RULE 510.
THEFT COVERAGE

A. Introduction

A Fire policy insuring Coverage **A** or **C** may be extended, for an additional premium, to provide On and Off-Premises Coverage for the perils of Theft and Vandalism and Malicious Mischief (V.&M.M.) resulting from theft.

1. Owner-Occupied Dwellings, Co-Op Or Condo Units; And Apartments Occupied By Tenant (Named Insured)

a. Coverage Description

The policy may be extended to provide On or Off-Premises Coverage.

b. Minimum Limit Of Liability

The minimum limit of liability is $1,000 each for On and Off-Premises Coverage.

c. Off-Premises Coverage

Off-Premises Coverage is **only** available when On-Premises Coverage is purchased.

The limit of liability shall not be greater than that selected for On-Premises Coverage.

d. Endorsement

Use Broad Theft Coverage Endorsement **DP 04 72.**

2. Non-Owner-Occupied Dwellings, Co-op Or Condo Units; And Apartments Occupied By Tenant (Other Than Named Insured)

a. Coverage Description

The policy may be extended to provide On-Premises Coverage **only.**

b. Limit Of Liability

The minimum limit of liability is $1,000.

c. Endorsement

Use Limited Theft Coverage Endorsement **DP 04 73.**

B. Premium Computation

Refer to state company rates/ISO loss costs for the Base Deductible.

Compute the premiums separately for each premises in the manner and sequence that follows:

1. Theft And Vandalism And Malicious Mischief

a. Owner-Occupied Dwellings

Compute the premiums for the desired limit of liability separately for On and Off-Premises Coverage.

b. Non-Owner-Occupied Dwellings, (On-Premises Only)

Multiply the On-Premises premium computed above by a factor of 1.50.

2. Burglar Alarm Discount (On-Premises Only)

a. Approved and properly maintained installations of burglar alarms in the dwelling may be recognized for a reduced premium – developed by applying the selected factors to the premiums computed in Paragraph **B.1.a.** or **B.1.b.**

Type Of Installation∗	Factor
Central Station Reporting Burglar Alarm	.95 to 1.00
Police Station Reporting Burglar Alarm	.97 to 1.00
Local Burglar Alarm	.98
∗ Refer to company for eligibility, types of systems and devices, installations and available credits.	

Table 510.B.2.a. Factors

b. Use Premises Alarm Or Fire Protection System Endorsement **DP 04 70.**

C. Deductibles

1. Base Deductible

$250 Deductible.

2. Optional Deductibles

To compute the premium for this provision, multiply the premium for the Base Deductible computed in Paragraph **B.1.** by the factor listed in the following table:

Deductible∗	Factor
$ 100	1.20
$ 500	.95
$ 1,000	.80
$ 2,500	.65
∗ Refer to the state company rates pages for the minimum annual additional premium charge that applies per policy	

Table 510.C.2 Factors

RULE 511.
SINKHOLE COLLAPSE COVERAGE

A. Coverage Description

The policy may endorsed to provide Sinkhole Collapse Coverage.

B. Premium Computation

1. Refer to state company rates/ISO loss costs and;

2. Multiply the rate per $1,000 by:

   a. Coverage **A, B** and/or **C** amounts of insurance;

   b. Improvements, Alterations and Additions – Increased Limits;

   c. Other Building or Structure Options (for example Bldg. Items Coverage);

   d. Other Personal Property Coverage Options (for example Merchandise in Storage);

   e. Ordinance or Law Coverage, basic amount and, if applicable, increased amount of coverage.

C. Endorsement

Use Sinkhole Collapse Endorsement **DP 04 99.**

RULE 512.
WINDSTORM OR HAIL COVERAGE – AWNINGS, SIGNS AND OUTDOOR RADIO AND TELEVISION EQUIPMENT

A. Coverage Description

The peril of Windstorm or Hail does **not** cover:

1. Awnings, Signs and Outdoor Radio and Television Equipment in **DP 00 01** or **DP 00 02;**

2. Outdoor Radio and Television Equipment in **DP 00 03;**

whether or not attached to a Dwelling Building or Other Structure.

B. Premium Computation

Coverage may be provided for an additional premium. Refer to the state company rates/ISO loss costs.

C. Endorsement

Use Windstorm Or Hail – Radio And Television Antennas, Awnings And Signs Endorsement **DP 04 19.**

RULE 513.
WATER BACK UP AND SUMP OVERFLOW

A. Coverage Description

The policy forms exclude coverage for loss resulting from water or water-borne material which backs up through sewers or drains or which overflows or is discharged from a sump, sump pump or related equipment.

B. Coverage Option

The policy may be endorsed to provide such coverage for a limit of liability of $5,000 subject to a $250 deductible. No other deductible option is available.

C. Premium Computation

Refer to state company rates/ISO loss costs.

D. Endorsement

Use Water Back Up And Sump Discharge Or Overflow Endorsement **DP 04 95.**

RULE 514.
ASSISTED LIVING CARE COVERAGE

A. Introduction

The policy provides coverage to named insureds and resident relatives who are members of the insured's household.

B. Coverage Description

1. The policy may be endorsed to provide personal property and additional living expense coverage to a person regularly residing in an Assisted Living Care facility, provided such person:

   a. Is related to an insured by blood, marriage or adoption; and

   b. Is not a member of that insured's household.

2. An assisted living care facility is a facility that provides assisted living services such as dining, therapy, medical supervision, housekeeping and social activities. It is **not** a hospice, prison or rehabilitation facility.

3. The endorsement provides the following basic limits of coverage:

   a. $10,000 for Coverage **C** – Personal Property with limitations ranging from $100 to $500 for certain items of property; and

   b. $6,000, at $500 per month, for Additional Living Expenses.

C. Premium

Refer to state company rates/ISO loss costs.

D. Endorsement

Use Assisted Living Care Coverage Endorsement **DP 04 59.**

RULE 515.
MOTORIZED GOLF CART – PHYSICAL LOSS COVERAGE

A. Coverage Description

The policy may be endorsed to provide coverage for physical loss to a motorized golf cart, including permanently installed accessories, equipment and parts, owned by an insured.

Also covered, for an amount equal to 10% of the limit of the highest scheduled cart, are accessories, equipment or parts designed or made solely for the cart that are **not** permanently installed provided such property is at an insured's residence or in or upon the cart off the insured's residence at the time of loss.

Coverage for loss caused by collision is optional and only applies if declared on the schedule of the endorsement.

B. Eligibility

To be eligible for coverage, the motorized golf cart shall be of the type designed to carry up to four people on a golf course for the purpose of playing golf and shall not have been built, or modified after manufacture, to exceed a speed of 25 m.p.h. on level ground.

Read the endorsement for all conditions of coverage.

C. Limit Of Liability

The limit of liability shall be selected by the insured. However, that limit should be representative of the actual cash value of the motorized golf cart including any permanently installed accessories, etc.

D. Deductible

A deductible amount of $500 applies separately to each involved golf cart and, separately to Property Coverages if not in or upon a golf cart at the time of loss.

The $500 deductible replaces any other deductible in the policy with respect to property covered under the endorsement.

E. Premium Computation

Rate each cart separately using the rate per $500 of insurance. Refer to state company rates/ISO loss costs.

F. Endorsement

Use Owned Motorized Golf Cart – Physical Loss Coverage Endorsement **DP 05 28.**

RULE 516.
GRAVEMARKERS

A. Coverage Description

Coverage for gravemarkers, including mausoleums, is not included in the forms. The policy may be endorsed to provide $5,000 in coverage for gravemarkers, including mausoleums, on the Described Location.

B. Premium Computation

1. Fire, Extended Coverage, Broad And Special Forms

Refer to the state company rates/ISO loss costs Rule **500.** Miscellaneous Rates.

2. Vandalism And Malicious Mischief (DP 00 01)

Refer to the state company rates/ISO loss costs Rule **302.** Vandalism And Malicious Mischief.

C. Endorsement

Use Gravemarkers Endorsement **DP 04 58.**

RULE 517.
LIMITED FUNGI, WET OR DRY ROT, OR BACTERIA COVERAGE

A. Coverage Description

When the optional Limited Fungi, Wet Or Dry Rot, Or Bacteria Coverage Endorsement is attached to the policy, limited amounts of insurance are automatically provided as follows:

$10,000 to pay for loss to covered real or personal property, owned by an insured, that is damaged by fungi, wet or dry rot, or bacteria on the described location.

This Coverage applies only for the policy period in which the loss or costs occur.

If more than one location is insured under this policy, enter the address of such locations on this endorsement or the policy declarations.

B. Increased Limits

1. Limits may be increased to $25,000 or $50,000. The limit selected is entered on the coverage endorsement or the policy declarations.

2. Refer to Paragraph **D.** Rating Basis, for premium computation instructions.

RULE 517.
LIMITED FUNGI, WET OR DRY ROT, OR BACTERIA
COVERAGE (Cont'd)

C. Application Of Limits Of Liability

For Property Coverage, $10,000 or the limit selected is the most coverage that will be provided during the policy period regardless of the number of locations insured for Limited Fungi, Wet Or Dry Rot, Or Bacteria Coverage or the number of claims made during the policy period.

D. Premium Computation

1. Basic Limits

There is no premium adjustment.

2. Increased Limits

Refer to state company rates/ISO loss costs for an additional charge.

E. Endorsement

1. Use Limited Fungi, Wet Or Dry Rot, Or Bacteria Endorsement **DP 04 22.**

2. The subject optional endorsement titled Limited Fungi, Wet Or Dry Rot, Or Bacteria Coverage provides complete details on coverages, limitations, definitions and additional policy conditions applicable to this coverage. Enter the applicable limit of liability that applies for the Other Coverage Limited Fungi, Wet Or Dry Rot, Or Bacteria. Also enter on this endorsement the address of all locations to be insured for Limited Fungi, Wet Or Dry Rot, Or Bacteria.

RULE 518. – RULE 600.
RESERVED FOR FUTURE USE

PERSONAL LINES

DWELLING POLICY PROGRAM MANUAL – NORTH CAROLINA RULES

NOTICE DP-NC-2019-RU-001

CAUTION

Manualholders should determine from company instructions whether a company has adopted this revision.

INSTRUCTIONS TO MANUALHOLDERS

If your company has adopted this revision, you should update your manual accordingly.

EFFECTIVE DATE

The revision is subject to the following rule of application:

These changes are applicable to all new and renewal policies becoming effective on or after February 1, 2019.

CHANGE(S)

We are revising and introducing the following rules in order to clarify the rating of Extended Coverage for Mobile Homes:

- Rule **103.** Eligibility is revised to clarify that both **DP 00 01** and **DP 00 02** with **DP 04 76** may be used to write a Dwelling policy for a Mobile Home;

- Rule **404.** Mobile Or Trailer Homes – **DP 00 01** Only Or **DP 00 02** With **DP 04 76** is introduced to reference both **DP 00 01** and **DP 00 02** with **DP 04 76** in the title of the rule.

We are revising the following rules in the North Carolina Rate Pages:

- Rule **A3.** Windstorm Or Hail Exclusion – Territories 110, 120, 130, 140, 150 And 160 Only to provide updated Building and Contents windstorm or hail exclusion credits;

- Rule **A9.** Windstorm Mitigation Program to provide updated windstorm loss mitigation credits for Coverage **A** Dwelling and Coverage **C** Personal Property;

- Rule **301.** Base Premium Computation to provide updated Fire And Extended Coverage, Broad And Special Forms Coverage **A** Key Premiums and Coverage **C** Key Premiums for various territories. For Extended Coverage, Broad And Special Forms we also added mobile home rates that reflect the 1.25 rating factor for mobile home construction;

- Rule **404.** Mobile Or Trailer Homes – (**DP 00 01** Only Or **DP 00 02** With **DP 04 76**) to replace the 1.25 factor for Extended Coverage previously included in this rule with a 1.00 factor.

In addition, Territory Definitions have been revised and several rules throughout the State Exception and State Rate pages have been revised to reflect the new territory codes.

REVISED PAGE(S)

DP-E-1, DP-E-2, DP-E-5 thru DP-E-23

DP-R-1 thru DP-R-29

DP-T-1 thru DP-T-3

PAGE CHECKLIST

Included with this Notice is a page checklist displaying the latest page numbers and edition dates.

INSURANCE SERVICES OFFICE, INC.
545 Washington Boulevard, Jersey City, NJ 07310-1686
Edition 2-19
Page 1 of 3

REFERENCE INFORMATION (FOR COMPANY USE ONLY)

Circular Reference(s):

- P-18-10 (08/01/2018) Dwelling Policy Program – Mobile Home Rating Clarification
- P-18-7 (07/02/2018) Dwelling Policy Program Revised Dwelling Fire and Extended Coverage Rates

Filing Reference(s):

- NCRI-131370773

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DWELLING POLICY PROGRAM MANUAL
PAGE CHECKLIST – NORTH CAROLINA

THIS MANUAL PAGE CHECKLIST DISPLAYS THE LATEST STATE PAGE INFORMATION AS OF **2-19.**

PLEASE REFER TO THE PAGE CHECKLIST IN MULTISTATE NOTICE TO MANUALHOLDERS **DP-MU-2003-RU-001** FOR THE MULTISTATE PAGES IN EFFECT FOR YOUR JURISDICTION.

NOTE: ALWAYS USE THE EDITION NUMBER TO DETERMINE THE LATEST PAGE.

PAGE NUMBER	EDITION NUMBER	DATE	PAGE NUMBER	EDITION NUMBER	DATE
DP-NC-2019-RU-001	–	2-19	DP-E-24 thru DP-E-27	1st	1-17
DP-E-1	5th	2-19	DP-R-1	10th	2-19
DP-E-2	4th	2-19	DP-R-2 thru DP-R-14	6th	2-19
DP-E-3	3rd	7-13	DP-R-15	9th	2-19
DP-E-4	1st	6-08	DP-R-16	10th	2-19
DP-E-5, DP-E-6	4th	2-19	DP-R-17	6th	2-19
DP-E-7, DP-E-8	6th	2-19	DP-R-18	4th	2-19
DP-E-9 thru DP-E-11	7th	2-19	DP-R-19	3rd	2-19
DP-E-12	8th	2-19	DP-R-20 thru DP-R-29	1st	2-19
DP-E-13	7th	2-19			
DP-E-14	5th	2-19	DP-T-1	3rd	2-19
DP-E-15	4th	2-19	DP-T-2, DP-T-3	1st	2-19
DP-E-16 thru DP-E-23	2nd	2-19			

ADDITIONAL RULE(S)

RULE A1.
SPECIAL STATE REQUIREMENTS

A. Special Provisions Endorsement DP 32 32

Use this endorsement with all Dwelling Policies.

B. Windstorm Exterior Paint And Waterproofing Exclusion Endorsement DP 32 61

Use this endorsement with **all** Dwelling Policies covering Extended Coverage in Territories 110 and 120.

C. Company Rates/State Rates

References in the manual to "state company rates" means "state rates" in North Carolina.

D. Flood, Earthquake, Mudslide, Mudflow, Landslide, Or Windstorm Or Hail Insurance Notice

North Carolina law provides that an insurer selling property insurance that does not provide coverage for the perils of flood, earthquake, mudslide, mudflow, landslide, or windstorm or hail shall provide a specific notice (a "warning" set forth in the related statute) to the policyholder as to which of the listed perils are not covered under the policy.

The required notice must be:

1. Provided upon issuance and renewal of each policy;

2. In Times New Roman 16-point font or another equivalent font; and

3. Must be included in the policy on a separate page immediately before the Declarations page.

The following warning, citing which peril is not covered, must be furnished with each new policy and upon each renewal:

"WARNING: THIS PROPERTY INSURANCE POLICY DOES NOT PROTECT YOU AGAINST LOSSES FROM [FLOODS], [EARTHQUAKES], [MUDSLIDES], [MUDFLOWS], [LANDSLIDES], [WINDSTORM OR HAIL]. YOU SHOULD CONTACT YOUR INSURANCE COMPANY OR AGENT TO DISCUSS YOUR OPTIONS FOR OBTAINING COVERAGE FOR THESE LOSSES. THIS IS NOT A COMPLETE LISTING OF ALL OF THE CAUSES OF LOSSES NOT COVERED UNDER YOUR POLICY. YOU SHOULD READ YOUR ENTIRE POLICY TO UNDERSTAND WHAT IS COVERED AND WHAT IS NOT COVERED."

E. North Carolina Endorsement DP 32 46

Use this endorsement with all Dwelling Policies.

RULE A2.
RESTRICTION OF INDIVIDUAL POLICIES

If a Dwelling Policy would not be issued because of unusual circumstances or exposures, the named insured may request a restriction of the policy provided no reduction in premium is allowed. Such request shall be referred to the company.

RULE A3.
WINDSTORM OR HAIL EXCLUSION – TERRITORIES 110, 120, 130, 140, 150 AND 160 ONLY

A. Introduction

The peril of Windstorm or Hail may be excluded if:

1. The property is located in an area eligible for such coverage from the North Carolina Insurance Underwriting Association; and

2. A Windstorm or Hail Rejection Form is secured and maintained by the company.

B. Premium Computation

1. To compute the Extended Coverage Non-seasonal or Seasonal Base Premium or the Broad or Special Form Non-seasonal Base Premium:

(a) Determine the Extended Coverage, Broad or Special Form Key Premium as described in Rule **301.**

(b) Subtract the Windstorm Or Hail Exclusion Credit shown on the state rates from the Extended Coverage, Broad or Special Form Key Premium.

(c) Multiply the Extended Coverage, Broad or Special Form Key Premium excluding Windstorm or Hail Coverage developed in Paragraph **B.1.(b)** by the Key Factor for the desired limit of liability.

2. To compute the Seasonal Broad or Special Form Base Premium:

(a) Determine the **DP 00 01** Extended Coverage Key Premium as described in Rule **301.**

(b) Multiply the **DP 00 01** Extended Coverage Key Premium by the appropriate Seasonal factor shown in Table **301.A.#42(R)** or Table **301.A.#45(R)** to determine the Seasonal Broad or Special Form Key Premium.

(c) Subtract the Windstorm Or Hail Exclusion Base Credit shown on the state rates from the Seasonal Broad or Special Form Key Premium determined in Paragraph **B.2.(b).**

(d) Multiply the Seasonal Broad or Special Form Key Premium excluding Windstorm Or Hail Coverage developed in Paragraph **B.2.(c)** by the Key Factor for the desired limit of liability.

RULE A3.
WINDSTORM OR HAIL EXCLUSION – TERRITORIES 110, 120, 130, 140, 150 AND 160 ONLY (Cont'd)

C. Endorsement

Use Windstorm Or Hail Exclusion – North Carolina Endorsement **DP 32 87.**

When Windstorm Or Hail Exclusion – North Carolina Endorsement **DP 32 87** is attached to the policy, enter the following in Declarations:

"This policy does not provide coverage for the peril of Windstorm or Hail."

RULE A4.
REPLACEMENT COST COVERAGE – DP 00 01 ONLY

A. The policy may be endorsed to provide replacement cost coverage on buildings without deduction for depreciation.

B. This rule is intended to have limited application. Use it **only** on those **DP 00 01** policies that currently use it. Do **not** use it on any new policies.

Use Replacement Cost – North Carolina Endorsement **DP 32 62.**

RULE A5.
INSTALLMENT PAYMENT PLAN

When an annual policy is issued on an installment basis, the following rules apply:

A. The first installment shall be due on the effective date of the policy and the due date of the last installment shall be no later than one month prior to the policy anniversary date.

B. The premium calculated for the first installment payment, exclusive of installment charges, shall not be less than the pro rata charge for the period from the inception date of the policy to the due date of the next installment.

C. Refer to the state rates for the additional charge that shall be made for each installment.

RULE A6.
UNPROTECTED DWELLINGS – PROTECTION CLASS 9, 9E, 9S OR 10

A. Unprotected Dwellings

Unprotected dwellings are dwellings located in areas:

1. With no fire protection, in which case, Class 10 premiums apply; or

2. Designated as protection Class 9, 9E, 9S or 10, in which case, the premiums shown for these classifications apply.

B. Seasonal Dwelling

1. When the heating, plumbing and telephone facilities are suspended during the period of seasonal unoccupancy, attach Seasonal Dwelling – North Carolina Endorsement **DP 32 47** to the policy.

2. To determine the premium, multiply the premium developed in Paragraph **A.** by a factor of 1.10.

C. Vacancy Period Extension

The policy provides coverage for a vacant dwelling only if the period of vacancy does not exceed 60 consecutive days. This period may be extended by use of one of the two following options:

1. Vacancy And/Or Unoccupancy Permit Unprotected Dwellings – North Carolina Endorsement **DP 32 52**

The additional premium for this option shall be the lower of the following calculations:

a. Multiply the limits of liability shown in the policy for Coverages **A, B** and **C** and for other coverages by the rate displayed on the state rates Table **A6.C.1.a.(R).**

b. Multiply the policy premium for all perils and coverages by a factor of .10 for each additional 30 consecutive day period (or fraction thereof) of vacancy.

2. Two Thirds Vacancy Clause Unprotected Dwellings – North Carolina Endorsement **DP 32 53**

There is no additional premium for this option, but, during the additional period of vacancy, policy limits are reduced by 33 1/3%.

D. Unoccupancy Period Extension

The policy provides coverage for an unoccupied dwelling only if the period of unoccupancy does not exceed 90 consecutive days. This period may be extended – at no additional charge – for successive periods of up to:

1. 90 consecutive days each, for non-seasonal dwellings, or

2. 10 months each, for seasonal dwellings.

Use Vacancy And/Or Unoccupancy Permit – Unprotected Dwellings – North Carolina Endorsement **DP 32 52.**

RULE A7.
PRIMARY INSURANCE NOTICE

A. Endorsement

Coverage	DP 00 01	DP 00 02 And DP 00 03
A	DP 32 80	DP 32 83
B	DP 32 81	DP 32 84
C	DP 32 82	DP 32 85

Table A7.A. Primary Insurance Notice

Use the appropriate Primary Insurance Endorsement(s), specified in Table **A7.A.,** only with a North Carolina Joint Underwriting Association (NCJUA) or North Carolina Insurance Underwriting Association (NCIUA) policy insuring a dwelling building covered under Coverage **A,** structures covered under Coverage **B** or personal property covered under Coverage **C.**

These endorsements replace the Other Insurance Condition in the policy form and make the NCJUA or NCIUA policy primary insurance for the insured property specified on the endorsement. Primary Insurance may be written for Coverages **A, B** and/or **C.** When a Primary Insurance Endorsement is not attached to the policy, the Other Insurance Condition in the policy form is unchanged.

B. Rating

1. Primary Insurance

a. When the Coverage **A, B** or **C** Limit of Liability is less than 100% of actual cash value or replacement value, divide the selected limit by the ACV or replacement value, whichever applies. The result is the "Percent of Total Value".

b. Go to the First Loss Table and select the factor that corresponds to the "Percent of Total Value" computed in Paragraph **1.a.**

c. Multiply the total value of the dwelling (actual or replacement) by the factor selected in Paragraph **1.b.**

d. Use the resulting product as the limit for computing the Coverage **A, B** or **C** premium.

2. Coverage A Example

Replacement Value of Dwelling: $6,000,000

Primary Policy – Coverage **A** Limit: $1,500,000

a. Divide Coverage **A** Limit by Replacement Value limit ($1,500,000/$6,000,000 = 25% or 25.00 Percent of Total Value).

b. Find Factor that corresponds to Percent of Total Value.

c. Multiply Replacement Value by Factor from Column **2** ($6,000,000)(.712) = $4,272,000.

d. Use resulting product to compute Coverage **A** premium. (Rate the policy as if $4,272,000 is the Coverage **A** limit to be insured.)

Note

This procedure is used to determine the appropriate exposure basis for primary insurance. It does not increase the amount of coverage available.

DP-E-3
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RULE A7.
PRIMARY INSURANCE NOTICE Cont'd)

FIRST LOSS TABLE

(Used When Primary Coverage Provided)

% Of Total Value	Factor	% Of Total Value	Factor	% Of Total Value	Factor
1.00	.224	10.00	.540	56.00	.841
1.10	.229	11.00	.551	57.00	.844
1.20	.235	12.00	.563	58.00	.846
1.30	.241	13.00	.574	59.00	.848
1.40	.247	14.00	.586	60.00	.850
1.50	.252	15.00	.597	61.00	.853
1.60	.258	16.00	.609	62.00	.855
1.70	.264	17.00	.620	63.00	.857
1.80	.270	18.00	.632	64.00	.860
1.90	.275	19.00	.643	65.00	.862
2.00	.281	20.00	.655	66.00	.864
2.10	.284	21.00	.660	67.00	.867
2.20	.287	22.00	.678	68.00	.869
2.30	.290	23.00	.689	69.00	.871
2.40	.293	24.00	.701	70.00	.873
2.50	.296	25.00	.712	71.00	.876
2.60	.298	26.00	.720	72.00	.878
2.70	.301	27.00	.721	73.00	.880
2.80	.304	28.00	.734	74.00	.883
2.90	.307	29.00	.741	75.00	.885
3.00	.310	30.00	.748	76.00	.890
3.10	.316	31.00	.756	77.00	.894
3.20	.321	32.00	.763	78.00	.899
3.30	.327	33.00	.770	79.00	.903
3.40	.333	34.00	.773	80.00	.908
3.50	.339	35.00	.776	81.00	.913
3.60	.344	36.00	.780	82.00	.917
3.70	.350	37.00	.784	83.00	.922
3.80	.356	38.00	.788	84.00	.926
3.90	.362	39.00	.792	85.00	.931
4.00	.367	40.00	.795	86.00	.936
4.10	.373	41.00	.799	87.00	.940
4.20	.379	42.00	.802	88.00	.945
4.30	.385	43.00	.804	89.00	.949
4.40	.390	44.00	.808	90.00	.954
4.50	.396	45.00	.811	91.00	.959
4.60	.402	46.00	.815	92.00	.963
4.70	.408	47.00	.818	93.00	.968
4.80	.413	48.00	.821	94.00	.972
4.90	.419	49.00	.824	95.00	.977
5.00	.425	50.00	.827	96.00	.982
6.00	.448	51.00	.830	97.00	.986
7.00	.471	52.00	.832	98.00	.991
7.50	.482	53.00	.834	99.00	.995
8.00	.494	54.00	.837	100.00	1.000
9.00	.517	55.00	.839		

RULE A8.
OPTIONAL RATING CHARACTERISTICS

Companies may use the following optional rating characteristics or any combination of such optional rating characteristics and Bureau filed characteristics to determine rates, as long as applicable legal requirements are satisfied. The resulting premium shall not exceed the premium that would have been determined using the rates, rating plans, classifications, schedules, rules and standards promulgated by the Bureau, except as provided by statute. The rating factor for any combination of the following optional risk characteristics cannot exceed 1.00, unless the resulting premium does not exceed the Bureau premium.

A. Policy characteristics not otherwise recognized in this manual. Examples include: account or multi-policy credit; tiers; continuity of coverage; coverages purchased; intra-agency transfers; payment history; payment options; prior insurance; and new and renewal status.

B. Policyholder/Insured personal characteristics not otherwise recognized in this manual. Examples include: smoker/non-smoker status; credit information; loss history; loss prevention training/education; age; work status; marital status; number of years owned; household composition; and good student/education.

C. Dwelling characteristics not otherwise recognized in this manual. Examples include: gated community; retirement community; limited access community; revitalized/renovated home; security, safety or loss deterrent systems or devices; age of home; and construction type and quality.

D. Affinity group or other group not otherwise recognized in this manual.

E. Any other rating characteristics or combination of characteristics if filed by a company and approved by the Commissioner.

RULE A9.
WINDSTORM MITIGATION PROGRAM

A. Introduction

With respect to risks located in Territories 110, 120, 130, 140, 150 and 160, premium credits shall be made available for insureds who build, rebuild or retrofit certain residential dwellings, in accordance with specified standards, to better resist hurricanes and other catastrophic windstorm events.

B. Eligibility

1. A dwelling may be eligible for a premium credit if:

    a. The dwelling has been designed and constructed in conformity with, and has been certified as meeting, the Hurricane, Tornado and Hail and High Wind requirements of the Hurricane Fortified for Safer Living® (Fortified) program promulgated by the Institute for Business and Home Safety® (IBHS);

    b. The dwelling has been certified as meeting, either the Bronze, Silver or Gold hurricane mitigation measures in the Hurricane Fortified for Existing Homes® program promulgated by the IBHS;

    c. The dwelling contains Opening Protection in accordance with the qualification requirements set forth in Paragraph **D.1.b.;** or

    d. The dwelling contains a Total Hip Roof.

2. The provisions of this rule do not apply:

    a. To condominiums or tenant policies.

    b. If the policy excludes the peril of Windstorm or Hail.

    c. To dwellings under construction.

    d. To Coverage **C** – Personal Property unless the policy also provides Coverage **A** – Dwelling.

    e. To mobile homes.

3. To be eligible for a premium credit, mitigation features are not required for adjacent structures including, but not limited to, detached garages, storage sheds, barns, apartments, etc. located on the insured premises.

C. Proof of Compliance

The named insured must submit proof that the windstorm loss mitigation features and/or construction techniques have been implemented for each of the following:

1. IBHS Hurricane Fortified for Safer Living®

The named insured shall provide a copy of the proper designation certificate from the IBHS issued for the dwelling.

2. IBHS Hurricane Fortified for Existing Homes®

The named insured shall provide a copy of the proper designation certificate from the IBHS issued for the dwelling. The credit will apply for five years from the date of designation. In order to continue receiving the mitigation credit after five years, the dwelling must be re-inspected and re-designated by the IBHS. If the IBHS designation expires, the applicable mitigation credit will expire upon renewal.

3. Opening Protection

The existence of Opening Protection may be verified by proof of installation.

4. Total Hip Roof

The existence of a hip roof may be verified through photographs of the roof.

D. Description of Mitigation Credit Tables

With respect to dwellings to which this rule applies and subject to all other provisions of this Windstorm Mitigation Program, the following approved and properly maintained windstorm mitigation features shall be recognized for a premium credit.

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RULE A9.
WINDSTORM MITIGATION PROGRAM (Cont'd)

1. Mitigation Features

a. IBHS Hurricane Fortified Homes

(1) A home designated by the IBHS as Hurricane Fortified for Safer Living®.

(2) A home designated by the IBHS as Hurricane Fortified for Existing Homes®, including:

(i) Hurricane Fortified for Existing Homes Bronze, Option 1

(ii) Hurricane Fortified for Existing Homes Bronze, Option 2

(iii) Hurricane Fortified for Existing Homes Silver, Option 1

(iv) Hurricane Fortified for Existing Homes Silver, Option 2

(v) Hurricane Fortified for Existing Homes Gold, Option 1

(vi) Hurricane Fortified for Existing Homes Gold, Option 2

b. Opening Protection

(1) Building opening protective features must have been tested and/or certified as having met standards of the American Society for Testing and Materials ASTM E 1886 (standard test method) and ASTM E 1996 (standard specification). Such opening protective features shall be considered qualified.

(2) Qualifying opening protection must be present at all exterior envelope openings (such as windows, garage doors, sliding doors, swinging doors, glass block, door sidelights, and skylights) on the dwelling structure. For the credit to apply, the following conditions must be met:

(i) In accordance with the qualification requirements set forth in Paragraph **D.1.b.(1):**

(a) All exterior building envelope openings with glazing (e.g. glass) shall have qualified impact-resistant and wind pressure-resistant opening protection;

(b) All exterior building envelope openings without glazing shall have qualified wind pressure-resistant opening protection; and

(c) All garage doors (with and without glazing) shall meet or exceed a qualified minimum pressure resistance.

(ii) Opening protection must be installed by a qualified contractor, according to the manufacturer's specifications.

(iii) Impact-resistant protective devices must not be made of wood structural panels, such as OSB or plywood, or be homemade.

c. Total Hip Roof

A Total Hip Roof is a roof that slopes in four directions such that the end formed by the intersection of slopes is a triangle.

E. Premium Determination

1. To compute the Extended Coverage Non-seasonal or Seasonal Base Premium or the Broad or Special Form Non-seasonal Base Premium:

a. Determine the Extended Coverage, Broad or Special Form Key Premium as described in Rule **301.**

b. Subtract the Coverage **A** Windstorm Loss Mitigation Credit shown on the state rates from the Coverage **A** Extended Coverage, Broad or Special Form Key Premium. If applicable, also subtract the Coverage **C** Windstorm Loss Mitigation Credit, shown on the state rates from the Coverage **C** Extended Coverage, Broad or Special Form Key Premium.

c. Multiply the Extended Coverage, Broad or Special Form Key Premium excluding Windstorm Loss Mitigation Coverage developed in Paragraph **E.1.b.** by the Key Factor for the desired limit of liability.

2. To compute the Seasonal Broad or Special Form Base Premium:

a. Determine the **DP 00 01** Extended Coverage Key Premium as described in Rule **301.**

b. Multiply the **DP 00 01** Extended Coverage Key Premium by the appropriate Seasonal factor shown in Table **301.A.#42(R)** or Table **301.A.#45(R)** to determine the Seasonal Broad or Special Form Key Premium.

c. Subtract the Coverage **A** Windstorm Loss Mitigation Credit shown in the state rates from the Coverage **A** Seasonal Broad or Special Form Key Premium determined in Paragraph **E.2.b.** If applicable, also subtract the Coverage **C** Windstorm Loss Mitigation Credit, shown on the state rates from the Coverage **C** Seasonal Broad or Special Form Key Premium.

d. Multiply the Seasonal Broad or Special Form Key Premium excluding Windstorm Loss Mitigation Coverage developed in Paragraph **E.2.c.** by the Key Factor for the desired limit of liability.

3. Mitigation Feature credits cannot be combined, except for Total Hip Roof and Opening Protection.

4. If mitigation measures are installed midterm, premium adjustment is required on a pro rata basis.

PART I
COVERAGE AND DEFINITION TYPE RULES

RULE 100.
INTRODUCTION

Paragraph **C.** does not apply.

RULE 103.
ELIGIBILITY

Paragraphs **B.1** and **B.4.** are replaced by the following:

1. Using Form **DP 00 01** only or **DP 00 02** in conjunction with Actual Cash Value Loss Settlement Endorsement **DP 04 76;**

4. For a policy period of not longer than three years; and

RULE 104.
PROTECTION CLASSIFICATION INFORMATION

Rule **104.** is replaced by the following:

Determine the ISO Public Protection classification; refer to ISO's Community Mitigation Classifications (CMC) Manual, applicable to the municipality or classified area where the insured property is located.

PART II
SERVICING TYPE RULES

RULE 201.
POLICY PERIOD

Paragraph **C.** is replaced by the following:

C. Three years in annual installments. Each annual installment shall be the annual premium then in effect for the company.

RULE 206.
MINIMUM PREMIUM

Paragraphs **D.** and **E.** are replaced by the following:

D. Refer to state company rates for the minimum premium.

RULE 208.
WAIVER OF PREMIUM

Paragraph **B.** is replaced by the following:

B. Refer to state company rates for amount that may be waived.

PART III
BASE PREMIUM COMPUTATION RULES

RULE 302.
VANDALISM AND MALICIOUS MISCHIEF – DP 00 01

The following is added to Rule **302.:**

The 60 day limit of vacancy may be extended. The charge for the additional period of vacancy shall be based on the difference between the premiums for vacant and non-vacant buildings, and shall be figured pro rata for the period allowed in the endorsement.

Use Vandalism And Malicious Mischief Vacancy Endorsement **DP 04 40.**

RULE 305.
LOSS SETTLEMENT OPTIONS

Paragraph **A.4.** is replaced by the following:

A. **Functional Replacement Cost Loss Settlement – Forms DP 00 02 And DP 00 03 Only**

4. **Endorsement**

Use Functional Replacement Cost Loss Settlement – North Carolina Endorsement **DP 32 63.**

Paragraph **B.** is replaced by the following:

B. **Actual Cash Value Loss Settlement – Forms DP 00 02 And DP 00 03 Only**

1. **Introduction**

The policy provides building loss settlement on a replacement cost basis if, at the time of loss, the amount of insurance on the damaged building represents at least 80% of the full replacement cost of the building immediately before the loss.

2. **Coverage Description**

The policy may be endorsed to provide building loss settlement exclusively on an actual cash value basis if, on the inception date of the policy, the Coverage **A** limit of liability selected by the insured is less than 80% of the full replacement cost of the dwelling.

3. **Mobile Or Trailer Home**

When written in conjunction with this endorsement, Form **DP 00 02** may be used to insure a mobile or trailer home.

To develop the Base Premium, multiply the premium developed in Rule **301.** by a factor of .98.

RULE 305.
LOSS SETTLEMENT OPTIONS (Cont'd)

4. Dwelling Building Other Than Mobile Or Trailer Home

The premium is computed as follows:

a. Multiply the Coverage **A** limit of liability by the appropriate factor from the following table and round to the nearest $1,000:

% Of Replacement Value*	Factor
20%	4.00
30%	2.67
40%	2.00
50%	1.60
60%	1.33
70%	1.14

Table 305.B.4.a. Factors

b. Develop a Base Premium in accordance with Rule **301.** for the amount of insurance computed in Paragraph **B.4.a.**

c. Multiply the premium determined in Paragraph **B.4.b.** by the appropriate factor from the following table:

% Of Replacement Value*	Factor
20%	.73
30%	.74
40%	.75
50%	.76
60%	.77
70%	.78
80%	.80

Table 305.B.4.c. Factors

5. Endorsement

Use Actual Cash Value Loss Settlement Endorsement **DP 04 76.**

PART IV
ADJUSTED BASE PREMIUM COMPUTATION RULES

RULE 401.
SUPERIOR CONSTRUCTION

Table **401.C.** is replaced by the following:

Classifications	Fire	E.C., Broad & Special Forms
Fire Resistive & Masonry Non-combustible	.50	.75
Non-combustible	.50	1.00

Table 401.C. Superior Construction Factors

RULE 404.
MOBILE OR TRAILER HOMES – DP 00 01 ONLY OR
DP 00 02 WITH DP 04 76

The title of Rule **404.**, Mobile Or Trailer Homes – **DP 00 01,** is replaced by the preceding title.

RULE 406.
DEDUCTIBLES

Rule **406.** is replaced by the following:

All policies are subject to a deductible that applies to loss from all perils, except Earthquake. A separate deductible type applies to Earthquake Coverage as described in Rule **509.**

Refer to the Earthquake Coverage rule for the applicable deductible provision.

A. Base Deductible

$500 Deductible

B. Optional Deductibles

1. All Perils Deductibles

To compute the premium for these options, multiply the Base Premium for the Base Deductible by the factors selected from the following tables:

Fire				
Coverage A, B, D Or E And Coverage Options For Buildings And Non-building Structures				
	Coverages A, B, D And E Limit (Expressed In $)			
Deductibles	**Up To 125,000**	**125,001 To 175,000**	**175,001 To 250,000**	**250,001 And Above**
$ 100*	1.080	1.070	1.060	1.050
250*	1.040	1.035	1.030	1.025
1,000	0.981	0.987	0.988	0.992
2,500	0.933	0.953	0.959	0.973
5,000	0.865	0.906	0.919	0.945
7,500	0.809	0.866	0.884	0.922
10,000	0.759	0.829	0.854	0.901
* Refer to state rates for the minimum annual additional premium charge that applies per location for all $100 and $250 Fire Deductibles.				

Table 406.B.1.#1 Fire Coverage A, B, D Or E Deductibles

RULE 406.
DEDUCTIBLES (Cont'd)

Fire	
Coverage C And Other Personal Property Coverage Options	
Deductibles	**Factors**
$ 100∗	1.070
250∗	1.035
1,000	0.989
2,500	0.961
5,000	0.923
7,500	0.891
10,000	0.862
∗ Refer to state rates for the minimum annual additional premium charge that applies per location for all $100 and $250 Fire Deductibles.	

Table 406.B.1.#2 Fire Coverage C Deductibles

Territories 110, 120, 130, 140, 150 and 160 (Beach & Coastal)	
E.C., V. & M.M., Broad And Special Forms	
Coverage C And Other Personal Property Coverage Options	
Deductibles	**Factors**
$ 100∗	1.030
250∗	1.016
1,000	0.973
2,500	0.910
5,000	0.833
7,500	0.775
10,000	0.728
∗ Refer to state rates for the minimum annual additional premium charge that applies per location for all $100 and $250 E.C., V. & M.M., Broad And Special Forms Deductibles.	

Table 406.B.1.#4 E.C., V. & M.M., Broad And Special Forms Coverage C Deductibles

Territories 110, 120, 130, 140, 150 and 160 (Beach & Coastal)				
E.C., V. & M.M., Broad And Special Forms				
Coverage A, B, D Or E And Coverage Options For Building And Non-building Structures				
	Coverage A, B, D Or E Limit (Expressed In $)			
Deductibles	**Up To 125,000**	**125,001 To 175,000**	**175,001 To 250,000**	**250,001 And Above**
$ 100∗	1.072	1.047	1.035	1.022
250∗	1.040	1.027	1.021	1.011
1,000	0.935	0.957	0.967	0.980
2,500	0.800	0.857	0.888	0.935
5,000	0.665	0.741	0.791	0.874
7,500	0.582	0.660	0.719	0.825
10,000	0.530	0.599	0.662	0.784
∗ Refer to state rates for the minimum annual additional premium charge that applies per location for all $100 and $250 E.C., V. & M.M., Broad And Special Forms Deductibles.				

Table 406.B.1.#3 E.C., V. & M.M., Broad And Special Forms Coverage A, B, D Or E Deductibles

Territories 170-390 (Inland)				
E.C., V. & M.M., Broad And Special Forms				
Coverage A, B, D Or E And Coverage Options For Building And Non-building Structures				
	Coverage A, B, D Or E Limit (Expressed In $)			
Deductibles	**Up To 125,000**	**125,001 To 175,000**	**175,001 To 250,000**	**250,001 And Above**
$ 100∗	1.108	1.083	1.073	1.056
250∗	1.060	1.047	1.044	1.034
1,000	0.910	0.928	0.939	0.948
2,500	0.727	0.773	0.802	0.838
5,000	0.548	0.603	0.645	0.711
7,500	0.451	0.500	0.541	0.621
10,000	0.393	0.436	0.472	0.555
∗ Refer to state rates for the minimum annual additional premium charge that applies per location for all $100 and $250 E.C., V. & M.M., Broad And Special Forms Deductibles.				

Table 406.B.1.#5 E.C., V. & M.M., Broad And Special Forms Coverage A, B, D Or E Deductibles

RULE 406.
DEDUCTIBLES (Cont'd)

Territories 170-390 (Inland)	
E.C., V. & M.M., Broad And Special Forms	
Coverage C And Other Personal Property Coverage Options	
Deductibles	Factors
$ 100∗	1.077
250*	1.045
1,000	0.936
2,500	0.800
5,000	0.651
7,500	0.555
10,000	0.489
∗ Refer to state rates for the minimum annual additional premium charge that applies per location for all $100 and $250 E.C., V. & M.M., Broad And Special Forms Deductibles.	

Table 406.B.1.#6 E.C., V. & M.M., Broad And Special Forms Coverage C Deductibles

2. Windstorm Or Hail Deductibles

When the policy covers the peril of Windstorm or Hail, the following deductible options may be used in conjunction with a deductible applicable to all other perils covered under Extended Coverage, Broad or Special Forms. They may not be used on a policy in conjunction with a Named Storm deductible as described in Paragraph **3.**

a. Percentage Deductibles

(1) Deductible Amounts

This option provides for higher Windstorm or Hail percentage deductibles of 1%, 2%, 5%, 7.5% and 10% of the limit of liability that applies to Coverage **A, B, D** or **E,** whichever is greatest, when the dollar amount of the percentage deductible selected exceeds the amount of the All Other Perils deductible. This option is not available for policies covering only personal property.

(2) Endorsement

Use Windstorm Or Hail Percentage Deductible Endorsement **DP 03 12.**

(3) Declarations Instructions

Enter, on the policy Declarations, the percentage amount that applies to Windstorm or Hail and the dollar amount that applies to All Other Perils. For example:

Deductible – Windstorm or Hail 2% of the Coverage **A** limit and $500 for All Other Perils.

(4) Deductible Application

In the event of a Windstorm or Hail loss to covered property, the dollar amount is deducted from the total of the loss for all coverages.

(5) Coverage Options

The deductible factors for Coverage **A, B, D** or **E** and Coverage Options For Buildings And Non-building Structures differ by the deductible percentage amounts that apply to Windstorm or Hail, deductible amounts that apply to other perils, and the Coverage **A, B, D** or **E** limit.

The deductible factors for Coverage **C** and Other Personal Property Coverage Options differ by the deductible percentage amounts that apply to Windstorm or Hail and the deductible amounts that apply to other perils.

(6) Use Of Factors

The factors for the Windstorm or Hail Deductibles incorporate the factors for the All Perils Deductibles. Do not use the factors for the All Perils Deductibles when rating a policy with a higher Windstorm or Hail deductible.

(7) Deductible Factors

When the property is located in an area serviced by the North Carolina Insurance Underwriting Association (NCIUA – Territories 110, 120, 130, 140, 150 and 160), additional calculations must be performed to ensure that the premium credit applied to the deductible is **not** greater than the premium credit that would be applied if the peril of Windstorm or Hail were excluded from the policy.

RULE 406.
DEDUCTIBLES (Cont'd)

(a) Property **Not** Located in Area Serviced by the NCIUA

To compute the premium for this provision, multiply the Extended Coverage, Broad or Special Form Base Premium for the Base Deductible for each coverage insured under the policy by the factor selected for the desired windstorm or hail deductible options from the following tables.

(b) Property **Is** Located in Area Serviced by the NCIUA

To determine if an "adjusted deductible credit" or the calculated deductible credit applies, complete each of the following steps:

Step **1.** Multiply the windstorm or hail exclusion credit shown in the state rates, under Additional Rule **A3.** Windstorm Or Hail Exclusion – Territories 110, 120, 130, 140, 150 And 160 Only, by the Key Factor for the same amount of insurance used to determine the Extended Coverage, Broad or Special Form Base Premium.

Step **2.** Multiply the result determined in Step **1.** by .9 to determine the "adjusted deductible credit".

Step **3.** Select the factor for the desired windstorm or hail deductible option from the following tables and subtract the factor from unity (1.00).

Step **4.** Multiply the factor determined in Step **3.** by the Extended Coverage, Broad or Special Form Base Premium. The result is the windstorm or hail deductible credit.

Step **5.** Compare the results in Steps **2.** and **4.** If the result in:

Step **2.** is **less than** the result in Step **4.,** to compute the premium, subtract the "adjusted deductible credit" from the Extended Coverage, Broad or Special Form Base Premium.

Step **2.** is **greater than or equal to** Step **4.,** multiply the Extended Coverage, Broad or Special Form Base Premium by the factor for the desired windstorm or hail deductible option.

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RULE 406.
DEDUCTIBLES (Cont'd)

Territories 110, 120, 130, 140, 150 And 160 (Beach & Coastal)				
Coverage A, B, D Or E And Coverage Options For Buildings And Non-building Structures				
Windstorm Or Hail Deductible Percentage	All Other Perils Deductible Amounts	Coverages A, B, D And E Limit (Expressed In $)		
		Up To 125,000	125,001 To 175,000	175,001 To 250,000	250,001 And Above
1%	$ 100	0.956	0.926	0.916	0.899
	250	0.952	0.925	0.915	0.898
	500	0.946	0.924	0.913	0.897
	1,000	0.933	0.921	0.911	0.895
	2,500	–	–	–	0.879
	5,000	–	–	–	0.878
	7,500	–	–	–	0.872
	10,000	–	–	–	0.855
2%	100	0.868	0.841	0.832	0.818
	250	0.866	0.840	0.832	0.817
	500	0.863	0.838	0.830	0.816
	1,000	0.856	0.836	0.828	0.815
	2,500	–	0.830	0.823	0.810
	5,000	–	–	–	0.805
	7,500	–	–	–	0.797
	10,000	–	–	–	0.792
5%	100	0.705	0.680	0.675	0.665
	250	0.704	0.679	0.674	0.664
	500	0.701	0.678	0.673	0.663
	1,000	0.697	0.675	0.670	0.661
	2,500	0.686	0.669	0.665	0.657
	5,000	0.671	0.663	0.659	0.652
	7,500	–	0.657	0.655	0.648
	10,000	–	–	0.651	0.646
7.5%	100	0.622	0.599	0.594	0.585
	250	0.620	0.598	0.593	0.585
	500	0.618	0.596	0.592	0.584
	1,000	0.615	0.594	0.590	0.582
	2,500	0.606	0.588	0.585	0.577
	5,000	0.594	0.581	0.578	0.572
	7,500	0.585	0.578	0.574	0.569
	10,000	–	0.574	0.572	0.566
10%	100	0.557	0.535	0.531	0.522
	250	0.555	0.534	0.530	0.522
	500	0.553	0.533	0.529	0.521
	1,000	0.550	0.530	0.527	0.519
	2,500	0.542	0.524	0.521	0.515
	5,000	0.532	0.518	0.515	0.510
	7,500	0.524	0.514	0.511	0.506
	10,000	0.518	0.511	0.509	0.504

Table 406.B.2.a.(7)#1 Coverage A, B, D Or E Windstorm
Or Hail Percentage Deductibles

RULE 406.
DEDUCTIBLES (Cont'd)

Territories 110, 120, 130, 140, 150 And 160 (Beach & Coastal)							
Coverage C And Other Personal Property Coverage Options∗							
Windstorm Or Hail Deductible Percentage	**All Other Perils Deductible Amounts (Expressed In $)**						
	100	**250**	**500**	**1,000**	**2,500**	**5,000**	**7,500**	**10,000**
1%	0.909	0.908	0.906	0.902	0.890	0.876	0.870	0.853
2%	0.827	0.826	0.825	0.822	0.815	0.804	0.795	0.791
5%	0.671	0.670	0.669	0.667	0.662	0.655	0.650	0.645
7.5%	0.591	0.590	0.589	0.587	0.582	0.575	0.571	0.568
10%	0.528	0.527	0.526	0.523	0.518	0.513	0.508	0.505
∗ Only use when policy also covers building or non-building structures.							

**Table 406.B.2.a.(7)#2 Coverage C And Other Personal
Property Windstorm Or Hail Percentage Deductibles**

RULE 406.
DEDUCTIBLES (Cont'd)

Territories 170-390 (Inland)				
Coverage A, B, D Or E And Coverage Options For Buildings And Non-building Structures				
Windstorm Or Hail Deductible Percentage	**All Other Perils Deductible Amounts**	**Coverages A, B, D And E Limit (Expressed In $)**		
		Up To 125,000	**125,001 To 175,000**	**175,001 To 250,000**	**250,001 And Above**
1%	$ 100	0.990	0.947	0.926	0.885
	250	0.975	0.937	0.917	0.878
	500	0.949	0.921	0.902	0.867
	1,000	0.903	0.893	0.878	0.848
	2,500	–	–	–	0.802
	5,000	–	–	–	0.711
	7,500	–	–	–	0.654
	10,000	–	–	–	0.608
2%	100	0.916	0.866	0.843	0.802
	250	0.902	0.855	0.833	0.795
	500	0.879	0.840	0.819	0.784
	1,000	0.841	0.812	0.794	0.765
	2,500	–	0.748	0.737	0.718
	5,000	–	–	–	0.664
	7,500	–	–	–	0.605
	10,000	–	–	–	0.567
5%	100	0.785	0.730	0.711	0.688
	250	0.771	0.720	0.701	0.681
	500	0.749	0.705	0.687	0.669
	1,000	0.715	0.676	0.663	0.650
	2,500	0.634	0.612	0.605	0.604
	5,000	0.540	0.542	0.539	0.549
	7,500	–	0.495	0.496	0.511
	10,000	–	–	0.464	0.483
7.5%	100	0.729	0.681	0.667	0.650
	250	0.715	0.670	0.658	0.643
	500	0.693	0.655	0.643	0.632
	1,000	0.659	0.626	0.619	0.613
	2,500	0.582	0.563	0.561	0.566
	5,000	0.498	0.492	0.495	0.512
	7,500	0.444	0.449	0.453	0.474
	10,000	–	0.421	0.423	0.446
10%	100	0.692	0.650	0.640	0.626
	250	0.678	0.639	0.630	0.619
	500	0.656	0.624	0.616	0.608
	1,000	0.623	0.596	0.591	0.589
	2,500	0.548	0.532	0.534	0.542
	5,000	0.466	0.461	0.468	0.487
	7,500	0.417	0.419	0.425	0.449
	10,000	0.384	0.391	0.396	0.422

Table 406.B.2.a.(7)#3 Coverage A, B, D Or E Windstorm
Or Hail Percentage Deductibles

RULE 406.
DEDUCTIBLES (Cont'd)

Territories 170-390 (Inland)							
Coverage C And Other Personal Property Coverage Options∗							
Windstorm Or Hail Deductible Percentage	**All Other Perils Deductible Amounts (Expressed In $)**						
	100	**250**	**500**	**1,000**	**2,500**	**5,000**	**7,500**	**10,000**
1%	0.927	0.917	0.901	0.873	0.789	0.693	0.634	0.587
2%	0.845	0.836	0.821	0.796	0.733	0.646	0.585	0.548
5%	0.719	0.709	0.695	0.671	0.616	0.550	0.504	0.469
7.5%	0.674	0.665	0.650	0.626	0.573	0.510	0.467	0.436
10%	0.646	0.636	0.621	0.598	0.545	0.483	0.441	0.412
∗ Only use when policy also covers building or non-building structures.							

Table 406.B.2.a.(7)#4 Coverage C And Other Personal Property Windstorm Or Hail Percentage Deductibles

b. Higher Fixed-Dollar Deductibles

(1) Deductible Amounts

This option provides for higher Windstorm or Hail fixed-dollar deductible amounts of $1,000, $2,000, $5,000, $7,500 and $10,000 when the dollar amount of the higher fixed-dollar deductible selected exceeds the amount of the All Other Perils deductible. This option is not available for policies covering only personal property.

(2) Endorsement

An endorsement is not required.

(3) Declarations Instructions

Separately enter, on the policy Declarations, the deductible amounts that apply to Windstorm or Hail and All Other Perils. For example: $1,000 for Windstorm or Hail and $500 for All Other Perils.

(4) Deductible Application

In the event of a Windstorm or Hail loss to covered property, the dollar amount is deducted from the total of the loss for all coverages.

(5) Coverage Options

The deductible factors for Coverage **A, B, D** or **E** and Coverage Options For Buildings And Non-building Structures differ by the deductible amounts that apply to Windstorm or Hail and to other perils and the Coverage **A, B, D** or **E** limit.

The deductible factors for Coverage **C** and Other Personal Property Coverage Options differ by the deductible amounts that apply to Windstorm or Hail and other perils.

(6) Use Of Factors

The factors for the Windstorm or Hail Deductibles incorporate the factors for the All Perils Deductibles. Do not use the factors for the All Perils Deductibles when rating a policy with a higher Windstorm or Hail deductible.

(7) Deductible Factors

When the property is located in an area serviced by the North Carolina Insurance Underwriting Association (NCIUA – Territories 110, 120, 130, 140, 150 and 160), additional calculations must be performed to ensure that the premium credit applied to the deductible is **not** greater than the premium credit that would be applied if the peril of Windstorm or Hail were excluded from the policy.

RULE 406.
DEDUCTIBLES (Cont'd)

(a) Property **Not** Located in Area Serviced by the NCIUA

Multiply the Extended Coverage, Broad or Special Form Base Premium for the Base Deductible for each coverage insured under the policy by the factor selected for the desired windstorm or hail deductible options from the following tables.

(b) Property **Is** Located in Area Serviced by the NCIUA

To determine if an "adjusted deductible credit" or the calculated deductible credit applies, complete each of the following steps:

Step **1.** Multiply the windstorm or hail exclusion credit shown in the state rates under Additional Rule **A3.** Windstorm Or Hail Exclusion – Territories 110, 120, 130, 140, 150 and 160 Only, by the Key Factor for the same amount of insurance used to determine the Extended Coverage, Broad or Special Form Base Premium.

Step **2.** Multiply the result determined in Step **1.** by .9 to determine the "adjusted deductible credit".

Step **3.** Select the factor for the desired windstorm or hail deductible option from the following tables and subtract the factor from unity (1.00).

Step **4.** Multiply the factor determined in Step **3.** by the Extended Coverage, Broad or Special Form Base Premium. The result is the windstorm or hail deductible credit.

Step **5.** Compare the results in Steps **2.** and **4.** If the result in:

Step **2.** is **less than** the result in Step **4.,** to compute the premium, subtract the "adjusted deductible credit" from the Extended Coverage, Broad or Special Form Base Premium.

Step **2.** is **greater than or equal to** Step **4.,** multiply the Extended Coverage, Broad or Special Form Base Premium by the factor for the desired windstorm or hail deductible option.

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RULE 406.
DEDUCTIBLES (Cont'd)

Territories 110, 120, 130, 140, 150 And 160 (Beach & Coastal)					
Coverage A, B, D Or E And Coverage Options For Buildings And Non-building Structures					
Windstorm Or Hail Deductible Amounts	**All Other Perils Deductible Amounts**	Coverage A Or B Limit (Expressed In $)			
		Up To 125,000	**125,001 To 175,000**	**175,001 To 250,000**	**250,001 And Above**
$ 1,000	$ 100	0.942	0.962	0.972	0.984
	250	0.940	0.961	0.971	0.983
	500	0.938	0.959	0.970	0.982
2,000	100	0.850	0.896	0.921	0.955
	250	0.849	0.895	0.920	0.954
	500	0.847	0.893	0.918	0.953
	1,000	0.843	0.891	0.916	0.952
5,000	100	0.685	0.758	0.807	0.887
	250	0.683	0.757	0.806	0.886
	500	0.681	0.756	0.805	0.885
	1,000	0.678	0.753	0.803	0.883
	2,500	0.672	0.747	0.797	0.879
7,500	100	0.606	0.681	0.738	0.841
	250	0.605	0.680	0.738	0.841
	500	0.603	0.679	0.736	0.840
	1,000	0.600	0.676	0.734	0.838
	2,500	0.593	0.670	0.729	0.833
	5,000	0.586	0.664	0.723	0.828
10,000	100	0.556	0.623	0.684	0.803
	250	0.555	0.622	0.684	0.802
	500	0.553	0.621	0.682	0.801
	1,000	0.550	0.618	0.680	0.799
	2,500	0.543	0.612	0.675	0.795
	5,000	0.536	0.606	0.669	0.790
	7,500	0.532	0.602	0.665	0.786

Table 406.B.2.b.(7)#1 Coverage A, B, D Or E Windstorm
Or Hail Fixed-dollar Deductibles

Territories 110, 120, 130, 140, 150 And 160 (Beach & Coastal)							
Coverage C And Other Personal Property Coverage Options∗							
Windstorm Or Hail Deductible Amounts	All Other Perils Deductible Amounts (Expressed In $)						
	100	**250**	**500**	**1,000**	**2,500**	**5,000**	**7,500**
$ 1,000	0.977	0.977	0.975	–	–	–	–
2,000	0.937	0.936	0.935	0.933	–	–	–
5,000	0.848	0.847	0.846	0.844	0.839	–	–
7,500	0.793	0.792	0.791	0.789	0.784	0.778	–
10,000	0.750	0.749	0.747	0.745	0.740	0.735	0.731
∗ Only use when policy also covers building or non-building structures.							

