Rationale for Assumptions

A rationale for each of the assumptions used in the current valuation is provided below.

Discount Rate

We have discounted the expected benefit payment cash flows using the expected investment return on the market value of the fund net of fees and less a margin for adverse deviations.

The discount rate is comprised of the following:

- An **assumed investment return** based on estimated return for each major asset class that are consistent with market conditions on the valuation date modified to include a provision for increases in market interest rates to a level higher than current historically low levels, on the expected time horizon over which benefits are expected to be paid, and on the target asset mix specified in the Plan's investment policy. Consistent with market observable and available data, the assumed investment return is a gross return for all asset classes.
- An **assumed passive investment management expense provision** which represents the hypothetical fees for passive investment management of assets based on estimated fees charged by index managers for balanced mandates.
- An **active investment management expense provision** of 28 bps. We have assumed that these fees would be offset by an equivalent **additional return resulting from active management**.
- An **implicit non-investment management expense provision** based on the average rate of non-investment expenses paid from the fund over the last three years. These would include all fees payable from the fund (administration, custodial, audit, consulting, etc.) except those payable to investment managers, to the extent that these fees are not covered in an explicit provision for expenses added to the current service cost
- A **margin for adverse deviations** of 0.30% as per the terms of engagement

The discount rate was developed as follows:

Assumed investment return	4.12%
Additional returns for active investment management	0.28%
Active investment management expense provision	(0.28%)
Assumed passive investment management expense provision	(0.02%)
Implicit non-investment management expense provision	(0.10%)
Margin for adverse deviations	(0.30%)
Net discount rate	3.70%

Inflation

The inflation assumption is based on the mid-point of the Bank of Canada's inflation target range of between 1% and 3%.

Income Tax Act Pension Limit and Year's Maximum Pensionable Earnings

The assumption is based on historical real economic growth and the underlying inflation assumption.

Pensionable Earnings

The assumption is based on a best estimate of future merit and promotional increases and general wage growth considering current economic and financial market conditions. The assumption takes into account the Company's current outlook for wage growth in the utility sector. Such merit and promotion increases are assumed to be in accordance with the table developed based on an experience study considering increases over the years 1985 to 1992 and which has continued to be reasonably predictive of merit and promotion increases experienced since that time.

Post-Retirement Pension Increases

The assumption is based on the Plan formula and inflation assumption above, considering that the Plan limits pension increases to 3% in the event that inflation exceeds 3%. We have determined the impact of this cap by performing a stochastic analysis based on trials using a mean of 2.0% and a standard deviation of 1.5%.

Retirement Rates

For this valuation we have continued to assume that active members will retire when their age and service sum to 90 years, provided that retirement does not occur after 65 or before 55. Individuals who have already attained this condition are assumed to retire immediately. This assumption is based on the Plan provisions and the experience of the Plan in recent years.

Retirement earlier than assumed may result in losses to the Plan, while later retirements may result in gains to the Plan. These gains and losses will be revealed in subsequent valuations.

Termination Rates

Use of a different assumption would not have a material impact on the valuation.

Mortality Rates

The assumption for the mortality rates is based on the Canadian Pensioners' Mortality (CPM) study published by the Canadian Institute of Actuaries in February 2014.

The mortality rates selected reflect plan-specific experience over the years 2005 to 2014. However, due to the size of the Plan, this mortality experience is not fully credible. The CPM mortality rates from the private sector have been adjusted after considering the plan-specific experience and characteristics, such as the type of employment, the industry experience, the pension and employment income for the plan members, and data in the CPM study.

There is broad consensus among actuaries and other longevity experts that mortality improvement will continue in the future, but the degree of future mortality improvement is uncertain. Two mortality improvement scales were recently published by the Canadian Institute of Actuaries (CIA) and may apply to Canadian pension valuations:

- The Canadian Pensioners Mortality (CPM) study published in February 2014 included CPM Improvement Scale B (CPM-B).
- A report released by the Task Force on Mortality Improvement on September 20, 2017 includes an analysis of the rate of mortality improvement for the Canadian population and provides for mortality improvement scale MI-2017 to be considered for the purpose of reflecting future mortality improvement in Canadian actuarial work, while acknowledging that it might be appropriate to use alternative mortality improvement assumptions to reflect the nature of the work.

The CIA Committee on Pension Plan Financial Reporting published a revised version of the Educational Note on the Selection of Mortality Assumptions for Pension Plan Valuations on December 21, 2017.

The Educational Note indicates that given the recent publication of the CPM-B and MI-2017 improvement scales and the similar data sets used in their development, it may be appropriate to use either scale in the absence of credible information to the contrary, such as the publication of a successor scale by the CIA.

For the present valuation, we have continued to use the CPM-B scale which is a reasonable outlook for future mortality improvement.

Based on the assumption used, the life expectancy of a member age 65 at the valuation date is 22.2 years for males and 24.6 years for females.

Disability Rates

Use of a different assumption would not have a material impact on the valuation.

Eligible Spouse

The assumption is based on actual membership data, which we believe is the most reliable source.

Spousal Age Difference

The assumption is based on an industry standard showing males are typically 3 years older than their spouse.

Appendix D
Methods and Assumptions – Hypothetical Wind-Up and Solvency

Hypothetical Wind-up Basis

The Canadian Institute of Actuaries requires actuaries to report the financial position of a pension plan on the assumption that the plan is wound up on the effective date of the valuation, with benefits determined on the assumption that the pension plan has neither a surplus nor a deficit.

To determine the actuarial liability on the hypothetical wind-up basis, we have valued those benefits that would have been paid had the Plan been wound up on the valuation date, with all members fully vested in their accrued benefits.

The Standards of Practice of the Canadian Institute of Actuaries require that the scenario upon which the hypothetical wind-up valuation is based be postulated. However, there are no benefits under the Plan contingent upon the circumstances of the plan wind-up or contingent upon other factors. Therefore, it was not necessary to postulate a scenario upon which the hypothetical wind-up valuation is made. No benefits payable on plan wind-up were excluded from our calculations. The plan wind-up is assumed to occur in circumstances that maximize the actuarial liability.

Upon plan wind-up, members are given options for the method of settling their benefit entitlements. The options vary by eligibility and by province of employment, but in general, involve either a lump sum transfer or an immediate or deferred pension.

The value of benefits assumed to be settled through a lump sum transfer is based on the assumptions described in Section 3500 – *Pension Commuted Values* of the Canadian Institute of Actuaries' Standards of Practice applicable for December 31, 2019.

Benefits provided as an immediate or deferred pension are assumed to be settled through the purchase of annuities based on an estimate of the cost of purchasing annuities.

We have estimated the cost of settlement through purchase of annuities in accordance with the *Canadian Institute of Actuaries Educational Note: Assumptions for Hypothetical Wind-up and Solvency Valuations with Effective Dates Between December 31, 2019 and December 30, 2020 (the "Educational Note").*

An alternative settlement method was hypothesized for solvency purposes, whereby plan benefits were modified, as permitted, pursuant to Alberta Treasury Board and Finance's Update 13-01

Alternative Settlement Methods for Hypothetical Wind-Up and Solvency Valuations ("Update 13-01"). Annuities are assumed to be purchased with future variable inflation protection replaced with a fixed percentage increase determined in accordance with Update 13-01.

However, it may not be possible to settle the liabilities through the purchase of annuities due to the size of the Plan and the limited annuity market in Canada. In accordance with the Educational Note, we have assumed that the settlement of such liabilities would be priced on the same basis as the smaller group annuities that are available in the market.

The Educational Note provides guidance on estimating the cost of annuity purchases assuming a typical group of annuitants. That is, no adjustments for sub- or super-standard mortality are considered. However, it is expected that insurers will consider plan experience and certain plan-specific characteristics when determining the mortality basis for a particular group. The Educational Note states that the actuary would be expected to make an adjustment to the regular annuity purchase assumptions where there is demonstrated substandard or super-standard mortality or where an insurer might be expected to assume so. In such cases, the actuary would be expected to make an adjustment to the mortality assumption in a manner consistent with the underlying annuity purchase basis. Given the uncertainty surrounding the actual mortality basis that would be typical of a group annuity purchase, it is reasonable to assume that there is a range of bases that can be expected not to be materially different from the actual mortality basis. Therefore, an adjustment to the regular annuity purchase assumptions would be warranted when the plan's assumed basis falls outside that range. In this context, we have determined that no adjustment to the mortality rates used in the regular annuity purchase assumptions is required.

Interest rate assumptions net of COLA used for lump sum transfers and annuity purchases take into consideration the 3% cap on pension increases provided by the plan provisions. We have carried out a stochastic analysis in order to determine the additional net interest rate as a result of this 3% cap.

We have not included a margin for adverse deviations in the solvency and hypothetical wind-up valuations.

The assumptions are as follows:

Form of Benefit Settlement Elected by Member	
Lump sum:	70% of active members under age 55, and 50% of active members over age 55, elect to receive their benefit entitlement in a lump sum
Annuity purchase:	All remaining members are assumed to elect to receive their benefit entitlement in the form of a deferred or immediate pension. These benefits are assumed to be settled through the purchase of deferred or immediate annuities from a life insurance company.
Basis for Benefits Assumed to be Settled through a Lump Sum	
Mortality rates:	100% of the rates of the 2014 Canadian Pensioners Mortality (CPM) Table with fully generational improvements using CPM Scale B
Interest rate:	2.40% per year for 10 years, 2.50% per year thereafter
COLA:	1.27% per year for 10 years, 1.33% per year thereafter
Interest rate net of COLA:	1.12% per year for 10 years, 1.15% per year thereafter
Basis for Benefits Assumed to be Settled through the Purchase of an Annuity	
Mortality rates:	100% of the rates of the 2014 Canadian Pensioners Mortality (CPM) Table with fully generational improvements using CPM Scale B
Adjustment to mortality rates:	No adjustment
Interest rate:	2.96% per year based on duration of 12.86 years determined for the liabilities assumed to be settled through the purchase of an annuity
COLA:	1.38% per year[4]
Interest Rate net of COLA:	1.56% per year
Retirement Age	
Maximum value:	Members are assumed to retire at the age that maximizes the value of their entitlement from the Plan, based on the eligibility requirements that have been met at the valuation date
Other Assumptions	
Final average earnings:	Based on actual pensionable earnings over the averaging period
Family composition:	Same as for going concern valuation
Termination expenses:	$2,000,000

[4] For the hypothetical wind-up scenario, it is assumed that annuities would be purchased with a fixed rate of increase of 3.0% per year, which is the maximum rate of increase under the Plan provisions.

To determine the hypothetical wind-up position of the Plan, a provision has been made for estimated termination expenses payable from the Plan's assets in respect of actuarial and administration expenses that may reasonably be expected to be incurred in terminating the Plan and to be charged to the Plan.

Because the settlement of all benefits on wind-up is assumed to occur on the valuation date and is assumed to be uncontested, the provision for termination expenses does not include custodial, investment management, auditing, consulting, and legal expenses that would be incurred between the wind-up date and the settlement date or due to the terms of a wind-up being contested.

Expenses associated with the distribution of any surplus assets that might arise on an actual wind-up are also not included in the estimated termination expense provisions.

In determining the provision for termination expenses payable from the Plan's assets, we have assumed that the plan sponsor would be solvent on the wind-up date. We have also assumed, without analysis, that the Plan's terms as well as applicable legislation and court decisions would permit the relevant expenses to be paid from the Plan.

Although the termination expense assumption is a best estimate, actual fees incurred on an actual plan wind-up may differ materially from the estimates disclosed in this report.

Incremental Cost

In order to determine the incremental cost, we estimate the solvency liabilities at the next valuation date. We have assumed that the cost of settling benefits by way of a lump sum or purchasing annuities remains consistent with the assumptions described above. Since the projected solvency liabilities will depend on the membership in the Plan at the next valuation date, we must make assumptions about how the Plan membership will evolve over the period until the next valuation.

We have assumed that the Plan membership will evolve in a manner consistent with the going concern assumptions as follows:

- Members terminate, retire, and die consistent with the termination, retirement, and mortality rates used for the going concern valuation.
- Pensionable earnings, the Income Tax Act pension limit, and the Year's Maximum Pensionable Earnings increase in accordance with the related going concern assumptions.
- Active members accrue pensionable service in accordance with the terms of the Plan.

  Cost of living adjustments are consistent with the inflation assumption used for the going concern valuation.

Appendix E
Membership Data

Analysis of Membership Data

The actuarial valuation is based on membership data as at December 31, 2019, provided by Canadian Utilities Limited.

