	E	F	G
Component	Period Midpoint	Processing Lag	Payment Lag	Total	Actual Payroll⁶	Weight	Weighted Days
1 Salaries, Overtime & Wages	7.0	2.0	4.0	13.0	10,820	62.64%	8.1
2 CRA	7.0	6.0	7.6	20.6	3,159	18.29%	3.8
3 Sun Life Benefits	7.0	6.0	3.0	16.0	591	3.42%	0.5
4 Sun Life Savings Plan	7.0	6.0	3.0	16.0	29	0.17%	0.0
5 Local Authorities Pension	7.0	6.0	15.0	28.0	2,102	12.17%	3.4
6 Union Dues	7.0	6.0	3.0	16.0	76	0.44%	0.1
7 EPCOR Social Club & Donations	7.0	6.0	3.0	16.0	17	0.10%	0.0
8 Employee Garnishes	7.0	6.0	3.0	16.0	3	0.02%	0.0
9 Employee Savings Plan	7.0	6.0	3.0	16.0	330	1.91%	0.3
10 Wellness Personal Spending Account	15.0	0.0	15.0	30.0	27	0.16%	0.0
11 Health Services	0.0	0.0	45.6	45.6	65	0.38%	0.2
12 WCB			45.6	45.6	56	0.33%	0.1
13 Average Withholding Lag						100.00%	16.7

⁶ \$ thousands.

Table A2-3
Salary and Benefit Lag
Year ending December 31, 2017
(days)

Component	A Period Midpoint	B Processing Lag	C Payment Lag	D Total	E Actual Payroll⁶	F Weight	G Weighted Days
1 Salaries, Overtime & Wages	7.0	2.0	4.0	13.0	10,310	62.46%	8.1
2 CRA	7.0	6.0	7.6	20.6	2,962	17.95%	3.7
3 Sun Life Benefits	7.0	6.0	3.0	16.0	528	3.20%	0.5
4 Sun Life Savings Plan	7.0	6.0	3.0	16.0	25	0.15%	0.0
5 Local Authorities Pension	7.0	6.0	15.0	28.0	2,140	12.96%	3.6
6 Union Dues	7.0	6.0	3.0	16.0	70	0.42%	0.1
7 EPCOR Social Club & Donations	7.0	6.0	3.0	16.0	16	0.10%	0.0
8 Employee Garnishes	7.0	6.0	3.0	16.0	3	0.02%	0.0
9 Employee Savings Plan	7.0	6.0	3.0	16.0	311	1.89%	0.3
10 Wellness Personal Spending Account	15.0	0.0	15.0	30.0	21	0.13%	0.0
11 Health Services	0.0	0.0	45.6	45.6	63	0.38%	0.2
12 WCB			45.6	45.6	58	0.35%	0.2
13 Average Withholding Lag						100.00%	16.7

Table A2-4
Salary and Benefit Lag
Year ending December 31, 2018
(days)

Component	A Period Midpoint	B Processing Lag	C Payment Lag	D Total	E Actual Payroll⁶	F Weight	G Weighted Days
1 Salaries, Overtime & Wages	7.0	2.0	3.9	12.9	9,980	62.43%	8.1
2 CRA	7.0	6.0	7.6	20.6	2,973	18.60%	3.8
3 Sun Life Benefits	7.0	6.0	3.0	16.0	464	2.91%	0.5
4 Sun Life Savings Plan	7.0	6.0	3.0	16.0	28	0.18%	0.0
5 Local Authorities Pension	7.0	6.0	15.0	28.0	2,032	12.71%	3.6
6 Union Dues	7.0	6.0	3.0	16.0	64	0.40%	0.1
7 EPCOR Social Club & Donations	7.0	6.0	3.0	16.0	14	0.09%	0.0
8 Employee Garnishes	7.0	6.0	3.0	16.0	3	0.02%	0.0
9 Employee Savings Plan	7.0	6.0	3.0	16.0	299	1.87%	0.3
10 Wellness Personal Spending Account	15.0	0.0	15.0	30.0	23	0.14%	0.0
11 Health Services	0.0	0.0	45.6	45.6	54	0.34%	0.2
12 WCB			45.8	45.8	51	0.32%	0.1
13 Average Withholding Lag						100.00%	16.7

7.3 Appendix 3: General Expense Lag details

Table A3-1
Operating Expense Lag
Years ended December 31, 2017, 2018, and 2019
(days)

	A	B	C	D	E	F
Period Start	Midpoint	Period End	Payment Date	Consumption Lag Days	Payment Lag Days	Total Lag Days
1 1-Jan	16-Jan	31-Jan	28-Feb	15.5	28.0	43.5
2 1-Feb	14-Feb	28-Feb	31-Mar	14.0	31.0	45.0
3 1-Mar	16-Mar	31-Mar	30-Apr	15.5	30.0	45.5
4 1-Apr	15-Apr	30-Apr	31-May	15.0	31.0	46.0
5 1-May	16-May	31-May	30-Jun	15.5	30.0	45.5
6 1-Jun	15-Jun	30-Jun	31-Jul	15.0	31.0	46.0
7 1-Jul	16-Jul	31-Jul	31-Aug	15.5	31.0	46.5
8 1-Aug	16-Aug	31-Aug	30-Sep	15.5	30.0	45.5
9 1-Sep	15-Sep	30-Sep	31-Oct	15.0	31.0	46.0
10 1-Oct	16-Oct	31-Oct	30-Nov	15.5	30.0	45.5
11 1-Nov	15-Nov	30-Nov	31-Dec	15.0	31.0	46.0
12 1-Dec	16-Dec	31-Dec	31-Jan	15.5	31.0	46.5
13 Total Operating Expenses Remittance Lag						45.6

Table A3-2
Operating Expense Lag
Year ended December 31, 2016
(days)

	Period Start	A Midpoint	B Period End	C Payment Date	D Consumption Lag Days	E Payment Lag Days	F Total Lag Days
1	1-Jan	16-Jan	31-Jan	29-Feb	15.5	29.0	44.5
2	1-Feb	15-Feb	29-Feb	31-Mar	14.5	30.0	45.5
3	1-Mar	16-Mar	31-Mar	30-Apr	15.5	30.0	45.5
4	1-Apr	15-Apr	30-Apr	31-May	15.0	31.0	46.0
5	1-May	16-May	31-May	30-Jun	15.5	30.0	45.5
6	1-Jun	15-Jun	30-Jun	31-Jul	15.0	31.0	46.0
7	1-Jul	16-Jul	31-Jul	31-Aug	15.5	31.0	46.5
8	1-Aug	16-Aug	31-Aug	30-Sep	15.5	30.0	45.5
9	1-Sep	15-Sep	30-Sep	31-Oct	15.0	31.0	46.0
10	1-Oct	16-Oct	31-Oct	30-Nov	15.5	30.0	45.5
11	1-Nov	15-Nov	30-Nov	31-Dec	15.0	31.0	46.0
12	1-Dec	16-Dec	31-Dec	31-Jan	15.5	31.0	46.5
13	Total Operating Expenses Remittance Lag						45.8