Table 406.B.2.b.(7)#2 Coverage C And Other Personal
Property Windstorm Or Hail Fixed-dollar Deductibles

RULE 406.
DEDUCTIBLES (Cont'd)

Territories 170-390 (Inland)					
Coverage A, B, D Or E And Coverage Options For Buildings And Non-building Structures					
Windstorm Or Hail Deductible Amounts	**All Other Perils Deductible Amounts**	**Coverage A Or B Limit (Expressed In $)**			
		Up To 125,000	**125,001 To 175,000**	**175,001 To 250,000**	**250,001 And Above**
$ 1,000	$ 100	0.979	0.983	0.987	0.985
	250	0.965	0.972	0.978	0.978
	500	0.943	0.957	0.963	0.967
2,000	100	0.900	0.917	0.930	0.940
	250	0.886	0.907	0.921	0.933
	500	0.864	0.892	0.906	0.922
	1,000	0.831	0.863	0.882	0.903
5,000	100	0.766	0.791	0.817	0.849
	250	0.752	0.781	0.808	0.842
	500	0.730	0.766	0.793	0.831
	1,000	0.697	0.737	0.769	0.812
	2,500	0.624	0.673	0.711	0.765
7,500	100	0.712	0.731	0.756	0.797
	250	0.698	0.721	0.747	0.790
	500	0.676	0.706	0.732	0.779
	1,000	0.643	0.677	0.708	0.760
	2,500	0.569	0.613	0.650	0.713
	5,000	0.494	0.543	0.584	0.659
10,000	100	0.681	0.695	0.716	0.759
	250	0.666	0.684	0.706	0.752
	500	0.645	0.669	0.692	0.741
	1,000	0.611	0.640	0.668	0.722
	2,500	0.538	0.577	0.610	0.675
	5,000	0.462	0.506	0.544	0.620
	7,500	0.420	0.463	0.501	0.582

Table 406.B.2.b.(7)#3 Coverage A, B, D Or E Windstorm
Or Hail Fixed-dollar Deductibles

Territories 170-390 (Inland)							
Coverage C And Other Personal Property Coverage Options∗							
Windstorm Or Hail Deductible Amounts	**All Other Perils Deductible Amounts (Expressed In $)**						
	100	**250**	**500**	**1,000**	**2,500**	**5,000**	**7,500**
$ 1,000	0.983	0.974	0.959	–	–	–	–
2,000	0.924	0.915	0.900	0.877	–	–	–
5,000	0.813	0.803	0.789	0.765	0.712	–	–
7,500	0.756	0.747	0.732	0.708	0.655	0.595	–
10,000	0.718	0.709	0.694	0.671	0.618	0.557	0.517
∗ Only use when policy also covers building or non-building structures.							

Table 406.B.2.b.(7)#4 Coverage C And Other Personal
Property Windstorm Or Hail Fixed-dollar Deductibles

RULE 406.
DEDUCTIBLES (Cont'd)

    3. Named Storm Deductibles – Territories 110, 120, 130, 140, 150 and 160

When the policy covers the peril of Windstorm or Hail, the following deductible options may be used in the listed territories in conjunction with the deductible applicable to all other Perils under Extended Coverage, Broad or Special Forms. They may not be used on a policy in conjunction with a Windstorm or Hail deductible as described in Paragraph **2.**

    a. Percentage Deductibles – Territories 110, 120, 130, 140, 150 and 160 Only

(1) Deductible Amounts

This option provides for higher Named Storm percentage deductibles of 1%, 2%, 5%, 7.5% and 10% of the limit of liability that applies to Coverage **A, B, D** or **E,** whichever is greatest, when the dollar amount of the percentage deductible selected exceeds the amount of the All Other Perils deductible. This option is not available for policies covering only personal property.

(2) Endorsement

Use Named Storm Deductible – North Carolina Endorsement **DP 32 18.**

(3) Declarations Instructions

Enter, on the policy Declarations, the percentage amount that applies to Named Storm and the dollar amount that applies to All Other Section **I** Perils. For example:

Deductible – Named Storm 2% of Coverage **A** limit and $500 for all other perils.

(4) Deductible Application

In the event of a Named Storm loss to covered property, the dollar amount is deducted from the total of the loss for all coverages.

(5) Coverage Options

The deductible factors for Coverage **A, B, D** or **E** and Coverage Options For Buildings and Non-building Structures differ by the deductible percentage amounts that apply to Named Storm, deductible amounts that apply to other perils and the Coverage **A, B, D** or **E** limit.

The deductible factors for Coverage **C** and Other Personal Property Coverage Options differ by the deductible percentage amounts that apply to Named Storm and the deductible amounts that apply to other perils.

(6) Use Of Factors

The factors displayed in Paragraph **B.3.a.(7)** incorporate the factors for the All Perils Deductibles. Do not use the factors for the All Perils Deductibles when rating a policy with a higher Named Storm deductible.

(7) Deductible Factors

When the property is located in an area serviced by the North Carolina Insurance Underwriting Association (NCIUA – Territories 110, 120, 130, 140, 150 and 160), additional calculations must be performed to ensure that the premium credit applied for the deductible is **not** greater than the premium credit that would be applied if the peril of Windstorm or Hail were excluded from the policy.

To determine if an "adjusted deductible credit" or the calculated deductible credit applies, complete each of the following steps:

Step **1.** Multiply the windstorm or hail exclusion credit shown in the state rate pages, under Additional Rule **A3.** Windstorm Or Hail Exclusion – Territories 110, 120, 130, 140, 150 and 160 Only, by the Key Factor for the same amount of insurance used to determine the Extended Coverage, Broad or Special Form Base Premium.

Step **2.** Multiply the result determined in Step **1.** by .9 to determine the "adjusted deductible credit".

Step **3.** Select the factor for the desired named storm deductible option from the following table and subtract that factor from unity (1.00).

Step **4.** Multiply the factor determined in Step **3.** by the Extended Coverage, Broad or Special Form Base Premium. The result is the named storm deductible credit.

Step **5.** Compare the results in Steps **2.** and **4.** If the result in:

Step **2.** is **less** than the result in Step **4.,** to compute the premium, subtract the "adjusted deductible credit" from the Extended Coverage, Broad or Special Form Base Premium.

Step **2.** is **greater than or equal to** the result in Step **4.,** multiply the Extended Coverage, Broad or Special Form Base Premium by the factor for the desired named storm deductible option.

RULE 406.
DEDUCTIBLES (Cont'd)

Territories 110, 120, 130, 140, 150 And 160 (Beach & Coastal)					
Coverage A, B, D Or E And Coverage Options For Buildings And Non-building Structures					
Named Storm Percentage	**All Other Perils Deductible Amounts**	**Coverage A, B, D Or E Limit (Expressed In $)**			
		Up To 125,000	**125,001 To 175,000**	**175,001 To 250,000**	**250,001 And Above**
1%	$ 100	0.958	0.928	0.918	0.902
	250	0.954	0.927	0.917	0.901
	500	0.947	0.925	0.915	0.900
	1,000	0.933	0.922	0.912	0.897
	2,500	–	–	–	0.886
	5,000	–	–	–	0.878
	7,500	–	–	–	0.872
	10,000	–	–	–	0.855
2%	100	0.872	0.845	0.837	0.824
	250	0.869	0.844	0.836	0.823
	500	0.865	0.842	0.834	0.821
	1,000	0.857	0.838	0.831	0.819
	2,500	–	0.831	0.824	0.813
	5,000	–	–	–	0.806
	7,500	–	–	–	0.798
	10,000	–	–	–	0.792
5%	100	0.711	0.688	0.683	0.673
	250	0.709	0.687	0.682	0.672
	500	0.707	0.685	0.680	0.671
	1,000	0.702	0.681	0.677	0.668
	2,500	0.689	0.674	0.670	0.663
	5,000	0.671	0.665	0.662	0.656
	7,500	–	0.657	0.656	0.651
	10,000	–	–	0.652	0.647
7.5%	100	0.629	0.608	0.603	0.594
	250	0.628	0.606	0.602	0.594
	500	0.625	0.605	0.600	0.592
	1,000	0.621	0.601	0.597	0.590
	2,500	0.609	0.593	0.590	0.584
	5,000	0.595	0.584	0.582	0.577
	7,500	0.585	0.579	0.577	0.572
	10,000	–	0.575	0.573	0.569
10%	100	0.565	0.545	0.541	0.532
	250	0.563	0.543	0.539	0.531
	500	0.561	0.541	0.538	0.530
	1,000	0.557	0.538	0.535	0.527
	2,500	0.546	0.530	0.528	0.521
	5,000	0.534	0.521	0.519	0.515
	7,500	0.525	0.516	0.514	0.510
	10,000	0.519	0.512	0.510	0.506

**Table 406.B.3.a.(7)#1 Coverage A, B, D Or E Named
Storm Percentage Deductibles**

RULE 406.
DEDUCTIBLES (Cont'd)

Territories 110, 120, 130, 140, 150 And 160 (Beach & Coastal)							
Coverage C And Other Personal Property Coverage Options∗							
	All Other Perils Deductible Amounts (Expressed In $)						
Named Storm Percentage	**100**	**250**	**500**	**1,000**	**2,500**	**5,000**	**7,500**	**10,000**
1%	0.912	0.910	0.908	0.904	0.890	0.876	0.869	0.852
2%	0.832	0.831	0.829	0.825	0.817	0.804	0.795	0.790
5%	0.679	0.678	0.676	0.673	0.666	0.658	0.651	0.646
7.5%	0.600	0.599	0.597	0.594	0.587	0.579	0.573	0.569
10%	0.537	0.536	0.534	0.531	0.525	0.516	0.511	0.507
∗ Only use when policy also covers building or non-building structures.							

Table 406.B.3.a.(7)#2 Coverage C And Other Personal
Property Named Storm Percentage Deductibles

RULE 406.
DEDUCTIBLES (Cont'd)

    b. Higher Fixed-dollar Deductibles – Territories 110, 120, 130, 140, 150 and 160 Only

      (1) Deductible Amounts

This option provides for higher Named Storm Fixed-dollar deductible amounts of $1,000, $2,000, $5,000, $7,500 and $10,000 when the dollar amount of the higher fixed-dollar deductible selected exceeds the amount of the All Other Perils deductible. This option is not available for policies covering only personal property.

      (2) Endorsement

Use Named Storm Deductible – North Carolina Endorsement **DP 32 18.**

      (3) Declarations Instructions

Enter, on the policy Declarations, the deductible amounts that apply to Named Storm and All Other Perils. For example: $1,000 for Named Storm and $500 for All Other Perils.

      (4) Deductible Application

In the event of a Named Storm loss to covered property, the dollar amount is deducted from the total of the loss for all coverages.

      (5) Coverage Options

The deductible factors for Coverage **A, B, D** or **E** and Coverage Options For Buildings And Non-building Structures differ by the deductible amounts that apply to Named Storm and to other perils and the Coverage **A, B, D** or **E** limit.

The deductible factors for Coverage **C** and Other Personal Property Coverage Options differ by the deductible amounts that apply to Named Storm and to other perils.

      (6) Use Of Factors

The factors displayed in Paragraph **B.3.b.(7)** incorporate the factors for the All Perils Deductibles. Do not use the factors for the All Perils Deductibles when rating a policy with a higher Named Storm deductible.

    (7) Deductible Factors

When the property is located in an area serviced by the North Carolina Insurance Underwriting Association (NCIUA – Territories 110, 120, 130, 140, 150 and 160), additional calculations must be performed to ensure that the premium credit applied for the deductible is not greater than the premium credit that would be applied if the peril of Windstorm or Hail were excluded from the policy.

To determine if an "adjusted deductible credit" or the calculated deductible credit applies, complete each of the following steps:

    Step **1.** Multiply the windstorm or hail exclusion credit shown in the state rate pages, under Additional Rule **A3.** Windstorm Or Hail Exclusion – Territories 110, 120, 130, 140, 150 And 160 Only, by the Key Factor for the same amount of insurance used to determine the Extended Coverage, Broad or Special Form Base Premium.

    Step **2.** Multiply the result determined in Step **1.** by .9 to determine the "adjusted deductible credit".

    Step **3.** Select the factor for the desired named storm deductible option from the following table and subtract that factor from unity (1.00).

    Step **4.** Multiply the factor determined in Step **3.** by the Extended Coverage, Broad or Special Form Base Premium. The result is the named storm deductible credit.

    Step **5.** Compare the results in Steps **2.** and **4.** If the result in:

Step **2.** is **less** than the result in Step **4.,** to compute the premium, subtract the "adjusted deductible credit" from the Extended Coverage, Broad or Special Form Base Premium.

Step **2.** is **greater than or equal to** the result in Step **4.,** multiply the Extended Coverage, Broad or Special Form Base Premium by the factor for the desired named storm deductible option.

RULE 406.
DEDUCTIBLES (Cont'd)

Territories 110, 120, 130, 140, 150 And 160 (Beach & Coastal)					
Coverage A, B, D Or E And Coverage Options For Buildings And Non-building Structures					
Named Storm Deductible Fixed-dollar Amounts	**All Other Perils Deductible Amounts**	Coverage A Or B Limit (Expressed In $)			
		Up To 125,000	**125,001 To 175,000**	**175,001 To 250,000**	**250,001 And Above**
$ 1,000	$ 100	0.943	0.963	0.973	0.985
	250	0.942	0.962	0.972	0.984
	500	0.939	0.960	0.970	0.983
2,000	100	0.853	0.899	0.923	0.957
	250	0.852	0.897	0.922	0.956
	500	0.849	0.895	0.920	0.955
	1,000	0.845	0.892	0.917	0.953
5,000	100	0.692	0.764	0.812	0.891
	250	0.690	0.763	0.811	0.890
	500	0.687	0.761	0.810	0.889
	1,000	0.683	0.757	0.807	0.887
	2,500	0.674	0.750	0.800	0.881
7,500	100	0.614	0.689	0.745	0.847
	250	0.613	0.687	0.744	0.846
	500	0.610	0.686	0.743	0.845
	1,000	0.606	0.682	0.740	0.842
	2,500	0.597	0.674	0.733	0.837
	5,000	0.587	0.665	0.724	0.830
10,000	100	0.565	0.631	0.692	0.809
	250	0.563	0.630	0.691	0.809
	500	0.561	0.628	0.690	0.807
	1,000	0.557	0.625	0.687	0.805
	2,500	0.548	0.617	0.680	0.799
	5,000	0.538	0.608	0.671	0.792
	7,500	0.533	0.602	0.666	0.787

Table 406.B.3.b.(7)#1 Coverage A, B, D Or E Named
Storm Higher Fixed-dollar Deductibles

Territories 110, 120, 130, 140, 150 And 160 (Beach & Coastal)							
Coverage C And Other Personal Property Coverage Options∗							
Named Storm Deductible Fixed-dollar Amounts	All Other Perils Deductible Amounts (Expressed In $)						
	100	**250**	**500**	**1,000**	**2,500**	**5,000**	**7,500**
$ 1,000	0.979	0.978	0.976	–	–	–	–
2,000	0.940	0.939	0.937	0.934	–	–	–
5,000	0.853	0.852	0.850	0.848	0.841	–	–
7,500	0.800	0.799	0.797	0.794	0.788	0.780	–
10,000	0.757	0.756	0.754	0.752	0.745	0.737	0.732
∗ Only use when policy also covers building or non-building structures.							

Table 406.B.3.b.(7)#2 Coverage C And Other Personal
Property Named Storm Higher Fixed-dollar Deductibles

RULE 407.
AUTOMATIC INCREASE IN INSURANCE

Rule **407.** is replaced by the following:

A. Automatic Increase In Insurance Endorsement – DP 32 11

1. The policy may be endorsed to provide automatic annual increases in the Coverage **A, B** and **C** limits of liability. Apply a factor to the Base Premium as follows:

Amount Of Annual Increase	Factor
4%	1.02
6%	1.03
8%	1.04
Each Additional 4% over 8% add:	.02

Table 407.A.1. Factors

2. The premium for a 3 year policy is 3.2 times the annual policy premium.

3. Use Automatic Increase In Insurance Endorsement **DP 32 11.**

B. Inflation Guard Endorsement – DP 32 70

1. The policy may be extended to automatically adjust the limit of liability applicable to Coverage **A** under the Dwelling Policy. This limit will be adjusted at the same rate as the change in the Index shown on the Declarations, billing notice or named on the form.

2. There is no additional charge for this endorsement. Companies electing to use this endorsement must use it exclusively and are required to notify the North Carolina Rate Bureau of their election.

3. The following Indexes have been approved by the Department of Insurance and may be used with the approved Inflation Guard Endorsement:

   (a) Marshall & Swift Boeckh (MS/B) Residential Cost Index published by the American Appraisal Company, Inc.;

   (b) Composite Construction Cost Index published by the U.S. Department of Commerce;

   (c) Consumer Price Index published by the U.S. Department of Labor;

   (d) Marshall & Swift Boeckh (MS/B) Construction Cost Index published Marshall & Swift Boeckh (MS/B);

   (e) RSMeans CostWorks Valuator published by RSMeans.

   (f) Xactware Inflation Index published by Xactware Solutions, Inc.

4. Use Inflation Guard Endorsement **DP 32 70.**

RULE 408.
ALARMS, SMOKE DETECTORS, FIRE EXTINGUISHERS AND AUTOMATIC SPRINKLERS

The title of Rule **408.** Protective Devices is replaced by the preceding title.

Rule **408.** is replaced by the following:

A. Approved and properly maintained installations of fire alarms, smoke detectors, automatic sprinklers and fire extinguishers in the dwelling may be recognized for a reduced premium – computed by multiplying the fire Base Premium by the selected factors as follows.

Type Of Installation∗	Dwelling Factor	Mobile Or Trailer Home Factor
Central Station Reporting Fire Alarm	.90	.92
Fire Department Reporting Fire Alarm	.93	.95
Local Fire Alarm Smoke Detectors	.95	.97
Automatic Sprinklers in all areas including attics, bathrooms, closets, attached structures	.80	.90
Automatic Sprinklers in all areas except attic, bathroom, closet and attached structure areas that are protected by a fire detector	.90	.95
Fire Extinguishers	.95	.95
∗ Refer to Company for eligibility, types of systems and devices, installation, and available credits.		

Table 408.A. Protective Devices Factors

B. A premium credit for Fire Extinguishers shall be allowed if the dwelling has, installed on each floor and basement in a readily accessible place, at least:

1. One fire extinguisher classified and labeled as 2-A (classified as A-1 prior to July 1, 1956), or

2. Two fire extinguishers classified and labeled as 1-A (classified as A-2 prior to July, 1956).

The extinguishers must be maintained in good, working order.

C. Use Premises Alarm Or Fire Protection System Endorsement **DP 32 50.**

RULE 409.
ACTUAL CASH VALUE LOSS SETTLEMENT
WINDSTORM OR HAIL LOSSES TO ROOF SURFACING
– DP 00 02, DP 00 03 AND DP 00 01 WITH DP 00 08

Rule **409.** does not apply.

RULE 410.
BUILDING CODE EFFECTIVENESS GRADING

Rule **410.** does not apply.

PART V
ADDITIONAL COVERAGES AND INCREASED LIMITS
RULES

RULE 502.
COVERAGE D – FAIR RENTAL VALUE COVERAGE E –
ADDITIONAL LIVING EXPENSE

Paragraph **A.** is replaced by the following:

A. Introduction

Coverage is provided in the forms on a limited basis as follows:

1. Form DP 00 01

a. Coverage D

Up to 10% of the Coverage **A** limit is available. Use of this option reduces the Coverage **A** limit for the same loss.

b. Coverage E

Not automatically included in form. It may be added as noted in Paragraph **B.**

2. Form DP 00 02 Or DP 00 03

Coverage **D** and **E** combined – Up to 10% of the Coverage **A** limit is available for Coverage **D** and Coverage **E** combined as additional insurance.

RULE 507.
FIRE DEPARTMENT SERVICE CHARGE

Rule **507.** is replaced by the following:

The limit of $500 provided under the policy may be increased. Refer to the state rates.

RULE 509.
EARTHQUAKE COVERAGE

Rule **509.** is replaced by the following:

A. Coverage Description

When added to the Fire policy, this peril shall apply to the same coverages and for the same limits that apply to the peril of Fire.

Use Earthquake Coverage Endorsement **DP 04 69.**

B. Loss Assessment Coverage

When the policy is extended to cover loss assessment resulting from loss by this peril, the limit of liability shall be based on the insured's proportionate interest in total value of all collectively owned buildings and structures of the corporation or association of property owners. Refer to company for rates.

Use Loss Assessment Coverage For Earthquake Endorsement **DP 04 68.**

C. Deductible

The base deductible is 5% of the limit of liability for Coverage **A, B** or **C,** whichever is greatest and is subject to a $250 minimum.

This deductible may be increased for a premium credit. In the event of an Earthquake loss to covered property, the dollar amount is deducted from the total of the loss for Coverages **A, B** and **C.**

D. Premium For Base Deductible

Develop the premium as follows:

1. From the state rates:

a. Determine the Earthquake Zone;

b. Determine if Rate Table **A,** and/or **B** applies;

c. Select the rate according to construction from the Rate Table; and

2. Multiply the rate determined in Paragraph **D.1.c.** by the amounts of insurance for:

a. Coverages **A, B, C, D** and **E;**

b. Improvements, Alterations and Additions – Increased Limits;

c. Other Building Coverage options (i.e. Bldg. Items Coverage);

d. Other Personal Property Coverage (i.e. Merchandise in Storage);

e. Ordinance or Law total amount of insurance (includes basic, and if applicable, increased amounts).

E. Premium for Higher Deductibles

Multiply the Base Premium determined in Paragraph **E.** by a factor from the following table:

Deductible Percentage	Frame And Superior	Masonry
10%	.89	.95
15%	.78	.89
20%	.67	.84
25%	.56	.79

Table 509.E. Higher Deductibles Factors

RULE 510.
THEFT COVERAGE

This rule is deleted.

Refer to the Theft Insurance program filed by or on behalf of the company insuring the risk.

RULE 512.
WINDSTORM OR HAIL COVERAGE – MISCELLANEOUS PROPERTIES

The title of Rule **512.** Windstorm Or Hail Coverage - Awnings, Signs And Outdoor Radio And Television Equipment is replaced by the preceding title.

Rule **512.** is replaced by the following:

A. Property Not Covered

The peril of Windstorm or Hail does **not** cover damage to the following properties whether attached to or separated from a dwelling or other structure on the Described Location:

1. Signs or cloth awnings, including their supports;

2. Radio or television antennas or aerials, including their lead-in wiring, masts or towers;

3. Swimming pools;

4. Screens, including their supports, around a swimming pool, patio or other areas;

5. Fences, property line and similar walls, including seawalls;

6. Bathhouses, cabanas, greenhouses, hothouses, pergolas, slathouses, trellises;

7. Outdoor equipment used to service the Described Location; or

8. Structures located over water, whether or not permanently attached to the ground, including the property in or on the structure.

B. Endorsement

Damage to these properties may be covered for an additional premium. Separately describe each property item and corresponding limit of liability on Windstorm Or Hail – Miscellaneous Properties Endorsement **DP 32 19** or the Declarations.

C. Greenhouses And/Or Hothouses

1. When the structure, greenhouse (hothouse) glass and any flowers and plants contained in the structure are insured as a single item:

a. Include, in the limit of liability for each structure, the value of all glass, as computed in Paragraph **1.c.,** and the value of any flowers and plants in that structure;

b. Add the "Glass Condition of Insurance", in Paragraph **3.a.** of this rule, to Windstorm Or Hail – Miscellaneous Properties Endorsement **DP 32 19** or the Declarations; and

c. Specify, in the "Glass Condition of Insurance", the dollar amount of all glass being insured. This amount is determined by multiplying the agreed value per square foot of glass by the number of square feet of all insured glass.

2. When the structure, greenhouse (hothouse) glass or the flowers and plants contained in the structure are **separately** insured, specify the limit of liability **separately** for each structure, all glass and the flowers and plants in that structure.

When glass is separately insured:

a. Add the "Glass Condition of Insurance", in Paragraph **3.b.** of this rule, to Windstorm Or Hail – Miscellaneous Properties Endorsement **DP 32 19** or the Declarations; and

b. Specify, in the "Glass Condition of Insurance", the agreed value per square foot of glass and the number of square feet of all glass. The limit of liability of all glass being insured is determined by multiplying these two amounts.

3. Glass Condition of Insurance

a. Use this Condition when glass is **not** separately insured:

"Windstorm or Hail Coverage for Greenhouse (Hothouse) Glass

It is understood by you and us that, in the event greenhouse (hothouse) glass is broken or destroyed by the peril of Windstorm or Hail, we will pay no more than the least of the following amounts:

A. $____. This dollar amount for greenhouse (hothouse) glass is determined by multiplying:

1. The agreed value per square foot of greenhouse (hothouse) glass, $____, by

2. The number of square feet of all insured greenhouse (hothouse) glass, ____;

B. An amount computed by:

1. Dividing the number of square feet of all broken or destroyed greenhouse (hothouse) glass by the total number of square feet of insured greenhouse (hothouse) glass, and

2. Multiplying the amount computed in **B.1.** above by the dollar amount for greenhouse (hothouse) glass stated in **A.** above; or

C. The actual cost to repair or replace the broken or destroyed greenhouse (hothouse) glass.

Also, if greenhouse (hothouse) glass is covered by other insurance, we will pay no more than the proportion of a loss that the dollar amount for such greenhouse (hothouse) glass stated in **A.** above bears to the total amount of insurance covering that glass".

RULE 512.
WINDSTORM OR HAIL COVERAGE – MISCELLANEOUS PROPERTIES (Cont'd)

    b. Use this Condition when glass **is** separately insured:

"Windstorm or Hail Coverage for Greenhouse (Hothouse) Glass

It is understood by you and us that, in the event greenhouse (hothouse) glass is broken or destroyed by the peril of Windstorm or Hail, we will pay no more than the least of the following amounts:

    A. The limit of liability declared above for greenhouse (hothouse) glass, which is determined by multiplying:

        1. The agreed value per square foot of greenhouse (hothouse) glass, $ _____, by

        2. The number of square feet of all insured greenhouse (hothouse) glass, _____;

    B. An amount computed by:

        1. Dividing the number of square feet of all broken or destroyed greenhouse (hothouse) glass by the total number of square feet of insured greenhouse (hothouse) glass, and

        2. Multiplying the amount computed in **B.1.** above by the limit of liability for greenhouse (hothouse) glass declared above; or

    C. The actual cost to repair or replace the broken or destroyed greenhouse (hothouse) glass.

Also, if greenhouse (hothouse) glass is covered by other insurance, we will pay no more than the proportion of loss that our limit of liability for such greenhouse (hothouse) glass bears to the total amount of insurance covering that glass".

    D. Premium

Refer to the state rates.

RULE 513.
WATER BACK UP AND SUMP OVERFLOW

Rule **513.** does not apply.

RULE 515.
MOTORIZED GOLF CART – PHYSICAL LOSS COVERAGE

Rule **515.** does not apply.

RULE 517.
LIMITED FUNGI, WET OR DRY ROT, OR BACTERIA COVERAGE

Rule **517.** does not apply.

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ADDITIONAL RULE(S)

RULE A3.
WINDSTORM OR HAIL EXCLUSION – TERRITORIES 110, 120, 130, 140, 150 AND 160 ONLY

Territory	Const.∗	Building Credit	Contents Credit
110	M	$ 127	$ 16
	F	134	17
	MH	167	22
120	M	139	19
	F	146	20
	MH	182	26
130	M	85	12
	F	90	12
	MH	112	15
140	M	92	12
	F	97	12
	MH	121	15
150	M	88	11
	F	93	11
	MH	116	14
160	M	92	12
	F	97	12
	MH	121	15

∗ M = Masonry, F = Frame. MH = Mobile Homes. Masonry Veneer is rated as masonry. Aluminum or plastic siding over frame is rated as frame.

Table A3.B.2.(R) Windstorm Or Hail Exclusion – Territories 110, 120, 130, 140, 150 and 160 Only

RULE A5.
INSTALLMENT PAYMENT PLAN

    C. The additional charge per installment is $3.00.

RULE A6.
UNPROTECTED DWELLINGS – PROTECTION CLASS 9, 9E, 9S OR 10

Rates Per $1,000	
Additional rate of insurance	$ 1.50

Table A6.C.1.a.(R) Unprotected Dwellings – Protection Class 9, 9E, 9S Or 10

RULE A9.
WINDSTORM MITIGATION PROGRAM

Mitigation Feature	Const.	Territory 110	Territory 120	Territory 130	Territory 140	Territory 150	Territory 160
Total Hip Roof	M	$ 7	$ 7	$ 4	$ 4	$ 5	$ 4
	F	7	7	4	4	5	4
Opening Protection	M	7	7	4	4	5	4
	F	7	7	4	4	5	4
Total Hip Roof and Opening Protection	M	14	14	9	9	9	9
	F	14	14	9	9	9	9
IBHS Designation: *Hurricane Fortified for Safer Living®*	M	22	24	10	16	12	16
	F	24	26	10	16	12	16
Hurricane Fortified for Existing Homes® Bronze Option 1	M	5	5	3	3	4	3
	F	5	5	3	3	4	3
Hurricane Fortified for Existing Homes® Bronze Option 2	M	9	9	4	6	5	6
	F	9	9	4	6	5	6
Hurricane Fortified for Existing Homes® Silver Option 1	M	14	16	6	10	6	10
	F	14	16	6	10	6	10
Hurricane Fortified for Existing Homes® Silver Option 2	M	17	18	7	12	7	12
	F	17	19	7	12	7	12
Hurricane Fortified for Existing Homes® Gold Option 1	M	17	18	9	12	9	12
	F	18	19	9	12	9	12
Hurricane Fortified for Existing Homes® Gold Option 2	M	19	22	10	15	10	15
	F	20	23	10	15	10	15

Table A9.E.#1(R) – Windstorm Loss Mitigation Credit – Coverage A – Dwelling

Mitigation Feature	Const.	Territory 110	Territory 120	Territory 130	Territory 140	Territory 150	Territory 160
Total Hip Roof	M	$ 1	$ 1	$ 1	$ 1	$ 1	$ 1
	F	1	1	1	1	1	1
Opening Protection	M	1	1	1	1	1	1
	F	1	1	1	1	1	1
Total Hip Roof and Opening Protection	M	1	2	1	1	1	1
	F	1	2	1	1	1	1
IBHS Designation: *Hurricane Fortified for Safer Living®*	M	4	4	2	3	2	3
	F	4	4	2	3	2	3
Hurricane Fortified for Existing Homes® Bronze Option 1	M	1	1	1	1	1	1
	F	1	1	1	1	1	1
Hurricane Fortified for Existing Homes® Bronze Option 2	M	1	2	1	1	1	1
	F	1	2	1	1	1	1
Hurricane Fortified for Existing Homes® Silver Option 1	M	2	2	1	2	1	2
	F	2	2	1	2	1	2
Hurricane Fortified for Existing Homes® Silver Option 2	M	2	3	1	2	1	2
	F	2	3	1	2	1	2
Hurricane Fortified for Existing Homes® Gold Option 1	M	3	3	1	2	1	2
	F	3	3	1	2	1	2
Hurricane Fortified for Existing Homes® Gold Option 2	M	3	3	2	2	2	2
	F	3	3	2	2	2	2

Table A9.E.#2(R) – Contents Windstorm Loss Mitigation
Credit – Coverage C – Personal Property

RULE 206.
MINIMUM PREMIUM

    D. Minimum Premium – $50.

RULE 208.
WAIVER OF PREMIUM

    B. Amount that may be waived – $3 or less.

RULE 301.
BASE PREMIUM COMPUTATION

Owner-occupied And Non-owner-occupied Key Premiums – Territories 110, 120, 130				
Fire – Coverage A – All Forms – Non-seasonal And Seasonal				
		1 – 5 Families		
Protection Class	**Const.∗**	**Territory 110**	**Territory 120**	**Territory 130**
1	M	$ 11	$ 11	$ 21
	F	16	16	29
2	M	12	12	21
	F	16	16	29
3	M	12	12	22
	F	16	16	30
4	M	12	12	22
	F	17	17	30
5	M	12	12	23
	F	17	17	31
6	M	13	13	24
	F	18	18	33
7	M	14	14	26
	F	19	19	35
8	M	16	16	30
	F	22	22	40
8B, 9, 9E, 9S	M	18	18	33
	F	24	24	44
10	M	22	22	40
	F	30	30	54

∗ M = Masonry, F = Frame. Masonry Veneer is rated as masonry. Aluminum or plastic siding over frame is rated as frame.

Table 301.A.#1(R) Fire – Coverage A – All Forms – Non-seasonal And Seasonal Owner-occupied And Non-owner-occupied Key Premiums

Fire – Coverage A – All Forms Owner And Non-owner-occupied – Non-seasonal And Seasonal			
Key Factors			
Limit Of Liability (000's)	**Coverage A**	**Limit Of Liability (000's)**	**Coverage A**
$ 1∗	.38	$ 27	1.48
2	.42	28	1.52
3	.47	29	1.56
4	.51	30	1.60
5	.56	31	1.64
6	.60	32	1.68
7	.65	33	1.72
8	.69	34	1.76
9	.74	35	1.80
10	.78	36	1.84
11	.82	37	1.88
12	.87	38	1.92
13	.92	39	1.96
14	.96	40	2.00
15	1.00	41	2.04
16	1.04	42	2.08
17	1.08	43	2.12
18	1.12	44	2.16
19	1.16	45	2.20
20	1.20	46	2.24
21	1.24	47	2.28
22	1.28	48	2.32
23	1.32	49	2.36
24	1.36	50	2.40
25	1.40	Each Additional $1,000	
26	1.44		.04

∗ Use this limit of liability to develop premiums for policy amounts less than $1,000.

Table 301.A.#2(R) Fire – Coverage A – All Forms Owner And Non-owner-occupied – Non-seasonal And Seasonal Key Factors

RULE 301.
BASE PREMIUM COMPUTATION (Cont'd)

Owner-occupied And Non-owner-occupied Key Premiums – Territories 140, 150, 160				
Fire – Coverage A – All Forms – Non-seasonal And Seasonal				
		1 – 5 Families		
Protection Class	Const.∗	Territory 140	Territory 150	Territory 160
1	M	$ 19	$ 20	$ 22
	F	26	27	29
2	M	19	20	22
	F	26	27	30
3	M	20	20	23
	F	27	28	31
4	M	20	21	23
	F	27	28	31
5	M	21	21	23
	F	28	29	32
6	M	22	23	25
	F	30	31	34
7	M	23	24	27
	F	32	33	36
8	M	27	28	31
	F	36	38	42
8B, 9, 9E, 9S	M	29	31	34
	F	40	42	46
10	M	36	37	41
	F	49	51	56

∗ M = Masonry, F = Frame. Masonry Veneer is rated as masonry. Aluminum or plastic siding over frame is rated as frame.

Table 301.A.#3(R) Fire – Coverage A – All Forms – Non-seasonal And Seasonal Owner-occupied And Non-owner-occupied Key Premiums

Fire – Coverage A – All Forms Owner And Non-owner-occupied – Non-seasonal And Seasonal			
Key Factors			
Limit Of Liability (000's)	Coverage A	Limit Of Liability (000's)	Coverage A
$ 1∗	.38	$ 27	1.48
2	.42	28	1.52
3	.47	29	1.56
4	.51	30	1.60
5	.56	31	1.64
6	.60	32	1.68
7	.65	33	1.72
8	.69	34	1.76
9	.74	35	1.80
10	.78	36	1.84
11	.82	37	1.88
12	.87	38	1.92
13	.92	39	1.96
14	.96	40	2.00
15	1.00	41	2.04
16	1.04	42	2.08
17	1.08	43	2.12
18	1.12	44	2.16
19	1.16	45	2.20
20	1.20	46	2.24
21	1.24	47	2.28
22	1.28	48	2.32
23	1.32	49	2.36
24	1.36	50	2.40
25	1.40	Each Additional $1,000	
26	1.44		.04

∗ Use this limit of liability to develop premiums for policy amounts less than $1,000.

Table 301.A.#4(R) Fire – Coverage A – All Forms Owner And Non-owner-occupied – Non-seasonal And Seasonal Key Factors

RULE 301.
BASE PREMIUM COMPUTATION (Cont'd)

Owner-occupied And Non-owner-occupied Key Premiums – Territories 170, 180, 190				
Fire – Coverage A – All Forms – Non-seasonal And Seasonal				
		1 – 5 Families		
Protection Class	Const.*	Territory 170	Territory 180	Territory 190
1	M	$ 30	$ 30	$ 31
	F	40	41	42
2	M	30	31	32
	F	41	42	43
3	M	31	32	32
	F	42	43	44
4	M	32	32	33
	F	43	44	45
5	M	32	33	34
	F	44	45	46
6	M	35	36	36
	F	47	48	49
7	M	37	37	38
	F	50	51	52
8	M	42	43	44
	F	57	59	60
8B, 9, 9E, 9S	M	46	47	48
	F	63	64	66
10	M	57	58	59
	F	77	79	81

* M = Masonry, F = Frame. Masonry Veneer is rated as masonry. Aluminum or plastic siding over frame is rated as frame.

Table 301.A.#5(R) Fire – Coverage A – All Forms – Non-seasonal And Seasonal Owner-occupied And Non-owner-occupied Key Premiums

Fire – Coverage A – All Forms Owner And Non-owner-occupied – Non-seasonal And Seasonal			
Key Factors			
Limit Of Liability (000's)	Coverage A	Limit Of Liability (000's)	Coverage A
$ 1*	.38	$ 27	1.48
2	.42	28	1.52
3	.47	29	1.56
4	.51	30	1.60
5	.56	31	1.64
6	.60	32	1.68
7	.65	33	1.72
8	.69	34	1.76
9	.74	35	1.80
10	.78	36	1.84
11	.82	37	1.88
12	.87	38	1.92
13	.92	39	1.96
14	.96	40	2.00
15	1.00	41	2.04
16	1.04	42	2.08
17	1.08	43	2.12
18	1.12	44	2.16
19	1.16	45	2.20
20	1.20	46	2.24
21	1.24	47	2.28
22	1.28	48	2.32
23	1.32	49	2.36
24	1.36	50	2.40
25	1.40	Each Addi-	
26	1.44	tional $1,000	.04

* Use this limit of liability to develop premiums for policy amounts less than $1,000.

Table 301.A.#6(R) Fire – Coverage A – All Forms Owner And Non-owner-occupied – Non-seasonal And Seasonal Key Factors

RULE 301.
BASE PREMIUM COMPUTATION (Cont'd)

Owner-occupied And Non-owner-occupied Key Premiums – Territories 200, 210, 220				
Fire – Coverage A – All Forms – Non-seasonal And Seasonal				
		1 – 5 Families		
Protection Class	Const.∗	Territory 200	Territory 210	Territory 220
1	M	$ 42	$ 28	$ 28
	F	57	38	38
2	M	43	28	28
	F	58	39	39
3	M	44	29	29
	F	60	39	39
4	M	45	29	29
	F	61	40	40
5	M	46	30	30
	F	62	41	41
6	M	49	32	32
	F	67	44	44
7	M	52	34	34
	F	70	47	47
8	M	59	39	39
	F	81	53	53
8B, 9, 9E, 9S	M	65	43	43
	F	89	59	59
10	M	80	53	53
	F	109	72	72

∗ M = Masonry, F = Frame. Masonry Veneer is rated as masonry. Aluminum or plastic siding over frame is rated as frame.

Table 301.A.#7(R) Fire – Coverage A – All Forms – Non-seasonal And Seasonal Owner-occupied And Non-owner-occupied Key Premiums

Fire – Coverage A – All Forms Owner And Non-owner-occupied – Non-seasonal And Seasonal			
Key Factors			
Limit Of Liability (000's)	Coverage A	Limit Of Liability (000's)	Coverage A
$ 1∗	.38	$ 27	1.48
2	.42	28	1.52
3	.47	29	1.56
4	.51	30	1.60
5	.56	31	1.64
6	.60	32	1.68
7	.65	33	1.72
8	.69	34	1.76
9	.74	35	1.80
10	.78	36	1.84
11	.82	37	1.88
12	.87	38	1.92
13	.92	39	1.96
14	.96	40	2.00
15	1.00	41	2.04
16	1.04	42	2.08
17	1.08	43	2.12
18	1.12	44	2.16
19	1.16	45	2.20
20	1.20	46	2.24
21	1.24	47	2.28
22	1.28	48	2.32
23	1.32	49	2.36
24	1.36	50	2.40
25	1.40	Each Additional $1,000	
26	1.44		.04

∗ Use this limit of liability to develop premiums for policy amounts less than $1,000.

Table 301.A.#8(R) Fire – Coverage A – All Forms Owner And Non-owner-occupied – Non-seasonal And Seasonal Key Factors

RULE 301.
BASE PREMIUM COMPUTATION (Cont'd)

Owner-occupied And Non-owner-occupied Key Premiums – Territories 230, 240, 250				
Fire – Coverage A – All Forms – Non-seasonal And Seasonal				
		1 – 5 Families		
Protection Class	Const.∗	Territory 230	Territory 240	Territory 250
1	M	$ 43	$ 28	$ 26
	F	59	39	35
2	M	44	29	26
	F	60	39	36
3	M	45	30	27
	F	61	40	36
4	M	46	30	27
	F	63	41	37
5	M	47	31	28
	F	64	42	38
6	M	51	33	30
	F	69	45	41
7	M	53	35	32
	F	73	48	43
8	M	61	40	36
	F	83	55	49
8B, 9, 9E, 9S	M	67	44	40
	F	92	60	54
10	M	82	54	49
	F	112	74	67

∗   M = Masonry, F = Frame. Masonry Veneer is rated as masonry. Aluminum or plastic siding over frame is rated as frame.

Table 301.A.#9(R) Fire – Coverage A – All Forms – Non-seasonal And Seasonal Owner-occupied And Non-owner-occupied Key Premiums

Fire – Coverage A – All Forms Owner And Non-owner-occupied – Non-seasonal And Seasonal			
Key Factors			
Limit Of Liability (000's)	Coverage A	Limit Of Liability (000's)	Coverage A
$ 1∗	.38	$ 27	1.48
2	.42	28	1.52
3	.47	29	1.56
4	.51	30	1.60
5	.56	31	1.64
6	.60	32	1.68
7	.65	33	1.72
8	.69	34	1.76
9	.74	35	1.80
10	.78	36	1.84
11	.82	37	1.88
12	.87	38	1.92
13	.92	39	1.96
14	.96	40	2.00
15	1.00	41	2.04
16	1.04	42	2.08
17	1.08	43	2.12
18	1.12	44	2.16
19	1.16	45	2.20
20	1.20	46	2.24
21	1.24	47	2.28
22	1.28	48	2.32
23	1.32	49	2.36
24	1.36	50	2.40
25	1.40	Each Addi-	
26	1.44	tional $1,000	.04

∗   Use this limit of liability to develop premiums for policy amounts less than $1,000.

Table 301.A.#10(R) Fire – Coverage A – All Forms Owner And Non-owner-occupied – Non-seasonal And Seasonal Key Factors

RULE 301.
BASE PREMIUM COMPUTATION (Cont'd)

Owner-occupied And Non-owner-occupied Key Premiums – Territories 260, 270, 280				
Fire – Coverage A – All Forms – Non-seasonal And Seasonal				
		1 – 5 Families		
Protection Class	Const.∗	Territory 260	Territory 270	Territory 280
1	M	$ 32	$ 20	$ 19
	F	43	28	26
2	M	32	21	19
	F	44	28	26
3	M	33	21	20
	F	45	29	27
4	M	34	22	20
	F	46	29	27
5	M	34	22	21
	F	47	30	28
6	M	37	24	22
	F	51	32	30
7	M	39	25	23
	F	53	34	32
8	M	45	29	27
	F	61	39	36
8B, 9, 9E, 9S	M	49	32	29
	F	67	43	40
10	M	60	39	36
	F	82	53	49

∗　M = Masonry, F = Frame. Masonry Veneer is rated as masonry. Aluminum or plastic siding over frame is rated as frame.

Table 301.A.#11(R) Fire – Coverage A – All Forms – Non-seasonal And Seasonal Owner-occupied And Non-owner-occupied Key Premiums

Fire – Coverage A – All Forms Owner And Non-owner-occupied – Non-seasonal And Seasonal			
Key Factors			
Limit Of Liability (000's)	Coverage A	Limit Of Liability (000's)	Coverage A
$ 1∗	.38	$ 27	1.48
2	.42	28	1.52
3	.47	29	1.56
4	.51	30	1.60
5	.56	31	1.64
6	.60	32	1.68
7	.65	33	1.72
8	.69	34	1.76
9	.74	35	1.80
10	.78	36	1.84
11	.82	37	1.88
12	.87	38	1.92
13	.92	39	1.96
14	.96	40	2.00
15	1.00	41	2.04
16	1.04	42	2.08
17	1.08	43	2.12
18	1.12	44	2.16
19	1.16	45	2.20
20	1.20	46	2.24
21	1.24	47	2.28
22	1.28	48	2.32
23	1.32	49	2.36
24	1.36	50	2.40
25	1.40	Each Addi-	
26	1.44	tional $1,000	.04

∗　Use this limit of liability to develop premiums for policy amounts less than $1,000.

Table 301.A.#12(R) Fire – Coverage A – All Forms Owner And Non-owner-occupied – Non-seasonal And Seasonal Key Factors

RULE 301.
BASE PREMIUM COMPUTATION (Cont'd)

Owner-occupied And Non-owner-occupied Key Premiums – Territories 290, 300, 310				
Fire – Coverage A – All Forms – Non-seasonal And Seasonal				
		1 – 5 Families		
Protection Class	Const.∗	Territory 290	Territory 300	Territory 310
1	M	$ 24	$ 32	$ 24
	F	32	43	32
2	M	24	32	24
	F	33	44	33
3	M	25	33	25
	F	34	45	34
4	M	25	34	25
	F	34	46	34
5	M	26	34	26
	F	35	47	35
6	M	28	37	28
	F	38	51	38
7	M	29	39	29
	F	40	53	40
8	M	33	45	33
	F	46	61	46
8B, 9, 9E, 9S	M	37	49	37
	F	50	67	50
10	M	45	60	45
	F	61	82	61

∗   M = Masonry, F = Frame. Masonry Veneer is rated as masonry. Aluminum or plastic siding over frame is rated as frame.

Table 301.A.#13(R) Fire – Coverage A – All Forms – Non-seasonal And Seasonal Owner-occupied And Non-owner-occupied Key Premiums

Fire – Coverage A – All Forms Owner And Non-owner-occupied – Non-seasonal And Seasonal			
Key Factors			
Limit Of Liability (000's)	Coverage A	Limit Of Liability (000's)	Coverage A
$ 1∗	.38	$ 27	1.48
2	.42	28	1.52
3	.47	29	1.56
4	.51	30	1.60
5	.56	31	1.64
6	.60	32	1.68
7	.65	33	1.72
8	.69	34	1.76
9	.74	35	1.80
10	.78	36	1.84
11	.82	37	1.88
12	.87	38	1.92
13	.92	39	1.96
14	.96	40	2.00
15	1.00	41	2.04
16	1.04	42	2.08
17	1.08	43	2.12
18	1.12	44	2.16
19	1.16	45	2.20
20	1.20	46	2.24
21	1.24	47	2.28
22	1.28	48	2.32
23	1.32	49	2.36
24	1.36	50	2.40
25	1.40	Each Addi-	
26	1.44	tional $1,000	.04

∗   Use this limit of liability to develop premiums for policy amounts less than $1,000.

Table 301.A.#14(R) Fire – Coverage A – All Forms Owner And Non-owner-occupied – Non-seasonal And Seasonal Key Factors

RULE 301.
BASE PREMIUM COMPUTATION (Cont'd)

Owner-occupied And Non-owner-occupied Key Premiums – Territories 320, 330, 340				
Fire – Coverage A – All Forms – Non-seasonal And Seasonal				
		1 – 5 Families		
Protection Class	Const.∗	Territory 320	Territory 330	Territory 340
1	M	$ 23	$ 24	$ 21
	F	31	33	29
2	M	23	25	21
	F	32	34	29
3	M	24	25	22
	F	33	35	30
4	M	24	26	22
	F	33	35	30
5	M	25	26	23
	F	34	36	31
6	M	27	28	24
	F	37	39	33
7	M	28	30	26
	F	39	41	35
8	M	32	34	30
	F	44	47	40
8B, 9, 9E, 9S	M	36	38	33
	F	49	52	44
10	M	44	46	40
	F	60	63	54

∗ M = Masonry, F = Frame. Masonry Veneer is rated as masonry. Aluminum or plastic siding over frame is rated as frame.

Table 301.A.#15(R) Fire – Coverage A – All Forms – Non-seasonal And Seasonal Owner-occupied And Non-owner-occupied Key Premiums

Fire – Coverage A – All Forms Owner And Non-owner-occupied – Non-seasonal And Seasonal			
Key Factors			
Limit Of Liability (000's)	Coverage A	Limit Of Liability (000's)	Coverage A
$ 1∗	.38	$ 27	1.48
2	.42	28	1.52
3	.47	29	1.56
4	.51	30	1.60
5	.56	31	1.64
6	.60	32	1.68
7	.65	33	1.72
8	.69	34	1.76
9	.74	35	1.80
10	.78	36	1.84
11	.82	37	1.88
12	.87	38	1.92
13	.92	39	1.96
14	.96	40	2.00
15	1.00	41	2.04
16	1.04	42	2.08
17	1.08	43	2.12
18	1.12	44	2.16
19	1.16	45	2.20
20	1.20	46	2.24
21	1.24	47	2.28
22	1.28	48	2.32
23	1.32	49	2.36
24	1.36	50	2.40
25	1.40	Each Addi-	
26	1.44	tional $1,000	.04

∗ Use this limit of liability to develop premiums for policy amounts less than $1,000.

Table 301.A.#16(R) Fire – Coverage A – All Forms Owner And Non-owner-occupied – Non-seasonal And Seasonal Key Factors

RULE 301.
BASE PREMIUM COMPUTATION (Cont'd)

Owner-occupied And Non-owner-occupied Key Premiums – Territories 350, 360, 370

Fire – Coverage A – All Forms – Non-seasonal And Seasonal

Protection Class	Const.∗	1 – 5 Families		
		Territory 350	Territory 360	Territory 370
1	M	$ 24	$ 20	$ 22
	F	32	27	29
2	M	24	20	22
	F	33	27	30
3	M	25	20	23
	F	34	28	31
4	M	25	21	23
	F	34	28	31
5	M	26	21	23
	F	35	29	32
6	M	28	23	25
	F	38	31	34
7	M	29	24	27
	F	40	33	36
8	M	33	28	31
	F	46	38	42
8B, 9, 9E, 9S	M	37	31	34
	F	50	42	46
10	M	45	37	41
	F	61	51	56

∗ M = Masonry, F = Frame. Masonry Veneer is rated as masonry. Aluminum or plastic siding over frame is rated as frame.

Table 301.A.#17(R) Fire – Coverage A – All Forms – Non-seasonal And Seasonal Owner-occupied And Non-owner-occupied Key Premiums

Fire – Coverage A – All Forms Owner And Non-owner-occupied – Non-seasonal And Seasonal

Key Factors			
Limit Of Liability (000's)	Coverage A	Limit Of Liability (000's)	Coverage A
$ 1∗	.38	$ 27	1.48
2	.42	28	1.52
3	.47	29	1.56
4	.51	30	1.60
5	.56	31	1.64
6	.60	32	1.68
7	.65	33	1.72
8	.69	34	1.76
9	.74	35	1.80
10	.78	36	1.84
11	.82	37	1.88
12	.87	38	1.92
13	.92	39	1.96
14	.96	40	2.00
15	1.00	41	2.04
16	1.04	42	2.08
17	1.08	43	2.12
18	1.12	44	2.16
19	1.16	45	2.20
20	1.20	46	2.24
21	1.24	47	2.28
22	1.28	48	2.32
23	1.32	49	2.36
24	1.36	50	2.40
25	1.40	Each Additional $1,000	
26	1.44		.04

∗ Use this limit of liability to develop premiums for policy amounts less than $1,000.

Table 301.A.#18(R) Fire – Coverage A – All Forms Owner And Non-owner-occupied – Non-seasonal And Seasonal Key Factors

RULE 301.
BASE PREMIUM COMPUTATION (Cont'd)

Owner-occupied And Non-owner-occupied Key Premiums – Territories 380, 390			
Fire – Coverage A – All Forms – Non-seasonal And Seasonal			
		1 – 5 Families	
Protection Class	Const.∗	Territory 380	Territory 390
1	M	$ 20	$ 20
	F	27	28
2	M	20	21
	F	27	28
3	M	20	21
	F	28	29
4	M	21	22
	F	28	29
5	M	21	22
	F	29	30
6	M	23	24
	F	31	32
7	M	24	25
	F	33	34
8	M	28	29
	F	38	39
8B, 9, 9E, 9S	M	31	32
	F	42	43
10	M	37	39
	F	51	53

∗   M = Masonry, F = Frame. Masonry Veneer is rated as masonry. Aluminum or plastic siding over frame is rated as frame.

Table 301.A.#19(R) Fire – Coverage A – All Forms – Non-seasonal And Seasonal Owner-occupied And Non-owner-occupied Key Premiums

Fire – Coverage A – All Forms Owner And Non-owner-occupied – Non-seasonal And Seasonal			
Key Factors			
Limit Of Liability (000's)	Coverage A	Limit Of Liability (000's)	Coverage A
$ 1∗	.38	$ 27	1.48
2	.42	28	1.52
3	.47	29	1.56
4	.51	30	1.60
5	.56	31	1.64
6	.60	32	1.68
7	.65	33	1.72
8	.69	34	1.76
9	.74	35	1.80
10	.78	36	1.84
11	.82	37	1.88
12	.87	38	1.92
13	.92	39	1.96
14	.96	40	2.00
15	1.00	41	2.04
16	1.04	42	2.08
17	1.08	43	2.12
18	1.12	44	2.16
19	1.16	45	2.20
20	1.20	46	2.24
21	1.24	47	2.28
22	1.28	48	2.32
23	1.32	49	2.36
24	1.36	50	2.40
25	1.40	Each Additional $1,000	
26	1.44		.04

∗   Use this limit of liability to develop premiums for policy amounts less than $1,000.

Table 301.A.#20(R) Fire – Coverage A – All Forms Owner And Non-owner-occupied – Non-seasonal And Seasonal Key Factors

RULE 301.
BASE PREMIUM COMPUTATION (Cont'd)

Owner-occupied And Non-owner-occupied Key Premiums – Territories 110, 120, 130				
Fire – Coverage C – All Forms – Non-seasonal And Seasonal				
		1 – 5 Families		
Protection Class	Const.∗	Territory 110	Territory 120	Territory 130
1	M	$ 3	$ 3	$ 6
	F	4	4	8
2	M	3	3	6
	F	4	4	8
3	M	3	3	6
	F	4	4	9
4	M	3	3	6
	F	4	4	9
5	M	3	3	7
	F	4	4	9
6	M	3	3	7
	F	4	4	10
7	M	3	3	7
	F	5	5	10
8	M	4	4	9
	F	5	5	12
8B, 9, 9E, 9S	M	4	4	9
	F	6	6	13
10	M	5	5	12
	F	7	7	16

∗   M = Masonry, F = Frame. Masonry Veneer is rated as masonry. Aluminum or plastic siding over frame is rated as frame.

Table 301.A.#21(R) Fire – Coverage C – All Forms – Non-seasonal And Seasonal Owner-occupied And Non-owner-occupied Key Premiums

Fire – Coverage C – All Forms Owner And Non-owner-occupied – Non-seasonal And Seasonal			
Key Factors			
Limit Of Liability (000's)	Coverage C	Limit Of Liability (000's)	Coverage C
$ 1∗	.35	$ 27	3.73
2	.48	28	3.86
3	.61	29	3.99
4	.74	30	4.12
5	.87	31	4.25
6	1.00	32	4.38
7	1.13	33	4.51
8	1.26	34	4.64
9	1.39	35	4.77
10	1.52	36	4.90
11	1.65	37	5.03
12	1.78	38	5.16
13	1.91	39	5.29
14	2.04	40	5.42
15	2.17	41	5.55
16	2.30	42	5.68
17	2.43	43	5.81
18	2.56	44	5.94
19	2.69	45	6.07
20	2.82	46	6.20
21	2.95	47	6.33
22	3.08	48	6.46
23	3.21	49	6.59
24	3.34	50	6.72
25	3.47	Each Addi-	
26	3.60	tional $1,000	.13

∗   Use this limit of liability to develop premiums for policy amounts less than $1,000.

Table 301.A.#22(R) Fire – Coverage C – All Forms Owner And Non-owner-occupied – Non-seasonal And Seasonal Key Factors

RULE 301.
BASE PREMIUM COMPUTATION (Cont'd)

Owner-occupied And Non-owner-occupied Key Premiums – Territories 140, 150, 160				
Fire – Coverage C – All Forms – Non-seasonal And Seasonal				
		1 – 5 Families		
Protection Class	Const.*	Territory 140	Territory 150	Territory 160
1	M	$ 6	$ 6	$ 7
	F	8	8	10
2	M	6	6	8
	F	8	8	10
3	M	6	6	8
	F	9	9	11
4	M	6	6	8
	F	9	9	11
5	M	7	7	8
	F	9	9	11
6	M	7	7	9
	F	10	10	12
7	M	7	7	9
	F	10	10	12
8	M	9	9	10
	F	12	12	14
8B, 9, 9E, 9S	M	9	9	12
	F	13	13	16
10	M	12	12	14
	F	16	16	19

∗ M = Masonry, F = Frame. Masonry Veneer is rated as masonry. Aluminum or plastic siding over frame is rated as frame.