We have applied tests for internal consistency, as well as for consistency with the data used for the previous valuation. These tests were applied to membership reconciliation, basic information (date of birth, date of hire, date of membership, gender, etc.), pensionable earnings, credited service, contributions accumulated with interest, and pensions to retirees and other members entitled to a deferred pension. Contributions, lump sum payments, and pensions to retirees were compared with corresponding amounts reported in financial statements. The results of these tests were satisfactory.

If the data supplied are not sufficient and reliable for its intended purpose, the results of our calculation may differ significantly from the results that would be obtained with such data. Although Mercer has reviewed the suitability of the data for its intended use in accordance with accepted actuarial practice in Canada, Mercer has not verified or audited any of the data or information provided.

Plan membership data are summarized below. For comparison, we have also summarized corresponding data from the previous valuation.

	31.12.2019	31.12.2017
Active Members Accruing DB Benefits		
Number	433	645
Total pensionable earnings for prior year	$52,295,763	$76,000,660
Average pensionable earnings for prior year	$120,775	$117,830
Average years of pensionable service	30.1	28.9
Average age	56.7	55.7
Active Members with DB Benefits, but Accruing DC		
Number	31	48
Total pensionable earnings for prior year	$4,371,086	$6,293,849
Average pensionable earnings for prior year	$141,003	$131,122
Average years of pensionable service	7.3	7.9
Average age	54.9	53.3

	31.12.2019	31.12.2017
Active Members with DC Benefits Only		
Number	3,832	4,319
Total pensionable earnings for prior year	$406,069,637	$447,251,193
Average pensionable earnings for prior year	$105,968	$103,554
Average age	41.5	40.7
Deferred Pensioners		
Number	73	79
Total annual pension	$1,549,018	$1,492,401
Average annual pension	$21,219	$18,891
Average age	57.6	57.1
Pensioners and Survivors		
Number	2,687	2,570
Total annual lifetime pension	$123,280,995	$106,279,769
Average annual lifetime pension	$45,881	$41,354
Average age	71.7	71.3

The membership movement for all categories of membership since the previous actuarial valuation is as follows:

	Active members accruing DB Benefits	Active members with DB benefits but accruing DC benefits	Deferred Pensioners	Pensioners and survivors	Total
Total at 31.12.2017	645	48	79	2,570	3,342
Transfer from ATCO Structures & Logistics	2				2
Terminations:					
• Transfers/lump sums	(18)	(4)	(1)	(1)	(24)
• Pending transfers					
• Deferred pensions	(15)	(2)	17		0
Deaths	(3)			(154)	(157)
Retirements	(178)	(11)	(22)	211	0
Beneficiaries				61	61
Data corrections					
Total at 31.12.2019	433	31	73	2,687	3,224

The distribution of the active members by age and pensionable service as at the valuation date is summarized as follows:

Age	Years of Pensionable Service									
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	Total
45 to 49					8	10	1			19
50 to 54					12	46	45			103
55 to 59		1	1	2	18	93	97	21		233
60 to 64	1				3	34	14	16	10	78
65+										
Total	1	1	1	2	41	183	157	37	10	433

The distribution of the inactive members by age as at the valuation date is summarized as follows:

Age	Deferred Pensioners		Pensioners and Survivors	
	Number	Average Pension	Number	Average Pension
40 – 44			1	*
45 – 49	1	*		
50 – 54	13	$20,026	1	*
55 – 59	39	$21,163	229	$66,618
60 – 64	19	$22,655	642	$60,817
65 – 69	1	*	497	$50,007
70 – 74			421	$39,070
75 – 79			292	$30,695
80 – 84			238	$32,102
85 – 89			232	$30,879
90 – 94			111	$25,647
95+			23	$23,816
Total	73	$21,219	2,687	$45,881

*Information suppressed to preserve member confidentiality.

Appendix F
Summary of Plan Provisions

Mercer has used and relied on the plan documents, including amendments and interpretations of plan provisions, supplied by Canadian Utilities Limited. If any plan provisions supplied are not accurate and complete, the results of any calculation may differ significantly from the results that would be obtained with accurate and complete information. Moreover, plan documents may be susceptible to different interpretations, each of which could be reasonable, and the results of estimates under each of the different interpretations could vary.

This valuation is based on the plan provisions in effect on December 31, 2019. The Plan has been amended and consolidated since the date of the previous valuation. None of the changes had a material impact on the cost of the benefits provided by the Plan.

DB Component

The following is a summary of the main provisions of the DB component of the Plan in effect on December 31, 2019. This summary is not intended as a complete description of the Plan.

Background	Plan 1 Members: • The Plan became effective January 2, 1962. On December 31, 1986, employees in the Yukon Territory and the Northwest Territories became covered by a separate arrangement. • Effective January 1, 1997, money purchase provisions were introduced into Plan 1, at which time existing Plan members had an option to continue to accrue benefits under the defined benefit component or participate in the new money purchase component. All new employees participate only in the money purchase component. Former Plan 2 Members: • The Predecessor Plan was effective January 2, 1962. On December 31, 1986 the Predecessor Plan was split into three parts, covering employees in the Yukon (Plan 2), the Northwest Territories (Plan 3) and elsewhere (Plan 1). Plan 2A was established effective April 1, 1987 to cover Yukon based employees who had previously been employed by the Northern Canada Power Commission (NCPC). • Effective January 1, 1994, Plan 2 was amended to extend coverage to all current and former members of Plan 2A and Plan 3. Service under Plan 2A and Plan 3 were assumed by Plan 2 in exchange for a transfer of assets. • Effective December 30, 2003, the Plan was extended to cover employees located in Ontario. Effective January 1, 2015, Plan 2 was merged with Plan 1.

Eligibility for Membership	Plan 1 Members: • The Plan covers salaried employees employed in Canada outside of Ontario, the Yukon and Northwest Territories upon appointment to permanent staff. This typically occurs after 6 months service. In the event that a salaried employee is not appointed to permanent staff earlier, participation in the Plan will commence upon completion of two years' service provided earnings exceed 35% of the YMPE in two consecutive calendar years. • Participation in the Plan is compulsory for all eligible employees who are not participating in another registered pension plan of the employer. Former Plan 2 Members: • The Plan is closed to new entrants. • Some individuals who were employed by NCPC immediately prior to April 1, 1987 elected to have their pension benefit entitlements under the PSSA transferred to the Plan. For these members, pensionable service under the Plan includes service that was pensionable under the PSSA. Service with NCPC counts for determination of vested rights whether or not the individual member elected to transfer his PSSA benefit entitlements to the Plan.
Employee Contributions	Members contribute 2.8% of earnings up to the YMPE and 4.0% of earnings over the YMPE, up to an annual maximum contribution of $2,000. Disabled members and certain executive members are not required to contribute.
Retirement Dates	Normal Retirement Date • The normal retirement date is the first day of the month coincident with or next following the member's 65th birthday. Early Retirement Date • If a member has been in the Plan for at least two years, the member may choose to retire as early as age 55.
Postponed Retirement	A member who remains employed with the company after age 65 may elect to commence receipt of pension or continue to accrue benefits under the Plan up to his actual retirement.
Normal Retirement Pension	2% of annual final average earnings times years of pensionable service between January 2, 1962 and January 2, 1966; PLUS 1.4% of annual final average earnings up to the YMPE, times years of pensionable service after January 2, 1966; PLUS 2.0% of annual final average earnings in excess of the YMPE, times years of pensionable service after January 2, 1966.
Pensionable Earnings	Annual final average earnings are calculated over the 60 consecutive months for which earnings are highest. The YMPE is calculated over the same period.

<table>
<tr><td>Early Retirement Pension</td><td>If a member retires from active service with the consent of the Company, a reduced early retirement benefit is payable, as follows:
If age and service sum to 90 years or more, no reduction applies;
otherwise, the pension payable is equal to the normal retirement pension times a percentage from the following table:
<table><tr><th>Age at Retirement</th><th>Percentage</th></tr><tr><td>64</td><td>100</td></tr><tr><td>63</td><td>100</td></tr><tr><td>62</td><td>100</td></tr><tr><td>61</td><td>97</td></tr><tr><td>60</td><td>94</td></tr><tr><td>59</td><td>88</td></tr><tr><td>58</td><td>82</td></tr><tr><td>57</td><td>76</td></tr><tr><td>56</td><td>70</td></tr><tr><td>55</td><td>64</td></tr></table>If retirement is not from active service, or if Company consent is not obtained, an actuarial reduction applies.
In addition, female participants employed prior to June 1, 1972 are entitled to a bridge benefit payable only until age 65. The bridge benefit is equal to the expected Canada pension Plan benefit times the ratio of 36 divided by the number of months from retirement to age 65, provided that the ratio is never more than 1.</td></tr>
<tr><td>Maximum Pension</td><td>The Plan provides that the pension payable at the time of commencement must not exceed the defined benefit limit prescribed under the Income Tax Act, multiplied by years of pensionable service (with service rendered prior to January 1, 1992 limited to 35 years).
Reductions to this maximum apply if retirement occurs before age 60, before completion of 30 years' service, and before attainment of age and service summing to 80. The maximum provision automatically reflects any increases to the defined benefit limit that occur in the Income Tax Act and Regulations.</td></tr>
<tr><td>Cost of Living Adjustments</td><td>The annual adjustment will be as determined by the Company but will not exceed 3% per annum. In calculating the annual adjustment the Company will take into consideration annual percentage changes in the Consumer Price Index for Canada and any previous annual adjustments paid. The annual adjustment is granted only to members who retire from active service.</td></tr>
</table>

Death Benefits	Pre-retirement: • If a member dies before becoming eligible for retirement, the member's spouse, or the member's beneficiary if there is no surviving spouse, will receive a benefit equal in value to the commuted value of the benefit to which the member would have been entitled had he terminated employment immediately prior to his death, plus any excess of the member's contributions over 50% of that commuted value. • If a member dies after becoming eligible for retirement, the member's spouse will receive the greater of: • a benefit equal in value to the commuted value of the benefit to which the member would have been entitled had he terminated employment immediately prior to his death, plus any excess of the member's contributions over 50% of that commuted value, and • an immediate pension equal to 60% of the pension to which the member would have been entitled had the member retired on their date of death. This pension will also receive future cost of living increases. • If a member dies after becoming eligible for retirement and there is no surviving spouse, the beneficiary will receive the commuted value of the benefit to which the member would have been entitled had he terminated employment immediately prior to his death, plus any excess of the member's contributions over 50% of that commuted value. Post retirement: • The normal form of pension for single employees guarantees a return of the member's own contributions with interest up to retirement date. • For employees with an eligible spouse, the normal form of pension provides a continuing survivorship pension to the member's spouse. If retirement occurs prior to July 1, 1987, the spouse's benefit is 50% of the member's benefit. If retirement occurs after July 1, 1987 the spouse's benefit is 60%.
Termination Benefits	A deferred pension commencing at normal retirement date, or alternatively the commuted value thereof may be transferred to the member's locked-in RRSP. If the member's own contributions exceed 50% of the commuted value of the deferred pension, the excess is available as an additional benefit.

DC Component

The following is a summary of the main provisions of the DC component of the Plan in effect on December 31, 2019. This summary is not intended as a complete description of the Plan.

Background	The DC component of the Plan became effective January 1, 1997. Employer and employee contributions are remitted to individual member accounts and are credited with interest.

Eligibility for Membership	An employee must join the Defined Contribution component of the Plan on the date the member is appointed to the permanent staff of Canadian Utilities Limited.
Employee Contributions	The lesser of 4% of member's pensionable earnings and 40% of the maximum contribution limit. Required contributions for Executive Officers and disabled members are made on their behalf by the Employer.
Employer Contributions	The lesser of 10% of member's pensionable earnings and maximum contribution limit reduced by the amount paid by the member.
Benefits	Members receive the balance of their individual employer and employee accounts upon termination, death or retirement.
Maximum Contribution	The employer and employee contributions are limited to the amounts under the Income Tax Act.
Pensionable Earnings	Base salary

Appendix G
Plausible Adverse Scenarios

In this Appendix, the financial impact on the Plan's going concern results (i.e., going concern financial position at the valuation date and current service cost from the valuation date to the next valuation date) of plausible adverse scenarios that would pose threats to the Plan's future financial condition is illustrated for the following risks:

- Interest rate risk, the potential that interest rates will be lower than expected;
- Deterioration of asset values; and
- Longevity risk, the potential that pension plan members will live longer than expected.