7.4 Appendix 4: GST Lag calculations

Table A4-1
GST Lag
Years ended December 31, 2017, 2018, and 2019
(days)

		A	B	C	D	E	F	G	H
	Period Start	Midpoint	Period End	Filing Date	Consumption Lag	Remittance Lag	GST Filing Lag	Payment Lag	Total Lag Days
1	1-Jan	16-Jan	31-Jan	28-Feb	15.5	28.0	43.5	64.5	108.0
2	1-Feb	14-Feb	28-Feb	31-Mar	14.0	31.0	45.0	66.0	111.0
3	1-Mar	16-Mar	31-Mar	30-Apr	15.5	30.0	45.5	66.5	112.0
4	1-Apr	15-Apr	30-Apr	31-May	15.0	31.0	46.0	67.0	113.0
5	1-May	16-May	31-May	30-Jun	15.5	30.0	45.5	66.5	112.0
6	1-Jun	15-Jun	30-Jun	31-Jul	15.0	31.0	46.0	67.0	113.0
7	1-Jul	16-Jul	31-Jul	31-Aug	15.5	31.0	46.5	67.5	114.0
8	1-Aug	16-Aug	31-Aug	30-Sep	15.5	30.0	45.5	66.5	112.0
9	1-Sep	15-Sep	30-Sep	31-Oct	15.0	31.0	46.0	67.0	113.0
10	1-Oct	16-Oct	31-Oct	30-Nov	15.5	30.0	45.5	66.5	112.0
11	1-Nov	15-Nov	30-Nov	31-Dec	15.0	31.0	46.0	67.0	113.0
12	1-Dec	16-Dec	31-Dec	31-Jan	15.5	31.0	46.5	67.5	114.0
13	Total GST Lag						45.6	66.6	112.3

Table A4-2
GST Lag
Years ended December 31, 2016
(days)

	Period Start	A Midpoint	B Period End	C Filing Date	D Consumption Lag	E Remittance Lag	F GST Filing Lag	G Payment Lag	H Total Lag Days
1	1-Jan	16-Jan	31-Jan	29-Feb	15.5	29.0	44.5	65.5	110.0
2	1-Feb	15-Feb	29-Feb	31-Mar	14.5	31.0	45.5	66.5	112.0
3	1-Mar	16-Mar	31-Mar	30-Apr	15.5	30.0	45.5	66.5	112.0
4	1-Apr	15-Apr	30-Apr	31-May	15.0	31.0	46.0	67.0	113.0
5	1-May	16-May	31-May	30-Jun	15.5	30.0	45.5	66.5	112.0
6	1-Jun	15-Jun	30-Jun	31-Jul	15.0	31.0	46.0	67.0	113.0
7	1-Jul	16-Jul	31-Jul	31-Aug	15.5	31.0	46.5	67.5	114.0
8	1-Aug	16-Aug	31-Aug	30-Sep	15.5	30.0	45.5	66.5	112.0
9	1-Sep	15-Sep	30-Sep	31-Oct	15.0	31.0	46.0	67.0	113.0
10	1-Oct	16-Oct	31-Oct	30-Nov	15.5	30.0	45.5	66.5	112.0
11	1-Nov	15-Nov	30-Nov	31-Dec	15.0	31.0	46.0	67.0	113.0
12	1-Dec	16-Dec	31-Dec	31-Jan	15.5	31.0	46.5	67.5	114.0
13	Total GST Lag						45.8	66.8	112.5



Appendix O3

EPCOR WATER SERVICES INC.

**Drainage Services
Lead Lag Study**

February 16, 2021

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1.0 INTRODUCTION

1. This lead-lag study has been undertaken to support the necessary working capital allowance for EPCOR Water Services Inc. (EWSI) for the 2022 to 2024 PBR filing with the City of Edmonton. A lead-lag study recognizes the timing differences between EWSI's provision of a service and payment, (revenue lag), and the timing differences between when an expense is incurred and subsequently paid, (expense lag). The net lag for an expense category is the difference between the associated revenue lag and the expense lag.

2. Lags are derived from analysis of each revenue and expenses stream and are broken down into their individual components in order to more precisely determine the total lag. EWSI's revenues are derived from fixed and metered charges for residential, multi-residential, commercial customers, and other sources. Since revenue cycles and the lead periods for each are not significantly different, they are considered together. Operating expenses are broken down into labour, salary and benefits, incentives, general expenses, property taxes, parent charges and franchise fees. An overall operating expense lag is then calculated on a weighted average and netted against the appropriate revenues. Net lags are also calculated for GST and individual capital expenses including debt interest, retained earnings, dividends, and depreciation.

3. The working capital ratio (net lag/365) is then applied against the corresponding expense amount in order to determine the portion of necessary working capital related to each component.

4. Lags are made up of two general components: consumption and payment:

- Consumption lag is the lag between when a service is provided or good consumed and the end of a consumption period. For example, if a service is billed on a weekly basis, the consumption period is a week and the consumption lag would vary between zero and seven days, depending on when the service was provided. As it is generally assumed that consumption occurs evenly over the consumption period, the mid-point of a consumption period is used to determine the consumption lag. In a weekly consumption period, the consumption lag would be 3.5 days (7/2) or in a monthly consumption period with 30 days the consumption lag would be 15 days (30/2).
- Payment lag is the time between the end of the consumption period and the receipt of cash. The payment lag sometimes includes a processing lag, which is time required to receive, process, and issue the order to proceed, however this is not always considered separately from the payment lag. The payment lag is also measured in

days and is the length between the last day of the consumption period and payment issue.

5. The lead-lag methodology used in this report is consistent with public lead-lag studies done for Hydro One Networks Inc., AltaLink, and Atco Gas among others. In addition, despite some changes in the assumptions, the underlying methodology is consistent with the principles applied in EDTI's 2020-2022 Transmission General Tariff Application with respect to necessary working capital. See further discussion in the Study Results section.