Table 301.A.#23(R) Fire – Coverage C – All Forms – Non-seasonal And Seasonal Owner-occupied And Non-owner-occupied Key Premiums

Fire – Coverage C – All Forms Owner And Non-owner-occupied – Non-seasonal And Seasonal			
Key Factors			
Limit Of Liability (000's)	Coverage C	Limit Of Liability (000's)	Coverage C
$ 1∗	.35	$ 27	3.73
2	.48	28	3.86
3	.61	29	3.99
4	.74	30	4.12
5	.87	31	4.25
6	1.00	32	4.38
7	1.13	33	4.51
8	1.26	34	4.64
9	1.39	35	4.77
10	1.52	36	4.90
11	1.65	37	5.03
12	1.78	38	5.16
13	1.91	39	5.29
14	2.04	40	5.42
15	2.17	41	5.55
16	2.30	42	5.68
17	2.43	43	5.81
18	2.56	44	5.94
19	2.69	45	6.07
20	2.82	46	6.20
21	2.95	47	6.33
22	3.08	48	6.46
23	3.21	49	6.59
24	3.34	50	6.72
25	3.47	Each Addi-	
26	3.60	tional $1,000	.13

∗ Use this limit of liability to develop premiums for policy amounts less than $1,000.

Table 301.A.#24(R) Fire – Coverage C – All Forms Owner And Non-owner-occupied – Non-seasonal And Seasonal Key Factors

RULE 301.
BASE PREMIUM COMPUTATION (Cont'd)

Owner-occupied And Non-owner-occupied Key Premiums – Territories 170, 180, 190				
Fire – Coverage C – All Forms – Non-seasonal And Seasonal				
		1 – 5 Families		
Protection Class	Const.∗	Territory 170	Territory 180	Territory 190
1	M	$ 9	$ 9	$ 9
	F	12	13	13
2	M	9	10	10
	F	12	13	13
3	M	9	10	10
	F	12	13	13
4	M	9	10	10
	F	13	14	14
5	M	10	10	10
	F	13	14	14
6	M	10	11	11
	F	14	15	15
7	M	11	12	12
	F	15	16	16
8	M	12	13	13
	F	17	18	18
8B, 9, 9E, 9S	M	14	15	15
	F	19	20	20
10	M	17	18	18
	F	23	25	25

∗   M = Masonry, F = Frame. Masonry Veneer is rated as masonry. Aluminum or plastic siding over frame is rated as frame.

Table 301.A.#25(R) Fire – Coverage C – All Forms – Non-seasonal And Seasonal Owner-occupied And Non-owner-occupied Key Premiums

Fire – Coverage C – All Forms Owner And Non-owner-occupied – Non-seasonal And Seasonal			
Key Factors			
Limit Of Liability (000's)	Coverage C	Limit Of Liability (000's)	Coverage C
$ 1∗	.35	$ 27	3.73
2	.48	28	3.86
3	.61	29	3.99
4	.74	30	4.12
5	.87	31	4.25
6	1.00	32	4.38
7	1.13	33	4.51
8	1.26	34	4.64
9	1.39	35	4.77
10	1.52	36	4.90
11	1.65	37	5.03
12	1.78	38	5.16
13	1.91	39	5.29
14	2.04	40	5.42
15	2.17	41	5.55
16	2.30	42	5.68
17	2.43	43	5.81
18	2.56	44	5.94
19	2.69	45	6.07
20	2.82	46	6.20
21	2.95	47	6.33
22	3.08	48	6.46
23	3.21	49	6.59
24	3.34	50	6.72
25	3.47	Each Addi-	
26	3.60	tional $1,000	.13

∗   Use this limit of liability to develop premiums for policy amounts less than $1,000.

Table 301.A.#26(R) Fire – Coverage C – All Forms Owner And Non-owner-occupied – Non-seasonal And Seasonal Key Factors

RULE 301.
BASE PREMIUM COMPUTATION (Cont'd)

Owner-occupied And Non-owner-occupied Key Premiums – Territories 200, 210, 220				
Fire – Coverage C – All Forms – Non-seasonal And Seasonal				
		1 – 5 Families		
Protection Class	Const.∗	Territory 200	Territory 210	Territory 220
1	M	$ 11	$ 9	$ 8
	F	15	12	11
2	M	11	9	8
	F	15	12	11
3	M	11	9	8
	F	15	12	12
4	M	12	9	9
	F	16	13	12
5	M	12	10	9
	F	16	13	12
6	M	13	10	9
	F	17	14	13
7	M	13	11	10
	F	18	15	14
8	M	15	12	11
	F	21	17	16
8B, 9, 9E, 9S	M	17	14	13
	F	23	19	17
10	M	21	17	15
	F	28	23	21

∗ M = Masonry, F = Frame. Masonry Veneer is rated as masonry. Aluminum or plastic siding over frame is rated as frame.

Table 301.A.#27(R) Fire – Coverage C – All Forms – Non-seasonal And Seasonal Owner-occupied And Non-owner-occupied Key Premiums

Fire – Coverage C – All Forms Owner And Non-owner-occupied – Non-seasonal And Seasonal			
Key Factors			
Limit Of Liability (000's)	Coverage C	Limit Of Liability (000's)	Coverage C
$ 1∗	.35	$ 27	3.73
2	.48	28	3.86
3	.61	29	3.99
4	.74	30	4.12
5	.87	31	4.25
6	1.00	32	4.38
7	1.13	33	4.51
8	1.26	34	4.64
9	1.39	35	4.77
10	1.52	36	4.90
11	1.65	37	5.03
12	1.78	38	5.16
13	1.91	39	5.29
14	2.04	40	5.42
15	2.17	41	5.55
16	2.30	42	5.68
17	2.43	43	5.81
18	2.56	44	5.94
19	2.69	45	6.07
20	2.82	46	6.20
21	2.95	47	6.33
22	3.08	48	6.46
23	3.21	49	6.59
24	3.34	50	6.72
25	3.47	Each Additional $1,000	
26	3.60		.13

∗ Use this limit of liability to develop premiums for policy amounts less than $1,000.

Table 301.A.#28(R) Fire – Coverage C – All Forms Owner And Non-owner-occupied – Non-seasonal And Seasonal Key Factors

RULE 301.
BASE PREMIUM COMPUTATION (Cont'd)

Owner-occupied And Non-owner-occupied Key Premiums – Territories 230, 240, 250				
Fire – Coverage C – All Forms – Non-seasonal And Seasonal				
		1 – 5 Families		
Protection Class	Const.∗	Territory 230	Territory 240	Territory 250
1	M	$ 11	$ 9	$ 8
	F	16	12	11
2	M	12	9	8
	F	16	12	11
3	M	12	9	8
	F	16	12	12
4	M	12	9	9
	F	17	13	12
5	M	12	10	9
	F	17	13	12
6	M	13	10	9
	F	18	14	13
7	M	14	11	10
	F	19	15	14
8	M	16	12	11
	F	22	17	16
8B, 9, 9E, 9S	M	18	14	13
	F	24	19	17
10	M	22	17	15
	F	30	23	21

∗   M = Masonry, F = Frame. Masonry Veneer is rated as masonry. Aluminum or plastic siding over frame is rated as frame.

Table 301.A.#29(R) Fire – Coverage C – All Forms – Non-seasonal And Seasonal Owner-occupied And Non-owner-occupied Key Premiums

Fire – Coverage C – All Forms Owner And Non-owner-occupied – Non-seasonal And Seasonal			
Key Factors			
Limit Of Liability (000's)	Coverage C	Limit Of Liability (000's)	Coverage C
$ 1∗	.35	$ 27	3.73
2	.48	28	3.86
3	.61	29	3.99
4	.74	30	4.12
5	.87	31	4.25
6	1.00	32	4.38
7	1.13	33	4.51
8	1.26	34	4.64
9	1.39	35	4.77
10	1.52	36	4.90
11	1.65	37	5.03
12	1.78	38	5.16
13	1.91	39	5.29
14	2.04	40	5.42
15	2.17	41	5.55
16	2.30	42	5.68
17	2.43	43	5.81
18	2.56	44	5.94
19	2.69	45	6.07
20	2.82	46	6.20
21	2.95	47	6.33
22	3.08	48	6.46
23	3.21	49	6.59
24	3.34	50	6.72
25	3.47	Each Addi-	
26	3.60	tional $1,000	.13

∗   Use this limit of liability to develop premiums for policy amounts less than $1,000.

Table 301.A.#30(R) Fire – Coverage C – All Forms Owner And Non-owner-occupied – Non-seasonal And Seasonal Key Factors

RULE 301.
BASE PREMIUM COMPUTATION (Cont'd)

Owner-occupied And Non-owner-occupied Key Premiums – Territories 260, 270, 280				
Fire – Coverage C – All Forms – Non-seasonal And Seasonal				
		1 – 5 Families		
Protection Class	Const.∗	Territory 260	Territory 270	Territory 280
1	M	$ 9	$ 7	$ 6
	F	12	9	8
2	M	9	7	6
	F	12	9	8
3	M	9	7	6
	F	12	10	9
4	M	9	7	6
	F	13	10	9
5	M	10	7	7
	F	13	10	9
6	M	10	8	7
	F	14	11	10
7	M	11	8	7
	F	15	11	10
8	M	12	10	9
	F	17	13	12
8B, 9, 9E, 9S	M	14	11	9
	F	19	14	13
10	M	17	13	12
	F	23	18	16

∗ M = Masonry, F = Frame. Masonry Veneer is rated as masonry. Aluminum or plastic siding over frame is rated as frame.

Table 301.A.#31(R) Fire – Coverage C – All Forms – Non-seasonal And Seasonal Owner-occupied And Non-owner-occupied Key Premiums

Fire – Coverage C – All Forms Owner And Non-owner-occupied – Non-seasonal And Seasonal			
Key Factors			
Limit Of Liability (000's)	Coverage C	Limit Of Liability (000's)	Coverage C
$ 1∗	.35	$ 27	3.73
2	.48	28	3.86
3	.61	29	3.99
4	.74	30	4.12
5	.87	31	4.25
6	1.00	32	4.38
7	1.13	33	4.51
8	1.26	34	4.64
9	1.39	35	4.77
10	1.52	36	4.90
11	1.65	37	5.03
12	1.78	38	5.16
13	1.91	39	5.29
14	2.04	40	5.42
15	2.17	41	5.55
16	2.30	42	5.68
17	2.43	43	5.81
18	2.56	44	5.94
19	2.69	45	6.07
20	2.82	46	6.20
21	2.95	47	6.33
22	3.08	48	6.46
23	3.21	49	6.59
24	3.34	50	6.72
25	3.47	Each Additional $1,000	
26	3.60		.13

∗ Use this limit of liability to develop premiums for policy amounts less than $1,000.

Table 301.A.#32(R) Fire – Coverage C – All Forms Owner And Non-owner-occupied – Non-seasonal And Seasonal Key Factors

RULE 301.
BASE PREMIUM COMPUTATION (Cont'd)

Owner-occupied And Non-owner-occupied Key Premiums – Territories 290, 300, 310				
Fire – Coverage C – All Forms – Non-seasonal And Seasonal				
		1 – 5 Families		
Protection Class	Const.∗	Territory 290	Territory 300	Territory 310
1	M	$ 7	$ 10	$ 7
	F	10	14	10
2	M	8	10	8
	F	10	14	10
3	M	8	11	8
	F	11	14	11
4	M	8	11	8
	F	11	15	11
5	M	8	11	8
	F	11	15	11
6	M	9	12	9
	F	12	16	12
7	M	9	12	9
	F	12	17	12
8	M	10	14	10
	F	14	20	14
8B, 9, 9E, 9S	M	12	16	12
	F	16	21	16
10	M	14	19	14
	F	19	26	19

∗   M = Masonry, F = Frame. Masonry Veneer is rated as masonry. Aluminum or plastic siding over frame is rated as frame.

Table 301.A.#33(R) Fire – Coverage C – All Forms – Non-seasonal And Seasonal Owner-occupied And Non-owner-occupied Key Premiums

Fire – Coverage C – All Forms Owner And Non-owner-occupied – Non-seasonal And Seasonal			
Key Factors			
Limit Of Liability (000's)	Coverage C	Limit Of Liability (000's)	Coverage C
$ 1∗	.35	$ 27	3.73
2	.48	28	3.86
3	.61	29	3.99
4	.74	30	4.12
5	.87	31	4.25
6	1.00	32	4.38
7	1.13	33	4.51
8	1.26	34	4.64
9	1.39	35	4.77
10	1.52	36	4.90
11	1.65	37	5.03
12	1.78	38	5.16
13	1.91	39	5.29
14	2.04	40	5.42
15	2.17	41	5.55
16	2.30	42	5.68
17	2.43	43	5.81
18	2.56	44	5.94
19	2.69	45	6.07
20	2.82	46	6.20
21	2.95	47	6.33
22	3.08	48	6.46
23	3.21	49	6.59
24	3.34	50	6.72
25	3.47	Each Addi-	
26	3.60	tional $1,000	.13

∗   Use this limit of liability to develop premiums for policy amounts less than $1,000.

Table 301.A.#34(R) Fire – Coverage C – All Forms Owner And Non-owner-occupied – Non-seasonal And Seasonal Key Factors

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RULE 301.
BASE PREMIUM COMPUTATION (Cont'd)

Owner-occupied And Non-owner-occupied Key Premiums – Territories 320, 330, 340				
Fire – Coverage C – All Forms – Non-seasonal And Seasonal				
		1 – 5 Families		
Protection Class	Const.∗	Territory 320	Territory 330	Territory 340
1	M	$ 7	$ 8	$ 6
	F	10	11	8
2	M	8	8	6
	F	10	11	8
3	M	8	8	6
	F	11	12	9
4	M	8	9	6
	F	11	12	9
5	M	8	9	7
	F	11	12	9
6	M	9	9	7
	F	12	13	10
7	M	9	10	7
	F	12	14	10
8	M	10	11	9
	F	14	16	12
8B, 9, 9E, 9S	M	12	13	9
	F	16	17	13
10	M	14	15	12
	F	19	21	16

∗ M = Masonry, F = Frame. Masonry Veneer is rated as masonry. Aluminum or plastic siding over frame is rated as frame.

Table 301.A.#35(R) Fire – Coverage C – All Forms – Non-seasonal And Seasonal Owner-occupied And Non-owner-occupied Key Premiums

Fire – Coverage C – All Forms Owner And Non-owner-occupied – Non-seasonal And Seasonal			
Key Factors			
Limit Of Liability (000's)	Coverage C	Limit Of Liability (000's)	Coverage C
$ 1∗	.35	$ 27	3.73
2	.48	28	3.86
3	.61	29	3.99
4	.74	30	4.12
5	.87	31	4.25
6	1.00	32	4.38
7	1.13	33	4.51
8	1.26	34	4.64
9	1.39	35	4.77
10	1.52	36	4.90
11	1.65	37	5.03
12	1.78	38	5.16
13	1.91	39	5.29
14	2.04	40	5.42
15	2.17	41	5.55
16	2.30	42	5.68
17	2.43	43	5.81
18	2.56	44	5.94
19	2.69	45	6.07
20	2.82	46	6.20
21	2.95	47	6.33
22	3.08	48	6.46
23	3.21	49	6.59
24	3.34	50	6.72
25	3.47	Each Addi-	
26	3.60	tional $1,000	.13

∗ Use this limit of liability to develop premiums for policy amounts less than $1,000.

Table 301.A.#36(R) Fire – Coverage C – All Forms Owner And Non-owner-occupied – Non-seasonal And Seasonal Key Factors

RULE 301.
BASE PREMIUM COMPUTATION (Cont'd)

Owner-occupied And Non-owner-occupied Key Premiums – Territories 350, 360, 370				
Fire – Coverage C – All Forms – Non-seasonal And Seasonal				
		1 – 5 Families		
Protection Class	Const.∗	Territory 350	Territory 360	Territory 370
1	M	$ 7	$ 6	$ 7
	F	10	8	9
2	M	8	6	7
	F	10	8	9
3	M	8	6	7
	F	11	9	10
4	M	8	6	7
	F	11	9	10
5	M	8	7	7
	F	11	9	10
6	M	9	7	8
	F	12	10	11
7	M	9	7	8
	F	12	10	11
8	M	10	9	10
	F	14	12	13
8B, 9, 9E, 9S	M	12	9	11
	F	16	13	14
10	M	14	12	13
	F	19	16	18

∗   M = Masonry, F = Frame. Masonry Veneer is rated as masonry. Aluminum or plastic siding over frame is rated as frame.

Table 301.A.#37(R) Fire – Coverage C – All Forms – Non-seasonal And Seasonal Owner-occupied And Non-owner-occupied Key Premiums

Fire – Coverage C – All Forms Owner And Non-owner-occupied – Non-seasonal And Seasonal			
Key Factors			
Limit Of Liability (000's)	Coverage C	Limit Of Liability (000's)	Coverage C
$ 1∗	.35	$ 27	3.73
2	.48	28	3.86
3	.61	29	3.99
4	.74	30	4.12
5	.87	31	4.25
6	1.00	32	4.38
7	1.13	33	4.51
8	1.26	34	4.64
9	1.39	35	4.77
10	1.52	36	4.90
11	1.65	37	5.03
12	1.78	38	5.16
13	1.91	39	5.29
14	2.04	40	5.42
15	2.17	41	5.55
16	2.30	42	5.68
17	2.43	43	5.81
18	2.56	44	5.94
19	2.69	45	6.07
20	2.82	46	6.20
21	2.95	47	6.33
22	3.08	48	6.46
23	3.21	49	6.59
24	3.34	50	6.72
25	3.47	Each Addi-	
26	3.60	tional $1,000	.13

∗   Use this limit of liability to develop premiums for policy amounts less than $1,000.

Table 301.A.#38(R) Fire – Coverage C – All Forms Owner And Non-owner-occupied – Non-seasonal And Seasonal Key Factors

RULE 301.
BASE PREMIUM COMPUTATION (Cont'd)

Owner-occupied And Non-owner-occupied Key Premiums – Territories 380, 390			
Fire – Coverage C – All Forms – Non-seasonal And Seasonal			
		1 – 5 Families	
Protection Class	Const.∗	Territory 380	Territory 390
1	M	$ 6	7
	F	8	9
2	M	6	7
	F	8	9
3	M	6	7
	F	9	10
4	M	6	7
	F	9	10
5	M	7	7
	F	9	10
6	M	7	8
	F	10	11
7	M	7	8
	F	10	11
8	M	9	10
	F	12	13
8B, 9, 9E, 9S	M	9	11
	F	13	14
10	M	12	13
	F	16	18
∗ M = Masonry, F = Frame. Masonry Veneer is rated as masonry. Aluminum or plastic siding over frame is rated as frame.			

Table 301.A.#39(R) Fire – Coverage C – All Forms – Non-seasonal And Seasonal Owner-occupied And Non-owner-occupied Key Premiums

Fire – Coverage C – All Forms Owner And Non-owner-occupied – Non-seasonal And Seasonal			
Key Factors			
Limit Of Liability (000's)	Coverage C	Limit Of Liability (000's)	Coverage C
$ 1∗	.35	$ 27	3.73
2	.48	28	3.86
3	.61	29	3.99
4	.74	30	4.12
5	.87	31	4.25
6	1.00	32	4.38
7	1.13	33	4.51
8	1.26	34	4.64
9	1.39	35	4.77
10	1.52	36	4.90
11	1.65	37	5.03
12	1.78	38	5.16
13	1.91	39	5.29
14	2.04	40	5.42
15	2.17	41	5.55
16	2.30	42	5.68
17	2.43	43	5.81
18	2.56	44	5.94
19	2.69	45	6.07
20	2.82	46	6.20
21	2.95	47	6.33
22	3.08	48	6.46
23	3.21	49	6.59
24	3.34	50	6.72
25	3.47	Each Addi-	
26	3.60	tional $1,000	.13
∗ Use this limit of liability to develop premiums for policy amounts less than $1,000.			

Table 301.A.#40(R) Fire – Coverage C – All Forms Owner And Non-owner-occupied – Non-seasonal And Seasonal Key Factors

RULE 301.
BASE PREMIUM COMPUTATION (Cont'd)

Extended Coverage, Broad And Special Forms – Coverage A Key Premiums∗				
		Forms		
Territory	Const.∗	DP 00 01	DP 00 02	DP 00 03
110	M	148	157	163
	F	156	165	172
	MH	195	207	n/a
120	M	165	175	182
	F	174	184	191
	MH	218	231	n/a
130	M	122	129	134
	F	128	136	141
	MH	160	170	n/a
140	M	127	135	140
	F	134	142	147
	MH	168	178	n/a
150	M	120	127	132
	F	126	134	139
	MH	158	167	n/a
160	M	124	131	136
	F	130	138	143
	MH	163	173	n/a
170	M	59	80	89
	F	62	84	93
	MH	78	105	n/a
180	M	59	80	89
	F	62	84	93
	MH	78	105	n/a
190	M	59	80	89
	F	62	84	93
	MH	78	105	n/a
200	M	73	99	110
	F	77	104	116
	MH	96	130	n/a
210	M	49	66	74
	F	52	70	78
	MH	65	88	n/a
220	M	44	59	66
	F	46	62	69
	MH	58	78	n/a
230	M	69	93	104
	F	73	99	110
	MH	91	123	n/a
240	M	48	65	72
	F	51	69	77
	MH	64	86	n/a

Extended Coverage, Broad And Special Forms – Coverage A Key Premiums∗				
		Forms		
Territory	Const.∗	DP 00 01	DP 00 02	DP 00 03
250	M	49	66	74
	F	52	70	78
	MH	65	88	n/a
260	M	48	65	72
	F	50	68	75
	MH	63	85	n/a
270	M	35	47	53
	F	37	50	56
	MH	46	62	n/a
280	M	35	47	53
	F	37	50	56
	MH	46	62	n/a
290	M	44	59	66
	F	46	62	69
	MH	58	78	n/a
300	M	37	50	56
	F	39	53	59
	MH	49	66	n/a
310	M	29	39	44
	F	31	42	47
	MH	39	53	n/a
320	M	32	43	48
	F	34	46	51
	MH	43	58	n/a
330	M	35	47	53
	F	37	50	56
	MH	46	62	n/a
340	M	28	38	42
	F	29	39	44
	MH	36	49	n/a
350	M	29	39	44
	F	30	41	45
	MH	38	51	n/a
360	M	28	38	42
	F	29	39	44
	MH	36	49	n/a
370	M	29	39	44
	F	31	42	47
	MH	39	53	n/a
380	M	26	35	39
	F	27	36	41
	MH	34	46	n/a

RULE 301.
PREMIUM COMPUTATION (Cont'd)

Extended Coverage, Broad And Special Forms – Coverage A Key Premiums∗				
		Forms		
Territory	Const.∗	DP 00 01	DP 00 02	DP 00 03
390	M	26	35	39
	F	27	36	41
	MH	34	46	n/a

∗ **DP 00 01** Key Premiums are Non-seasonal and Seasonal. **DP 00 02** and **DP 00 03** Key Premiums are Non-seasonal only and include the charge for Extended Coverage and Vandalism and Malicious Mischief perils. M = Masonry, F = Frame, MH = Mobile Home. Masonry Veneer is rated as masonry. Aluminum or plastic siding over frame is rated as frame. **DP 00 02** Key Premiums for MH should be used in conjunction with Actual Cash Value Loss Settlement Endorsement **DP 04 76** Only; see Rule **305.**

Table 301.A.#41(R) Extended Coverage, Broad And Special Forms – Coverage A Key Premiums

To develop the Seasonal Base Premiums, multiply the following factors by the **DP 00 01** Extended Coverage Base Premiums:

Territory	DP 00 02	DP 00 03
110-160	1.10	1.20
170-390	1.50	1.55

Table 301.A.#42(R) Extended Coverage, Broad And Special Forms – Coverage A Seasonal Key Premiums Forms DP 00 02 And DP 00 03

Extended Coverage, Broad And Special Forms – Coverage A			
Key Factors			
Limit Of Liability (000's)	Coverage A	Limit Of Liability (000's)	Coverage A
$ 1∗	.24	$ 27	1.64
2	.29	28	1.69
3	.34	29	1.74
4	.40	30	1.79
5	.45	31	1.84
6	.51	32	1.89
7	.56	33	1.94
8	.62	34	1.99
9	.67	35	2.04
10	.72	36	2.09
11	.78	37	2.14
12	.83	38	2.19
13	.89	39	2.24
14	.94	40	2.29

Extended Coverage, Broad And Special Forms – Coverage A			
Key Factors			
Limit Of Liability (000's)	Coverage A	Limit Of Liability (000's)	Coverage A
15	1.00	41	2.34
16	1.05	42	2.39
17	1.10	43	2.44
18	1.16	44	2.49
19	1.21	45	2.54
20	1.27	46	2.59
21	1.32	47	2.64
22	1.37	48	2.69
23	1.43	49	2.74
24	1.48	50	2.79
25	1.54	Each Addi-	
26	1.59	tional $1,000	.05

∗ Use this limit of liability to develop premiums for policy amounts less than $1,000.

Table 301.A.#43(R) Extended Coverage, Broad And Special Forms – Coverage A Key Factors

Extended Coverage, Broad And Special Forms – Coverage C Key Premiums∗				
		Forms		
Territory	Const.∗	DP 00 01	DP 00 02	DP 00 03
110	M	21	22	23
	F	22	23	24
	MH	28	30	n/a
120	M	25	27	28
	F	26	28	29
	MH	33	35	n/a
130	M	18	19	20
	F	19	20	21
	MH	24	25	n/a
140	M	18	19	20
	F	19	20	21
	MH	24	25	n/a
150	M	11	12	12
	F	12	13	13
	MH	15	16	n/a
160	M	13	14	14
	F	14	15	15
	MH	18	19	n/a
170	M	5	7	8
	F	5	7	8
	MH	6	8	n/a

RULE 301.
PREMIUM COMPUTATION (Cont'd)

Extended Coverage, Broad And Special Forms – Coverage C Key Premiums∗				
		Forms		
Territory	**Const.∗**	**DP 00 01**	**DP 00 02**	**DP 00 03**
180	M	6	8	9
	F	6	8	9
	MH	8	11	n/a
190	M	7	9	11
	F	7	9	11
	MH	9	12	n/a
200	M	10	14	15
	F	10	14	15
	MH	13	18	n/a
210	M	4	5	6
	F	4	5	6
	MH	5	7	n/a
220	M	3	4	5
	F	3	4	5
	MH	4	5	n/a
230	M	9	12	14
	F	9	12	14
	MH	11	15	n/a
240	M	3	4	5
	F	3	4	5
	MH	4	5	n/a
250	M	3	4	5
	F	3	4	5
	MH	4	5	n/a
260	M	2	3	3
	F	2	3	3
	MH	3	4	n/a
270	M	2	3	3
	F	2	3	3
	MH	3	4	n/a
280	M	2	3	3
	F	2	3	3
	MH	3	4	n/a
290	M	2	3	3
	F	2	3	3
	MH	3	4	n/a
300	M	4	5	6
	F	4	5	6
	MH	5	7	n/a

Extended Coverage, Broad And Special Forms – Coverage C Key Premiums∗				
		Forms		
Territory	**Const.∗**	**DP 00 01**	**DP 00 02**	**DP 00 03**
310	M	1	1	2
	F	1	1	2
	MH	1	1	n/a
320	M	1	1	2
	F	1	1	2
	MH	1	1	n/a
330	M	1	1	2
	F	1	1	2
	MH	1	1	n/a
340	M	1	1	2
	F	1	1	2
	MH	1	1	n/a
350	M	1	1	2
	F	1	1	2
	MH	1	1	n/a
360	M	2	3	3
	F	2	3	3
	MH	3	4	n/a
370	M	2	3	3
	F	2	3	3
	MH	3	4	n/a
380	M	1	1	2
	F	1	1	2
	MH	1	1	n/a
390	M	1	1	2
	F	1	1	2
	MH	1	1	n/a

∗ **DP 00 01** Key Premiums are Non-seasonal and Seasonal. **DP 00 02** and **DP 00 03** Key Premiums are Non-seasonal only and include the charge for Extended Coverage and Vandalism and Malicious Mischief perils. M = Masonry, F = Frame, MH = Mobile Home. Masonry Veneer is rated as masonry. Aluminum or plastic siding over frame is rated as frame. **DP 00 02** Key Premiums for MH should be used in conjunction with Actual Cash Value Loss Settlement Endorsement **DP 04 76** Only; see Rule **305.**

Table 301.A.#44(R) Extended Coverage, Broad And Special Forms – Coverage C Key Premiums

RULE 301.
PREMIUM COMPUTATION (Cont'd)

To develop the Seasonal Base Premiums, multiply the following factors by the **DP 00 01** Extended Coverage Base Premiums:

Territory	DP 00 02	DP 00 03
110-160	1.10	1.20
170-390	1.50	1.55

Table 301.A.#45(R) Extended Coverage, Broad And Special Forms – Coverage C Seasonal Key Premiums Forms DP 00 02 And DP 00 03

Extended Coverage, Broad And Special Forms – Coverage C			
Key Factors			
Limit Of Liability (000's)	**Coverage C**	**Limit Of Liability (000's)**	**Coverage C**
$ 1*	.17	$ 27	4.51
2	.33	28	4.68
3	.50	29	4.85
4	.67	30	5.02
5	.83	31	5.19
6	1.00	32	5.36
7	1.17	33	5.53
8	1.34	34	5.70
9	1.50	35	5.87
10	1.67	36	6.04
11	1.84	37	6.21
12	2.00	38	6.38
13	2.17	39	6.55
14	2.33	40	6.72
15	2.50	41	6.89
16	2.67	42	7.06
17	2.84	43	7.23
18	3.00	44	7.40
19	3.17	45	7.57
20	3.34	46	7.74
21	3.51	47	7.91
22	3.67	48	8.08
23	3.84	49	8.25
24	4.00	50	8.42
25	4.17	Each Addi-	
26	4.34	tional $1,000	.17

* Use this limit of liability to develop premiums for policy amounts less than $1,000.

Table 301.A.#46(R) Extended Coverage, Broad And Special Forms – Coverage C Key Factors

RULE 302.
VANDALISM AND MALICIOUS MISCHIEF – (DP 00 01)

Rates Per $1,000	
Not Seasonal or Vacant	$ .17
Seasonal and Not Vacant	1.40
Vacant	9.30
In Course of Construction	.19

Table 302.(R) Vandalism And Malicious Mischief (DP 00 01)

RULE 404.
MOBILE OR TRAILER HOMES – (DP 00 01 ONLY OR DP 00 02 WITH DP 04 76)

Multiply the Frame Construction, Coverage **A** or **C** Base Premium by .9 for Fire and multiply the Mobile Home Construction, Coverage **A** or **C** Base Premium by 1.00 for Extended Coverage.

RULE 406.
DEDUCTIBLES

B. Optional Deductibles

The Minimum Additional Charge is $25.00.

RULE 500.
MISCELLANEOUS LOSS COSTS

Rates Per $1,000*	
Exposure	**Rates**
A. Fire: Protection Class 1 – 8	$ 2.50
Fire: Protection Class 8B, 9, 9E, 9S & 10	4.50
B. Extended Coverage **(DP 00 01)**	1.00
C. Broad Form **(DP 00 02)**	1.50
D. Special Form **(DP 00 03)**	2.00
E. Broad Form **(DP 00 02)** with Endorsement **DP 04 65**	2.00
* These rates apply to all occupancies, territories, construction and protection classifications, unless otherwise specified. Rates for **A.** are cumulative with either **B., C., D.,** or **E.**	

Table 500.(R) Miscellaneous Rates

RULE 507.
FIRE DEPARTMENT SERVICE CHARGE

The Additional Rate per $1,000 of insurance is $15.00.

RULE 508.
TREES, SHRUBS AND OTHER PLANTS

C. Premium Computation

1. Fire, Extended Coverage, Broad And Special Forms

The rates in the following table apply to all occupancies, territories, construction and protection classifications, unless otherwise specified:

Fire (DP 00 01)		
Protection Class	**Rates Per $1,000**	
1 – 8	$ 2.50	
8B, 9, 9E, 9S & 10	4.50	
Extended Coverage (DP 00 01) – All Specified Perils		
	Rates Per $1,000	
Territory	**Including Wind Or Hail**	**Excluding Wind Or Hail**
110-120	$ 57.00	$ 1.00
130-160	29.00	1.00
170-290	15.00	1.00
300-390	13.10	1.00
Windstorm Or Hail (DP 00 02 And DP 00 03)		
Territory	**Rates Per $1,000**	
110-120	$ 56.00	
130-160	28.00	
170-290	14.00	
300-390	12.10	

Table 508.C.1.(R) Premium Computation

RULE 509.
EARTHQUAKE COVERAGE

D. Premium For Base Deductible

	Zone	Frame*	Masonry*	Superior
Table A Coverages **A, B, D** Or **E** Improvements, etc. & Other Building Options	3 4 5	$ .36 .23 .18	$ 1.72 1.05 .57	$ .68 .39 .27
Table B Coverage **C** & Other Personal Property Options	3 4 5	$ .36 .23 .18	$ 1.43 .82 .57	$ .36 .23 .18
* If exterior Masonry Veneer is covered, rate as Masonry; if not covered – rate as Frame.				
Zone Definitions				

Zone 3		
Anson	Davie	Richmond
Brunswick	Gaston	Robeson
Cabarrus	Iredell	Rowan
Catawba	Lincoln	Scotland
Cleveland	Mecklenburg	Stanly
Columbus	Montgomery	Union

Zone 4		
Alexander	Forsyth	Pender
Alleghany	Graham	Polk
Ashe	Haywood	Randolph
Avery	Henderson	Rutherford
Bladen	Hoke	Surry
Buncombe	Jackson	Swain
Burke	Macon	Transylvania
Caldwell	Madison	Watauga
Cherokee	McDowell	Wilkes
Clay	Mitchell	Yadkin
Cumberland	Moore	Yancey
Davidson	New Hanover	

Zone 5		
Balance of State		

Table 509.D.1.(R) Premium For Base Deductible 5% Deductible

RULE 511.
SINKHOLE COLLAPSE COVERAGE

Rates Per $1,000	
Cov. **A** or **B** and Other Bldg. Options	$ .30
Cov. **C** or Personal Property Options	.10

Table 511.B.1.(R) Premium Computation

RULE 512.
WINDSTORM OR HAIL COVERAGE – MISCELLANEOUS PROPERTIES

Rates Per $1,000				
	Territories			
	110-120	**130-160**	**170-290**	**300-390**
1. Signs				
All Metal	$ 33.60	$ 16.80	$ 12.10	$ 11.20
Other Construction	112.00	56.00	44.30	38.70
2. Cloth Awnings	56.00	28.00	14.00	12.10
3. Radio Or Television Equipment	112.00	56.00	44.30	32.70
4. Swimming Pools – Construction Of Pool And Related Structures∗				
Masonry, Uncovered	.94	.47	.37	.28
Masonry, With Combustible Superstructures (Including Roof) And/Or Fencing – Pool Only	.94	.47	.37	.28
Masonry, With Combustible Superstructures (Including Roof) And/Or Fencing – Superstructure And/Or Fencing	32.60	16.30	11.20	8.40
Other Construction With Or Without Roof	32.60	16.30	11.20	8.40
Inflated Enclosure Or Covering Of Plastic Material	168.00	84.00	65.30	56.00
5. Screens (Including Supports)	32.60	16.30	11.20	8.40
6. Fences And Walls				
Masonry, Iron Or Reinforced Concrete	2.80	1.40	1.12	1.03
Other Construction	56.00	28.00	14.00	12.10
7. Bathhouses, Cabanas, Pergolas, Slathouses, Trellises; Structures Over Water				
Masonry	4.67	2.33	1.49	1.31
Other Construction – Fully Enclosed	6.53	3.27	1.96	1.68
Other Construction – Not Fully Enclosed	17.72	8.86	7.00	6.53
8. Outdoor Equipment	4.80	2.40	2.12	2.03
9. Greenhouses Or Hothouses				
Structures Including Glass, Flowers And Plants	130.60	65.30	61.10	60.60
If insured separately: Structure	11.56	5.78	4.67	4.48
Glass	66.20	33.10	31.30	30.80
Flowers And Plants	87.80	43.90	40.60	40.10
∗ If any part of a pool's enclosure or roof is made of plastic film or cloth, supported on wood framing, the entire pool is subject to the rates displayed for Inflated Enclosure or Covering of Plastic Material.				

Table 512.D.(R) Premium Windstorm Or Hail Coverage – Miscellaneous Properties

RULE 514.
ASSISTED LIVING CARE

C. Premium

For Basic Limits, the rate per unit is $55.38.

For increased Coverage **C** Limit, the rate per $1,000 is $6.38.

1. TERRITORY ASSIGNMENTS

If a territory shown is defined in terms of United States Postal Service (USPS) ZIP code:

A. Determine the applicable rating territory based on the location of the dwelling.

B. An insured's rates shall not be changed solely because the USPS changed his or her ZIP code and the physical boundaries of a rating territory shall be determined by the ZIP code boundaries in effect at the time of the latest rate filing defining the territory.

Territory boundaries in North Carolina are concurrent with USPS ZIP code boundaries in effect as of **July 1, 2013**. If the USPS introduces a new ZIP code or realigns a ZIP code boundary after **July 1, 2013**, the new ZIP code may not yet be listed in Rule **2.C.** If this is the case, assign the rating territory based on the ZIP code boundary that formerly applied to the dwelling before the USPS changed the ZIP code.

2. TERRITORY DEFINITIONS – (For all Coverages and Perils Other than Earthquake).

Assign the applicable territory using the following order of priority:

A. Counties

County of	Code
Alamance	310
Alexander	340
Alleghany	360
Anson	300
Ashe	360
Avery	370
Beaufort	150
Bertie	180
Bladen	230
Buncombe	360
Burke	360
Cabarrus	320
Caldwell	360
Camden	150
Caswell	310
Catawba	360
Chatham	280
Cherokee	390
Chowan	150
Clay	390
Cleveland	350
Columbus	200
Craven	150
Cumberland	220

County of	Code
Currituck (other than Beach Areas)	130
Dare (other than Beach Areas)	130
Davidson	320
Davie	310
Duplin	190
Durham	270
Edgecombe	210
Forsyth	310
Franklin	240
Gaston	350
Gates	170
Graham	390
Granville	260
Greene	180
Guilford	310
Halifax	240
Harnett	250
Haywood	380
Henderson	360
Hertford	170
Hoke	250
Hyde (other than Beach Areas)	130
Iredell	340
Jackson	390
Johnston	240
Jones	150
Lee	290
Lenoir	190
Lincoln	350
Macon	390
Madison	380
Martin	180
McDowell	360
Mecklenburg	340
Mitchell	370
Montgomery	300
Moore	290

County of	Code
Nash	240
Northampton	240
Orange	280
Pamlico	130
Pasquotank	150
Perquimans	150
Person	260
Pitt	180
Polk	360
Randolph	320
Richmond	300
Robeson	230
Rockingham	310
Rowan	320
Rutherford	350
Sampson	220
Scotland	250
Stanly	340
Stokes	310
Surry	310
Swain	380
Transylvania	380
Tyrrell	150
Union	340
Vance	260
Wake	270
Warren	260
Washington	150
Watauga	360
Wayne	180
Wilkes	340
Wilson	210
Yadkin	330
Yancey	360

B. Beach Areas

Beach Area – Localities south and east of the Inland Waterway from the South Carolina Line to Fort Macon (Beaufort Inlet), thence south and east of Core, Pamlico, Roanoke and Currituck Sounds to the Virginia Line, being those portions of land generally knows as the "Outer Banks".

Beach Areas in Currituck, Dare and Hyde Counties: 110

Beach Areas in Brunswick, Carteret, New Hanover, Onslow and Pender Counties: 120

C. Other Than Beach Areas of Brunswick, Carteret, New Hanover, Onslow and Pender Counties

For areas of Brunswick, Carteret, New Hanover, Onslow and Pender Counties, other than the Beach Areas, refer to the following ZIP codes. If portions of these ZIP codes fall in Counties other than Brunswick, Carteret, New Hanover, Onslow and Pender Counties use the territory code for those counties.

1. Eastern Coastal Territory

ZIP Code	USPS ZIP Code Name	Code
28403	Wilmington	140
28404	Wilmington	140
28405	Wilmington	140
28406	Wilmington	140
28407	Wilmington	140
28408	Wilmington	140
28409	Wilmington	140
28410	Wilmington	140
28411	Wilmington	140
28412	Wilmington	140
28422	Bolivia	140
28428	Carolina Beach	140
28443	Hampstead	140
28445	Holly Ridge	140
28459	Shallotte	140
28460	Sneads Ferry	140
28461	Southport	140
28462	Supply	140
28467	Calabash	140
28468	Sunset Beach	140
28469	Ocean Isle Beach	140
28470	Shallotte	140
28480	Wrightsville Beach	140
28511	Atlantic	140
28516	Beaufort	140
28520	Cedar Island	140
28524	Davis	140
28528	Gloucester	140
28531	Harkers Island	140
28532	Havelock	140
28533	Cherry Point	140
28539	Hubert	140
28553	Marshallberg	140
28557	Morehead City	140
28570	Newport	140
28577	Sealevel	140
28579	Smyrna	140
28581	Stacy	140
28584	Swansboro	140
28589	Williston	140

2. **Western Coastal Territory**

ZIP Code	USPS ZIP Code Name	Code
28401	Wilmington	160
28402	Wilmington	160
28420	Ash	160
28421	Atkinson	160
28425	Burgaw	160
28429	Castle Hayne	160
28435	Currie	160
28436	Delco	160
28447	Ivanhoe	160
28448	Kelly	160
28451	Leland	160
28452	Longwood	160
28454	Maple Hill	160
28456	Riegelwood	160
28457	Rocky Point	160
28466	Wallace	160
28478	Willard	160
28479	Winnabow	160
28518	Beulaville	160
28521	Chinquapin	160
28540	Jacksonville	160
28541	Jacksonville	160
28542	Camp Lejeune	160
28543	Tarawa Terrace	160
28544	Midway Park	160
28545	McCutcheon Field	160
28546	Jacksonville	160
28547	Camp Lejeune	160
28555	Maysville	160
28574	Richlands	160
28582	Stella	160

PREFILED TESTIMONY
OF
PAUL ERICKSEN

2019 DWELLING INSURANCE
RATE FILING BY THE
NORTH CAROLINA RATE BUREAU

Q: Please state your name and business address.

A: My name is Paul Ericksen. My business address is Insurance Services Office, 545 Washington Boulevard, Jersey City, New Jersey.

Q: Please describe your educational background and your background in actuarial science.

A: I graduated from Princeton University in 1992 with a B.A. in mathematics.

       I became a Fellow of the Casualty Actuarial Society (CAS) in 1995 and am a member of the American Academy of Actuaries (AAA). I have met the professional continuing education requirements of the AAA and I am in good standing with those organizations.

       I served as a member of the CAS Examination Committee from 1996 through 2009.

       I have given multiple presentations at CAS meetings, including a presentation titled "The Actuary as an Expert Witness" at the following venues:

       •   CAS Ratemaking and Project Management Seminar in March of 2013
       •   Casualty Actuaries of New England Meeting in September of 2011
       •   CAS Ratemaking and Project Management Seminar in March of 2011

Q: By whom are you employed?

A: I am employed by Insurance Services Office (ISO) and started employment at ISO in 1992.

Q: What are your current responsibilities at ISO?

A: I lead the actuarial consulting practice at Proscendian. Proscendian is a division of ISO that specializes in providing a wide array of consulting services to individual companies. I have been responsible for managing, overseeing, and developing customized actuarial analyses including ratemaking, reserving and other

miscellaneous studies. I have provided services to insurers, captives, managing general agents, law firms and insurance departments.

Q: What is your employment background?

A: I started my career in 1992 as an actuarial assistant in the increased limits division of ISO. In 1993, I left ISO and spent a year as a consulting actuary in the New York office of Milliman, working primarily on medical malpractice projects. I returned to ISO in 1994 as an actuarial associate in the Financial Analysis division. In 1999, I transferred to ISO's Actuarial Consulting unit and assisted clients as a consulting actuary. In 2007, I was promoted to Principal of the Actuarial Consulting unit. In 2019, I became the Principal and leader of the actuarial consulting practice within Proscendian (a new division of ISO that specializes in consulting services).

During the past 20 plus years that I have provided actuarial consulting services, I have worked on a wide range of projects involving several different lines of insurance within the property/casualty insurance industry. I have prepared rate analyses for Homeowners, Dwelling and other lines of insurance. I have also conducted reserve analyses as the Appointed Actuary for several insurers.

A large part of my consulting experience has dealt with property insurance in areas of the country that have exposure to hurricane losses. For example, I have been the Appointed Actuary for Citizens Property Insurance Corporation of Florida ("Citizens") for four years (2004, 2005, 2007 and 2009), and was also responsible for preparing rate analyses for Citizens' Homeowners, Mobile Home, Dwelling and Commercial Property programs. Citizens is the insurer of last resort in Florida, and has been one of the largest property insurers in the state. In addition to work performed on behalf of Citizens, I have also conducted ratemaking and reserving projects for several voluntary insurers that write Homeowners and Dwelling business in Florida. I have developed indicated rates for both multi-peril policies and wind-only policies. I have extensive experience working with multiple hurricane models (including both AIR and RMS) and developing provisions for the cost of reinsurance.

In North Carolina, I have provided actuarial consulting services to both the North Carolina Insurance Underwriting Association ("NCIUA") and the North Carolina Joint Underwriting Association ("NCJUA"). Those organizations rely upon the rates set in filings by the North Carolina Rate Bureau ("Bureau").

Q: Are you familiar with dwelling insurance ratemaking in North Carolina and other states?

A: Yes. ISO has provided actuarial consulting to the Bureau on North Carolina dwelling rate filings since the Bureau was created. I have longstanding knowledge of the methodologies employed by ISO and the Bureau in this filing as well as in past Bureau dwelling filings. As part of a consulting assignment that I performed for the NCIUA and NCJUA, I have also reviewed prior filings by the Bureau on which ISO

provided actuarial consulting and filing preparation assistance. I have prepared many dwelling rate analyses in several different states. In addition, I have testified as an expert witness in support of my clients' dwelling rate filings in various hearings that were held in Florida and Massachusetts. In Florida, I have testified in support of rate filings submitted by Citizens.

While the initial stages of the preparation of this filing by ISO were under the direction of Yanjun Yao, FCAS, MAAA, when she resigned from ISO effective May 31, 2019, I was chosen to testify in support of this filing because of my background and knowledge of ISO's loss cost methodologies for dwelling rate filings and my knowledge and experience reviewing and preparing actuarial rate analyses for insurers in hurricane prone states. Beginning in June 2019, I have been involved in the review of the dwelling rate analysis prepared by ISO.

Q: What work has ISO performed with respect to the Bureau's 2019 dwelling rate filing in North Carolina?

A: First, ISO, as a licensed statistical agent in North Carolina, collects dwelling insurance data from a significant number of the companies which write that line in North Carolina, as well as from the NCIUA (commonly called the "Beach Plan") and the NCJUA (commonly called the "Fair Plan") which are residual market mechanisms.

Second, ISO collects, reviews and compiles data from three other statistical organizations licensed in North Carolina that collect dwelling data from Bureau member companies. All companies writing dwelling insurance in North Carolina must report to one of these four organizations. The other three organizations are: the Independent Statistical Service (ISS), the American Association of Insurance Services (AAIS) and the National Independent Statistical Service (NISS).

Third, ISO provides consulting actuarial services directly to the Bureau. As in the past, ISO staff compiled the ratemaking data to be reviewed by the Bureau's Property Rating Subcommittee, Property Committee and Governing Committee in preparation of rate reviews and filings.

Fourth, ISO staff put together the vast majority of the data, information and calculations contained in Exhibit RB-1. This lengthy process was performed under the direction of the Bureau committees. ISO staff attended meetings of those Bureau committees.

Finally, I have reviewed the filed rates to determine if they are calculated in accordance with the CAS guidance, including the Statement of Principles Regarding Property and Casualty Insurance Ratemaking and the Actuarial Standards of Practice. In accordance with Actuarial Standard of Practice No. 17 Expert Testimony by Actuaries, I conducted my review in terms of reasonableness rather than solely in terms of whether there is precise agreement on each issue. In addition, I applied the

applicable rate standards set forth in Article 36 of Chapter 58 of the North Carolina General Statutes, including but not limited to 58-36-10, i.e., that rates must not be excessive, inadequate or unfairly discriminatory and that certain statutory rating factors must be considered.

Q: What is the source of the data utilized in Exhibit RB-1?

A: The Bureau has the responsibility of filing forms and making rates for all dwelling insurance policies written in North Carolina (with the exception of such policies that may be written by county farm mutuals pursuant to N.C.G.S. 58-36-50). ISO, on behalf of the Bureau, combines the data as to those policies in its filings as if there were a single company with the aggregate loss experience of all those policies. Rates are then analyzed in rate filings as if those rates were being made for this hypothetical one company. The ratemaking data reflected in Exhibit RB-1 is, in general, based on the aggregate dwelling experience of the approximately 46 individual insurance companies that write dwelling policies in North Carolina, together with the experience written on dwelling insurance policies in the residual market as described below. Those entities submit their data to one of the four statistical agents described above. The four statistical agents subject each entity's data to a series of verification edits and then consolidate the data. The statistical agents then transmit their consolidated data to ISO for final review and consolidation with the ISO data. After consolidating the data, ISO produces exhibits of the combined data in a format and detail necessary for review by the Bureau committees and ultimately for use in rate filings.

The statistical agents are licensed by the Commissioner of Insurance in North Carolina.   They have collected, reviewed, compiled and submitted the data underlying this filing in the regular course of their business responsibilities.

Q.   Please describe what are commonly called the "Beach Plan" and the "FAIR Plan" and the role of their loss data in this filing?

A.   They are both residual market organizations that write policies for those policyholders who can't obtain insurance in the voluntary market.

The term "Beach Plan" is a commonly used name for the North Carolina Insurance Underwriting Association. It is a residual market organization created by the North Carolina legislature in Article 45 of the insurance statutes. It writes dwelling, homeowners, and other types of insurance for policyholders in the 18 coastal counties. It uses forms, rules and rates filed by the Bureau. Although voluntary insurers have chosen not to accept the risk of writing policies that have been written by the Beach Plan, North Carolina law requires voluntary insurers to be responsible for the losses that may occur on those Beach Plan policies, up to an aggregate statutory cap of $1 billion annually.   The significance of such non-recoupable assessments on the companies is discussed elsewhere in my testimony.

The Beach Plan uses the same dwelling forms that are used by voluntary companies. Those forms have been prepared and filed by the Bureau on behalf of all member companies. The Beach Plan writes policies in its own name. The Beach Plan receives and retains premiums, adjusts losses, reports statistics and operates in a manner similar to voluntary insurance companies in many respects. It uses dwelling forms and rates filed by the Bureau, except that it applies a 5% statutory surcharge on the wind and hail rate where it writes only the wind and hail coverage on dwelling policies. When the Beach Plan reports its statistical data to ISO, ISO reviews those statistical data in the same manner that it does for voluntary companies.

The second residual market mechanism in North Carolina is the called the North Carolina Joint Underwriting Association or Fair Access to Insurance Requirements organization (commonly called the "FAIR Plan.") It writes in all areas of the state except the beach. It writes dwelling fire and extended coverage policies but does not write homeowners policies. No surcharge is applied to FAIR Plan policies.

Statutes distinguish between the "beach" and "coastal" areas under the Beach Plan's jurisdiction. Based on data underlying Exhibit RB-4, approximately 95% of dwelling premium in the "beach" territories (territories 110 and 120) was written by the Beach Plan in 2017. In the "coastal" territories (territories 130, 140, 150 and 160), approximately 74% of the dwelling premium was written in either the Beach Plan or the FAIR Plan. On a statewide basis, approximately 51% of dwelling premium was written in either the Beach Plan or FAIR Plan.

Over the years, the Beach and FAIR Plan's large growth reflects the fact that voluntary companies are unwilling to write in coastal areas where the manual rate level is inadequate. This growth has occurred despite the fact that the legislature only intended the Beach Plan to be the "market of last resort" in those areas.

Loss and exposure data from these two residual market organizations have always been included in Bureau property filings for the line of insurance (the homeowners line of insurance or the dwelling fire and extended coverage line of insurance) under review, in the same manner as loss and exposure data from voluntary insurance companies that write that line of insurance. It is actuarially appropriate and necessary to include the residual market data with the voluntary data to ensure that the rates developed are representative of the entire market, since every policy has the potential to be written in the voluntary market.

Q: What statistical data supporting the filing are contained in Exhibit RB-1?

A: In general, the supporting data for the rate level changes are contained in Section C. The most recent five years of experience are displayed in Section C.

The loss experience used in the filing is what we call "accident year" experience for the years ended December 31, 2013 through December 31, 2017. This is the most recent five years of data available. I can explain what is meant by accident year

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experience by providing an example. The losses for the accident year ended December 31, 2017 consist of all losses caused by accidents which occurred during the one-year period ended December 31, 2017. If an accident occurred on December 29, 2017 and resulted in either a loss being paid or a reserve being established after January 1, 2018, that loss would be a part of the accident year losses for the period ended December 31, 2017. The test for breaking losses down into accident years is the date the accident occurred. The term "accident year" is an insurance accounting term that includes the various incidents that give rise to a dwelling insurance claim, including fires, hurricanes, tornados, etc. during a 12-month period.

Q: What is the reason for using five years of data to determine the indicated rate level change?

A: Ratemaking is prospective. The objective is to set rates at the level sufficient to pay expected losses, expected expenses and to allow insurance companies to earn a reasonable margin for profit. This is the fundamental equation in insurance ratemaking to set the adequate rate level; i.e., a rate level that is not "excessive, inadequate or unfairly discriminatory" as required by law.

Rates are set for the period when they will be in effect, which is often the year after the effective date of the filing. Historical loss data are generally used for the purpose of projecting expected losses. The North Carolina statutes allow the Bureau to review five years of experience in its rate level filings in addition to other factors that are to be considered. For non-catastrophic types of loss, five years of data balance the stability of the rates with responsiveness to more recent conditions. For catastrophic hurricane losses, the average of modeled losses from two hurricane models is used.

Traditional ratemaking for the fire coverage of a dwelling policy has relied on five years of experience with weights of 0.10, 0.15, 0.20, 0.25 and 0.30 being given to each year respectively. Those weights are used in this filing as in past Bureau dwelling filings. The weights used by the Bureau are identical to those used by ISO in all other states for dwelling fire insurance. These weights are generally accepted in all jurisdictions in which ISO makes dwelling filings. For the extended coverage portion of the dwelling policy, which by nature is more likely to be unstable because of weather events, equal weights are given to each year to help promote stability. This treatment is a common and accepted ratemaking practice used by ISO countrywide.

Q: Please turn to page C-2 of Exhibit RB-1. Would you explain what that page shows?

A: Page C-2 is what is called a statewide rate level calculation for the fire portion on a dwelling policy in North Carolina. Page C-2 determines the actuarially indicated rate level change for dwelling fire. The data shown are for all business written in the voluntary market and data written by the North Carolina Beach and FAIR Plans.

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The overall dwelling program to which this filing applies consists of both a fire and an extended coverage ("EC") component. Page C-2 shows the calculation of the indicated rate change for the fire component, and Page C-4 shows the corresponding indicated rate change for the EC component. I will first focus on describing Page C-2. However, later parts of my testimony will refer to the EC calculations on Page C-4.

Q: Referring to column 1 on page C-2, what are "Adjusted Incurred Losses"?

A: The incurred losses in column 1 are the losses from all causes from insured events that occurred during each of the five respective accident years. The figure includes losses which have already been paid, losses which are not yet paid and are represented by outstanding claim reserves, and losses which have been incurred but for which no individual reserve yet exists because they have not yet been reported.

Q: Have the losses as shown in column (1) been adjusted in any way?

A: Yes, as explained below, there are two adjustments. First, these losses have been adjusted to a common $500 deductible level. Second, these losses have been developed to ultimate by applying the loss development factors.

Q: Please explain what is done to adjust losses to a common deductible level.

A: In order to properly analyze losses for ratemaking, it is necessary to adjust losses from all policies to some common deductible level. The common deductible level that is assumed for dwelling is the base deductible of $500. Loss elimination ratios (LERs) are applied to the reported losses in order to account for the difference between the reported deductible and the assumed common deductible.

Q: What is the purpose of adjusting the reported losses by applying loss development factors?

A: The losses in column 1 of page C-2 include losses from events which have happened but which have not yet been reported. Such events are included by what is known as an adjustment for IBNR (incurred but not reported) losses.

       In addition, adjustments must be made to reflect the fact that loss payments occur over time. The losses, as they are reported to statistical agents, cover all accidents which occur during the respective accident years ended December 31. When they are reported to the statistical agent, they are evaluated as of March 31 of the next year. As of March 31, some of the losses have already been paid and some have not. Those that have not are represented by loss reserves. Loss reserves are estimates of what will ultimately be paid on these outstanding claims.

Since we want the losses used in the filing to be as accurate as possible, we look at history to see how losses have changed, or "developed," from the time they were initially reported to the time they were ultimately paid. For example, if we want to evaluate how losses reported in 2017 will eventually turn out, we look back and see what has happened in the past. If historically there has been a 1% increase in the dollar amount of losses from the time they were initially reported as reserves until the time they were ultimately paid, we would logically assume that the same development will hold true for losses incurred during the accident year ended December 31, 2017. Accordingly, we would make an adjustment by increasing the losses as they are initially reported to us by 1%.

Q: What causes losses to change or develop as you have described?

A: Changes to the reserve portion of the losses typically result from the fact that the ultimate loss payments turn out to be more or less than estimated at the time of the initial report that led to the reserve. Another factor that could lead to changes in losses is the late reporting of claims. For example, if a loss event occurred in late December of any given year and for some reason was not timely reported to the company by the end of the year, it might very well be that the losses as initially reported would not include any provision for that particular claim. By the next year's evaluation, however, the claim would have worked its way into the system and the loss would include either the paid amount or the reserved amount for that particular claim. This would cause an upward development in the losses as initially reported.

Q: Please refer to page D-12 of RB-1 and explain how the loss development factors used in the filing were calculated.

A: Page D-12 shows the calculation of loss development factors for the fire portion of a dwelling policy. The top section of that page shows the incurred losses evaluated as of 15, 27, 39, 51, 63, 75 and 87 months for the accident years for which available data are shown. In calculating loss development factors, we have used the data of companies reporting to ISO. The entry in the first column for the accident year ended December 31, 2013 is $9,609,120. This is in the column that is labeled "15 Months." This is the first evaluation of the losses caused by claims that occurred during the year that ended December 31, 2013. The evaluation was made as of March 31, 2014 -- 15 months after the beginning of the accident year. Twelve months later (March 31, 2015) the losses caused by claims that occurred during the year ended December 31, 2013 had decreased to $9,287,968. This is the evaluation as of 27 months after the beginning of the accident year. This decrease represents a decrease in losses, or negative development, of -3.3% (0.967) as shown in the column on that page labeled "27:15." As shown on page D-12, we have looked at the development from 15 months to 27 months for eleven different years. The average development for those years was 0.974, or -2.6%.

