January 26, 2018

CONFIDENTIAL / VIA EMAIL

Ms. Cindy Veinot
Assistant Deputy Minister & Provincial Controller
Office of the Provincial Controller Division
Treasury Board Secretariat
2nd Floor, Frost Building South
7 Queen's Park Crescent
Toronto, Ontario M7A 1Y7

Dear Ms. Veinot:

Re: Actuarial Information for the OPSEU Pension Plan

In response to the Assistant Deputy Minister (Acting) Alex Killoch's letter dated December 5, 2017, please find attached the requested 2017 yearend financial information related to the OPSEU Pension Plan (the "Plan"). The requested information has been determined as of December 31, 2017 and is contained in the body of this letter and in the attached exhibits.

The calculations for items 1, 3, 5, 9, 10, and 11 have been performed on an accounting basis by Willis Towers Watson using the projected unit credit cost method and the economic assumptions detailed in Mr. Killoch's letter. All other requested calculations were compiled by OPTrust.

Please note the following regarding the attached information:

- Items 1 to 12 are disclosed in Exhibit 1.

- Mr. Killoch requested that the actuarial information be prepared using three sets of economic assumptions (Basis 1, 2, and 3). The assumptions used under each basis are described in Exhibit 1.

- The December 31, 2017 calculations are based on December 31, 2017 member data for the Plan, as provided by OPTrust to Willis Towers Watson and as used in the December 31, 2017 funding valuation of the Plan. A summary of the December 31, 2017 member data for the Plan is contained in the attached Exhibit 2.

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- The information on the market value and actuarial value of the Plan's assets as at December 31, 2017 is preliminary and is subject to change. In particular, the December 31, 2017 valuation for alternative assets will not be complete until after January 26, 2018. As of December 31, 2017, approximately 30% of the Fund is allocated to alternative assets. As such, the total market and actuarial value of assets may materially change once those asset valuations are complete.

- The contribution breakdown in item 4 of the attached Exhibit 1 reflects the same level of detail as the Plan's financial statements, as requested by the government.

- The December 31, 2017 liability calculations have been based on the provisions of the Plan as at December 31, 2017. A summary of the applicable provisions is contained in Willis Tower Watson's funding actuarial valuation report for the Plan as at December 31, 2016. There have been no material changes to the Plan provisions since December 31, 2016.

- Except for the economic assumptions noted in Exhibit 1 and the asset valuation method (OPTrust does not use a smoothed value of assets), the December 31, 2017 liability calculations are based on the same preliminary assumptions that are being considered for use in the December 31, 2017 financial statement valuation of the Plan. A description of those preliminary assumptions for the Plan's December 31, 2017 financial statement valuation is contained in the attached Exhibit 3.

As you are aware, the government's best estimate economic assumptions are not those of OPTrust. These assumptions have not been used in the past for the Plan's funding valuations, or the Plan's financial statement actuarial valuations and, in particular, they have not been used for the most recent December 31, 2017 funding valuation of the Plan, or the December 31, 2017 financial statement valuation of the Plan. We would also note that the obligations of employers to contribute to the Plan are based on the terms of the Plan and the funding actuarial valuations of the Plan.

If you have any questions or require any additional information, please contact me at 416-681-6207.

Yours truly,

Julie Belair

Julie Belair
Director, Actuarial Services

Encls.

cc: Mr. Alex Killoch, Ministry of Finance
Mr. Robert Pomykacz, Ministry of Finance
Mr. Ian Markham, Willis Towers Watson
Mr. Hugh O'Reilly, OPTrust
Mr. Dani Goraichy, OPTrust

EXHIBIT 1

Economic Assumptions as provided by the Province

	Basis 1	*Basis 2*	*Basis 3*
Assumptions provided by Province			
Return on investment	5.90%	5.75%	5.75%
Inflation	2.00%	2.00%	2.00%
Real rate of return	3.90%	3.75%	3.75%
Salary escalation rate			
2018-2019	1.75%	1.75%	2.00%
2020-2021	2.75%	2.75%	2.00%
2022 onwards	2.75%	2.75%	2.50%

Other assumptions – Based on the same assumptions used for the December 31, 2017 funding valuation of the Plan as shown in Exhibit 3.

Actuarial Information for the OPSEU Pension Plan as Requested by the Province

		December 31, 2017 (Amounts in $ millions)		
		Basis 1	*Basis 2*	*Basis 3*
1.	Actuarial present value of accrued benefit obligations	17,186	17,512	17,442
2.	(a) Actuarial value of pension fund assets (preliminary)	19,505	19,505	19,505
	(b) Market value of pension fund assets (preliminary)	20,290	20,290	20,290
3.	For the year ended: Actuarial present value of accrued benefit obligations as of December 31, 2016	16,596	16,596	16,596
	a) Interest on accrued benefits	963	963	963
	b) Cost of benefits accrued [(i)]	447	447	447
	c) Cost of benefit improvements	0	0	0
	d) Changes in assumptions	109	435	353
	e) Benefits paid [(ii)]	(1,003)	(1,003)	(1,003)
	f) Experience (Gains)/Loss	74	74	86
	Actuarial present value of accrued benefit obligations as of December 31, 2017	17,186	17,512	17,442

EXHIBIT 1 (continued)

Actuarial Information for the OPSEU Pension Plan as Requested by the Province

(Amounts in $ millions)

(i) Includes current period service cost, past service contributions and transfers from other plans made during 2017.

