NOVA SCOTIA RISK SHARING POOL

OCTOBER 2021 OPERATIONAL REPORT

ACTUARIAL HIGHLIGHTS

Related Bulletin: F2021-092_NS_RSP_October_2021_Operational_Report

For your convenience, bookmarks have been added to this document. To view them, please click on the BOOKMARK tab at the left.

Should you require any further information, please call Philippe Gosselin, VP Actuarial & CRO at (416) 863-1750 x4968.

FACILITY ASSOCIATION

ACTUARIAL HIGHLIGHTS

RSP NOVA SCOTIA

OPERATIONAL REPORT

OCTOBER 2021

TABLE OF CONTENTS

1 Summary 2
1.1 Valuation Schedule (Fiscal Year 2021) 2
1.2 New Valuation 3
1.3 Appointed Actuary and Hybrid Actuarial Services Model 4
1.4 Consideration of Recent Legal Decisions and Changes in Legislation / Regulation 5
1.5 Current Provision Summary 5

2 Activity since previous valuation implementation 6
2.1 Recorded Premium and Claims Activity 6
2.1.a Actual vs. Projected (AvsP): Earned Premium 7
2.1.b AvsP: Recorded Indemnity & Allowed Claims Expense 8
2.1.c AvsP: Paid Indemnity & Allowed Claims Expense 11
2.2 Actuarial Provisions 12

3 Ultimate Loss Ratio Matching Method 13

4 Calendar Year-to-Date Results 13

5 Current Operational Report – Additional Exhibits 14

6 EXHIBITS 15

1 Summary

Note to members: this is the quarterly Actuarial Highlights we will release going forward to replace the monthly Actuarial Highlights. The next report will be available for reporting month October 2021 in November 2021, in line with the valuation implementation schedule. Please contact us with any questions or concerns in regards to this matter.

1.1 Valuation Schedule (Fiscal Year 2021)

The October 2021 Operational Report incorporates the results of an updated valuation (as at March 31, 2021) – the impact of the implementation of the valuation is discussed in section 1.2. The following table summarizes the valuation implementations scheduled for fiscal year 2021.

NOVA SCOTIA RISK SHARING POOL
FISCAL YEAR 2021 – SCHEDULE OF VALUATIONS

Valuation Date	Discount Rate (per annum)	Operational Report	Description of Changes
Sep 30, 2020 (completed)	0.19% mfad[1] 25 bp	Oct. 2020	update valuation (roll-forward): accident year 2020 loss ratio increased 0.2 points to 87.7%; discount rate decreased 4 basis points; no change to selected margins for adverse deviations
Dec. 31, 2020 (completed)	0.22% mfad 25 bp	Mar. 2021	update valuation: accident year 2020 loss ratio decreased 9.4 points to 78.3% and accident year 2021 loss ratio decreased 8.1 points to 91.3%; discount rate increased 3 basis points; no change to selected margins for adverse deviations
Mar. 31, 2021 (completed)	0.69% mfad 25 bp	May. 2021	update valuation (roll-forward): accident year 2021 loss ratio decreased 0.8 points to 90.5%; discount rate increased 47 basis points; no change to selected margins for adverse deviations
Jun. 30, 2021 (completed)	0.68% mfad 25 bp	Aug. 2021	update valuation: accident year 2021 loss ration decreased 12.3 points to 78.2%; discount rate decreased by 1 basis point; selected margins for adverse deviation were updated
Sep. 30, 2021	0.78% mfad 25 bp	Oct. 2021	update valuation (roll-forward): accident year 2021 loss ration decreased 0.8 points to 77.4%; discount rate increased by 10 basis point; no change to selected margins for adverse deviations

[1] The selected interest rate margin is limited to reducing the selected discount rate to 0%; the approach is that if the net impact is negative, the discount rate will be capped at 0%.

Under the proposed schedule for fiscal year 2021, the off-half valuation quarters ending March 31, 2021 and September 30, 2021 would not reflect a full valuation update of assumptions, but would rather roll-forward key assumptions from the previous valuation.

1.2 New Valuation

A valuation of the Nova Scotia Risk Sharing Pool ("RSP") as at September 30, 2021 has been completed since last month's Operational Report and the results of that valuation have been incorporated into this month's Report. The valuation was completed by the Facility Association's internal actuarial group in conjunction with, and approved by, the Appointed Actuary, under the hybrid model for actuarial services.

The valuation implementation impact is summarized in the following two tables, where the abbreviations PAYs refers to prior accident years, CAY refers to the current accident year (2021), and Prem Def refers to premium deficiency / deferred acquisition costs impacts.

Summary of Impact ($000s) of Implementing Result of Valuation as at Sep. 30, 2021[2]

NS — unfav / (fav) for the month and ytd

	IMPACT in $000s from changes in:					
	ults & payout patterns			dsct rate	margins	
	Nominal [1]	apv adj. [2]	sub-tot [3]	apv adj. [4]	apv adj. [5]	TOTAL [6]
PAYs	260	10	270	(107)	-	163
CAY	(286)	(33)	(319)	(68)	-	(387)
Prem Def	(49)	9	(40)	(54)	-	(94)
TOTAL	(75)	(14)	(89)	(229)	-	(318)

As indicated in the preceding table, the incorporation of the new valuation had an estimated ***$0.3 million favourable impact*** on the month's net result from operations, subtracting an estimated 0.9 points (see following table) from the **year-to-date Combined Operating Ratio** to end at **68.7%**.

Summary of Impact (% YTD EP) of Implementing Result of Valuation as at Sep. 30, 2021

NS — ytd EP 35,250 (actual)

	IMPACT unfav / (fav) as % ytd EP from changes in:					
	ults & payout patterns			dsct rate	margins	
	Nominal [1]	apv adj. [2]	sub-tot [3]	apv adj. [4]	apv adj. [5]	TOTAL [6]
PAYs	0.7%	-	0.8%	(0.3%)	-	0.5%
CAY	(0.8%)	(0.1%)	(0.9%)	(0.2%)	-	(1.1%)
Prem Def	(0.1%)	-	(0.1%)	(0.2%)	-	(0.3%)
TOTAL	(0.2%)	-	(0.3%)	(0.6%)	-	(0.9%)

[2]In these tables, "PAYs" refers to prior accident years, "CAY" refers to the current accident year, and "Prem Def" refers to the provision for premium deficiency or the deferred policy acquisition asset (as applicable). "Nominal" refers to changes excluding any actuarial present value adjustments, whereas "apv adj." refers to actuarial present value adjustments.

The columns under the heading "ults & payout patterns" reflect the impact of changes in the valuation selected ultimates and claims payment patterns (i.e. based on unchanged selection of discount rates and margins for adverse deviation). The column "dsct rate" reflects the impact of the change in the selected discount rate and the column "margins" reflects the impact of any changes in selected margins for adverse deviations.

The impact of the **nominal changes** is shown in column [1] of the two preceding summary tables. The change in the selected nominal ultimates was **favourable by $75 thousand** overall. This reflects the impact attributable to the changes in the selected ultimate loss ratios (i.e. for each accident year, it is the product of life-to-date earned premium for the accident year and the change in the selected ultimate loss ratio).

The **PAYs** overall showed a **$260 thousand unfavourable** nominal variance or 0.6% of the PAYs nominal unpaid balance of $42.7 million determined at the end of last month (September 2021), relatively unchanged since the prior valuation.

