Willis Towers Watson

New Jersey Schools Insurance Group

# Rate Review for the July 1, 2019-2020 Policy Year

November 16, 2018

DRAFT

Willis Towers Watson

November 16, 2018

Mr. William M. Mayo, CPCU, ARM
Executive Director
New Jersey Schools Insurance Group
6000 Midlantic Drive
Suite 300 North
Mount Laurel, NJ 08054

Dear Bill:

Attached is our rate level review for the July 1, 2019-2010 policy year using data evaluated as of September 30, 2018.

This draft report is intended for discussion purposes only, and should not be relied upon by NJSIG or referenced or distributed to third parties without Willis Towers Watson's express written consent. We look forward to the opportunity to discuss our analysis and findings with you and will issue a final report shortly thereafter, which will replace this draft.

Attention is called to the section of the report entitled *Distribution*, which sets out the limits on distribution of the report.

This report contains workpapers, trade secrets, and confidential information of both NJSIG and Willis Towers Watson, and as such, it is not intended to be subject to disclosure requirements under any Freedom of Information Act or similar laws.

The authors of this report are members of the American Academy of Actuaries and meet its qualification standards to render the actuarial opinion contained herein.

We have enjoyed working with you in the preparation of this report. Please call if you have any questions.

Sincerely,

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# Purpose and Scope

Willis Towers Watson was retained by the New Jersey Schools Insurance Group (NJSIG) to perform a rate level review for the July 1, 2019 through June 30, 2020 policy year (2019-2020 policy year). Willis Towers Watson was also asked to produce deductible rating factors for the 2019-2020 policy year.

This report was prepared for the internal use of NJSIG management to present our findings with respect to this analysis. It is our understanding that NJSIG management will consider the findings of this report for the purposes of establishing rate levels and for internal management reporting.

Our report is not intended or necessarily suitable for any other purposes.

The exhibits and appendices attached in support of our conclusions are an integral part of this report. These sections have been prepared so that our actuarial assumptions and judgments are documented. Judgments about the analysis and findings presented in this report should be made only after considering the report in its entirety. Our projections are predicated on a number of assumptions as to future conditions and events. These assumptions are documented in subsequent sections of this report, and should be understood in order to place the actuarial estimates in their appropriate context. In addition, the projections are subject to a number of reliances and limitations, as described in subsequent sections of this report.

We are available to answer any questions that may arise regarding this report. We assume that the user of this report will seek such explanation on any matter in question.

In this report, we develop estimates of NJSIG's 2019-2020 rate indications on several bases representing various intended measures. These include an actuarial central estimate, as well as estimates above and below this actuarial central estimate. We also develop deductible factors on an actuarial central estimate basis. These estimates were arrived at through evaluation of the results of various actuarial methods and models applied to NJSIG's experience. As such, the derivation of these estimates does not reflect extreme events which are believed to have a remote possibility of occurring.

The scope does not include quantification of the uncertainty in our estimates. However, our report includes commentary on this uncertainty, to assist in understanding the financial implications of our results.

Our analysis was based on data evaluated as of September 30, 2018. Additional information was provided through October 29, 2018. No account whatsoever has been taken in the projections of developments or data received subsequent to November 8, 2018.

As requested by NJSIG, our analysis included the following coverages:

- Workers Compensation
- General Liability
- Auto Liability
- Auto Physical Damage
- Errors and Omissions
- Property

We have included data only for those members who were part of the program from October 1, 2017 through September 30, 2018. We also excluded a portion of claims due to asbestos losses. NJSIG has indicated that the property coverage document has been modified to exclude asbestos abatement losses and as such these losses would no longer represent a future exposure to NJSIG.

Our analysis was performed on data net of subrogation and other such recoveries. We have assumed that all of NJSIG's future subrogation and other recoveries will be valid and collectible. In addition, we have not reduced our projected premiums for anticipated investment income.

Throughout this report, the term loss without modification, includes loss and allocated loss adjustment expense (ALAE), but does not include unallocated loss adjustment expense (ULAE).

## Material Assumptions

The findings in this report are materially influenced by certain assumptions related to the 2019-2020 expenses and exposure levels selected by NJSIG. NJSIG provided forecasted expenses based on knowledge of its operational costs and exposure levels based on expected changes in its book of business. Evaluating the reasonableness of these assumptions is outside the scope of this assignment.

# Distribution

Our report is delivered under the following terms and conditions:

- This report is provided to NJSIG solely for the intended purpose, and may not be referenced or distributed to any other party without our prior written consent
- This report has been prepared for use by persons technically competent in the areas covered and with the necessary background information
- Draft versions of this report must not be relied upon by any person for any purpose
- A copy of this report may be shared with your auditors solely in the context of their performing regular audit activities
- You shall not refer to us or include any portion of this report in any shareholder communication or in any offering materials or fairness opinion provided by your professional advisors prepared in connection with the public offering or private placement of any security
- This report may be shared with your affiliates, provided that you ensure that each such affiliate complies with the terms above and the applicable statement of work as if it were a party to them, and you remain responsible for such compliance

In addition, we understand that NJSIG may wish to provide copies of this report to its broker and current or prospective reinsurers or excess insurers and the New Jersey Department of Banking and Insurance (the Recipients). Permission is hereby granted for such distribution on the conditions that:

- This report is distributed in its entirety
- Each Recipient agrees not to reference or distribute the report to any other party
- Each Recipient recognizes that the furnishing of this report is not a substitute for its own due diligence and agrees to place no reliance on this report or the data contained herein that would result in the creation of any duty or liability by Willis Towers Watson to such party
- Each Recipient understands that such RECIPIENT IS DEEMED TO HAVE ACCEPTED THESE TERMS AND CONDITIONS by retaining a copy of this report

We accept no responsibility for any consequences arising from any third party relying on this report. If we agree to provide this report to a third party, you are responsible for ensuring that the report is provided in its entirety, that the third party is made aware of the fact that they are not entitled to rely upon it, and that they may not distribute the report to any other party.