The following table summarizes the going concern results, where we assumed for:

- Interest rate risk, an immediate parallel decrease in market interest rates of 90 basis points
- Deterioration of asset values, an immediate decrease of 16% in the market value of non-fixed income assets; and
- Longevity risk, that life expectancy from the valuation date at age 65 for a male and a female would increase by 1.5 years and 1.3 years, respectively.

Scenario	Going Concern Valuation Results as at 31.12.2019	Plausible Adverse Scenario Results as at 31.12.2019		
		Interest Rate Risk	Deterioration of Asset Values	Longevity Risk
Going Concern Financial Status				
Market value of assets	$2,818,113,100	$3,099,924,400	$2,677,207,400	$2,818,113,100
Going concern funding target	$2,710,842,700	$3,061,682,400	$2,710,842,700	$2,834,835,700
Funding excess (shortfall)	$107,270,400	$38,242,000	($33,635,300)	($16,722,600)
Estimated Employer's Current Service Cost expressed as a percentage of members' pensionable earnings				
From January 1, 2020	38.90%	46.10%	38.90%	41.06%

The balance of this Appendix provides details of the plausible adverse scenarios selected and the determination of the impact on the going concern results.

Interest Rate Risk

The purpose of this scenario is to illustrate the sensitivity of the Plan's going concern results to the potential that interest rates will be lower than expected. For this purpose, we have assumed an immediate parallel decrease in market interest rates underlying fixed income investments, where fixed income investments include Canadian fixed income and global fixed income as shown in the investment policy summarized in Appendix B.

Using a methodology consistent with the one used to determine the going concern discount rate, we have determined that a parallel decrease in market interest rates of 90 basis points would have a non-trivial probability (between 1 in 10 and 1 in 20) of occurring within the year following the valuation date. For the purpose of this scenario, we have assumed that such a decrease in market interest rates would occur immediately on the valuation date and would have the following impact on the value of assets and going concern assumptions.

Defined Term	Description
Market value of assets	The decrease in market interest rates has been assumed to affect only the market value of the fixed income investments. The decrease is assumed to have occurred immediately on the valuation date.
Discount rate assumption	It was assumed that the decrease in market interest rates affects only the expected return on assets for the fixed income portion of assets. The same margin for adverse deviations was used. The discount rate assumption was therefore decreased from 3.7% to 2.8%.
Other assumptions	Except as mentioned above, all assumptions used were the same as those used for this valuation. In particular, the discount rate used to value benefits assumed to be settled through a lump sum was not changed.

Deterioration of Asset Values

The purpose of this scenario is to illustrate the sensitivity of the Plan's going concern results to a deterioration of asset values. For this purpose, we assumed an immediate reduction in the market value of the Plan's non-fixed income assets, where non-fixed income investments include global equities and real estate as shown in the investment policy summarized in Appendix B.

Using a methodology consistent with the one used to determine the going concern discount rate, we have determined that a decrease of 16% in the market value of non-fixed income assets would have a non-trivial probability (between 1 in 10 and 1 in 20) of occurring within the year following the valuation date. For the purpose of this scenario, we have assumed that such a decrease would occur immediately on the valuation date and would have the following impact on the value of assets and going concern assumptions:

Market value of assets	The decrease in the market value of the non-fixed income portion of assets is assumed to have occurred immediately on the valuation date.
Going concern assumptions	This scenario is assumed to have no impact on the assumptions used for this valuation.

Longevity Risk

The purpose of this scenario is to illustrate the sensitivity of the Plan's going concern results to the potential that pension plan members will live longer than expected. For this purpose, we have determined that a plausible adverse scenario would be to assume that future mortality improvements[5] will be in line with the average improvements experienced by the Canadian population over the most recent 15-year period available, with uniform improvement rates for all future years but varying by age[6] and gender.

The table below summarizes the improvement rates under the plausible adverse scenario compared to those currently assumed under the CPM-B scale and is based on Canadian population experience from the Human Mortality Database (HMD) from 2002 to 2016.

	Males				Females			
	CPM-B			Adverse	CPM-B			Adverse
Age	2020	2025	2030+	Scenario	2020	2025	2030+	Scenario
20	1.59%	1.20%	0.80%	1.68%	0.98%	0.89%	0.80%	1.47%
30	1.88%	1.34%	0.80%	1.68%	0.98%	0.89%	0.80%	1.47%
40	1.80%	1.30%	0.80%	1.68%	1.17%	0.98%	0.80%	1.47%
50	1.17%	0.98%	0.80%	1.76%	0.98%	0.89%	0.80%	1.34%
55	1.47%	1.13%	0.80%	1.67%	1.11%	0.96%	0.80%	1.14%
60	1.77%	1.28%	0.80%	1.75%	1.24%	1.02%	0.80%	1.34%
65	2.06%	1.43%	0.80%	2.11%	1.36%	1.08%	0.80%	1.65%
70	2.06%	1.43%	0.80%	2.48%	1.36%	1.08%	0.80%	1.77%
75	2.01%	1.41%	0.80%	2.66%	1.36%	1.08%	0.80%	1.93%
80	1.96%	1.38%	0.80%	2.63%	1.36%	1.08%	0.80%	2.03%
85	1.38%	1.03%	0.68%	2.32%	1.31%	0.99%	0.68%	1.98%
90	0.75%	0.62%	0.48%	1.68%	0.75%	0.62%	0.48%	1.60%
95	0.16%	0.25%	0.34%	1.04%	0.16%	0.25%	0.34%	1.12%
100	0.14%	0.22%	0.30%	0.64%	0.14%	0.22%	0.30%	0.80%
105	0.14%	0.22%	0.30%	0.38%	0.14%	0.22%	0.30%	0.55%

[5] i.e. starting one year after the valuation in this context

[6] improvement rates below age 45 are set to those at age 45

Appendix H
Employer Certification

With respect to the Report on the Actuarial Valuation for Funding Purposes as at December 31, 2019 of the Plan, I hereby certify that, to the best of my knowledge and belief:

- The valuation reflects the terms of the Company's engagement with the actuary described in Section 2 of this report, particularly the requirement to include a margin of 0.3% in the discount rate used to perform the going concern valuation and the Company's decisions in regards to determining the going concern and solvency funding requirements.
- A copy of the official plan documents and of all amendments made up to December 31, 2019 was provided to the actuary and is reflected appropriately in the summary of plan provisions contained herein.
- The asset information summarized in Appendix B is reflective of the Plan's assets.
- The membership data provided to the actuary included a complete and accurate description of every person who is entitled to benefits under the terms of the Plan for service up to December 31, 2019.
- All events subsequent to December 31, 2019 that may have an impact on the Plan have been communicated to the actuary.

July 10, 2020
Date

Carol McCabe
Signed

Carol McCabe
Name

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MARSH & McLENNAN COMPANIES

Mercer

Retirement Plan for Employees of Canadian Utilities Limited and Participating Companies – Plan 1

Report on the Actuarial Valuation for Funding Purposes as at December 31, 2020

August 11, 2021

Canada Revenue Agency Registration Number: 0343343

welcome to brighter

Note to reader regarding actuarial valuations:

This valuation report may not be relied upon for any purpose other than those explicitly noted in the Introduction, nor may it be relied upon by any party other than the parties noted in the Introduction. Mercer is not responsible for the consequences of any other use. A valuation report is a snapshot of a plan's estimated financial condition at a particular point in time; it does not predict a pension plan's future financial condition or its ability to pay benefits in the future. If maintained indefinitely, a plan's total cost will depend on a number of factors, including the amount of benefits the plan pays, the number of people paid benefits, the amount of plan expenses, and the amount earned on any assets invested to pay the benefits. These amounts and other variables are uncertain and unknowable at the valuation date. The content of the report may not be modified, incorporated into or used in other material, sold or otherwise provided, in whole or in part, to any other person or entity, without Mercer's permission. All parts of this report, including any documents incorporated by reference, are integral to understanding and explaining its contents; no part may be taken out of context, used, or relied upon without reference to the report as a whole.

To prepare the results in this report, actuarial assumptions are used to model a single scenario from a range of possibilities for each valuation basis. The results based on that single scenario are included in this report. However, the future is uncertain and the Plan's actual experience will differ from those assumptions; these differences may be significant or material. Different assumptions or scenarios within the range of possibilities may also be reasonable, and results based on those assumptions would be different. Furthermore, actuarial assumptions may be changed from one valuation to the next because of changes in regulatory and professional requirements, developments in case law, plan experience, changes in expectations about the future, and other factors.

The valuation results shown in this report also illustrate the sensitivity to the discount rate, and the sensitivity to three adverse scenarios. We note that the results presented herein rely on many assumptions, all of which are subject to uncertainty, with a broad range of possible outcomes, and the results are sensitive to all the assumptions used in the valuation.

Should the Plan be wound up, the going concern funded status and solvency financial position, if different from the wind-up financial position, become irrelevant. The hypothetical wind-up financial position estimates the financial position of the Plan assuming it is wound up on the valuation date. Emerging experience will affect the wind-up financial position of the Plan assuming it is wound up in the future. In fact, even if the Plan were wound up on the valuation date, the financial position would continue to fluctuate until the benefits are fully settled.

Decisions about benefit changes, granting new benefits, investment policy, funding policy, benefit security, and/or benefit-related issues should not be made solely on the basis of this valuation, but only after careful consideration of alternative economic, financial, demographic, and societal factors, including financial scenarios that assume future sustained investment losses.

Funding calculations reflect our understanding of the requirements of the *Alberta Employment Pension Plans Act*, the *Income Tax Act*, and related regulations that are effective as of the valuation date. Mercer is not a law firm, and the analysis presented in this report is not intended to be a legal opinion. You should consider securing the advice of legal counsel with respect to any legal matters related to this report.

Contents

1. Summary of Results 1
2. Introduction 2
3. Defined Contribution Component of the Plan 6
4. Valuation Results – Going Concern 7
5. Valuation Results – Hypothetical Wind-up 10
6. Valuation Results – Solvency 11
7. Minimum Funding Requirements 13
8. Maximum Eligible Contributions 15
9. Actuarial Opinion 16
Appendix A: Prescribed Disclosure 17
Appendix B: Plan Assets 19
Appendix C: Methods and Assumptions – Going Concern 21
Appendix D: Methods and Assumptions – Hypothetical Wind-Up and Solvency 27
Appendix E: Membership Data 31
Appendix F: Summary of Plan Provisions 34
Appendix G: Plausible Adverse Scenarios 39
Appendix H: Employer Certification 42

1 Summary of Results

	31.12.2020	31.12.2019
Going Concern Financial Status		
Market value of assets	$3,015,005,300	$2,818,113,100
Going concern funding target	$2,981,917,700	$2,710,842,700
Funding excess (shortfall)	$33,087,600	$107,270,400
Funded ratio	101.1%	104.0%
Hypothetical Wind-up Financial Position		
Wind-up assets	$3,013,005,300	$2,816,113,100
Wind-up liability	$3,471,697,200	$3,335,781,100
Wind-up excess (shortfall)	($458,691,900)	($519,668,000)
Wind-up ratio	86.8%	84.4%
Solvency Financial Position		
Solvency assets	$3,013,005,300	$2,816,113,100
Solvency liabilities	$2,896,047,500	$2,770,068,000
Solvency excess (shortfall)	$116,957,800	$46,045,100
Solvency ratio	104.0%	101.7%
Funding Requirements in the Year Following the Valuation[1]		
Total current service cost	$11,331,800	$13,412,600
Estimated members' required contributions	($398,000)	($542,000)
Estimated employer's current service cost	$10,933,800	$12,870,600
Employer's current service cost expressed as a percentage of members' pensionable earnings	44.38%	38.90%
Minimum special payments	$0	$0
Estimated minimum employer contribution	$10,933,800	$12,870,600
Estimated maximum eligible employer contribution	$10,933,800	$12,870,600
Next required valuation date	31.12.2023	31.12.2022

[1] Provided for reference purposes only. Contributions must be remitted to the Plan in accordance with the Minimum Funding Requirements and Maximum Eligible Contributions sections of this report.

2
Introduction

To the Management Pension Committee of Canadian Utilities Limited

At your request, we have conducted an actuarial valuation of the Retirement Plan for the Employees of Canadian Utilities Limited and Participating Companies - Plan 1 (the "Plan"), sponsored by Canadian Utilities Limited (the "Company"), as at the valuation date, December 31, 2020. We are pleased to present the results of the valuation.