2.0 EXECUTIVE SUMMARY

6. The overall impact of the lead-lag study using 2019, and 2018 actual financial results are shown in Table 2.0-1.

Table 2.0-1
Summary of Necessary Working Capital
(\$ thousands)

	A	B	C	D	E	F
	2019			2018		
	Actual	Ratio	Working Cap	Actual	Ratio	Working Cap
1 Operating Expenses, net of revenue offsets	106,471	4.0 %	4,220	98,693	3.9 %	3,881
2 Depreciation	32,854	13.3 %	4,353	32,811	13.6 %	4,457
3 Retained Earnings	29,710	13.3 %	3,937	31,680	13.6 %	4,303
4 Dividends	-	(50.0 %)	-	-	(50.0 %)	-
5 Interest Expense	20,156	(5.7 %)	(1,140)	19,789	(5.5 %)	(1,094)
6 GST Collection	372	0.8 %	3	480	1.1 %	5
7 GST Input Tax Credit	5,268	5.8 %	303	7,568	5.8 %	435
8 Necessary Working Capital			11,677			11,987

7. The ratios used to determine EWSI's necessary working capital requirements reflect the revenue and expense lags as shown in Tables 2.0-2 and 2.0-3.

Table 2.0-2
Summary of Lags and Working Capital Ratio – 2019
(Days)

	A	B	C	D
	Revenue	Expense	Net	Ratio
1 Metered	48.4	33.9	14.5	4.0 %
2 Fixed	48.4	33.9	14.5	4.0 %
3 Miscellaneous	48.4	33.9	14.5	4.0 %
4 GST Collection	48.4	45.6	2.7	0.8 %
5 GST Input Tax Credit	66.6	45.6	21.0	5.8 %
Capital Expenses	Revenue	Expense	Net	Ratio
6 Debt interest	48.4	69.0	(20.6)	(5.7 %)
7 Retained Earnings	48.4	-	48.4	13.3 %
8 Dividends	-	182.5	(182.5)	(50.0%)
9 Depreciation	48.4	-	48.4	13.3 %

Table 2.0-3
Summary of Lags and Working Capital Ratio – 2018
Number of Days
(Days)

	A	B	C	D
	Revenue	Expense	Net	Ratio
1 Metered	49.6	35.2	14.4	3.9 %
2 Fixed	49.6	35.2	14.4	3.9 %
3 Miscellaneous	49.6	35.2	14.4	3.9 %
4 GST Collection	49.6	45.6	4.0	1.1 %
5 GST Input Tax Credit	66.6	45.6	21.0	5.8 %
Capital Expenses	Revenue	Expense	Net	Ratio
6 Debt interest	49.6	69.8	(20.2)	(5.5 %)
7 Retained Earnings	49.6	-	49.6	13.6 %
8 Dividends	-	182.5	(182.5)	(50.0%)
9 Depreciation	49.6	-	49.6	13.6 %

8. Working capital lags between 2018 and 2019 have remained relatively consistent, with the changes in revenue lags attributable to changes in customer payment lag (account receivable balance). While changes in expense lags are primarily attributable to a reduction in operating expenses between 2018 and 2019, and decreases in the net lag for debt interest, reflecting debt issuances in the latter part of each year, with interest payments shifting back to mid-year, decreasing the overall debt interest expense lag.

3.0 REVENUE

9. The revenue lag is the measure of time from consumption or provision of a service by EWSI to the receipt of payment from the customer. All of EWSI's revenue streams, including: metered, fixed, and miscellaneous revenues, are subject to similar billing and payment cycles. Therefore, since these revenues are all billed in the same manner and are based on the same payment and consumption schedules, the lag period is similar for each revenue function and will not be considered separately for purposes of this report.

10. The revenue lag calculation considers several key components. Each has been broken down for clarity in understanding.

3.1 Average Consumption Period Lag

11. In order to determine the average lag for each consumption period, an average consumption period between meter readings must be determined. Each site is billed once per month, or 12 times per year. Given 365 days in 1 year, the average consumption period billed is calculated to be 30.42 days (365 divided by 12). EWSI has used the mid-point of the average consumption period billed as the consumption period lag. (30.4 days divided by 2 = 15.2 days).

3.2 Average Tariff Bill File Publish Lag and Invoice Lag

12. EWSI publishes each billing cycle exactly 6 business days after the scheduled reading date. This is in accordance with performance requirements as specified in section 2.14 of the Tariff Billing Code. Due to the fact that meter reading operations and billing cycles are performed on a business day schedule, the actual calendar day lag is 8 days for 4 (Tuesday – Friday) of the 5 cycles billed in a week and 10 days for the tariff files published on Mondays due to an extra weekend coming into play. These dates are summarized in Table 3.2-1.

Table 3.2-1
Tariff Bill File Publish Lag and Invoice Lag
(Days)

		A	B	C	D	E
	Bill Cycle	Meter Reading	Tariff Bill File Publish	Billing	TBF Lag	Invoice Lag
1	1	Friday	Monday	Wednesday	10.0	2.0
2	2	Monday	Tuesday	Thursday	8.0	2.0
3	3	Tuesday	Wednesday	Friday	8.0	2.0
4	4	Wednesday	Thursday	Monday	8.0	4.0
5	5	Thursday	Friday	Tuesday	8.0	4.0
6				Average	8.4	2.8

13. These lags are unchanged from EWSI's 2016 Lead-Lag Study, which is as expected since the billing schedule is also unchanged.

3.3 Customer Payment Lags

14. Payment is due from customer 21 days after the invoice date. Analysis of year end accounts receivable showed collections lags of 23.2 days in 2018, and 22.0 days in 2019.

15. The overall revenue lags for EWSI revenues are summarized in Table 3.3-1.

Table 3.3-1
Revenue Lag Summary
(Days)

	A	B
	2019	2018
1 Consumption period mid-point	15.21	15.21
2 TBF Publish lag	8.40	8.40
3 Invoicing lag	2.80	2.80
4 Customer payment	21.96	23.17
5 Total	48.36	49.58

16. As most expense lags are netted against these revenue lags to determine the corresponding working capital ratios and requirements, revenue lags play a significant role in the determination of EWSI's overall working capital requirement.

4.0 EXPENSES

17. EWSI examined operating expenses by breaking them down into the categories of labour, salary and benefits, incentive, property taxes, franchise fees, parent charges (inter-company

allocations) and general operating expenses. The total operating expense lag is calculated by taking the weighted average of these components on a yearly basis.

4.1 Labour, Salary and Benefits

18. Labour expense is comprised of salary and benefits, including remittances to CRA, Sun Life and other employee benefit and withholding categories. The total labour and benefits lag is calculated using the weighted average of all expenses types (incentive is calculated separately). Contractor fees are included in general operating expense as they are paid through the general accounts payable cheque runs.