This report contains workpapers, trade secrets, and confidential information of both NJSIG and Willis Towers Watson. Because of the nature of the material contained in the report, it is not intended to be subject to disclosure requirements under any Freedom of Information Act or similar laws.

# Background

## Overview

In 1983, the New Jersey school districts joined to create a workers compensation partnership under the sponsorship of the New Jersey School Boards Association. Since that time membership has expanded and loss exposures covered by the Group have increased. Beginning in 2014, the Group changed its name to the New Jersey Schools Insurance Group. NJSIG is governed by a Board of Trustees, comprised of superintendents, school board members and business administrators from member districts.

The NJSIG retains a portion of the following exposures:

- Workers Compensation (WC)
- General Liability (GL)
- Auto Liability (AL)
- Auto Physical Damage (APD)
- Errors and Omissions (7/1/02 through 6/30/08 only) (E&O)
- Property

We note that for E&O, APD and property, coverage is over a member deductible.

All claims are self-administered by NJSIG, except for E&O claims beginning July 1, 2015. Effective with the 2015-2016 policy year, Summit Claim Services, LLC handles all E&O claims.

## Changes in Operations and Business Environment

Effective with the July 1, 2015 coverage year, the E&O program was reinsured with QBE with all claims handled by a third party administrator, Summit. We understand that Summit's claim philosophy is to set reserves quickly and to pursue settlements aggressively and we see some evidence of higher average case reserves in the recent experience. We have responded to this change by reflecting the more recent development in our selected reporting and payment patterns. This recent change in operations introduces additional uncertainty in the E&O loss estimates.

In addition, the general liability claims with payment frequency increased significantly for the 2016/17 and 2017/18 accident years. NJSIG management believes that this increase is due to QBE's participation in the E&O program, which resulted in bullying and physical assault claims falling under the general liability policy rather than the E&O coverage where they were assigned historically. We understand that a fairly large percentage of these claims will close without indemnity but expense costs can be material given the nature of these claims. In addition, when indemnity is paid on these claims, the amount can be substantial. As this change is recent and there is limited data with which to estimate the impact of this change we have not made any explicit changes to our analysis. Our ultimate loss selections for these two accident years assume that NJSIG will have exposure to these claims under the general liability coverage.

Based on discussions with NJSIG management, we understand there have been several changes in the workers compensation claims management process which could impact the average case reserves on open claims and the overall claim severity.

- Additional focus on safety programs at the member level including the increased use of modified duty to return injured workers to work faster
- A new medical bill review provider has been engaged which has increased network penetration and savings
- Adjusters utilizing new tools to assist in setting case reserves
- Aggressive use of nurse case management to control medical costs
- Recent success in getting litigated claims settled or dismissed

We gave consideration to these changes in our selection of ultimate losses for the 2014/15 to 2017/18 years.

Effective July 1, 2017, the claims management software was changed for all coverages except E&O. Based on input from NJSIG, we do not anticipate that this change will impact the findings herein.

Based on discussions with NJSIG management, we are not aware of any other recent changes in its claim, underwriting, reinsurance or any other aspect of the Group's operation or business environment that would be expected to materially affect the methods or assumptions used in this analysis. Consequently, we have not made any adjustments to the data, methods, assumptions or parameters implied by the Group's historical data to account for such changes.



## Terminology

**Accident Year:** Includes all claims that occurred during the "accident period", e.g., accident year July 1, 2018 through June 30, 2019 would include all claims occurring during that period, regardless of when they were reported.

**Allocated Loss Adjustment Expense (ALAE):** ALAE refers to defense, litigation and medical cost containment expenses, whether internal or external (e.g., attorney fees for defense, cost of engaging experts, etc.).

**Case Reserves:** The estimate of unpaid loss (or loss and ALAE) amounts established for unpaid claims that have been reported to NJSIG. Case reserves are established on an individual claim basis.

**Earned Premium:** The pro rata portion of written premium that represents the earned portion of the insurance contract as of a given point in time.

**Exposure:** The units in which the insurer's exposure to loss are measured. In NJSIG's case, exposures are defined as payroll, average daily attendance, number of vehicles or total insured value.

**Frequency:** Claims per unit of exposure.

**IBNR:** IBNR stands for claims Incurred But Not Reported. In this report, we have used the term in its broader, more general sense, to represent development on outstanding case reserves (also referred to as supplemental or IBNER – Incurred But Not Enough Reported) and unreported claims (also referred to as "pure" IBNR or IBNYR – Incurred But Not Yet Reported).