The CAY and premium deficiency impacts are a result of the change in the selected loss ratio for accident year **2021** (decreased 0.8 points to 77.4%). This is a minimal change from the prior valuation driven by slightly lower than expected claims emergence during the quarter.

The impacts related to actuarial present value ("apv") adjustments are split into the impact prior to any change in the selected discount rate and selected margins for adverse deviations or "MfADs" (at the level they were selected i.e. coverage and accident half-year), the impact of then updating the discount rate, and finally the impact of any changes to the MfADs (at the level they were selected). The changes in actuarial present value adjustments are shown in the preceding summary tables in columns [2], [4], and [5].

Column [2] recognizes that changing the nominal selections also changed the unpaid estimates (including changes to the relative mix by government line, which had an impact on the weighted-average MfADs). It also reflects the fact that we updated the projected emergence of claims payments, resulting in a change in the projected cash flows. These changes generated a favourable change of $229 thousand in the actuarial present value adjustments, prior to any changes in the selected discount rate and/or MfADs.

Updated projected cash flows were reviewed against the selected risk-free yield curve, derived from Government of Canada benchmark bond yields monthly series using values for September 2021. Column [4] accounts for the change in the **discount rate** selected (increased 10 basis point to **0.78%**), indicating an unfavourable impact of $24 thousand. The impact *related only to claims liabilities* (i.e. PAYs plus CAY) was $18 thousand at October 2021 – this compares to the $18 thousand change one would estimate as the impact by interpolation using the interest rate sensitivity table provided in the previous Actuarial Highlights.

Column [5] accounts for any changes to selected MfADs. The selected **investment rate MfAD** was **left unchanged at 25 basis points** and the selected **claims development MfADs** at the coverage and accident year level were also left unchanged (as per our usual practice, development margins are reviewed with the June 30 valuation).

Consideration was given to recent legal decisions and changes in legislation / regulation as outlined in section 1.4.

1.3 Appointed Actuary and Hybrid Actuarial Services Model

The Annual General Meeting of the members of Facility Association ("FA") appointed Mr. Cosimo

Pantaleo as the Appointed Actuary at its meeting on March 4, 2021.

Facility Association operates under a hybrid model in relation to the management and provision of actuarial services. Under this model, actuarial services are performed by both Facility Association's internal staff and its external actuarial consulting firm. The hybrid model approach maximizes the efficiency of resource allocation while providing access to additional expertise and capacity as needed.

1.4 Consideration of Recent Legal Decisions and Changes in Legislation / Regulation

There have been no changes in these descriptions since last Highlights.

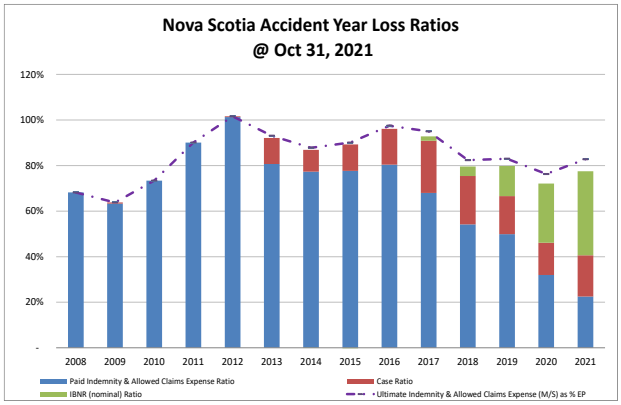
Consideration and assessment of potential impacts of legal decisions and changes in legislation / regulation constitutes a regular part of the valuation process. Descriptions of some of the more recent (i.e. within the last five years) changes are provided below.

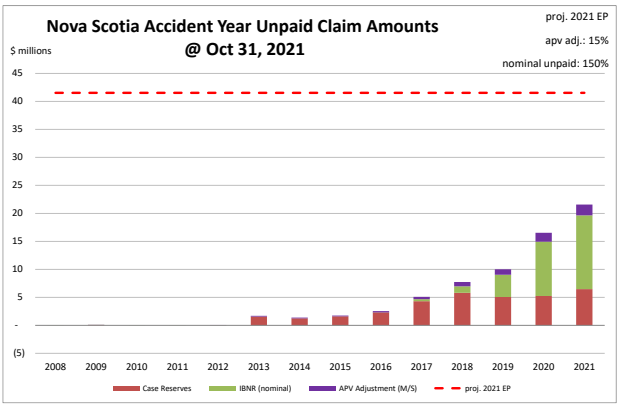
The **Nova Scotia Court of Appeal** confirmed, in a unanimous decision released on **January 18, 2019** in relation to **Sparks v Holland** (**2019 NSCA 3**), that future Canada Pension Plan (CPP) disability benefits are deductible from future income loss awards in motor-vehicle accident claims in that province. Sparks sustained injuries as a result of a motor vehicle accident in Nova Scotia and sought damages for personal injuries and loss of income. The decision supported an earlier decision (Tibbets v Murphy, 2017 NSCA 35) that both past and future CPP disability benefits are deductible under section 133A of the Insurance Act. At the current time, no adjustments have been made to our valuation estimates as a result of this decision, and at this point we do not believe this judgment will have a further impact on our valuation results.

1.5 Current Provision Summary

The following charts show the current levels of claim liabilities[3] booked by accident year. The left chart displays life-to-date payments, case reserves, IBNR, and the total including actuarial present value adjustments against accident year earned premium. The right chart shows the associated dollar amounts for the components of the claim liabilities and the current projected amount of 2021 full year earned premium (the red hash-mark line) to provide some perspective.

[3]Claim liabilities refer to provision for unpaid indemnity and allowed claims expenses. Allowed claims expenses are first party legal and other expenses as listed in the RSP Claims Guide. Claims expenses paid through the member company expense allowance are NOT included in this discussion.





"M/S" refers to "Member Statement" values – that is, actuarial present value adjustments at the selected discount rate.

The current actuarial present value adjustments balance ($6.3 million – see the following table) represents 15% of the earned premium projected for the full year 2021 (see the upper right corner of the right chart above). If our current estimates of the nominal unpaid amounts prove to match actual claims payments, the actuarial present value adjustments will be released into the net operating result over future periods.

claim liabilities ($000s)

	amt	%
case	33,823	49.4%
ibnr	28,381	41.4%
M/S apv adjust.	6,288	9.2%
M/S total	68,492	100.0%

The table to the left breaks down the Member Statement (M/S) claim liabilities total into component parts, showing that the majority of the claim liabilities for this RSP is in case reserves. Approximately 81% of the IBNR balance relates to accident years 2020 and 2021 (see Exhibit B). Approximately 89% of the M/S total claim liabilities are related to accident years 2017-2021 inclusive (i.e. the most recent 5 accident years), and just over 0% is related to accident years 2011 and prior (i.e. prior to the most recent 10 accident years).

The following tables summarize the premium liabilities and the total policy liabilities.

premium liabilities ($000s)

	amt	%
unearned prem	21,452	101.8%
prem def/(dpac)	(2,047)	(9.7%)
M/S apv adjust.	1,662	7.9%
M/S total	21,067	100.0%

policy liabilities ($000s)

	amt	%
claim	62,204	69.5%
premium	19,405	21.7%
M/S apv adjust.	7,950	8.9%
M/S total	89,559	100.0%

2 Activity since previous valuation implementation

2.1 Recorded Premium and Claims Activity

The following table summarizes the extent to which premiums and claims amounts recorded since the prior implementation differ from the prior projection.