19. The individual labour and benefit lag for EWSI was essentially unchanged between 2018 and 2019, which is as expected.

20. Components of the labour lag other than salaries, overtime and wages are based on lag times and weightings calculated by EUI's Payroll department for EPCOR as a whole. These weighting reflect the fact that these payments are processed centrally for all EPCOR subsidiaries, so the lag times will not differ between the various EPCOR subsidiaries, including EWSI. In addition, the weighting of categories within labour and benefits is comparable between areas.

4.2 Incentive Payments

21. Employee incentives are categorized separately from other operating costs as they have a longer payment lag of approximately 290 days compared to 46 days for other operating costs and only 16-17 days for other labour costs. Employee incentives are paid annual in the second pay period of April for the previous fiscal year, resulting in a consumption lag of 182 days and a payment lag of 108 days in 2018 and 2019. Total lags for incentives were 290 days for 2018 and 2019.

4.3 Property and Business Taxes

22. Property taxes are due June 30 for the current fiscal year, halfway through the consumption period. Accordingly, the property tax lead is 1.5 days for 2018 and 2019. Business taxes are paid March 31, so the expense lag for business taxes is 92.5 days for 2018 and 2019. Total weighted lead for property and business taxes are 1.6 days for 2018, and 1.7 days for 2019.

4.4 Franchise Fees

23. Franchise fees are paid monthly to municipalities; EPCOR pays these bills in the same fashion as the general operating expenses discussed below. It is therefore assumed that the lag period is the same as general operating expenses of 45.6 days in 2018, and 2019.

4.5 Parent Charges

24. EPCOR Corporate or “Parent” charges are categorized separately from other operating costs such as material costs and contractor costs as they have a shorter payment lag. Parent charges are allocated from corporate on a monthly basis therefore the lag is the average monthly consumption period of 15.0 days compared to 45.6 days for other operating costs.

4.6 General Operating Expenses

25. A majority of EPCOR’s general operating expenses are paid within 30 days of receiving the invoice; therefore, assuming expenses are incurred evenly over a month, the average consumption period is approximately 15 days. Assuming all expenses incurred in the month are paid at the end of the next month, the total lag for general operating expenses is 45.6 days in each of 2018, and 2019.

26. Net lags for revenues and expenses are summarized in Tables 4.6-1 and 4.6-2.

Table 4.6-1
Net Lag (Lead) for Revenues and Expenses – 2019
(\$ thousands)

	A	B	C	D
	Amount	Percentage	Lag days	Weighted Days
REVENUE				
1 Metered	150,363	75.7%	48.4	36.6
2 Fixed	40,019	20.2%	48.4	9.7
3 Miscellaneous	8,197	4.1%	48.4	2.0
4 Subtotal	198,578	100%		48.4
5 NET REVENUE LAG				48.4
EXPENDITURES				
6 Labour, salaries & benefits	45,216	39.4%	16.6	6.5
7 Incentive	3,355	2.9%	290.0	8.5
8 Other operating expenses	38,639	33.7%	45.6	15.4
9 Parent charges	17,436	15.2%	15.0	2.3
10 Property tax	773	0.7%	(1.7)	(0.0)
11 Franchise fees	9,248	8.1%	15.2	1.2
12 Subtotal	114,668	100%		33.9
13 NET EXPENSE LAG				33.9
14 Net Lag (Lead) For Receipts & Payments 2019				14.5

Table 4.6-2
Net Lag (Lead) for Revenues and Expenses – 2018
(\$ thousands)

	A	B	C	D
	Amount	Percentage	Lag days	Weighted Days
REVENUE				
1 Metered	146,024	75.0%	49.6	37.2
2 Fixed	38,522	19.8%	49.6	9.8
3 Miscellaneous	10,102	5.2%	49.6	2.6
4 Subtotal	194,648	100%		49.6
5 NET REVENUE LAG				49.6
EXPENDITURES				
6 Labour, salaries & benefits	36,837	33.9%	16.7	5.6
7 Incentive	3,120	2.9%	290.0	8.3
8 Other operating expenses	42,262	38.8%	45.6	17.7
9 Parent charges	16,750	15.4%	15.0	2.3
10 Property tax	901	0.8%	(1.6)	(0.0)
11 Franchise fees	8,925	8.2%	15.2	1.2
12 Subtotal	108,795	100%		35.2
13 NET EXPENSE LAG				35.2
14 Net Lag (Lead) For Receipts & Payments 2018				14.4

27. Overall for EWSI, the net lags for receipts and payments are 14.4 days in 2018, and 14.5 days in 2019. The changes in net lag times between 2018 and 2019 are primarily due to changes in customer payment lag each year, offset by a reduction in operating expense in 2019. These values are based on actual costs for 2018 and 2019. The working capital ratios of 3.9% in 2018, and 4.0% in 2019 are calculated from the expense net lags (14.4/365 and 14.5/365) are then applied to the overall operating expenses, net of revenue offsets, to provide the appropriate necessary working capital for this component (see Table 2.0-1).

5.0 GST

28. GST is not applicable to water sales, so EWSI only collects GST on a small proportion of its revenues, mainly for surplus sales, facility revenues and miscellaneous fees. Accordingly, EWSI is always in a refund position with the CRA. GST returns are filed monthly (usually on the last business day of the following month). Per discussions with EPCOR tax group, input credits are normally received from the CRA within 2-4 weeks of filing. Calculation of the GST remittance lag is shown in Appendix 5.

Table 5.0-1
GST Impact on Working Capital
(\$ thousands)

	A	B 2019	C 2018
REVENUE			
1 Net Receipts applicable to GST		7,437	9,593
2 GST rate		5.00%	5.00%
3 GST collected	(a)	372	480
4 Day factor - revenue lag		48.4	49.6
5 Day factor - GST remittance		45.6	45.6
6 Net	(b)	2.7	4.0
7 Impact on Working Capital	(a)*(b)/365	3	5
EXPENDITURES			
8 Other operating costs		38,639	42,262
9 Capital expenditures excluding labour		66,723	109,094
10 Net costs applicable to GST		105,362	151,356
11 GST rate		5.00%	5.00%
12 GST remitted	(d)	5,268	7,568
13 Day factor- GST refund lag		66.6	66.6
14 Day factor - GST applicable expense lag		45.6	45.6
15 Net	(e)	21.0	21.0
16 Impact on Working Capital	(d)*(e)/365	303	435
17 Net GST impact on Working Capital		306	441

29. GST collected by EWSI is based on analysis of 2018-2019 revenues, with input tax credits based on total operating expenses less labour, salaries, benefits and incentives and property taxes plus capital expenditures excluding labour components.