**Loss Adjustment Expense (LAE):** The term LAE includes both allocated and unallocated loss adjustment expense. See definition of unallocated loss adjustment expense below.

**Loss Development Factors:** Factors used to project losses and/or ALAE to their ultimate value. These factors adjust actual losses to include IBNR and case reserve adequacy, or total unpaid amounts, to produce an estimate of total or ultimate loss (and/or ALAE).

**Loss Reserves:** A liability item on the entity's balance sheet to provide for unpaid claims. It consists of two components – case reserves and IBNR reserves.

**Paid Loss:** The amount of money that has been paid by the entity on behalf of insureds to cover claims of the insured.

**Pure Premium:** Loss (or loss and ALAE) per unit of exposure.

**Reported Loss:** The total of paid loss and case reserves for known claims.

**Report Year:** Includes all claims reported during the report period that occurred subsequent to the retroactive date of the coverage, e.g., report year July 1, 2018 through June 30, 2019 with a retroactive date of July 1, 2018 would include all claims arising from accident year 2018-2019 that were reported in 2018-2019.

**Severity:** Average loss per claim.

**Unallocated Loss Adjustment Expense (ULAE):** Those loss adjustment expenses not included within ALAE (e.g., fees of adjusters, attorney fees incurred in the determination of coverage, etc.).

**Written Premium:** The total premium that is charged for policies with effective dates during the accounting period.

# Findings

Based on our analysis of NJSIG's experience at September 30, 2018 and subject to the considerations set forth in the *Reliances and Limitations* section, we have developed the following rate level indications.

## Indicated Premiums and Rate Level Changes for 2019-2020

The indicated results of our rate level review are summarized on Summary Exhibit 1 and in the table below based on the indicated costs for the 2019-2020 year divided by the estimated premium for the 2019-2020 year using 2018-2019 rates, experience modification factors and member rating adjustments and 2019-2020 estimated exposures.

**2019-2020 INDICATED PREMIUMS AND RATE CHANGES**

| | Central Estimate | | Low Reasonable | | High Reasonable | |
|---|---|---|---|---|---|---|
| | Premium ($000s) | Rate Change | Premium ($000s) | Rate Change | Premium ($000s) | Rate Change |
| WC at Statutory | $71,635 | +0.1% | $70,230 | -1.9% | $73,041 | +2.1% |
| GL at $500,000 | 9,623 | +64.2% | 9,113 | +55.5% | 10,184 | +73.7% |
| AL at $500,000 | 2,979 | -22.7% | 2,680 | -30.5% | 3,332 | -13.6% |
| APD | 676 | -14.0% | 655 | -16.8% | 703 | -10.5% |
| E&O at Policy Limits | 13,273 | -7.8% | 12,586 | -12.6% | 14,189 | -1.4% |
| Property at $1 Million | 6,325 | +13.4% | 5,884 | +5.5% | 6,765 | +21.3% |
| Total | $104,511 | +2.4% | $101,147 | -0.9% | $108,215 | +6.0% |
| Total Excl. E&O | $91,239 | +4.1% | $88,561 | +1.0% | $94,027 | +7.3% |

## Comparison to Prior Analysis

Details of the effect of rating components underlying the central estimate rate level indications are summarized in the following table.

| INDICATED 2019-2020 RATE LEVEL CHANGE BY COMPONENT – CENTRAL ESTIMATE | | | | | | |
|---|---|---|---|---|---|---|
| | **WC** | **GL** | **AL** | **APD** | **E&O** | **Property** |
| **Prior Analysis** | | | | | | |
| Prior Indication | +4.3% | -1.0% | -23.6% | +14.0% | -8.2% | -27.9% |
| Annual Loss Trend | +2.5% | +2.1% | +2.7% | +1.5% | +10.8% | +0.4% |
| Impact of 2018-19 Rate Change | -4.8% | +15.0% | +11.6% | +15.9% | -1.1% | +14.0% |
| **Preliminary Indication** | **+1.9%** | **+16.2%** | **-12.4%** | **+34.1%** | **+0.6%** | **-17.5%** |
| **Updated Analysis** | | | | | | |
| Experience Change | -1.8% | +7.1% | -17.8% | -39.5% | -0.4% | +7.0% |
| Change in Trend | 0.0% | +10.7% | -2.4% | -5.8% | -4.4% | +3.3% |
| Change in Expenses | +0.3% | +2.0% | +2.7% | +2.8% | +0.7% | +2.1% |
| Change in e-mod/ individ rating | -0.3% | +16.8% | +7.0% | +9.5% | -4.4% | +21.6% |
| **Current Indication** | **+0.1%** | **+64.2%** | **-22.7%** | **-14.0%** | **-7.8%** | **+13.4%** |

The most significant observations regarding the analysis are detailed below:

**Workers Compensation** – The prior rate indication is +4.3%. We expected a +2.5% inflationary cost impact on losses. The average implemented rate increase for the 2018-2019 policy year reduces the prior indication by 4.8% resulting in a preliminary indication of +1.9%. The recent years' loss experience and individual rating has improved which is somewhat offset by an increase in expenses. Combining these effects results in an indicated rate change of +0.1%.