Nova Scotia RSP Actual vs Projected Summary: Recorded Transaction Amounts ($ thousands)

AY Group	Share Year	Share Month	Actual Earned Premium (000s)	Actual minus Projected Earned Premium (000s)	Actual Paid Claims (000s)	Actual minus Projected Paid Claims (000s)	Actual Recorded Claims (000s)	Actual minus Projected Recorded Claims (000s)
PAY	2021	September	(7)	(7)	1,347	423	32	(232)
		October	(190)	(190)	307	(377)	360	91
PAY Total			**(197)**	**(197)**	**1,654**	**46**	**392**	**(141)**
CAY	2021	September	3,541	(1,316)	1,357	927	2,239	1,396
		October	2,246	(2,362)	652	(313)	1,039	(1,092)
CAY Total			**5,787**	**(3,678)**	**2,009**	**614**	**3,278**	**304**
Grand Total			**5,590**	**(3,875)**	**3,663**	**660**	**3,670**	**163**

(Recorded transaction amounts exclude IBNR & other actuarial provisions)

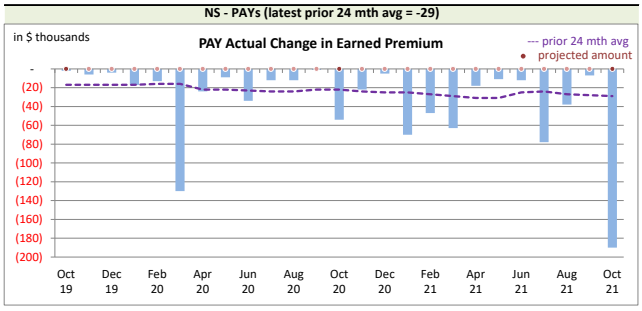
Claims transaction activity is generally volatile and changes from one month to the next are anticipated due to this natural "process variance" (i.e. random variation), and this is particularly true where volumes are low as found in this RSP. Each month, the projection variances are reviewed for signs of projection bias and to identify potential ways to reduce the level of the variance. The variances are also reviewed as part of the quarterly valuation process, as an indicator of changes in the claims development process or potential bias in ultimate claims estimates.

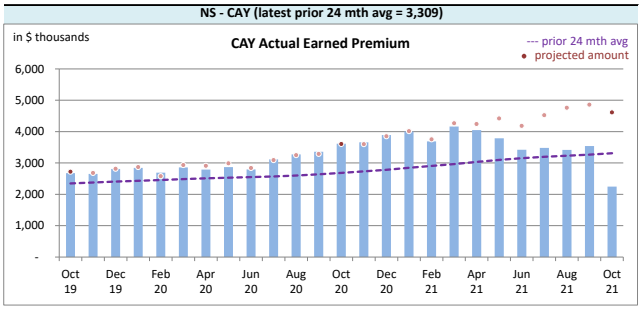
More detailed analysis and commentary on actual vs. projected for the most recent reporting months is provided below.

2.1.a Actual vs. Projected (AvsP): Earned Premium

The following charts show actual **earned premium**[4] activity in each of the most recent 25 calendar months, along with a "prior 24-month average" to show how each month's actual compares with the average amount of the preceding 24 calendar months.

*Nova Scotia RSP Actual **Earned Premium** by Calendar Month*





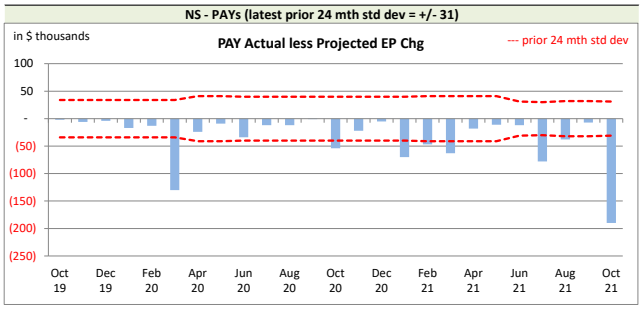
Earned premium changes during a given calendar month in relation to prior accident years tend to be at modest levels, although relatively high levels generally occur at the beginning of each year.

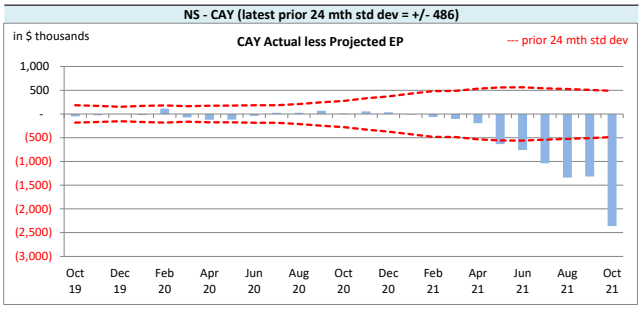
[4]Premium is earned on a daily basis based on the transaction term measured in days. As a result, months with 31 days earned relatively more than those with 30 days, and February earns the least.

On Latest $ thousands		
Earned Premium	PAYs	CAY
Mthly Avg EP Chg (prior 24 mths)	(29)	3,309
std dev	31	486
A-P <> std dev	8	6
% <> std dev	32.0%	24.0%
norm <> std dev	31.7%	31.7%
performance vs 24-mth avg:	no better	better

The associated variance between the actual changes and the projections from the previous month are shown in the following charts. **Earned premium** change projections are all attributed to the current accident year as the projection upload does not accept **earned premium** changes for other accident years. We do not see this limitation as being significant for our purposes, but it does mean that the actual less projection variance will equal the actual **earned premium** change in relation to prior accident years.

*Nova Scotia RSP Actual vs. Projected Summary: **Earned Premium** Variances by Calendar Month*





We project **earned premium** changes from known unearned premium balances and projected written premium levels, but upload the total projections as current accident year (CAY). This process has generated prior accident years' (PAYs) bias[5], with actuals generally lower than projected, although the magnitude is not high relative to monthly premium. In addition to the PAYs' bias, the CAY has also shown bias[6], with actuals being generally lower than projected, and while we modified our projections processes in response, bias still exists. Over time, we may consider other projection approaches to address the bias issue, but it is not currently deemed as priority.

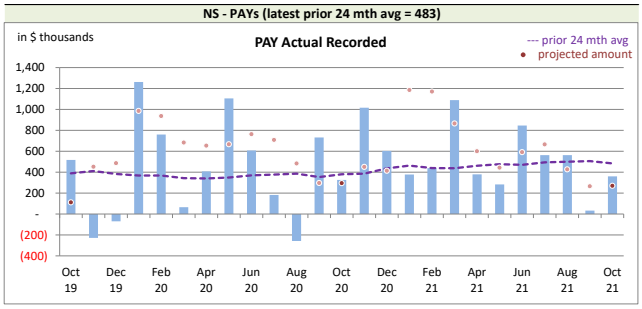
2.1.b AvsP: Recorded Indemnity & Allowed Claims Expense

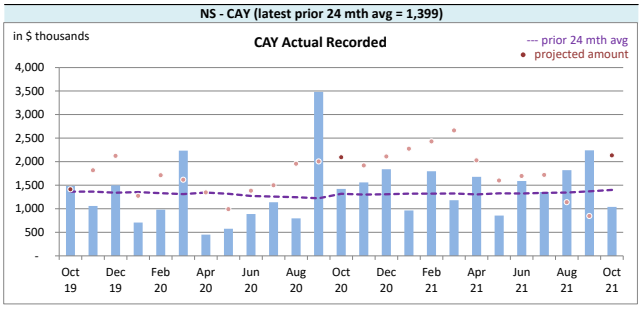
The following charts show actual **recorded** activity (**paid** and case reserve changes), in each of the most recent 25 calendar months, along with a "prior 24-month average" to show how each month's actual compares with the average amount of the preceding 24 calendar months.