Q: Does page D-12 also show development figures for periods longer than 27 months?

A: Yes. Studies have shown that for dwelling fire virtually all losses have been paid by the time of the evaluation at 87 months after the beginning of an accident year. We calculate loss development factors for the periods from 27 months to 39 months, 39 months to 51 months, 51 months to 63 months, 63 months to 75 months and 75 months to 87 months. For example, by the time of the 39-month evaluation the losses for the accident year ended December 31, 2013 had become $9,335,943. This represents an increase of 1.005, or 0.5%, over the losses for the same accident year evaluated as of 27 months. The average development over the period 27 months to 39 months for the ten most recent years for which the data are available was 0.997, or -0.3%.

Q: Please explain how the loss development factor used to determine the ultimate payment value of the accident year ended December 31, 2017 losses was determined.

A: For dwelling fire, the loss development factors for each of the applicable periods, as shown on page D-12, are:

Development Period	Factor
15 to 27	0.974
27 to 39	0.997
39 to 51	0.999
51 to 63	1.000
63 to 75	1.000
75 to 87	1.000

If you multiply all of these factors together, you will get a factor of 0.970 to apply to the year ended December 31, 2017 losses.

Q: Please explain trending of the losses.

A: The losses need to be adjusted by trend to reflect the cost levels anticipated to prevail during the period that the proposed rates are expected to be in effect. For this filing, the assumed effective date is July 1, 2020. This date is relevant for trending purposes. If the filing were to become effective on a date later than the July 1, 2020 assumed effective date, then the rate indications would be slightly higher.

Q: Please describe how the loss trend is developed and applied.

A: The loss trend is developed in a two step process. The first step is the development of a current cost factor that brings the losses up to the cost level of the external Current Cost Index that is used as the basis of the loss trend. The second step is the development of a loss projection factor based upon an exponential fit of the last twelve quarters of the Current Cost Index and the actual dwelling pure premium trend. The loss projection factor projects the losses from November 15, 2018 (the

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midpoint of the latest quarter of the external index) to July 1, 2021, the average date of loss for one year policies which are assumed to be written at the proposed rates (i.e. one year beyond the trend effective date of July 1, 2020).

Q: What are the components of the Current Cost Index used for dwelling fire?

A: The Current Cost Index is a weighted average of the Modified Consumer Price Index (MCPI) and the CoreLogic Residential Index (CRI), with the MCPI receiving 5% weight and the CLRI receiving 95% weight. The intent of the weights is to reflect the split between contents type losses and buildings type losses.

Q: What is the CoreLogic Residential index?

A: The CoreLogic Residential Index is an index of construction costs. The particular index used in this filing is based on information compiled specifically for construction costs in North Carolina.

Q: What is the Modified Consumer Price Index?

A: The Modified Consumer Price Index is based on selected components of the Consumer Price Index that correspond to the items that dwelling policies cover. The components used and the weights given to them are House Furnishings (70%), Apparel Commodities (20%) and Entertainment Commodities (10%).

Q.   How are the weights of 95% to the CoreLogic Residential Index and 5% to the Modified Consumer Price Index determined?

A.   The weights are based on the relative split of fire losses between buildings and contents. For example, for the five-year period from 2013 to 2017, buildings contributed 94.6% of total fire losses in North Carolina.

Q: Please illustrate what factors would be applied to trend the losses for the year ended December 31, 2017.

A: The losses from the accident year ended December 31, 2017 are first adjusted by the Current Cost Factor for 2017 of 1.058 which is found on page D-14. The Current Cost Factor is the ratio of the Current Cost Index from the quarter ending December 31, 2018 to the Current Cost Index value for the full year 2017. The Current Cost Factor brings the losses from the cost levels corresponding to an average date of loss of June 30, 2017 to the cost levels corresponding to the midpoint of the latest quarter (November 15, 2018) of the Current Cost Index. Since the average date of loss for policies that will be written at the proposed rates is July 1, 2021 (one year past the trend effective date), it is necessary to project the losses from the November 15, 2018 cost level to that date. This is accomplished by projecting the losses at the annual rate of change of 2.8% for 31.5 months. This loss projection factor of 1.075 is calculated on page D-15.

Q: You mentioned that the pure premium trend was considered in the selection of trend factors. How was that data considered?

A: A pure premium is the ratio of the losses to the number of insured house years. The pure premium experience was examined by ISO and the Bureau Property Rating Subcommittee. These data were fit to an exponential curve, and an annual rate of change was calculated. This rate of change was compared with the annual rate of change of the Current Cost Index. In reviewing the loss trends, the annual rates of change in dwelling pure premium during the 2013-2017 experience period are lower than the observed annual changes in the external indices for dwelling fire. Upon consideration of this fact, the Property Rating Subcommittee selected a negative 1% annual loss trend adjustment to project losses to a July 1, 2021 level for dwelling fire. This results in the 1.8% annual rate of change used to trend the prospective losses for dwelling fire.

Q: Please describe the development of the Current Amount Factor.

A: The Current Amount Factor is calculated, separately for buildings and contents, by taking the ratio of the average policy size relativity for each year to the projected average policy size relativity as of November 15, 2018, the same projection date as is used for the losses in the development of the current cost factor. The average policy size relativity is calculated by taking a weighted average of the policy size relativity curve for each amount of insurance using the exposures for each amount of insurance as weights. By taking the ratio of these relativities for each year to the November 15, 2018 value, we are in effect measuring the percentage growth in the premiums at present rates from year to year caused by changes in amount of insurance. Selections of an annual growth rate of 1.0% for buildings and 2.6% for contents were made by the Property Rating Subcommittee for dwelling fire. Since the average relativity differs for buildings and contents and is forecasted separately, the resulting current amount factors for buildings and contents are weighed on a premium distribution to produce a combined current amount factor.

Q: Where on page C-2 are these factors applied?

A: The Current Cost Factor for each year is applied as part of the Current Cost/Amount factor in column 3. For example, for the year ended December 31, 2017, the Current Cost/Amount Factor of 1.036 is shown on page D-18. The Loss Projection Factor is combined with the Premium Projection Factor and the Trend from First Dollar to produce the Composite Projection Factor. This Composite Projection Factor is applied on page C-2 in column 5 in the development of the Trended Loss Cost.

Q: You mentioned the trend from first dollar. Please describe what that is and how it is developed and applied.

A: The external indices used in the trend analysis are all first dollar indices. This means that they are measuring changes from the first dollar of an item's value. Since a deductible is applied when insurance claims are settled, an adjustment must be made to the trends from the external indices so that they are appropriate for use with a deductible. All of the losses have been adjusted to a common $500 deductible level. As such, increases in cost as measured by the current cost index would affect losses below the deductible and cause an additional increase as losses below the deductible increase above it.

       For example, a loss of $1,000 subject to a $500 deductible results in a payment of $500 to the insured. If there is 10% inflation, the $1,000 loss grows to $1,100. This results in a payment to the insured of $600, which is a resulting effective inflation of 20.0% – an incremental trend of 9.1%. The procedure used in the filing is a standard one that accounts for this effect. The procedure essentially converts all the losses to a first dollar basis before the trend factor is applied. To obtain the resulting trended losses, the deductible portion of the trended losses is subtracted out. The trend from first dollar factor as shown on page D-19 is the incremental difference in the trend factor resulting from the application of our procedure. Using our example from before, the formula for trend from first dollar on page D-19 results in trend of $1 + (((.1)(500))/((1.1)(500))) = 1.091$, which matches what was calculated earlier.

Q: Please refer to column 2 of page C-2. With reference to the column headed "Adjusted Incurred Losses Including LAE," please tell us what the figure 49,899,245 represents.

A: These are the losses and loss adjustment expenses associated with claims that occurred in the accident year ended December 31, 2017. The losses are equal to the adjusted incurred losses found in Column 1, multiplied by a trended loss adjustment expense factor of 1.089.

Q: How is the trended loss adjustment expense factor of 1.089 developed?

A: Each year the Bureau sends a call to its member companies for expense-related data. These calls showed that loss adjustment expenses for the calendar years December 31, 2013, December 31, 2014, December 31, 2015, December 31, 2016 and December 31, 2017, after dropping the high and low values, averaged 8.9% for the period, as shown on page D-26.

       This factor of 8.9% must be adjusted for the change in cost levels of the items that go into loss adjustment expenses. These expenses include items such as adjuster's salaries, rents and overhead items related to claims settlement. In essence, these items will vary as general economic trends vary. We adjust the loss adjustment expense factor by taking a ratio of the expense trend to the loss trend on page D-29. This adjustment results in a trended loss adjustment factor of 1.089.

Q: Please explain how the expense trend used to adjust the loss adjustment expense factor is developed.

A: The expense trend used to adjust the loss adjustment expense factor is based on an analysis of the Current Expense Index, which is an index based on a 50% weighting to the Compensation Cost Index, a 25% weight to the all items CPI (less energy) and a 25% weight to the all items CPI (including energy). The latest available information for marine, fire and casualty insurance was used. The data for this index are shown on pages D-23-24. Based on an analysis of these data, an annual rate of change of 2.0% was selected by the Property Rating Subcommittee of the Bureau.

Q: Please explain the development and application of the expense projection factor in adjusting the loss adjustment expense factor.

A: The five year (excluding the high and low values) average loss adjustment expense factor of 8.9% reflects an averaging of the five years 2013, 2014, 2015, 2016 and 2017. As such, the factor is representative of the time period corresponding to July 1, 2015.

      The expense projection factor uses the 2.0% annual rate of change based on an exponential curve of the Current Expense Index. Since the Loss Adjustment Expense ratio is at the cost level corresponding to July 1, 2015, it is necessary to project this cost to the average date of accident for the period during which our rates are assumed to be effective, July 1, 2021 (one year beyond our assumed effective date of July 1, 2020). This calculation is displayed on page D-29.

Q: What other adjustments must be made to the Loss Adjustment Expense factor in order to use it?

A: The Loss Adjustment Expense Factor is determined as the ratio of loss adjustment expenses to losses. Having adjusted the expense portion of the factor in the numerator, we need to adjust the losses in the denominator by the Loss Trend to reflect both the Current Cost Factor and the Loss Projection Factor.

Q: Please describe what is done in Column 3 on page C-2.

A: In Column 3 the Current Cost Factors and Current Amount of Insurance Factors are combined into the Current Cost/Amount Factors. This is done by taking the ratio of the Current Cost Factor to the Current Amount Factor. For example, the Current Cost/Current Amount Factor of 1.036 for 2017 is the ratio of the 2017 Current Cost Factor of 1.058 to the 2017 Current Amount Factor of 1.021. In combining these steps, the losses and average rating factor have been brought to the cost level of November 15, 2018.

Q: Please describe what is done in Column 5 of page C-2.

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A: Column 5 combines the elements in columns 1 through 4. In column 5, the losses and loss adjustment expenses are trended to the cost level expected to prevail during the period in which the policies written at the proposed rates will be providing coverage (average date of accident of July 1, 2021). The house years in column 4 are also projected via the current cost/amount factor in column (5) to reflect the anticipated amounts of insurance for business written between July 1, 2020 and June 30, 2021. As an example, the calculation of Column 5 for 2017 is:

(1)   Adjusted Incurred Losses Including LAE (C-2, Col 2)   49,899,245

(2)   Current Cost/Amount Factor (C-2, Col.3 from p. D-18)   1.036

(3)   Earned House Years (C-2, Col. 4)   738,742

(4)   Composite Projection Factor (D-19, line 8)   1.029

(5)   Trended Loss Cost (C-2, Col. 5) (1)*(2)*(4)/(3)   72.01

Q: Please describe the development of the Premium Projection Factor.

A: For each year we compute an average policy size relativity, which is calculated as a weighted average of each amount of insurance relativity. The Premium Projection Factor is calculated by fitting an exponential curve to the average policy size relativities. This curve is used to develop an annual rate of change for the policy size relativities. In the case of dwelling fire buildings, the average annual rate of change is 1.0% as shown on page D-17. Since the Current Amount Factor has been calculated as the value up to November 15, 2018, the premium projection factor will be calculated as the expected growth from November 15, 2018 to January 1, 2021 (six months beyond the assumed effective date of July 1, 2020). This date of January 1, 2021 represents the midpoint of the year in which policies are assumed to be written using the proposed rates. This results in a Premium Projection Factor of 1.023, which is shown on Page D-19 in row 5.

Q: Could you please explain column 6 on page C-2?

A: Column 6 is the average rating factor for the policies purchased in each year. The average rating factor is the ratio of the average rate at manual level to the average current base rate. For example, let's assume that the current territory base rate for frame construction with $75,000 buildings coverage is $100, that the rating factor for masonry is 0.9 and that the rating factor to purchase an additional $25,000 of coverage A is 1.2. Then the average rating factor for a $100,000 masonry policy is calculated as:

(100 * 1.2 * 0.9) / 100 = 1.08

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This factor is needed to adjust the average trended loss costs in column (5) to a base class level. Since most policyholders do not purchase exactly the base amount of coverage, the average trended loss cost is divided by the average rating factor to convert this average trended loss cost into a trended base class loss cost which is shown in column 7.

Q: Please explain line 9 on page C-2.

A: Line 9 is the resulting Weighted Trended Base Class Loss Cost obtained by applying the accident year weights shown in Column 8 to the Trended Base Class Loss Cost for each year shown in Column 7. This Weighted Trended Base Class Loss Cost is the forecasted Base Class Loss Cost for policies written during the one-year period after the assumed effective date of July 1, 2020.

Q: Please explain line 10 on page C-2.

A: Line 10 is the credibility of the experience based on the number of house years during the 5-year period. The full credibility standard is based on a procedure that considers the frequency of claims and the variability of the size of those claims. The procedure is explained in a CAS Proceedings Paper "Credibility of the Pure Premium" by Mayerson, Jones and Bowers. The full credibility standard is based on a normal distribution with a 90% probability of the pure premium being within 10% of the expected value. The full credibility standard for Fire is 500,000 house years and 330,000 house years for Extended Coverage.

Q: Please explain what line 11 entitled "fixed expense per policy" on page C-2 refers to and what it represents.

A: Line 11 "fixed expense per policy" refers to the amount of the prospective premium dollar needed to cover general expenses on policies written in the prospective period. General expenses along with other acquisition expenses constitute the so-called fixed expenses. They are fixed in that they do not vary as a direct function of the premium dollar. For example, the cost of office equipment, rent and other overhead-type expenses are fixed expenses. Expenses such as commissions and premium taxes, on the other hand, are examples of expenses that rise or fall directly with premium.

The number shown on line 11, $3.94, represents the dollars of general and other acquisition expenses trended to the levels anticipated to prevail during the prospective period. This is appropriate because general and other acquisition expenses are normally incurred at the time a policy is written.

Q: Please explain how the figure $3.94 on line 11 of page C-2 was derived.

A: The derivation of the $3.94 is shown on page D-29. The untrended general expense ratio of 0.059 and the other acquisition expense ratio of 0.088 are obtained from the

expense data collected by the Bureau and based on an average of the 2015, 2016 and 2017 ratios. These are shown on page D-25. This average represents the average fixed expense ratio corresponding to calendar year 2016. In order to trend these to the cost levels anticipated to prevail, we project these forward to the prospective period. The average selected expense trend of 2.0% is applied over the time period from July 1, 2016 (the average date of the experience on which the general expense ratio is based) to January 1, 2021 (the average date of writing under the proposed rates). Since this ratio is relative to premium, we must also project the amount of insurance from 2016 levels to the level anticipated to be in effect on business written between July 1, 2020 and June 30, 2021. This is done by using the Current Amount Factor for 2016 of 1.033 and the premium projection factor of 1.023 which I have previously discussed. The resulting calculation is:

$$\frac{(0.059 + 0.088) \times 1.093}{1.033 \times 1.023} = 0.152$$

This trended fixed expense ratio is then multiplied by the latest year current base rate of $25.90. The result is a statewide dwelling fire fixed expense loading of $3.94.

Q: What does Line 12 show on page C-2?

A: Line 12 is a combination of the Trended Base Class Loss Cost and the Trended General Expense and Other Acquisition expenses. The figure $21.78 is the dollar amount that is required to cover the portion of the base rate that covers losses, loss adjustment expenses, general expenses and other acquisition expenses.

Q: What does line 13 on page C-2 show?

A: This line takes into account the variable expenses, profit, contingencies and dividends. Based on information from page D-25 of the filing, the commission and brokerage provision rounds to 10.9%, and the taxes, licenses and fees provision rounds to 2.8%. The selected provision for dividends is 0.4%. The provision for underwriting profit is 8.5%. The contingency provision is 1.0%.

As in past dwelling filings, Bureau committees reviewed the latest available policyholder dividends payment data as well as the multi-year history of companies consistently paying dividends to policyholders. The Bureau's subcommittee concluded that a factor for expected dividends is appropriate to include in this filing. The data contained on page D-25 show that the dividends, though constituting a small percentage of premium, have been paid consistently and in material amounts over the years. Based on these facts, the Bureau has included a provision of 0.4% of premium to reflect anticipated dividends during the experience period. Given the consistency of the historical data as to the payment of dividends, this is a reasonable assumption. Reflecting dividends in a filing by a rating bureau is an actuarially sound

methodology. If dividends were not reflected, the profit level in the filing would not be achieved because of dividends paid.

The 8.5% underwriting profit provision was selected by the Bureau's committees based on reviewing the analyses by Dr. Vander Weide and Dr. Zanjani. This filing also contains a 1% margin for contingencies. The profit and contingency factors are applied equally across the state.

The items known as variable expenses are reflected in line 13. They vary in direct proportion with the premium dollar.

Combining variable expenses, profit, contingencies, and dividends results in 23.6 cents of every premium dollar being paid for these expenses. The remaining 76.4 cents pays for losses, loss adjustment expenses, general expenses and other acquisition expenses.

Q: What is the source of the percentages on page D-25 with respect to commissions and brokerage and taxes, licenses, and fees?

A: They were calculated from the 2015, 2016 and 2017 North Carolina expense call for data undertaken by the Bureau.

Q: What is the source of the percentage on page D-25 for contingencies?

A: The Bureau committees selected that factor, and I agree with it. A 1% factor has been consistently employed in past Bureau property insurance rate filings. A 1% contingency factor is a standard factor that has been used for many years across the country in property insurance ratemaking. The factor was selected by the Bureau committees based upon recognition of the systematic bias that causes actual underwriting results, analyzed over time, to be worse than the provision assumed in the rates. There are numerous reasons for this bias.

One reason is that property insurance involves many risks, but not all of them are observable in the experience or are adequately recognized in normal ratemaking.

In addition, the writing of property insurance in North Carolina is subject to law changes, court interpretations, jury determinations and judicial decisions that expand losses beyond what was contemplated when the policies were written.

An additional and significant factor contributing to the justification for a contingency factor is the delay, uncertainty and difficulty in obtaining needed rate increases in North Carolina. In North Carolina, insurance companies writing dwelling insurance are required to go through rating bureaus in order to achieve needed rate increases. This regulatory system can cause significant delay in obtaining needed rate level increases. North Carolina differs from states that rely more on competition to set rates. The system in this state requires that data be collected from about 46

companies writing dwelling insurance and then be aggregated and analyzed prior to making a filing for needed higher rates on behalf of all companies. As the physical size of this 2019 filing demonstrates, the amount of information required to be submitted is massive, and it takes significant time to compile that information.

Q: Would you explain line 14 on page C-2 entitled "Base Class Rate Excluding Comp. for Assess. Risk & Dev."?

A: The net base rate per policy is calculated by dividing the Loss and Fixed Expenses in line 12 by the expected loss and expense ratio in line 13. This is the net base rate before incorporating the factors for deviations and the compensation for assessment risk per policy.

Q: Would you explain line 15 on page C-2 entitled "Compensation for Assessment Risk per Policy"?

A: Compensation for assessment risk is a provision that is calculated by Mr. Anderson of Milliman (see his prefiled testimony and exhibits) to reflect the cost to voluntary market insurers of maintaining sufficient capital to pay the assessments for residual market losses, to the extent required by law. If the two residual market mechanisms (the Beach Plan and the FAIR Plan) do not have sufficient capital, reinsurance and reserves to pay losses for a catastrophic hurricane event or series of events, then companies writing homeowners, dwelling and other lines of property insurance in the voluntary market will be assessed for such losses even if they do not write in the coastal or beach areas where the losses originated. In effect, the voluntary market companies are being required to provide free reinsurance to the residual market and its policyholders who can only find coverage in the residual market. The voluntary market companies must therefore maintain capital sufficient to cover such losses, in addition to their own losses, even though those companies have elected not to write the policies that give rise to those losses. The compensation for assessment risk factor is the provision that must be reflected in the rates for voluntary market insurers bearing this risk of assessments from the Beach/FAIR Plans, i.e., it is the cost of the capital required to support the exposure to potential residual market assessments.

The Bureau started incorporating a factor for this exposure in its property insurance rate filings a number of years ago. As a result of legislative action in 2009, some of the exposure of the voluntary market companies to residual market assessments has been capped at one billion dollars per year. Milliman's analysis of the necessary compensation for the risk of residual market assessments incorporates this cap.

It should be noted that the $1 billion cap only applies to assessments by the Beach Plan (i.e., for losses in the beach and coastal areas) and does not apply to assessments to pay for losses in the FAIR Plan. In recent years, the FAIR Plan has rapidly increased its writings statewide. As the number of policies and amount

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of uncapped exposure in the FAIR Plan has grown in the last few years, that growth is reflected in the factor for the compensation for assessment risk.

The compensation for assessment risk amount of 1.03 per policy is calculated by first multiplying the 3.4% provision by the current average statewide base rate of 26.14, resulting in a value of 0.89. To be incorporated in the rates, however, this provision must be adjusted to account for the commissions and taxes, licenses and fees that the companies will need to pay on this additional premium. That is done by dividing the 0.89 by 1 minus the sum of commission and brokerage expense and taxes, licenses and fees expense as shown below.

$$\frac{0.89}{1 - 0.109 - 0.028} = 1.03$$

Q: What is the source of the percentages used on line 17 for anticipated deviations?

A: As in past dwelling filings, the Bureau committees reviewed deviations. The Bureau reviewed them in conjunction with consent to rate data and surcharges on dwelling policies written in the Beach Plan. The Bureau and ISO believe that it is actuarially appropriate for filings made by rating bureaus to contain a factor to reflect expected deviations and other variations from the manual rate that would result in the filed profit level not being achieved. The Bureau also recognizes that the reflection of expected deviations has been a contentious issue in previous rate filings. Based on its review in this filing, the Bureau elected to include a provision of zero for deviations.

Q: Would you explain line 19 on page C-2 entitled "Required Base Class Rate per Policy"?

A: Line 19 is the required base rate that is needed to ensure that sufficient revenue is collected to cover the losses and expenses that are expected to result from the policies written during the year following the effective date of this filing.

Q: Would you explain line 20 on page C-2 entitled "Current Average Base Class Rate"?

A: Line 20 is the current average base class rate for fire for all dwelling policies included in the review. This rate assumes that each policyholder is buying only the base coverage.

Q: Would you explain line 21 on page C-2 entitled "Indicated Rate Level Change"?

A: Line 21 is the percentage change in the current rates that will be necessary to make the rates adequate for the cost levels that are expected to prevail in the one-year period following the effective date of the filing. The percentage change is determined by taking the required base rate per policy on line 19 and dividing it by the current

base rate from line 20. This results in an indicated rate level change of 13.0% for the fire portion of dwelling policies.

Q.   How are these changes distributed by class?

A.   On page C-7 the calculations of the indicated change for fire buildings and contents classes are shown. Column 1 displays the Trended Adjusted Incurred Losses for each of the two classes - buildings and contents. The losses shown are for the latest five years. Column 2 gives the Five-Year House Years total, which is the sum of the exposures by class for the five-year period. Column 3 provides the Trended Average Rating Factor. Each year's costs have been trended using each class's own current cost factors and a loss projection factor. Column 4 gives the Base Class Loss Cost for each class and total. This loss cost is obtained by dividing the five-year total trended adjusted incurred losses by the five-year total house years times the trended average rating factor. Column 5 is the credibility assigned to each class's experience, based on the full credibility standard of 500,000 house years for fire. Column 6 is the Credibility Weighted Loss Cost for each class. The complement of credibility for use in this calculation is the Total Base Class Loss Cost multiplied by the ratio of the class's current base rate to the total current base rate.

The statewide credibility weighted loss cost is obtained by weighting the class credibility weighted loss cost by the individual class house years. Column 7 provides the Indicated Base Loss Cost by class.

This is the statewide base loss cost adjusted by the class relativity indicated by the credibility weighted loss cost. Column 8 shows the Current Base Rate by class. Column 9 displays the Expected Loss and Fixed Expense Ratio. The Indicated Base Rate is shown in column 10. The indicated base rate is the sum of the loss cost and fixed expenses divided by the expected loss and fixed expense ratio. Column 11 is the Compensation for Assessment Risk Per Policy. Column 12 is the Base Rate Excluding Deviations. Column 14 is the deviation amount per policy that is needed to be reflected in the required base rate. Column 15 is the sum of the indicated base rate before deviations in column 12 and the deviation amount in column 14. Column 17 shows the Indicated Base Rate Change by class. Column 18 shows the Indicated Rate Change Balanced to Statewide Level. This rate change includes the impact of the indicated statewide change of 13.0%.

Q: Does the filing contain a revision to the present territory rate levels?

A: Yes. In connection with the statewide rate level change we have been discussing, new territory rate changes are displayed on page A-3.

The development of the indicated relative change by territory is completed in such a way that the overall effect is to balance to the indicated statewide change. The allocation of the statewide rate change to individual territories is done on pages C-9 and C-10 for the fire portion of dwelling.

Q: How has the Bureau treated general and other acquisition expense by territory?

A: The Bureau has treated general expense and other acquisition expense as not varying by territory.

Q: Please turn to page C-4 of Exhibit RB-1. Would you explain what that page shows?

A: Page C-4 shows the statewide rate level calculation for the extended coverage portion on a dwelling policy in North Carolina. As page C-2 did for fire, Page C-4 determines the actuarially indicated rate level change for dwelling extended coverage.

Q.   Is the indicated statewide rate change for extended coverage calculated in the same general manner as for fire?

A.   Although the statewide methodology for extended coverage is similar to that used for fire, there are three main areas where the methodology differs for these two components. First, actual hurricane losses for extended coverage, while reviewed and considered, have been excluded from the losses shown in column 1 and replaced by the "Trended Modeled Hurricane Base Class Loss Cost", which is displayed in line 12 of page C-4. Second, the actual excess non-modeled losses in column 2 have been replaced by an excess factor loading included in column 3 of page C-4. The excess loss factor is shown on page D-33. Third, a provision for the net cost of reinsurance is included in line 19 of page C-4.

Q.   Other than on page C-4, have actual hurricane losses been excluded anywhere else in the filing?

A.   Yes, they have been excluded in the development of the indications by class and by territory, and in the calculation of the non-hurricane excess factor.

Q.   How have these hurricane losses been identified in order to be excluded?

A.   The method to remove the hurricane losses from the derivation of the excess factor depends on the detail of the available data during different periods of time. For 1950-1965, only statewide wind data is available. Consequently, for a year in which a hurricane occurred, the year is excluded from the calculation of the statewide non-hurricane excess factor. This is shown on page D-32. For example, in 1954 Hurricane Hazel was a Category 4 storm that caused major losses in North Carolina, so that year was removed from the exhibit.

Since territory data is available (in varying detail) for 1966-2017, the calculation of the non-hurricane losses is performed at the territory level for this period. After it has been determined that a particular hurricane is accounted for by hurricane models, the territories affected are determined by use of recorded wind speeds and central pressures at 6 hour intervals, storm tracks, and wind to non-wind ratios.

The non-hurricane wind losses for a territory are calculated by replacing the hurricane year wind to non-wind ratio by the average wind to non-wind ratio of the non-hurricane years. Given the revised wind to non-wind ratio for the hurricane year, the reported non-hurricane total losses and the reported non-hurricane wind losses are then "backed into." For the years in which the territory codes 01-04 were in effect (1966-1982), the average wind to non-wind ratios are based on the non-hurricane years from 1966-1982. For the years in which the territory codes 04 and 30-41 were in effect (1983-1999), the average wind to non-wind ratios are based on the non-hurricane years from 1983 to 1999.

For 1986-1995, territory losses by month are available for ISO data only. The territory non-hurricane losses for this period are calculated as follows: first the average losses for the month in which the hurricane occurred are calculated based on the non-hurricane years. The average monthly losses are then added to the eleven remaining months of the hurricane year and divided by the hurricane year annual losses resulting in a non-hurricane adjustment factor. This factor is then applied appropriately to either reported losses or adjusted losses by territory for all statistical agents to obtain non-hurricane losses. For severe hurricanes, wind type losses are sometimes reported as water losses or all other property damage losses. To accurately estimate the non-hurricane losses, the above non-hurricane factors are calculated for water and all other property damage and then applied to the water losses and the all other property damage losses.

For 1996-2002, based on information from NOAA and other sources, the specific dates on which a given hurricane was active in North Carolina are determined. The loss experience for ISO is then examined by date and cause-of-loss. Wind losses and losses for other weather-related perils which occurred on these dates are assumed to be hurricane losses. For ISO data, the percentage of hurricane losses to total losses is calculated. To estimate the hurricane losses for statistical agents other than ISO, the percentage of hurricane losses in the ISO data (relative to the ISO yearly total) is applied to the total loss amounts for the other statistical agents.

For 2003-2017, a procedure similar to that of 1996-2002 is used. The difference is that ISO and ISS data is available and examined rather than just the ISO data. For the ISO and ISS data, the percentage of hurricane losses to total losses is calculated. To estimate the hurricane losses for statistical agents other than ISO and ISS, the percentage of hurricane losses in the ISO and ISS data (relative to the ISO and ISS yearly total) is applied to the total loss amounts for the other statistical agents.

This procedure is similar to the procedure ISO uses in other states.

Actual hurricane losses of $3,250,532 were removed from 2014; $3,874,157 were removed from 2015; $65,758,824 were removed from 2016; and $259,435 were removed from 2017. This information is shown in a footnote on page C-4.

Q.   Do you have an opinion as to whether the incurred losses excluding hurricanes shown in column 1 on page C-4 of RB-1 accurately represent the anticipated value of dwelling extended coverage incurred losses, excluding actual hurricane losses, which resulted from claims which took place during each of the years ended December 31 in North Carolina?

A.   Yes, I do.

Q.   What is that opinion?

A.   I believe that the losses excluding actual hurricane losses shown in column 1 do accurately represent the expected ultimate value of those losses.

Q: Please explain the figure contained on Line 12 of page C-4 labeled "Trended Modeled Hurricane Base Class Loss Cost".

A: That figure is the expected hurricane losses for a base risk written in the prospective period. Aon provided the average modeled hurricane losses from running two hurricane simulation models developed by AIR Worldwide (AIR) and Risk Management Solutions (RMS). The average modeled hurricane losses were then trended and loaded with catastrophe loss adjustment expenses (LAE). To obtain an average loss cost value, the modeled loss amounts are divided by 2017 house years. To convert the average trended modeled hurricane losses with LAE to base class level, it is divided by the latest year trended average rating factor. The trended average rating factor is calculated as the product of 2017 average rating factor, 2017 Current Amount Factor and Premium Projection Factor. The derivation of the modeled hurricane base class loss cost is shown on page D-37.

Q.   Why were models used to develop the projected hurricane losses instead of using actual hurricane losses?

A.   The catastrophic nature of the hurricane peril makes it a very volatile peril in terms of loss severity, frequency and location of occurrence. Catastrophe losses in general tend to be high severity, low frequency events. Since we use five years of loss experience data in dwelling ratemaking calculations, it is likely that there will be scenarios such as either no hurricane losses or extremely severe hurricane losses during the experience period. Also, if a hurricane were to hit a particular area of the state, the losses might be reflected only in that area of the state, with little or no reflection in other areas of the state. Therefore, if we analyze hurricane losses without any adjustment, the indicated rate level need will be subject to large yearly fluctuations resulting in rates beyond the actuarially sound level.

Devastating hurricanes are relatively uncommon events in comparison with other causes of loss. The occurrence or non-occurrence of actual hurricane events is not properly predictive of the range of hurricane events that can occur or the probability of occurrence of those events. In addition, there is not enough experience with hurricanes since accurate insurance loss records began to be maintained for actuaries to employ actual losses as opposed to models. For older years, much of the past insurance data is quite outdated for the purpose of examining hurricane exposure and is of limited utility in projecting future hurricane losses. It includes losses from hurricanes that occurred when housing patterns were different, population density was lower, houses were built differently, building codes were different, construction prices were different, houses had fewer and less expensive contents and labor costs and practices were different, etc.

The hurricane models are based on publicly available scientific data, mathematical and empirical models, and the experience of engineering, geological, meteorological, economic and insurance experts. Actual hurricane loss experience is also used to calibrate the models. The models are run for a large number of simulated events (e.g. 100K years) to estimate what would be the expected long-term average hurricane losses for a given risk profile. The modeled hurricane losses are accurate, stable, and represent the best and most unbiased projections of the long-term average annual hurricane losses. The benefits of using models to project hurricane losses over using actual hurricane losses are several. First, the models improve the accuracy of hurricane loss projection in a long-term average view as described above. Second, replacing the volatile actual hurricane losses with modeled hurricane losses will smooth out the periodic spikes in the indications following hurricanes. Hurricane modeling is the widely accepted and most accurate way of considering the hurricane exposure. Modeling has become the standard practice in the insurance industry for insurers to estimate long term expected hurricane losses for ratemaking purposes and has been widely accepted by the regulatory bodies in the United States. Modeling is also uniformly employed in the reinsurance industry, financial world and meteorological world to determine expected prospective hurricane losses. Scientists who work on the models update those models frequently to reflect the latest understanding of meteorological science.

An example of the need and value of models in producing stable loss costs can be seen from the hurricane season of 2017 and its effects in other states. In 2017, there were multiple significant hurricane events that hit Florida, Puerto Rico and the Gulf coast. If rates for the next year in those jurisdictions were based on those hurricanes rather than on models, rates would spike up. Conversely, if rates for 2017 had been made the year before based on there being no major hurricane strikes during the preceding five-year period in those jurisdictions, it would not be actuarially appropriate to assume that the absence of hurricane losses would be the expectation for 2017 or for a future prospective rating period.

My actuarial opinion is that it is actuarially unsound for regulators to justify suppressing rates by claiming that there have been no recent significant hurricane

losses and promising to raise rates after a future significant hurricane. Further, from a practical standpoint, raising rates significantly following a devastating and often tragic hurricane is the worst time for the policyholder. The use of simulation models produces a stable and actuarially sound projection of the true loss potential both in terms of statewide exposure values and in terms of territorial distribution of that exposure. Modeling is far preferable to any analysis based on the happenstance of historical hurricane loss data.

The Property Rating Subcommittee and ISO Staff have examined actual hurricane losses in North Carolina and have excluded those losses from the incurred losses in filings for a number of years. As done for the 2018 dwelling filing, we have replaced the actual hurricane losses with the average modeled hurricane losses from two hurricane models for the rate review underlying this filing, which I deem to be the actuarially sound practice for the hurricane peril.

Q.   Who performed the hurricane modeling for the Bureau?

A.   Aon.

Q.   What did ISO furnish to Aon to enable it to perform its analysis?

A.   ISO furnished to Aon the North Carolina extended coverage insurance exposure data on the total number of earned house years and earned insurance years by territory for the most recent year in the experience period. These data included ISO, FAIR Plan/Beach Plan, NISS and ISS data that were compiled by ISO. These data are correct to the best of my knowledge, information and belief.

Q.   How were modeled hurricane losses derived?

A.   Aon ran two hurricane models, one from RMS and one from AIR. These two models are the most widely used and relied upon hurricane models. The use of multiple models is required by statute starting with filings made on or after October 1, 2017.

The hurricane models simulate many years of hurricanes and resulting losses for the portfolio of North Carolina exposures. The results of the two models were averaged by Aon. Aon also trended the losses for use in the filing. The Property Rating Subcommittee reviewed the blended model results provided by Aon and found them to be actuarially sound. By averaging the two models, the Bureau has appropriately given them equal weight. Given the legislature's mandate to use more than one model, it would be inappropriate to employ the results of just a single model. Using an average of the two models also produces an unbiased estimate for future hurricane losses. The development of the statewide trended modeled hurricane base class loss cost is shown on page D-37. Page D-38 shows the development of the territory modeled base class loss cost (BCLC).

Aon also accounted for loss adjustment expenses (LAE). Aon's database shows that LAE, as a percentage of hurricane losses, is lower than the LAE percentage for non-hurricane losses. Therefore, upon review of Aon's database, the Property Rating Subcommittee selected a 6% provision to be applied to the modeled hurricane losses.

Q.   How is the amount of insurance in effect determined?

A.   For the purpose of developing the hurricane loss cost, the amount of insurance that is in effect is determined as the sum of the various internal limits found in the extended coverage portion of a dwelling policy. There are four coverages involved: Coverage A (building), Coverage B (other structures), Coverage C (contents) and Coverage D (loss of use). The total amount of coverage can vary by policy form. For form 1, the total limit for buildings is the Coverage A amount, and neither Coverage B nor Coverage D provides additional limits because any Coverage B or D losses are applied against the Coverage A limit. The coverage C limit is as reported on the individual policy record.

For policy forms 2 and 3, the total limit for buildings is the sum of Coverage A, Coverage B, and Coverage D limits. The Coverage B limit is 10% of Coverage A, and the Coverage D limit is also 10% of Coverage A. The coverage C limit is as reported on the individual policy record. These differences in total amounts were reflected by Aon in running the models.

Q: You referred earlier to a separate procedure for dealing with non-hurricane excess losses. Please describe that procedure.

A: An excess loss analysis and procedure was employed to deal with non-hurricane excess losses. An adjustment was made to the non-hurricane losses in the years in which there were very severe storms such as tornadoes, thunderstorms and other damaging wind storms. The adjustment caps average losses by territory in years where abnormally high losses coincide with severe non-hurricane storm activity. The adjustment relies on a factor developed by using a statewide average consisting of years without losses influenced by severe non-hurricane storms. A long-term excess factor of 1.055 was loaded into the losses. This calculation is shown on pages D-32 and D-33. This procedure has been employed in past filings and is customarily employed to smooth out and properly reflect prospective non-hurricane wind losses.

Q: Was it necessary to exclude hurricane losses in calculating the excess loss factor?

A: Yes. Those losses have been excluded in the calculation of the Excess Factor derived on pages D-32 through D-33.

Q: What is the source of the $25.48 for net cost of reinsurance in line 19 of page C-4?

A: The source of the $25.48 for net cost of reinsurance is an analysis performed for the Bureau by Aon. In that analysis, Aon determined the expected net cost of reinsurance for the composite one company writing dwelling insurance in North Carolina. The need for reinsurance results from the fact that companies need to buy catastrophe reinsurance due to North Carolina's significant hurricane exposure. The net cost of that reinsurance is the expense and profit component of the reinsurance premium paid by insurers (the loss component is in the direct losses used in the overall rate determination). More details of the analysis are included in the testimony of other witnesses.

The Bureau relies upon the data that Aon has accumulated as to the actual cost of purchasing reinsurance in the current reinsurance market. Aon is the world's largest reinsurance broker and maintains a database of reinsurance transactions in the actual reinsurance market.

To calculate the net cost of reinsurance per policy, the amount of total dollars of reinsurance is divided by the number of house years for 2017 times the 2017 average rating factor, current amount factor and premium projection factor. This quantity is then divided by the expected loss and fixed expense ratio. For extended coverage, the actual calculation is:

$$\frac{111,806,215}{744,286 * 7.370 * 1.015 * 1.017 * 0.775} = 25.48$$

Q. Are the remaining portions of the rate level calculation for extended coverage similar to that for fire insurance?

A. Yes, they are.

Q: Have the indicated rate changes been voluntarily capped by the Bureau?

A: Yes. To minimize the impact on policyholders, the Governing Committee decided to cap the territorial rate changes. For fire, territorial rate increases have been capped at 5%. For extended coverage, territorial rate increases have been capped at 30%. Although the indicated overall statewide rate increase is equal to 48.3%, the proposed statewide average rate change (after capping) is equal to 19.2%.

Page A-3 shows both the indicated (uncapped) and filed (capped) rate changes for each territory.

Q. What other changes does the filing make for dwelling insurance?

A. In addition to revising the base rates, the filing makes changes to three other items. The filing revises the key factors, introduces Age of Construction factors, and revises the credits for Windstorm or Hail Exclusion and for Wind Mitigation.

Q.   Why are key factors used?

A.   Key factors are used in the rating of a dwelling policy to calibrate the premium that is charged to reflect the selected amount of insurance. Key factors are sometimes referred to as amount of insurance relativities. There are four sets of dwelling key factors: fire buildings, fire contents, extended coverage buildings, and extended coverage contents.

Q.   How are the key factors being changed?

A.   There are two types of changes being made to the key factors.

The first change is that the key factors are being rebased to reflect base amounts of insurance of $100,000 for buildings coverage and $15,000 for contents coverage. The current base amounts of insurance ($15,000 for buildings coverage and $6,000 for contents coverage) are viewed as being too low for typical coverages that are currently being purchased. Within rounding, rebasing the key factors should not have any impact on the premium that is charged to policyholders. The reason for this is that an off-balance factor is applied to the territorial base rates so as keep the total premium being charged the same.

The second change being made to the key factors only impacts fire buildings coverage. The current key factors for fire buildings are generally linear (for amounts of insurance greater than $15,000). However, based on an analysis prepared by ISO, it was found that the marginal increase in fire buildings losses gets smaller as higher and higher amounts of insurance are purchased. To improve the accuracy of the rating of dwelling policies, the Bureau decided to revise the key factors for fire buildings. In order to mitigate large swings in premiums, the Governing Committee decided to set the proposed key factors equal to a weighted average of the indicated and current key factors, with the current factors receiving two-thirds weight and the indicated factors receiving one-third weight. The proposed key factors are being introduced on a revenue-neutral basis through the application of territorial off-balance factors.

Pages F-3 to F-10 show the key factor analysis prepared by ISO and filed by the Bureau.

Q.   How will the Age of Construction factors be used?

A.   Age of Construction factors are used to reflect the impact that the age of a building has on expected losses.

Although the Bureau's homeowners program already includes Age of Construction factors as part of its rating structure, the Bureau's dwelling program is not currently using these factors. As part of this filing, the Bureau is proposing to implement Age of Construction factors for its dwelling program.

Q.   How will the Age of Construction factors impact the premiums that are charged?

A.   All else equal, a newer building generally incurs less losses than an older building. To reflect this relationship, the proposed Age of Construction factors will result in a newer building being charged a lower premium, while an older building will be charged a higher premium. Adjusting the premiums in this manner promotes the actuarial fairness of the dwelling rating structure.

Based on the analysis prepared by ISO, the indicated Age of Construction relativities imply large credits for newer buildings and significant surcharges for older buildings. In order to mitigate large swings in premiums, the Governing Committee decided to only apply Age of Construction credits for buildings that are less than 25 years old. Furthermore, to limit the impact of the off-balance factor on older homes, the Governing Committee selected more modest credits for newer homes than what was indicated. The proposed Age of Construction factors are being introduced on a revenue-neutral basis through the application of territorial off-balance factors.

Age of Construction factors are only being introduced for fire buildings and extended coverage buildings. Corresponding factors will not be applied to the contents portion of a dwelling policy.

Pages F-11 to F-15 show the key factor analysis prepared by ISO and adopted by the Bureau.

Q.   You made reference to off-balance factors when discussing changes to key factors and the introduction of Age of Construction factors. What are off-balance factors, and why are they used?

A.   Off-balance factors represent the rate level effect that would result if the revised and newly introduced factors were implemented without any adjustments to the base rates. Off-balance factors are used in the calculation of revised base rates to remove the rate impact associated with the revised or new rating factors. In other words, use of off-balance factors will ensure that the revised and new rating factors will be implemented on a revenue-neutral basis.

Note that separate off-balance factors are applied for each territory. As such, the revised and new rating factors will be revenue-neutral for each territory. However, individual policyholders may see either a premium reduction or increase as a result of the change in rating factors. Pages F-22 and F-23 show the estimated impact to policyholders as a result of the filed rating factor changes.

Q.   Does the filing revise the credits for the Windstorm or Hail Exclusion and for Wind Mitigation?

A.	Yes. The filing revises the credits for the Windstorm or Hail Exclusion and for Wind Mitigation that is available in Territories 110, 120, 130, 140, 150 and 160. The derivation of these credits is shown on pages C-16 to C-20.

Q:	Please turn to page A-2 of Exhibit RB-1 and explain what is shown on that page.

A:	Page A-2 of Exhibit RB-1 shows the indicated and filed statewide rate level changes. The differences between these percentages are due to the capping imposed by the Bureau as described earlier in my testimony.

Q:	What is shown on Page A-3 of Exhibit RB-1?

A:	Page A-3 shows the indicated and filed rate level change for each territory. Separate rate changes are shown for fire buildings, fire contents, extended coverage buildings, and extended coverage contents.

Q:	Do you have an opinion as to whether the data utilized and the methods of calculating the indicated rate level changes and other changes contained in the filing are actuarially sound and reliable and if so, what is that opinion?

A:	Yes, I have an opinion. In my opinion, the data utilized and the ratemaking methodologies used by the Bureau are based on and consistent with generally accepted actuarial principles and procedures, and the indicated rates are actuarially sound and reliable. In my opinion the ratemaking methodology is actuarially sound and produces indicated rates that meet the statutory standard of being not excessive, inadequate or unfairly discriminatory. The filed rates differ from the actuarially indicated rates because of territory caps of +5% for fire and +30% for extended coverage as described previously. The filed rates are a reasonable step toward an adequate level.

Q:	Do you have an opinion as to whether the indicated rate level changes contained in Exhibit RB-1 are fully justified and, if so, what is that opinion?

A:	In my opinion, the indicated rate level changes are fully justified and are not excessive or unfairly discriminatory in any respect.

Q:	Are there any qualifications you wish to attach to your opinion?

A:	Yes. In reaching my opinion, I have relied on the accuracy of the data supplied by the Bureau, by ISS, AAIS, NISS, by the individual companies that reported their data to ISO and the other statistical agents and by the Beach Plan and FAIR Plan. I have relied on Dr. Vander Weide and Dr. Zanjani for the determination of the appropriate profit. I have relied on Mr. Anderson as to the compensation for assessment risk component of the rates. I have relied on Mr. Fiete and Aon for the net cost of reinsurance component of the rates. Additionally, I have relied upon Ms. Henderson and Aon for the blended output of the AIR and RMS models. I

have also relied upon and concur with the decisions and the actuarial judgments of the persons on the Bureau's committees, who in many cases are actuaries. I have also reviewed, approved and relied on the work conducted by Yanjun Yao, FCAS and MAAA, and other staff at ISO with regards to the preparation of the ISO portions of the rate filing. I have applied appropriate actuarial standards when reviewing these various data sources.

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Q: Does that conclude your testimony?

A: Yes, it does.

North Carolina FAIR Plan and Beach Plan
Dwelling Extended Coverage Written Premium
2017 Market Share by Territory

Market Share

- 0-10%
- 10-20%
- 20-30%
- 30-40%
- 40-50%
- 50-60%
- 60-70%
- 70-80%
- 80-90%
- 90-100%
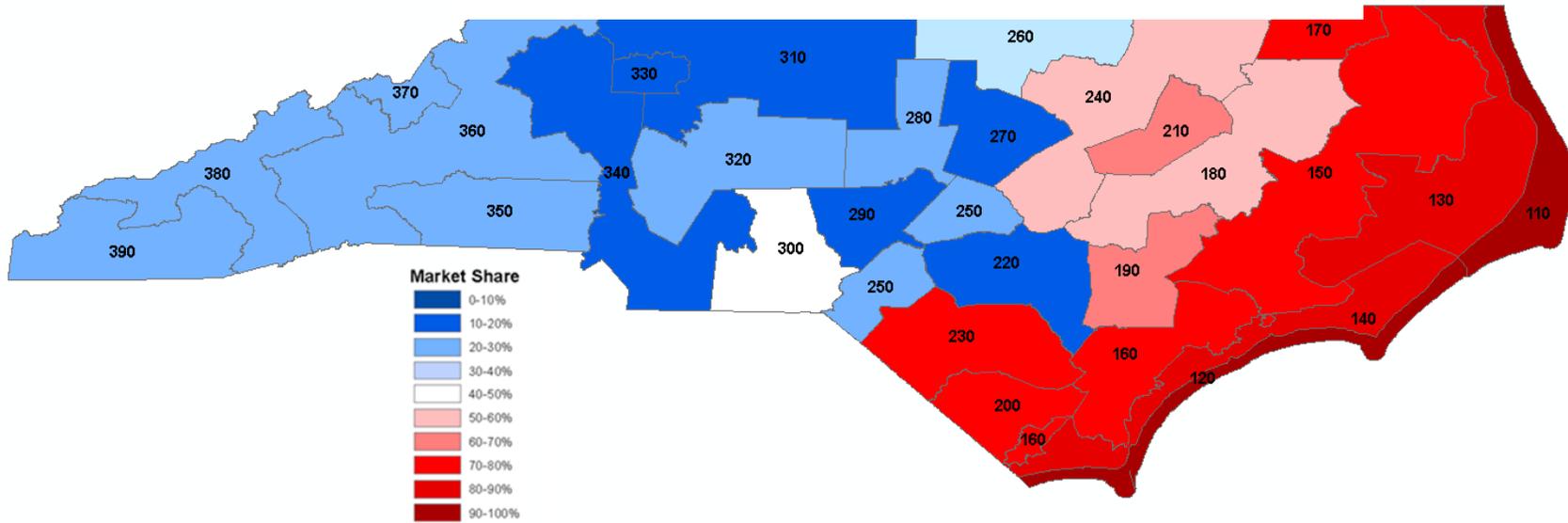
North Carolina–Northeast Coast
FAIR Plan and Beach Plan
Dwelling Extended Coverage
2017 Market Share by Territory
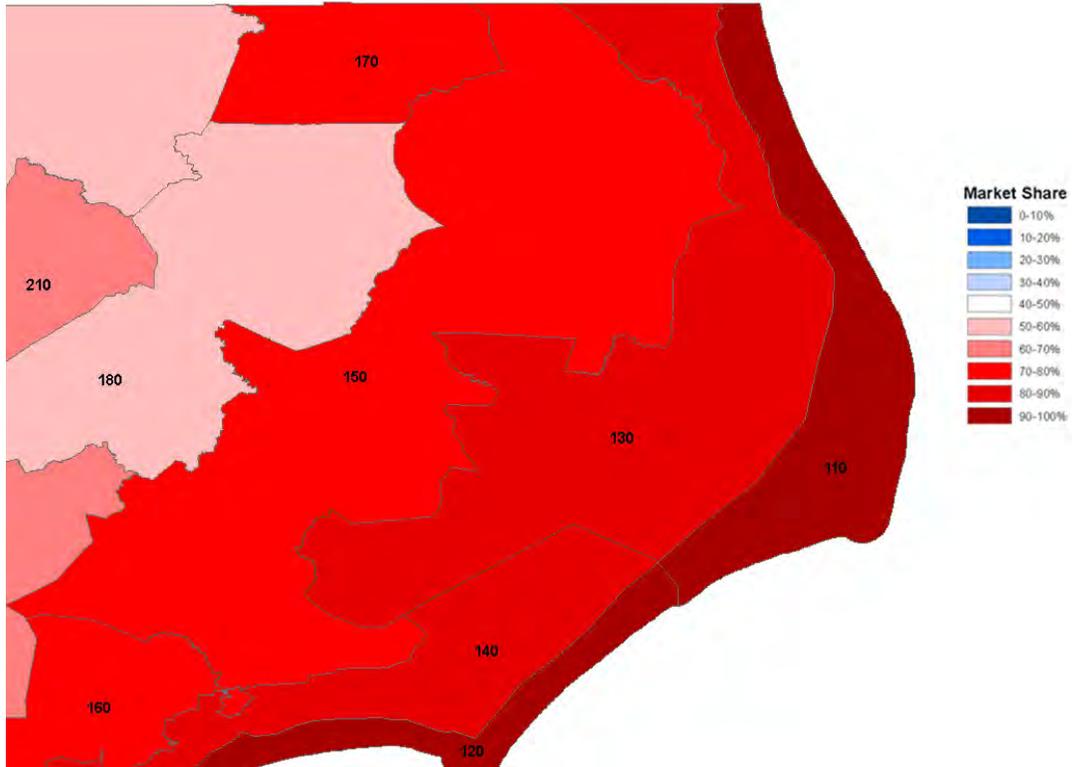
North Carolina–Southeast Coast
FAIR Plan and Beach Plan
Dwelling Extended Coverage
2017 Market Share by Territory

Market Share
- 0-10%
- 10-20%
- 20-30%
- 30-40%
- 40-50%
- 50-60%
- 60-70%
- 70-80%
- 80-90%
- 90-100%
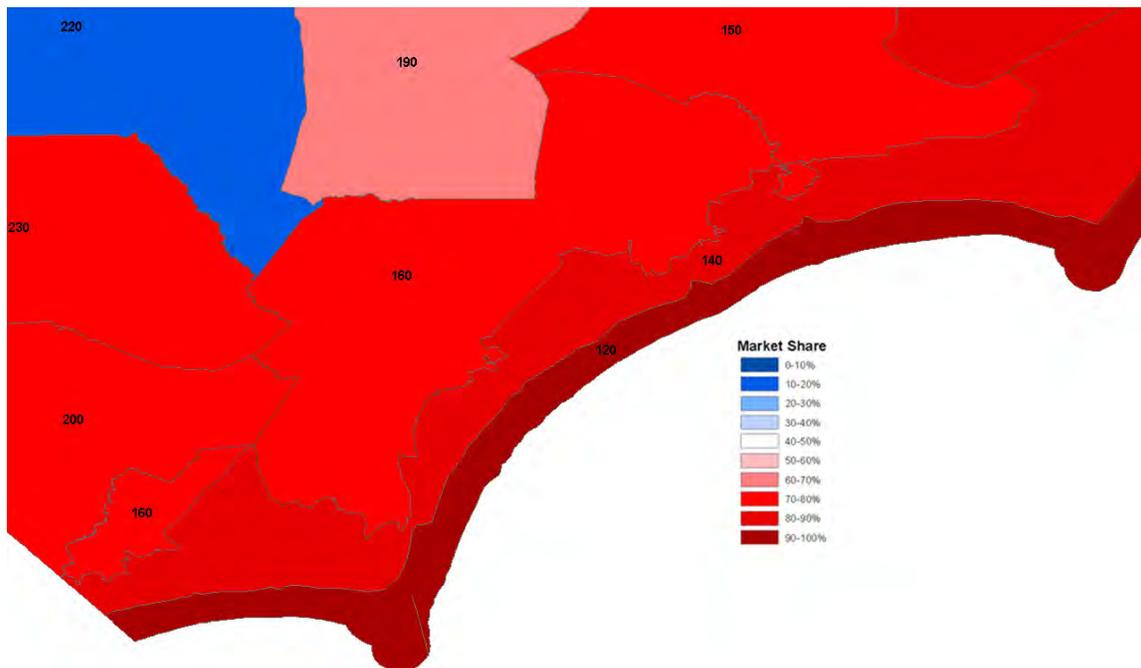
PREFILED TESTIMONY

OF

MATTHEW BERRY

2019 DWELLING INSURANCE

RATE FILING BY THE

NORTH CAROLINA RATE BUREAU

Q: **Please state your name and your employer.**

A: My name is Matthew Berry. I work at Allstate Insurance Company at 2775 Sanders Road, Northbrook, IL 60062.

Q: **What is your educational background?**

A: I received my Bachelor of Science in 2013 from Purdue University – West Lafayette with a double major in Actuarial Science (with Honors) and Applied Statistics.

Q: **Do you have any additional certifications or qualifications?**

A: Yes. I have been a Fellow of the Casualty Actuarial Society (FCAS) since 2016 after passing each exam on my first attempt. I am a current member of the Casualty Actuarial Society Examination Committee where I volunteer for writing as well as grading actuarial exams. I also hold the Certified Specialist in Predictive Analytics (CSPA) credential awarded by the CAS Institute. I am a member of the American Academy of Actuaries (MAAA) and meet all of its continuing education requirements. I am in good standing with the CAS and the AAA.

Q: **What is your employment background?**

A: I have worked as an actuary for Allstate Insurance Company's auto and owners lines of business for my entire career since August 2013. I started on Allstate's Actuarial Training Unit before becoming an Actuarial Analyst in 2014 for the West Central region, which encompasses Colorado, North Dakota, South Dakota, Montana, Wyoming, Kansas, Nebraska, Iowa and Missouri. In 2016 I became an Actuarial Analyst for the state of California. Finally, in 2017 I was promoted to my current role as Actuarial Manager for the state of North Carolina.

Q: What is your background in property insurance ratemaking?

A: I have extensive experience in residential property insurance ratemaking in my career at Allstate. In prior roles on the Training Unit and West Central regions, I ran owners rate-level indications where I analyzed factors that drove owners loss and premium trends and evaluated the adequacy of segmented rates. While working on California, I led a research project on incorporating catastrophe exposure into rate-level indications for owners, condo and tenants that complied with the unique regulatory environment. That California catastrophe exposure methodology remains in place today and has been incorporated into multiple filings approved by the California Department of Insurance.

In my current role as Actuarial Manager for the state of North Carolina, I have led multiple initiatives to modernize Allstate's owners product through ratemaking improvements. I have also facilitated multiple data calls and have collaborated with our actuarial department on various projects. I work on residential property insurance ratemaking through my work on behalf of the North Carolina Rate Bureau ("Bureau.")

Q: What is your role with respect to property insurance ratemaking in North Carolina?

A: As Allstate's representative, I chair the Property Rating Subcommittee of the Bureau. That Subcommittee has jurisdiction over rates for residential real property insurance, which includes Dwelling, Homeowners and Mobile Home insurance rates. I am also on the Property Committee of the Bureau. That Committee has jurisdiction over forms and rates for the Dwelling and Homeowners lines and the Mobile Home subline of insurance.

Q: Can you explain the role of the Bureau with respect to Dwelling rates?

A: The Bureau was created by statute in 1977. According to the statutes and the Bureau's Constitution, its jurisdiction and role generally include the establishment of policy forms and rates for residential real property insurance policies written in North Carolina. This jurisdiction includes all policies of Dwelling insurance as well as Homeowners and Mobile Home insurance. Companies writing Dwelling policies must be members of the Bureau (with the limited exception of town or county farm mutual writers pursuant to N.C. G. S. 58-36-50). Approximately 46 companies that are members of the Bureau write Dwelling policies in the voluntary market.