**General Liability** – The prior rate indication is -1.0%. Consideration of the implemented rate change and inflationary costs, +15.0% and +2.1%, respectively, results in a preliminary rate indication of +16.2%. All of the current rating components indicate deterioration in overall results. The loss experience increased 7.1% due to the increased frequency of claims related to bullying and misconduct; this change in frequency also impacted the trend assumption for frequency from -2.0% to 0.0% resulting in a further 10.7% increase in the rate indication. There is a small increase in expenses of +2.0, while the change in individual modification factors creates an increase of 16.8%. The overall rate indication as of September 30, 2018 is +64.2%.

**Auto Liability** – The preliminary rate indication implies a rate decrease of 12.4% based on the prior indication of -23.6%, an expected trend impact of +2.7% and a rate change impact of +11.6%. Favorable loss experience and trend in the last twelve months (-17.8% and -2.4%, respectively), combined with increases in expenses (+2.7%) and experience and individual modification factors (+7.0%) result in the current indication of -22.7%.

**Auto Physical Damage** – For the 2018-2019 coverage year, the rate indication was +14.0%. This combined with a loss trend impact of +1.5% and a 15.9% rate decrease implemented in 2018-2019 results in a preliminary indication of +34.1%. The overall indication for the 2019-2020 year is -14.0%, reflecting favorable loss experience (-39.5%) and trend (-5.8%) which is more than offset by higher expenses (+2.8%) and changes in the individual premium modification factors (+9.5%). The favorable loss experience includes a premium adjustment for the replacement cost coverage on approximately 650 school buses.

**Errors & Omissions** – The rate indication for 2019-2020 (-7.8%) is relatively flat as compared to the 2018-2019 indication (-8.2%). The preliminary rate indication implies a slight rate increase of 0.6% after consideration of the prior selected trend (+10.8%) and a decrease based the rate change (-1.1%). Favorable loss experience in the last twelve months (-0.4%), trend (-4.4%) and changes in experience and individual modification factors (-4.4%) combined with a small increase in expenses (+0.7%) result in the current indication of -7.8%.

**Property** – The preliminary indication is a decrease of 17.5%, which is the result of the prior indicated rate change of -27.9%, adjusted for trend of +0.4% and a decrease in 2018-2019 rates (+14.0%). All rating components in the current analysis showed deterioration: historical experience (+7.0%), trend (+3.3%), expenses (+2.1%) and individual rating (+21.6%). The combined effect is an indicated rate increase of +13.4%.

Key assumptions regarding premium and cost levels are as follows:

**Expenses** (other than workers compensation specific items) – Expenses increased $1,511,000 from our prior analysis. Expenses are distributed proportionally by coverage based on a combination of gross and net premium volume and management's assessment of the operational costs associated with each coverage. We offset operating expenses by the premium retained by NJSIG for the "pass-through" coverages of $1.8 million (e.g., builders risk, boiler and machinery, excess liability, etc.). In addition, expenses were reduced by premium collected for E&O coverage that was not ceded to reinsurers, totalling $0.1 million.

**Sub Fund Administration Fee** – The Sub Fund administration fees were provided by NJSIG and are determined by the Sub Fund agreements/contracts. The fees are allocated to the workers compensation coverage only.

**Experience Modification Factors** – The average experience modification factors for workers compensation for all members and for the Sub Funds were calculated based on the 2018-2019 experience modification factors and member premiums supplied by NJSIG. We understand that NJSIG derived the workers compensation experience modification factors using the New Jersey Compensation Rating and Inspection Bureau (NJCRIB) approved plan effective January 1, 2018. The average experience modification factor increased from 0.773 in our prior analysis to 0.788 in the current analysis.

The average experience modification factors for general liability and auto liability were calculated based on the underwriting model and were 0.996 and 0.978, respectively.

**Individual Rating Adjustment** – NJSIG adjusts individual risk premiums by coverage based on underwriting judgment regarding member risk characteristics. The total adjustment across all coverages is approximately -$6.7 million or 8.0% of the estimated 2018-2019 net written premium. All coverages, except E&O, have net credits.

**Exposures** – Estimated 2019-2020 exposures are assumed to increase 3.0% over the 2018-2019 levels for WC while we assume no exposure growth for all other coverages.

**Trends** – Annual loss trends by coverage are detailed in the *Analysis* section.

## Indicated Workers Compensation Sub Fund Premiums and Rate Level Changes for 2019-2020

Details of our analysis of the indicated rates for the workers compensation Sub Funds and for the remaining unassigned insureds (referred to as NJSIG) for the 2019-2020 policy year can be found in the Summary section. Indicated deviations from the NJCRIB rates effective January 1, 2018 are shown on Exhibit 3 of the Summary and the implied rate changes from 2018-2019 levels are shown in Summary, Exhibit 2. The indicated premiums and rate changes for the 2019-2020 policy year are summarized below.