The contributions to the defined contribution component of the Plan are determined by the Plan provisions. An estimate of the defined contributions for 2021 is included in this report.

Purpose

The purpose of this valuation is to determine:

- The funded status of the Plan as at December 31, 2020 on going concern, hypothetical wind-up, and solvency bases;
- The minimum required funding contributions from 2021, in accordance with the *Alberta Employment Pension Plans Act* (the "Act"); and
- The maximum permissible funding contributions from 2021, in accordance with the *Income Tax Act.*

The information contained in this report was prepared for the internal use of the Management Pension Committee and the Company, and for filing with Alberta Treasury Board and Finance and with the Canada Revenue Agency, in connection with our actuarial valuation of the Plan. This report will be filed with Alberta Treasury Board and Finance and with the Canada Revenue Agency. This report is not intended or suitable for any other purpose.

In accordance with pension benefits legislation, the next actuarial valuation of the Plan will be required as at a date not later than December 31, 2023, or as at the date of an earlier amendment to the Plan depending on any funding implications.

Terms of Engagement

In accordance with our terms of engagement with the Company, our actuarial valuation of the Plan is based on the following material terms:

- It has been prepared in accordance with applicable pension legislation and actuarial standards of practice in Canada.
- As instructed by the Company, the going concern discount rate reflects a margin for adverse deviations of 0.30% per year.
- We have reflected the Company's decisions for determining the solvency funding requirements, summarized as follows:
  - Different plan wind-up scenarios were hypothesized for hypothetical wind-up and solvency valuations.
  - No benefits were excluded from the solvency liabilities. However, an alternative settlement method for solvency funding purposes was hypothesized, whereby plan benefits were modified as permitted, pursuant to Alberta Treasury Board and Finance's *Update 13-01 Alternative Settlement Methods for Hypothetical Wind-Up and Solvency Valuations,* to replace future variable inflation protection with a fixed percentage increase.

See the Valuation Results – Solvency section of the report for more information.

Events since the Last Valuation at December 31, 2019

Pension Plan

There have been no special events since the last valuation date that had a material impact on the funding position.

This valuation reflects the provisions of the Plan as at December 31, 2020. There have been no amendments since the date of the previous valuation that had a material impact on the funding position of the Plan, and we are not aware of any pending definitive or virtually definitive amendments coming into effect during the period covered by this report. The Plan provisions are summarized in Appendix F.

Assumptions

We have used the same going concern valuation assumptions and methods as were used for the previous valuation, except for the following:

	Current valuation	Previous valuation
Discount rate:	2.80%	3.70%

A summary of the going concern methods and assumptions is provided in Appendix C.

The hypothetical wind-up and solvency assumptions have been updated to reflect market conditions at the valuation date. A summary of the hypothetical wind-up and solvency methods and assumptions is provided in Appendix D.

Regulatory Environment and Actuarial Standards

On June 24, 2020, the Employment Pension Plans Regulation (EPPR) was amended to permit a temporary suspension of unfunded liability and solvency deficiency payments (special payments) until the end of 2020. The impact of this relief must be amortized over a period not exceeding 15 years commenced at the date of the next actuarial valuation report of the plan. The Company did not elect to apply for this suspension.

On July 2, 2020, the Minister of Finance of Canada released draft regulations that would permit sponsors of pension plans to recognize full pensionable service in 2020 for employees who are working reduced hours or who are receiving reduced earnings. The eligible period of reduced pay will be subject to the limit of five years of full-time equivalent compensation. In addition, effective May 5, 2020, the Canada Revenue Agency waived the one percent minimum required employer contributions on defined contribution pension plans for the remainder of 2020.

On July 23, 2020, the CIA published the final version of Section 3500 of the Standards of Practice on Pension Commuted Values and confirmed that the effective date of the new standards is December 1, 2020.

From the effective date, the revised standards affect the assumptions used to value the solvency and wind-up liabilities for benefits assumed to be settled through a lump sum transfer. The financial impact of this change is reflected in this actuarial valuation on a solvency and hypothetical wind-up basis.

Subsequent Events

On May 10, 2021, the Bank of Canada revised certain rates for real return bond data (based on the rollover of the 2050 bond) retroactive to June 1, 2020. The previously published rates, based on the 2044 bond, were used for the preparation of the hypothetical wind-up results and solvency results in this report. We note the retroactive nature of this change but have not reflected it in this report given that the actuarial valuation was effectively complete at the time the revised rates were published and using them would not have a material impact on the results.

After checking with representatives of the Company, to the best of our knowledge there have been no events subsequent to the valuation date that, in our opinion, would have a material impact on the results of the valuation as at December 31, 2020.

Impact of Case Law

This report has been prepared on the assumption that all claims on the Plan after the valuation date will be in respect of benefits payable to members of the Plan determined in accordance with the Plan terms and that all Plan assets are available to provide for these benefits. It is possible that court and regulatory decisions and changes in legislation could give rise to additional entitlements to benefits under the Plan and cause the results in this report to change. By way of example, we bring your attention to the following decisions:

- The Ontario Court of Appeal's 2003 decision in *Aegon Canada Inc. and Transamerica Life Canada versus ING Canada Inc.* restricted the use of original plan surplus where two or more pension plans were merged.

- The Supreme Court of Canada's 2004 decision in *Monsanto Canada Inc. versus Superintendent of Financial Services* upheld the requirement, with retroactive effect, to distribute surplus on partial plan wind-up under the *Pension Benefits Act (Ontario).*

Although these decisions dealt with Ontario legislation, it is possible that they could have application to other provinces where the underlying language in the *Pension Benefits Act (Ontario)* is similar to language in the legislation of other provinces.

We are not in a position to assess the impact that such decisions or changes could have on the assumption that all plan assets on the valuation date are available to provide for benefits determined in accordance with the Plan terms. If such a claim arises subsequent to the date of this report, the consequences will be dealt with in a subsequent report. We are making no representation as to the likelihood of such a claim.

3

Defined Contribution Component of the Plan

The Plan is made up of defined contribution ("DC") and defined benefit ("DB") components. The DC component is considered in this Section. The remainder of the report relates to the DB component of the Plan, unless otherwise noted.

Current Service Cost

For the DC component of the Plan, Canadian Utilities Ltd.'s funding requirement is the employer DC current service cost. We have estimated the employer DC current service cost based on the projected payroll of participants. Our estimate, compared with the result of the previous valuation, is as follows:

	2021	2020
Estimated DC pensionable earnings that will attract an employer contribution	$428,410,000	$423,644,000
Employer DC current service cost	$25,705,000	$25,419,000

For reference, the Plan terms are summarized in Appendix F.

4

Valuation Results – Going Concern

Financial Status

A going concern valuation compares the relationship between the value of Plan assets and the present value of expected future benefit cash flows in respect of accrued service, assuming the Plan will be maintained indefinitely.

The results of the current valuation, compared with those from the previous valuation, are summarized as follows:

	31.12.2020	31.12.2019
Assets		
Market value of assets	$3,015,005,300	$2,818,113,100
Going concern funding target		
Active members	$558,312,900	$574,233,900
Pensioners and survivors	$2,407,498,500	$2,105,589,900
Deferred pensioners and pending transfers	$16,106,300	$31,108,900
Total	$2,981,917,700	$2,710,842,700
Funding excess (shortfall)	$33,087,600	$107,270,400

The going concern funding target includes a provision for adverse deviations.

Reconciliation of Financial Status ($Millions)

Funding excess (shortfall) as at previous valuation		$107.3
Interest on funding excess (shortfall) at 3.70% per year		$4.0
Employer's special payments, with interest		$0.0
Expected funding excess (shortfall)		$111.3
Net experience gains (losses)		
• Investment return	$211.7	
• Increases in pensionable earnings	$1.4	
• Indexation	$38.3	
• Mortality	($0.3)	
• Retirement	$5.9	
• Termination	$0.8	
Total experience gains (losses)		$257.8
Impact of changes in discount rate		($335.7)
Net impact of other elements of gains and losses		($0.3)
Funding excess (shortfall) as at current valuation		$33.1

Current Service Cost

The current service cost is an estimate of the present value of the additional expected future benefit cash flows in respect of pensionable service that will accrue after the valuation date, assuming the Plan will be maintained indefinitely.

The current service cost during the year following the valuation date, compared with the corresponding value determined in the previous valuation, is as follows:

	2021	2020
Total current service cost	$11,331,800	$13,412,600
Estimated members' required contributions	($398,000)	($542,000)
Estimated employer's current service cost	$10,933,800	$12,870,600
Employee's current service cost expressed as a percentage of members' pensionable earnings	1.62%	1.64%
Employer's current service cost expressed as a percentage of members' pensionable earnings	44.38%	38.90%
Total current service cost expressed as a percentage of members' pensionable earnings	46.00%	40.54%

The key factors that have caused a change in the employer's current service cost since the previous valuation are summarized in the following table:

Employer's current service cost as at previous valuation	38.90%
Demographic changes	(1.42%)
Changes in assumptions	6.90%
Employer's current service cost as at current valuation	44.38%

Discount Rate Sensitivity

The following table summarizes the effect on the going concern liabilities and current service cost shown in this report of using a discount rate that is 1% lower than that used in the valuation.

Scenario	Valuation Basis	Reduce Discount Rate by 1%
Going concern funding liabilities	$2,981,917,700	$3,440,860,000
Current service cost		
• Total current service cost	$11,331,800	$13,756,400
• Estimated members' required contributions	($398,000)	($398,000)
Estimated employer's current service cost	$10,933,800	$13,358,400

Plausible Adverse Scenarios

The financial impact on the going concern results of plausible adverse scenarios that would pose threats to the Plan's future financial condition is presented in Appendix G.

5
Valuation Results – Hypothetical Wind-up

Financial Position

When conducting a hypothetical wind-up valuation, we determine the relationship between the respective values of the Plan's assets and its liabilities assuming the Plan is wound up and settled on the valuation date, assuming benefits are settled in accordance with the Act and under circumstances consistent with the hypothesized scenario on the valuation date. For this purpose, we have assumed that annuities would be purchased with a fixed rate of increase of 3.0% per year, which is the maximum rate of increase under the Plan provisions.

More details on such scenario are provided in Appendix D.

The hypothetical wind-up financial position as of the valuation date, compared with that at the previous valuation, is as follows:

	31.12.2020	31.12.2019
Assets		
Market value of assets	$3,015,005,300	$2,818,113,100
Termination expense provision	($2,000,000)	($2,000,000)
Wind-up assets	$3,013,005,300	$2,816,113,100)
Present value of accrued benefits for:		
• Active members	$550,763,800	$609,570,900
• Pensioners and survivors	$2,904,074,700	$2,691,528,200
• Deferred pensioners	$16,858,700	$34,682,000
Total wind-up liability	$3,471,697,200	$3,335,781,100
Wind-up excess (shortfall)	($458,691,900)	($519,668,000)

6
Valuation Results – Solvency

Overview

The Act also requires the financial position of the Plan to be determined on a solvency basis. An alternative settlement method for solvency funding purposes was hypothesized, whereby plan benefits were modified as permitted, pursuant to Alberta Treasury Board and Finance's Update 13-01 Alternative Settlement Methods for Hypothetical Wind-Up and Solvency Valuations, to replace future variable inflation protection with a fixed percentage increase. Specifically, as at December 31, 2020, annuities were assumed to be purchased with a fixed rate of increase of 1.48% per year.

More details on such scenario are provided in Appendix D.

Financial Position

The financial position on a solvency basis, compared with the corresponding figures from the previous valuation, is as follows:

	31.12.2020	31.12.2019
Assets		
Market value of assets	$3,015,005,300	$2,818,113,100
Present value of going concern special payments	$0	($0)
Termination expense provision	($2,000,000)	($2,000,000)
Net assets	$3,013,005,300	$2,816,113,100
Liabilities		
Total hypothetical wind-up liabilities	$3,471,697,200	$3,335,781,100
Difference in circumstances of assumed wind-up	($575,649,700)	($565,713,100)
Value of excluded benefits	($0)	($0)
Liabilities on a solvency basis	$2,896,047,500	$2,770,068,000
Surplus (shortfall) on a market value basis	$116,957,800	$46,045,100
Solvency ratio	104.0%	101.7%

Solvency Incremental Cost

The solvency incremental cost is an estimate of the present value of the projected change in the solvency liabilities from the valuation date until the next scheduled valuation date, adjusted for the benefit payments expected to be made in that period. The solvency incremental cost determined in this valuation, compared with the corresponding value determined in the previous valuation, is as follows:

	31.12.2020	31.12.2019
Number of years covered by report	3 years	3 years
Total solvency liabilities at the valuation date (A)	$2,896,047,500	$2,770,068,000
Present value at the valuation date of projected solvency liability at the next required valuation plus expected benefit payments until the next required valuation (B)	$2,975,018,500	$2,856,452,000
Solvency incremental cost (B – A)	$78,971,000	$86,384,000

The incremental cost is not an appropriate measure of the contributions that would be required to maintain the windup position of the Plan even if actual experience is exactly in accordance with the going concern valuation assumptions. For example, the expected return on plan assets (based on the going concern assumptions) is greater than the discount rate used to determine the solvency liabilities.