[5]The PAYs' variances will show bias as the projection upload forces all earned premium projections to be attributed to the CAY.

[6]We measure bias based on a 95% confidence range for a binominal distribution with trials based on the range being considered (25 in this case) and 50% probability of success. The rolling 25-month CAY variances at October 2021 has only 7 months where the actuals were higher than projected, and as the 95% confidence range is 8 to 17, bias continues to be indicated.

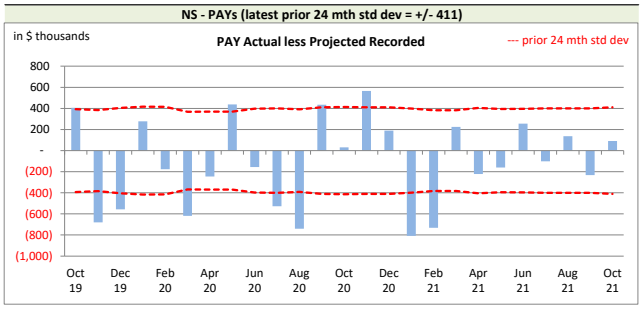
*Nova Scotia RSP Actual **Recorded** by Calendar Month*

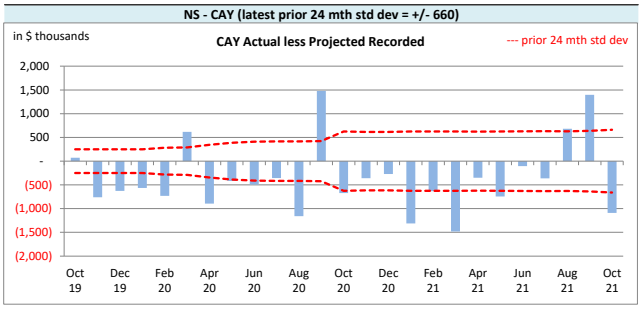




Recorded activity variances from the previous month's projections are shown in the following charts, including the "prior 24-month standard deviation" levels to show how the variances from projection compare with historical standard deviations.

*Nova Scotia RSP Actual vs Projected Summary: **Recorded** Variances by Calendar Month*





On Latest $ thousands		
Recorded	PAYs	CAY
Mthly Avg Recorded (prior 24 mths)	483	1,399
std dev	411	660
A-P <> std dev	11	18
% <> std dev	44.0%	72.0%
norm <> std dev	31.7%	31.7%
performance vs 24-mth avg:	worse	worse

With respect to **recorded** indemnity & allowed claims expense activity, caution must be exercised in reviewing the variances as this is a small pool and single claim transactions that are normal course for the business may look unusual and generate relatively significant variances that in nominal value terms are not that significant in relative or overall terms. That said, 44% of prior accident years' (PAYs) **recorded** variances over the last 25 calendar months have fallen outside of one standard deviation of the actual **recorded** amounts (see the preceding table), suggesting the projection process has performed worse than simply projecting the prior 24-month average amount (assuming it follows a normal distribution). Bias has not been indicated at a 95% confidence level on a rolling 25-month basis (11 of 25 variances are positive).

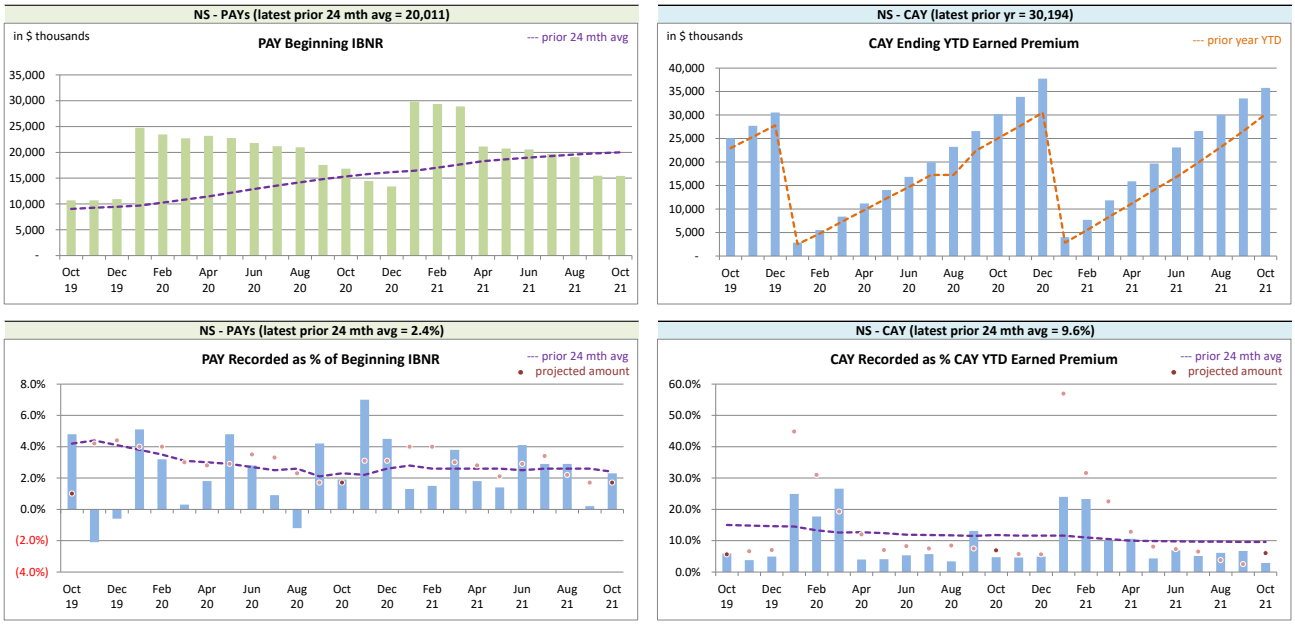
The current accident year (CAY) **recorded** variances fell outside of one standard deviation 72% of the time over the last 25 calendar months (see preceding table on the left), suggesting that the projection process has performed worse than simply projecting the prior 24-month average amount. We are considering ways to improve our projection process as a result, but efforts so far have fallen short. Bias has been indicated at a 95% confidence level on a rolling 25-month basis (5 of 25 variances are positive).

The CAY **recorded** variance was just outside of the one standard deviation band this month (see preceding chart on the right). The lower than projected recorded activity was reviewed, and attributed to process variance.

The method for establishing IBNR adjusts automatically for changes in **earned premium** and **recorded** claims activity level (see sections 2.2 and 3).

We have included, for reference, the following charts related to levels influencing **recorded** activity. Note in particular the increase in the level of PAY beginning IBNR. Part of this will be as a response to valuations and showing up as a beginning IBNR change one month after the valuation is implemented (i.e. April, June, September, and November), and part will also reflect the maturity level of the RSP.