Dwelling policies are also written by the North Carolina Insurance Underwriting Association (commonly called the "Beach Plan") and the North Carolina Joint Underwriting Association (commonly called the "FAIR Plan"). The Beach Plan writes Dwelling policies in the 18 coastal counties, and the FAIR plan writes Dwelling policies throughout the rest of the state. When those two organizations, which are known as "residual market organizations," write Dwelling policies, they use the Bureau's forms and rates are based on Bureau manual rates. Policyholders may end up purchasing Dwelling policies either from a company in the voluntary market or from the Beach and FAIR Plans.

The rates for all Dwelling policies are filed by the Bureau and are subject to approval by the Commissioner of Insurance in filings such as this one. Total premium for Dwelling insurance earned (at the current rate level) in the voluntary

and residual markets is over $325 million a year (see RB-1, Section A). Approved Bureau rates are sometimes called "manual rates" or "bureau rates."

Individual companies can charge more or less than the approved Bureau rates through consent to rate and deviations, respectively. Such actions by individual companies are outside of the Bureau's jurisdiction. In recent years, there has been a significant growth in the use of consent to rate, by which companies may charge higher premiums on individual policies upon compliance with the consent to rate procedures. Full Dwelling policies written by the Beach Plan and FAIR Plan are written at the Bureau rate. There is a 5% surcharge on the premium for wind only Dwelling policies written in the Beach Plan.

In the 18 beach and coastal counties, the residual market is overwhelmingly the largest writer of Dwelling policies. Dwelling policies have increasingly been written by the FAIR Plan in the rest of the state. These facts, together with the fact that there has been an increase in the use of consent to rate by individual companies, point to the fact that the current Dwelling rates are too low.

Q: Can you explain the responsibilities of the Property Rating Subcommittee of the Bureau?

A: The Property Rating Subcommittee is involved in the development of rates, rating plans and territories for property insurance for the Bureau, including the Dwelling rates. Companies on the Subcommittee include American Bankers Insurance Company of Florida, American Modern Home Insurance Company, Farmers Insurance Exchange, Foremost Insurance Company, Horace Mann Insurance Company, Nationwide Mutual Insurance Company, N.C. Farm Bureau Mutual Insurance Company, State Farm Mutual Automobile Insurance Company, Travelers Indemnity Company, USAA and Allstate Insurance Company. Allstate Insurance Company chairs the Subcommittee. All representatives on the Subcommittee are actuaries and/or have extensive experience in ratemaking.

Q: **Please describe how the Property Rating Subcommittee was involved in this particular Filing.**

A: The Subcommittee analyzed the data and methodologies that were presented to the Subcommittee by the Bureau's consultants who are experts in their fields. This includes premium and loss data, expense data, modeled hurricane results, reinsurance analyses and economic analyses. The Subcommittee made selections based on the data and the expertise of Paul Ericksen and others of Insurance Services Office (ISO), Dr. George Zanjani, Paul Anderson of Milliman, Dr. Jim Vander Weide, Elizabeth Henderson of Aon, and Steve Fiete of Aon.

Ultimately, the Subcommittee developed recommendations to the Property Committee and the Governing Committee of the Bureau as to rate levels that meet the statutory requirement that rates not be "excessive, inadequate or unfairly discriminatory." Those Committees adopted the recommendations of the Subcommittee. The Governing Committee capped the actuarially sound rates as will be discussed below.

The Subcommittee has always been involved in developing and recommending to the Bureau the methodology used in its property filings. The approach in this Filing is generally consistent with the prior Dwelling filing.

Q: **Please describe the overall ratemaking methodology in the Filing.**

A. The approach in this Filing is consistent with prior property filings of the Bureau. Premiums should equal expected losses, plus expected expenses, plus a margin for a fair and reasonable profit. This is the fundamental insurance ratemaking equation to comply with the statutory ratemaking standard. In this Filing, the required base rate per policy is developed by adding the appropriate profit and contingencies to the estimated costs associated with the policy. The required base rate is then compared to the current base rate to determine the "indicated"

rate change. For Dwelling filings, this is done separately for the two portions of the policy, the Fire portion and the Extended Coverage portion.

The indicated rate change is the actuarially sound percentage change necessary to make the rates comply with the statutory standard that they not be excessive, inadequate or unfairly discriminatory. The indicated rate level change differs from the "filed" rate level change because of capping, which I will discuss later in my testimony. The Bureau's Governing Committee elected to cap to mitigate the impact of this Filing on policyholders. The Bureau's goal is to have rates eventually reach the indicated rate level, but the Bureau has in the past engaged in a process of gradualism to reach the actuarially sound rate level.

The Governing Committee opted to cap, by territory, the Fire indications at 5%, and applied a separate cap of 30%, by territory, to the Extended Coverage indications. Combined, these caps result in an overall filed rate increase of +19.2% for the Dwelling program. Since the indicated Extended Coverage changes generally were the largest in the beach and coastal territories, the impact of capping is greatest in those areas.

Q: **How does the methodology account for the loss experience of all of the insurance companies and entities that write Dwelling insurance in North Carolina?**

A: For purposes of Bureau rate filings for Dwelling, all Dwelling loss and exposure data in the state is consolidated to essentially assume a single insurance entity (often called the "hypothetical one company"). This data contains the aggregate loss experience of all Dwelling policies in the state as well as the rating characteristics of every Dwelling policy. Since the Beach Plan writes many of these policies, its losses and exposure data are included. ISO aggregates the data that it receives directly from various insurers as well as the data compiled by other licensed statistical organizations. The latest year of available data used in

the Filing is 2017. In 2017, the total earned premium (at current rate level) for the Fire portion of Dwelling policies was approximately $84 million. In 2017, the total earned premium (at current rate level) for the Extended Coverage portion of Dwelling policies was approximately $241 million. These dollar amounts include both residual market mechanisms that write Dwelling policies.

Q: **How are the expected losses determined?**

A: This Filing uses the loss experience of five accident years from January 1, 2013 through December 31, 2017. Using five years is consistent with prior filings, North Carolina statutes, and generally accepted ratemaking practices. The losses, excluding hurricane and excess losses, are adjusted to the base class level ($500 deductible level) and loss development factors are applied. The loss development factors account for the fact that the ultimate losses are oftentimes different from those estimated early on. Reasons for loss development include but are not limited to claims that were incurred in the policy period but have not been reported yet, as well as reported claims for which their current estimate will ultimately be inaccurate.

As I explain in more detail below, hurricane losses were determined by modeling. As to non-hurricane losses, a smoothing factor for excess losses of 5.5% for Extended Coverage was determined based on historical experience and applied to each accident year. The use of an excess loss factor is consistent with the general actuarial approach of using either a greater number of years or a model-based approach to estimate exposures that tend to be significantly lower in frequency and higher in severity and therefore might not be properly reflected in the five years of experience data. The excess loss factor was determined based on the longstanding excess loss procedure employed by ISO in prior Dwelling filings. Under that procedure, hurricane losses are first excluded. Then, the long-term excess factor is the ratio of the long-term average of the excess loss ratios

to the average of the long-term normal loss ratios. Historical non-hurricane wind experience back to 1950 is considered.

Losses are also trended to reflect the change in costs. The current cost index reflects this trend and is based on a Modified Consumer Price Index and the CoreLogic Residential Index. In determining the current amount factor, the Subcommittee determined that a loss trend adjustment factor of -1% should be used for Fire and that no additional loss trend adjustment would be applied for Extended Coverage. The trended losses and loss adjustment expenses are divided by the house years to determine the average trended loss cost. That cost is then converted to the trended base-class loss cost by dividing the average rating factor for each accident year.

Each of the five accident years is applied a weight. For the Fire portion of the policy, accident year 2017, the most recent year for which data is available, receives a weight of 30%. Accident year 2016 receives a weight of 25%. Accident year 2015 receives a weight of 20%. Accident year 2014 receives a weight of 15%. Accident year 2013 receives a weight of 10%. These weights are consistent with past filings. The use of differing weights is a longstanding procedure in the Fire analysis that is intended to reflect responsiveness to changes while incorporating multiple years of data. For the Extended Coverage analysis, all five accident years are applied an equal weight of 20%. This is consistent with past filings and is based on the concept that Extended Coverage perils are weather related and thus more random. In connection with modeled hurricane losses, trending was performed by Aon based on the selections made by the Subcommittee and the resulting modeled hurricane losses including trend and loss adjustment expense were provided to ISO.

Q: How is hurricane exposure reflected?

A: The Subcommittee considered actual historical experience of hurricanes in North Carolina. However, hurricane losses are so extreme and volatile that for many years the accepted and uniform actuarial procedure for determining prospective hurricane losses has been through the use of hurricane models rather than actual hurricane losses. The Bureau began doing so in 1993 using the AIR model, and that model was used uniformly and exclusively by the Bureau in all property filings until 2015 when the Bureau resolved to use two models. The Bureau first filed using two models in its 2016 Dwelling filing. In considering whether to use two models in that filing, the Subcommittee reviewed the positions and statements of the North Carolina Commissioner of Insurance, the North Carolina Department of Insurance, legislation that had been proposed in the North Carolina legislature and the practices of many companies that use two models despite the significant expense and technical difficulty compared to only using one model. The Bureau decided that an actuarially appropriate methodology for a Bureau filing is to use two models and to weight their results equally. The legislature subsequently enacted a requirement that the Bureau use more than one hurricane model in Bureau property rate filings made after October 1, 2017, which is satisfied in this filing through the use of two models.

Prior to selecting the two modelers, the Subcommittee reviewed which modelers are most commonly relied upon by insurers, reinsurers and parties to related financial transactions. The Subcommittee found that AIR and RMS are the two most widely used hurricane modelers. Therefore, the Subcommittee selected RMS to be the second modeler and decided to continue using AIR as the Bureau has done since 1993.

In determining prospective hurricane losses in the Filing, the Subcommittee made certain to use modelers whose models have been approved by the rigorous review process of the Florida Commission on Hurricane Loss Projection Methodology. That Commission has examined hurricane models in great detail over many years and authorizes their use in Florida rate filings. It retains experts

in relevant fields who review the meteorological, wind engineering, damageability, claims, statistical, computer programming, economic and other aspects of modeling in great detail. Over the years, it has reviewed advancements in various scientific disciplines related to hurricane modeling and has required modelers to reflect such advancements. It approves only those models that meet its rigorous standards.

The Subcommittee noted that it is natural and expected that model results will differ and will change over time. Different models project different loss costs in different areas. Prior to the Bureau having a second model run for the first time, the Subcommittee concluded that the actuarially sound and fair approach to the use of two models is to blend those models by averaging the loss costs of the two models. The Subcommittee determined that Aon, the world's largest reinsurance broker with extensive experience with modeling, is able to supply the modelers' results and to average the results from the two modelers. The blended results from the AIR standard catalogue and the RMS long term historical model are employed to determine the prospective hurricane losses on page C-1 of the Filing. As will be discussed further below, the AIR warm sea surface temperature catalogue and the RMS medium term rate model are employed in the analysis by Aon of the net cost of reinsurance factor in the filing.

Q.   Was hurricane modeling designed to produce high rate levels?

A.   Absolutely not. One of the great values of models is that they help stabilize rate levels. Without modeling, rate levels would fluctuate wildly following the occurrence or non-occurrence of significant hurricanes. Modeling is relied upon on all sides of insurance, reinsurance, catastrophe bond and other financial transactions to give the best and most unbiased projection of future hurricane losses. Different parties to those transactions often have opposing economic interests but nevertheless rely on models in their negotiations with each other.

Further, the Subcommittee made decisions that led to a lower estimate of hurricane loss costs than could otherwise have resulted. For example, the Subcommittee chose not to utilize the storm surge component of the models. The storm surge component is intended to reflect the fact that losses from storm surge flooding, that are not intended to be covered under a Dwelling policy, are sometimes paid as wind losses after a hurricane. Additionally, for catastrophe loss expenses in this Filing, the Bureau elected to employ the loss adjustment expense factor based on AON's data as to catastrophes, a factor that is lower than the factor based on data in non-catastrophe situations.

The model versions used were RMS RiskLink v 18 and AIR Touchstone v 6. As is the customary and accepted practice in the insurance, reinsurance, and catastrophe bond industries, the models were run with aggregate demand surge (AIR) and loss amplification (RMS) included. The aforementioned Florida Commission on Hurricane Loss Projection Methodology has approved the use of aggregate demand surge and loss amplification for the RMS and AIR models respectively. These aspects of the models account for the expected additional cost of supplies and labor if a very large hurricane event or series of events occurs. Experience demonstrates that when such catastrophic events have occurred, there is significant increase in demand for the limited supply of plywood, shingles, labor, hotel rooms and other necessities that in aggregate result in larger than normal claims payments. Additionally, there are delays in repairing properties, there are longer stays in hotels and there are other increased costs beyond those when smaller hurricanes occur. Loss amplification also factors in claims inflation. Claims adjusters may not investigate every claim if it is under a certain threshold, given the volume of claims they have to settle post-event in a limited amount of time.

Q: How is the expense data compiled and reviewed?

A: The Bureau conducts special expense data calls annually. Companies complete the special expense call, which includes reporting expense dollars as well as premiums at collected level and adjusted to manual level. The Bureau checks and compiles this information for all companies and sends it to ISO to include in the Filing.

The percentages for commissions and brokerage, taxes, licenses, and fees are a function of written premium. The determination of whether to select expenses as a percentage of written premium or as a percentage of earned premium considers which premium best matches the time at which the expenses are incurred. The ratios for these expenses from the North Carolina special calls for 2015, 2016 and 2017 were considered. The three-year average was selected. For commissions & brokerage, the selection was 10.9% for Fire and 9.5% for Extended Coverage. For taxes, licenses and fees, the selection was 2.8% for Fire and 2.7% for Extended Coverage. General and other acquisition expenses are determined based on a ratio to earned premium at manual level. The selected general expense was 5.9% for Fire and 3.6% for Extended Coverage. The selected other acquisition expense was 8.8% for Fire and 6.0% for Extended Coverage. These selections are then adjusted by ISO to reflect trend.

The loss adjustment expenses, both allocated and unallocated, are included with the losses in calculating the indication. Similar to the other expenses, the Subcommittee reviewed the loss adjustment expense data from the Bureau's data calls. Experience from calendar years 2013 through 2017 were reviewed. The ratio of loss adjustment expenses to incurred losses was analyzed. Consistent with past filings, the highest and lowest years were removed to allow for more stability due to the variable nature of incurred losses. The selected loss adjustment expense was 8.9% for Fire and 11.7% for Extended Coverage. A lower loss adjustment expense provision for modeled hurricane losses of 6.0% was selected, based upon data from Aon.

The Subcommittee reviewed expense index trends, including the All items CPI Index (both with and without Energy) and the Total Compensation Cost Index – Insurance Carriers, Agent Brokers and Service from the Bureau of Labor Statistics. Based on the review, the Subcommittee selected a 2.0% expense trend. This factor was then used to trend expense dollars from the midpoint of the expense experience period to the midpoint of the prospective loss period.

Q: Did the Subcommittee consider the profit provision?

A: Yes. Like past filings, the Subcommittee picked a conservative underwriting profit provision. Dr. Vander Weide provided a range for the current cost of capital, which was relied on by the Subcommittee. The range varied from 8.9% on net worth using a risk premium analysis to 12.9% using a discounted cash flow methodology for the property/casualty insurance industry.

The Subcommittee selected an underwriting profit provision of 8.5% of premium. Based on Dr. Zanjani's analysis, this would generate a statutory return of 7.9% on net worth for Fire and 6.6% for Extended Coverage. This is significantly below Dr. Vander Weide's lower bound of 8.9%.

It is the statutory return that should be considered when determining the underwriting profit in North Carolina because it does not take into account investment income on surplus. Clearly, the Subcommittee is being very conservative with its selection. Even if the 8.5% underwriting profit were to consider investment income on surplus in addition to investment income from insurance operations, the estimated return on net worth would be 11.0% for Fire and 10.1% for Extended Coverage. These are within Dr. Vander Weide's range and thus the selected underwriting profit provision remains a selection that is not excessive.

Furthermore, the Bureau has capped the filed rate changes below the indicated rates such that the fire rate change does not exceed 5% and the extended

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coverage rate change does not exceed 30% in any territory. Assuming all other assumptions in the Filing are realized, that would result in even lower profit margins being realized.

Q: **Did the Subcommittee consider a contingency provision?**

A: Yes, the Subcommittee selected a 1% contingency provision. This is consistent with past filings and is a common industrywide practice across the country. The contingency provision reflects the total systematic bias from multiple sources that causes the indicated rate level without this adjustment to be inadequate. These biases can cause actual losses to be higher than reflected in the rates as well as cause actual premiums to be lower, each of which would cause the indicated rate level to be understated.

Sources of this systematic bias in property insurance include, but are not limited to, judicial decisions that extend policy coverage beyond what was anticipated in the rates, legislative changes, regulatory delay in achieving the indicated rate change or regulatory reduction of the rate change.

Courts rarely restrict coverage to less than intended in the policy forms and frequently expand coverage beyond what was intended. In addition, major unexpected losses can and do come from large and infrequent events of a type and magnitude that are not reflected in the experience period.

One historical example is the sudden surge of mold claims around the early 2000's that far exceeded the amounts seen in experience periods. In addition to unforeseen claims, rate filings are generally not approved prior to their intended effective date or for more than requested while some much-needed rate filings are denied altogether.

Because of these factors, estimated premium that does not reflect a provision for these contingencies will fall short of adequate premium very frequently. When these premiums are inadequate and underwriting losses are observed, an insurer must borrow from surplus to properly indemnify its policyholders or claimants. According to the Actuarial Standard of Practice #30, "the actuary should include a contingency provision if the assumptions used in the ratemaking process produce cost estimates that are not expected to equal average actual costs, and if this difference cannot be eliminated by changes in other components of the ratemaking process." The Subcommittee believes that a contingency provision is appropriate and necessary, and has selected a 1% factor in this Filing, the same as with all recent property insurance filings. The Subcommittee also believes this is a conservative estimate given the multitude of factors impacting this provision.

Q: **Has the risk of a residual market assessment been considered in the Filing?**

A: Yes. The residual market for property insurance in North Carolina is very large. In all 100 counties, Dwelling policies can be written by a residual market mechanism. For non-coastal areas, that mechanism is known as the FAIR Plan. In the 18 coastal counties, Dwelling policies can be written by the Beach Plan. The companies that voluntarily write property insurance in North Carolina are vulnerable to situations where large hurricanes cause losses that exceed the surplus and reinsurance of the residual market mechanisms. In such cases, there will be a non-recoupable assessment on the voluntary insurers writing property insurance in the state of Beach Plan losses up to $1 billion. There is no cap as to FAIR Plan losses that are assessed to the companies. These potential residual market assessments are a legislatively imposed cost of doing business in the state and are a condition for writing Dwelling insurance. The voluntary companies need to have and retain capital to contemplate potential assessments. The Subcommittee reviewed and adopted an analysis done by Mr. Anderson on the necessary compensation for this assessment risk. This

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analysis is explained in the testimony of Mr. Anderson. Based on this analysis the Subcommittee determined that a 3.4% factor is appropriate to reflect in the Filing. It is important to note that the assessment potential changes with the surplus level of the Beach Plan and with the size of the FAIR Plan. The assessment percentage would be much higher if the exposure for the voluntary market companies for Beach Plan losses were potentially greater than $1 billion.

Q: Was the cost of reinsurance considered in the Filing?

A: Yes. There are numerous scenarios where the potential losses due to a single hurricane are far greater than the entire premium collected by all the companies for the entire state of North Carolina. To remain viable long-term and protect against insolvency, the industry must purchase reinsurance to account for these scenarios. The costs associated with such reinsurance are costs of doing business in the state.

Q: What is reinsurance?

A: Simply, reinsurance is insurance for insurers. When insurers are aware of situations in which the potential losses are greater than the company is willing or able to tolerate, they will frequently purchase reinsurance to mitigate those situations. Additionally, insurers may issue catastrophe bonds to mitigate those situations. Essentially the insurers will use a portion of the premium to purchase reinsurance. This is common across the industry, including at Allstate.

Q: How are the reinsurance costs reflected in the Filing?

A: The costs of reinsurance are incorporated through the work of Aon, the largest reinsurance broker in the world. Based on Aon's extensive data and experience related to reinsurance transactions, Aon advised the Subcommittee as to the parameters of the reinsurance program that the hypothetical one company for

which rates are being made in the Filing would reasonably select. Aon then applied these selected parameters to calculate the net cost of reinsurance. As the world's largest reinsurance broker, Aon maintains extensive and up to date data on reinsurance transactions and has vast experience as to those transactions. The parameters that were recommended by Aon and selected by the Subcommittee include the attachment and exhaustion points, the placement percentage, the perils that are commonly included in reinsurance treaties for a hurricane prone state such as North Carolina, and the inclusion of one reinstatement. The parameters reflect the amount of reinsurance that the hypothetical one company should purchase to optimally protect its solvency. Based on Aon's extensive experience and advice, the Subcommittee recommended the use of AIR's warm sea surface temperature event set and RMS' medium term rate model as the bases for determining the provision for reinsurance costs. Reinsurers, primary insurers and other parties customarily use such models to determine reinsurance rates. The results from those two models were used in the calculation of the net cost of reinsurance displayed on page C-2 of the Filing.

Q: **Can reinsurance costs of each company writing in North Carolina be allocated and aggregated for use in this Filing?**

A: No. It is not possible to measure reinsurance costs of the various insurance companies applicable to Dwelling insurance written in North Carolina. The first reason is that companies often do not enter reinsurance treaties exclusive to only one line of insurance. The approximately 46 individual insurance companies have hundreds of different treaties that cover many different lines of insurance (automobile, commercial property, other residential property, etc.) as well as Dwelling. Second, reinsurance treaties often are not exclusive to just North Carolina or for only one peril. Companies negotiate reinsurance treaties in many different geographical areas (portion of a state, single state, multiple states, Atlantic Basin areas, countrywide, international, etc.), and covering many

different perils (such as automobile flooding, hurricanes, direct earthquake losses, tornados, wildfires, etc.). Finally, reinsurance for a given set of risk exposure (such as North Carolina Dwelling) is often not limited to one treaty. An individual company will purchase reinsurance from different reinsurers for different layers of loss under different types of treaties or also use catastrophe bonds for different layers of loss. For these reasons, it is not feasible to measure reinsurance costs specific to North Carolina and specific to the line of Dwelling insurance in each individual treaty or bond or for each individual company.

It is important to note that the calculation of the net cost of reinsurance in this Filing relates exclusively to the loss costs in North Carolina. It would not be appropriate for North Carolina insureds to assume the reinsurance costs of exposures in other states and vice-versa. Aon's database is based on actual reinsurance transactions and on conditions in the current reinsurance market and is updated regularly to reflect changes in actual market conditions. Aon's database and expertise are a great source of information as to actual reinsurance practices and costs for the hypothetical one company writing Dwelling insurance in North Carolina.

Q. **From the standpoint of individual companies, how does ratemaking in North Carolina differ from other states?**

A. In other states each company files its own Dwelling rates independently. However, in North Carolina, the Bureau has the responsibility to file rates on behalf of the entire industry. The process in North Carolina establishes a system of bureau rates for use on all Dwelling policies written in the state.

In essence, the Bureau makes rates for a hypothetical one company that is composed of the aggregate policyholder attributes and loss experience of all the Dwelling policies written in the state. Those policies include attributes such as the dollar amount of insurance written on the home, the geographic location of

the home, the protection class of the area in which the house is located, the type of construction, the deductible amount, etc.

Once the Bureau rate has been set through the filing and approval process, Bureau companies must charge that rate unless they file their own deviations with the Department or engage in the consent to rate process. If the proposed premium exceeds the Bureau rate, the company must comply with the consent to rate process.

Q.   **You stated earlier that premiums are established at a level equal to expected losses plus expected expenses and a margin for a fair and reasonable profit. Does this mean that ratemaking is a simple matter of adding up past losses, past expenses and past profit and then putting them into a simple equation to equal premium?**

A.   That is not at all the case, for numerous reasons. The first reason is that ratemaking is prospective in nature. The ratemaking process requires the determination of the expected future losses and the expected future expenses of the composite company that will be incurred in the projection period. While it is important to consider past losses and expenses in determining expected future losses and expenses, the process is much more complex than that. There may be many reasons why past losses and expenses are not a perfectly accurate reflection of future loss and expense levels. Loss and expense cost trends can be driven by a wide range of factors such as inflation, cost of building materials, frequency of weather events, etc. Therefore, trends need to be projected into the future to determine accurate projected losses and expenses.

Further, it is particularly difficult to estimate prospective losses for property lines of business such as Dwelling insurance because losses in those lines are so volatile and the types of perils insured are so varied. For numerous reasons, it is more difficult in property lines than in other personal lines to determine

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prospective losses because policies cover so many different situations and events. For instance, Dwelling policies must pay for losses to buildings and contents for fires, for numerous types of weather events including hurricanes and tornados and for other perils. Even putting aside the potential impact of hurricanes, property lines are highly dependent upon weather events, including tornado outbreaks, winter storms, hailstorms, freezing temperatures, etc.

Such volatility is greatly compounded in hurricane prone states such as North Carolina. In North Carolina and other hurricane prone states, a significant percentage of the prospective long-term average annual losses in certain territories of the state are caused by intense hurricanes which are relatively infrequent but are devastating when they do occur. It would be actuarially unsound to rely on a few years of actual hurricane losses to estimate prospective hurricane losses because of the volatility of these losses driven by low frequency and high severity.

The volatility of property insurance in a hurricane prone state can be explained in part by a statistical concept of "independence" that is useful to consider in distinguishing between different lines of property casualty insurance. If one home is damaged by a hurricane, it is very likely that many other homes in the same geographic region will be damaged at the same time. The risk of damage for each individual home is not independent of the risk of damage to the other homes because a single event can cause widespread damage. As a contrast, in auto liability insurance, when there is one auto collision there generally is not a greater likelihood of there being numerous other auto collisions in the same geographic region at the same time. While the amount paid under bodily injury or property damage coverage because of that single auto collision may far exceed the premium collected for the individual policy involved, that fact is not replicated to numerous other policies because auto collisions are generally random and independent events. However, when intense hurricanes occur,

there are likely to be payments far greater than the total premium collected on a large number of policies due to the geographic concentration of the event.

Q: **Please describe the nature and the operations of the Beach Plan and FAIR Plan as they relate to Dwelling insurance in North Carolina.**

A. The Beach Plan and the FAIR Plan are both residual market mechanisms set up by the North Carolina legislature to write property insurance in situations where policyholders cannot obtain insurance through the competitive, voluntary market.

The Beach Plan and FAIR Plan write Dwelling insurance on the same policy forms as those that have been approved for use by the voluntary insurance companies. Data from all these policies is in the Filing. Companies that voluntarily write Dwelling insurance anywhere in North Carolina are subject to Beach Plan assessments, even if they do not write in the 18 coastal counties. However, voluntary companies are statutorily prohibited from receiving a distribution from the Beach Plan's surplus or from profiting on business written by the Beach Plan. Thus, the voluntary companies have no opportunity to make a profit on policyholders that are written in the Beach Plan, but are subject to assessments for losses on those policyholders.

When a prospective policyholder seeks Dwelling insurance, it is not predetermined whether the policyholder will be written by the Beach Plan or FAIR Plan, or instead by a voluntary company. Policyholders often switch back and forth between the residual market and a voluntary company depending on which option works best for them and depending on whether a voluntary company will write them. In computing the exposures and the loss experience of the hypothetical one company in North Carolina for which rates are being made in this Filing, the exposures and loss experience of the Beach Plan and the FAIR Plan must be combined with the rest of the data as if the Beach Plan and FAIR Plan were private insurance companies.

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It is noteworthy that a very large percentage of Dwelling premium in the coastal counties goes to the residual market, rather than the voluntary companies. While the Beach Plan was statutorily set up to be the market of "last resort," it appears to be the market of first resort in many instances. This is predominantly because the currently approved Bureau rates in the coastal counties are highly inadequate for the risk. Otherwise, with numerous companies competing in the state, normal competitive market forces would come into play and companies would write voluntarily.

The fact that rates at the beach and coast are significantly inadequate creates a dilemma for the Beach Plan. On the one hand, the inadequate rates diminish the Beach Plan's ability to build up sufficient surplus in the "good" years when there are no hurricanes in order to provide a cushion to pay losses in the "bad" years when severe hurricanes occur. Even in the good years, the Beach Plan has to pay claims for higher frequency insured events such as fires, etc.

The Beach Plan's approach has been to purchase both reinsurance and catastrophe bonds. Whatever amounts the Beach Plan spends in the reinsurance and catastrophe bond markets is at the expense of building up its surplus in those years when hurricanes do not affect North Carolina.

Q. **Please explain assessments on companies and policyholders that will occur when a catastrophic hurricane hits the coastal area and exceeds the ability of the Beach Plan to pay losses.**

A. When the next truly catastrophic hurricane next occurs, the inadequacy of rates at the beach and coast will increase the likelihood of one and possibly two types of assessments: "non-recoupable assessments" on the companies that voluntarily write insurance throughout the state and "catastrophe recovery charges" on all property insurance policyholders throughout the state. These

assessments are set forth by statute and will arise after exhaustion of the Beach Plan's ability to pay, including any reinsurance that it has purchased. The assessments on the companies will occur first, and any assessments on policyholders will occur following exhaustion of that assessment on companies.

As discussed previously, companies that write any Dwelling insurance in North Carolina are subject to a non-recoupable assessment for Beach Plan losses in a given year up to a total of $1 billion. This assessment will be imposed in accordance with a formula reflecting each company's property insurance writings across the entire state and in the 18 coastal counties. Each company makes an individual decision whether it will write Dwelling insurance at all in North Carolina and if so the extent that it writes in the vulnerable coastal counties. The risk of an assessment drives each company's decision whether to write at all in the state, and if so, how much to write and where.

The potential assessment on statewide policyholders is called the catastrophe recovery charge. Statutes require the assessment of all policyholders who have purchased Dwelling and other property policies throughout the entire state after their insurance companies have paid the $1 billion non-recoupable assessment discussed above. The catastrophe recovery charge on policyholders could be up to 10% of their premium per year. The voluntary companies will be required to impose and administer this assessment on policyholders. The 10% charge would continue annually as long as necessary to collect the amounts that were paid out for Beach Plan losses in excess of the $1 billion assessment on companies.

The ultimate effect of the regulatory system in North Carolina is that rates for policyholders insured through the Beach Plan are being subsidized, both explicitly and implicitly. The explicit subsidy arises from the fact that insurance companies must pay the first $1 billion of losses over and above the Beach Plan's existing surplus and reinsurance, and the Filing passes along this cost in

the form of the 3.4% provision for the compensation for assessment risk to policyholders throughout the state. In addition, there is an implicit subsidy in that policyholders across the state face the possibility of imposition of the 10% catastrophe recovery charge. Another way of looking at the situation is that the insurance industry and policyholders across the state are providing free reinsurance to the Beach Plan.

It is important to note that the companies' exposure to losses of the FAIR Plan are not subject to the $1 Billion cap that is applicable to Beach Plan losses. The FAIR Plan writes Dwelling policies statewide. Policies written throughout the state are also vulnerable to losses from catastrophic hurricanes to different degrees. The companies are subject to unlimited assessments as to those losses. The FAIR Plan has experienced significant growth in the years before and during the experience period of this Filing.

Q. **Is the reason that the Beach Plan purchases reinsurance similar to the reason that private companies purchase reinsurance?**

A. Yes. The Beach Plan and companies must purchase reinsurance for essentially the same reasons. Likewise, for ratemaking purposes, the hypothetical "one company" for which the Bureau files rates must purchase reinsurance. That hypothetical one company is faced with numerous realistic hurricane loss scenarios that far exceed its ability to pay.

The hypothetical one company (voluntary companies plus the Beach Plan) receives about $325 million in Dwelling earned current level premium annually in North Carolina. There are many scenarios in which hurricane losses are projected to be many multiples of that amount. If an individual company experienced a loss many multiples of its collected premium, it would first look to its surplus and reinsurance. If the surplus and reinsurance were not sufficient, then that company would become insolvent. Individual companies do not have a

backstop like the Beach Plan which can call upon the companies and policyholders across the state to pay its claims. There has been a history of company insolvencies following major hurricanes in the United States. Following Hurricane Hugo that hit Charleston, South Carolina and Hurricane Andrew that hit Florida, there were multiple insolvencies.

It would be irresponsible and imprudent for the hypothetical one company not to purchase reinsurance. The net cost of reinsurance analysis prepared by Aon reflects the need of that hypothetical one company to purchase and maintain reinsurance. Aon has access to the world's largest database of reinsurance transactions and uses that database to calculate the net cost of reinsurance provision used in the Filing. The Rating Subcommittee reviewed and approved Aon's analysis.

Q. **Does the Filing in any manner require policyholders in North Carolina to pay the losses or subsidize the rates of policyholders in other states, particularly hurricane prone states such the Gulf Coast states?**

A: No, it would be actuarially inappropriate to do so. Each state is evaluated separately, and rates in North Carolina are based only on North Carolina's loss potential. Imposing such a subsidy would not be fair to North Carolina policyholders and would not be permitted by North Carolina regulators. There is a greater risk of hurricane losses in Florida and some other Gulf states than in North Carolina, and it would not be fair or actuarially sound for North Carolina policyholders to be asked pay for their losses or subsidize the insurance costs for persons in those areas. For the same reason, it would not be fair or actuarially sound for the Bureau to attempt to spread the hurricane exposure of the hypothetical one company in North Carolina to persons in other states such as in the Midwest where there is little hurricane exposure. Policyholders and regulators in Iowa, for example, would not be willing to do that. To summarize,

using other states losses to determine North Carolina rates is unfair and unequitable, and the Bureau does not do this for these reasons.

Q: Have dividends to policyholders been considered in the Filing?

A: Yes. According to the Statement of Principles Regarding Property and Casualty Insurance Company Ratemaking, the rates should contemplate the cost of policyholder dividends. Policyholder dividends are returns of premium to a company's policyholders and are not the same as dividends that publicly traded stock companies (owned by shareholders) pay to their shareholders. The Subcommittee reviewed policyholder dividends over the years 2013 through 2017. It noted that payments have consistently been made and in material amounts. Therefore, the Filing has incorporated a provision of 0.4% of premium for fire and 0.8% for extended coverage to reflect anticipated dividends during the prospective period for which rates are being made in this Filing. Reflecting anticipated dividends is an actuarially sound methodology in a rating bureau context such as that in North Carolina where rates are made for all companies.

Q: Have deviations been considered in the Filing?

A: Yes. Deviations are a cost of doing business in North Carolina for the insurers that have them approved by the Department. They are a cost of risk transfer and therefore need to be contemplated in the rates according to the Statement of Principles Regarding Property and Casualty Insurance Ratemaking. They constitute "savings" that must be considered pursuant to statute. Companies are required to report their approved deviations. If rates were set without contemplating them, the industry would not achieve the profit provision included in the rates. The Subcommittee reviewed the net variances from manual premium from deviations, consent to rate and Beach Plan surcharges and elected to include a factor of zero for deviations in this filing.

Q: **Are the data in the Filing reliable and accurate for ratemaking purposes?**

A. Yes. The data underlying the Filing are reliable, accurate and appropriate for ratemaking. There are three levels of quality checks performed by individual companies, statistical agents and ISO. Individual insurance companies employ extensive procedures to assure the quality and reliability of ratemaking data used in the Filing. When individual companies submit their data to their statistical agents, the statistical agents review the data for possible errors and compliance with approved statistical plans. If an error is suspected, the statistical agents ask the company to review the data and to correct the data if necessary.

When ISO aggregates premium, loss and expense data from the statistical agents, it reviews the accuracy of the data and similarly requests that the data be reviewed and corrected if errors are suspected.

These data include data for business written at or below the Bureau manual rates, business written under consent to rate procedures and therefore above the Bureau manual rate and business written in residual markets (the Beach Plan and FAIR Plan). When the Bureau assembles expense data and furnishes it to ISO, they also perform checks to determine the data's accuracy. Sometimes it is not feasible for a company to correct its data, and in these cases that company's data is excluded from the filing and that fact is noted in the filing.

An additional check is that the Bureau requested that the statistical agents produce exhibits for the 10 largest writers of the Fire and Extended Coverage portions of the policy displaying exposure distributions for key factors (such as territory, amount of insurance and protection class) for the experience years in the Filing. Each company was asked to review and evaluate the accuracy of its data as reported to its statistical agent. Companies have confirmed that they have performed these reviews and that to the best of their knowledge their data are correct in all material respects.

Q. **Did the Subcommittee review rate level adequacy by territory?**

A. Yes, the committee asked ISO to calculate the indicated rate level changes by territory. The indicated change for a particular territory, as you would calculate indicated change for any given rating group, was calculated by dividing the required base class rate by the existing base class rate and subtracting 1.

First, ISO calculated the indicated base class loss cost by territory. This resulted from calculating the total loss cost by territory and applying the resulting territorial relativity to the indicated statewide base loss cost. The territorial indicated base class loss cost was converted to the required base class rate by performing expense, profit, and deviation adjustments at the territorial level, in the same manner that adjustments were performed at the statewide level for these ratemaking elements. The indicated changes by territory show rate levels by territory that are needed to equitably spread the overall rate level.

Q. **Are the filed territorial rates the indicated rates?**

A. No. In consideration of customer impacts, the Governing Committee directed that the filed changes be capped by territory at 5% for Fire and at 30% by territory for Extended Coverage. These caps, when combined, result in an overall filed rate increase of 19.2%. It should be noted that the indicated rate level is the actuarially sound and correct rate level. The indicated rate level is the rate level necessary to cover prospective losses and expenses and leave a fair and reasonable profit. The indicated rate level is the one that complies with the statutory standard that the rates be neither excessive, nor inadequate, nor unfairly discriminatory.

Q. **Are you aware of changes in this filing other than to the rates?**

A. Yes. The filing proposes several rating plan changes. The Committee reviewed the amount of insurance rating variable and elected to modernize the base levels to $100,000 for buildings and $15,000 for contents, to be more in line with the current average amounts. In addition, the amount of insurance curve for Fire (buildings only) suggested that a flatter curve would be more appropriate. As a result, the Property Rating Subcommittee decided to move towards the curve indicated by the data, and new relativities are included in the filing.

The Committee opted to introduce a new age of construction rating variable into the Dwelling program. This rating variable is designed to reflect that newly built homes typically have better loss experience than older homes. This newly introduced rating variable provides discounts to homes that are less than 25 years old.

All of these changes achieve meaningful movement towards the actuarially indicated factors by segment. These changes are set forth in the filing and are described further in the testimony of Mr. Ericksen of ISO.

These rating plan changes are being filed on a revenue neutral basis by way of off balance factors and therefore do not create additional overall rate increases or decreases on top of the filed amount.

Q. Can you identify Exhibit RB-1?

A. Yes. This is a large portion of the Filing submitted by the Bureau with respect to revised Dwelling insurance rates in North Carolina. Exhibit RB-1 includes numerous exhibits and voluminous statutory and regulation responses and explanations pertaining to the indicated and filed rate level changes. The Filing also includes the current manual as Exhibit RB-2. The manual contains the rules, rates and classifications used to write Dwelling insurance in North Carolina. These have been approved by the Department and are on file with the

Department. The Filing also contains the prefiled testimony and exhibits of witnesses in addition to mine (Exhibits RB-3 through RB-26).

Q.   Do you have an opinion as to whether the indicated rate level changes in the Filing are excessive, inadequate or unfairly discriminatory?

A.   Yes.

Q.   What is that opinion?

A.   It is my opinion that the indicated rates in the Filing are actuarially sound and meet the statutory standard of producing rates that are not excessive, inadequate or unfairly discriminatory. In that regard, I note that I have relied upon the accuracy of the data and analyses supplied by the statistical agents, the Bureau, Aon and Milliman as reviewed and checked, and I have also relied on the reinsurance and profit analyses performed by Dr. Zanjani and Dr. Vander Weide. I qualify my opinion by noting that the filed rates have been developed by applying territory caps to the indicated rates. The filed rates are not excessive and the 19.2% filed rate increase is a reasonable step toward the adequate level.

Q.   Does this conclude your prefiled testimony?

A.   Yes.

PRE-FILED DIRECT TESTIMONY OF ELIZABETH A HENDERSON

2019 DWELLING INSURANCE RATE FILING
by the
NORTH CAROLINA RATE BUREAU

Q. Please state your full name and business address for the record.

A. My name is Elizabeth Ann Henderson. My business address is Aon, 200 East Randolph Street, 11th Floor, Chicago, Illinois 60601.

Q. What is your involvement in this matter?

A. My employer, Aon, has been retained by North Carolina Rate Bureau (NCRB) to provide expertise and analysis with respect to the expected hurricane losses utilized in the NCRB 2019 Dwelling Insurance rate filing. I am part of the team at Aon that performed these services.

Q. What are your primary duties for Aon?

A. Aon's Reinsurance Solutions division is the world's largest reinsurance brokerage firm, and I am a Senior Managing Director of the Catastrophe Risk Analytics group. I lead a catastrophe risk management team, consisting of 25+ catastrophe modeling professionals, engineers, and meteorologists. I am responsible for providing catastrophe modeling support for reinsurance

1   placements and expected hurricane losses and am charged with positioning my

2   team as a key differentiator in client solutions including support for multi-model

3   analyses, benchmark pricing, data quality peer comparisons, model evaluation,

4   real-time event response, portfolio optimization, catastrophe cost allocations, and

5   rating agency questionnaire support. In effect, we assist our clients in all aspects

6   of managing their exposure to catastrophe risk.

7

8   **Q. Describe your professional and educational background.**

9

10   A. I have been with Aon for 15 years since graduating from Northwestern

11   University with Bachelor of Arts degrees in Mathematics and Philosophy. In my

12   role at Aon, I have participated in and led the modeling efforts for reinsurance

13   treaty placements on behalf of Aon's clients. My specializations include

14   providing risk management consulting and catastrophe modeling services to

15   United States property and casualty insurance companies, particularly in

16   personal lines property, small commercial property, and worker's compensation.

17   I have worked directly with companies to help them analyze the amount of risk

18   due to catastrophes against which they are exposing their capital and compare

19   that risk to their risk tolerances. In assessing their catastrophe risk, we utilize

20   two independent modeling firms: Risk Management Solutions (RMS) and Applied

21   Insurance Risk (AIR). We provide detailed analyses of the model results to

22   enable companies to make business decisions around catastrophe risk

23   management, including setting underwriting guidelines, developing rate

1   indications, determining the appropriate amount of reinsurance to purchase and

2   deploying growth capacity.

3

4   **Q. Describe your early career at Aon.**

5

6   A. I began working at Aon 15 years ago as a Catastrophe Risk Analyst. During

7   my tenure at Aon, I have worked within the Catastrophe Risk Analytics Group

8   and have been promoted through six positions (Analyst, Senior Analyst,

9   Associate Director, Director, Managing Director, and now Senior Managing

10   Director). My responsibilities grew with each new job as I expanded my

11   capabilities. When I began my career as an Analyst, I was responsible for the

12   day-to-day modeling for a variety of client accounts. This included processing

13   and profiling raw client data into model-specific import files, importing client data

14   into the models of AIR and RMS, setting up and executing model runs in AIR and

15   RMS, and pulling out results and building exhibits. I was responsible for ensuring

16   the accuracy of my work, and reporting back to my clients about their results and

17   how those results impacted their reinsurance treaties. In my early career, I spent

18   most of my time working within the models' frameworks and learning how

19   different types of insurance terms are handled in each model, how to properly

20   code client data to ensure accurate results, and how to interpret how portfolio

21   changes and model changes impact results.

22

1   I was working in this role in 2004 and 2005 during the very active hurricane

2   seasons that produced Hurricanes Katrina, Wilma, and others. These events

3   were among the first major tests of the hurricane models after Hurricane Andrew

4   in 1992. These events greatly impacted the utilization of modeling and

5   understanding of how the models worked, and the new knowledge resulting from

6   those events led to changes that had a far-reaching impact on the insurance

7   industry. It was at this time that both RMS and AIR developed their Medium-

8   Term and Warm Sea-Surface Temperature hurricane event sets.

9

10   **Q. How has your career progressed and changed over time?**

11

12   A. In my current role at Aon, I am responsible for the work output of a team of

13   over 25 catastrophe analysts covering many clients. My job has three distinct

14   areas of responsibility. First, I am responsible to my clients. I work directly with

15   clients on specific projects such as reviewing how their internal coding process

16   impacts model results and making recommendations on refining their data to

17   produce more accurate loss estimates. I help clients identify their profitable

18   business opportunities and build out a plan with regular monitoring to achieve the

19   clients' growth plans. In addition to working directly on client projects, I meet

20   regularly with my team to discuss and review other active client projects to

21   ensure that we are delivering best in class analytics to all our clients.

22   My second responsibility is to my team. I am a mentor and a coach to all

23   members of my team and I take steps every day to align individual performance

1   goals with business and client needs. The number of clients and amount of

2   support we provide to our clients has increased significantly. As clients become

3   more dependent on using model input across their business, there has been a

4   large demand for support and evaluation of model results. We have increased

5   the number of engagements pertaining to model evaluation and validation.

6   My third responsibility is to the business unit. I help to set the strategic priorities

7   of the Catastrophe Analytics team within the context of the overall goals of Aon.

8   In that role, I am responsible for delivering innovative analytics solutions for Aon

9   clients. Two years ago, I lead a team that developed and launched a new,

10   interactive, data and analytics platform: Analytics Dashboards. Analytics

11   Dashboards advance the way that business-critical data is visualized,

12   interpreted, and delivered.

13

14   **Q. Describe the role of Aon Reinsurance Solutions Analytics.**

15

16   A. Aon Reinsurance Solutions Analytics provides consultative services to clients

17   of Aon who sell primary insurance coverage and assists those insurers in the

18   assessment of the risk of catastrophe loss to their portfolio and in the placement

19   of reinsurance treaties to address that risk of catastrophe loss. The main areas of

20   services to Aon clients include: catastrophe modeling; catastrophe insurance rate

21   making assistance; actuarial services (e.g., range of loss and expense

22   estimation, enterprise risk management, reinsurance analysis, capital analysis);

1   rating agency modeling and analysis; insurance and reinsurance accounting; and

2   tax and finance related modeling and assistance.

3

4   **Q. Describe the role of the Catastrophe Risk Analytics group.**

5

6   A. The Catastrophe Risk Analytics group is a part of Aon Reinsurance Solutions

7   Analytics. The role of this group is to provide clients of Aon with analytics

8   involving the management of catastrophe risk and how it relates to their

9   reinsurance purchasing decisions. We provide clients with analyses of their

10 catastrophe risk and develop their understanding around different model views

11 for their portfolio. We help our clients develop a management view of their

12 catastrophe risk against which they can evaluate reinsurance purchasing

13 decisions.

14

15

16 **Q. Describe your experience with catastrophe models.**

17

18 A. Beginning 15 years ago in my role as a catastrophe analyst, I have used

19 multiple models to evaluate catastrophe risk for my clients. My daily work

20 requires me to interpret and transform client data into appropriate "model-ready"

21 files. I determine how to best incorporate the client data into the different

22 models. I have prepared data and run analyses in the models RMS RiskLink,

23 AIR Touchstone, Impact Forecasting Elements, and CoreLogic RQE, and have

1   pulled and analyzed loss output from those models. I have observed and

2   reviewed changes in these models during my tenure at Aon. I use the output of

3   the models (such as PMLs, AALs, Layer Expected Losses, Historical Loss

4   projections) to help clients determine the exposures at risk to a catastrophe at

5   various confidence intervals. Clients compare those loss projections to their

6   internal risk thresholds to determine how much reinsurance they need to protect

7   their earnings and capital. The models are used by reinsurers to evaluate

8   portfolios and determine an appropriate price for risk transfer.

9

10   **Q. Describe your experience with catastrophe reinsurance.**

11

12   A. I work for Aon Reinsurance Solutions, the world's largest reinsurance

13   brokerage. My role as a catastrophe analyst means that I am directly involved

14   with our clients who are seeking to purchase catastrophe reinsurance. Output

15   from our modeling is used by our brokers, clients, and capital markets to

16   determine AAL's and the appropriate amount of reinsurance to purchase and

17   what the appropriate fair market price for that reinsurance should be.

18

19   **Q. Do you speak on topics pertaining to catastrophe modeling?**

20

21   A. Yes. I speak annually at the Aon Reinsurance Solutions Analytics Client

22   conference on various topics related to catastrophe modeling. That conference

1 is routinely attended by primary insurers, reinsurers, regulatory agencies, and

2 modeling firms.

3

4 **Q. What was Aon's role in this filing with respect to expected hurricane**

5 **losses?**

6

7 A. We provided advice to NCRB regarding how to input the exposure data it

8 provided, how to run the AIR and RMS models consistently based on that

9 exposure data, how to assure that the model output is correct and how to blend

10 the results of the two models in the manner utilized in the marketplace by Aon's

11 clients.

12

13 **Q. Did the NCRB asked Aon to run the AIR and RMS models?**

14

15 A. Yes. We ran the models of AIR Touchstone and RMS RiskLink. These are

16 the most commonly relied upon hurricane catastrophe models in the industry and

17 we run these two models on all of our clients' data, regardless of whether either

18 model is used by the client to set rates. Our view is that it is important to

19 understand the two primary views of risk that exist in the industry. These two

20 models are routinely relied upon by reinsurers in pricing catastrophe risk and by

21 primary insurers in determining anticipated hurricane losses. More than half of

22 our clients use two models when evaluating their catastrophe risk and blend

23 those results, as opposed to relying only on one model for management

1   decisions. Of those that utilize two models, the vast majority blend the results

2   evenly, taking a straight average. We have used the same approach here for the

3   NCRB to determine the appropriate modeled hurricane losses to use in the rate

4   filing. Our recommendation is to use a straight average when calculating a blend

5   of the results. This means that we run the individual models and determine the

6   appropriate allocation of reinsurance and loss costs independently for each

7   model. Then we average the two results to determine the blend. The majority of

8   our clients who blend multiple models use this method. One reason is due to the

9   ease of understanding and auditing of results. Models change frequently in

10   different ways, and it is important for people making business decisions based on

11   those models to be able to track those changes at every point. By first

12   determining the losses from RMS and AIR independently, you can gain insight

13   into how each model interprets the risk differently. It is an approach that

14   balances an insurer's access to detailed information from both models and then

15   uses a blended metric to make purchasing decisions and allocate costs.

16

17   **Q. Is it customary to run multiple models to determine catastrophe risk for**

18   **your clients?**

19

20   A. Yes. At Aon Reinsurance Solutions, we believe it is important to understand

21   the various views of catastrophe risk that exist about any particular client's

22   portfolio. In a reinsurance transaction, multiple parties must agree upon a fair

23   estimate of the cost to transfer the risk. Our clients need to understand how the

1   market will be interpreting their catastrophe risk; therefore it is important for them

2   to understand how various models interpret their portfolios.

3

4   **Q. Is it common that modeled losses will differ between the various model**

5   **vendors?**

6

7   A. Yes. There exists a degree of uncertainty in predicting losses from

8   catastrophes. That is a natural consequence of the substantial volatility

9   associated with the occurrence of relatively infrequent and rare events. While all

10   modeling firms start with relatively similar meteorological and insurance data

11   inputs, such as information on past storm characteristics and claims data from

12   insurance companies, there are differences between modelers in their

13   approaches to interpreting and supplementing this data to build a robust model.

14   The process of developing the models brings with it a degree of uncertainty in the

15   results, although there is no inherent upward or downward bias in this degree of

16   uncertainty. Modelers must take the known meteorological data from actual

17   storms and employ standard statistical techniques to distribute that limited data

18   to create a distribution of storms that may happen in the future. This is how

19   models can take similar input and arrive at different results. The spread between

20   two views of the same risk helps companies understand the uncertainty inherent

21   in these models. Through blending of the results of multiple models, clients can

22   better manage their catastrophe risks despite variation between model results.

23   Given the number of variables involved in the development of a catastrophe

1   model and the degree of uncertainty associated with each variable, it would be

2   unexpected and atypical if two independently derived models resulted in the

3   same output or conclusions on a given set of data.

4

5   **Q. How do the models change over time?**

6

7   A. Over time modelers utilize advanced research and loss analyses to enhance

8   their methodology, applying the most recent and relevant scientific understanding

9   to their models. New research into past events, updates to building practices

10   and building codes, insight from engineering experiments, and findings from

11   recent events are among the many different types of information that are used to

12   inform how the modelers make updates to their models. Each modeling firm

13   takes a different approach to how frequently it updates its models and how it

14   prioritizes the schedule by which perils and regions will be updated.

15

16   **Q. Do modeled losses change as updated data is entered into the models?**

17

18   A. Yes. As noted above, the models are reliant on many sources of data. Data

19   on past storms and updated building code data, for example, will be used by

20   modeling firms as inputs into developing their models. For the insurer, changes

21   in coverage and the underlying policies-in-force will change the model output.

22   Also, changes in an insurer's portfolio composition (i.e., where they write new

1   policies and the geographic concentration of their exposures) over time will

2   change the results of the models.

3

4   **Q. How do clients typically account for variation in the model losses between**

5   **different models?**

6

7   A. It has become increasingly common for companies to use two models. As I

8   said, more than half of our clients use two models when evaluating their

9   catastrophe risk, blending those results. Of those that utilize two models, the vast

10 majority blend the results evenly, taking a straight average, as has been done for

11 the NCRB in this filing. The percentage of clients that blend models to build a

12 management view of risk has grown substantially in recent years. In my opinion,

13 this has been driven by large loss experience, most specifically from hurricanes,

14 that demonstrates the degree of uncertainty around any single selection, as well

15 as what I will call model change volatility. The blending of two models produces

16 less volatile and more reliable results over the long term than the use of a single

17 model.

18

19 Clients are also exposed to volatility related to model change. When the models

20 make changes to their underlying assumptions around frequency, hazard, and

21 vulnerability, clients will see their catastrophe loss estimates change. The fact that

22 modeling firms make updates on different schedules, and often interpret and apply

23 new research in different ways, results in a changing risk management

1   environment. Using a blended view will smooth out some of that model change

2   volatility over time.

3

4   **Q. Let's talk further about the work Aon Reinsurance Solutions performed**

5   **for the NCRB for this Dwelling rate filing. Can you describe the client data**

6   **that was employed as input for the model runs?**

7

8   A. The data we employed was provided to us by the NCRB. My understanding is

9   that the data had been compiled on behalf of the NCRB by Insurance Services

10   Office (ISO). The NCRB advised us that the data consisted of the aggregate

11   exposure information for all residential dwelling risks in North Carolina, including

12   those written by the companies and those written by the residual market (which in

13   North Carolina is the NCIUA, or Beach Plan, and the NCJUA, or FAIR Plan). In

14   effect, the NCRB asked us to run the models using the aggregate data as if there

15   were a single company writing all of the residential dwelling insurance in North

16   Carolina.

17

18   **Q. Please describe what Aon Reinsurance Solutions then did with the data**

19   **provided by NCRB.**

20

21   A. As is customary in our work, we reviewed the data received from the NCRB for

22   completeness and reasonableness before we input it into the AIR and RMS

23   models. Since the two models have different formats for inputting data, we worked

1   with the NCRB to assure that the exposure data was properly and consistently

2   entered in the required format for each model. We are accustomed to this

3   procedure because we have to do the same thing for the many individual

4   companies that we represent.

5

6   The next step was to input the data and run the models. We ran the AIR Standard

7   model and the RMS Historical model for the purpose of determining the modeled

8   hurricane losses. We ran the AIR WSST model and the RMS Medium Term Rate

9   model for the purpose of analyzing the cost of reinsurance against our extensive

10   reinsurance market data, which is what we always do in assisting our clients with

11   their reinsurance placements. In my experience, it is standard practice throughout

12   the industry to rely upon the models we used to determine modeled hurricane

13   losses and in reinsurance placements.

14

15   After we ran the models, we reviewed each model's output individually to be sure

16   that the output resulted from a consistent entry of the same exposure data. We

17   again followed the same procedure for assuring data quality that we follow for all

18   our clients. Then we blended the results of the two models, taking a straight

19   average of the results as I described earlier. We again reviewed the blended

20   results to assure that the blending procedures were correctly performed and that

21   the blended results were correct. Once we were satisfied that the results were

22   correct, we provided the blended modeled hurricane losses to the NCRB for use

23   in its dwelling rate review. At the NCRB's request, we also provided the results to

1 Milliman for its use in the work it was doing as part of the NCRB's dwelling rate

2 review. Exhibit RB-7 sets forth the blended modeled hurricane losses resulting

3 from the work I have described. Based on my knowledge and experience and the

4 input data provided by the NCRB, these modeled hurricane losses are reasonable

5 and appropriate projections of expected hurricane losses for use by the NCRB in

6 its dwelling rate review and rate filing.

7

8 Also, we employed the modeled hurricane losses as part of our work determining

9 and allocating the cost of reinsurance. My colleague, Steve Fiete, led our analysis

10 of the net cost of reinsurance, and his testimony is also included in this filing. I

11 assisted with that work and, from my perspective, the procedures that we followed

12 were consistent with our standard business practices in assisting our clients with

13 their reinsurance placements and produced results that are reasonable, sound and

14 reliable.

15

16 **Q. Does that conclude your testimony?**

17

18 A. Yes.

19

20

21

22

23

North Carolina Rate Bureau
2019 Dwelling Insurance Rate Filing
Gross Modeled Hurricane Expected Losses including Cat LAE and Trend

Total	99,073,353

Territory	All Policy Forms
110	21,109,959
120	26,134,190
130	2,205,768
140	19,167,791
150	4,343,926
160	5,246,288
170	173,767
180	2,721,686
190	1,361,979
200	889,799
210	620,784
220	3,025,056
230	1,488,434
240	1,550,494
250	1,104,016
260	373,518
270	1,865,861
280	289,066
290	456,966
300	291,884
310	1,315,461
320	728,808
330	38,400
340	1,490,422
350	421,417
360	528,314
370	23,152
380	56,016
390	50,134

Modeled hurricane expected losses for North Carolina Rate Bureau, net of limits and deductibles. Results include demand surge and exclude storm surge. Losses represent 50/50 blend of AIRv6 100k Standard event set and RMSv18 Historical event set. Results also include provisions for LAE and loss trend.