**2018-2019 SUB FUND PREMIUMS AND RATE CHANGES**

| | Indicated – Central Estimate | | Indicated – Low Reasonable | | Indicated – High Reasonable | |
|---|---|---|---|---|---|---|
| | **Premium ($000s)** | **Rate Change** | **Premium ($000s)** | **Rate Change** | **Premium ($000s)** | **Rate Change** |
| BACCEIC | $6,037 | -1.3% | $5,901 | -3.5% | $6,156 | +0.7% |
| MOCSSIF | 11,773 | +0.9% | 11,564 | -0.9% | 11,970 | +2.6% |
| ERIC NORTH | 22,075 | +2.7% | 21,653 | +0.8% | 22,504 | +4.7% |
| NJEIF | 11,317 | -4.3% | 11,091 | -6.2% | 11,551 | -2.4% |
| ERIC SOUTH | 6,763 | -6.3% | 6,648 | -7.9% | 6,874 | -4.7% |
| ERIC WEST | 9,117 | +5.7% | 8,924 | +3.4% | 9,311 | +7.9% |
| CAIP | 2,195 | +0.9% | 2,139 | -1.7% | 2,257 | +3.7% |
| NJSIG | 2,359 | -3.7% | 2,310 | -5.7% | 2,418 | -1.3% |
| **TOTAL** | **$71,635** | **+0.1%** | **$70,230** | **-1.9%** | **$73,041** | **+2.1%** |

Consistent with our prior analysis, the indications were produced at a $1 million limit and use the average experience modification factor for all insureds, which gives more weight for favorable experience. The workers compensation Sub Fund expenses are generally allocated based on the total payroll for each group. The only expense item which is Sub Fund specific is the Sub Fund administration fees as provided by NJSIG.

We also produce results for each Sub Fund based on the Sub Fund's average experience modification factor. Details can be found in Appendix 3.

## Comparison to Prior Analysis – Workers Compensation Sub Funds

Details of the effect of rating components underlying the Sub Fund central estimate rate level indications are summarized in the following table.

**INDICATED 2019-2020 SUB FUND RATE LEVEL CHANGE BY COMPONENT – CENTRAL ESTIMATE**

| Prior Analysis | BACCEIC | MOCSSIF | ERIC N | NJEIF | ERIC S | ERIC W | CAIP | NJSIG |
|---|---|---|---|---|---|---|---|---|
| Prior Indication | +0.3% | +10.4% | +2.6% | +4.3% | +4.2% | +0.1% | +3.9% | +21.5% |
| Annual Loss Trend | +2.5% | +1.7% | +2.1% | +1.7% | +2.5% | +2.5% | +2.6% | +2.7% |
| Impact of 2018-19 rate change | -0.9% | -9.9% | -3.2% | -4.6% | -4.6% | -0.8% | -4.4% | -18.2% |
| Preliminary Indication | +1.9% | +1.1% | +1.4% | +1.1% | +1.9% | +1.8% | +1.9% | +2.1% |
| <u>Updated Analysis</u> | | | | | | | | |
| Experience Change | -3.2% | -0.6% | +0.7% | -4.9% | -8.6% | +4.1% | -0.7% | -4.3% |
| Change in Trend | +0.0% | +0.0% | +0.0% | +0.0% | +0.0% | +0.0% | +0.0% | +0.0% |
| Change in Expenses | -0.1% | +0.3% | +0.4% | -0.6% | +1.2% | +1.0% | +1.0% | +1.1% |
| Exper / Individ Mod | +0.2% | +0.1% | +0.2% | +0.1% | -0.5% | -1.2% | -1.3% | -2.5% |
| **Current Indication** | **-1.3%** | **+0.9%** | **+2.7%** | **-4.3%** | **-6.3%** | **+5.7%** | **+0.9%** | **-3.7%** |



The primary driver for changes in Sub Fund rate level indications from our prior analysis to the current analysis is generally loss experience. ERIC WEST experienced the most deterioration in loss experience at +4.1%. The largest improvement was seen in ERIC SOUTH at -8.6%.

## Indicated Deductible Factors for the 2019-2020 Policy Year

Appendix 2 details the estimated deductible factors for the 2019-2020 policy year for each coverage. Observations by coverage are as follows; note that our commentary assumes no change in member deductible, which may not prove accurate, particularly if there are significant changes in the level of credits offered.

- For WC, NJSIG does not currently offer deductibles while there is a standard $1,000 deductible for APD. We have provided indicated deductible rating factors at limits similar to other coverages.
- The selected deductible factors for GL indicate that the current rates provide more discount to members than the experience suggests. For example, at a $5,000 deductible the current rate would be reduced by 10% (1.000 – 0.900). The selected factor indicates that the credit should be 6.8% (1.000 – 0.932). If NJSIG implements the selected factors found in Item (14) of Appendix 2, Exhibit 1, Sheet 2, member premium would increase if there is no offset made to the base rate.
- The selected deductible factors for AL at all levels are similar to the current factors. There would likely be minimal change in the premium collected if the selected factors were implemented.
- For E&O, the base rate deductible is $5,000. The difference in the selected and current factors for deductibles above $10,000 is significant. The current factors provide more premium credit to members than the selected factors indicate. The selected deductible factors, if implemented, would increase the premium (if no offset to base rate were implemented).
- The current property factors are giving more premium credit than is indicated by the selected deductible factors for deductibles below $15,000. The deductible factors at the higher levels provide less credit than the selected factors. Implementation of the selected factors, with no base rate change, would likely increase total premium collected.

Some of the key assumptions in deriving these factors include:

- The deductible will be applied against loss only for each and every claim.
- These factors are applied to the primary premium derived from the base rates and exposures prior to any experience modification factors or underwriting credits/debits. Primary premium is defined as premium for coverage limited to $500,000 for AL and GL, limited to $1 million for property, limited to policy limits for E&O and at statutory limits for workers compensation.