*Nova Scotia RSP Levels that influence[7] **Recorded** activity by Calendar Month*



We track PAY beginning IBNR as **recorded** activity comes out of IBNR. Changes in the PAY beginning IBNR (see upper left of the preceding group of charts) occur for several possible reasons:

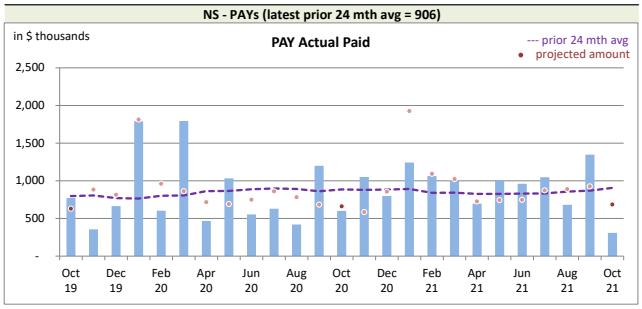
- to offset actual **recorded** activity (through loss ratio matching);
- the annual switchover as a CAY becomes a PAY (occurs in January); and
- when a new valuation is implemented, where the valuation resulted in changes to the selection of PAYs' ultimates (will show up as a beginning IBNR change one month after the valuation is implemented, i.e. the change will generally show in April, June, September, and November).

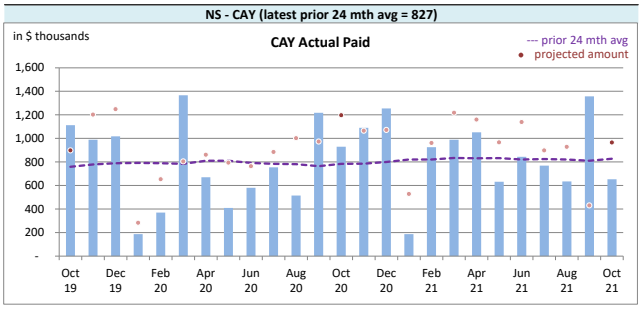
[7]Our recorded activity projections for the prior accident years are based on selected ratios of recorded activity to beginning unpaid balances, whereas the current accident year projections are based on selected ratios of year-to-date IBNR to year-to-date selected ultimate (i.e. selected LR x earned premium), deriving year-to-date recorded as selected ultimate less IBNR. In both cases, the ratio selection is based on our review of the more recent recorded activity and recent AvsP analyses.

2.1.c AvsP: Paid Indemnity & Allowed Claims Expense

The following charts show actual **paid** activity in each of the most recent 25 calendar months, along with a "prior 24-month average" to show how each month's actual compares with the average amount of the preceding 24 calendar months.

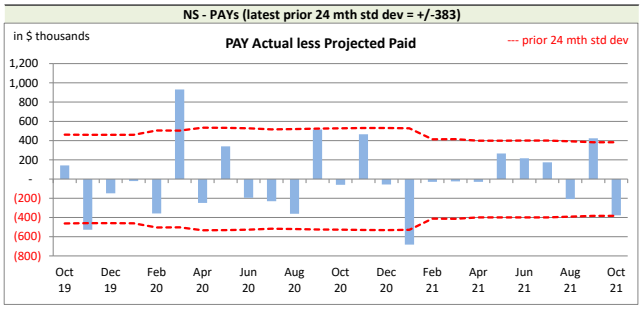
*Nova Scotia RSP Actual **Paid** by activity Calendar Month*

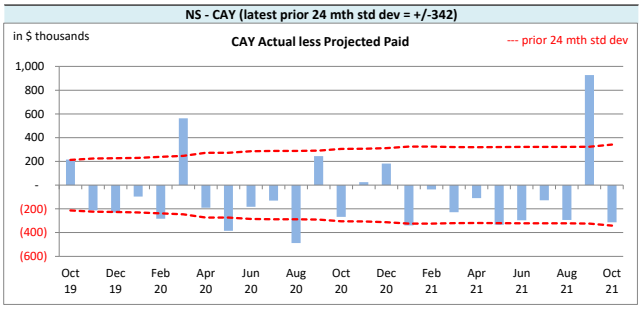




Paid activity variances from the previous month's projections are shown in the following charts, including the "prior 24-month standard deviation" levels to show how the variances from projection compare with historical standard deviations.

*Nova Scotia RSP Actual vs Projected Summary: **Paid** Variances by Calendar Month*





On Latest $ thousands		
Paid	PAYs	CAY
Mthly Avg Paid (prior 24 mths)	906	827
std dev	383	342
A-P <> std dev	4	9
% <> std dev	16.0%	36.0%
norm <> std dev	31.7%	31.7%
performance vs 24-mth avg:	better	no better

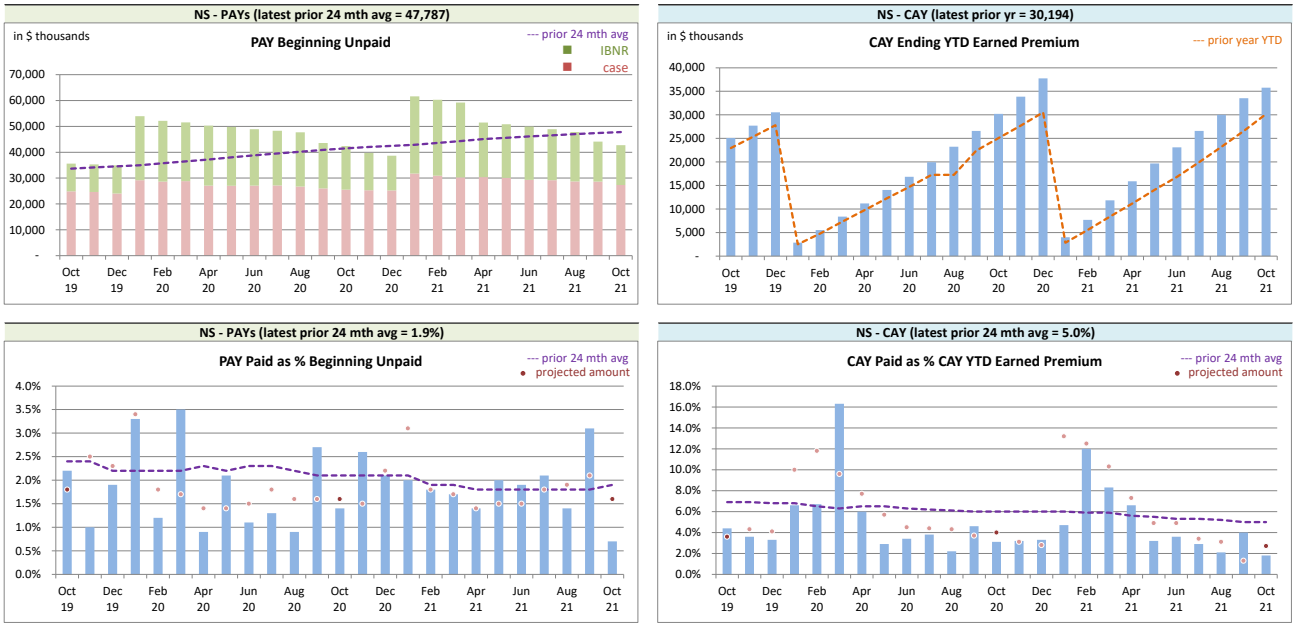
With respect to **paid** indemnity & allowed claims expense activity, caution must be exercised in reviewing the variances as this is a small pool and single claim transactions that are normal course for the business may look unusual and generate relatively significant variances that in nominal value terms are not that significant in relative or overall terms. That said, 16% of the prior accident years' (PAYs) variances over the last 25 calendar months have fallen outside of one standard deviation of the actual **paid** amounts (see preceding table on the left), suggesting the projection process has performed better than simply projecting the prior 24-month average amount (assuming it follows a normal distribution). Bias has been indicated at a 95% confidence level on a rolling 25-month basis (9 of 25 variances are positive).