30. The day factor on GST applicable expenses is based on lead-lag days for general operating expenses, since capital expenditures (excluding labour) are assumed to be on the same payment schedule as all other operating costs.

31. As shown in Table 5.0-1, the impact of GST on working capital is negligible; resulting in an increase to necessary working capital of \$0.44 million in 2018, and \$0.31 million in 2019.

6.0 CAPITAL EXPENSES

32. Capital expenses include four categories: interest, retained earnings, common dividends and depreciation. Drainage Services did not issue a common dividend in 2018 or 2019 and is not forecast to issue a dividend over the 2022 to 2024 period. However, common dividends have

been included in the current lead lag study using the same assumption as EWSI's Water and Wastewater Treatment business units. Table 6.0-1 provides the capital expense lags for 2018 to 2019.

Table 6.0-1
Capital Expense Lags for 2018 and 2019
(\$ thousands)

Expense	A	B	C	D
	2019		2018	
	Lag Days	Expense	Lag Days	Expense
1 Interest	69.0	20,156	69.8	19,789
2 Retained Earnings	-	29,710	-	31,680
3 Dividends	182.5	-	182.5	-
4 Depreciation	-	32,854	-	32,811

6.1 Retained Earnings and Depreciation

33. Consistent with accepted practice for lead-lag studies, retained earnings and depreciation both have expense lags equivalent to zero days.

6.2 Interest on Long Term Debt

34. EWSI pays interest on inter-company long term debt issued by EPCOR Utilities Inc. (EUI) as well as interest on the City of Edmonton Debentures (COE debt). Both the COE debt and inter-company notes are paid at various times throughout the year. Interest on inter-company long term debt is paid on a semi-annual basis, while interest on COE debt is paid annually. The midpoint of the consumption period for long term interest is 182.5 days, or July 2. The overall lag (lead) for interest expense is calculated as the weighted average lag (lead) of each individual debt issue.

35. Tables 6.2-1 and 6.2-2 show the calculation of long term debt lag (lead) days. The interest expense lag was 69.8 days in 2018, and 69.0 days in 2019. The change in the net lag for long term debt are attributable to new debt issuances in the latter part of each year, with interest payments shifting back to mid-year, decreasing the overall long term debt expense lag.

**Table 6.2-1
Long Term Debt Lag (Lead) – 2019**

Description	A Interest Rate	B Principal	C Interest Expense	Payment Dates			Payment Lags			J Weight	K Weighted Total Lag
				D First	E Second	F Mid-Year	G First	H Second	I Average		
1 IC-EUI-9K-2018	2.31%	30,000	652	17-Mar	17-Sep	1-Jul	(106.5)	77.5	(14.5)	3.2%	(0.5)
2 IC-EUI-9K-2019	2.31%	80,000	500	31-Dec		1-Jul	182.5		182.5	2.5%	4.5
3 COE-Sanitary-03	3.58%	50,953	1,685	31-Jul		1-Jul	29.5		29.5	8.4%	2.5
4 COE-Sanitary-04	4.15%	5,902	222	15-Apr		1-Jul	(77.5)		(77.5)	1.1%	(0.9)
5 COE-Sanitary-06	3.70%	107,598	3,812	15-Jun		1-Jul	(16.5)		(16.5)	18.9%	(3.1)
6 COE-Sanitary-07	6.04%	730	44	15-Jul		1-Jul	13.5		13.5	0.2%	0.0
7 COE-Sanitary-09	3.36%	50,492	1,686	15-Sep		1-Jul	75.5		75.5	8.4%	6.3
8 COE-Sanitary-10	3.73%	6,017	222	15-Oct		1-Jul	105.5		105.5	1.1%	1.2
9 COE-Sanitary-11	6.14%	5,358	342	15-Nov		1-Jul	136.5		136.5	1.7%	2.3
10 COE-Sanitary-12	3.83%	123,521	4,855	15-Dec		1-Jul	166.5		166.5	24.1%	40.1
11 COE-Storm-03	3.34%	21,677	670	15-Mar		1-Jul	(108.5)		(108.5)	3.3%	(3.6)
12 COE-Storm-04	4.15%	2,951	111	15-Apr		1-Jul	(77.5)		(77.5)	0.6%	(0.4)
13 COE-Storm-06	3.64%	64,479	2,238	15-Jun		1-Jul	(16.5)		(16.5)	11.1%	(1.8)
14 COE-Storm-09	3.07%	21,788	671	15-Sep		1-Jul	75.5		75.5	3.3%	2.5
15 COE-Storm-10	3.73%	3,009	111	15-Oct		1-Jul	105.5		105.5	0.6%	0.6
16 COE-Storm-12	3.59%	66,399	2,336	15-Dec		1-Jul	166.5		166.5	11.6%	19.3
17			20,156							100.0%	69.0

**Table 6.2-2
Long Term Debt Lag (Lead) – 2018**

Description	A Interest Rate	B Principal	C Interest Expense	Payment Dates			Payment Lags			J Weight	K Weighted Total Lag
				D First	E Second	F Mid-Year	G First	H Second	I Average		
1 IC-EUI-9K-2018	2.31%	30,000	28	31-Dec		1-Jul	182.5		182.5	0.1%	0.3
2 COE-Sanitary-03	3.58%	53,162	1,733	31-Jul		1-Jul	29.5		29.5	8.8%	2.6
3 COE-Sanitary-04	4.15%	6,163	230	15-Apr		1-Jul	(77.5)		(77.5)	1.2%	(0.9)
4 COE-Sanitary-06	3.70%	111,980	3,935	15-Jun		1-Jul	(16.5)		(16.5)	19.9%	(3.3)
5 COE-Sanitary-07	6.04%	888	53	15-Jul		1-Jul	13.5		13.5	0.3%	0.0
6 COE-Sanitary-09	3.36%	52,398	1,738	15-Sep		1-Jul	75.5		75.5	8.8%	6.6
7 COE-Sanitary-10	3.73%	6,283	231	15-Oct		1-Jul	105.5		105.5	1.2%	1.2
8 COE-Sanitary-11	6.14%	6,052	381	15-Nov		1-Jul	136.5		136.5	1.9%	2.6
9 COE-Sanitary-12	3.83%	130,417	5,124	15-Dec		1-Jul	166.5		166.5	25.9%	43.1
10 COE-Storm-03	3.34%	22,475	689	15-Mar		1-Jul	(108.5)		(108.5)	3.5%	(3.8)
11 COE-Storm-04	4.15%	3,081	115	15-Apr		1-Jul	(77.5)		(77.5)	0.6%	(0.4)
12 COE-Storm-06	3.64%	67,055	2,308	15-Jun		1-Jul	(16.5)		(16.5)	11.7%	(1.9)
13 COE-Storm-09	3.07%	22,600	692	15-Sep		1-Jul	75.5		75.5	3.5%	2.6
14 COE-Storm-10	3.73%	3,142	115	15-Oct		1-Jul	105.5		105.5	0.6%	0.6
15 COE-Storm-12	3.59%	69,154	2,418	15-Dec		1-Jul	166.5		166.5	12.2%	20.3
16			19,789							100.0%	69.8

6.3 Common Dividends

36. EWSI issues common dividends on December 31 for the current fiscal year, at the end of the consumption period. Accordingly, the common dividend lag is 182.5 days (365/2).