PRE-FILED DIRECT TESTIMONY OF STEPHEN C. FIETE

2019 DWELLING INSURANCE RATE FILING
by the
NORTH CAROLINA RATE BUREAU

Q. Please state your full name and business address for the record.

A. My name is Stephen Fiete. My business address is 200 East Randolph Street, 11th Floor, Chicago, Illinois 60601.

Q. What is your involvement in this matter?

A. I am currently an employee of the Aon Corporation working in the Catastrophe Management area of Aon Reinsurance Services. Aon has been retained by the North Carolina Rate Bureau (NCRB) to provide expertise and analysis with respect to the expected catastrophe losses and net cost of reinsurance utilized in the NCRB's 2019 Dwelling Insurance rate filing. I manage an analytics group within the Catastrophe Management area which focuses on analysis of catastrophe cost as it relates to ratemaking and underwriting.

Q. You indicated that you are employed by Aon. Who is Aon and what are your primary duties for that employer?

A. Aon is a leading global professional services firm that provides advice and solutions to clients focused on risk, retirement, and health. I work in the Reinsurance Services area which represents insurance carriers in the reinsurance market. My position is Managing Director in the Catastrophe Modeling group. My primary responsibility is to assist insurance company clients of Aon in the areas of managing catastrophe risk. I work with carriers that purchase catastrophe reinsurance and perform analyses to provide insight into how segments of their portfolio contribute to their total catastrophe cost.

Q. Describe the role of the Catastrophe Management area within Aon Reinsurance Services.

A. The Cat Management group provides consultative services to Aon's reinsurance clients. The main areas of services include: catastrophe modeling; catastrophe ratemaking assistance; catastrophe cost allocation; actuarial services; rating agency modeling and analysis; insurance and reinsurance accounting; and tax and finance related modeling and assistance.

Q. Describe the role of the analytics group that you manage.

A. This group performs analysis and provides tools to help Aon's reinsurance clients manage their total cost of catastrophe risk. The total cost of catastrophe risk consists of the following: expected average annual loss from modeled catastrophic perils, net cost of reinsurance, and cost of capital required to support the volatility of retained loss. The group draws on Aon's experience placing catastrophe reinsurance to develop an

understanding of the factors that drive reinsurance cost, which is used to develop a method to allocate portfolio level reinsurance cost to any subset of the portfolio. This method reflects the relationship between modeled loss distributions and market reinsurance prices. The analyses and tools are used in ratemaking, including rate filings, underwriting, and exposure management by carriers.

Q. What is catastrophe reinsurance, who buys it, and why do they buy it?

A. Catastrophe reinsurance is bought by insurance carriers to protect their solvency by transferring risk to other entities. It has some similarities to an individual who buys insurance. For such an individual, there is typically a deductible which means that person would have to pay the cost of a portion of a loss when he or she files a claim, and the insurance company would also pay a portion of the loss up to a specified limit. The deductible is thus analogous to the attachment point in a reinsurance agreement. The key differences between an individual buying insurance and a carrier buying catastrophe reinsurance are:

1. The risk subject to reinsurance is typically a group of locations, where an individual insures loss to just a single property.

2. There is much more complexity and variation in reinsurance agreements.

3. The insurance purchased by an individual is typically provided by a single carrier. Reinsurance coverage is typically provided by a group of reinsurers. The reason for this is that loss from a single reinsurance buyer can be very large. To ensure adequate funding is available, a reinsurance broker finds multiple reinsurers to participate in providing coverage for a single reinsurance buyer.

4. Instead of a deductible for a single property, the reinsurance agreement contains a "retention" for aggregate loss to a portfolio.

5. Reinsurance agreements have annual aggregate limits of loss; most individual property insurance policies do not.

Carriers buy reinsurance so that they will not have their solvency impaired if they experience a year with a large loss or multiple large losses. They also buy reinsurance to reduce income volatility.

Q. Describe your professional and educational background.

A. I have been employed as an actuary since 1992 and have focused on ratemaking for my entire career. From 1992 to 1999, I worked for CNA Insurance and worked in both commercial lines and personal lines pricing. From 2000 to early 2006, I worked in a pricing area of Allstate Insurance. I have performed state rate level indications, workers compensation program pricing, underwriting scorecard development and rating plan development.

I was hired by Aon in 2006 to lead, design, develop, and market underwriting tools based on Aon's catastrophe cost allocation methodologies.

I received a BA in Math from West Virginia University in 1988 and an MS in Math from the University of Illinois at Urbana Champaign in 1991. I am an associate of the Casualty Actuarial Society. I have satisfied the continuing education requirements of and am in good standing with the CAS.

Q. Describe your experience with catastrophe models.

A. I have been using output from catastrophe models since joining Aon in 2006. My initial work was to develop an underwriting tool for carriers which would provide total catastrophe cost allocated to an individual location at the point of sale. I am still responsible for maintaining and enhancing the capabilities of that tool today. I have also designed tools for measuring incremental catastrophe volatility and reinsurance cost impact from changes to a portfolio that are larger than a single policy.

Q. Describe your experience with catastrophe reinsurance.

A. Since joining Aon in 2006, I have been working on projects which involve allocation of average annual loss, ceded average annual loss, allocation of reinsurance premium, and allocation of capital cost for Aon's reinsurance clients. Allocation has been done by geographic area and business division, and all the way to a location level. I have also developed tools for clients to calculate the effect on probable maximum loss (PML), and other volatility metrics, from possible changes to the client portfolio.

I have also collaborated with colleagues at Aon to adjust Aon's reinsurance and capital cost allocation methodology to reflect observed changes in market pricing.

Q. What was your role in this filing with respect to expected catastrophe losses?

A. In collaboration with my colleagues in the Cat Management Group, I provided advice to the NCRB regarding best practices for estimating expected catastrophe losses for ratemaking based on my experience advising primary company clients.

Q. Are catastrophe simulation models commonly used by insurers for ratemaking in catastrophe-exposed lines and jurisdictions?

A. Yes, catastrophe models have become the standard method of estimating catastrophe risk in rate filings. I have personally provided data and analysis for Aon clients to use in their rate filings in multiple states.

Q. What is demand surge?

A. Demand surge is simply a function of the economic law of supply and demand. It represents the increase in the cost of labor, materials and services (lodging, for example) needed to repair damaged property following a significant natural catastrophe event or series of events. This increase has been observed following such very large events and it is a natural result of the increased demand for labor, materials and services in those situations. As a result, the models incorporate it into their loss estimates.

Q. Which applications of catastrophe model output typically reflect demand surge?

A. All applications of catastrophe model output should reflect demand surge. There is no reason to underestimate the impact of large events by ignoring the increase in demand for labor and materials as a result of those events. In our experience, all companies run the models with demand surge. In fact, the only times we have ever run a model without demand surge at Aon are to measure the impact of demand surge for testing purposes and where specifically requested. Here, the Rate Bureau requested that we also run the models without demand surge so that it could provide certain statutory information in the filing.

Q. Does any state prohibit the inclusion of demand surge in modeled losses for rate filings?

A. No. I am not aware of any prohibitions against the use of demand surge in rate filings in any jurisdiction. South Carolina asks for the impact of demand surge in rate filings (SC DOI Bulletin 2014-03), but does not prohibit its inclusion in expected losses. In fact, the Florida Commission on Hurricane Loss Projection Methodology standards actually require that accepted models incorporate demand surge based on relevant data and actuarially sound methods and assumptions.

Q. North Carolina has laws prohibiting "price gouging" following a hurricane. Does that eliminate demand surge?

A. No. Florida has a similar law (Title XXXIII 501.160). Demand surge can and does occur due to supply and demand economics in situations that would not be considered price gouging and/or that would not be prevented by statutes prohibiting price gouging.

Q. Does it make sense for North Carolina hurricane losses to include demand surge for very large events impacting other states even if those events were less significant in North Carolina?

A. The intent of the model is to reflect economic conditions that will influence construction prices and other aspects of insured loss (such as, for example, the increased period of time a carrier must pay for hotel rooms for insureds while their damaged homes are repaired) after a hurricane occurs. The model assumes the economic conditions that would drive up costs in a nearby state due to demand for labor and materials would also affect North Carolina in certain situations. This makes sense because materials and labor can be quickly transferred between states.

Q. How was the reinsurance program structure for this rate filing designed?

A. The Aon Reinsurance Cat Management Team reviewed the actual catastrophe reinsurance programs issued in 2018 for two cohorts of its client companies. One cohort consists of carriers writing property insurance predominantly in the Southeast, including North Carolina. Companies whose peak exposure is in Florida are not included, as those costs would be higher than reasonably expected in the other Southeastern states. The other cohort is labeled "nationwide" which consists of carriers which write in multiple regions. The two cohorts are mutually exclusive.

Catastrophe reinsurance programs were analyzed using stochastic catastrophe models published by AIR and RMS. These models are commonly used for the placement of reinsurance.

For each cat model and each cohort of carriers, the median return periods of attachment and exhaustion points were calculated. The results of this process are 4 indications of attachment return periods and 4 indications of exhaustion return periods. Selected attachment and exhaustion return periods are the mean of the 4 indications. The dollar attachment and limit is determined from PML (probable maximum loss) curves of the Dwelling portfolio.

The reinsurance layers between the attachment and exhaustion points were chosen by analyzing the change in standard deviation relative to the limit. The ratio of standard deviation to limit tends to drop as the layer level increases. Breakpoints were selected based on the rate at which that ratio drops as the layer increases. Consideration was also given to the return periods of the breakpoints used in the prior dwelling insurance rate filing. This reinsurance structure, as recommended by Aon and approved by the Rate Bureau, is shown in Exhibit RB-9 accompanying this testimony.

Q. Do you believe the reinsurance structure selected by the Rate Bureau is reasonable?

A. Yes. The structure is consistent with how carriers have recently been purchasing catastrophe reinsurance.

Q. How was the reinsurance premium estimated?

A. Aon's approach relies on a proprietary trend line analysis which fits rate-on-line based on the relationship between loss-on-line and rate-on-line for treaties effective in 2018 for the cohorts referenced above. There are separate trend line analyses for AIR and RMS.

For each layer in the program structure, and for the AIR and RMS models, an indicated price was calculated using the trend line analysis. The selected price for each layer is the mean of the indicated prices from each of the two catastrophe model trend line analyses.

In the prior filing, the loss-on-line method discussed above was blended with Aon's technical pricing model, which reflected ceded margin differences across the reinsurance marketplace due to peak industry ceded loss. As Aon's reinsurance pricing model has been updated over time, Aon determined that the trend line model generated an equally good or better statistical fit as the technical pricing model, and the trend line model is now used exclusively.

Exhibit RB-10 shows a summary of the reinsurance structure and the rates-on-line that result from our loss-on-line analysis, along with a summary of the resulting components of the reinsurance program.

Q. You have indicated that the program structure and pricing were determined separately using output from AIR and RMS models and then averaged to get a

blended result. If two different results were produced, is it appropriate to select the average for indicated costs?

A. Yes. The practice of calculating prospective indicated costs often utilizes different methods which reflect different model assumptions. Examples include loss trend and loss development. The real-world process which leads to trend and development is complex, as it involves decisions made by many individuals. Actuaries rely on calculation methods applied to aggregated data to model provisions for loss reserves or inflationary effects on loss costs. Since any one method simplifies the real-world process, it is common to look at the results of more than one method. Multiple methods typically provide a range of results. Unless there is a good reason to do otherwise, I have always made selections in the middle of the range of results. In the case of provisions for catastrophe costs, the two models used here provide two sets of results and using the average of those results is reasonable and appropriate. In fact, blending two catastrophe model results to inform catastrophe reinsurance decisions has become common for Aon clients.

Q. How was the reinsurance premium allocated?

A. For each territory, the average annual loss & loss adjustment expense (LAE) contributed to the portfolio ceded loss & LAE is calculated for each layer of the reinsurance program. The portfolio premium for each layer is allocated in proportion to the average annual ceded loss & LAE for each territory. Allocation is done separately for each model and the results are averaged to obtain the final allocation. Exhibit RB-12 shows the proportion of hurricane peril reinsurance premium, ceded average annual

loss, and reinsurance margin (a.k.a. "net cost of reinsurance") allocated to each territory for each layer. Exhibit RB-13 shows the dollar amount of reinsurance margin allocated by territory.

Last year, we also used our technical pricing model in allocating the reinsurance premium. However, as with estimating the reinsurance premium, we did not use our technical pricing model this year when allocating the reinsurance premium.

Q. Why was the technical pricing model not utilized this year?

A. Technical pricing is designed to measure differences in reinsurance market prices based on capacity constraints of the reinsurance industry. Several years ago, Aon observed that the ratio of reinsurance premium to expected ceded loss was higher in the Gulf and South Atlantic regions than it was further north or in the Midwest. To capture the driving cause of this difference, technical pricing was developed which incorporated contribution to industry volatility. At that time, technical pricing was an improvement over allocation based solely on ceded loss and the method became standard practice at Aon for allocation work. Over the past 3 to 5 years, reinsurance rates on line have dropped, and the increased accuracy of using the more complicated technical pricing model with the ceded loss method dwindled. Aon has now made it standard practice to rely solely on the ceded loss method because the market has changed and the technical pricing model no longer provides improved accuracy.

Q. How was the net cost of reinsurance calculated?

A. The net cost of reinsurance can be thought of simply as the reinsurance premium paid by the insurance company less expected ceded losses recoverable by the insurance company from the reinsurer. However, there are two adjustments that need to be made.

The first adjustment stems from the standard practice of charging a "reinstatement premium" in the event of a ceded loss in a reinsurance treaty. If there is a big enough loss to trigger a payment from reinsurers, then the cedant must pay a "reinstatement premium" proportional to the size of the ceded loss in order for the full coverage of the reinsurance treaty to continue for the remainder of the reinsurance term. The reinstatement premium contributes to the net cost of reinsurance.

Second, reinsurance treaties typically cover loss adjustment expenses (LAE) that can be allocated to a catastrophe event. Assuming a 6% ratio of "catastrophe LAE" to catastrophe loss, we adjust all modeled loss events by a factor of 1.06. The factor of 1.06 was selected based on a review of LAE factors applied to catastrophe losses in AM Best SRQ submissions of Aon clients as shown in Exhibit RB-11.

For each of the cat models (which simulate thousands of years of events), Aon uses monte-carlo simulation to estimate the average annual ceded loss and reinstatement premium for each layer of the reinsurance program. The net cost of reinsurance is deposit premium plus expected reinstatement premium less expected ceded losses and catastrophe LAE recoverable.

For the NCRB Dwelling filing, the analysis shows that expected premiums are $174,028,336, expected recoverables are $62,222,121, and the net cost of reinsurance is $111,806,215, as shown on Exhibit RB-13 and the summary on Exhibit RB-10. Allocation by territory is done using the method described above.

Q. Given your experience in catastrophe reinsurance, do you find this approach to be reasonable?

A. Yes. Our approach is based on detailed information on current reinsurance market rates and underlying model output.

Q. Do you know whether the Rate Bureau has used in its 2019 Dwelling filing the Aon net cost of reinsurance results you provided?

A. Yes, I am advised that the Rate Bureau has used in the filing both our statewide net cost of reinsurance results and those results allocated to the territory level.

Q. Are you aware of the provisions in the North Carolina statutes, in N.C.G.S. 58-36-10(7), that state:

> **Property insurance rates established under this Article may include a provision to reflect the cost of reinsurance to protect against catastrophic exposure within this State. Amounts to be paid to reinsurers, ceding commissions paid or to be paid to insurers by reinsurers, expected reinsurance recoveries, North Carolina exposure to catastrophic events relative to other states' exposure, and any other relevant information may be considered when determining the provision to reflect the cost of reinsurance.**

A. Yes, I am.

Q. Do you have an opinion whether the analysis you and Aon have performed on behalf of the Rate Bureau on the net cost of reinsurance for this filing has taken into consideration the provisions of that statute?

A. Yes. Based on my experience with hurricane models and using modeled hurricane losses and my experience with catastrophe reinsurance and determining catastrophe reinsurance costs for rate filings, it is my opinion that the analysis we have performed on the net cost of reinsurance for this filing properly considers all of the items set out in that statute. Further, it is my opinion based on my experience in the actual marketplace that a reasonable and appropriate provision for the net cost of reinsurance must be incorporated into Dwelling insurance rates in North Carolina in order for those rates to properly reflect and protect against the catastrophe exposure in this state.

Q. Do you have an opinion regarding the appropriateness of the net cost of reinsurance provision incorporated into this Dwelling filing?

A. Yes. Based on my experience with hurricane models and using modeled hurricane losses and my experience with catastrophe reinsurance and determining catastrophe reinsurance costs for rate filings, it is my opinion that the provision for the net cost of reinsurance in the filing, at the statewide and territory levels, is reasonable and appropriate.

Q. Does that conclude your testimony?

A. Yes.

North Carolina Rate Bureau
2019 Dwelling Insurance Rate Filing
Support for Selected Reinsurance Structure

Attachment Points	All Perils Dwelling 50/50 Blend				CY17 Dwelling		
					ROL	LOL	MSD
	1,000	4,891					
	500	3,861	Over the Top				
	250	2,925					
180	200	2,624		2.50B			
118	100	1,816	$500M xs $2,000M	2.00B	3.0%	0.8%	27.1%
56	50	1,211	$700M xs $1,300M	1.30B	4.3%	1.3%	28.4%
28	25	728	$500M xs $800M	0.80B	6.6%	2.6%	28.1%
	20	600	$340M xs $460M				
15	15	455		0.46B	10.1%	4.9%	27.5%
6	10	288	$320M xs $140M	0.14B	17.2%	10.7%	27.4%
	5	99					
	Avg Annual	152	Retention				
	Std Dev	431					

in $Millions

The table above shows the trended PML curve with Catastrophe LAE for the North Carolina Rate Bureau portfolio, along with the selected reinsurance program.

North Carolina Rate Bureau
2019 Dwelling Insurance Rate Filing
Reinsurance Program Summary

Reinsurance Layer	Rate-On-Line	Deposit Premium	Expected Reinstatement Premium	Expected Total Premium	Expected Ceded Loss	Net Cost of Reinsurance
$500M xs $2,000M	2.97%	14,850,000	87,673	14,937,673	2,979,877	11,957,796
$700M xs $1,300M	4.28%	29,960,000	308,772	30,268,772	7,294,314	22,974,458
$500M xs $800M	6.62%	33,100,000	665,386	33,765,386	10,237,937	23,527,449
$340M xs $460M	10.06%	34,204,000	1,299,129	35,503,129	13,309,871	22,193,257
$320M xs $140M	17.17%	54,944,000	4,609,376	59,553,376	28,400,121	31,153,255
Total		167,058,000	6,970,336	174,028,336	62,222,121	111,806,215

Amounts are in dollars

The table above shows indicated rates-on-line for the filing's reinsurance structure along with analysis of modeled catastrophe losses. Rate-on-Line values have been selected using the current Loss-On-Line approach, which is a benchmarking analysis done using reinsurance treaties placed by Aon.

Deposit Premium is Rate-On-Line * Layer Limit

Expected Ceded Loss and Expected Reinstatement premium are the average annual amounts of each based on a simulation of catastrophe losses subject to the reinsurance program.

Expected Total Premium = Deposit Premium + Expected Reinstatement Premium

Net Cost of Reinsurance = Expected Total Premium – Expected Ceded Loss

North Carolina Rate Bureau
2019 Dwelling Insurance Rate Filing
Support for Selected Catastrophe LAE Factor
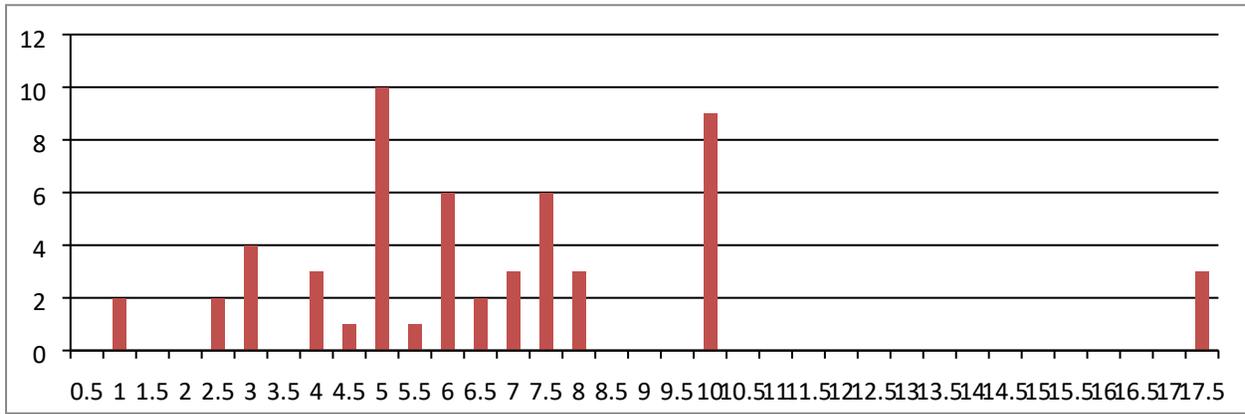
This chart shows Catastrophe LAE factors applied to modeled catastrophe event losses in AM Best SRQ Submissions by Aon clients in 2016.

- Factors were rounded to the nearest 0.5
- A weighted average was used where factors varied by peril
- Multiple factors were counted where factors varied by company within a group
- Reflects all clients that included a provision for LAE

The mean factor is 6.8, the median is 6.0, and the mode is 5.0.

North Carolina Rate Bureau
Reinsurance Cost Allocation
CY 2017
Dwelling
AIR v6.0 / RMS v18.0

Peril	Territory	Layer 1 320M xs 140M Premium 100.0% [1]	Ceded AAL 100.0% [2]	Reins Margin 100.0% [3]
FF		0.0%	0.0%	0.0%
HU	110	21.5%	21.3%	21.6%
HU	120	24.8%	24.7%	24.9%
HU	130	2.3%	2.3%	2.4%
HU	140	18.3%	18.4%	18.2%
HU	150	4.6%	4.5%	4.7%
HU	160	5.1%	5.0%	5.2%
HU	170	0.2%	0.2%	0.2%
HU	180	2.9%	2.8%	3.0%
HU	190	1.4%	1.3%	1.4%
HU	200	0.9%	0.9%	0.9%
HU	210	0.7%	0.6%	0.7%
HU	220	2.9%	2.8%	3.0%
HU	230	1.4%	1.4%	1.5%
HU	240	1.6%	1.5%	1.6%
HU	250	1.1%	1.0%	1.1%
HU	260	0.4%	0.4%	0.4%
HU	270	1.9%	1.8%	1.9%
HU	280	0.3%	0.3%	0.3%
HU	290	0.4%	0.4%	0.5%
HU	300	0.3%	0.3%	0.3%
HU	310	1.3%	1.2%	1.3%
HU	320	0.7%	0.7%	0.7%
HU	330	0.0%	0.0%	0.0%
HU	340	1.4%	1.4%	1.5%
HU	350	0.4%	0.4%	0.4%
HU	360	0.4%	0.4%	0.5%
HU	370	0.0%	0.0%	0.0%
HU	380	0.0%	0.0%	0.0%
HU	390	0.0%	0.0%	0.0%
OW		2.2%	3.2%	1.2%
WT		0.6%	0.6%	0.6%

North Carolina Rate Bureau
Reinsurance Cost Allocation
CY 2017
Dwelling
AIR v6.0 / RMS v18.0

		Layer 2 340M xs 460M		
		100.0%	100.0%	100.0%
		Premium	Ceded AAL	Reins Margin
Peril	Territory	[1]	[2]	[3]
FF		0.0%	0.0%	0.0%
HU	110	18.6%	18.3%	18.7%
HU	120	26.6%	27.0%	26.4%
HU	130	2.1%	2.1%	2.2%
HU	140	19.5%	20.0%	19.1%
HU	150	4.6%	4.5%	4.6%
HU	160	5.7%	5.7%	5.8%
HU	170	0.2%	0.2%	0.2%
HU	180	3.1%	3.0%	3.1%
HU	190	1.5%	1.5%	1.6%
HU	200	1.0%	0.9%	1.0%
HU	210	0.7%	0.7%	0.7%
HU	220	3.4%	3.2%	3.5%
HU	230	1.6%	1.6%	1.6%
HU	240	1.7%	1.7%	1.8%
HU	250	1.2%	1.2%	1.2%
HU	260	0.4%	0.4%	0.4%
HU	270	2.1%	2.0%	2.2%
HU	280	0.3%	0.3%	0.3%
HU	290	0.5%	0.5%	0.5%
HU	300	0.3%	0.3%	0.3%
HU	310	1.4%	1.4%	1.4%
HU	320	0.7%	0.7%	0.7%
HU	330	0.0%	0.0%	0.0%
HU	340	1.3%	1.3%	1.4%
HU	350	0.3%	0.3%	0.3%
HU	360	0.4%	0.4%	0.4%
HU	370	0.0%	0.0%	0.0%
HU	380	0.0%	0.0%	0.0%
HU	390	0.0%	0.0%	0.0%
OW		0.4%	0.7%	0.2%
WT		0.2%	0.1%	0.2%

North Carolina Rate Bureau
Reinsurance Cost Allocation
CY 2017
Dwelling
AIR v6.0 / RMS v18.0

Peril	Territory	Layer 3 500M xs 800M 100.0% Premium [1]	Layer 3 500M xs 800M 100.0% Ceded AAL [2]	Layer 3 500M xs 800M 100.0% Reins Margin [3]
FF		0.0%	0.0%	0.0%
HU	110	16.3%	15.4%	16.7%
HU	120	28.1%	28.9%	27.7%
HU	130	1.9%	1.8%	2.0%
HU	140	20.2%	21.1%	19.8%
HU	150	4.3%	4.3%	4.4%
HU	160	6.1%	6.1%	6.1%
HU	170	0.2%	0.2%	0.2%
HU	180	3.1%	3.0%	3.1%
HU	190	1.6%	1.6%	1.6%
HU	200	1.0%	1.0%	1.0%
HU	210	0.7%	0.7%	0.7%
HU	220	3.6%	3.4%	3.7%
HU	230	1.7%	1.7%	1.7%
HU	240	1.8%	1.7%	1.8%
HU	250	1.3%	1.2%	1.3%
HU	260	0.4%	0.4%	0.4%
HU	270	2.2%	2.1%	2.2%
HU	280	0.3%	0.3%	0.3%
HU	290	0.5%	0.5%	0.5%
HU	300	0.3%	0.3%	0.3%
HU	310	1.4%	1.4%	1.5%
HU	320	0.7%	0.7%	0.7%
HU	330	0.0%	0.0%	0.0%
HU	340	1.3%	1.2%	1.3%
HU	350	0.3%	0.3%	0.3%
HU	360	0.3%	0.3%	0.3%
HU	370	0.0%	0.0%	0.0%
HU	380	0.0%	0.0%	0.0%
HU	390	0.0%	0.0%	0.0%
OW		0.1%	0.2%	0.1%
WT		0.1%	0.1%	0.1%

North Carolina Rate Bureau
Reinsurance Cost Allocation
CY 2017
Dwelling
AIR v6.0 / RMS v18.0

		Layer 4 700M xs 1.3B		
		100.0%	100.0%	100.0%
		Premium	Ceded AAL	Reins Margin
Peril	Territory	[1]	[2]	[3]
FF		0.0%	0.0%	0.0%
HU	110	14.2%	12.4%	14.8%
HU	120	29.4%	30.5%	29.0%
HU	130	1.7%	1.6%	1.8%
HU	140	20.9%	22.0%	20.6%
HU	150	4.1%	4.0%	4.2%
HU	160	6.5%	6.5%	6.5%
HU	170	0.2%	0.1%	0.2%
HU	180	3.0%	3.0%	3.0%
HU	190	1.7%	1.6%	1.7%
HU	200	1.0%	1.1%	1.0%
HU	210	0.7%	0.7%	0.7%
HU	220	3.8%	3.7%	3.8%
HU	230	1.7%	1.8%	1.7%
HU	240	1.8%	1.8%	1.8%
HU	250	1.3%	1.3%	1.3%
HU	260	0.4%	0.4%	0.4%
HU	270	2.3%	2.3%	2.3%
HU	280	0.3%	0.4%	0.3%
HU	290	0.5%	0.5%	0.5%
HU	300	0.3%	0.3%	0.3%
HU	310	1.5%	1.5%	1.5%
HU	320	0.7%	0.7%	0.7%
HU	330	0.0%	0.0%	0.0%
HU	340	1.2%	1.2%	1.2%
HU	350	0.3%	0.3%	0.3%
HU	360	0.3%	0.3%	0.3%
HU	370	0.0%	0.0%	0.0%
HU	380	0.0%	0.0%	0.0%
HU	390	0.0%	0.0%	0.0%
OW		0.0%	0.0%	0.0%
WT		0.0%	0.0%	0.0%

North Carolina Rate Bureau
Reinsurance Cost Allocation
CY 2017
Dwelling
AIR v6.0 / RMS v18.0

		Layer 5 500M xs 2B		
		100.0%	**100.0%**	**100.0%**
		Premium	Ceded AAL	Reins Margin
Peril	Territory	[1]	[2]	[3]
FF		0.0%	0.0%	0.0%
HU	110	13.3%	10.2%	14.1%
HU	120	30.0%	31.4%	29.6%
HU	130	1.7%	1.4%	1.8%
HU	140	21.4%	22.7%	21.1%
HU	150	3.9%	3.7%	4.0%
HU	160	6.7%	6.8%	6.6%
HU	170	0.1%	0.1%	0.1%
HU	180	2.9%	2.9%	2.9%
HU	190	1.7%	1.7%	1.7%
HU	200	1.0%	1.1%	1.0%
HU	210	0.7%	0.7%	0.7%
HU	220	3.8%	4.0%	3.8%
HU	230	1.7%	1.8%	1.7%
HU	240	1.7%	1.8%	1.7%
HU	250	1.3%	1.4%	1.3%
HU	260	0.4%	0.4%	0.4%
HU	270	2.3%	2.4%	2.3%
HU	280	0.4%	0.4%	0.3%
HU	290	0.6%	0.6%	0.5%
HU	300	0.3%	0.3%	0.3%
HU	310	1.5%	1.6%	1.5%
HU	320	0.8%	0.8%	0.7%
HU	330	0.0%	0.0%	0.0%
HU	340	1.2%	1.2%	1.2%
HU	350	0.2%	0.3%	0.2%
HU	360	0.3%	0.3%	0.3%
HU	370	0.0%	0.0%	0.0%
HU	380	0.0%	0.0%	0.0%
HU	390	0.0%	0.0%	0.0%
OW		0.0%	0.0%	0.0%
WT		0.0%	0.0%	0.0%

North Carolina Rate Bureau
Reinsurance Cost Allocation
CY 2017
Dwelling
AIR v6.0 / RMS v18.0

Reinsurance Margin

Total	111,806,215

Territory	All Policy Forms
110	19,948,528
120	30,362,249
130	2,310,103
140	21,819,792
150	4,971,478
160	6,657,229
170	189,160
180	3,407,574
190	1,758,863
200	1,104,969
210	782,445
220	3,970,242
230	1,816,508
240	1,939,525
250	1,405,268
260	455,374
270	2,447,481
280	371,044
290	582,778
300	335,769
310	1,675,113
320	865,269
330	44,924
340	1,623,243
350	405,382
360	484,004
370	20,441
380	31,617
390	19,842

**PREFILED TESTIMONY
OF
PAUL D. ANDERSON**

**DWELLING INSURANCE
2019 RATE FILING BY THE
NORTH CAROLINA RATE BUREAU**

Q.   Please state your name and business address.

A.   My name is Paul D. Anderson. My business address is 15800 West Bluemound Road, Brookfield, WI 53005.

Q.   By whom are you employed?

A.   I am employed by Milliman, Inc. (Milliman) and have been employed by Milliman since February 1, 2007.

Q.   What is your educational background?

A.   I received a Bachelor of Science in Actuarial Science from Drake University in Des Moines, Iowa in 1993.

Q.   Do you have any additional certifications or qualifications?

A.   Yes. I have been a Fellow of the Casualty Actuarial Society (CAS) since 2002 and a Certified Specialist in Predictive Analytics of the CAS Institute (iCAS) since 2018. Since 2002, I have participated on several committees of the organization. I was on the Examination Committee of the Casualty Actuarial Society between 2004 and 2006. I served on the Volunteer Support Task Force from February 2012 until April 2013 and as a member of the Vehicle Technology and Impact on Loss Trends Planning Committee from October 2017 through July 2018. I have been a member of the Volunteer Resources Committee since April 2013. I have also been a member of the American Academy of Actuaries since 2002, and meet all of the continuing education requirements of that organization as well as those of the Casualty Actuarial Society.

Q.   What is your employment background?

A.   I was employed by Allstate Insurance Company from June 1993 until January 2007. While at Allstate, I held various actuarial roles. I began my career as an Auto Pricing Analyst and over time, I assumed increasing responsibility in various departments that included Property Pricing, Auto Pricing, Property Research, and Auto Research. On the pricing teams, I assisted in developing rates for property and auto insurance products in most states across the country. On the research

teams, I assisted in developing new property and auto risk classification plans to be implemented by Allstate's pricing teams. From 2006 until January 2007, I served as a Senior Manager for Allstate's Eastern region, which included assisting in the oversight of the pricing strategies for approximately half the country, including North Carolina.

In February 2007 I began my career at Milliman. Since 2007 I have completed, managed, or overseen numerous property and auto pricing analyses for a variety of clients. My clients have included small single-state insurance companies, industry-leading national insurance companies, start-up InsurTech insurance companies, government entities, the North Carolina Rate Bureau, and other entities with similar coastal property exposure in states such as Florida, Hawaii, and Texas. These client assignments have included such projects as pricing analyses to evaluate overall rate adequacy, predictive modeling assignments to develop new risk classification plans, and analyses of catastrophe losses to evaluate the adequacy and allocation of property premiums corresponding to catastrophe risk.

Q.   What is Milliman?

A.   Milliman is among the world's largest independent actuarial and consulting firms. Milliman was founded in Seattle in 1947 as Milliman & Robertson and today has offices in principal cities worldwide, covering markets in North America, Latin America, Europe, Asia and the Pacific, the Middle East, and Africa. Milliman employs more than 3,400 people, including actuaries and specialists ranging from clinicians to economists. The firm has consulting practices in employee benefits, financial services, healthcare, life insurance, and property and casualty insurance. Milliman serves the full spectrum of business, education, financial, governmental, union, and nonprofit organizations.

Q.   What are your current responsibilities at Milliman?

A.   I am responsible for managing and overseeing the personal lines and insurance-related predictive analytics portion of Milliman's Milwaukee Casualty practice. The personal lines and predictive analytics team conducts a variety of property and auto pricing, product development, and predictive modeling assignments, primarily for insurance companies. Over the last five years, we have completed property analyses for nearly every state in the country, including North Carolina.

Q.   Were you engaged to provide actuarial services to the North Carolina Rate Bureau (the Rate Bureau) in relation to its 2019 dwelling rate filing?

A.   Yes, I was.

Q.   What was the scope of that engagement?

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A. Milliman was engaged for several aspects of the 2019 dwelling rate filing. My role was to review the compensation for assessment risk provision and the contingency provision in this filing. I was also engaged to conduct an independent review and provide feedback on the actuarial analyses underlying the filing. In this role, I participated in many of the discussions in which ISO presented preliminary data and analyses to the Rate Bureau. In addition, my role also included participating in the Rate Bureau's Property Rating Subcommittee meetings in which the 2019 dwelling filing was discussed. During these discussions, I offered feedback and insights to assist in the subcommittee's selections and decisions related to this filing.

Q. **Is your firm being compensated for this engagement?**

A. Yes, it is.

Q. **Is that compensation in any way contingent on the provision of favorable testimony in support of the proposed filing?**

A. No, it is not.

Q. **Have you completed your review of the 2019 dwelling rate filing?**

A. Yes, I have.

Q. **Were there any constraints placed on your review, such as limited or delayed access to data or limited time that may have hindered your complete review?**

A. No, I was provided all the data and information that were necessary, and I had adequate time for a complete review. My review was not limited in any way.

Q. **What is the overall indicated change in dwelling rates in this filing?**

A. This filing shows the need for an overall 48.3% statewide average rate increase. This includes a 13.0% change to fire rates and a 60.6% change to extended coverage rates.

Q. **Please describe the overall ratemaking methodology that underlies the filing.**

A. The approach in this filing is generally consistent with prior dwelling filings submitted by the Rate Bureau. Consistent with the *Statement of Principles Regarding Property and Casualty Insurance Ratemaking* as published by the Casualty Actuarial Society, the indicated rates reflect the expected costs associated with insuring residential real property on dwelling policies. These expected costs include claims, claim settlement expenses, operational and administrative expenses, and the cost of capital.

The statewide rate-level indications for dwelling insurance are developed based on a loss cost methodology (instead of a loss ratio methodology). The indicated rate-level change is calculated for each segment by comparing the required base rate per policy to the current base rate. The required base rate per policy is calculated by first projecting the losses and loss adjustment expenses for the policy period for which the filed rates are expected to be in effect. For extended coverage, losses are projected excluding historical hurricane losses. In addition to the exclusion of hurricane losses, the projected losses for extended coverage are adjusted to remove excess wind losses, and an excess factor is applied based on an average of the excess wind losses over more than 55 years of historical experience. Base class loss costs are calculated by dividing the adjusted incurred losses and loss adjustment expenses for each historical accident year by the corresponding earned house years and average rating factors. The base class loss costs by year are weighted together to develop a weighted trended base class loss cost. For the extended coverage portion of the filing, a modeled base class loss cost is also developed and added to the weighted trended base class loss cost to determine the total base class loss cost.

Following the development of the base class loss cost, a per-policy fixed expense provision and other expected underwriting expenses associated with issuing dwelling insurance policies are incorporated to determine the required base rate per policy. These expected underwriting expenses include provisions for underwriting profit, contingencies, policyholder dividends, compensation for assessment risk, the net cost of reinsurance, and deviations. As mentioned above, the required base rate per policy is compared to the current average base rate to develop the overall statewide indicated rate-level change. This comparison of the required and current base rates is consistent with the *Statement of Principles* referenced above, is commonly used throughout the industry, and as such, is an actuarially sound method of developing an indicated rate-level change.

Q.   Are there any changes in the ratemaking methodology compared to prior filings?

A.   This filing is very similar to the 2018 dwelling filing, and the ratemaking methodology used in this filing is consistent with the methodology used in the previous dwelling filing. However, there are two minor changes in ratemaking methodology included in this filing, neither of which had a significant impact on the overall indicated rate change. The first change in methodology is that the net cost of reinsurance was determined by Aon using its loss-on-line method. In the previous filing, Aon determined the net cost of reinsurance using the blended results of its loss-on-line and technical pricing models. The second change in ratemaking methodology is that provisions for policyholder dividends were determined separately for dwelling fire and dwelling extended coverage. In the previous filing, a provision for policyholder dividends was determined on a combined basis.

Q.   How are the expected losses determined?

A.   This filing uses the latest available five years of historical loss experience, which is accident years ending December 31, 2013 through December 31, 2017, to determine expected losses other than hurricane losses. Using five years of experience is consistent with North Carolina statutes and prior dwelling fire and extended coverage rate filings. It is also consistent with generally accepted ratemaking practices because the use of five years of historical experience balances stability of the overall rate level with responsiveness to the most recent conditions. Because severe weather-related events can cause volatility in the loss experience, hurricane losses and excess wind losses (for extended coverage only) have been removed from the base loss experience. Each of the five years of losses have been developed to ultimate amounts and have been adjusted to a common $500 deductible level. Losses are developed to ultimate because the final incurred losses for an accident year are often different than initial loss estimates due to late-reporting claims or as yet unknown settlement amounts on known claims.

After these initial adjustments, a provision for excess wind losses is applied to each accident year for extended coverage, and a provision for loss adjustment expenses is applied to each accident year for all dwelling forms. The excess loss factor of 1.055 for the extended coverage section of the filing is determined using ISO's standard excess wind procedure. This procedure evaluates historical non-hurricane wind experience back to 1950 to develop a ratio of the long-term average excess loss ratio to the long-term average normal loss ratio.

Following these additional adjustments, in order to reflect the expected change in costs, the losses are trended from the midpoint of each experience period to the midpoint of the trend period. Similar to prior dwelling filings, external trend information is considered to select the loss trends. In reviewing external trends, the Corelogic Residential Index and the Modified Consumer Price Index are averaged together using an appropriate weight on each to develop the current cost index. The current cost index for each year is compared to the current cost index for the trend period to determine current cost factors for each accident year.

In addition to reflecting a loss trend, a premium trend is also determined by calculating current amount factors for each accident year. The current amount factors are developed by comparing the average policy size relativity for each year to the comparable relativity for the trend period. The ratio of the current cost factor and the current amount factor is calculated for each year in order to apply a net trend (i.e., the net difference between the loss trend and premium trend) to each year's adjusted incurred losses.

In my opinion, all of the selections referenced above, including the excess loss factor, the loss adjustment expense factors, the loss trend factors, and the premium trend factors, are reasonable and actuarially sound.

After adjusting the losses for each of the items mentioned above, each year's trended losses and loss adjustment expenses are divided by the earned house years to determine the average trended loss cost. The average trended loss costs are multiplied by a composite projection factor, which reflects the combined impact of a loss projection factor and premium projection factor. This composite projection factor adjusts the loss costs to the policy period for which the filed rates are expected to be in effect. Those loss costs are converted to trended base class loss costs by dividing by the average rating factor applicable to each accident year. Finally, these base loss costs are weighted together to develop a weighted trended base loss cost. The weights applied to each accident year differ between fire and extended coverage because there tends to be more variation in the extended coverage loss costs as compared to the fire loss costs. As a result, to avoid giving too much weight to an unusually high or low loss cost, an even distribution of weights is applied to the historical experience for extended coverage. In contrast to this, a distribution that assigns more weight to the more recent years is used for fire, since that segment typically has more stable base loss costs.

In my opinion, the methodology used to develop average loss costs and the weights assigned to each of the dwelling policy forms are reasonable and are consistent with widely-used actuarial ratemaking practices.

Q. **In the previous response, you mentioned a loss adjustment expense provision. How are the dwelling provisions for loss adjustment expense determined?**

A. The allocated and unallocated loss adjustment expenses are included with non-hurricane losses by applying a trended loss adjustment expense factor. Using information received from the Rate Bureau's data call for expense experience, loss adjustment expenses are summarized for calendar years 2013 through 2017. Consistent with the prior dwelling filing, a three-year average is calculated after removing the highest and lowest ratio of expenses to losses. By excluding the highest and lowest ratios observed in the historical experience period, this methodology reduces the volatility in the average loss adjustment expense ratio that may result from variation in the underlying incurred losses from year to year. After the average loss adjustment expense ratio is calculated, it is adjusted to reflect the difference in the loss adjustment expense trend and the loss trend.

A separate provision for hurricane-related loss adjustment expenses is included in the modeled hurricane losses based on data and a recommendation provided by Aon.

Q. **In your opinion, are the provisions for loss adjustment expenses reasonable?**

A.   Yes, the loss adjustment expense provisions are reasonable.   It is common practice in the industry to use an average of historical experience to determine a loss adjustment expense provision, and it is reasonable to adjust that provision for expected differences in the loss adjustment expense trend and the loss trend.

Q.   Is credibility considered in the rate-level indication?

A.   Yes, credibility is considered. At the statewide level, based on the volume of data supporting the statewide rate-level indications, both fire and extended coverage are considered fully credible. The full credibility standards are 500,000 house years for fire and 330,000 house years for extended coverage. When the territorial rate-level indications are calculated, partial credibility is determined using the square root rule, which is a long-standing actuarial methodology used throughout the industry.

Q.   How is hurricane exposure reflected in each policy form's rate-level indication?

A.   Similar to the Rate Bureau's prior dwelling filings, this filing reflects hurricane exposure in the extended coverage section of the rate-level indication by using modeled hurricane losses rather than actual hurricane loss experience. Although there are actual hurricane losses in the experience period, the hurricane and excess wind losses have been removed from the base loss experience, as noted in my comments above. Actual hurricane losses have a significant amount of variability even when evaluating twenty or more years of historical loss experience in a state. As such, it is widely accepted by the property and casualty insurance industry that hurricane models provide the most reliable basis of determining anticipated average annual hurricane losses over an extended time period. Hurricane models can be used to simulate 100,000 or more years of events, which provides a broader perspective on potential insured losses as compared to only evaluating the last several decades of losses. This broader perspective provides a more reliable estimate of the average frequency of insured hurricane losses. Similarly, it provides a more reliable estimate of the frequency (and severity) of very rare, but very severe events that may not have occurred within the last 100 years of recorded history, but have the potential to occur during a 100,000 year window of time.

Q.   How is the provision for expected hurricane losses different from that in dwelling rate filings prior to 2016?

A.   The provision for average annual hurricane losses in this filing is consistent with the prior dwelling filing in that expected hurricane losses are developed through the use of hurricane models of two independent catastrophe modelers. It is my understanding that, prior to the 2016 dwelling filing (which was withdrawn), all prior Rate Bureau dwelling filings containing a provision for modeled hurricane losses included estimated hurricane losses that were developed by AIR Worldwide (or its

predecessor). With this filing (and previously in the 2018 dwelling filing), in addition to relying on AIR's hurricane model, the Rate Bureau also relied upon hurricane losses derived from the RMS (Risk Management Solutions) hurricane model. To facilitate the use of two hurricane models, the Rate Bureau retained Aon to run both models and to develop modeled hurricane losses using the blended results of these two models. I reviewed the exposure data provided as input to each model, and it is my opinion that the data was reasonable and consistent with other sections of this filing. I am also familiar with the assumptions selected as inputs to each model, and it is my opinion that the assumptions were applied consistently in both the AIR and RMS models such that the resulting output of both models are comparable. However, because Aon ran both models, I am relying on the work and opinions of Aon as it relates to specific details about the modeling process. The reliance on Aon to run both models and to develop modeled hurricane losses using the blended results of these two models is consistent with the prior dwelling filing.

The Rate Bureau requested that Aon combine the results of the two hurricane models by averaging the results from each model. This approach of giving equal weight to each model is intuitive, easy to understand, and the most reasonable method of blending two hurricane models. This blending approach (i.e., averaging) is also a common practice among insurance companies that consider multiple hurricane models. Based on my review of the blended model results, it is my opinion that the resulting hurricane losses reflected in this filing are reasonable and can be relied upon for the various purposes for which modeled hurricane losses are used in this filing. Additionally, since both models are equally credible, it is also my opinion that assigning equal weight to each model is the most reliable blending method and the most actuarially sound manner to consider two hurricane models.

Q.   What model versions and modeling assumptions were used to develop estimated hurricane losses?

A.   The current AIR model is Touchstone v6.0 and the current RMS model is Risklink v18.0. To develop the expected hurricane losses, Aon relied on AIR's Standard event set and on RMS' Historical event set. These event sets were used instead of AIR's Warm Sea Surface Temperature (WSST) event set and RMS' Medium Term Rate event set. Although many primary insurance companies consider the WSST and Medium Term Rate events sets when developing indicated rates in states other than North Carolina, the event sets selected for this filing are reasonable and actuarially sound.

Both the AIR and RMS models were run with aggregate demand surge included, which was identified as loss amplification in the RMS model. This standard procedure accounts for the expected additional cost for labor and materials after a very large hurricane occurs or a series of hurricanes occur. Historical experience shows that, when major catastrophic events occur, the increased demand for

building materials, labor, temporary housing, and other basic necessities can exceed the supply of these same items, which consequently increases their cost. Running models with demand surge is consistent with the Rate Bureau's prior dwelling filings, and is a common practice by insurance companies that develop rates based on modeled hurricane losses. Although the demand surge component of each model was used in this filing, the storm surge component of each model was not used to develop hurricane losses.

Q.   Were any other calculations applied to the hurricane losses derived from the models?

A.   Yes. Before providing the blended hurricane losses, Aon trended the modeled hurricane losses and applied a hurricane-specific provision for loss adjustment expense. After Aon provided the trended modeled hurricane losses (including LAE), ISO calculated a modeled base class loss cost for the extended coverage segment. The modeled base class loss cost has been adjusted for LAE and trended in a consistent manner as the weighted trended base class loss costs.

Q.   How are the provisions for commission and brokerage determined?

A.   The provisions for commission and brokerage are determined based on the three-year average of the ratio of each segment's commission and brokerage expense relative to each segment's written premium including deviations. Deviations are included in the premium amounts underlying this calculation to be consistent with the actual calculation of commission and brokerage amounts paid by individual companies within the industry.

Q.   In your opinion, are the provisions for commission and brokerage reasonable?

A.   Yes, the commission and brokerage provisions are reasonable. It is common practice in the industry to use a three-year average to determine a commission and brokerage provision.

Q.   How are the provisions for taxes, licenses, and fees determined?

A.   The provisions for taxes, licenses, and fees are determined based on the three-year average of the ratio of each segment's taxes, licenses, and fees expense relative to each segment's written premium including deviations. Deviations are included in the premium amounts underlying this calculation to be consistent with the actual calculation of taxes, licenses, and fees paid by individual companies within the industry.

Q.   In your opinion, are the provisions for taxes, licenses, and fees reasonable?

A. Yes, the taxes, licenses, and fees provisions are reasonable. It is common practice in the industry to use a three-year average to determine a taxes, licenses, and fees provision.

Q. How are the provisions for other acquisition expense determined?

A. The provisions for other acquisition expense are determined based on the three-year average of the ratio of each segment's other acquisition expense relative to each segment's earned premium excluding deviations.

The three-year average provisions are then trended from the midpoint of the experience period to the midpoint of the trend period based on an expense trend derived from cost indices. Following this, the trended other acquisition expense provisions are added to the trended general expense provisions and applied to the statewide average current base rates (adjusted for premium trend) to develop an average fixed expense per policy for fire and for extended coverage.

Q. In your opinion, are the provisions for other acquisition expense reasonable?

A. Yes, the other acquisition expense provisions are reasonable. It is common practice in the industry to use a three-year average to determine an other acquisition expense provision, and to trend fixed expense provisions to account for inflation.

Q. How are the provisions for general expense determined?

A. The provisions for general expense are determined based on the three-year average of the ratio of each segment's general expense relative to each segment's earned premium.

The three-year average provisions are then trended from the midpoint of the experience period to the midpoint of the trend period based on an expense trend derived from cost indices. As noted above, the trended general expense provisions are added to the trended other acquisition expense provisions and applied to the statewide average current base rates (adjusted for premium trend) to develop an average fixed expense per policy for fire and for extended coverage.

Q. In your opinion, are the provisions for general expense reasonable?

A. Yes, the general expense provisions are reasonable. It is common practice in the industry to use a three-year average to determine a general expense provision, and to trend fixed expense provisions to account for inflation.

Q. Is a provision for policyholder dividends included in the filing?

A.   Yes, the Rate Bureau reviewed historical data and developed a provision for expected policyholder dividends. The Rate Bureau evaluated five years of historical experience and selected a provision for policyholder dividends to be 0.40% based on a five-year average ratio of the total policyholder dividends issued by dwelling insurers in North Carolina to the total direct written premium of those same companies.

The Actuarial Standard of Practice (ASOP) No. 29 regarding *Expense Provisions in Property/Casualty Insurance Ratemaking* states the following:

> The *Statement of Principles Regarding Property and Casualty Insurance Ratemaking* of the Casualty Actuarial Society (CAS) classifies policyholder dividends as an expense to operations. When the actuary determines that policyholder dividends are a reasonably expected expense and are associated with the risk transfer, the actuary may include a provision in the rate for the expected amount of policyholder dividends. In making this determination, the actuary should consider the following: the company's dividend payment history, its current dividend policy or practice, whether dividends are related to loss experience, the capitalization of the company, and other considerations affecting the payment of dividends.

As stated in ASOP NO. 29, policyholder dividends are classified as an operating expense. In addition to the above excerpt from the *Statement of Principles Regarding Property and Casualty Insurance Ratemaking*, the Statement also articulates that indicated rates should reflect the expected costs associated with issuing dwelling policies, including all operating expenses. As such, since policyholder dividends are classified as an operating expenses, it is consistent with the *Statement of Principles Regarding Property and Casualty Insurance Ratemaking* and ASOP No. 29 to include a provision for policyholder dividends in the proposed rates reflected in this filing.

Q.   In your opinion, is the provision for policyholder dividends reasonable?

A.   Yes, the policyholder dividends provision is reasonable. It is reasonable and actuarially sound to calculate a five-year average ratio to determine a provision for policyholder dividends, and to treat this provision in a similar manner as a variable underwriting expense.

By reviewing five years of historical experience to determine a provision for policyholder dividends, the Rate Bureau is complying with the *Statement of Principles Regarding Property and Casualty Insurance Ratemaking* by considering the dividend payment history and ensuring that the selected provision is a reasonably expected expense.

Q. **Is a contingency provision included in the filing?**

A. Yes, the Rate Bureau is including a 1% contingency provision in this filing. This is consistent with the prior dwelling rate filings submitted by the Rate Bureau.

In addition to being consistent with the prior Rate Bureau filings, the use of a contingency provision is common within the property and casualty insurance industry. According the *Actuarial Standard of Practice No. 30: Treatment of Profit and Contingency Provisions and the Cost of Capital in Property/Casualty Insurance Ratemaking,* "the actuary should include a contingency provision if the assumptions used in the ratemaking process produce cost estimates that are not expected to equal average actual costs, and if this difference cannot be eliminated by changes in other components of the ratemaking process." There are several reasons why expected cost estimates may not be equal to actual costs. Some of these reasons include adverse court decisions, extension of coverage for unforeseen or unintended exposures, regulatory delay or reduction in filed rate changes, and unexpected large losses not sufficiently recognized in the normal ratemaking process. Based on reasons such as those listed above, the Rate Bureau believes a contingency provision is appropriate and necessary. It is my opinion that a 1% contingency provision is reasonable, consistent with common actuarial practice, and appropriate based on fundamental actuarial principles.

Included with this filing as Exhibit RB-16 is an exhibit I prepared that summarizes the estimated impact of delays in the filing process within the State of North Carolina. The delay in filed rate changes, whether caused by the regulatory review process or other delays inherent in the filing process, is one of several items listed above that supports the use of a contingency provision in a rate-level indication. Exhibit RB-16 lists the ten property rate filings submitted by the North Carolina Rate Bureau between 2008 and 2018. For each filing, I compare the effective date assumed in the rate filing to the actual effective date. This difference, which reflects the delay due to the filing process, ranges from 1 month in the 2012 homeowners filing, to 22 months in the 2011 dwelling filing. After determining the length of delay for each filing, I apply the net trend (i.e., the loss trend offset by the premium trend) in that filing for the number of months of delay to determine the estimated impact of the delay in the filing process on the overall rate level. The estimated impact of delay varies across the ten filings, ranging from -1.2% in the 2018 dwelling filing to +5.9% in the 2008 MH(C) mobile homeowners filing, with an average impact of +1.2%.

Based on prior filings submitted by the North Carolina Rate Bureau, my experience with property filings submitted by insurance companies in other states, and the 1.2% estimated impact of delays in the North Carolina filing process, it is my opinion that a 1% contingency provision is reasonable, consistent with common actuarial practice, and appropriate based on fundamental actuarial principles.

Q. Are you providing expert testimony concerning the underwriting profit provision?

A. No, I am relying on the work and opinions of Dr. Vander Weide and Dr. Zanjani as to the underwriting profit provision. The scope of my analysis and testimony relates to other aspects of the proposed rate filing.

Q. Earlier you said that one of your roles related to this filing was to review the compensation for assessment risk provision. Can you please explain this issue?

A. Yes. There is considerable risk to primary insurers that is attributable to the exposures written in the North Carolina Insurance Underwriting Association (i.e., the Coastal Property Insurance Pool, or "Beach Plan") and the North Carolina Joint Underwriting Association (i.e., the FAIR Plan). Together, the Beach Plan and FAIR Plan serve as the "residual market" for residential property insurance in North Carolina. These two entities provide property insurance when policyholders are unable to purchase insurance coverage from companies in the voluntary market. In states with significant exposure to catastrophic events, property insurance residual markets may grow to represent a sizable portion of the total insured risk in the exposed regions of the state. In North Carolina, the Beach Plan has become the predominant writer of homeowners insurance in the 18 coastal counties that it covers.

Similar to voluntary insurance companies, the Beach and FAIR Plans use the premiums collected from policies they issue to fund the losses and expenses attributable to the coverages they insure. When premiums are greater than losses and expenses during a fiscal year, the Beach and FAIR Plans accumulate surplus. That surplus is available to pay losses in the event that future losses and expenses exceed collected premiums plus investment income. However, if the surplus of either the Beach Plan or FAIR Plan is exhausted, then additional losses are passed through to property insurers in North Carolina in the form of an assessment. The potential overall industry assessment from the Beach Plan is limited to $1 billion, but the potential assessment from the FAIR Plan is unlimited. If losses in the Beach Plan exceed the retained surplus, the $1 billion industry assessment, and any other resources of the Beach Plan (such as reinsurance), any additional losses are passed through directly to residential property insurance policyholders in North Carolina.

This risk of potential assessment by the Beach Plan or FAIR Plan on property insurers in North Carolina requires that insurance companies be compensated for the additional risk to their capital. To quantify this risk, I have applied a procedure developed by Milliman to incorporate a provision in the dwelling rates that compensates insurers for that risk.

Q. Can you please explain the procedure you applied?

A.   Yes. The methodology developed by Milliman to quantify the compensation for assessment risk involves two steps. The first step is to calculate the magnitude of the exposure itself, and the second step is to determine the fair compensation to be paid to insurers for being required to bear that risk.

To quantify the magnitude of the exposure, it was necessary to estimate the expected value of the assessments on insurers arising from catastrophic losses incurred by the Beach Plan or FAIR Plan. Because an assessment on insurers results only after either the Beach or FAIR Plan has exhausted other resources available to pay losses, I needed to determine the likelihood of that occurring as well as the amount by which the losses exceed those other resources. As such, I obtained information from the Beach and FAIR Plans regarding the reinsurance programs in place for the 2019 storm season, along with assumptions of each plan's accumulated surplus available for the season. The accumulated surplus and available reinsurance represent the "other resources" that are available to pay for hurricane losses during the 2019 storm season. I then obtained the AIR and RMS hurricane model runs used by the Beach and FAIR Plans, and evaluated the estimated losses corresponding to each event simulated by the models. For each modeled loss, I determined the amount of loss that would be covered by reinsurance and the remaining losses that would be funded either from the plans' accumulated surplus, through assessments on property insurers in the state, or ultimately through assessments on North Carolina property insurance policyholders. I subtracted the accumulated surplus of the Beach and FAIR Plans from the losses remaining after reinsurance, limited the assessable losses due to Beach Plan exposures to $1 billion, and calculated the average assessment on property insurers across all events simulated by the models. This average assessment on property insurers is equal to the expected value of the losses that would be funded through assessments on North Carolina property insurers.

As noted above, this calculation produces a measure of the magnitude of the exposure. That is, it represents the risk to insurers' capital that is associated with the exposure to Beach or FAIR Plans assessments. The second step in Milliman's analysis is to develop a method of measuring the fair compensation to insurers for bearing this risk.