The current accident year (CAY) **paid** variances fell outside of one standard deviation 36% of the time over the last 25 calendar months (see the preceding table), suggesting that the projection process has performed no better than simply projecting the prior 24-month average amount. Bias has not

been indicated at a 95% confidence level on a rolling 25-month basis (6 of 25 variances are positive).

We have included, for reference, the following charts related to levels influencing **paid** activity. Both case and IBNR increases contribute to the increase of PAY beginning unpaid. This is somewhat expected, given the maturity level of the RSP.

*Nova Scotia RSP Levels that influence[8] **Paid** activity by Calendar Month*



We track the PAY beginning unpaid balance (case and IBNR) as **paid** activity comes out of the unpaid balance. Changes in the PAY beginning unpaid balance (see upper left of the preceding group of charts) occur for several possible reasons:

- to offset actual **paid** activity (may reduce case or IBNR or both);
- the annual switchover as a CAY becomes a PAY (occurs in January); and
- when a new valuation is implemented, where the valuation resulted in changes to the selection of PAYs' ultimates (will show up as a beginning unpaid balance change one month after the valuation is implemented, i.e. the change will generally show in April, June, September, and November).

2.2 Actuarial Provisions

An ultimate loss ratio matching method (described in section 3) was used to determine the month's IBNR[9], and factors were applied to the nominal unpaid claims liability (case plus IBNR) to determine

[8]Our paid projections for the prior accident years are based on selected ratios of paid to beginning unpaid balances, whereas the current accident year projections are based on selected ratios of year-to-date paid to year-to-date selected ultimate indemnity (i.e. selected LR x earned premium). In both cases, the ratio selection is based on our review of the more recent recorded activity and recent AvsP analyses.

[9]For ease of discussion, "IBNR" is used in place of "provisions for incurred but not recorded (IBNR) and development".

the discount amount (shown as a negative value to indicate its impact of reducing the liability) and the Provisions for Adverse Deviations. The loss ratios and the factors used to determine the current month's provisions and projections were based on the applicable valuation.

Exhibit G shows the accident year IBNR amount change from last month to this month broken down into:

(i) the change projected last month;

(ii) the additional change due to variances in earned premium (because we apply a loss ratio to earned premium in determining ultimate level) and/or recorded claims (as IBNR is calculated as ultimate less recorded) differences; and

(iii) the additional change due to valuation implementation impacts (as applicable)

3 Ultimate Loss Ratio Matching Method

An "ultimate loss ratio matching method" continues to be applied to the current month and two projected months shown in the Operational Reports, with IBNR determined by accident year as follows:

(a) Earned premium to-date
(b) Ultimate loss[10] ratio per latest valuation
(c) Estimated ultimate incurred = (a) x (b)
(d) Recorded indemnity & allowed claims expense to-date
(e) IBNR = (c) – (d)

4 Calendar Year-to-Date Results

The following table summarizes the calendar year-to-date results for indemnity & allowed claims expenses[11], including IBNR.

In calculating the amounts as percentages of earned premium, the calendar year-to-date earned premium has been used, which includes not only the earned premium associated with the current accident year, but also earned premium adjustments related to prior accident years. Specifically, the current accident year (CAY) ratio in the table is 78.6% rather than 77.4% (the valuation ultimate ratio for accident year 2021), as the calendar year-to-date earned premium includes prior accident year earned premium adjustments. (Note that the ratios in this table may differ slightly from those shown in the Nova Scotia RSP Summary of Operations due to rounding.)

[10]"Loss" here refers to indemnity and allowed claims expenses, but does not include the claims expense allowance included in member company overall expense allowances ("Expense Allowance" in the Operational Report).

[11]Allowed claims expenses are first party legal and other expenses as listed in the RSP Claims Guide. Claims expenses paid through the member company expense allowance are NOT included in this analysis.

Nova Scotia RSP Calendar Year-to-Date Indemnity & Allowed Claims Expense Summary ($ thousands)

Table 04	YTD Nominal Values		YTD actuarial present value adjustment		YTD Total		Change from Prior Month YTD	
	Amount	% EP	Amount	% EP	Amount	% EP	Amount	LR pts
PAYs	(9,701)	(27.5%)	(2,855)	(8.1%)	(12,556)	(35.6%)	(22)	2.2%
CAY	27,697	78.6%	1,931	5.5%	29,628	84.1%	1,481	(0.7%)
TOTAL	17,996	51.1%	(924)	(2.6%)	17,072	48.4%	1,459	1.4%

("% EP" based on 2020 calendar year-to-date earned premium; ratios may not total due to rounding)

In general, prior accident years (PAYs) changes from last month are due to the release of the actuarial present value adjustments with claims payments, except when valuations are implemented. The loss ratio change year-to-date in Table 04 reflects not only changes in the prior accident year levels, but also the increase in the calendar year-to-date earned premium with an additional month's earned premium, and due to the impact of valuation implementation.

For the current accident year (CAY), changes in the year-to-date total reflects the additional month's exposure and regular changes to actuarial present value adjustments as the year ages, and due to the impact of valuation implementation.

5 Current Operational Report – Additional Exhibits

Section 6 provides exhibits pertaining to the actuarial provisions reflected in the current month's Operational Report.

IBNR (including actuarial present value adjustments) presented in section 6, Exhibit A, were derived on a discounted basis, and therefore reflect the time value of money and include an explicit provision for adverse deviations in accordance with accepted actuarial practice in Canada.

IBNR presented in section 6, Exhibit B, does NOT include any actuarial present value adjustments. The "Total IBNR" from this exhibit is shown in the Operational Report as "Undiscounted IBNR".

The ultimate loss ratios detailed in section 6, Exhibit B, refer to the estimates derived on the basis of various actuarial methodologies applied to the experience of the Nova Scotia Risk Sharing Pool for the purposes of the most recent quarterly valuation. As discussed in section 3, IBNR reflected in the current month's Operational Report was derived as the difference between the estimated ultimate for the claims amount (i.e. earned premium x ultimate loss ratio) and the associated current recorded amounts (life-to-date payments plus current case reserves).

6 EXHIBITS

The exhibits listed below are provided on the pages that follow:

EXHIBIT A	IBNR for Member Sharing – includes Actuarial Present Value Adjustments
EXHIBIT B	IBNR
EXHIBIT C	Premium Liabilities
EXHIBIT D	Projected Year-end Policy Liabilities
EXHIBIT E	Discount Rate & Margins for Adverse Deviations
EXHIBIT F	Interest Rate Sensitivity
EXHIBIT G	Components of IBNR Change During Month

EXHIBIT A

IBNR for Member Sharing – includes Actuarial Present Value Adjustments

TABLE EXHIBIT A

IBNR + M/S actuarial present value adjustments

discount rate 0.78%

interest rate margin 25 basis pts

	Amounts in $000s							
Accident Year	Actual Sep. 2021	Actual Oct. 2021	Projected Nov. 2021	Projected Dec. 2021	Projected Jan. 2022	Projected Feb. 2022	Projected Mar. 2022	Projected Dec. 2022
2008	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
2009	12	12	12	12	12	12	12	10
2010	4	4	4	4	4	4	4	3
2011	4	4	4	4	4	4	4	3
2012	(105)	8	8	8	9	9	9	8
2013	(33)	140	139	137	130	128	126	112
2014	97	108	107	105	102	100	99	90
2015	147	113	114	113	111	110	111	103
2016	235	211	209	207	198	196	193	172
2017	896	777	765	734	722	704	670	547
2018	2,323	1,937	1,910	1,849	1,803	1,753	1,714	1,349
2019	4,805	4,958	4,778	4,652	4,508	4,347	4,232	3,400
2020	11,551	11,282	10,966	10,659	10,299	9,918	9,634	7,515
2021	14,677	15,119	16,167	16,300	15,673	15,090	14,660	11,886
TOTAL	34,609	34,669	35,179	34,780	35,290	35,369	35,927	39,658
Change		60	510	(399)	510	79	558	