7.0 STUDY RESULTS

37. For the 2022-2024 PBR Term EWSI is proposing the lead lag ratios and days provided in Table 7.0-1 (columns C and D).

**Table 7.0-1
Summary of 2018-2019
Lead Lag Ratios**

	A	B	C	D
	2019	2018	Average	Lead/(Lag) Days
1 Operating Expenses	4.0 %	3.9 %	3.9 %	14.4
2 Depreciation	13.3 %	13.6 %	13.4 %	49.0
3 Retained Earnings	13.3 %	13.6 %	13.4 %	49.0
4 Dividend	(50.0 %)	(50.0 %)	(50.0 %)	(182.5)
5 Interest Expense	(5.7 %)	(5.5 %)	(5.6 %)	(20.4)
6 GST Collection	0.8 %	1.1 %	0.9 %	3.3
7 GST Input Tax Credit	5.8 %	5.8 %	5.8 %	21.0

38. Comparison of EWSI's Lead Lag Study with those of other Canadian regulated entities shows that both the items included in the lead lag study and the resulting working capital ratios are consistent with those of other Canadian regulated entities.

39. Table 7.0-2 compares working capital ratios among other regulated entities. Review of the calculation of these ratios shows a high degree of consistency in study methodology among regulated entities.

**Table 7.0-2
Comparative Study Working Capital Ratios**

	Comparative Studies					Range			EWSI
	A	B	C	D	E	F	G	H	I
	EDTI Tran ¹	ATCO Gas ²	Enmax Tran ³	AltaLink ⁴	Hydro One ⁵	Low	High	Avg	Avg
1 O&M Expenses	3.8 %	1.5 %	0.8 %	9.5 %	7.3 %	0.8 %	9.5 %	4.6 %	3.9 %
2 Income Tax Installments	N/A	4.8 %	N/A	(0.1)%	10.5 %	(0.1)%	10.5 %	5.0 %	N/A
3 Other Taxes	-	(6.7)%	(8.2)%	(4.4)%	9.4 %	(8.2)%	9.4 %	(2.0)%	6.7 %
4 Long Term Debt Interest	(37.8)%	4.1 %	8.2 %	(12.7)%	14.7 %	(37.8)%	14.7 %	(4.7)%	(5.6)%
5 Common Dividends	(0.2)%	(15.0)%	-	-	N/A	(15.0)%	-	(3.8)%	(50.0)%
6 Retained Earnings	12.2 %	8.5 %	12.4 %	12.1 %	N/A	8.5 %	12.4 %	11.3 %	13.4 %
7 Depreciation Expense	12.2 %	8.5 %	12.4 %	12.1 %	N/A	8.5 %	12.4 %	11.3 %	13.4 %

40. Comparison of EWSI's working capital ratios to those of the other companies included in Table 7.0-2 shows the following:

- EWSI's working capital ratios for O&M Expenses and Other Taxes are well within the range of the other companies included in the comparison;
- Since EWSI is not subject to income taxes this category does not apply to it;
- EWSI's working capital ratio for Dividends are higher than the other companies. The other companies included in the comparison issue dividends either quarterly or mid-year. EWSI issues its dividend at the end of the year, resulting in a higher working capital lag;
- EWSI's working capital ratios for retained earnings and depreciation are higher than those of the other companies included in Table 7.0-2. These ratios are based on revenue lag days. Since all of EWSI's revenues are derived from retail customers, rather than settlement with AESO or other system operators, EWSI's collection periods are longer than those of the other companies in the comparison. Accordingly, EWSI's ratios are reasonable;
- EWSI's long term debt interest ratios are slightly lower than those of the other companies in Table 7.0-2. These ratios are based on the difference between revenue lag days and interest expense lag days. EWSI based its calculation of interest expense lag days on the actual dates of interest paid during the year, a methodology also used by ENMAX, HydroOne, and AltaLink. This methodology provides a representative

¹ EDTI 2020-2022 TFO Tariff Application, MFR Schedules, Schedule 11-3.

² ATCO Gas GRA Filing 2011-2012, December 2010.

³ EPC 2018-2020 Transmission General Tariff Application, Appendix Q - EPC Lead Lag Study (Chymko).

⁴ AltaLink Management Ltd. 2019 - 2021 General Tariff Application, Table 11.2-1.

⁵ Hydro 1 EB-2017-0049, GTA Exhibit D1, Tab 1, Schedule 3, 2018 Test Year, March 03, 2017.

view of actual cash flows throughout the year. Accordingly, EWSI's long term debt interest ratio is reasonable;

41. EDTI and EWSI have significantly different long term debt interest ratios. EDTI used a simplified methodology to calculate interest expense lag days. EDTI assumed that interest is paid twice annually, resulting in a consumption period of 182.5 days ($365/2$). Subtracting this lag from EDTI's revenue lag of 44.50 days, yields an interest expense lag 138 days (37.8%).

7.1 Appendix 1: Salary, Overtime and Wage Lag details

Table A1-1
Salary Lag
Year Ending December 31, 2019
(days)