Q.   **Can you please explain how you measured the compensation for bearing this risk?**

A.   Yes. To measure the fair compensation for bearing this risk, I relied on publicly-available data that quantifies the market price of catastrophe risk, taken from recently-issued insurance linked securities. Insurance linked securities (ILS) are securities such as bonds, which have conditional payoffs that are very similar to reinsurance. Investors purchase these securities at significant yield premiums compared to risk-free bonds because the investors are exposed to loss of principal and interest if certain "insured events" occur.

Q. **What kind of data is available and how is this information used to determine the compensation for assessment risk?**

A. Lane Financial, LLC is a firm that specializes in the analysis of insurance linked securities. In March of each year, Lane publishes a table of data that summarizes a variety of information that can be used to evaluate the fair compensation for bearing catastrophe risk. For each ILS in the table, Lane publishes the following data: the yield on the security; the excess return over the risk-free rate; the probability that the security will suffer a loss; and the expected value of loss anticipated on the security. These data elements provide the foundation for my analysis of the proper compensation for bearing the risk of Beach or FAIR Plan assessments.

Before describing the mechanics of the analysis, I will first define several terms that will prove useful in this discussion.

- The "*yield spread*" is simply the difference between the yield on a particular ILS and the risk-free rate. If a $100 million bond is issued with a yield spread of 10%, this implies that the insurer issuing the bond would pay $10 million in interest in excess of the risk-free rate to encourage investors to purchase such a security.

- Now assume that the distribution of hurricane losses is such that, based on the probability and amount of potential hurricane losses, an investor would anticipate having an average loss of $2 million per year. This amount is identified as the "*expected loss.*"

- Since the investor in this example receives compensation of $10 million in excess of the risk-free rate for bearing the risk of loss, the "*expected profit*" to the investor is $8 million (i.e., $10 million in interest in excess of the risk-free rate minus $2 million of expected losses).

- Finally, I define a term known as the "*profit multiple,*" which is the ratio of expected profit to expected loss. In the above example, the profit multiple would be $8 million of expected profit divided by $2 million of expected loss, or a profit multiple of 4.0.

The profit multiples derived from insurance linked securities provide an estimate of the compensation that investors require to bear catastrophe risk, in that they tell us what investment returns are required in order to take on the risk of loss from a catastrophic event. One particularly important feature of this metric is that it is a measure of compensation per dollar of expected loss. As a result, because the first step of my analysis determines the expected value of losses that would be funded through assessments, the profit multiple can be applied to those expected values to develop an estimate of the fair compensation for bearing such risk. This is the measure of risk I rely upon in evaluating the fair compensation for property insurers whose capital is exposed to Beach or FAIR Plan assessments.

Q. Generally speaking, which insurance linked securities have larger risk premiums and higher profit multiples?

A. For exposures such as catastrophic events, securities that have a lower probability of incurring a loss have greater volatility and as a result, have larger risk premiums. Securities with larger risk premiums have a larger ratio of expected profit to expected loss and as such, have higher profit multiples.

Q. Have you developed any exhibits that summarize the calculations used to develop the fair compensation to insurers for bearing the risk of Beach Plan or FAIR Plan assessments?

A. Yes. Exhibit RB-15 contains ten pages of information required to develop the fair compensation for bearing Beach Plan and FAIR Plan assessment risk.

- Page 1 of Exhibit RB-15 shows the curve I fit to the ILS profit multiples based on all catastrophe-related securities issued in the last ten years. This exhibit also includes the equation of the fitted curve, which can be used to determine the average profit multiple for any layer to which insurer capital is exposed.

- Page 2 shows a summary of the Beach Plan's reinsurance program, and Page 6 shows a similar summary of the FAIR Plan's reinsurance program. These summaries include the various layers of reinsurance purchased and the coverage levels within those layers.

- Pages 3 and 7 display the profit multiples calculated for each layer of the Beach Plan's and FAIR Plan's loss distributions, based on the equation shown on Page 1. In order to determine the fair compensation to voluntary insurers for bearing the risk of assessments, I need to determine which layers contain losses that will be funded by assessments, as well as the corresponding expected losses within those layers. The profit multiples can then be applied to the expected losses to determine the appropriate compensation per dollar of expected loss in each layer.

- Pages 4 and 8 illustrate how potential losses for the Beach Plan Residential Account and FAIR Plan are funded. (The Beach Plan determines losses and assesses voluntary insurers separately for each account, while the FAIR Plan has only one account.) Because of the $1 billion limit on Beach Plan assessments, any amounts needed to pay claims in excess of the assessable amounts are to be collected through surcharges on property insurance policyholders statewide.

  For each event simulated by the hurricane models, losses are separated by account (Beach Plan Residential, Beach Plan Commercial, FAIR Plan Residential, and FAIR Plan Commercial). Then, the losses for each account are divided into layers based on the source of funding for those losses – Beach

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Plan or FAIR Plan surplus, assessments on voluntary insurers, private reinsurance, and ultimately any additional amounts in the Beach Plan to be covered by policyholder surcharges. Finally, the losses associated with each event are accumulated in each of the loss layers to determine expected values.

- Although Pages 4 and 8 illustrate the funding of potential losses within each layer, the purpose of my analysis is to determine the fair compensation for the risk of assessments on private insurers. As such, the analysis must take into account the probability of losses occurring within each layer and the expected value of losses that will be borne by private insurers. Pages 5 and 9 of Exhibit RB-15 provide that analysis. They show the expected value of the losses that would be covered by the Beach Plan Residential and FAIR Plan Residential accounts, and the average annual amount of those losses that would be assessed to private insurers. Pages 5 and 9 also display the average profit multiples associated with each layer of the loss distribution, and the product of the indicated profit multiples times the expected losses within each layer. The sum of those values is the indicated compensation for assessment risk for each account.

- The final step in my calculation is to determine the appropriate provision to be included in the dwelling rates to compensate insurers for the risk of Beach Plan or FAIR Plan assessments. This provision, expressed as a percent of premium, is developed on Page 10 of Exhibit RB-15. Since assessments for Beach or FAIR Plan losses are applied to all property insurance lines in the state, the bottom table on Exhibit RB-15, Page 10 shows the development of a charge that will produce an amount of revenue equal to the total required compensation of $108.24 million. As shown on this exhibit, that charge amounts to 3.4% of total property insurance premium in the state.

Q. **In your opinion, is it appropriate to include a 3.4% provision for the compensation for assessment risk in dwelling rates in North Carolina?**

A.   Yes. Insurance companies writing dwelling policies in North Carolina are exposed to the risk of Beach Plan or Fair Plan assessments as a result of writing voluntary market property insurance in the state. As such, those insurance companies are entitled to receive fair compensation for bearing that risk, and it is appropriate to include that compensation in the dwelling rates. The model Milliman has developed relies on a widely-accepted measure of compensation to determine a provision that will fairly reward insurers for bearing this additional risk to their capital.

Q. **Earlier, when describing the overall ratemaking methodology that underlies this filing, you said that the expected underwriting expenses include a provision for the net reinsurance cost per policy. Can you please explain this issue?**

A.   Yes. Dwelling insurance is one of several types of coverages that has exposure to potential catastrophic events. In such coverages (dwelling, homeowners, and other property coverages), individual catastrophic events can result in significant losses that exceed the amount of liability the typical insurer can reasonably assume for solvency and financial stability considerations and that can jeopardize the insurer's ability to pay claims. As a result, in these lines of business, insurers routinely purchase reinsurance to mitigate their exposure to extreme events. In order to accurately reflect the expected costs associated with insuring property policies, as discussed in the *Statement of Principles Regarding Property and Casualty Insurance Ratemaking*, it is appropriate to include the cost of this reinsurance in the ratemaking process for these lines of insurance.

Q.   In your opinion, is it appropriate to include a provision for the net cost of reinsurance in dwelling rates in North Carolina?

A.   Yes. Insurance companies writing dwelling policies in North Carolina incur a significant cost for bearing the risk of properties exposed to catastrophic events. Regardless of whether the risk of catastrophic losses is retained by the primary insurer or transferred to a reinsurer, the market cost of bearing that risk must be included in the rates. This is a foundational actuarial principle included in the *Statement of Principles Regarding Property and Casualty Insurance Ratemaking* and is a legitimate cost of the risk transfer inherent in the purchase of property insurance. As such, the net cost of reinsurance should be included in the North Carolina dwelling rates.

Q.   How does this filing reflect the net cost of reinsurance?

A.   For many years, the Rate Bureau has included a provision for the net cost of reinsurance. To support this filing, the Rate Bureau has engaged Aon, the world's largest reinsurance broker, to develop the provision for the net cost of reinsurance. It is my understanding that Aon was retained by the Rate Bureau based on their ability to access relevant data and experience from the reinsurance market, their expertise with reinsurance and catastrophe-related issues, and their prominence with respect to the reinsurance industry. This is consistent with the previous dwelling rate filing submitted by the Rate Bureau.

Q.   In your opinion, is it appropriate to allocate reinsurance costs within North Carolina in a way that is proportional to risk?

A.   Yes. The risk associated with insuring properties exposed to catastrophic events varies geographically within North Carolina. As such, the cost of bearing that risk should be allocated proportional to the measurement of risk. In its analysis of reinsurance costs for this filing, Aon provides the statewide provision for the net cost of reinsurance and also allocates the reinsurance costs to each policy form and each territory. This allocation is appropriate and consistent with the objective

of producing rates that are fair, reasonable, and not unfairly discriminatory across policyholders.

Q.   Are you providing expert testimony concerning the development of the net cost of reinsurance provision?

A.   No, I am relying on the work and opinion of Aon as to the development of the net cost of reinsurance provision.

Q.   Is a provision for deviations included in the filing?

A.   No, the Rate Bureau reviewed historical data and considered whether to apply a provision for deviations, but elected not to include one in this filing.

Q.   Does the filing review the rate-level adequacy by class?

A.   Yes. With this filing, the Rate Bureau developed indicated rate-level changes by class (i.e., Buildings or Contents) using a similar methodology as the statewide indication. A base loss cost is calculated for each class using the historical loss experience. In addition, a credibility value is assigned to each class based on the number of house years underlying each loss cost. As mentioned above, the full credibility standards are 500,000 house years for the fire section and 330,000 house years for the extended coverage section. Using the credibility for each class, a credibility-weighted base loss cost is determined by class. Additional calculations are applied to each class to reflect expenses, dividends, and reinsurance in a similar manner as applied at a statewide level. The result of these calculations is an indicated rate change by class.

In my opinion, the methodology used to develop the indicated rate-level change by class is reasonable and is consistent with widely-used actuarial ratemaking practices.

Q.   Does the filing review the rate-level adequacy by territory?

A.   Yes. With this filing, the Rate Bureau developed indicated rate-level changes by territory using a similar methodology as the statewide indication. A base loss cost is calculated for each territory using the historical loss experience. In addition, a credibility value is assigned to each territory based on the number of house years underlying each loss cost. As mentioned above, the full credibility standards are 500,000 house years for the fire section and 330,000 house years for the extended coverage section. Using the credibility for each territory, a credibility-weighted base loss cost is determined by territory. Additional calculations are applied to each territory to reflect expenses, dividends, and reinsurance in a similar manner as applied at a statewide level. The result of these calculations is an indicated rate-level change by territory.

In my opinion, the methodology used to develop the indicated rate-level change by territory is reasonable and is consistent with widely-used actuarial ratemaking practices.

Q.   Does the filing review the wind exclusion credits and wind mitigation credits?

A.   Yes. Based on the indicated rates by territory (for Territories 110 to 160) and by class that are being proposed with this filing, the wind exclusion credits and wind mitigation credits are being updated in a corresponding manner. Using the underlying formula for the statewide rate-level indication, an adjustment is made to the appropriate components of the indication formula to reflect the non-wind losses as a percent of the total losses. The indicated non-wind rate is subtracted from the indicated overall rate to determine the indicated wind exclusion credit for each territory. For those territories where the proposed rate is less than the indicated rate, the wind exclusion credit is similarly reduced such that the resulting non-wind rate remains consistent with the indicated non-wind rate. The wind mitigation credits for Territories 110 to 160 are being revised in a manner proportional to the wind exclusion credits.

In my opinion, the methodology used to develop the revised wind exclusion credits and wind mitigation credits is reasonable and is consistent with widely-used actuarial ratemaking practices.

Q.   What is the difference between the <u>indicated</u> rate level and the <u>filed</u> rate level?

A.   The indicated rate level is the actuarially sound and correct rate level for each territory, each segment, and each class. The indicated rate change is the amount needed to sufficiently cover the expected losses and expenses while still providing a fair and reasonable profit. The indicated rate level is also the rate level that complies with the statutory requirement that insurance rates not be excessive, inadequate, or unfairly discriminatory.

For extended coverage, the statewide indicated rate-level change is 60.6%. Due to differences by territory in historical loss experience, modeled hurricane losses, and other expenses, the indicated change by territory varies throughout the state. For many of the western territories, the indicated change is less than 60.6%, but for several of the territories closer to the coast, the indicated change is greater than 60.6%. The indicated rate-level change by territory is further divided into an indicated Buildings rate-level change and an indicated Contents rate-level change based on the indicated rate change by class (discussed above) relative to the total indicated rate change. For extended coverage, the statewide indicated Contents rate-level change is significantly lower than the statewide indicated Buildings rate-level change. As such, the indicated Contents rate-level change for each territory

is also significantly lower than the corresponding indicated Buildings rate-level change.

In contrast to extended coverage, the statewide indicated rate-level change for fire is 13.0%. Similar to the extended coverage segment, the indicated change by territory varies across the state, but the variation is less significant. Also similar to the extended coverage segment, the indicated rate-level change by territory is further divided by class such that the indicated Contents rate-level changes are lower than the indicated Buildings rate-level changes in each territory. When the indicated rate changes for fire and extended coverage are combined, the total statewide indicated dwelling rate-level change is 48.3% and several territories have a combined rate-level change in excess of 50%.

In order to mitigate the impact of these indicated rate changes on policyholders, the Rate Bureau has filed rates that reflect caps on the dwelling fire and dwelling extended coverage rate changes by territory within each class. The filing caps the rate changes by territory and by class for fire such that the dwelling fire rate change for each territory within each class does not exceed 5%. In addition, the filing caps the rate changes by territory and by class for extended coverage such that the dwelling extended coverage rate change for each territory within each class does not exceed 30%. This capping results in an overall statewide rate-level change of 19.2% instead of the indicated rate-level change of 48.3%.

In my opinion, the Rate Bureau's selected caps of 5% per territory for fire and 30% per territory for extended coverage are reasonable and are an effective strategy to mitigate the impact of this filing on those territories with the highest indicated rate changes. However, for those territories that are impacted by the cap (i.e., their indicated fire and extended coverage rate changes are greater than 5% or 30%, respectively), it should be noted that the filed rates in those territories will continue to be inadequate.

Q. **I understand that you are not providing an opinion concerning the underwriting profit (profit) provision or the net cost of reinsurance (NCOR) provision. If I ask you to assume that the provisions for profit and NCOR are reasonable and actuarially sound, then in your opinion is the overall rate-level indication shown in the dwelling filing by the North Carolina Rate Bureau reasonable?**

A.   Yes, if I assume that the provisions for profit and NCOR are reasonable, then in my opinion, the overall dwelling rate-level indication shown by the Rate Bureau, and the rate-level indications for each segment and each class, are reasonable and actuarially sound.

Q. **Again, assuming that the provisions for profit and NCOR are reasonable, do you have an opinion whether the proposed rates, as capped in the filing,**

reasonably provide for the expected costs for dwelling insurance in North Carolina?

A.   If I assume that the provisions for profit and NCOR are reasonable, then in my opinion, the proposed rates in this filing reasonably reflect the expected costs for dwelling insurance. However, in those territories where the Rate Bureau has capped the rates in this filing to mitigate the impact on affected policyholders, the proposed rates do not reflect <u>all</u> expected costs. The expected costs that can be quantified by the difference between a territory's indicated rate change and its capped rate change are not being reflected in the proposed rates.

Q.   Assuming that the provisions for profit and NCOR are reasonable, in your opinion, are the proposed dwelling rates not excessive, inadequate, or unfairly discriminatory?

A.   If I assume that the provisions for profit and NCOR are reasonable, then in my opinion, the proposed dwelling rates in this filing are not excessive or unfairly discriminatory. Similarly, the rates in those territories unaffected by the caps applied by the Rate Bureau are not inadequate; however, in those territories where the Rate Bureau has capped the effect of this filing, the proposed rates continue to be inadequate by the difference between the indicated rate change and the capped rate change.

Q.   Does this conclude your testimony?

A.   Yes, it does.

North Carolina Insurance Underwriting Association (NCIUA) -- Beach Plan
North Carolina Joint Underwriting Association (NCJUA) -- FAIR Plan

Catastrophe Bond Profit Multiples

Adjusted Profit Multiples by Average Probability of Loss
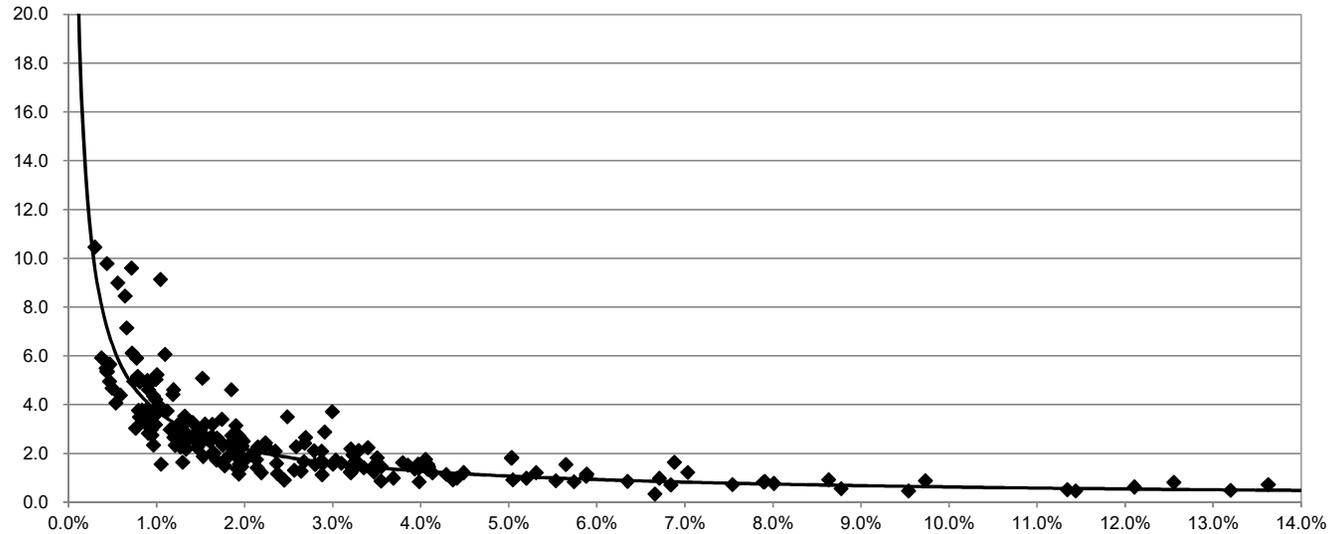
Source: Lane Financial LLC, Annual Securitization Reviews (http://lanefinancialllc.com).

Notes: Based on near-term cat bonds issued from January 2010 to March 2019.

Includes all U.S. bonds with a probability of first loss between 0.05% and 20.0%; excludes bonds with no stated profit multiples.

Profit multiples were adjusted based on the year each bond was issued in order to normalize for different market conditions by year.

Equation of the fitted curve: $y = 0.10314\, x^{-0.77999}$

Equation to determine average Profit Multiple over specific interval: $\text{Avg PM} = \int_a^b 0.10314\, x^{-0.77999}\,dx / (b-a)$

North Carolina Insurance Underwriting Association (NCIUA) -- Beach Plan

Summary of 2019 Reinsurance Structure

Risk Finance Structure [1]	Attachment Point ($ Millions)	Exhaustion Point ($ Millions)	Coverage
Reinsurance Layer 1	$1,300.0	$1,600.0	100.0%
Reinsurance Layer 2	1,600.0	1,750.0	100.0%
Reinsurance Layer 3	1,750.0	2,250.0	100.0%
Reinsurance Layer 4	2,250.0	2,300.0	100.0%
Reinsurance Layer 5	2,300.0	2,870.0	100.0%

Source: https://www.ncjua-nciua.org/html/mbr_co.htm

Note: The above reinsurance covers aggregate losses for all Beach Plan accounts combined (Residential & Commercial).

(1) Each layer of reinsurance provides Annual Aggregate coverage, which implies that a reinstatement provision is not applicable.

North Carolina Insurance Underwriting Association (NCIUA) -- Beach Plan

Determination of Average Profit Multiple by Layer of Loss
($ in Millions)

Annual Aggregate Layer	Source of Funding	Total Beach Plan		Attachment Probability	Exhaustion Probability	Indicated Profit Multiple
		Layer Attachment	Layer Exhaustion [1]			
$0 to 300	Surplus	$0.0	$300.0	46.35%	13.57%	0.29
$300 to 1,300	Company Assessments	300.0	1,300.0	13.57%	4.29%	0.73
$1,300 to 1,600	Reinsurance Layer 1	1,300.0	1,600.0	4.29%	3.41%	1.31
$1,600 to 1,750	Reinsurance Layer 2	1,600.0	1,750.0	3.41%	3.09%	1.49
$1,750 to 2,250	Reinsurance Layer 3	1,750.0	2,250.0	3.09%	2.26%	1.75
$2,250 to 2,300	Reinsurance Layer 4	2,250.0	2,300.0	2.26%	2.21%	2.00
$2,300 to 2,870	Reinsurance Layer 5	2,300.0	2,870.0	2.21%	1.66%	2.25
$2,870 & Higher	Policyholder Surcharges	2,870.0	50,065.2	1.66%	0.0005%	9.56

(1) The Layer Exhaustion for the highest layer was selected to be equal to the largest amount of modeled annual hurricane losses after blending 100,000 years of AIR and RMS
    modeled losses.

North Carolina Insurance Underwriting Association (NCIUA) -- Beach Plan
Residential Accounts Only

Illustration of How Hurricane Losses are Funded
Voluntary Market Assessments Limited to $1 Billion on All Beach Plan Accounts Combined
($ in Millions)

| | Total Beach Plan | | | Beach Plan: | Hurricane Losses Funded by: | | | |
| | Layer | Layer | Total Losses | Residential | Beach Plan | Private | Assessments on Member | Policyholder |
Annual Aggregate Layer	Attachment	Exhaustion	in Layer	Share of Layer	Surplus	Reinsurance	Companies [1]	Surcharges
$0 to 300	$0.0	$300.0	$300.0	$262.2	$262.2	-	-	-
$300 to 1,300	300.0	1,300.0	1,000.0	863.7	-	-	$863.7	-
$1,300 to 1,600	1,300.0	1,600.0	300.0	258.6	-	$258.6	-	-
$1,600 to 1,750	1,600.0	1,750.0	150.0	129.4	-	129.4	-	-
$1,750 to 2,250	1,750.0	2,250.0	500.0	431.8	-	431.8	-	-
$2,250 to 2,300	2,250.0	2,300.0	50.0	43.2	-	43.2	-	-
$2,300 to 2,870	2,300.0	2,870.0	570.0	493.3	-	493.3	-	-
$2,870 & Higher	2,870.0	50,065.2	47,195.2	41,434.6	-	-	-	$41,434.6
Total					$262.2	$1,356.4	$863.7	$41,434.6

(1) Total losses paid by Member Companies ($863.7 M) reflects the Residential portion of the $1 Billion Beach Plan assessment on the total Voluntary Market.

North Carolina Insurance Underwriting Association (NCIUA) -- Beach Plan
Residential Accounts Only

Determination of the Cost of Reinsurance Provided to the NCIUA by the Voluntary Market
Voluntary Market Assessments Limited to $1 Billion on All Beach Plan Accounts Combined
($ in Millions)

Annual Aggregate Layer	Beach Plan: Residential Share of Layer	Potential Assessments Paid by Member Companies [1]	Expected Losses [2] Total	Exposed [3]	Indicated Profit Multiple [4]	Cost of Providing Reinsurance [5]
$0 to 300	$262.2	-	$52.21	-	0.29	-
$300 to 1,300	863.7	$863.7	65.16	$65.16	0.73	$47.56
$1,300 to 1,600	258.6	-	9.95	-	1.31	-
$1,600 to 1,750	129.4	-	4.23	-	1.49	-
$1,750 to 2,250	431.8	-	11.54	-	1.75	-
$2,250 to 2,300	43.2	-	0.97	-	2.00	-
$2,300 to 2,870	493.3	-	9.48	-	2.25	-
$2,870 & Higher	41,434.6	-	41.68	-	9.56	-
Total		$863.7	$195.21	$65.16		$47.56

(1) See Exhibit RB-15, Page 4.
(2) From AIR & RMS hurricane models.
(3) Expected loss subject to Beach Plan assessments of Voluntary Market.
(4) See Exhibit RB-15, Page 3.
(5) = Exposed Expected Losses x Profit Multiple (based on Cat Bond data).

North Carolina Joint Underwriting Association (NCJUA) -- FAIR Plan

Summary of 2019 Reinsurance Structure

Risk Finance Structure [1]	Attachment Point ($ Millions)	Exhaustion Point ($ Millions)	Coverage
Reinsurance Layer 1	$115.0	$261.0	100.0%

Source: https://www.ncjua-nciua.org/html/mbr_co.htm

Notes: The above reinsurance covers aggregate losses for all FAIR Plan accounts combined (Residential & Commercial).

(1) Each layer of reinsurance provides Annual Aggregate coverage, which implies that a reinstatement provision is not applicable.

North Carolina Joint Underwriting Association (NCJUA) -- FAIR Plan

Determination of Average Profit Multiple by Layer of Loss
($ in Millions)

Annual Aggregate Layer	Source of Funding	Total FAIR Plan		Attachment Probability	Exhaustion Probability	Indicated Profit Multiple
		Layer Attachment	Layer Exhaustion [1]			
$0 to 15	Surplus	$0.0	$15.0	45.80%	19.72%	0.26
$15 to 115	Company Assessments	15.0	115.0	19.72%	6.73%	0.53
$115 to 261	Reinsurance	115.0	261.0	6.73%	2.93%	1.14
$261 & Higher	Company Assessments	261.0	6,096.4	2.93%	0.0005%	6.27

(1) The Layer Exhaustion for the highest layer was selected to be equal to the largest amount of modeled annual hurricane losses after blending 100,000 years of AIR and RMS modeled losses.

North Carolina Joint Underwriting Association (NCJUA) -- FAIR Plan
Residential Accounts Only

Illustration of How Hurricane Losses are Funded
Reflecting Unlimited Industry Exposure to FAIR Plan Assessments
($ in Millions)

	Total FAIR Plan			FAIR Plan:	Hurricane Losses Funded by:		
							Assessments
	Layer	Layer	Total Losses	Residential	FAIR Plan	Private	on Member
Annual Aggregate Layer	Attachment	Exhaustion	in Layer	Share of Layer	Surplus	Reinsurance	Companies
$0 to 15	$0.0	$15.0	$15.0	$14.5	$14.5	-	-
$15 to 115	15.0	115.0	100.0	96.5	-	-	$96.5
$115 to 261	115.0	261.0	146.0	140.3	-	$140.3	-
$261 & Higher	261.0	6,096.4	5,835.4	5,585.5	-	-	5,585.5
Total					$14.5	$140.3	$5,682.0

North Carolina Joint Underwriting Association (NCJUA) -- FAIR Plan
Residential Accounts Only

Determination of the Cost of Reinsurance Provided to the NCJUA by the Voluntary Market
Reflecting Unlimited Industry Exposure to FAIR Plan Assessments
($ in Millions)

Annual Aggregate Layer	FAIR Plan: Residential Share of Layer	Potential Assessments Paid by Member Companies [1]	Expected Losses [2] Total	Exposed [3]	Indicated Profit Multiple [4]	Cost of Providing Reinsurance [5]
$0 to 15	$14.5	-	$3.61	-	0.26	-
$15 to 115	96.5	$96.5	10.63	$10.63	0.53	$5.64
$115 to 261	140.3	-	6.22	-	1.14	-
$261 & Higher	5,585.5	5,585.5	8.78	8.78	6.27	55.04
Total		$5,682.0	$29.24	$19.41		$60.68

(1) See Exhibit RB-15, Page 8.
(2) From AIR & RMS hurricane models.
(3) Expected loss subject to FAIR Plan assessments of Voluntary Market.
(4) See Exhibit RB-15, Page 7.
(5) = Exposed Expected Losses x Profit Multiple (based on Cat Bond data).

North Carolina Insurance Underwriting Association (NCIUA) -- Beach Plan
North Carolina Joint Underwriting Association (NCJUA) -- FAIR Plan
Residential Accounts Only

Determination of the Compensation for Bearing the Risk of Beach Plan & FAIR Plan Assessments
($ in Millions)

(1) Cost of Reinsurance Provided by the Voluntary Market to the Residential Accounts in the NCIUA (Beach Plan): $47.56

(2) Cost of Reinsurance Provided by the Voluntary Market to the Residential Accounts in the NCJUA (FAIR Plan): $60.68

(3) Total Cost of Reinsurance Provided by the Voluntary Market to the Residential Accounts in the NCIUA & NCJUA: $108.24

Policy Form	(4) Estimated 2019 Industry Written Premium @ Manual Rates	(5) = (4) / Total (4) % of Total Industry Premium	(6) = (3) x (5) Allocated Compensation for Risk of Assessment	(7) = (6) / (4) Compensation for Assessment Risk as % of 2019 Manual Premium
Homeowners	$2,716.9	85.4%	$92.45	3.4%
Dwelling Fire & EC	333.3	10.5%	11.34	3.4%
MobileHome	130.7	4.1%	4.45	3.4%
Total	$3,180.9	100.0%	$108.24	3.4%

(1) From Exhibit RB-15, Page 5.
(2) From Exhibit RB-15, Page 9.
(3) = (1) + (2)
(4) 2019 Industry Written Premium includes NCIUA and NCJUA.

NORTH CAROLINA
DWELLING PROPERTY INSURANCE

Development of the Estimated Impact of Delay in Rate Filing Process

			(1)	(2)	(3)	(4)	(5)
NCRB Rate Filing	Policy Type / Coverage	Premium Weight	Assumed Effective Date	Actual Effective Date	Selected Loss Trend	Selected Premium Trend	Estimated Impact of Delay in Filing Process
2018 Dwelling	Fire	$102,088,428	6/1/18	2/1/19	0.2%	2.3%	-1.3%
	EC	187,663,877	6/1/18	2/1/19	0.4%	2.1%	-1.1%
	Total	$289,752,305					-1.2%
2017 HO	Owners	$2,010,516,565	6/1/18	10/1/18	3.1%	1.1%	0.7%
	Tenants	62,551,401	6/1/18	10/1/18	-3.1%	-1.0%	-0.7%
	Condos	24,591,783	6/1/18	10/1/18	1.9%	0.5%	0.5%
	Total	$2,097,659,749					0.6%
2014 HO	Owners	$2,257,970,589	7/1/14	6/1/15	5.3%	2.3%	2.7%
	Tenants	45,065,871	7/1/14	6/1/15	2.9%	-1.0%	3.6%
	Condos	22,629,842	7/1/14	6/1/15	5.4%	0.0%	5.0%
	Total	$2,325,666,302					2.7%
2014 MH(C)	Property	$77,349,418	6/1/15	10/1/15	3.0%	2.8%	0.1%
	Liability	1,546,804	6/1/15	10/1/15	2.8%	n/a	0.9%
	Total	$78,896,222					0.1%
2014 MH(F)	Owners	$44,750,216	6/1/15	10/1/15	4.6%	2.2%	0.8%
	Tenants	100,658	6/1/15	10/1/15	2.5%	-0.2%	0.9%
	Total	$44,850,874					0.8%
2012 HO	Owners	$2,168,814,729	6/1/13	7/1/13	5.4%	3.0%	0.2%
	Tenants	32,405,190	6/1/13	7/1/13	4.0%	0.0%	0.3%
	Condos	18,252,996	6/1/13	7/1/13	4.0%	2.0%	0.2%
	Total	$2,219,472,915					0.2%
2011 Dwelling	Fire	$84,664,174	6/1/11	4/1/13	3.6%	2.9%	1.3%
	EC	150,823,062	6/1/11	4/1/13	4.1%	2.8%	2.3%
	Total	$235,487,236					2.0%
2008 HO	Owners	$1,498,766,325	1/1/09	5/1/09	4.4%	3.9%	0.2%
	Tenants	24,074,875	1/1/09	5/1/09	0.2%	2.7%	-0.8%
	Condos	13,213,524	1/1/09	5/1/09	0.2%	2.9%	-0.9%
	Total	$1,536,054,724					0.1%
2008 MH(C)	Property	$76,284,985	10/1/07	12/1/08	7.5%	2.4%	5.9%
	Liability	1,161,840	10/1/07	12/1/08	4.0%	n/a	4.7%
	Total	$77,446,825					5.9%
2008 MH(F)	Owners	$43,659,180	10/1/07	12/1/08	6.6%	5.8%	0.9%
	Tenants	158,638	10/1/07	12/1/08	0.4%	-4.1%	5.5%
	Total	$43,817,818					0.9%

Average Impact of Delay in Filing Process: **1.2%**

(1), (3), (4) From historical NCRB rate filings

(2) From historical NCRB settlement agreements or circulars

(5) = {[1 + (3)] / [1 + (4)]} ^ {[(2) - (1)]/365} - 1

PREFILED TESTIMONY
OF
JAMES H. VANDER WEIDE

2019 DWELLING FIRE AND EXTENDED COVERAGE
INSURANCE RATE FILING
BY THE NORTH CAROLINA RATE BUREAU

Q.   WHAT IS YOUR NAME, OCCUPATION, AND BUSINESS ADDRESS?

A.   My name is James H. Vander Weide. I am President of Financial Strategy

Associates, a firm that provides strategic and financial consulting services to

corporate clients. My business address is 3606 Stoneybrook Drive, Durham,

North Carolina 27705.

Q.   PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND AND PRIOR

ACADEMIC EXPERIENCE.

A.   I graduated from Cornell University with a Bachelor's Degree in Economics and

then attended Northwestern University where I earned a Ph.D. in Finance. I

joined the faculty of the School of Business at Duke University where I was

subsequently named Assistant Professor, Associate Professor, Professor, and

Research Professor. I have published research in the areas of finance and

economics and taught courses in these fields at Duke for more than thirty-five

years. I am now retired from my teaching duties at Duke.

I have taught courses in corporate finance, investment management, and

management of financial institutions. I also taught a graduate seminar on the

theory of public utility pricing and lectured in executive development seminars on

the cost of capital, financial analysis, capital budgeting, mergers and acquisitions, cash management, short-run financial planning, and competitive strategy.

I have served as Program Director and taught in numerous executive education programs at Duke, including the Duke Advanced Management Program, the Duke Management Challenge, the Duke Executive Program in Telecommunications, Competitive Strategies in Telecommunications, and the Duke Program for Manager Development for managers from the former Soviet Union. I have also taught in tailored programs developed for corporations such as ABB, Accenture, Allstate, AT&T, Progress Energy, GlaxoSmithKline, Lafarge, MidAmerican Energy, Norfolk Southern, The Rank Group, Siemens, TRW, and Wolseley PLC.

In addition to my teaching and executive education activities, I have written research papers on such topics as portfolio management, the cost of capital, capital budgeting, the effect of regulation on the performance of public utilities, and cash management. My articles have been published in *American Economic Review, Financial Management, International Journal of Industrial Organization, Journal of Finance, Journal of Financial and Quantitative Analysis, Journal of Bank Research, Journal of Accounting Research, Journal of Cash Management, Management Science, The Journal of Portfolio Management, Atlantic Economic Journal, Journal of Economics and Business,* and *Computers and Operations Research.* I have written a book titled *Managing Corporate Liquidity: an Introduction to Working Capital Management*, a chapter for *The Handbook of*

Modern Finance, "Financial Management in the Short Run," and a chapter for the book, *The Handbook of Portfolio Construction: Contemporary Applications of Markowitz Techniques,* "Principles for Lifetime Portfolio Selection: Lessons from Portfolio Theory."

Q.   HAVE YOU PREVIOUSLY PRESENTED EVIDENCE ON THE COST OF CAPITAL AND OTHER REGULATORY ISSUES?

A.   Yes. As an expert on financial and economic theory and practice, I have participated in more than five hundred regulatory and legal proceedings before the public service commissions of forty-five states and four Canadian provinces, the Federal Energy Regulatory Commission, the National Energy Board (Canada), the Federal Communications Commission, the Canadian Radio-Television and Telecommunications Commission, the United States Congress, the National Telecommunications and Information Administration, the insurance commissions of five states, the Iowa State Board of Tax Review, the National Association of Securities Dealers, and the North Carolina Property Tax Commission. In addition, I have prepared expert testimony in proceedings before the United States District Court for the District of Nebraska; the United States District Court for the District of New Hampshire; the United States District Court for the District of Northern Illinois; the United States District Court for the Eastern District of North Carolina; the Montana Second Judicial District Court, Silver Bow County; the United States District Court for the Northern District of California; the Superior Court, North Carolina; the United States Bankruptcy Court for the

Southern District of West Virginia; the United States District Court for the Eastern

District of Michigan; and the Supreme Court of the State of New York.

Q.   WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A.   I have been asked by the North Carolina Rate Bureau to make an independent

appraisal of the aggregate cost of equity capital for the companies writing

Dwelling Fire and Extended Coverage insurance in North Carolina and to

recommend a rate of return on equity that is fair, that allows those companies in

the aggregate to attract and retain capital on reasonable terms, that is

commensurate with returns on investments of comparable risk, and that

maintains the financial integrity of those companies in the aggregate.

Q.   WHAT DO YOU MEAN BY THE PHRASE "COST OF EQUITY CAPITAL?"

A.   A firm's cost of equity capital is the rate of return expectation that is required in

the marketplace on equity investments of comparable risk. If an investor does not

expect to earn a return on an equity investment in a firm that is at least as large

as the return the investor could expect to earn on other investments of

comparable risk, then the investor will not invest in that firm's shares. Thus, a

firm's cost of equity capital is also the rate of return expectation that is required in

the marketplace in order to induce equity investors to purchase shares in that

firm.

Q.   IS THE COST OF EQUITY CAPITAL THE SAME AS THE RETURN ON

EQUITY?

A.   No. The cost of equity capital is a market-based concept that reflects investors'

future expectations, while the return on equity is an accounting concept that

measures results of past performance. The return on equity is equal to income

available for common equity divided by the book value of common equity.

Q.   HAVE YOU FORMED AN OPINION REGARDING THE COST OF EQUITY

CAPITAL FOR THE AVERAGE COMPANY WRITING DWELLING FIRE AND

EXTENDED COVERAGE INSURANCE IN NORTH CAROLINA?

A.   Yes.

Q.   WHAT IS YOUR OPINION IN THAT REGARD?

A.   The cost of equity capital for such a company is in the range 8.9 percent to

12.9 percent.

Q.   WHAT ECONOMIC PRINCIPLES DID YOU CONSIDER IN ARRIVING AT THAT

OPINION?

A.   There are two primary economic principles relevant to my appraisal of the cost of

equity capital. The first, relating to the demand for capital, states that a firm

should continue to invest in its business only so long as the return on its

investment is greater than or equal to its cost of capital. In the context of a

regulated firm, this principle suggests that the regulatory agency should establish

revenue levels which will offer the firm an opportunity to earn a return on its

investment that is at least equal to its cost of capital.

The second principle, relating to the supply of capital, states that rational

investors are maximizing their total return on capital only if the returns they

expect to receive on investments of comparable risk are equal. If these returns

are not equal, rational investors will reduce or completely eliminate investments

in those activities yielding lower expected returns for a given level of risk and will

increase investments in those activities yielding higher expected returns. The

second principle implies that regulated firms will be unable to obtain the capital

required to expand service on reasonable terms unless they are able to provide

investors returns equal to those expected on investments of comparable risk.

Q.   DO THESE ECONOMIC PRINCIPLES APPLY TO THE SETTING OF

        INSURANCE RATES?

A.   Yes. These are general economic principles that apply to investing in any

        business activity, including insurance.

Q.   HOW DID YOU GO ABOUT DETERMINING THE COST OF EQUITY CAPITAL

        FOR THE AVERAGE COMPANY WRITING DWELLING FIRE AND EXTENDED

        COVERAGE INSURANCE IN NORTH CAROLINA?

A.   I used two generally accepted methods to estimate the cost of equity: (1) the

        Discounted Cash Flow (DCF) Model, and (2) the Risk Premium Approach.

Q.   PLEASE DESCRIBE THE DCF MODEL.

A.   The DCF Model suggests that investors value an asset on the basis of the future

        cash flows they expect to receive from owning the asset. Thus, investors value

an investment in a bond because they expect to receive a sequence of semi-

annual coupon payments over the life of the bond and a terminal payment equal

to the bond's face value at the time the bond matures. Likewise, investors value

an investment in a firm's stock because they expect to receive a sequence of

dividend payments and, perhaps, expect to sell the stock at a higher price

sometime in the future.

A second fundamental principle of the DCF approach is that investors value a

dollar received in the future less than a dollar received today. This is because, if

they had the dollar today, they could invest it in an interest earning account and

increase their wealth. This principle is called the time value of money.

Applying the two fundamental DCF principles noted above to an investment in a

bond suggests that investors should value their investment in the bond on the

basis of the present value of the bond's future cash flows. Thus, the price of the

bond should be equal to:

Equation 1

$$P_B \;=\; \frac{C}{(1 + i)} \;+\; \frac{C}{(1 + i)^2} \;+\; \dots \;+\; \frac{C + F}{(1 + i)^n}$$

where:

P_B	=	Bond price;
C	=	Cash value of the coupon payment (assumed for notational convenience to occur annually rather than semi-annually);
F	=	Face value of the bond;
i	=	The rate of interest the investor could earn by investing his money in an alternative bond of equal risk; and
n	=	The number of periods before the bond matures.

Applying these same principles to an investment in a firm's stock suggests that

the price of the stock should be equal to:

Equation 2

$$P_S = \frac{D_1}{(1+k)} + \frac{D_2}{(1+k)^2} + \ldots + \frac{D_n + P_n}{(1+k)^n}$$

where:

P_S	=	Current price of the firm's stock;
$D_1, D_2 \ldots D_n$	=	Expected annual dividend per share on the firm's stock;
P_n	=	Price per share of stock at the time the investor expects to sell the stock; and
k	=	Return the investor expects to earn on alternative investments of the same risk, i.e., the investor's required rate of return.

Equation (2) is frequently called the Annual Discounted Cash Flow (DCF) Model

of stock valuation.

Q.   HOW DO YOU USE THE DCF MODEL TO DETERMINE THE COST OF

EQUITY CAPITAL?

A.   The "k" in the equation is the cost of equity capital. We make certain simplifying

assumptions regarding the other factors in the equation and then mathematically

solve for "k."

Q.   WHAT ARE THE ASSUMPTIONS YOU MAKE?

A.   Most analysts make three simplifying assumptions. First, they assume that

dividends are expected to grow at the constant rate ("g") into the indefinite future.

Second, they assume that the stock price at time "n" is simply the present value

of all dividends expected in periods subsequent to "n." Third, they assume that

the investors' required rate of return, "k," exceeds the expected dividend growth

rate, "g."

Q.   DOES THE ANNUAL DCF MODEL OF STOCK VALUATION PRODUCE

      APPROPRIATE ESTIMATES OF A FIRM'S COST OF EQUITY CAPITAL?

A.   No. The Annual DCF Model of stock valuation produces appropriate estimates of

      a firm's cost of equity capital only if the firm pays dividends just once a year.

      Since most firms pay dividends quarterly, the Annual DCF Model produces

      downwardly biased estimates of the cost of equity. Investors can expect to earn a

      higher annual effective return on an investment in a firm that pays quarterly

      dividends than in one which pays the same amount of dollar dividends once at

      the end of each year. A complete analysis of the implications of the quarterly

      payment of dividends on the DCF Model is provided in Exhibit RB-20. For the

      reasons cited there, I employed the Quarterly DCF Model throughout my

      calculations.

Q.   PLEASE DESCRIBE THE QUARTERLY DCF MODEL YOU USED.

A.   The Quarterly DCF Model I use is described by Equation 10 on page 10 in

      Exhibit RB-20. This equation shows that the cost of equity is: the sum of the

      dividend yield and the growth rate, where the dividend in the dividend yield is the

      equivalent dividend at the end of the year, and the growth rate is the expected

      growth in dividends or earnings per share.

Q.   HOW DO YOU APPLY THE DCF APPROACH TO OBTAIN THE COST OF

       EQUITY CAPITAL FOR THE COMPANIES WRITING DWELLING FIRE AND

       EXTENDED COVERAGE INSURANCE IN NORTH CAROLINA?

A.   I apply the DCF approach to two groups of companies: Value Line's group of

       property/casualty insurance companies and the S&P 500.

Q.   WHY DO YOU APPLY THE DCF APPROACH TO THE S&P 500 AS WELL AS

       TO VALUE LINE'S PROPERTY/CASUALTY INSURANCE COMPANIES?

A.   As I noted previously, the cost of equity is defined as the rate of return investors

       expect to earn on investments in other companies of comparable risk. I apply the

       DCF approach to the S&P 500 because they are a large group of companies

       that, on average, are typically viewed as being comparable in risk to the

       property/casualty insurance industry. The use of a larger set of comparable risk

       companies should provide an accurate estimate of the cost of equity for the

       companies writing Dwelling Fire and Extended Coverage insurance in North

       Carolina.

Q.   DO YOU INCLUDE ALL THE VALUE LINE PROPERTY/CASUALTY

       INSURANCE COMPANIES?

A.   No. Among the Value Line property/casualty insurance companies, I only include

       companies which pay a quarterly dividend, have not lowered their dividends, and

       have a positive five-year earnings growth forecast available from I/B/E/S

       (formerly known as the Institutional Brokers Estimate System, now part of

Refinitiv). The Value Line property/casualty companies I use are shown in

Exhibit RB-18.

Q.   WHAT CRITERIA DO YOU USE TO SELECT COMPANIES IN THE S&P 500?

A.   I include those firms which pay dividends and which have at least three five-year

earnings forecasts available from I/B/E/S. I exclude the insurance companies in

the S&P 500, as identified by I/B/E/S Refinitiv, because I have already calculated

DCF results for the Value Line property/casualty insurance companies. The S&P

500 companies I use are shown in Exhibit RB-19.

Q.   WHY DO YOU ELIMINATE ANY COMPANY WHICH HAD RECENTLY

LOWERED ITS DIVIDEND OR WHICH FAILS TO PAY DIVIDENDS?

A.   I eliminate those companies because it is difficult to make a reliable estimate of

the future dividend growth rate for companies that have recently lowered their

dividends or do not pay dividends. If a company has recently lowered its

dividend, investors do not know whether the company will again lower its

dividend in the future, or whether the company will attempt to increase its

dividend back toward its previous level. If a company does not pay a dividend,

one cannot mathematically apply the DCF approach.

Q.   HOW DO YOU ESTIMATE THE GROWTH COMPONENT OF THE

QUARTERLY DCF MODEL?

A.   I use the average of analysts' estimates of future earnings per share (EPS)

growth reported by I/B/E/S. As part of their research, financial analysts working at

Wall Street firms periodically estimate EPS growth for each firm they follow. The EPS forecasts for each firm are then published. The forecasts are used by investors who are contemplating purchasing or selling shares in individual companies.

Q.   WHAT IS I/B/E/S?

A.   I/B/E/S is a collection of analysts' forecasts for a broad group of companies expressed in terms of a mean forecast and a standard deviation of forecast for each firm. The mean forecast is used by investors as an estimate of future firm performance.

Q.   WHY DO YOU USE THE I/B/E/S GROWTH ESTIMATES?

A.   The I/B/E/S growth rates (1) are widely circulated in the financial community, (2) include the projections of reputable financial analysts who develop estimates of future growth, (3) are reported on a timely basis to investors, and (4) are widely used by institutional and other investors. For these reasons, I believe these estimates represent unbiased estimates of investors' expectations of each firm's long-term growth prospects and, accordingly, are incorporated by investors into their return requirements. Consequently, in my opinion, they provide the best available estimate of investors' long-term growth expectations.

Q.   WHY DO YOU RELY EXCLUSIVELY ON ANALYSTS' PROJECTIONS OF FUTURE EPS GROWTH IN ESTIMATING THE INVESTORS' EXPECTED

GROWTH RATE RATHER THAN LOOKING AT PAST HISTORICAL GROWTH

RATES?

A.   There is considerable empirical evidence that analysts' forecasts are more highly

correlated with stock prices than are firms' historical growth rates, and, thus, that

investors actually use these forecasts.

Q.   HAVE YOU PERFORMED ANY STUDIES CONCERNING THE USE OF

ANALYSTS' FORECASTS AS THE BEST ESTIMATE OF INVESTORS'

EXPECTED GROWTH RATE, G?

A.   Yes, I prepared a study with Willard T. Carleton, Professor of Finance Emeritus

at the University of Arizona, on why analysts' forecasts provide the best estimate

of investors' expectations of future long-term growth. This study is described in a

paper entitled "Investor Growth Expectations: Analysts vs. History," published in

The Journal of Portfolio Management.

Q.   PLEASE SUMMARIZE THE RESULTS OF YOUR STUDY.

A.   First, we performed a correlation analysis to identify the historically-oriented

growth rates which best described a firm's stock price. Then we did a regression

study comparing the historical growth rates with the consensus analysts'

forecasts. In every case, the regression equations containing the average of

analysts' forecasts statistically outperformed the regression equations containing

the historical growth estimates. These results are consistent with those found by

Cragg and Malkiel, the early major research in this area. These results are also

consistent with the hypothesis that investors use analysts' forecasts, rather than

historically-oriented growth calculations, in making buy and sell decisions. They provide overwhelming evidence that the analysts' forecasts of future growth are superior to historically-oriented growth measures in predicting a firm's stock price.

Q.   WHAT PRICE DO YOU USE IN YOUR DCF MODEL?

A.   I use a simple average of the monthly high and low stock prices for each firm for the three-month period, February, March, and April 2019. These high and low stock prices are obtained from Refinitiv.

Q.   WHY DO YOU USE THE THREE-MONTH AVERAGE STOCK PRICE, P_0, IN APPLYING THE DCF METHOD?

A.   I use a three-month average stock price in applying the DCF method because stock prices fluctuate daily, while financial analysts' forecasts for a given company are generally changed less frequently, often on a quarterly basis. Thus, to match the stock price with an earnings forecast, it is appropriate to average stock prices over a three-month period.

Q.   PLEASE EXPLAIN YOUR INCLUSION OF FLOTATION COSTS.

A.   All firms that have sold securities in the capital markets have incurred some level of flotation costs, including underwriters' commissions, legal fees, printing expense, etc. These costs are paid from the proceeds of the stock sale and must be recovered over the life of the equity issue. Costs vary depending upon the size of the issue, the type of registration method used and other factors, but

in general these costs range between four percent and five percent of the

proceeds from the issue. In addition to these costs, the underwriter's offer price is

set below the most recent closing price before the public offering in order to

reduce the risk that the underwriters will be unable to sell the entire offering at

the offer price. The difference between the offer price and the recent closing

price is generally in the range two percent to three percent. Thus, the total

flotation cost, including both issuance expense and underwriter discount, could

range anywhere from five percent to eight percent of the proceeds of an equity

issue. These cost ranges have been developed and confirmed in a number of

generally accepted studies. I believe a combined five percent allowance for

flotation costs is a conservative estimate that should be used in applying the DCF

model in this proceeding.

Q.   PLEASE SUMMARIZE THE RESULTS OF YOUR APPLICATION OF THE DCF

      METHOD TO THE PROPERTY/CASUALTY INSURANCE COMPANIES AND

      THE S&P 500.

A.   As shown in Exhibits RB-18 and RB-19, the average DCF cost of equity capital

      for my group of Value Line property/casualty companies is 12.9 percent; and for

      the S&P 500 companies, 12.2 percent.

Q.   WHAT CONCLUSION DO YOU REACH FROM YOUR DCF ANALYSIS ABOUT

      THE COST OF EQUITY CAPITAL FOR COMPANIES WRITING DWELLING

      FIRE AND EXTENDED COVERAGE INSURANCE IN NORTH CAROLINA?

A.   On the basis of my DCF analysis, I would conclude that for companies writing

Dwelling Fire and Extended Coverage insurance in North Carolina the cost of

equity is in the range 12.2 percent to 12.9 percent.

Q.   YOU NOTE THAT THE SECOND METHOD YOU USE TO ESTIMATE THE

COST OF EQUITY CAPITAL FOR COMPANIES WRITING DWELLING FIRE

AND EXTENDED COVERAGE INSURANCE IN NORTH CAROLINA IS A RISK

PREMIUM APPROACH. PLEASE DESCRIBE THAT APPROACH.

A.   I perform a study of the comparable returns received by bond and stock investors

over the last ninety-three years. I estimate the returns on stock and bond

portfolios, using stock price and dividend yield data on the S&P 500 stock

portfolio and bond yield data on Moody's A–rated utility bonds.

My study consists of analyzing the historically achieved returns on broadly based

stock and bond portfolios going back to 1926. For stocks, I use the S&P 500

stock portfolio; and for bonds, I use Moody's A-rated utility bonds. The resulting

annual returns on the stock and bond portfolios purchased in each year from

1926 through 2018 are shown on Exhibit RB-21. The difference between the

stock return and the bond return over that period of time on an arithmetic

average basis is 4.7 percentage points.

Q.   WHAT CONCLUSIONS DO YOU DRAW FROM YOUR RISK PREMIUM

ANALYSES?

A.   My own studies, combined with my analysis of other studies, provide strong

evidence for the belief that investors today require an equity return of at least

4.7 percentage points above the expected yield on A-rated long-term debt issues.

The average yield on Moody's seasoned A-rated utility bonds for the three months February through April was 4.2 percent. On the basis of this information and my knowledge of bond market conditions, I conclude that the long-term yield on A-rated utility bonds is approximately 4.2 percent. Adding a 4.7 percentage point risk premium to the 4.2 percent expected yield on A-rated utility bonds, I obtain an expected return on equity of 8.9 percent.

Q.   ARE THERE REASONS TO BELIEVE THAT THE RESULT OF YOUR EX POST RISK PREMIUM ANALYSIS MAY UNDERESTIMATE THE COST OF EQUITY AT THIS TIME?

A.   Yes. The ex post risk premium model may produce an unrealistically low result because the model result is highly sensitive to the estimate of the bond yield. At this time, bond yields are unusually low, reflecting policy decisions of the United States government and the Federal Reserve Bank to keep interest rates low in order to stimulate the economy. The ex post risk premium cost of equity result is the sum of the risk premium and the bond yield; and, as a result, the use of an unusually low bond yield in the model may cause the ex post risk premium model result to underestimate the cost of equity.

Q.   BASED ON YOUR ANALYSES, WHAT IS YOUR OPINION AS TO THE COST OF CAPITAL FOR THE AVERAGE INSURANCE COMPANY WRITING

DWELLING FIRE AND EXTENDED COVERAGE INSURANCE IN NORTH

CAROLINA?

A.   Based on my review and studies, I believe that a conservative estimate of the

cost of common equity capital for the average insurance company writing

Dwelling Fire and Extended Coverage insurance in North Carolina is in the range

8.9 percent to 12.9 percent.