# Analysis

For each coverage reviewed, our analysis consisted of the steps outlined below.

## Initial Expected Losses

The selected initial expected losses (IELs) in the Bornhuetter-Ferguson (B-F) projection methods for the coverage analysis are based on the results of the June 30, 2018 liability analysis dated October 8, 2018, adjusted to reflect the current membership. For 2009-2010 and subsequent, the IELs for E&O are based on the frequency/severity method in Section EO, Exhibit 3, Sheet 1. This method is described in the *Description of Projection Methods* section of this report.

## Trends

Pure premium trend factors are applied to historical loss experience to project the impact of the economic, judicial, and social changes that affect loss costs. Pure premium trends are a function of severity, frequency and exposure trends. The annual trend rates are based on NJSIG's historical experience and insurance industry data and are as follows:

**TREND RATES FOR 2019-2020 RATE LEVEL ANALYSIS**

| Coverage | Pure Premium Trend | Severity Trend | Frequency Trend | Exposure Trend |
|---|---|---|---|---|
| Workers Compensation | +1.5% | +3.5% | -2.0% | +3.0% |
| General Liability | +5.0% | +5.0% | 0.0% | 0.0% |
| Auto Liability | +2.2% | +6.5% | -4.0% | 0.0% |
| Auto Physical Damage | 0.0% | n/a | n/a | 0.0% |
| Errors & Omissions | +10.0% | +3.0% | +7.0% | 0.0% |
| Property | +1.5% | n/a | n/a | 0.0% |



## Increased Limit Factors

Increased limit factors (ILFs) are used to project the selected losses to the current retention level.

It is assumed that NJSIG's experience is only partially meaningful as a measure of expected limited loss. We do not believe that the data available for NJSIG's exposure is sufficient in size to rely upon exclusively regarding expected losses at retention. Therefore, the ILFs applied are based on a blend of insurance industry data and NJSIG's large loss experience.

## Expenses

NJSIG provided estimated expenses for the 2019-2020 policy year (based on internal budgets), which we show in Summary, Exhibit 6, Sheets 1 through 2. Expenses were generally allocated to coverage based on of gross and net premium volume and management's assessment of the operational costs associated with each coverage.

## Reinsurance

We have assumed the following retentions for the 2019-2020 policy year.

**NJSIG LOSS RETENTIONS ($000s)**

| WC | GL | E&O | AL | Property |
|---|---|---|---|---|
| $1,000 | $500 | Policy limits | $500 | $1,000 |

These retentions refer to losses only. ALAE is shared pro-rata with NJSIG's reinsurers once the retained limit has been pierced. Auto Physical Damage coverage is unlimited and fully retained by NJSIG.

All coverages are written on an occurrence form, except for E&O which is written on a claims-made basis. NJSIG also issues tail liability coverage for E&O business.

## Development Patterns

This report utilizes the report-to-report development factors (RTR factors) selected in our liability analysis as of June 30, 2018. The historical RTR factors and benchmark factors based on industry experience from public entity pools in other states form the basis for selecting the RTR factors used in projecting the current valuation of losses to an ultimate basis. In addition, a tail factor is selected to account for loss development beyond the observed experience. The tail factor is based on trends shown in the data and consideration of external benchmarks. For our analysis, we rely on the benchmark pattern primarily for the E&O coverage. While we show benchmarks for WC, GL and AL for comparison purposes, our selections rely on NJSIG specific experience.

Benchmark patterns are constructed internally by Willis Towers Watson, drawing upon available relevant sources of loss development data. We use benchmark patterns for the E&O coverage only. These benchmark patterns are based on an internal Willis Towers Watson study of public entity pools professional liability experience. Benchmarks are revised periodically as new information and trends emerge. While each entity's own development can be expected to vary from the benchmark based on individual circumstances, we believe the benchmark is an approximate supplement to the analysis of NJSIG data, as it represents our current judgment as to the typical emergence of loss that can be expected for that class of business.

The selected development patterns are used for both the development and B-F projection methods.

## Ultimate Losses

The ultimate losses for each coverage are selected in Exhibit 2 of each respective section (and in Exhibit 6 for the WC Sub Funds). The ultimate loss and ALAE are selected based on the results of five projection methods: the reported and paid B-F and development methods, and the Frequency/Severity Method, where applicable. We have selected central, low reasonable and high reasonable estimates for ultimate losses.

## Rate Level Review

Exhibit 1 of each section and Exhibit 5 of Section WC show the calculation of "pure premiums on level." This means that historical ultimate losses are adjusted to expected 2019-2020 cost and benefit levels. We selected an expected 2019-2020 pure premium, as well as a low reasonable and high reasonable estimate, based on various averages of the historic pure premiums on level. The selected pure premiums are then converted to indicated losses and ALAE by multiplying by the estimated 2019-2020 exposures. The total indicated 2019-2020 cost is calculated by adding the estimated loss and the allocated expenses by coverage or Sub Fund.

We compare the total estimated costs for each coverage or Sub Fund to the premium derived using 2019-2020 exposures and 2018-2019 rates, which produces the indicated rate change for each coverage or Sub Fund. The results are shown on Summary, Exhibit 2. Sheet 1 shows the results at the central estimate. Summary, Exhibit 2, Sheets 2 and 3 show the low reasonable and high reasonable rate indications, respectively. Summary, Exhibit 1 shows the indicated premiums and rate changes under all three scenarios.