Discount Rate Sensitivity

The following table summarizes the effect on the solvency liabilities shown in this report of using a discount rate that is 1% lower than that used in the valuation:

Scenario	Valuation Basis	Reduce Discount Rate by 1%
Total solvency liability	$2,896,047,500	$3,337,088,000

7
Minimum Funding Requirements

The Act prescribes the minimum contributions that Canadian Utilities Limited must make to the Plan. The minimum contributions in respect of a defined benefit component of a pension plan are comprised of going concern current service cost and special payments to fund any going concern or solvency shortfalls.

On the basis of the assumptions and methods described in this report, the rule for determining the minimum required employer monthly contributions, as well as an estimate of the employer contributions, from the valuation date until the next required valuation are as follows:

Period beginning	Employer's contribution rule		Estimated employer's contributions
	Monthly current service cost[2]	Minimum monthly deficiency payments	Total minimum monthly contributions
January 1, 2021	44.38%	$0	$911,200

The estimated contribution amounts above are based on projected members' pensionable earnings. If current service cost contributions are based on a percentage of members' pensionable earnings, then the actual employer's current service cost will be different from the above estimates and, as such, the contribution requirements should be monitored closely to ensure contributions are made in accordance with the Act.

Alternatively, as the Plan is closed to new employees and therefore the active membership is declining, it would be acceptable under the Act to contribute the above dollar amount of estimated employer's contributions to the Plan.

The estimated 2021 contributions to the defined contribution component of the Plan are set out in Section 3.

[2] Expressed as a percentage of members' pensionable earnings capped at $180,758 per member.

Other Considerations

Differences between Valuation Bases

There is no provision in the minimum funding requirements to fund the difference between the hypothetical wind-up and solvency shortfalls, if any.

In addition, although minimum funding requirements do include a requirement to fund the going concern current service cost, there is no requirement to fund the expected growth in the hypothetical wind-up or solvency liability after the valuation date, which could be greater than the going concern current service cost.

Timing of Contributions

Funding contributions must be made no less frequently than monthly, and must be made within 30 days following the end of the month to which they apply.

Retroactive Contributions

The Company must contribute the excess, if any, of the minimum contribution recommended in this report over contributions actually made in respect of the period following the valuation date. This contribution, along with an allowance for interest, is due no later than 30 days following the date this report is filed.

Payment of Benefits

The Act imposes certain restrictions on the payment of lump sums from the Plan when the solvency ratio revealed in an actuarial valuation is less than one. If the solvency ratio shown in this report is less than one, the plan administrator should ensure that the monthly special payments are sufficient to meet the requirements of the Act to allow for the full payment of benefits, and otherwise should take the prescribed actions.

Specifically, pursuant to the Act, transfers out of the Plan may only be made in full provided an amount equal to the transfer deficiency has been remitted to the pension fund in addition to the minimum special payments.

8
Maximum Eligible Contributions

The *Income Tax Act* (the "ITA") limits the amount of employer contributions that can be remitted to the defined benefit component of a registered pension plan.

In accordance with Section 147.2 of the ITA and *Income Tax Regulation* 8516, for a plan that is underfunded on either a going concern or on a hypothetical wind-up basis, the maximum permitted contributions are equal to the employer's current service cost, including the explicit expense allowance if applicable, plus the greater of the going concern funding shortfall and hypothetical wind-up shortfall.

For a plan that is fully funded on both going concern and hypothetical wind-up bases, the employer can remit a contribution equal to the employer's current service cost, including the explicit expense allowance if applicable, as long as the surplus in the plan does not exceed a prescribed threshold. Specifically, in accordance with Section 147.2 of the ITA, for a plan that is fully funded on both going concern and hypothetical wind-up bases, the plan may not retain its registered status if the employer makes a contribution while the going concern funding excess exceeds 25% of the going concern funding target.

Notwithstanding the above, any contributions that are required to be made in accordance with pension benefits legislation are eligible contributions in accordance with Section 147.2 of the ITA and can be remitted.

Schedule of Maximum Contributions

Since the surplus does not exceed 25% of the going concern funding target, the Company may make monthly contributions of up to 44.38% of members' pensionable earnings, calculated on a going concern basis, until the next valuation. The monthly amount is estimated at $911,200 as shown in Section 7.

The Company could elect to contribute the service cost on a plan termination basis instead of the going concern service cost. For example, based on the scenario in Section 6, the maximum employer contribution for the period to December 31, 2023 is the three year solvency incremental cost of $78,971,000.

The estimated 2021 contributions to the defined contribution component of the plan are set out in Section 3.

9

Actuarial Opinion

In my opinion, for the purposes of the valuations,

- The membership data on which the valuation is based are sufficient and reliable;
- The assumptions are appropriate.
- The methods employed in the valuation are appropriate.

This report has been prepared, and my opinion given, in accordance with accepted actuarial practice in Canada. It has also been prepared in accordance with the funding and solvency standards set by the *Alberta Employment Pension Plans Act.*



Mark Greenwood
FCIA, FIA

August 11, 2021
Date

Appendix A
Prescribed Disclosure

Definitions

The Act defines a number of terms as follows:

Defined Term	Description	Result
Going Concern Assets Value	The value of the assets of a plan as of the relevant review date, determined on the basis of a going concern valuation.	$3,015,005,300
Going Concern Liabilities Value	The actuarial present value of a plan's benefits as of the relevant review date, determined on the basis of a going concern valuation.	$2,981,917,700
Unfunded Liability	The amount, if any, by which a plan's going concern liabilities value exceed its going concern assets value.	$0
Going Concern Funded Ratio	The fraction obtained by dividing the Going Concern Assets Value by the Going Concern Liabilities Value	1.0111
Accessible Going Concern Excess	The amount, if any, by which a plan's Going Concern Assets Value exceed 105% of its Going Concern Liabilities Value.	$0
Solvency Asset Value	The value of the plan's assets determined on a plan termination basis including any cash balances and accrued and receivable income and reduced by the actuary's estimate of the expenses that would be incurred in winding-up the plan.	$3,013,005,300
Solvency Liabilities Value	The liabilities of the plan calculated on a plan termination basis.	$2,896,047,500
Solvency Asset Adjustment	The sum of	
	(a) the face amount of any prescribed letters of credit.	$0
	(b) the present value of special payments sufficient to amortize the unfunded liability due over the next five years, and	$0
		$0
Solvency Ratio	The fraction obtained by dividing:	1.0404
	(a) the Solvency Asset Value, and	$3,013,005,300
	(b) the Solvency Liabilities Value.	$2,896,047,500
Solvency Deficiency	The amount, if any, by which:	$0
	(a) the Solvency Liabilities Value	$2,896,047,500
	exceed the sum of:	
	(a) the Solvency Asset Value, and	$3,013,005,300
	(b) the Solvency Asset Adjustment.	$0
		$0

Defined Term	Description	Result
Accessible Solvency Excess	The amount, if any, by which a plan's Solvency Asset Value exceed 105% of its Solvency Liabilities Value.	$0
Special Payments	A monthly special payment established to amortize an unfunded liability is hereafter referred to as an unfunded liability special payment.	$0
	A monthly special payment established to amortize a solvency deficiency is hereafter referred to as a solvency special payment.	$0

Timing of Next Required Valuation

In accordance with the Act and the Superintendent's Directives, an actuarial report must be prepared at intervals not exceeding three years. The Superintendent also directs that the plan administrator file actuarial reports annually if the going concern funded ratio of the plan is less than 85%. Triennial filings may resume with the filing of a report showing that the going concern funded ratio is at least 85%.

Accordingly, the next valuation of the Plan will be required as of December 31, 2023.

Special Payments

Going Concern Basis

No unfunded liability special payments are required.

Solvency Basis

No solvency special payments are required.

Appendix B
Plan Assets

The pension fund is held by Northern Trust. In preparing this report, we have relied upon fund statements prepared by Northern Trust without further audit. Customarily, this information would not be verified by a plan's actuary. We have reviewed the information for internal consistency and we have no reason to doubt its substantial accuracy.

Reconciliation of Market Value of Plan Assets

The pension fund transactions since the last valuation are summarized in the following table:

	2020
January 1	$2,818,113,095
PLUS	
Members' contributions	$626,533
Company's contributions	$12,878,200
Investment earnings	$106,164,852
Net capital gains (losses)	$217,687,955
	$337,357,540
LESS	
Pensions paid	$122,466,684
Lump-sums paid	$7,970,815
Administration and investment fees	$10,027,797
	$140,465,296
December 31	$3,015,005,339
Gross rate of return[3]	11.76%
Rate of return net of expenses[3]	11.37%

We have tested the pensions paid, the lump-sums paid, and the contributions for consistency with the membership data for the Plan members who have received benefits or made contributions. The results of these tests were satisfactory.

[3] Assuming mid-period cash flows.

Investment Policy

The plan administrator has adopted a statement of investment policy and procedures. This policy is intended to provide guidelines for the manager(s) as to the level of risk that is consistent with the Plan's investment objectives. A significant component of this investment policy is the asset mix.

The plan administrator is solely responsible for selecting the Plan's investment policies, asset allocations, and individual investments.

The constraints on the asset mix and the actual asset mix at the valuation date are provided for information purposes:

	Investment Policy			Actual asset Mix as at 31.12.2020
	Minimum	Target	Maximum	
Canadian Fixed Income	30.0%	50.0%	60.0%	70.0%
Global Fixed Income	15.0%	22.0%	35.0%	
Real Estate	0.0%	9.0%	10.0%	7.3%
Global Equity	0.0%	19.0%	40.0%	21.6%
Cash and cash equivalents	-	-	-	1.1%
		100%		100%

Appendix C
Methods and Assumptions – Going Concern

Valuation of Assets

For this valuation, we have used the market value of assets.

Going Concern Funding Target

Over time, the real cost to the employer of a pension plan is the excess of benefits and expenses over member contributions, if any, and investment earnings. The actuarial cost method allocates this cost to annual time periods.

For purposes of the going concern valuation, we have continued to use the projected unit credit actuarial cost method. Under this method, we determine the present value of benefit cash flows expected to be paid in respect of service accrued prior to the valuation date, based on projected final average earnings. This is referred to as the funding target.

The funding excess or funding shortfall, as the case may be, is the difference between the market or smoothed value of assets and the funding target. A funding excess on a market value basis indicates that the current market value of assets and expected investment earnings are expected to be sufficient to meet the cash flows in respect of benefits accrued to the valuation date as well as expected expenses – assuming the plan is maintained indefinitely. A funding shortfall on a market value basis indicates the opposite – that the current market value of the assets is not expected to be sufficient to meet the plan's cash flow requirements in respect of accrued benefits, absent additional contributions.

As required under the Act, a funding shortfall including the provision for adverse deviations must be amortized over no more than 15 years through special payments. A funding excess may, from an actuarial standpoint, be applied immediately to reduce required employer current service contributions unless precluded by the terms of the plan or by legislation.

The actuarial cost method used for the purposes of this valuation produces a reasonable matching of contributions with accruing benefits. Because benefits are recognized as they accrue, the actuarial cost method provides an effective funding target for a plan that is maintained indefinitely.

Current Service Cost

The current service cost is the present value of projected benefits to be paid under the plan with respect to service expected to accrue during the period until the next valuation.

The employer's current service cost is the total current service cost reduced by the members' required contributions.

The employer's current service cost has been expressed as a percentage of the members' pensionable earnings to provide an automatic adjustment in the event of fluctuations in membership and/or pensionable earnings.

Under the projected unit credit actuarial cost method, the current service cost for an individual member will increase each year as the member approaches retirement. As the DB component is closed to new members, the current service cost for DB members, expressed as a percentage of the members' pensionable earnings, can be expected to increase as the average age increases.