Current period	412
Past service	24
Transfers from other plans	11
	447

(ii) Includes retirement pensions, refunds, commuted value transfers and transfers to other plans. The retirement pensions paid during 2017 were $799 million. Refunds and commuted value transfers were $75 million. Transfers to other plans were $129 million.

4.	For the year ended:	***December 31, 2017***
(a)	Employee contributions:	
	Current service (includes LTIP)	248
	Prior service	16
		264
(b)	Employer contributions:	
	Current service (includes LTIP)	247
	Prior service	7
		254
(c)	Transfers from other plans	11
5.	Expected average remaining service lifetime of active employees	12.3 years

6. Preliminary economic assumptions used in the Plan's financial statements:

(a)	Return on investment	5.60%
(b)	Inflation	2.00%
(c)	General salary escalation	1.50% for 2018, 2.75% thereafter
(d)	YMPE increases	2.50%

EXHIBIT 1 (continued)

Actuarial Information for the OPSEU Pension Plan as Requested by the Province

(Amounts in $ millions)

7. The following preliminary schedule provides the composition of the actuarial asset value adjustment as at December 31, 2017:

	Deferred (Gains)/Losses	**Timing of Future Recognition**			
	2017	**2018**	**2019**	**2020**	**2021**
2013	0	-	-	-	-
2014	(161)	(161)	-	-	-
2015	(102)	(51)	(51)	-	-
2016	6	2	2	2	-
2017	(528)	(132)	(132)	(132)	(132)
Total	**(785)**	**(342)**	**(181)**	**(130)**	**(132)**

The actuarial asset value adjustment reflects the portion of gains or losses not yet recognized for purposes of determining the value of actuarial assets. The actuarial asset value adjustment provides for the smoothing of gains and losses.

The actuarial value of investments as at the reporting dates has been determined using a formula that smoothes out the effects of the changes in market values over a five-year period. The approach recognizes differences between the actual and management's best estimate of the return on investments in income evenly over the current and following four years. Management's best estimate of investment return is 5.75% for 2017, 5.75% for 2016, 6.1% for 2015 and 6.4% for 2014 financial statement purposes.

8. For the year ended December 31, 2017:

(a)	Number of active members	45,259
(b)	Number of inactive members	
	Pensioners and survivors	37,355
	Deferred pensioners	6,274
	Special deferred pensioners	2,112
	Former members with unprocessed benefits	1,399
	Total	47,140

EXHIBIT 1 (continued)

Actuarial Information for the OPSEU Pension Plan as Requested by the Province

(Amounts in $ millions)

9. The economic assumption changes requested by the Province under Basis 2 and Basis 3 are the biggest source of actuarial losses, followed by the change in demographic assumptions for all bases. The demographic assumption changes stem from OPTrust's experience study which resulted in changes to retirement and termination rates, mortality improvement scale, assumed retirement age for terminated members and marital status assumption. Salary losses are the largest source of the experience losses.

10. The 2017 current service cost for each basis is as follows:

	Basis 1	***Basis 2***	***Basis 3***
	481	495	486

11. Actuarial present values on open group basis:

	Basis 1	***Basis 2***	***Basis 3***
Future current service accruals	15,284	16,505	14,939
Future required employee contributions	9,068	9,522	8,812

12. The following is a list of participating employers and the corresponding employer contributions for 2017:

Employer	**Current Service Contributions (includes LTIP)**	**Prior Service Contributions**
AGC	2.4	-
CAMH	1.6	-
HR Ottawa Employee Services	-	-
LA	0.2	-
LCBO	20.2	2.5
NORTH BAY REGIONAL HEALTH CENTRE	0.1	-
NPC	1.4	0.1
OAHPP	1.8	-
OCOT	0.1	-
OLG	0.1	-
ONSHORES	2.0	-
OPB	0.6	-
OPSEU	0.1	-
OPTSTAFF	2.6	-
OSS	207.3	4.2
OTTP	2.7	0.1
PCCC	0.2	-
ST. JOSEPH	0.7	-
WAYPOINT	2.5	-
WSIAT	0.5	-
Total	**247.1**	**6.9**

Note: Some employer contributions are zero due to rounding.