		A	B	C	D	E	F	G	H
	Period start date	Mid Period	Period End	Processing	Payment Date	Consumption Lag	Processing Lag	Payment Lag	Total Lag
1	23-Dec-18	29-Dec-18	05-Jan-19	07-Jan-19	11-Jan-19	7.00	2.00	4.00	13.00
2	06-Jan-19	12-Jan-19	19-Jan-19	21-Jan-19	25-Jan-19	7.00	2.00	4.00	13.00
3	20-Jan-19	26-Jan-19	02-Feb-19	04-Feb-19	08-Feb-19	7.00	2.00	4.00	13.00
4	03-Feb-19	09-Feb-19	16-Feb-19	18-Feb-19	22-Feb-19	7.00	2.00	4.00	13.00
5	17-Feb-19	23-Feb-19	02-Mar-19	04-Mar-19	08-Mar-19	7.00	2.00	4.00	13.00
6	03-Mar-19	09-Mar-19	16-Mar-19	18-Mar-19	22-Mar-19	7.00	2.00	4.00	13.00
7	17-Mar-19	23-Mar-19	30-Mar-19	01-Apr-19	05-Apr-19	7.00	2.00	4.00	13.00
8	31-Mar-19	06-Apr-19	13-Apr-19	15-Apr-19	18-Apr-19	7.00	2.00	3.00	12.00
9	14-Apr-19	20-Apr-19	27-Apr-19	29-Apr-19	03-May-19	7.00	2.00	4.00	13.00
10	28-Apr-19	04-May-19	11-May-19	13-May-19	17-May-19	7.00	2.00	4.00	13.00
11	12-May-19	18-May-19	25-May-19	27-May-19	31-May-19	7.00	2.00	4.00	13.00
12	26-May-19	01-Jun-19	08-Jun-19	10-Jun-19	14-Jun-19	7.00	2.00	4.00	13.00
13	09-Jun-19	15-Jun-19	22-Jun-19	24-Jun-19	28-Jun-19	7.00	2.00	4.00	13.00
14	23-Jun-19	29-Jun-19	06-Jul-19	08-Jul-19	12-Jul-19	7.00	2.00	4.00	13.00
15	07-Jul-19	13-Jul-19	20-Jul-19	22-Jul-19	26-Jul-19	7.00	2.00	4.00	13.00
16	21-Jul-19	27-Jul-19	03-Aug-19	05-Aug-19	09-Aug-19	7.00	2.00	4.00	13.00
17	04-Aug-19	10-Aug-19	17-Aug-19	19-Aug-19	23-Aug-19	7.00	2.00	4.00	13.00
18	18-Aug-19	24-Aug-19	31-Aug-19	02-Sep-19	06-Sep-19	7.00	2.00	4.00	13.00
19	01-Sep-19	07-Sep-19	14-Sep-19	16-Sep-19	20-Sep-19	7.00	2.00	4.00	13.00
20	15-Sep-19	21-Sep-19	28-Sep-19	30-Sep-19	04-Oct-19	7.00	2.00	4.00	13.00
21	29-Sep-19	05-Oct-19	12-Oct-19	14-Oct-19	18-Oct-19	7.00	2.00	4.00	13.00
22	13-Oct-19	19-Oct-19	26-Oct-19	28-Oct-19	01-Nov-19	7.00	2.00	4.00	13.00
23	27-Oct-19	02-Nov-19	09-Nov-19	11-Nov-19	15-Nov-19	7.00	2.00	4.00	13.00
24	10-Nov-19	16-Nov-19	23-Nov-19	25-Nov-19	29-Nov-19	7.00	2.00	4.00	13.00
25	24-Nov-19	30-Nov-19	07-Dec-19	09-Dec-19	13-Dec-19	7.00	2.00	4.00	13.00
26	08-Dec-19	14-Dec-19	21-Dec-19	23-Dec-19	27-Dec-19	7.00	2.00	4.00	13.00
27	Average Salary Lag					7.00	2.00	3.96	12.96

Table A1-2
Salary Lag
Year Ending December 31, 2018
(days)

		A	B	C	D	E	F	G	H
	Period start date	Mid Period	Period End	Processing	Payment Date	Consumption Lag	Processing Lag	Payment Lag	Total Lag
1	24-Dec-17	30-Dec-17	06-Jan-18	08-Jan-18	12-Jan-18	7.00	2.00	4.00	13.00
2	07-Jan-18	13-Jan-18	20-Jan-18	22-Jan-18	26-Jan-18	7.00	2.00	4.00	13.00
3	21-Jan-18	27-Jan-18	03-Feb-18	05-Feb-18	09-Feb-18	7.00	2.00	4.00	13.00
4	04-Feb-18	10-Feb-18	17-Feb-18	19-Feb-18	23-Feb-18	7.00	2.00	4.00	13.00
5	18-Feb-18	24-Feb-18	03-Mar-18	05-Mar-18	09-Mar-18	7.00	2.00	4.00	13.00
6	04-Mar-18	10-Mar-18	17-Mar-18	19-Mar-18	23-Mar-18	7.00	2.00	4.00	13.00
7	18-Mar-18	24-Mar-18	31-Mar-18	02-Apr-18	06-Apr-18	7.00	2.00	4.00	13.00
8	01-Apr-18	07-Apr-18	14-Apr-18	16-Apr-18	20-Apr-18	7.00	2.00	4.00	13.00
9	15-Apr-18	21-Apr-18	28-Apr-18	30-Apr-18	04-May-18	7.00	2.00	4.00	13.00
10	29-Apr-18	05-May-18	12-May-18	14-May-18	18-May-18	7.00	2.00	4.00	13.00
11	13-May-18	19-May-18	26-May-18	28-May-18	01-Jun-18	7.00	2.00	4.00	13.00
12	27-May-18	02-Jun-18	09-Jun-18	11-Jun-18	15-Jun-18	7.00	2.00	4.00	13.00
13	10-Jun-18	16-Jun-18	23-Jun-18	25-Jun-18	29-Jun-18	7.00	2.00	4.00	13.00
14	24-Jun-18	30-Jun-18	07-Jul-18	09-Jul-18	13-Jul-18	7.00	2.00	4.00	13.00
15	08-Jul-18	14-Jul-18	21-Jul-18	23-Jul-18	27-Jul-18	7.00	2.00	4.00	13.00
16	22-Jul-18	28-Jul-18	04-Aug-18	06-Aug-18	10-Aug-18	7.00	2.00	4.00	13.00
17	05-Aug-18	11-Aug-18	18-Aug-18	20-Aug-18	24-Aug-18	7.00	2.00	4.00	13.00
18	19-Aug-18	25-Aug-18	01-Sep-18	03-Sep-18	07-Sep-18	7.00	2.00	4.00	13.00
19	02-Sep-18	08-Sep-18	15-Sep-18	17-Sep-18	21-Sep-18	7.00	2.00	4.00	13.00
20	16-Sep-18	22-Sep-18	29-Sep-18	01-Oct-18	05-Oct-18	7.00	2.00	4.00	13.00
21	30-Sep-18	06-Oct-18	13-Oct-18	15-Oct-18	19-Oct-18	7.00	2.00	4.00	13.00
22	14-Oct-18	20-Oct-18	27-Oct-18	29-Oct-18	02-Nov-18	7.00	2.00	4.00	13.00
23	28-Oct-18	03-Nov-18	10-Nov-18	12-Nov-18	16-Nov-18	7.00	2.00	4.00	13.00
24	11-Nov-18	17-Nov-18	24-Nov-18	26-Nov-18	30-Nov-18	7.00	2.00	4.00	13.00
25	25-Nov-18	01-Dec-18	08-Dec-18	10-Dec-18	14-Dec-18	7.00	2.00	4.00	13.00
26	09-Dec-18	15-Dec-18	22-Dec-18	24-Dec-18	28-Dec-18	7.00	2.00	4.00	13.00
27	Average Salary Lag					7.00	2.00	4.00	13.00