Actuarial Assumptions – Going Concern Basis

The present value of future benefit payment cash flows is based on economic and demographic assumptions. At each valuation we determine whether, in our opinion, the actuarial assumptions are still appropriate for the purposes of the valuation, and we revise them, if necessary. Emerging experience will result in gains or losses that will be revealed and considered in future actuarial valuations.

The table below shows the various assumptions used in the current valuation in comparison with those used in the previous valuation.

Assumption	Current valuation	Previous valuation
Discount rate:	2.80%	3.70%
Inflation:	2.00%	2.00%
ITA limit / YMPE increases:	2.25%	2.25%
Pensionable earnings increases:	2.50% (plus Merit and Promotion)	2.50% (plus Merit and Promotion)
Post-retirement pension increases:	1.85%	1.85%
Retirement rates:	Retirement occurs when age and service sum to 90 years, but not after age 65 or before 55	Retirement occurs when age and service sum to 90 years, but not after age 65 or before 55
Termination rates:	None	None
Mortality rates:	95% of the rates of the 2014 Private Sector Canadian Pensioners Mortality (CPM) Table	95% of the rates of the 2014 Private Sector Canadian Pensioners Mortality (CPM) Table
Mortality improvements:	Fully generational using CPM Improvement Scale B (CPM-B)	Fully generational using CPM Improvement Scale B (CPM-B)

Assumption	Current valuation	Previous valuation
Disability rates:	None	None
Eligible spouse at retirement:	Based on current marital status	Based on current marital status
Spousal age difference:	Male 3 years older	Male 3 years older

The assumptions are best-estimate with the exception that the discount rate includes a margin for adverse deviations, as shown below.

Age-Related Tables

Sample rates from the age-related tables are summarized in the following table:

Age	Merit and Promotion
20	13.65%
25	6.02%
30	3.08%
35	1.75%
40	1.07%
45	0.70%
50	0.47%
55	0.33%

Pensionable Earnings

The benefits ultimately paid will depend on each member's final average earnings. To calculate the pension benefits payable upon retirement or death, we have taken 2020 earnings and assumed that such pensionable earnings will increase at the assumed rate.

Rationale for Assumptions

A rationale for each of the assumptions used in the current valuation is provided below.

Discount Rate

We have discounted the expected benefit payment cash flows using the expected investment return on the market value of the fund net of fees and less a margin for adverse deviations.

The discount rate is comprised of the following:

- An **assumed investment return** based on estimated return for each major asset class that are consistent with market conditions on the valuation date modified to include a provision for increases in market interest rates to a level higher than current historically low levels, on the expected time horizon over which benefits are expected to be paid, and on the target asset mix specified in the Plan's investment policy. Consistent with market observable and available data, the assumed investment return is a gross return for all asset classes except for alternative investments for which it would normally be net of any investment management expense. The assumed investment return includes the diversification and rebalancing effect.
- An **assumed passive investment management expense provision** which represents the hypothetical fees for passive investment management of assets based on estimated fees charged by index managers for balanced mandates.
- An **active investment management expense provision** of 28 bps. We have assumed that these fees would be offset by an equivalent **additional return resulting from active management**.
- An **implicit non-investment management expense provision** determined as the average rate of non-investment expenses paid from the fund over the last three years. These would include all fees payable from the fund (administration, custodial, audit, consulting, etc.) except those payable to investment managers, to the extent that these fees are not covered in an explicit provision for expenses added to the current service cost
- A **margin for adverse deviations** of 0.30% as per the terms of engagement.

The discount rate was developed as follows:

Assumed investment return	3.22%
Additional returns for active investment management	0.28%
Active investment management expense provision	(0.28%)
Assumed passive investment management expense provision	(0.02%)
Implicit non-investment management expense provision	(0.10%)
Margin for adverse deviations	(0.30%)
Net discount rate	2.80%

Inflation

The inflation assumption is based on the mid-point of the Bank of Canada's inflation target range of between 1% and 3%.

Income Tax Act Pension Limit and Year's Maximum Pensionable Earnings

The assumption is based on historical real economic growth and the underlying inflation assumption.

Pensionable Earnings

The assumption is based on a best estimate of future merit and promotional increases and general wage growth considering current economic and financial market conditions. The assumption takes into account the Company's current outlook for wage growth in the utility sector. Such merit and promotion increases are assumed to be in accordance with the table developed based on an experience study considering increases over the years 1985 to 1992 and which has continued to be reasonably predictive of merit and promotion increases experienced since that time.

Post-Retirement Pension Increases

The assumption is based on the Plan formula and inflation assumption above, considering that the Plan limits pension increases to 3% in the event that inflation exceeds 3%. We have determined the impact of this cap by performing a stochastic analysis based on trials using a mean of 2.0% and a standard deviation of 1.5%.

Retirement Rates

For this valuation we have continued to assume that active members will retire when their age and service sum to 90 years, provided that retirement does not occur after 65 or before 55. Individuals who have already attained this condition are assumed to retire immediately. This assumption is based on the Plan provisions and the experience of the Plan in recent years.

Retirement earlier than assumed may result in losses to the Plan, while later retirements may result in gains to the Plan. These gains and losses will be revealed in subsequent valuations.

Termination Rates

Use of a different assumption would not have a material impact on the valuation.

Mortality Rates

The assumption for the mortality rates is based on the Canadian Pensioners' Mortality (CPM) study published by the Canadian Institute of Actuaries in February 2014. Considering the characteristics of the group, it was considered appropriate to use the CPM mortality rates from the private sector as a reference table.
The mortality rates selected reflect plan-specific experience over the years 2005 to 2014. However, due to the size of the Plan, this mortality experience is not fully credible. The CPM mortality rates from the private sector have been adjusted after considering the plan-specific experience and characteristics, such as the type of employment, the industry experience, the pension and employment income for the plan members, and data in the CPM study.

There is broad consensus among actuaries and other longevity experts that mortality improvement will continue in the future, but the degree of future mortality improvement is uncertain. Two mortality improvement scales published by the Canadian Institute of Actuaries (CIA) are generally adopted for Canadian pension valuations:

- The Canadian Pensioners Mortality (CPM) study published in February 2014 included CPM Improvement Scale B (CPM-B).
- A report released by the Task Force on Mortality Improvement on September 20, 2017 included an analysis of the rate of mortality improvement for the Canadian population and provides for mortality improvement scale MI-2017 to be considered for the purpose of reflecting future mortality improvement in Canadian actuarial work, while acknowledging that it might be appropriate to use alternative mortality improvement assumptions to reflect the nature of the work.

The CIA Committee on Pension Plan Financial Reporting published a revised version of the Educational Note on the Selection of Mortality Assumptions for Pension Plan Valuations on December 21, 2017. The Educational Note indicated that given the recent publication of the CPM-B and MI-2017 improvement scales and the similar data sets used in their development, it may be appropriate to use either scale in the absence of credible information to the contrary, such as the publication of a successor scale by the CIA.

COVID-19 has impacted mortality rates globally. Statistics Canada reported excess mortality in 2020 for the general Canadian population and other peer countries globally have also seen excess mortality over the course of the pandemic. Mortality experience for the plan has been reflected up to the date of the valuation. We have not adjusted the expected mortality rates for Plan members after the valuation date. The long-term implications of the pandemic on mortality rates is unclear as at the date of this report. Credible plan specific experience and relevant broader observed mortality trends after the report date will be reflected in future valuations.

For the current valuation, we have continued to use the CPM-B scale, which is a reasonable outlook for future mortality improvement.

Based on the assumption used, the life expectancy of a member age 65 at the valuation date is 22.3 years for males and 24.6 years for females.

Disability Rates

Use of a different assumption would not have a material impact on the valuation.

Eligible Spouse

The assumption is based on actual membership data, which we believe is the most reliable source.

Spousal Age Difference

The assumption is based on an industry standard showing males are typically 3 years older than their spouse.

Appendix D

Methods and Assumptions – Hypothetical Wind-Up and Solvency

Hypothetical Wind-up Basis

The Canadian Institute of Actuaries requires actuaries to report the financial position of a pension plan on the assumption that the plan is wound up on the effective date of the valuation, with benefits determined on the assumption that the pension plan has neither a surplus nor a deficit.

To determine the actuarial liability on the hypothetical wind-up basis, we have valued those benefits that would have been paid had the Plan been wound up on the valuation date, with all members fully vested in their accrued benefits.

The Standards of Practice of the Canadian Institute of Actuaries require that the scenario upon which the hypothetical wind-up valuation is based be postulated. However, there are no benefits under the Plan contingent upon the circumstances of the plan wind-up or contingent upon other factors. Therefore, it was not necessary to postulate a scenario upon which the hypothetical wind-up valuation is made. No benefits payable on plan wind-up were excluded from our calculations. The plan wind-up is assumed to occur in circumstances that maximize the actuarial liability.

Upon plan wind-up, members are given options for the method of settling their benefit entitlements. The options vary by eligibility and by province of employment, but in general, involve either a lump sum transfer or an immediate or deferred pension.

The value of benefits assumed to be settled through a lump sum transfer is based on the assumptions described in Section 3500 – *Pension Commuted Values* of the Canadian Institute of Actuaries' Standards of Practice applicable for December 31, 2020.

Benefits provided as an immediate or deferred pension are assumed to be settled through the purchase of annuities based on an estimate of the cost of purchasing annuities.

We have estimated the cost of settlement through purchase of annuities in accordance with the *Canadian Institute of Actuaries Educational Note: Assumptions for Hypothetical Wind-up and Solvency Valuations with Effective Dates between December 31, 2020 and no later than December 30, 2021 (the "Educational Note").*

An alternative settlement method was hypothesized for solvency purposes, whereby plan benefits were modified, as permitted, pursuant to Alberta Treasury Board and Finance's Update 13-01 Alternative Settlement Methods for Hypothetical Wind-Up and Solvency Valuations ("Update 13-01"). Annuities are assumed to be purchased with future variable inflation protection replaced with a fixed percentage increase determined in accordance with Update 13-01.

However, it may not be possible to settle the liabilities through the purchase of annuities due to the size of the Plan and the limited annuity market in Canada. In accordance with the Educational Note, we have assumed that the settlement of such liabilities would be priced on the same basis as the smaller group annuities that are available in the market.

The Educational Note provides guidance on estimating the cost of annuity purchases assuming a typical group of annuitants. That is, no adjustments for sub- or super-standard mortality are considered. However, it is expected that insurers will consider plan experience and certain plan-specific characteristics when determining the mortality basis for a particular group. The Educational Note states that the actuary would be expected to make an adjustment to the regular annuity purchase assumptions where there is demonstrated substandard or super-standard mortality or where an insurer might be expected to assume so. In such cases, the actuary would be expected to make an adjustment to the mortality assumption in a manner consistent with the underlying annuity purchase basis. Given the uncertainty surrounding the actual mortality basis that would be typical of a group annuity purchase, it is reasonable to assume that there is a range of bases that can be expected not to be materially different from the actual mortality basis. Therefore, an adjustment to the regular annuity purchase assumptions would be warranted when the plan's assumed basis falls outside that range. In this context, we have determined that no adjustment to the mortality rates used in the regular annuity purchase assumptions is required.

Interest rate assumptions net of COLA used for lump sum transfers and annuity purchases take into consideration the 3% cap on pension increases provided by the plan provisions. We have carried out a stochastic analysis in order to determine the additional net interest rate as a result of this 3% cap.

We have not included a margin for adverse deviations in the solvency and hypothetical wind-up valuations.

The assumptions are as follows:

Form of Benefit Settlement Elected by Member	
Lump sum:	70% of active members under age 55, and 50% of active members over age 55, elect to receive their benefit entitlement in a lump sum
Annuity purchase:	All remaining members are assumed to elect to receive their benefit entitlement in the form of a deferred or immediate pension. These benefits are assumed to be settled through the purchase of deferred or immediate annuities from a life insurance company.