13. We will provide the 2017 financial statements as soon as they are available.

EXHIBIT 2

Summary of Plan Member Data at December 31, 2017

The membership data at December 31, 2017 was used for the Plan's December 31, 2017 funding valuation and was provided to Willis Towers Watson by OPTrust. A summary of the data follows:

Active Members[1]	
Number	45,259
Average Credited Service	11.1
Average Age	44.9
Average Salary[2]	$63,887
Pensioners and Survivors	
Number	37,355
Average Age	70.9
Average Annual Lifetime Pension[3]	$19,893
Deferred Pensioners	
Number	6,274
Average Age	47.2
Average Annual Lifetime Pension[3]	$5,403
Special Deferred Pensioners[4]	
Number	2,112
Average Age	53.7
Average Annual Lifetime Pension[3]	$6,790
Former Members with Unprocessed Benefits[5]	
Number	1,399
Average Age	47.9
Average Annual Lifetime Pension[3]	$5,319

1 Active member statistics reflect the removal of 1,200 profile members who were assumed to join the Plan during the last 5 months of 2017 in excess of actual new entrants.
2 The average salary is based on the assumed salaries as at January 1, 2018.
3 The average annual pension is based on the pension as at January 1, 2018.
4 Former Plan members whose membership terminated as a result of a divestment.
5 Former members who ceased Plan participation prior to December 31, 2017 but who have not elected a benefit entitlement option.

EXHIBIT 3

Preliminary Actuarial Assumptions Used in Plan's December 31, 2017 Financial Statements

Investment Return

The assumed rate of return on investments is 5.60% per annum. This rate is net of expected investment-related expenses.

Inflation Rate

The inflation rate as measured by increases in the Consumer Price Index is assumed to be 2.00% per annum.

Salary Scale

The rate of salary increase consists of two components:

(a) <u>Economic Increases</u>

1.50% for 2018 and 2.75% per annum thereafter have been assumed for increases in salary related to inflation and productivity.

(b) <u>Promotion Increases</u>

A salary promotion scale based on years of service has been assumed and is presented in Appendix "A".

Rate of Increase in the Year's Maximum Pensionable Earning ("YMPE") under the Canada Pension Plan

It is assumed that the YMPE will increase at a rate of 2.50% per annum.

Income Tax Act Maximum Pension Limit

It is assumed that the maximum annual pension limit of $2,944.44 per year of pensionable service will increase at a rate of 2.50% per annum, starting in 2019.

Interest on Employee Contributions

It is assumed that employee contributions will be credited with interest at the rate of 3.00% per annum.

Mortality Rates

It has been assumed that the mortality of members before and after retirement will be represented by 108% of 2014 Canadian Pensioner's Mortality Private Sector Table (CPM2014Priv) projected back to 2011 using an improvement scale CPM-B with generational projection scale MI-2017 from 2011.

Withdrawal Rates

It is assumed that members will terminate their employment in accordance with rates based on member age. Rates are shown in Appendix "B".

EXHIBIT 3 (continued)

Actuarial Assumptions Used in Plan's December 31, 2017 Financial Statements

Transfer Value Take-up Rate and Transfer Value Basis

It is assumed that 70% of members terminating will elect a transfer value option. Lump sum transfer values determined for this group were calculated using a discount rate of 2.0% real. Mortality was assumed to be represented by the 2014 Canadian Pensioner Mortality Table (CPM2014) projected with the mortality improvement scale CPM-B.

Retirement Rates

It is assumed that members will retire in accordance with the rates of retirement shown in Appendix "C".

Disability

No provision has been made for disability in recognition of the continuation of pension accrual and contributions under the Plan.

Marital Status

It has been assumed that 80% of male members and 60% of female members are married at the time a benefit commences to be paid.

It has been assumed that the spouse of a male member is three years younger than the member and the spouse of a female member is two years older than the member.

Expenses

A provision for administrative expenses equal to the present value of the estimated future costs attributable to administering the accrued pension benefits.

Special Deferred Pensioners

For special deferred pensioners, it was assumed that mortality, withdrawal and retirement rates subsequent to divestment will be the same as the rates for active members of the OPSEU Pension Plan. Salaries and the YMPE for these members are assumed to increase at the rate of 2.00% annum to account for the indexation of their accrued pensions.

APPENDIX "A"

Rates of Promotional Salary Increase

Years of Service	Increase
1	4.00%
2	3.60%
3	3.20%
4	2.60%
5	2.10%
6	1.80%
7	1.60%
8	1.40%
9	1.20%
10	1.00%
11	0.80%
12	0.60%
13	0.60%
14	0.50%
15	0.50%
16	0.50%
17	0.50%
18	0.30%
19	0.30%
20	0.30%
21 and over	0.00%

APPENDIX "B"

Withdrawal Rates

Attained Age	Rate
17 – 19	0.20
20 – 21	0.15
22 – 24	0.10
25	0.09
26	0.08
27	0.07
28-31	0.06
32-33	0.05
34-40	0.04
41-50	0.03
51-54	0.02
55	0.00

APPENDIX "C"

Retirement Rates

Age	Before EURA *	On or after EURA **
54 and earlier	0.00	0.25
55	0.03	0.25
56	0.03	0.25
57	0.03	0.25
58	0.03	0.25
59	0.03	0.25
60	0.08	0.20
61	0.08	0.20
62	0.08	0.20
63	0.08	0.20
64	0.11	0.20
65	0.60	0.60
66	0.50	0.50
67	0.50	0.50
68	0.50	0.50
69	0.50	0.50
70	0.50	0.50
71	1.00	1.00

*   EURA stands for Earliest Unreduced Retirement Age

** Plus 35% at first eligibility date if EURA is before 60 or plus 25% at first eligibility date if EURA is age 60 or later