Summary, Exhibit 3, shows the indicated central estimate deviation factors from the benchmark rates. The benchmark rates for all coverages except workers compensation were provided by NJSIG. The workers compensation benchmark rates are the NJCRIB published rates effective January 1, 2018. Exhibit 3 also provides estimates of the stabilization fund amounts for each coverage and Sub Fund based on the central estimate rate indications.

## Selected Deductible Factors

Our selected loss elimination ratios are based on indications derived from the trended reported loss data. First historic unlimited loss and ALAE are trended to the 2019-2020 policy year using the trend assumptions described above. This is done for each individual historic claim from accident years 7/1/2001-02 through 7/1/2015-16 for the liability coverages and 7/1/2001-02 through 7/1/2017-18 for APD and property. The severity trends for APD and property are based on Willis Towers Watson analysis of industry information.

Each individual trended claim is then reduced by the various deductible amounts and limited to the applicable retention for each coverage. The loss elimination ratios are calculated for each accident year by summing up the trended losses and ALAE reduced by the deductible amount and dividing by the retained trended losses and ALAE. This loss elimination ratio is interpreted as the average percent of retained loss and ALAE that is not eliminated from the application of the deductible.

Retained losses are limited to $500,000 for AL and GL, $1 million for E&O and Property and statutory limits for workers compensation and include ALAE on a pro-rata basis.

Selected loss elimination ratios are based on various averages of the historic ratios and judgment reflecting the range of estimates. The selected loss elimination ratios are then adjusted to a rate basis by loading in a provision for general expenses which are unaffected by the deductible level.

# Reliances and Limitations

## Inherent Uncertainty

Projections of loss and ALAE in connection with rate level indications are subject to potentially large errors of estimation, since the ultimate disposition of claims incurred prior to the evaluation date, whether reported or not, is subject to the outcome of events that have not yet occurred. Examples of these events include jury decisions, court interpretations, legislative changes, changes in the medical condition of claimants, public attitudes, and social/economic conditions such as inflation. Any estimate of future costs is subject to the inherent limitation on one's ability to predict the aggregate course of future events. It should therefore be expected that the actual emergence of loss and ALAE will vary, perhaps materially, from any estimate. Thus, no assurance can be given that NJSIG's or any Sub Fund's actual loss and ALAE will not ultimately exceed the estimates contained herein. In our judgment, we have employed techniques and assumptions that are appropriate, and the conclusions presented herein are reasonable, given the information currently available.

The inherent uncertainty associated with loss and ALAE estimates is magnified in this case due to the following circumstances.

- NJSIG's mix of business is weighted toward coverages such as workers compensation, general liability and auto liability for which the estimation of loss is more uncertain than for shorter-tailed property and casualty lines.
- NJSIG has relatively high per occurrence retentions, which increase the uncertainty associated with our estimates. This is particularly significant with respect to the E&O coverage, which is a high severity/low frequency exposure.
- The geographic and public sector concentration of NJSIG could cause adverse results due to legislative or judicial changes or catastrophic events (e.g., hurricanes).
- Recent changes in loss emergence (especially GL), case reserving methodology (especially for E&O and WC) and claims handling for WC may produce different patterns of loss development than are anticipated by our analysis.
- NJSIG has a relatively small volume of losses for some of the WC Sub Funds. Loss projections based on small volumes of data tend to be volatile.
- The year to year variation in the impact of individual risk rating adds additional uncertainty to the rate indications.

Furthermore, there is no guarantee that the rate level indications will prove to be adequate or not excessive.

## Range of Estimates

The range of estimates presented herein is intended to reflect the reasonably expected variation in loss and LAE based on information currently available. It is possible that actual results will fall outside this range.

## Data Reliance

Throughout this analysis, we have relied on historical data and other quantitative and qualitative information supplied by NJSIG. We have not independently audited or verified this information; however, we have reviewed it for reasonableness and internal consistency. We have assumed that the information is complete and accurate, and that we have been provided with all information relevant to the analysis of NJSIG's and each Sub Fund's ultimate losses and ALAE. The accuracy of our results is dependent upon the accuracy and completeness of the underlying data; therefore, any material discrepancies discovered in this data should be reported to us and this report amended accordingly, if warranted.

We note that there was one area where data was inconsistent or incomplete. E&O reported and paid loss histories were provided to us on an accident year basis, while the coverage is provided on a claims-made basis. Estimates of ultimate losses on a report year basis may differ from the results by accident year.

Complete and consistent data is a critical component of actuarial analyses; incomplete and/or inconsistent data increases the uncertainty associated with our estimates.

## Extraordinary Future Emergence

We have not anticipated any extraordinary changes to the legal, social, or economic environment that might affect the cost, frequency, or future reporting of claims. In addition, our estimates make no provision for potential future claims arising from loss causes not contained in the historical data (e.g., new types of mass torts or latent injuries, terrorist acts, etc.) except insofar as claims of these types are included but not identified in the reported losses and are implicitly analyzed.