Basis for Benefits Assumed to be Settled through a Lump Sum	
Mortality rates:	100% of the rates of the 2014 Canadian Pensioners Mortality (CPM) Table with fully generational improvements using CPM Scale B
Interest rate:	1.40% per year for 10 years, 2.90% per year thereafter
COLA:	0.93% per year for 10 years, 1.83% per year thereafter
Interest rate net of COLA:	0.47% per year for 10 years, 1.05% per year thereafter
Basis for Benefits Assumed to be Settled through the Purchase of an Annuity	
Mortality rates:	100% of the rates of the 2014 Canadian Pensioners Mortality Table (CPM2014) with fully generational improvements using CPM Scale B
Adjustment to mortality rates:	No adjustment
Interest rate:	2.56% per year based on a duration of 13.15 years determined for the liabilities assumed to be settled through the purchase of an annuity.
COLA:	1.48% per year[4]
Interest rate net of COLA:	1.06% per year
Retirement Age	
Maximum value:	Members are assumed to retire with a 50% probability at the age that maximizes the value of their entitlement from the Plan and a 50% probability at the member's earliest unreduced age in accordance with applicable legislation and based on the eligibility requirements that have been met at the valuation date
Other Assumptions	
Final average earnings:	Based on actual pensionable earnings over the averaging period
Family composition:	Same as for going concern valuation
Termination expenses:	$2,000,000

To determine the hypothetical wind-up position of the Plan, a provision has been made for estimated termination expenses payable from the Plan's assets in respect of actuarial and administration expenses that may reasonably be expected to be incurred in terminating the Plan and to be charged to the Plan.

Because the settlement of all benefits on wind-up is assumed to occur on the valuation date and is assumed to be uncontested, the provision for termination expenses does not include custodial, investment management, auditing, consulting, and legal expenses that would be incurred between the wind-up date and the settlement date or due to the terms of a wind-up being contested.

Expenses associated with the distribution of any surplus assets that might arise on an actual wind-up are also not included in the estimated termination expense provisions.

[4] For the hypothetical wind-up scenario, it is assumed that annuities would be purchased with a fixed rate of interest of 3.0% per year, which is the maximum rate of increase under the Plan provisions.

In determining the provision for termination expenses payable from the Plan's assets, we have assumed that the plan sponsor would be solvent on the wind-up date. We have also assumed, without analysis, that the Plan's terms as well as applicable legislation and court decisions would permit the relevant expenses to be paid from the Plan.

Although the termination expense assumption is a best estimate, actual fees incurred on an actual plan wind-up may differ materially from the estimates disclosed in this report.

Incremental Cost

In order to determine the incremental cost, we estimate the solvency liabilities at the next valuation date. We have assumed that the cost of settling benefits by way of a lump sum or purchasing annuities remains consistent with the assumptions described above. Since the projected solvency liabilities will depend on the membership in the Plan at the next valuation date, we must make assumptions about how the Plan membership will evolve over the period until the next valuation.

We have assumed that the Plan membership will evolve in a manner consistent with the going concern assumptions as follows:

- Members terminate, retire, and die consistent with the termination, retirement, and mortality rates used for the going concern valuation.
- Pensionable earnings, the Income Tax Act pension limit, and the Year's Maximum Pensionable Earnings increase in accordance with the related going concern assumptions.
- Active members accrue pensionable service in accordance with the terms of the Plan.

Cost of living adjustments are consistent with the inflation assumption used for the going concern valuation.

Appendix E
Membership Data

Analysis of Membership Data

The actuarial valuation is based on membership data as at December 31, 2020, provided by Canadian Utilities Limited.

We have applied tests for internal consistency, as well as for consistency with the data used for the previous valuation. These tests were applied to membership reconciliation, basic information (date of birth, date of hire, date of membership, gender, etc.), pensionable earnings, credited service, contributions accumulated with interest, and pensions to retirees and other members entitled to a deferred pension. Contributions, lump sum payments, and pensions to retirees were compared with corresponding amounts reported in financial statements. The results of these tests were satisfactory.

If the data supplied are not sufficient and reliable for its intended purpose, the results of our calculation may differ significantly from the results that would be obtained with such data. Although Mercer has reviewed the suitability of the data for its intended use in accordance with accepted actuarial practice in Canada, Mercer has not verified or audited any of the data or information provided.

Plan membership data are summarized below. For comparison, we have also summarized corresponding data from the previous valuation.

	31.12.2020	31.12.2019
Active Members Accruing DB Benefits		
Number	344	433
Total pensionable earnings for prior year	$43,021,123	$52,295,763
Average pensionable earnings for prior year	$125,061	$120,775
Average years of pensionable service	30.6	30.1
Average age	57.2	56.7
Active Members with DB Benefits, but Accruing DC		
Number	24	31
Total pensionable earnings for prior year	$3,631,384	$4,371,086
Average pensionable earnings for prior year	$151,308	$141,003
Average years of pensionable service	7.2	7.3
Average age	55.1	54.9

	31.12.2020	31.12.2019
Active Members with DC Benefits Only		
Number	3,823	3,832
Total pensionable earnings for prior year	$411,669,259	$406,069,637
Average pensionable earnings for prior year	$107,682	$105,968
Average age	42.1	41.5
Deferred Pensioners		
Number	60	73
Total annual pension	$946,356	$1,549,018
Average annual pension	$15,773	$21,219
Average age	58.3	57.6
Pensioners and Survivors		
Number	2,747	2,687
Total annual lifetime pension	$123,349,289	$123,280,995
Average annual lifetime pension	$44,903	$45,881
Average age	72.0	71.7

The membership movement for all categories of membership since the previous actuarial valuation is as follows:

	Active members accruing DB Benefits	Active members with DB Benefits accruing DC Benefits	Deferred Pensioners	Pensioners and survivors	Total
Total at 31.12.2019	433	31	73	2,687	3,224
New entrants					
Terminations:					
• Transfers/lump sums	(3)	(1)	(1)		(5)
• Pending Transfers					
• Deferred pensions					
Deaths	(3)			(80)	(83)
Retirements	(84)	(6)	(11)	101	0
Beneficiaries				39	39
Adjustments	1		(1)		0
Total at 31.12.2020	344	24	60	2,747	3,175

The distribution of the active members by age and pensionable service as at the valuation date is summarized as follows:

	Years of Pensionable Service									
Age	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	Total
45 to 49					5	7				12
50 to 54					5	35	37	3		80
55 to 59				3	6	62	93	16	1	181
60 to 64	1	1			1	26	19	10	11	69
65 +						1		1		2
Total	1	1		3	17	131	149	30	12	344

The distribution of the inactive members by age as at the valuation date is summarized as follows:

	Deferred Pensioners		Pensioners and Survivors	
Age	Number	Average Pension	Number	Average Pension
40 – 44			1	*
45 – 49	1	*		
50 – 54	10	$10,807	2	$29,000
55 – 59	30	$18,296	193	$63,623
60 – 64	16	$14,270	650	$61,457
65 – 69	3	$10,310	529	$50,286
70 – 74			447	$40,539
75 – 79			304	$29,727
80 – 84			241	$28,242
85 – 89			223	$30,105
90 – 94			120	$24,370
95+			37	$21,950
Total	60	$15,773	2,747	$44,903

*Information supressed to preserve member confidentiality.

Appendix F
Summary of Plan Provisions

Mercer has used and relied on the plan documents, including amendments and interpretations of plan provisions, supplied by Canadian Utilities Limited. If any plan provisions supplied are not accurate and complete, the results of any calculation may differ significantly from the results that would be obtained with accurate and complete information. Moreover, plan documents may be susceptible to different interpretations, each of which could be reasonable, and the results of estimates under each of the different interpretations could vary.

This valuation is based on the plan provisions in effect on December 31, 2020. The Plan has not been amended since the date of the previous valuation. There were no changes that had a material impact on the cost of the benefits provided by the Plan.

DB Component

The following is a summary of the main provisions of the DB component of the Plan in effect on December 31, 2020. This summary is not intended as a complete description of the Plan.

Background	Plan 1 members: • The Plan became effective January 2, 1962. On December 31, 1986, employees in the Yukon Territory and the Northwest Territories became covered by a separate arrangement. • Effective January 1, 1997, money purchase provisions were introduced into Plan 1, at which time existing Plan members had an option to continue to accrue benefits under the defined benefit component or participate in the new money purchase component. All new employees participate only in the money purchase component. Former Plan 2 members: • The Predecessor Plan was effective January 2, 1962. On December 31, 1986 the Predecessor Plan was split into three parts, covering employees in the Yukon (Plan 2), the Northwest Territories (Plan 3) and elsewhere (Plan 1). Plan 2A was established effective April 1, 1987 to cover Yukon based employees who had previously been employed by the Northern Canada Power Commission (NCPC). • Effective January 1, 1994, Plan 2 was amended to extend coverage to all current and former members of Plan 2A and Plan 3. Service under Plan 2A and Plan 3 were assumed by Plan 2 in exchange for a transfer of assets. • Effective December 30, 2003, the Plan was extended to cover employees located in Ontario. Effective January 1, 2015, Plan 2 was merged with Plan 1.

Eligibility for Membership	Plan 1 members: • The Plan covers salaried employees employed in Canada outside of Ontario, the Yukon and Northwest Territories upon appointment to permanent staff. This typically occurs after 6 months service. In the event that a salaried employee is not appointed to permanent staff earlier, participation in the Plan will commence upon completion of two years' service provided earnings exceed 35% of the YMPE in two consecutive calendar years. • Participation in the Plan is compulsory for all eligible employees who are not participating in another registered pension plan of the employer. Former Plan 2 members: • The Plan is closed to new entrants. • Some individuals who were employed by NCPC immediately prior to April 1, 1987 elected to have their pension benefit entitlements under the PSSA transferred to the Plan. For these members, pensionable service under the Plan includes service that was pensionable under the PSSA. Service with NCPC counts for determination of vested rights whether or not the individual member elected to transfer his PSSA benefit entitlements to the Plan.
Employee Contributions	Members contribute 2.8% of earnings up to the YMPE and 4.0% of earnings over the YMPE, up to an annual maximum contribution of $2,000. Disabled members and certain executive members are not required to contribute.
Retirement Dates	Normal Retirement Date • The normal retirement date is the first day of the month following the member's 65th birthday. Early Retirement Date • The member may choose to retire as early as age 55
Postponed Retirement	A member who remains employed with the company after age 65 may elect to commence receipt of pension or continue to accrue benefits under the Plan up to his actual retirement.
Normal Retirement Pension	2% of annual final average earnings times years of pensionable service between January 2, 1962 and January 2, 1966; PLUS 1.4% of annual final average earnings up to the YMPE, times years of pensionable service after January 2, 1966; PLUS 2.0% of annual final average earnings in excess of the YMPE, times years of pensionable service after January 2, 1966.
Pensionable Earnings	Annual final average earnings are calculated over the 60 consecutive months for which earnings are highest. The YMPE is calculated over the same period.

Early Retirement Pension

If a member retires from active service with the consent of the Company, a reduced early retirement benefit is payable, as follows:

- If age and service sum to 90 years or more, no reduction applies;
- otherwise, the pension payable is equal to the normal retirement pension times a percentage from the following table:

Age at Retirement	Percentage
64	100
63	100
62	100
61	97
60	94
59	88
58	82
57	76
56	70
55	64

If retirement is not from active service, or if Company consent is not obtained, an actuarial reduction applies.

In addition, female participants employed prior to June 1, 1972 are entitled to a bridge benefit payable only until age 65. The bridge benefit is equal to the expected Canada pension Plan benefit times the ratio of 36 divided by the number of months from retirement to age 65, provided that the ratio is never more than 1.

Maximum Pension

The Plan provides that the pension payable at the time of commencement must not exceed the defined benefit limit prescribed under the Income Tax Act, multiplied by years of pensionable service (with service rendered prior to January 1, 1992 limited to 35 years).

Reductions to this maximum apply if retirement occurs before age 60, before completion of 30 years' service, and before attainment of age and service summing to 80. The maximum provision automatically reflects any increases to the defined benefit limit that occur in the Income Tax Act and Regulations.

Cost of Living Adjustments

The annual adjustment will be as determined by the Company but will not exceed 3% per annum. In calculating the annual adjustment the Company will take into consideration annual percentage changes in the Consumer Price Index for Canada and any previous annual adjustments paid. The annual adjustment is granted only to members who retire from active service.

Death Benefits	Pre-retirement: • If a member dies before becoming eligible for retirement, the member's spouse, or the member's beneficiary if there is no surviving spouse, will receive a benefit equal in value to the commuted value of the benefit to which the member would have been entitled had he terminated employment immediately prior to his death, plus any excess of the member's contributions over 50% of that commuted value. • If a member dies after becoming eligible for retirement, the member's spouse will receive the greater of: - a benefit equal in value to the commuted value of the benefit to which the member would have been entitled had he terminated employment immediately prior to his death, plus any excess of the member's contributions over 50% of that commuted value, and - an immediate pension equal to 60% of the pension to which the member would have been entitled had the member retired on their date of death. This pension will also receive future cost of living increases. • If a member dies after becoming eligible for retirement and there is no surviving spouse, the beneficiary will receive the commuted value of the benefit to which the member would have been entitled had he terminated employment immediately prior to his death, plus any excess of the member's contributions over 50% of that commuted value. Post retirement: • The normal form of pension for single employees guarantees a return of the member's own contributions with interest up to retirement date. • For employees with an eligible spouse, the normal form of pension provides a continuing survivorship pension to the member's spouse. If retirement occurs prior to July 1, 1987, the spouse's benefit is 50% of the member's benefit. If retirement occurs after July 1, 1987 the spouse's benefit is 60%.
Termination Benefits	A deferred pension commencing at normal retirement date, or alternatively the commuted value thereof may be transferred to the member's locked-in RRSP. If the member's own contributions exceed 50% of the commuted value of the deferred pension, the excess is available as an additional benefit.