Please see Exhibit G, page 1 for Components of Change during Current Month

EXHIBIT B

IBNR

TABLE EXHIBIT B

Amounts in $000s

IBNR

Ultimate Loss Ratio	Accident Year	Actual Sep. 2021	Actual Oct. 2021	Projected Nov. 2021	Projected Dec. 2021	Projected Jan. 2022	Projected Feb. 2022	Projected Mar. 2022	Projected Dec. 2022
68.2%	2008	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
63.8%	2009	5	5	5	5	5	5	5	4
73.4%	2010	4	4	4	4	4	4	4	3
90.1%	2011	4	4	4	4	4	4	4	3
101.6%	2012	(113)	5	5	5	5	5	5	4
92.1%	2013	(165)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
86.9%	2014	(19)	(8)	(8)	(8)	(8)	(8)	(7)	(6)
89.1%	2015	(5)	(29)	(28)	(27)	(27)	(26)	(24)	(17)
96.1%	2016	21	1	1	1	1	1	1	1
92.8%	2017	459	358	354	343	338	328	297	215
79.6%	2018	1,493	1,166	1,145	1,111	1,067	1,024	998	767
79.8%	2019	3,830	3,983	3,820	3,717	3,568	3,425	3,322	2,595
72.1%	2020	9,921	9,711	9,420	9,137	8,772	8,421	8,168	6,254
77.4%	2021	12,757	13,188	13,993	13,998	13,438	12,900	12,513	10,080
	TOTAL	28,188	28,381	28,708	28,283	28,605	28,564	28,986	32,065
	Change		193	327	(425)	322	(41)	422	

Please see Exhibit G, page 2 for Components of Change during Current Month

EXHIBIT C

Premium Liabilities

TABLE EXHIBIT C

Amounts in $000s

Premium Liabilities	Actual Sep. 2021	Actual Oct. 2021	Projected Nov. 2021	Projected Dec. 2021	Projected Jan. 2022	Projected Feb. 2022	Projected Mar. 2022	Projected Dec. 2022
(1) unearned premium (UP)	24,090	21,452	18,494	17,394	16,969	16,108	15,497	16,613
FOR MEMBER SHARING								
(2) expected future costs ratio {% of (1)}	96.7%	98.2%	101.5%	103.4%	103.3%	103.5%	103.7%	110.8%
(3) expected future costs {(1) x (2)}	23,298	21,067	18,764	17,991	17,534	16,665	16,074	18,403
(4) premium deficiency / (deferred policy acquisition cost)	(792)	(385)	270	597	565	557	577	1,790
Excluding Actuarial Present Value Adjustments								
(5) expected future costs ratio {% of (1)}	88.9%	90.5%	93.5%	95.3%	95.2%	95.3%	95.5%	102.0%
(6) expected future costs {(1) x (5)}	21,418	19,405	17,286	16,573	16,150	15,350	14,806	16,949
(7) premium deficiency / (deferred policy acquisition cost)	(2,672)	(2,047)	(1,208)	(821)	(819)	(758)	(691)	336

EXHIBIT D

Projected Year-end Policy Liabilities

The table below presents the projected policy liabilities as at December 31, 2021, broken down by component.

Nova Scotia	Projected Balances as at Dec. 31, 2021 ($000s)									
ending 2021	nominal values			actuarial present value adjustments (apvs)						
Acc Yr	Case	IBNR	Total Unpaid	discount	investment PfAD	nominal development PfAD	development PfAD discount	development PfAD	Total apvs	TOTAL
2008	-	(3)	(3)	-	-	-	-	-	-	(3)
2009	66	5	71	-	-	7	-	7	7	78
2010	-	4	4	-	-	-	-	-	-	4
2011	-	4	4	-	-	-	-	-	-	4
2012	39	5	44	(1)	-	4	-	4	3	47
2013	1,544	(3)	1,541	(17)	5	154	(2)	152	140	1,681
2014	1,241	(8)	1,233	(13)	4	123	(1)	122	113	1,346
2015	1,590	(27)	1,563	(21)	7	156	(2)	154	140	1,703
2016	2,281	1	2,282	(28)	9	228	(3)	225	206	2,488
2017	4,030	343	4,373	(59)	19	437	(6)	431	391	4,764
2018	5,572	1,111	6,683	(105)	33	823	(13)	810	738	7,421
2019	4,976	3,717	8,693	(166)	52	1,069	(20)	1,049	935	9,628
2020	5,359	9,137	14,496	(321)	101	1,781	(39)	1,742	1,522	16,018
PAYs (sub-total):	26,698	14,285	40,983	(731)	230	4,782	(86)	4,696	4,195	45,178
CAY (2021)	9,440	13,998	23,438	(570)	180	2,759	(67)	2,692	2,302	25,740
claims liabilities:	36,138	28,283	64,421	(1,301)	410	7,541	(153)	7,388	6,497	70,918
	Unearned Premium	Premium Deficiency / (DPAC)	Total Provision	discount	investment PfAD	nominal development PfAD	development PfAD discount	development PfAD	Total apvs	TOTAL*
premium liabilities:	17,394	(821)	16,573	(335)	106	1,681	(34)	1,647	1,418	17,991
									*Total may not be sum of parts, as apvs apply to future costs within UPR	
policy liabilities:			**80,994**	**(1,636)**	**516**	**9,222**	**(187)**	**9,035**	**7,915**	**88,909**

EXHIBIT E

Discount Rate & Margins for Adverse Deviations

The tables below present selected margins for adverse development by coverage (the total is a weighted average, based on the unpaid claims projection for December 31, 2021 from the valuation), followed by the selected discount rate and the associated margin for investment income.

Accident Year	Selected Claims Development MfADs: Third Party Liability	Accident Benefits	Other Coverages	Total
	Margins	Margins	Margins	Margins
2004	10.0%	10.0%	10.0%	10.0%
2005	10.0%	10.0%	10.0%	10.0%
2006	10.0%	10.0%	10.0%	10.0%
2007	10.0%	10.0%	10.0%	10.0%
2008	10.0%	10.0%	10.0%	10.0%
2009	10.0%	10.0%	10.0%	10.0%
2010	10.0%	10.0%	10.0%	10.0%
2011	10.0%	10.0%	10.0%	10.0%
2012	10.0%	10.0%	10.0%	10.0%
2013	10.0%	10.0%	10.0%	10.0%
2014	10.0%	10.0%	10.0%	10.0%
2015	10.0%	10.0%	10.0%	10.0%
2016	10.0%	10.0%	10.0%	10.0%
2017	10.0%	10.0%	10.0%	10.0%
2018	12.5%	10.0%	10.8%	12.3%
2019	12.5%	10.0%	9.9%	12.3%
2020	12.5%	10.0%	11.5%	12.3%
2021	12.4%	10.0%	5.6%	11.8%
2022	12.0%	10.0%	5.2%	10.3%
prem liab	12.0%	10.0%	5.2%	10.3%

discount rate:	0.78%
margin (basis points):	25

*prem liabilities as at 2021m09

EXHIBIT F

Interest Rate Sensitivity

The tables below present sensitivity to the member statement claims liability as projected to Dec. 31, 2021 from the latest valuation date (projections in exhibits A to D are to Dec. 31, 2021, and are based on more up-to-date information). We have included the most recent valuation selection (0.68%), the prior valuation assumption (0.69%) and the prior fiscal year end valuation assumption (0.19%) for comparative purposes. A 25 basis point margin for investment return adverse deviation is used in all scenarios presented.