7.2 Appendix 2: Labour and Benefit Summary Lag details

Table A2-1
Salary and Benefit Lag
Year ending December 31, 2019
(days)

Component	A Period Midpoint	B Processing Lag	C Payment Lag	D Total	E Actual Payroll ⁶	F Weight	G Weighted Days
1 Salaries, Overtime & Wages	7.0	2.0	4.0	13.0	28,367	62.74%	8.1
2 CRA	7.0	6.0	7.6	20.6	8,459	18.71%	3.9
3 Sun Life Benefits	7.0	6.0	3.0	16.0	1,601	3.54%	0.6
4 Sun Life Savings Plan	7.0	6.0	3.0	16.0	64	0.14%	0.0
5 Local Authorities Pension	7.0	6.0	15.0	28.0	5,192	11.48%	3.2
6 Union Dues	7.0	6.0	3.0	16.0	193	0.43%	0.1
7 EPCOR Social Club & Donations	7.0	6.0	3.0	16.0	44	0.10%	0.0
8 Employee Garnishes	7.0	6.0	3.0	16.0	6	0.01%	0.0
9 Employee Savings Plan	7.0	6.0	3.0	16.0	871	1.93%	0.3
10 Wellness Personal Spending Account	15.0	0.0	15.0	30.0	65	0.14%	0.0
11 Health Services			45.6	45.6	208	0.46%	0.2
12 WCB			45.6	45.6	147	0.32%	0.1
13 Average Withholding Lag						100.00%	16.6

Table A2-2
Salary and Benefit Lag
Year ending December 31, 2018
(days)

Component	A Period Midpoint	B Processing Lag	C Payment Lag	D Total	E Actual Payroll ⁶	F Weight	G Weighted Days
1 Salaries, Overtime & Wages	7.0	2.0	4.0	13.0	23,074	62.64%	8.1
2 CRA	7.0	6.0	7.6	20.6	6,736	18.29%	3.8
3 Sun Life Benefits	7.0	6.0	3.0	16.0	1,259	3.42%	0.5
4 Sun Life Savings Plan	7.0	6.0	3.0	16.0	62	0.17%	0.0
5 Local Authorities Pension	7.0	6.0	15.0	28.0	4,482	12.17%	3.4
6 Union Dues	7.0	6.0	3.0	16.0	162	0.44%	0.1
7 EPCOR Social Club & Donations	7.0	6.0	3.0	16.0	36	0.10%	0.0
8 Employee Garnishes	7.0	6.0	3.0	16.0	7	0.02%	0.0
9 Employee Savings Plan	7.0	6.0	3.0	16.0	703	1.91%	0.3
10 Wellness Personal Spending Account	15.0	0.0	15.0	30.0	59	0.16%	0.0
11 Health Services	0.0	0.0	45.6	45.6	138	0.38%	0.2
12 WCB			45.6	45.6	120	0.33%	0.1
13 Average Withholding Lag						100.00%	16.7

⁶ \$ thousands.

7.3 Appendix 3: General Expense Lag details

Table A3-1
Operating Expense Lag
Years ended December 31, 2018, and 2019
(days)

	Period Start	A Midpoint	B Period End	C Payment Date	D Consumption Lag Days	E Payment Lag Days	F Total Lag Days
1	1-Jan	16-Jan	31-Jan	28-Feb	15.5	28.0	43.5
2	1-Feb	14-Feb	28-Feb	31-Mar	14.0	31.0	45.0
3	1-Mar	16-Mar	31-Mar	30-Apr	15.5	30.0	45.5
4	1-Apr	15-Apr	30-Apr	31-May	15.0	31.0	46.0
5	1-May	16-May	31-May	30-Jun	15.5	30.0	45.5
6	1-Jun	15-Jun	30-Jun	31-Jul	15.0	31.0	46.0
7	1-Jul	16-Jul	31-Jul	31-Aug	15.5	31.0	46.5
8	1-Aug	16-Aug	31-Aug	30-Sep	15.5	30.0	45.5
9	1-Sep	15-Sep	30-Sep	31-Oct	15.0	31.0	46.0
10	1-Oct	16-Oct	31-Oct	30-Nov	15.5	30.0	45.5
11	1-Nov	15-Nov	30-Nov	31-Dec	15.0	31.0	46.0
12	1-Dec	16-Dec	31-Dec	31-Jan	15.5	31.0	46.5
13	Total Operating Expenses Remittance Lag						45.6

7.4 Appendix 4: GST Lag calculations

Table A4-1
GST Lag
Years ended December 31, 2018, and 2019
(days)

	Period Start	A Midpoint	B Period End	C Filing Date	D Consumption Lag	E Remittance Lag	F GST Filing Lag	G Payment Lag	H Total Lag Days
1	1-Jan	16-Jan	31-Jan	28-Feb	15.5	28.0	43.5	64.5	108.0
2	1-Feb	14-Feb	28-Feb	31-Mar	14.0	31.0	45.0	66.0	111.0
3	1-Mar	16-Mar	31-Mar	30-Apr	15.5	30.0	45.5	66.5	112.0
4	1-Apr	15-Apr	30-Apr	31-May	15.0	31.0	46.0	67.0	113.0
5	1-May	16-May	31-May	30-Jun	15.5	30.0	45.5	66.5	112.0
6	1-Jun	15-Jun	30-Jun	31-Jul	15.0	31.0	46.0	67.0	113.0
7	1-Jul	16-Jul	31-Jul	31-Aug	15.5	31.0	46.5	67.5	114.0
8	1-Aug	16-Aug	31-Aug	30-Sep	15.5	30.0	45.5	66.5	112.0
9	1-Sep	15-Sep	30-Sep	31-Oct	15.0	31.0	46.0	67.0	113.0
10	1-Oct	16-Oct	31-Oct	30-Nov	15.5	30.0	45.5	66.5	112.0
11	1-Nov	15-Nov	30-Nov	31-Dec	15.0	31.0	46.0	67.0	113.0
12	1-Dec	16-Dec	31-Dec	31-Jan	15.5	31.0	46.5	67.5	114.0
13	Total GST Lag						45.6	66.6	112.3