DC Component

The following is a summary of the main provisions of the DC component of the Plan in effect on December 31, 2020. This summary is not intended as a complete description of the Plan.

Background	The DC component of the Plan became effective January 1, 1997. Employer and employee contributions are remitted to individual member accounts and are credited with interest.
Eligibility for Membership	An employee must join the Defined Contribution component of the Plan on the date the member is appointed to the permanent staff of Canadian Utilities Limited.
Employee Contributions	The lesser of 4% of member's pensionable earnings and 40% of the maximum contribution limit. Required contributions for Executive Officers and disabled members are made on their behalf by the Employer.
Employer Contributions	The lesser of 10% of member's pensionable earnings and maximum contribution limit reduced by the amount paid by the member.
Benefits	Members receive the balance of their individual employer and employee accounts upon termination, death or retirement.
Maximum Contribution	The employer and employee contributions are limited to the amounts under the *Income Tax Act.*
Pensionable Earnings	Base salary

Appendix G
Plausible Adverse Scenarios

In this Appendix, the financial impact on the Plan's going concern results (i.e., going concern financial position at the valuation date and current service cost from the valuation date to the next valuation date) of plausible adverse scenarios that would pose threats to the Plan's future financial condition is illustrated for the following risks:

- Interest rate risk, the potential that interest rates will be lower than expected;
- Deterioration of asset values; and
- Longevity risk, the potential that pension plan members will live longer than expected.

The following table summarizes the going concern results, where we assumed for:

- Interest rate risk, an immediate parallel decrease in market interest rates of 125 basis points
- Deterioration of asset values, an immediate decrease of 15% in the market value of non-fixed income assets; and
- Longevity risk, that life expectancy from the valuation date at age 65 for a male and a female would increase by 1.5 years and 1.4 years respectively.

Scenario	Going Concern Valuation Results as at 31.12.2020	Plausible Adverse Scenario Results as at 31.12.2020		
		Interest Rate Risk	Deterioration of Asset Values	Longevity Risk
Going Concern Financial Status				
Market value of assets	$3,015,005,300	$3,316,505,800	$2,894,405,100	$3,015,005,300
Going concern funding target	$2,981,917,700	$3,390,191,900	$2,981,917,700	$3,139,374,300
Funding excess (shortfall)	$33,087,600	($73,686,100)	($87,512,600)	($124,369,000)
Estimated Employer's Current Service Cost expressed as a percentage of Members' Pensionable Earnings				
From January 1, 2021	44.38%	53.11%	44.38%	47.28%

The balance of this Appendix provides details of the plausible adverse scenarios selected and the determination of the impact on the going concern results.

Interest Rate Risk

The purpose of this scenario is to illustrate the sensitivity of the Plan's going concern results to the potential that interest rates will be lower than expected. For this purpose, we have assumed an immediate parallel decrease in market interest rates underlying fixed income investments, where fixed income investments include Canadian fixed income and global fixed income as shown in the investment policy summarized in Appendix B.

Using a methodology consistent with the one used to determine the going concern discount rate, we have determined that a parallel decrease in market interest rates of 125 basis points would have a non-trivial probability (between 1 in 10 and 1 in 20) of occurring within the year following the valuation date. For purpose of this scenario, we have assumed that such a decrease in market interest rates would occur immediately on the valuation date and would have the following impact on the value of assets and going concern assumptions:

Defined Term	Description
Market value of assets	The decrease in market interest rates has been assumed to affect only the market value of the fixed income investments. The decrease is assumed to have occurred immediately on the valuation date.
Discount rate assumption	It was assumed that the decrease in market interest rates affects only the expected return on assets for the fixed income portion of assets. The same margin for adverse deviations was used The discount rate assumption was therefore decreased from 2.8% to 1.9%.
Other assumptions	Except as mentioned above, all assumptions used were the same as those used for this valuation. In particular, the discount rate used to value benefits assumed to be settled through a lump sum was not changed.

Deterioration of Asset Values

The purpose of this scenario is to illustrate the sensitivity of the Plan's going concern results to a deterioration of asset values. For this purpose, we assumed an immediate reduction in the market value of the Plan's non-fixed income assets, where non-fixed income investments include global equities and real estate as shown in the investment policy summarized in Appendix B.

Using a methodology consistent with the one used to determine the going concern discount rate, we have determined that a decrease of 15% in the market value of non-fixed income assets would have a non-trivial probability (between 1 in 10 and 1 in 20) of occurring within the year following the valuation date. For purpose of this scenario, we have assumed that such a decrease would occur immediately on the valuation date and would have the following impact on the value of assets and going concern assumptions:

Market value of assets	The decrease in the market value of the non-fixed income portion of assets is assumed to have occurred immediately on the valuation date.
Going concern assumptions	This scenario is assumed to have no impact on the assumptions used for this valuation.

Longevity Risk

The purpose of this scenario is to illustrate the sensitivity of the Plan's going concern results to the potential that pension plan members will live longer than expected. For this purpose, we have determined that a plausible adverse scenario would be to assume that future mortality improvements[5] will be in line with the average improvements experienced by the Canadian population over the most recent 15-year period available, with uniform improvement rates for all future years but varying by age[6] and gender.

The table below summarizes the improvement rates under the plausible adverse scenario compared to those currently assumed under the CPM-B scale and is based on Canadian population experience from the Human Mortality Database (HMD) from 2002 to 2016.

	Males				Females			
	CPM-B			Adverse Scenario	CPM-B			Adverse Scenario
Age	2020	2025	2030+		2020	2025	2030+	
20	1.59%	1.20%	0.80%	1.68%	0.98%	0.89%	0.80%	1.47%
30	1.88%	1.34%	0.80%	1.68%	0.98%	0.89%	0.80%	1.47%
40	1.80%	1.30%	0.80%	1.68%	1.17%	0.98%	0.80%	1.47%
50	1.17%	0.98%	0.80%	1.76%	0.98%	0.89%	0.80%	1.34%
55	1.47%	1.13%	0.80%	1.67%	1.11%	0.96%	0.80%	1.14%
60	1.77%	1.28%	0.80%	1.75%	1.24%	1.02%	0.80%	1.34%
65	2.06%	1.43%	0.80%	2.11%	1.36%	1.08%	0.80%	1.65%
70	2.06%	1.43%	0.80%	2.48%	1.36%	1.08%	0.80%	1.77%
75	2.01%	1.41%	0.80%	2.66%	1.36%	1.08%	0.80%	1.93%
80	1.96%	1.38%	0.80%	2.63%	1.36%	1.08%	0.80%	2.03%
85	1.38%	1.03%	0.68%	2.32%	1.31%	0.99%	0.68%	1.98%
90	0.75%	0.62%	0.48%	1.68%	0.75%	0.62%	0.48%	1.60%
95	0.16%	0.25%	0.34%	1.04%	0.16%	0.25%	0.34%	1.12%
100	0.14%	0.22%	0.30%	0.64%	0.14%	0.22%	0.30%	0.80%
105	0.14%	0.22%	0.30%	0.38%	0.14%	0.22%	0.30%	0.55%

[5] i.e. starting one year after the valuation in this context
[6] improvement rates below age 45 are set to those at age 45

Appendix H
Employer Certification

With respect to the Report on the Actuarial Valuation for Funding Purposes as at December 31, 2020 of the Plan, I hereby certify that, to the best of my knowledge and belief:

- The valuation reflects the terms of the Company's engagement with the actuary described in Section 2 of this report, particularly the requirement to include a margin of 0.30% in the discount rate used to perform the going concern valuation and the Company's decisions in regards to determining the going concern and solvency funding requirements.
- A copy of the official plan documents and of all amendments made up to December 31, 2020 was provided to the actuary and is reflected appropriately in the summary of plan provisions contained herein.
- The asset information summarized in Appendix B is reflective of the Plan's assets.
- The membership data provided to the actuary included a complete and accurate description of every person who is entitled to benefits under the terms of the Plan for service up to December 31, 2020.
- All events subsequent to December 31, 2020 that may have an impact on the Plan have been communicated to the actuary.

August 11, 2021

Date

Brent Perdue

Signed

Manager, Pension & Benefits

Name and Title

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Retirement Plan for Employees of Canadian Utilities Limited and Participating Companies – Plan 1

Report on the Actuarial Valuation for Funding Purposes as at December 31, 2021

August 8, 2022

Canada Revenue Agency Registration Number: 0343343

Note to reader regarding actuarial valuations:

This valuation report may not be relied upon for any purpose other than those explicitly noted in the Introduction, nor may it be relied upon by any party other than the parties noted in the Introduction. Mercer is not responsible for the consequences of any other use. A valuation report is a snapshot of a plan's estimated financial condition at a particular point in time; it does not predict a pension plan's future financial condition or its ability to pay benefits in the future. If maintained indefinitely, a plan's total cost will depend on a number of factors, including the amount of benefits the plan pays, the number of people paid benefits, the amount of plan expenses, and the amount earned on any assets invested to pay the benefits. These amounts and other variables are uncertain and unknowable at the valuation date. The content of the report may not be modified, incorporated into or used in other material, sold or otherwise provided, in whole or in part, to any other person or entity, without Mercer's permission. All parts of this report, including any documents incorporated by reference, are integral to understanding and explaining its contents; no part may be taken out of context, used, or relied upon without reference to the report as a whole.

To prepare the results in this report, actuarial assumptions are used to model a single scenario from a range of possibilities for each valuation basis. The results based on that single scenario are included in this report. However, the future is uncertain and the Plan's actual experience will differ from those assumptions; these differences may be significant or material. Different assumptions or scenarios within the range of possibilities may also be reasonable, and results based on those assumptions would be different. Furthermore, actuarial assumptions may be changed from one valuation to the next because of changes in regulatory and professional requirements, developments in case law, plan experience, changes in expectations about the future, and other factors.

The valuation results shown in this report also illustrate the sensitivity to one of the key actuarial assumptions, the discount rate, and the sensitivity to three adverse scenarios. We note that the results presented herein rely on many assumptions, all of which are subject to uncertainty, with a broad range of possible outcomes, and the results are sensitive to all the assumptions used in the valuation.

Should the Plan be wound up, the going concern funded status and solvency financial position, if different from the wind-up financial position, become irrelevant. The hypothetical wind-up financial position estimates the financial position of the Plan assuming it is wound up on the valuation date. Emerging experience will affect the wind-up financial position of the Plan assuming it is wound up in the future. In fact, even if the Plan were wound up on the valuation date, the financial position would continue to fluctuate until the benefits are fully settled.

Decisions about benefit changes, granting new benefits, investment policy, funding policy, benefit security, and/or benefit-related issues should not be made solely on the basis of this valuation, but only after careful consideration of alternative economic, financial, demographic, and societal factors, including financial scenarios that assume future sustained investment losses.

Funding calculations reflect our understanding of the requirements of the Alberta *Employment Pension Plans Act*, the *Income Tax Act*, and related regulations that are effective as of the valuation date. Mercer is not a law firm, and the analysis presented in this report is not intended to be a legal opinion. You should consider securing the advice of legal counsel with respect to any legal matters related to this report.

Contents

1. Summary of results 1

2. Introduction 2

3. Defined contribution component of the plan 5

4. Valuation results – Going concern 6

5. Valuation results – Hypothetical wind-up 9

6. Valuation results – Solvency 10

7. Minimum funding requirements 12

8. Maximum eligible contributions 14

9. Actuarial opinion 15

Appendix A: Prescribed disclosure 16

Appendix B: Plan assets 18

Appendix C: Methods and assumptions – Going concern 20

Appendix D: Methods and assumptions – Hypothetical wind-up and solvency 26

Appendix E: Membership data 30

Appendix F: Summary of plan provisions 33

Appendix G: Plausible adverse scenarios 38

Appendix H: Employer Certification 41