	Actuarial Present Value of Provisions at Various Discount Rates - Dec. 31, 2021 projected Unpaid							
AY	0.00%	0.28%	0.78%	1.28%	1.78%	2.28%	0.68%	0.19%
& prior	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
	64	64	64	63	63	63	64	64
	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
	37	37	37	36	36	36	37	37
	1,427	1,426	1,416	1,407	1,397	1,388	1,418	1,427
	1,128	1,127	1,120	1,112	1,105	1,097	1,121	1,128
	1,549	1,548	1,534	1,521	1,508	1,496	1,537	1,549
	2,224	2,222	2,205	2,187	2,170	2,154	2,208	2,223
	4,636	4,632	4,592	4,553	4,514	4,477	4,600	4,635
	7,353	7,345	7,270	7,198	7,126	7,057	7,285	7,350
	9,604	9,591	9,473	9,358	9,245	9,135	9,496	9,599
	16,337	16,310	16,077	15,850	15,629	15,414	16,123	16,327
	24,726	24,681	24,292	23,914	23,547	23,190	24,369	24,710
	-	-	-	-	-	-	-	-
Total	69,086	68,982	68,079	67,199	66,342	65,506	68,258	69,049
	curr - 100 bp	curr - 50 bp	curr val assumption	curr + 50bp	curr + 100bp	curr + 150bp	prior val assumption	prior fyr end assumption

	Dollar Impact Relative to Valuation Assumption							
AY	0.00%	0.28%	0.78%	1.28%	1.78%	2.28%	0.68%	0.19%
Total	1,007	903	-	(880)	(1,737)	(2,573)	179	970
	curr - 100 bp	curr - 50 bp	curr val assumption	curr + 50bp	curr + 100bp	curr + 150bp	prior val assumption	prior fyr end assumption

	Percentage Impact Relative to Valuation Assumption							
AY	0.00%	0.28%	0.78%	1.28%	1.78%	2.28%	0.68%	0.19%
0 & prior	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
0	0.4%	0.4%	0.0%	-0.4%	-0.7%	-1.1%	0.1%	0.4%
0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
0	1.0%	0.9%	0.0%	-0.9%	-1.7%	-2.6%	0.2%	1.0%
0	0.8%	0.7%	0.0%	-0.7%	-1.4%	-2.0%	0.1%	0.7%
0	0.8%	0.7%	0.0%	-0.7%	-1.3%	-2.0%	0.1%	0.7%
0	1.0%	0.9%	0.0%	-0.9%	-1.7%	-2.5%	0.2%	0.9%
0	0.9%	0.8%	0.0%	-0.8%	-1.6%	-2.3%	0.2%	0.9%
0	1.0%	0.9%	0.0%	-0.9%	-1.7%	-2.5%	0.2%	0.9%
0	1.1%	1.0%	0.0%	-1.0%	-2.0%	-2.9%	0.2%	1.1%
0	1.4%	1.2%	0.0%	-1.2%	-2.4%	-3.6%	0.2%	1.3%
0	1.6%	1.4%	0.0%	-1.4%	-2.8%	-4.1%	0.3%	1.6%
0	1.8%	1.6%	0.0%	-1.6%	-3.1%	-4.5%	0.3%	1.7%
0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total	1.5%	1.3%	0.0%	-1.3%	-2.6%	-3.8%	0.3%	1.4%
	curr - 100 bp	curr - 50 bp	curr val assumption	curr + 50bp	curr + 100bp	curr + 150bp	prior val assumption	prior fyr end assumption

EXHIBIT G

Components of Member Statement IBNR (i.e. "Discounted") Change

(September 2021 to October 2021)

RSP **Nova Scotia**
AccountCode Desc **IBNR - Discounted**

M/S IBNR - in $000s

AccYear	Sum of Prior Month Actual Amount	Sum of Projected Change	Sum of Change Due to AvsP Variances	Sum of Change Due to Valuation Implementation	Sum of Total Change	Sum of % Total Change	Sum of Current Month Final Amount
prior	-	-	-	-	-	-	-
2002	-	-	-	-	-	-	-
2003	-	-	-	-	-	-	-
2004	-	-	-	-	-	-	-
2005	-	-	-	-	-	-	-
2006	-	-	-	-	-	-	-
2007	(1)	-	-	-	-	-	(1)
2008	(3)	-	-	-	-	-	(3)
2009	12	-	-	-	-	-	12
2010	4	-	-	-	-	-	4
2011	4	-	-	-	-	-	4
2012	(103)	5	(7)	113	111	(107.8%)	8
2013	(16)	3	(24)	177	156	(975.0%)	140
2014	97	(2)	-	13	11	11.3%	108
2015	143	(5)	(22)	(3)	(30)	(21.0%)	113
2016	243	(8)	(52)	28	(32)	(13.2%)	211
2017	720	(47)	197	(93)	57	7.9%	777
2018	2,498	(96)	(119)	(346)	(561)	(22.5%)	1,937
2019	4,874	(187)	(8)	279	84	1.7%	4,958
2020	11,625	(355)	17	(5)	(343)	(3.0%)	11,282
2021	14,002	5,038	(3,534)	(387)	1,117	8.0%	15,119
Grand Total	**34,099**	**4,346**	**(3,552)**	**(224)**	**570**	**1.7%**	**34,669**

EXHIBIT G

Components of IBNR (i.e. "Undiscounted") Change

(September 2021 to October 2021)

RSP **Nova Scotia**
AccountCode Desc **IBNR - Undiscounted**

IBNR - in $000s

AccYear	Sum of Prior Month Actual Amount	Sum of Projected Change	Sum of Change Due to AvsP Variances	Sum of Change Due to Valuation Implementation	Sum of Total Change	Sum of % Total Change	Sum of Current Month Final Amount
prior	-	-	-	-	-	-	-
2002	-	-	-	-	-	-	-
2003	-	-	-	-	-	-	-
2004	-	-	-	-	-	-	-
2005	-	-	-	-	-	-	-
2006	-	-	-	-	-	-	-
2007	(1)	-	-	-	-	-	(1)
2008	(3)	-	-	-	-	-	(3)
2009	5	-	-	-	-	-	5
2010	4	-	-	-	-	-	4
2011	4	-	-	-	-	-	4
2012	(111)	5	(7)	118	116	(104.5%)	5
2013	(150)	8	(27)	166	147	(98.0%)	(3)
2014	(19)	1	(3)	13	11	(57.9%)	(8)
2015	(9)	-	(20)	-	(20)	222.2%	(29)
2016	29	(1)	(57)	30	(28)	(96.6%)	1
2017	201	(14)	247	(76)	157	78.1%	358
2018	1,662	(80)	(114)	(302)	(496)	(29.8%)	1,166
2019	3,879	(154)	(15)	273	104	2.7%	3,983
2020	9,977	(298)	(6)	38	(266)	(2.7%)	9,711
2021	12,227	4,427	(3,180)	(286)	961	7.9%	13,188
Grand Total	**27,695**	**3,894**	**(3,182)**	**(26)**	**686**	**2.5%**	**28,381**