## Excess Insurance/Reinsurance Collectibility

Our estimates are presented net of the retentions as described in the *Analysis* section. We have assumed that all of NJSIG's excess insurance/reinsurance protection will be valid and collectible. Contingent liability may exist for any excess insurance/reinsurance recoveries that may prove to be uncollectible. Should such liabilities materialize, they would be in addition to the net prospective cost estimates contained herein.

## Self-Insurance Risk

When reviewing our findings, it is important to note certain implications of a group self-insurance plan. The entire retained risk remains with the group members, which likely exposes these entities to greater potential fluctuations in financial experience than does a first-dollar insurance program. The members of NJSIG should have sufficient financial capacity to reserve for and withstand those fluctuations. Actual losses in excess of projected losses will have to be paid by NJSIG members. It is not possible to estimate such fluctuations completely accurately; however, the effects of such fluctuations can be reduced by the funding of a provision for contingencies (a margin for the risk of adverse deviation from the expected loss levels).

An important factor bearing on a group self-insurer's financial capacity is the existence of an excess insurance/reinsurance program. Excess insurance/reinsurance is generally considered an integral part of programs with the potential for catastrophic losses; workers compensation and liability losses are characterized by this potential.

Nothing in this report should be construed as recommending that NJSIG members should or should not self-insure these coverages. Many factors other than the indicated rate levels should be considered in that decision.

# Data and Information

NJSIG provided the following data and information for use in this analysis:

- For each coverage, recoveries (salvage, subrogation and excess insurance) as of September 30, 2018
- Gross and net earned premium information for each calendar year by coverage
- Exposure, experience modification factor and coverage data for 2018-19 by coverage and member
- Individual risk premium adjustments by member and coverage for the 2018-2019 coverage year
- Claims detail for each coverage as of September 30, 2018
- A description of NJSIG's reinsurance agreements
- 2019-2020 expense budget, including WC Sub Fund administration fees
- Policy year 2018-2019 Sub Fund definitions
- Benchmark rates by coverage
- 2018-2019 NJSIG rates by coverage
- Distribution of APD exposures by vehicle type for 2017-2018
- Estimated WC reinsurance costs for 2018-2019
- Estimated increase in 2018-2019 property cost per square foot

# Description of Projection Methods

The choice of method to estimate ultimate losses should consider, among other things, the line of coverage, the number of years of experience, and the age of the accident year being developed. In general, these methods can be applied to losses, ALAE, and various measures of claim count.

## Reported Development Method

The reported development method is based upon the assumption that the relative change in a given year's reported loss estimates from one evaluation point to the next is similar to the relative change in prior years' reported loss estimates at similar evaluation points. In utilizing this method, actual annual historical reported loss data is evaluated. Successive years can be arranged to form a triangle of data.

Report-to-report (RTR) development factors are calculated to measure the change in cumulative reported costs from one evaluation point to the next. These historical RTR factors and comparable benchmark factors form the basis for selecting the RTR factors used in projecting the current valuation of losses to an ultimate basis. In addition, a tail factor is selected to account for loss development beyond the observed experience. The tail factor is based on trends shown in the data and consideration of external benchmarks.

This method's implicit assumption is that the relative adequacy of case reserves has been consistent over time, and that there have been no material changes in the rate at which claims have been reported.

## Paid Development Method

The paid development method is similar to the reported development method; however, case reserves are excluded from the analysis. While this method has the disadvantage of not recognizing the information provided by current case reserves, it has the advantage of avoiding potential distortions in the data due to changes in case reserving methodology.

This method's implicit assumption is that the rate of payment of claims has been relatively consistent over time.

## Reported Bornhuetter-Ferguson (B-F) Method

The reported Bornhuetter-Ferguson (B-F) method is essentially a blend of two other methods. The first method is the loss development method whereby actual reported losses are multiplied by an expected loss development factor. For slow reporting coverages, the loss development method can lead to erratic and unreliable projections because a relatively small swing in early reportings can result in a large swing in ultimate projections. The second method is the expected loss method whereby the IBNR estimate equals the difference between a predetermined estimate of expected losses and actual reported losses. This has the advantage of stability, but it does not respond to actual results as they emerge.

The reported B-F method combines these two methods by setting ultimate losses equal to actual reported losses plus expected unreported losses. As an experience year matures and expected unreported losses become smaller, the initial expected loss assumption becomes gradually less important.

Two parameters are needed to apply the B-F method: the initial expected losses and the expected reporting pattern. The initial expected losses are selected as described in the *Analysis* section, while the expected reporting pattern is based on the reported loss development analysis described above.

This method is often used for long-tail lines and in situations where the reported loss experience is relatively immature or lacks sufficient credibility for the application of other methods.

## Paid Bornhuetter-Ferguson Method

The paid B-F method is analogous to the reported B-F method using paid losses and development patterns in place of reported losses and patterns.

## Frequency/Severity Method

The frequency/severity method calculates ultimate losses by separately projecting ultimate claim frequency (claims per exposure) and ultimate claim severity (cost per claim) for each experience period. Typically, loss development methods are used to project ultimate frequency and severity based on historical data. Ultimate losses are calculated as the product of the two items. This method is intended to avoid distortions that may exist with the other methods for the most recent years as the result of changes in case reserve levels, settlement rates, etc. In addition, it may provide insight into the drivers of the loss experience.