SUMMARY OF DISCOUNTED CASH FLOW ANALYSIS FOR
PROPERTY/CASUALTY INSURANCE COMPANIES

	COMPANY	MOST RECENT QUARTERLY DIVIDEND (d_0)	STOCK PRICE (P_0)	FORECAST OF FUTURE EARNINGS GROWTH	DCF MODEL RESULT
1	Allstate Corp.	0.500	94.084	13.3%	15.8%
2	Amer. Financial Group	0.400	97.916	6.1%	7.9%
3	Berkley (W.R.)	0.150	55.985	11.6%	12.9%
4	Chubb Ltd.	0.730	136.237	12.1%	14.6%
5	Cincinnati Financial	0.560	86.250	4.9%	7.7%
6	CNA Fin'l	0.350	44.221	6.7%	10.3%
7	Erie Indemnity	0.900	175.144	10.0%	12.4%
8	First American Financial Corp	0.420	52.380	12.5%	16.4%
9	Old Republic	0.200	21.003	10.0%	14.5%
10	RLI Corp.	0.220	71.695	9.8%	11.3%
11	Selective Ins. Group	0.200	65.252	12.3%	13.7%
12	Travelers Cos.	0.770	134.103	14.8%	17.8%
13	Average				12.9%

Note:

d_0	=	Latest quarterly dividend.
$d_1, d_2, d_3, d_4,$	=	Expected next four quarterly dividends, calculated by multiplying the last four quarterly dividends per Value Line, by the factor $(1 + g)$.
P_0	=	Average of the monthly high and low stock prices during the three months ending April 2019 per Refinitiv.
FC	=	Flotation costs.
g	=	I/B/E/S forecast of future earnings growth April 2019.
k	=	Cost of equity using the quarterly version of the DCF Model and a five percent allowance for flotation costs as shown by the formula below:

$$k = \frac{d_1(1 + k)^{.75} + d_2(1 + k)^{.50} + d_3(1 + k)^{.25} + d_4}{P_0(1 - FC)} + g$$

SUMMARY OF DISCOUNTED CASH FLOW ANALYSIS FOR
S&P 500 COMPANIES

	COMPANY	STOCK PRICE (P_0)	D_0	FORECAST OF FUTURE EARNINGS GROWTH	MODEL RESULT
1	3M	203.78	5.76	6.59%	9.8%
2	ABBOTT LABORATORIES	76.50	1.28	11.60%	13.6%
3	ABBVIE	79.97	4.28	9.59%	15.9%
4	ACCENTURE CLASS A	168.59	2.92	8.88%	10.9%
5	ACTIVISION BLIZZARD	45.10	0.37	7.30%	8.2%
6	ADV.AUTO PARTS	167.45	0.24	17.52%	17.7%
7	AGILENT TECHS.	78.38	0.66	10.65%	11.6%
8	ALBEMARLE	84.06	1.47	13.29%	15.4%
9	ALLEGION	91.44	1.08	8.67%	10.0%
10	ALTRIA GROUP	53.13	3.20	7.03%	14.0%
11	AMER.ELEC.PWR.	82.43	2.68	5.96%	9.6%
12	AMERISOURCEBERGEN	79.64	1.60	8.62%	10.9%
13	APPLE	184.31	3.08	13.00%	15.0%
14	AT&T	30.70	2.04	2.85%	10.2%
15	AVERY DENNISON	109.20	2.32	11.97%	14.5%
16	BANK OF NEW YORK MELLON	51.63	1.12	9.43%	12.0%
17	BAXTER INTL.	76.13	0.76	10.90%	12.1%
18	BECTON DICKINSON	243.74	3.08	11.67%	13.2%
19	BEST BUY	69.20	2.00	8.67%	12.0%
20	BLACKROCK	438.57	13.20	6.51%	9.9%
21	BRISTOL MYERS SQUIBB	49.15	1.64	7.58%	11.4%
22	BROWN-FORMAN 'B'	50.47	0.66	9.44%	11.0%
23	CARDINAL HEALTH	50.15	1.91	4.92%	9.2%
24	CBS 'B'	49.46	0.72	15.33%	17.1%
25	CENTERPOINT EN.	30.41	1.15	5.78%	10.1%
26	CH ROBINSON WWD.	87.80	2.00	8.19%	10.8%
27	CHUBB	136.24	2.92	10.77%	13.3%
28	CHURCH & DWIGHT CO.	68.12	0.91	8.62%	10.2%
29	CIGNA	170.73	0.04	14.51%	14.5%
30	CINTAS	202.71	2.05	14.60%	15.8%
31	CISCO SYSTEMS	52.49	1.40	9.91%	13.0%
32	CITRIX SYS.	103.11	1.40	9.13%	10.7%
33	CMS ENERGY	54.11	1.53	7.09%	10.3%
34	COCA COLA	46.85	1.60	5.35%	9.2%
35	COGNIZANT TECH.SLTN.'A'	72.10	0.80	8.81%	10.1%
36	COMCAST A	39.56	0.84	13.78%	16.3%
37	CONAGRA BRANDS	25.72	0.85	6.14%	9.9%
38	CONSTELLATION BRANDS 'A'	178.29	3.00	6.44%	8.3%
39	COSTCO WHOLESALE	228.78	2.60	10.68%	12.0%
40	COTY CL.A	10.47	0.50	7.55%	13.1%
41	CSX	73.21	0.96	11.64%	13.2%
42	CUMMINS	157.67	4.56	8.50%	11.8%

	COMPANY	STOCK PRICE (P_0)	D_0	FORECAST OF FUTURE EARNINGS GROWTH	MODEL RESULT
43	CVS HEALTH	57.54	2.00	8.25%	12.3%
44	DANAHER	125.00	0.68	8.21%	8.8%
45	DELTA AIR LINES	52.09	1.40	12.52%	15.7%
46	DENTSPLY SIRONA	46.85	0.35	8.81%	9.7%
47	DOLLAR GENERAL	117.90	1.28	11.43%	12.7%
48	DOMINION ENERGY	74.76	3.67	4.68%	10.2%
49	DXC TECHNOLOGY	65.65	0.76	9.95%	11.3%
50	E TRADE FINANCIAL	48.41	0.56	10.31%	11.7%
51	EATON	80.81	2.84	7.43%	11.5%
52	EBAY	36.76	0.56	11.24%	13.0%
53	ECOLAB	173.38	1.84	13.37%	14.6%
54	EDISON INTL.	61.74	2.45	4.79%	9.2%
55	EMERSON ELECTRIC	68.70	1.96	9.05%	12.4%
56	ESTEE LAUDER COS.'A'	158.20	1.72	10.86%	12.1%
57	EVERSOURCE ENERGY	70.03	2.14	5.72%	9.2%
58	EXPEDIA GROUP	125.06	1.28	12.77%	14.0%
59	FEDEX	182.55	2.60	8.80%	10.4%
60	FIDELITY NAT.INFO.SVS.	110.09	1.40	11.70%	13.2%
61	FOOT LOCKER	60.36	1.52	9.75%	12.7%
62	FORTIVE	81.71	0.28	12.55%	13.0%
63	FORTUNE BNS.HM.& SCTY.	47.92	0.88	8.49%	10.6%
64	GENERAL MILLS	48.41	1.96	5.36%	9.9%
65	GOLDMAN SACHS GP.	197.71	3.40	6.10%	8.0%
66	HARTFORD FINL.SVS.GP.	49.05	1.20	14.84%	17.8%
67	HCA HEALTHCARE	132.08	1.60	11.93%	13.4%
68	HERSHEY	113.13	2.89	7.85%	10.8%
69	HOME DEPOT	191.45	5.44	10.68%	14.0%
70	HONEYWELL INTL.	157.04	3.28	6.38%	8.7%
71	HUMANA	274.90	2.20	14.13%	15.1%
72	HUNT JB TRANSPORT SVS.	104.34	1.04	12.40%	13.6%
73	INGERSOLL-RAND	108.53	2.12	10.48%	12.8%
74	INTEL	52.96	1.26	7.85%	10.6%
75	INTERCONTINENTAL EX.	77.11	1.10	7.45%	9.1%
76	INTUIT	246.05	1.88	15.23%	16.2%
77	INVESCO	19.63	1.24	2.95%	10.0%
78	JOHNSON & JOHNSON	136.80	3.80	6.24%	9.4%
79	JUNIPER NETWORKS	26.90	0.76	13.23%	16.6%
80	KROGER	26.73	0.56	6.06%	8.4%
81	MARTIN MRTA.MATS.	198.66	1.92	14.64%	15.8%
82	MASCO	38.09	0.48	11.90%	13.4%
83	MAXIM INTEGRATED PRDS.	55.30	1.84	13.36%	17.4%
84	MEDTRONIC	89.96	2.00	7.77%	10.3%
85	MERCK & COMPANY	79.28	2.20	9.94%	13.2%
86	METLIFE	44.14	1.76	9.94%	14.6%
87	MICROSOFT	115.78	1.84	14.53%	16.5%
88	MONDELEZ INTERNATIONAL CL.A	48.41	1.04	5.83%	8.2%

	COMPANY	STOCK PRICE (P_0)	D_0	FORECAST OF FUTURE EARNINGS GROWTH	MODEL RESULT
89	MORGAN STANLEY	43.28	1.20	11.18%	14.5%
90	MOTOROLA SOLUTIONS	138.19	2.28	14.16%	16.2%
91	NEXTERA ENERGY	188.29	5.00	7.45%	10.5%
92	NIELSEN	25.64	1.40	4.71%	10.9%
93	NIKE 'B'	85.11	0.88	14.03%	15.3%
94	NORFOLK SOUTHERN	185.69	3.44	13.60%	15.8%
95	NORTHERN TRUST	92.67	2.40	13.63%	16.8%
96	NVIDIA	167.41	0.64	10.58%	11.0%
97	ORACLE	52.85	0.96	10.40%	12.5%
98	PARKER-HANNIFIN	173.98	3.04	9.12%	11.1%
99	PEPSICO	119.22	3.82	4.92%	8.5%
100	PERKINELMER	94.58	0.28	12.59%	12.9%
101	PFIZER	41.80	1.44	5.50%	9.4%
102	PINNACLE WEST CAP.	93.20	2.95	4.56%	8.1%
103	PNC FINL.SVS.GP.	126.54	3.80	8.46%	11.9%
104	PPG INDUSTRIES	111.75	1.92	9.29%	11.3%
105	PRINCIPAL FINL.GP.	51.79	2.16	6.20%	10.9%
106	PROCTER & GAMBLE	101.28	2.98	6.24%	9.6%
107	PVH	120.38	0.15	11.82%	12.0%
108	QUEST DIAGNOSTICS	88.10	2.12	5.61%	8.3%
109	RALPH LAUREN CL.A	125.39	2.50	11.92%	14.3%
110	REPUBLIC SVS.'A'	78.54	1.50	11.93%	14.2%
111	ROCKWELL AUTOMATION	177.52	3.88	8.61%	11.1%
112	ROSS STORES	94.16	1.02	9.93%	11.2%
113	SEALED AIR	44.39	0.64	15.28%	17.0%
114	SHERWIN-WILLIAMS	433.62	4.52	14.01%	15.3%
115	SKYWORKS SOLUTIONS	83.84	1.52	11.18%	13.3%
116	SOUTHWEST AIRLINES	53.90	0.64	12.04%	13.4%
117	STANLEY BLACK & DECKER	136.93	2.64	8.31%	10.5%
118	STATE STREET	69.23	1.88	5.95%	9.0%
119	STRYKER	187.23	2.08	10.48%	11.8%
120	SYMANTEC	23.10	0.30	10.57%	12.1%
121	SYSCO	67.04	1.56	9.79%	12.5%
122	TEXAS INSTRUMENTS	108.72	3.08	8.04%	11.3%
123	THERMO FISHER SCIENTIFIC	259.59	0.76	10.82%	11.2%
124	TIFFANY & CO	98.93	2.20	8.96%	11.5%
125	TJX	52.16	0.92	9.42%	11.5%
126	TOTAL SYSTEM SERVICES	95.00	0.52	12.70%	13.4%
127	TRACTOR SUPPLY	95.77	1.24	11.41%	12.9%
128	UNION PACIFIC	167.47	3.52	12.78%	15.3%
129	UNITED PARCEL SER.'B'	108.91	3.84	9.07%	13.2%
130	UNITEDHEALTH GROUP	243.94	3.60	14.51%	16.3%
131	UNIVERSAL HEALTH SVS.'B'	132.89	0.40	11.51%	11.9%
132	V F	87.52	2.04	13.39%	16.2%
133	VERISK ANALYTICS CL.A	129.47	1.00	9.94%	10.8%
134	VERIZON COMMUNICATIONS	57.07	2.41	4.19%	8.9%

	COMPANY	STOCK PRICE (P_0)	D_0	FORECAST OF FUTURE EARNINGS GROWTH	MODEL RESULT
135	VIACOM 'B'	28.85	0.80	4.98%	8.1%
136	WALGREENS BOOTS ALLIANCE	65.22	1.76	5.12%	8.1%
137	WASTE MANAGEMENT	100.57	2.05	10.50%	12.9%
138	WEC ENERGY GROUP	76.44	2.36	4.62%	8.1%
139	WHIRLPOOL	137.95	4.80	8.60%	12.6%
140	WILLIS TOWERS WATSON	174.28	2.60	10.94%	12.7%
141	ZOETIS	95.56	0.66	14.63%	15.5%
142	Average				12.2%

Note: In applying the DCF Model to the S&P 500, I include in the DCF analysis only those companies in the S&P 500 group which pay a dividend, have a positive growth rate, and have at least three analysts' long-term growth estimates. In addition, I exclude all companies in the I/B/E/S group of insurance companies. I also eliminate those companies with DCF results that vary from the mean by one standard deviation or more.

D_0	=	Latest dividend per Refinitiv.
d_0	=	Latest quarterly dividend.
P_0	=	Average of monthly high and low stock prices February, March, and April 2019 per Refinitiv.
FC	=	Selling and flotation costs.
g	=	I/B/E/S forecast of future earnings growth April 2019.
k	=	Cost of equity using the quarterly version of the DCF Model and a five percent allowance for flotation costs as shown by the formula below:

$$k = \left[\frac{d_0(1+g)^{\frac{1}{4}}}{P_0(1-FC)} + (1+g)^{\frac{1}{4}} \right]^4 - 1$$

THE QUARTERLY DCF MODEL

The simple DCF Model assumes that a firm pays dividends only at the end of each year. Since firms in fact pay dividends quarterly and investors appreciate the time value of money, the annual version of the DCF Model generally underestimates the value investors are willing to place on the firm's expected future dividend stream. In this appendix, we review two alternative formulations of the DCF Model that allow for the quarterly payment of dividends.

When dividends are assumed to be paid annually, the DCF Model suggests that the current price of the firm's stock is given by the expression:

$$P_0 = \frac{D_1}{(1+k)} + \frac{D_2}{(1+k)^2} + \ldots + \frac{D_n + P_n}{(1+k)^n} \quad (1)$$

where

P_0	=	current price per share of the firm's stock,
$D_1, D_2,\ldots,D_n$	=	expected annual dividends per share on the firm's stock,
P_n	=	price per share of stock at the time investors expect to sell the stock, and
k	=	return investors expect to earn on alternative investments of the same risk, i.e., the investors' required rate of return.

Unfortunately, expression (1) is rather difficult to analyze, especially for the purpose of estimating k. Thus, most analysts make a number of simplifying assumptions. First, they assume that dividends are expected to grow at the constant rate g into the indefinite future. Second, they assume that the stock price at time n is simply the present value of all dividends expected in periods subsequent to n. Third, they assume that the investors' required rate of return, k, exceeds the expected dividend growth rate g. Under the above simplifying assumptions, a firm's stock price may be written as the following sum:

$$P_0 = \frac{D_0(1+g)}{(1+k)} + \frac{D_0(1+g)^2}{(1+k)^2} + \frac{D_0(1+g)^3}{(1+k)^3} + \dots , \qquad (2)$$

where the three dots indicate that the sum continues indefinitely.

As we shall demonstrate shortly, this sum may be simplified to:

$$P_0 = \frac{D_0(1+g)}{(k-g)}$$

First, however, we need to review the very useful concept of a geometric progression.

Geometric Progression

Consider the sequence of numbers 3, 6, 12, 24,…, where each number after the first is obtained by multiplying the preceding number by the factor 2. Obviously, this sequence of numbers may also be expressed as the sequence 3, 3 x 2, 3 x 2^2, 3 x 2^3, … This sequence is an example of a geometric progression.

Definition: A geometric progression is a sequence in which each term after the first is obtained by multiplying some fixed number, called the common ratio, by the preceding term.

A general notation for geometric progressions is: a, the first term, r, the common ratio, and n, the number of terms. Using this notation, any geometric progression may be represented by the sequence:

$$a, ar, ar^2, ar^3, \ldots, ar^{n-1}.$$

In studying the DCF Model, we will find it useful to have an expression for the sum of n terms of a geometric progression. Call this sum S_n. Then

$$S_n = a + ar + \ldots + ar^{n-1} . \qquad (3)$$

However, this expression can be simplified by multiplying both sides of equation (3) by r and then subtracting the new equation from the old. Thus,

$$rS_n = ar + ar^2 + ar^3 + \ldots + ar^n$$

and

$$S_n - rS_n = a - ar^n ,$$

or

$$(1 - r) S_n = a (1 - r^n) .$$

Solving for S_n, we obtain:

$$S_n = \frac{a(1 - r^n)}{(1 - r)} \qquad (4)$$

as a simple expression for the sum of n terms of a geometric progression. Furthermore, if $|r| < 1$, then S_n is finite, and as n approaches infinity, S_n approaches $a \div (1 - r)$. Thus, for a geometric progression with an infinite number of terms and $|r| < 1$, equation (4) becomes:

$$S = \frac{a}{1-r} \qquad (5)$$

<u>Application to DCF Model</u>

Comparing equation (2) with equation (3), we see that the firm's stock price (under

the DCF assumption) is the sum of an infinite geometric progression with the first term

$$a = \frac{D_0(1+g)}{(1+k)}$$

and common factor

$$r = \frac{(1+g)}{(1+k)}$$

Applying equation (5) for the sum of such a geometric progression, we obtain

$$S = a \cdot \frac{1}{(1-r)} = \frac{D_0(1+g)}{(1+k)} \cdot \frac{1}{1-\frac{1+g}{1+k}} = \frac{D_0(1+g)}{(1+k)} \cdot \frac{1+k}{k-g} = \frac{D_0(1+g)}{k-g}$$

as we suggested earlier.

Quarterly DCF Model

The Annual DCF Model assumes that dividends grow at an annual rate of g% per year (see Figure 1).

Figure 1

Annual DCF Model

D_0 D_1

0   1

Year

$D_0 = 4d_0$ $D_1 = D_0(1 + g)$

Figure 2

Quarterly DCF Model (Constant Growth Version)

d_0 d_1 d_2 d_3 D_4

0   1
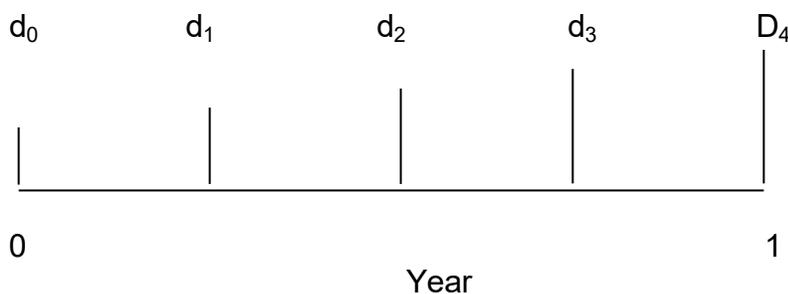
Year

$d_1 = d_0(1+g)^{.25}$ $d_2 = d_0(1+g)^{.50}$

$d_3 = d_0(1+g)^{.75}$ $d_4 = d_0(1+g)$

In the Quarterly DCF Model, it is natural to assume that quarterly dividend payments differ from the preceding quarterly dividend by the factor $(1 + g)^{.25}$, where g is expressed in terms of percent per year and the decimal .25 indicates that the growth has only occurred for one quarter of the year. (See Figure 2.) Using this assumption, along with the assumption of constant growth and **k** > **g**, we obtain a new expression for the firm's stock price, which takes account of the quarterly payment of dividends. This expression is:

$$P_0 = \frac{d_0(1+g)^{\frac{1}{4}}}{(1+k)^{\frac{1}{4}}} + \frac{d_0(1+g)^{\frac{2}{4}}}{(1+k)^{\frac{2}{4}}} + \frac{d_0(1+g)^{\frac{3}{4}}}{(1+k)^{\frac{3}{4}}} + \ldots \qquad (6)$$

where d_0 is the last quarterly dividend payment, rather than the last annual dividend payment. (We use a lower case d to remind the reader that this is not the annual dividend.)

Although equation (6) looks formidable at first glance, it too can be greatly simplified using the formula [equation (4)] for the sum of an infinite geometric progression. As the reader can easily verify, equation (6) can be simplified to:

$$P_0 = \frac{d_0(1+g)^{\frac{1}{4}}}{(1+k)^{\frac{1}{4}} - (1+g)^{\frac{1}{4}}} \qquad (7)$$

Solving equation (7) for **k**, we obtain a DCF formula for estimating the cost of equity under the quarterly dividend assumption:

$$k = \left[\frac{d_0(1 + g)^{\frac{1}{4}}}{P_0} + (1 + g)^{\frac{1}{4}} \right]^4 - 1 \qquad \textbf{(8)}$$

<u>An Alternative Quarterly DCF Model</u>

Although the constant growth Quarterly DCF Model [equation (8)] allows for the quarterly timing of dividend payments, it does require the assumption that the firm increases its dividend payments each quarter. Since this assumption is difficult for some analysts to accept, we now discuss a second Quarterly DCF Model that allows for constant quarterly dividend payments within each dividend year.

Assume then that the firm pays dividends quarterly and that each dividend payment is constant for four consecutive quarters. There are four cases to consider, with each case distinguished by varying assumptions about where we are evaluating the firm in relation to the time of its next dividend increase. (See Figure 3.)

Figure 3

Quarterly DCF Model (Constant Dividend Version)

Case 1

d_0 d_1 d_2 d_3 d_4

0 ——————————————————— 1

Year
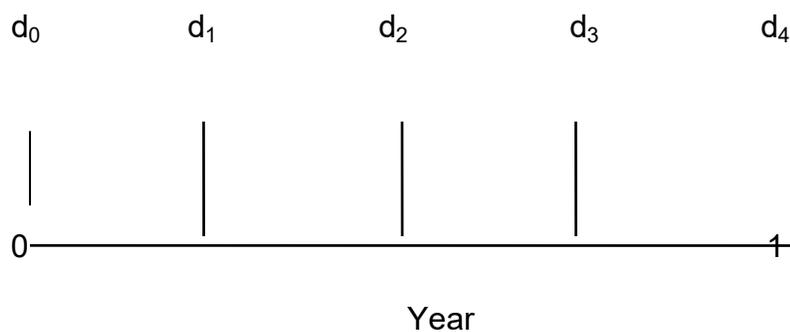
$$d_1 = d_2 = d_3 = d_4 = d_0(1+g)$$

Case 2

d_0 d_1 d_2 d_3 d_4

0   1
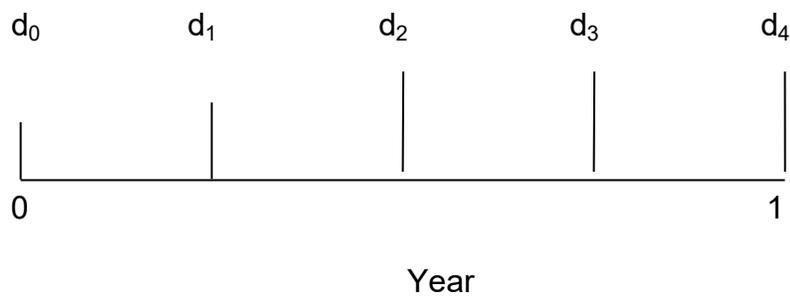
Year

$$d_1 = d_0$$

$$d_2 = d_3 = d_4 = d_0(1+g)$$

Figure 3 (continued)

Case 3

d_0 d_1 d_2 d_3 d_4

0   1
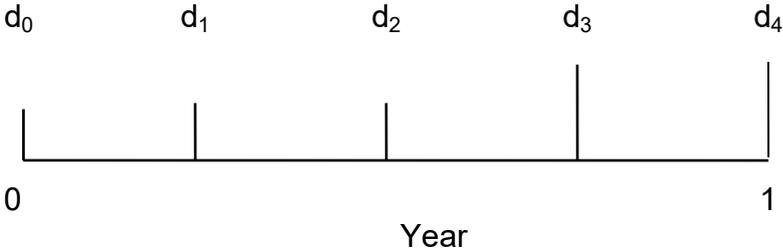
Year

$d_1 = d_2 = d_0$

$d_3 = d_4 = d_0(1+g)$

Case 4

d_0 d_1 d_2 d_3 d_4

0   1
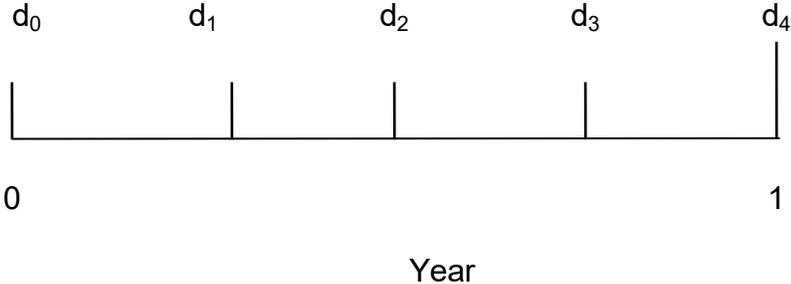
Year

$d_1 = d_2 = d_3 = d_0$

$d_4 = d_0(1+g)$

If we assume that the investor invests the quarterly dividend in an alternative investment of the same risk, then the amount accumulated by the end of the year will in all cases be given by

$$D_1{}^* = d_1 (1+k)^{3/4} + d_2 (1+k)^{1/2} + d_3 (1+k)^{1/4} + d_4$$

where d_1, d_2, d_3 and d_4 are the four quarterly dividends. Under these new assumptions, the firm's stock price may be expressed by an Annual DCF Model of the form (2), with the exception that

$$D_1{}^* = d_1 (1 + k)^{3/4} + d_2 (1 + k)^{1/2} + d_3 (1 + k)^{1/4} + d_4 \qquad (9)$$

is used in place of $D_0(1+g)$. But, we already know that the Annual DCF Model may be reduced to

$$P_0 = \frac{D_0(1+g)}{k-g}$$

Thus, under the assumptions of the second Quarterly DCF Model, the firm's cost of equity is given by

$$k = \frac{D_1{}^*}{P_0} + g \qquad (10)$$

with $D_1{}^*$ given by (9).

Although equation (10) looks like the Annual DCF Model, there are at least two very

important practical differences. First, since $D_1{}^*$ is always greater than $D_0(1+g)$, the estimates

of the cost of equity are always larger (and more accurate) in the Quarterly Model (10) than

in the Annual Model. Second, since $D_1{}^*$ depends on k through equation (9), the unknown

"k" appears on both sides of (10), and an iterative procedure is required to solve for k.

COMPARATIVE RETURNS ON S&P 500 STOCKS
AND MOODY'S A-RATED UTILITY BONDS 1926-2018

YEAR	S&P 500 STOCK PRICE	STOCK DIVIDEND YIELD	STOCK RETURN	A-RATED BOND PRICE	BOND RATE OF RETURN	RISK PREMIUM
2018	2,789.80	0.0198	-4.56%	$102.46	-2.59%	-1.97%
2017	2,275.12	0.0209	24.71%	$96.13	10.75%	13.97%
2016	1,918.60	0.0222	20.80%	$95.48	4.87%	15.93%
2015	2,028.18	0.0208	-3.32%	$107.65	-7.59%	4.26%
2014	1,822.36	0.0210	13.39%	$89.89	24.20%	-10.81%
2013	1,481.11	0.0220	25.24%	$97.45	-3.65%	28.89%
2012	1,300.58	0.0214	16.02%	$94.36	7.52%	8.50%
2011	1,282.62	0.0185	3.25%	$77.36	27.14%	-23.89%
2010	1,123.58	0.0203	16.18%	$75.02	8.44%	7.74%
2009	865.58	0.0310	32.91%	$68.43	15.48%	17.43%
2008	1,378.76	0.0206	-35.16%	$72.25	0.24%	-35.40%
2007	1,424.16	0.0181	-1.38%	$72.91	4.59%	-5.97%
2006	1,278.72	0.0183	13.20%	$75.25	2.20%	11.01%
2005	1,181.41	0.0177	10.01%	$74.91	5.80%	4.21%
2004	1,132.52	0.0162	5.94%	$70.87	11.34%	-5.40%
2003	895.84	0.0180	28.22%	$62.26	20.27%	7.95%
2002	1,140.21	0.0138	-20.05%	$57.44	15.35%	-35.40%
2001	1,335.63	0.0116	-13.47%	$56.40	8.93%	-22.40%
2000	1,425.59	0.0118	-5.13%	$52.60	14.82%	-19.95%
1999	1,248.77	0.0130	15.46%	$63.03	-10.20%	25.66%
1998	963.36	0.0162	31.25%	$62.43	7.38%	23.87%
1997	766.22	0.0195	27.68%	$56.62	17.32%	10.36%
1996	614.42	0.0231	27.02%	$60.91	-0.48%	27.49%
1995	465.25	0.0287	34.93%	$50.22	29.26%	5.68%
1994	472.99	0.0269	1.05%	$60.01	-9.65%	10.71%
1993	435.23	0.0288	11.56%	$53.13	20.48%	-8.93%
1992	416.08	0.0290	7.50%	$49.56	15.27%	-7.77%
1991	325.49	0.0382	31.65%	$44.84	19.44%	12.21%
1990	339.97	0.0341	-0.85%	$45.60	7.11%	-7.96%
1989	285.41	0.0364	22.76%	$43.06	15.18%	7.58%
1988	250.48	0.0366	17.61%	$40.10	17.36%	0.25%
1987	264.51	0.0317	-2.13%	$48.92	-9.84%	7.71%
1986	208.19	0.0390	30.95%	$39.98	32.36%	-1.41%
1985	171.61	0.0451	25.83%	$32.57	35.05%	-9.22%
1984	166.39	0.0427	7.41%	$31.49	16.12%	-8.72%
1983	144.27	0.0479	20.12%	$29.41	20.65%	-0.53%
1982	117.28	0.0595	28.96%	$24.48	36.48%	-7.51%
1981	132.97	0.0480	-7.00%	$29.37	-3.01%	-3.99%
1980	110.87	0.0541	25.34%	$34.69	-3.81%	29.16%
1979	99.71	0.0533	16.52%	$43.91	-11.89%	28.41%
1978	90.25	0.0532	15.80%	$49.09	-2.40%	18.20%
1977	103.80	0.0399	-9.06%	$50.95	4.20%	-13.27%

COMPARATIVE RETURNS ON S&P 500 STOCKS
AND MOODY'S A-RATED UTILITY BONDS 1926-2018

YEAR	S&P 500 STOCK PRICE	STOCK DIVIDEND YIELD	STOCK RETURN	A-RATED BOND PRICE	BOND RATE OF RETURN	RISK PREMIUM
1976	96.86	0.0380	10.96%	$43.91	25.13%	-14.17%
1975	72.56	0.0507	38.56%	$41.76	14.75%	23.81%
1974	96.11	0.0364	-20.86%	$52.54	-12.91%	-7.96%
1973	118.40	0.0269	-16.14%	$58.51	-3.37%	-12.77%
1972	103.30	0.0296	17.58%	$56.47	10.69%	6.89%
1971	93.49	0.0332	13.81%	$53.93	12.13%	1.69%
1970	90.31	0.0356	7.08%	$50.46	14.81%	-7.73%
1969	102.00	0.0306	-8.40%	$62.43	-12.76%	4.36%
1968	95.04	0.0313	10.45%	$66.97	-0.81%	11.26%
1967	84.45	0.0351	16.05%	$78.69	-9.81%	25.86%
1966	93.32	0.0302	-6.48%	$86.57	-4.48%	-2.00%
1965	86.12	0.0299	11.35%	$91.40	-0.91%	12.26%
1964	76.45	0.0305	15.70%	$92.01	3.68%	12.02%
1963	65.06	0.0331	20.82%	$93.56	2.61%	18.20%
1962	69.07	0.0297	-2.84%	$89.60	8.89%	-11.73%
1961	59.72	0.0328	18.94%	$89.74	4.29%	14.64%
1960	58.03	0.0327	6.18%	$84.36	11.13%	-4.95%
1959	55.62	0.0324	7.57%	$91.55	-3.49%	11.06%
1958	41.12	0.0448	39.74%	$101.22	-5.60%	45.35%
1957	45.43	0.0431	-5.18%	$100.70	4.49%	-9.67%
1956	44.15	0.0424	7.14%	$113.00	-7.35%	14.49%
1955	35.60	0.0438	28.40%	$116.77	0.20%	28.20%
1954	25.46	0.0569	45.52%	$112.79	7.07%	38.45%
1953	26.18	0.0545	2.70%	$114.24	2.24%	0.46%
1952	24.19	0.0582	14.05%	$113.41	4.26%	9.79%
1951	21.21	0.0634	20.39%	$123.44	-4.89%	25.28%
1950	16.88	0.0665	32.30%	$125.08	1.89%	30.41%
1949	15.36	0.0620	16.10%	$119.82	7.72%	8.37%
1948	14.83	0.0571	9.28%	$118.50	4.49%	4.79%
1947	15.21	0.0449	1.99%	$126.02	-2.79%	4.79%
1946	18.02	0.0356	-12.03%	$126.74	2.59%	-14.63%
1945	13.49	0.0460	38.18%	$119.82	9.11%	29.07%
1944	11.85	0.0495	18.79%	$119.82	3.34%	15.45%
1943	10.09	0.0554	22.98%	$118.50	4.49%	18.49%
1942	8.93	0.0788	20.87%	$117.63	4.14%	16.73%
1941	10.55	0.0638	-8.98%	$116.34	4.55%	-13.52%
1940	12.30	0.0458	-9.65%	$112.39	7.08%	-16.73%
1939	12.50	0.0349	1.89%	$105.75	10.05%	-8.16%
1938	11.31	0.0784	18.36%	$99.83	9.94%	8.42%
1937	17.59	0.0434	-31.36%	$103.18	0.63%	-31.99%
1936	13.76	0.0327	31.10%	$96.46	11.12%	19.99%
1935	9.26	0.0424	52.84%	$82.23	22.17%	30.66%
1934	10.54	0.0336	-8.78%	$66.78	29.13%	-37.91%
1933	7.09	0.0542	54.08%	$79.55	-11.03%	65.11%

COMPARATIVE RETURNS ON S&P 500 STOCKS
AND MOODY'S A-RATED UTILITY BONDS 1926-2018

YEAR	S&P 500 STOCK PRICE	STOCK DIVIDEND YIELD	STOCK RETURN	A-RATED BOND PRICE	BOND RATE OF RETURN	RISK PREMIUM
1932	8.30	0.0822	-6.36%	$70.67	18.23%	-24.59%
1931	15.98	0.0550	-42.56%	$84.49	-11.63%	-30.93%
1930	21.71	0.0438	-22.01%	$81.19	8.99%	-31.00%
1929	24.86	0.0336	-9.31%	$83.95	1.48%	-10.79%
1928	17.53	0.0431	46.12%	$86.71	1.43%	44.69%
1927	13.40	0.0502	35.84%	$83.28	8.92%	26.92%
1926	12.65	0.0446	10.39%	$80.81	8.01%	2.38%
Average 1926 - 2018			11.57%		6.82%	4.69%

Note: See Page 4 for an explanation of how stock and bond returns are derived and the source of the data presented.

COMPARATIVE RETURNS ON S&P 500 STOCKS
AND MOODY'S A-RATED UTILITY BONDS 1926-2018

RISK PREMIUM APPROACH

SOURCE OF DATA

Stock price and yield information is obtained from Standard & Poor's Security Price publication. Standard & Poor's derives the stock dividend yield by dividing the aggregate cash dividends (based on the latest known annual rate) by the aggregate market value of the stocks in the group. The bond price information is obtained by calculating the present value of a bond due in thirty years with a $4.00 coupon and a yield to maturity of a particular year's indicated Moody's A-rated Utility bond yield. The values shown on the ex post risk premium schedule are the January values of the respective indices.

Calculation of Stock and Bond Returns

Sample calculation of "Stock Return" column:

$$StockReturn(2018) = \left[\frac{StockPrice(2019) - StockPrice(2018) + Dividend(2018)}{StockPrice(2018)} \right]$$

where Dividend (2018) = Stock Price (2018) x Stock Div. Yield (2018)

Sample calculation of "Bond Return" column:

$$BondReturn(2018) = \left[\frac{Bond\ Price(2019) - Bond\ Price(2018) + Interest\ (2018)}{Bond\ Price(2018)} \right]$$

where Interest = $4.00.

PREFILED TESTIMONY
OF
GEORGE ZANJANI

DWELLING INSURANCE RATE FILING
NORTH CAROLINA RATE BUREAU
AUGUST, 2019

I.   Qualifications and Summary

Q: What is your name, occupation, and business address?

A: My name is George Zanjani. I am Professor of Finance and the holder of the Frank Park Samford Chair of Insurance at the University of Alabama. My business address is 1074 Alderwood Lane NE, Marietta, Georgia 30068.

Q: Please describe your educational and employment background.

A: A complete curriculum vitae is attached as Exhibit RB-26 with this testimony. To summarize, my undergraduate studies were at Stanford University from 1987-1990, where I earned an A.B./B.S in Economics and Biology. I joined the commercial lines actuarial department of Fireman's Fund Insurance Companies in 1990 as an Assistant Actuarial Analyst. Upon leaving in 1994, I was a Senior Actuarial Analyst, an Associate of the Casualty Actuarial Society, and the head of the company's Workers Compensation actuarial unit. I did my graduate studies in Economics at the University of Chicago, earning a Ph.D. in 2000. I joined the Research Department of the Federal Reserve Bank of New York in the Capital Markets Function as a Research Economist in 2000, leaving as a Senior Economist in 2008. I joined the Robinson College of Business of Georgia State University in 2008 as an Associate Professor of Risk Management and Insurance and was honored as the inaugural holder of the AAMGA Distinguished Chair in Risk Management and Insurance in 2011. I started my current position in 2017.

Q: Please elaborate on some of your professional activities.

A: My professional career has been focused on insurance.   After four years of actuarial work in commercial lines insurance, my dissertation addressed the economics of insurance pricing. I specialized on insurance issues while at the Federal Reserve Bank of New York. In particular, I served for the Bank on the Presidential Working Group on Financial Markets during its review of the renewal of the Terrorism Risk Insurance Act in 2006 and on the Committee on the Global Financial System Task Force on Institutional Investors, Global Savings, and Asset Allocation.

 My academic service activities include 1) service as referee for various academic journals, 2) service as an associate editor of the *Journal of Insurance Issues*, and 3) (current) service as a senior editor for the *Journal of Risk and Insurance*. In addition, I have served on the Board of the American Risk and Insurance Association and served as President of that association. I have also served as President of the Risk Theory Society. I currently serve on the International Research Advisory Board of National Chengchi University.

 As an academic, I continue to write on insurance pricing, participate in academic conferences on insurance, and engage in various sponsored research and consulting activities related to insurance. The latter activities include two research projects on capital allocation sponsored by the Casualty Actuarial Society during the last decade and a project on the financial crisis and the insurance industry sponsored by the Society of Actuaries in 2009. In addition, I have taught various courses at the undergraduate and graduate levels over the past decade, including classes on financial risk management, risk modeling, and property-casualty insurance.

Q: Have you published any papers or books?

A: Yes. I have published various articles, book chapters, reviews, and white papers on insurance pricing and other aspects of insurance markets. Published or forthcoming work includes articles on insurance topics in the *American Economic Review*, *Insurance: Mathematics and Economics*, the *Journal of Financial Economics*, the *Journal of Public Economics*, the *Journal of Risk and Insurance*, *Management Science,* and the *North American Actuarial Journal.* My co-authors and I have two chapters in the 2013 edition of the Handbook of Insurance, one on capital allocation for insurance companies, and the other on the financial pricing of insurance. Two papers have won awards for their contributions to the field of actuarial science: I received the 2010 ARIA award from the Casualty Actuarial Society and shared the 2015 Charles A. Hachemeister Prize (also from the Casualty Actuarial Society) with a co-author.

Q: Are you a member of any professional organizations?

A: I am a member of the American Economic Association, the American Finance Association, the American Risk and Insurance Association, and the Risk Theory Society. I am also an Associate of the Casualty Actuarial Society.   I served on the Board of Directors of the American Risk and Insurance Association from 2007 to 2014 and served as President in 2012-2013. I served as President of the Risk Theory Society in 2012.

Q: Have you ever testified in insurance rate regulatory proceedings?

A: Yes. I have offered testimony in workers compensation insurance rate filings in Florida (2015 and 2017) and Virginia (2016). In addition, I have supplied testimony for the 2019 Private Passenger Auto and Mobile Homeowners rate filings in North Carolina.

Q: What was the nature of your testimony in those previous cases?

A: In the Florida and Virginia cases, I offered testimony on the underwriting profit factors used in the rates. Specifically, I evaluated the suitability of the methods and assumptions used to develop those factors, as well as whether the rate of return on capital implied by those factors was reasonable. For the North Carolina filings, I estimated the rate of return on capital implied by the selected underwriting profit factors and assessed whether that rate of return was reasonable.

Q: What is the purpose of your testimony?

A: I was asked by the North Carolina Rate Bureau, as a financial economist with expertise in insurance, 1) to assist the Bureau committee with the underwriting profit factor selection, 2) to determine the expected return on insurance net worth implicit in the filing, and 3) to assess

whether the expected return on net worth constitutes a reasonable rate of return and thus whether the selected underwriting profit factor selection satisfies North Carolina's statutory requirements.

Q: Please summarize the main findings of your testimony.

A: Using a pro forma return model, I analyzed how the selected underwriting profit provisions used in the filing translate into expected returns on net worth. Consistent with previous filings, and with North Carolina law stipulating that the investment income earned on capital and surplus is not to be considered in determining the appropriate rate of return for the insurance industry, I refer to the expected return on net worth without including investment income on capital and surplus as the *statutory return*. When calculating the expected return on net worth including investment income earned on capital and surplus, I refer to the figure as the *total return.*   My calculations are detailed in Exhibits RB-23 and RB-24 and are summarized below:

Return Definition	Fire	Extended Coverage
Statutory Return	7.88%	6.55%
Total Return	10.99%	10.12%

I then reviewed Dr. Vander Weide's testimony on the cost of insurance capital and considered other third-party estimates of the cost of insurance capital. I also considered adjustments to those cost of capital estimates that I deemed necessary for the North Carolina Dwelling insurance market. In particular, since non-public companies underwrite a significant portion of the market, I considered the effects of non-public ownership on the cost of equity. Ultimately, I found the expected returns implied by the underwriting profit provisions used in the filing to be reasonable and not excessive. Specifically, the expected returns fall toward the lower end of the range of cost of equity estimates produced by Dr. Vander Weide and others. Moreover, my conclusion is unchanged after adjusting the cost of capital to reflect both 1) the presence of debt financing at insurance holding companies and 2) a market value-to-book value premium at insurance holding companies.

II.   Expected Return on Net Worth

Q: In general terms, how did you determine the expected return on net worth implied by the underwriting profit provision used in the filing?

A: I used a *pro forma* return model similar to that used in previous filings in North Carolina. The model accounts for underwriting income, installment payment income, investment income on unearned premium and loss/loss adjustment expense (LAE) reserves, and taxes as a percentage of premium. Total after-tax income from these sources (as a percentage of premium) is then related to net worth (as a percentage of premium) to obtain an expected return on net worth.

Q: What do you mean by *pro forma*?

A: The model is *pro forma* in the sense that it assumes 1) that the indicated rate change will be implemented and 2) that all loss, expense, and investment return realizations will coincide with their projected expected values.

The results of the model and supporting information are presented in Exhibits RB-23 and RB-24.

Q: Could you state what you mean by "net worth"?

A: Net worth is the book value of equity of a company under Generally Accepted Accounting Principles (GAAP) rather than Statutory Accounting Principles (SAP).

Q: Did you account for investment income on capital and surplus in calculating the expected return?

A: It is my understanding that North Carolina law provides that insurance rates are to be set such that those rates are expected to provide a return to insurers that is equal to the returns of industries of comparable risk and that, in calculating that expected return, the investment income on capital and surplus is to be excluded from consideration. Therefore, I present the expected return projected to result from the selected underwriting profit provision excluding investment income on capital and surplus.   However, for informational purposes, I also present the expected return projected to result from the selected underwriting profit provision including investment income on capital and surplus.

Q: Would you please elaborate on the elements of the return and how they are calculated?

A: The return is composed of underwriting profit (Line 2 of Exhibits RB-23/RB-24, Pages 1 and 1A), installment fee income (Line 3 of Exhibits RB-23/RB-24, Pages 1 and 1A) and investment gain on insurance transaction (Line 7 of Exhibits RB-23/RB-24, Pages 1 and 1A). In the calculation that includes investment income on surplus for informational purposes, I additionally include investment gain on surplus (Line 8 of Exhibits RB-23/RB-24, Page 1A). (Please note that, in my exhibits and sometimes in my testimony, I refer to investment income on surplus as a shorthand reference to investment income on capital and surplus.) All of the foregoing income components are adjusted for taxes. The components are discussed in greater detail below:

Underwriting profit and installment fee income - As a matter of arithmetic and definition, the underwriting profit as a percentage of premium matches the underwriting profit provision selected by the NCRB. It is the percentage of premium left over after accounting for the loss and expense provisions, with the projected loss and LAE ratio and fixed expense (Other Acquisition and General) ratios being adjusted to reflect the indicated rate change. Installment fee income is based on the average installment charges as a percentage of premium over the past five years (Exhibits RB-23/RB-24, Page 3). The underwriting profit income and installment fee income are both assumed to be taxed at the current corporate rate of 21% (Line 4 of Exhibits RB-23/RB-24, Pages 1 and 1A), as revised in the Tax Cut and Jobs Act of 2017. I also account for additional tax liabilities relating to IRS rules regarding the treatment of unearned premium reserves and of loss reserves (Line 5 of Exhibits RB-23/RB-24, Pages 1 and 1A). Details of the calculation of these additional tax liabilities are found on Pages 4 to 6 of Exhibits RB-23/RB-24.

Net Investment Gain on Insurance Transaction – This portion of the return reflects investment income on investible funds generated by the insurance transaction. Specifically, this quantity is estimated as the product of an investment yield and the average loss/LAE and unearned premium reserves. An adjustment is made for investment income on agents balances (specifically, to account for the fact that agents balances, which are premiums held by agents and not yet remitted to the company, are not available for investment by the insurance company). The details of the estimation of investible reserves and the investment income generated from those reserves are found on Pages 7 to 9 of Exhibits RB-23/RB-24. The tax liability is based on a weighted average of estimated tax rates on the different sources of investment income, with the weights based on the composition of the overall property-casualty industry portfolio.

Investment Gain on Surplus – This portion of the return reflects investment income generated from surplus. The investment yield is applied to investible surplus, the amount of which is based on the ten-year average premium-to-surplus ratio for groups writing Dwelling insurance in North Carolina from Page 14 of Exhibits RB-23/RB-24.   The tax liability is again based on a weighted average of estimated tax rates on the different sources of investment income, with the weights based on the composition of the overall property-casualty industry portfolio.

These components of after-tax return, which are all denominated as a percent of premium, are then summed and related to net worth. This is accomplished by multiplying the returns as percent of premium by the product of the premium-to-surplus ratio from Page 14 of Exhibits RB-23/RB-24 and the inverse of the industry-wide net worth-to-surplus ratio from Page 15 of Exhibits RB-23/RB-24.

Q: Please explain how the investment yield is calculated.

A: My understanding is that the conventional approach in North Carolina, based on a decision by the Commissioner in the 1990's, is to estimate the investment yield as an average of the ”embedded yield” based on the industry statutory annual statement reports and a "current yield" based on current market rates. I have followed this convention in my analysis. For the current yield, I start with the overall industry invested asset portfolio and use various sources to estimate the current market yields for those assets. Sources for current market rates, and a summary of the overall calculation, are provided on Page 11 of Exhibits RB-23/RB-24. For each of the bond subcategories, I obtain a maturity distribution for the industry portfolio in that subcategory from the Schedule D summary exhibits and match each maturity level from the exhibits to a corresponding bond yield of similar maturity, so that the average yield shown on Page 11 is a weighted average across maturities according to the industry portfolio. The overall pre-tax current yield on the industry portfolio as thus determined is 4.32%. The embedded yield calculations, based on the actual investment income reported by the industry, are shown on Pages 12 and 13 of Exhibits RB-23/RB-24; the pre-tax embedded yield is 3.42%. For the pro forma calculations, I average these two figures to obtain 3.87% (shown on Page 10 of Exhibits RB-23/RB-24).

The tax liability for investment income is determined for each asset class, reflecting tax advantages as appropriate on municipal bond interest, preferred and common stock dividends, and capital gains on stock. The expected return on equity is split into a capital gain and dividend

component, for tax purposes, based on the experience of the S&P 500 over the 1998-2018 period.

Q: What is the expected return on net worth?

A: To calculate the implied return on insurance company equity, components of after-tax return are summed and related to net worth, which, as a percentage of premium, is calculated based on the product of the premium-to-surplus ratio from Page 14 of Exhibits RB-23/RB-24 and the inverse of the industry-wide net worth-to-surplus ratio from Page 15 of Exhibits RB-23/RB-24. This approach indicates that the selected underwriting profit factor for Fire of 8.5%, if achieved, would yield an expected statutory return on net worth of 7.88% (without including investment income on surplus) and a total return on net worth of 10.99% (when including investment income on surplus). For the 8.5% underwriting profit selected for Extended Coverage, the corresponding return figures are 6.55% and 10.12%.

Q: How were the underwriting profit factors determined?

A: The Bureau selected the 8.5% provision for Fire and the 8.5% provision for Extended Coverage. I participated in the Bureau's Property Rating Subcommittee meeting for the discussion of the profit portion of the rate review. I described for the committee my pro forma profit analysis and provided an array of underwriting profit provisions and their associated returns on net worth, both without including investment income on surplus and including investment income on surplus. The returns shown in that array spanned the range for the cost of equity that had been provided by Dr. Vander Weide. Following my presentation and the committee discussion, the committee selected the underwriting profit factors.

III.   Rate of Return on Capital

Q: What steps did you take in the course of assessing whether the returns described above would produce a reasonable rate of return on equity?

A: I first reviewed Dr. Vander Weide's testimony. I then compared his results to other independent estimates based on various methodologies. I then made adjustments to both sets of estimates to account for the particular ownership structures that prevail in the North Carolina market. Finally, I compared the estimated statutory and total return on net worth determined in Section II above to these adjusted cost of equity estimates.

Q: What was the nature of Dr. Vander Weide's analysis?

A: The cost of equity for an industry is a difficult figure to pin down, and Dr. Vander Weide uses two approaches to estimate it. The first is a discounted cash flow (DCF) model, which estimates the cost of equity under the assumption that the current equity price is a discounted present value of future dividend cash flows. The critical input to this calculation is the dividend growth rate estimate, which he bases on analyst forecasts. His final estimates under this approach are 12.9%, which he obtains when restricting his attention to property-casualty firms specifically, and 12.2% when using the S&P 500, which he views as having generally similar risk characteristics as the property-casualty industry. The second approach is a risk premium approach, which estimates the current cost of equity as a current bond yield plus a spread, or

risk premium. This analysis, which again uses the S&P 500 for purposes of estimating the risk premium, produces an estimate of 8.9%.

Q: How do Dr. Vander Weide's estimates compare with other estimates of the cost of equity for the industry?

A: The two methods employed by Dr. Vander Weide---the DCF and the risk premium method---are perhaps the two most widely accepted and widely deployed methods for estimating the cost of equity.   However, there is substantial variation in implementation of these methods, which can have significant effects on the estimates. For example, the DCF/dividend growth model is sometimes estimated with different time period stages, with time-varying growth rates. There is also substantial methodological variation in implementation of the risk premium method---differences in averaging techniques, differences in the sample period used to estimate the risk premium, differences in the choice of the reference bond yield, differences in the methods used to estimate the relative risk of the industry of interest, and so forth. To get a sense of the import of these differences, I reviewed some additional third-party estimates of the cost of equity for the property-casualty industry, particularly those from Damodaran Online (an open-access website maintained by Aswath Damodaran, a valuation expert affiliated with New York University) and Duff & Phelps (a consultancy that took over the pioneering Ibbotson Cost of Capital franchise). The most recent estimates from Damodaran Online (January 2019) and Duff & Phelps (March 31, 2019 edition of *Valuation Handbook – U.S. Industry Cost of Capital*, for the SIC Code Composite) are listed along with Dr. Vander Weide's estimates in the table below.

Property-Casualty Industry Cost of Equity Estimates

Source	Method	Estimate
James Vander Weide	Risk Premium	8.9%
Duff & Phelps	Risk Premium (CAPM)	8.1%
Damodaran Online	Risk Premium (CAPM)	7.1%
James Vander Weide	DCF	12.2% to 12.9%
Duff & Phelps	DCF (1-stage)	17.1%
Duff & Phelps	DCF (3-stage)	16.2%
Duff & Phelps	CAPM + Size Premium	8.5%
Duff & Phelps	Fama-French	10.4%

As can be seen from the table, Dr. Vander Weide's estimates are comparable to other estimates for the industry produced using various methods.

Q: In the table, you also listed additional cost of equity estimates from Duff & Phelps. Can you explain these methods and their relevance to this filing?

A: Yes. While the CAPM and DCF methods are the basic models and are widely used, various extensions have gained acceptance over the years because of the need to draw finer distinctions among industries and firms when calculating the cost of equity. In particular, the "CAPM + size premium" recognizes the higher cost of capital endured by smaller firms and thus corrects for the average size of firms within an industry. The Fama-French-5-factor model extends the single risk factor framework of the CAPM to a five factor risk framework, thus pricing an industry's

equity on the basis of its sensitivity to four additional factors in addition to overall market returns. These methods produce higher estimates for the cost of equity in the property-casualty industry than the single factor risk premium model approaches. They provide additional perspective on the cost of equity.

Q: Do you believe any adjustments are necessary to the estimated cost of equity in the context of this filing?

A: Yes. All of the foregoing estimates are based on the data of publicly traded companies, which have the easiest access to financing and thus the lowest costs of capital. However, I found that operating companies affiliated with publicly traded holding companies wrote only 23% of the 2017 direct premiums written for North Carolina Dwelling insurance. The remaining 77% was underwritten by companies associated with private, often mutual, ownership---a segment well-known to have more difficulty in accessing the capital markets. The industry average cost of equity needs to be adjusted upward to account for this non-public ownership.

Q: How much higher is the cost of equity for non-public firms?

A: Research dating back at least as far as the 1960's has demonstrated that private equity trades at a substantial discount to public equity. The discount is thought to derive from a variety of factors, including the illiquid nature of private equity stakes (also known as a "lack of marketability") as well as information, monitoring, and control issues. The discount translates into a higher cost of equity. For example, if a public firm's cost of equity is estimated at 10% and the equity of a comparable private firm is selling at a 20% discount to that of the public firm, the private firm's cost of equity would be estimated as:

$$12.5\% \ = \ 10\% \ / \ (1 - 20\%)$$

The discount is difficult to estimate. Exhibit RB-25 summarizes some of the academic research on the private firm discount. Studies have taken a variety of approaches to measurement. "IPO" studies compare the prices of pre-IPO share transactions in a private company with post-IPO share prices after the company is public. "Acquisition" studies compare the valuations of acquired private companies versus the valuations of acquired public companies. "Restricted stock" and "private placement" studies compare the prices of restricted stock issued by public companies with the prices of their traded shares.

All the approaches have their flaws. IPO studies, for example, are thought to have a bias toward overstating the discount because of the differences in timing of transactions. Restricted stock and private placement studies tend to understate the discount: Since they confine their attention to public companies, they do not account for factors other than the discount for lack of marketability (DLOM), and, moreover, the actual restrictions on marketability for private placements have been loosened significantly over the years by the Securities and Exchange Commission.

On balance, however, the studies point to a substantial discount. For purposes of this testimony, I use a discount of 25%, which is slightly below the average of the averages of the

three groups in Exhibit RB-25 (when taking the midpoint of the ranges for the studies with ranges of estimates).

Q: How would this affect the estimated cost of equity for the industry?

A: Assuming a 25% private company discount and a 77% market share for non-public companies, I calculate adjusted estimates of the private cost of equity and the public cost of equity:

$$77\% * \left(\frac{COE}{(1 - 0.25)} \right) + (23\%) * (COE),$$

where COE is the estimated cost of equity for public companies. The adjusted estimates are as follows :

Cost of Equity Estimates, Adjusted for Non-Public Ownership

Source	Method	Adjusted Estimate
James Vander Weide	Risk Premium	11.1%
Duff & Phelps	Risk Premium (CAPM)	10.2%
Damodaran Online	Risk Premium (CAPM)	8.9%
James Vander Weide	DCF	15.3% to 16.2%
Duff & Phelps	DCF (1-stage)	21.5%
Duff & Phelps	DCF (3-stage)	20.4%
Duff & Phelps	CAPM + Size Premium	10.7%
Duff & Phelps	Fama-French	13.1%

Q: How do these figures speak to the issue of whether or not the pro forma expected return on net worth is reasonable?

A: There are at least two schools of thought on this issue.

The first is that the "net worth" in the pro forma return exhibit should be interpreted as an equity investment akin to the equity analyzed by Dr. Vander Weide and others. Thus, it should be entitled to a similar rate of return. Under this school of thought, the return on net worth calculated in the previous section should be compared directly with the figures in the table above. If one does this, the projected returns are, in my opinion, clearly not excessive, even when including investment income on surplus in the calculation of the return. The projected returns of 10.99% (for Fire) and 10.12% (for Extended Coverage) fall toward the lower end of the span of estimates above, which range from 8.9% to 21.5%. If one instead focuses on the statutory return by excluding investment income on surplus, the projected returns for both coverages are below the lowest available estimate for the cost of equity.

A second school of thought is that, although the capital of the operating subsidiaries may be fully financed by equity, one should "look through" the operating subsidiaries to the level of the holding companies to determine a cost of capital, which is important because the holding companies---unlike the insurance subsidiaries---typically hold some debt in the capital structure. Holding companies that are typically classified as property-casualty companies have, in recent history and on average, had in the neighborhood of 20% debt. Thus, the cost of capital for the

holding company is, under this school of thought, calculated as a weighted average of the cost of equity and the cost of debt, with the weights based on each component's share of the capital structure. The result is a weighted average cost of capital (WACC), which is typically lower than the cost of equity as a reflection of the lower cost of debt. On the other hand, another consideration is that the market value of the capital of the holding company will be different than the book value of the capital invested in the insurance subsidiaries. Thus, a particular return on net worth at the level of the operating subsidiary will translate into a lower (higher) return on holding company capital if the market value of the holding company capital exceeds (is less than) the net worth of the insurance subsidiaries.

The following table shows the most current WACC estimates for the property-casualty industry from Damodaran Online and Duff & Phelps, after adjusting the cost of equity for non-public ownership as described above. It also shows the required return on operating company net worth under different assumptions about the ratio of holding company equity market capitalization to holding company net worth and under the assumption of 20% debt (trading at par) in the capital structure. For example, the required return on operating company net worth for a WACC estimate of 10.0% and a Market-to-Net Worth Ratio of 1.2, would be:

$$10\% * (1.2 * 80\% + 20\%) = 11.6\%$$

Note that the WACC estimates vary, due not only to the previously described differences in estimating the cost of equity, but also due to different estimates for the cost of debt and for the share of debt in the capital structure.

Property-Casualty WACC Estimates, Adjusted for Non-Public Ownership

Source	Method	WACC Estimate	Required Return on Net Worth, Assuming Market-to-Net Worth Ratio of:		
			1	1.2	1.4
Duff & Phelps	Risk Premium (CAPM)	9.2%	9.2%	10.6%	12.1%
Damodaran Online	Risk Premium (CAPM)	7.7%	7.7%	8.9%	10.1%
Duff & Phelps	DCF (1-stage)	18.7%	18.7%	21.7%	24.7%
Duff & Phelps	DCF (3-stage)	17.8%	17.8%	20.7%	23.5%
Duff & Phelps	CAPM + Size Premium	9.7%	9.7%	11.2%	12.7%
Duff & Phelps	Fama-French	11.6%	11.6%	13.4%	15.3%

At current stock market valuations, the market-to-net worth ratio of the public companies underwriting Dwelling insurance in North Carolina, using July 23, 2019 market capitalization data and the most recent available accounting data from Yahoo Finance (3/31/19, in most cases), is typically well above 1. However, even if one sets this ratio to 1, the table above demonstrates that a return on capital in the 10% to 11% range (counting investment income on

surplus) is reasonable and not excessive. The same characterization applies to a return on capital in the 6% to 8% range (not counting investment income on surplus).

In summary, the expected return on net worth calculated in Section II is, in my opinion, consistent with a reasonable and not excessive return on invested capital.

IV.   Conclusion

Q: Based on your knowledge and experience and on the studies and analyses you have performed, have you come to any conclusions regarding the underwriting profit factor selected by the Bureau and used in its indicated rate level calculations in this filing?

A: Yes. For Dwelling Fire, based on my pro forma return analysis, I found that the expected statutory return on net worth implied by the selected 8.5% underwriting profit factor was 7.88% (not including investment income on surplus): The expected total return on net worth was 10.99% (including investment income on surplus). For Dwelling Extended Coverage, based on my pro forma return analysis, I found that the expected statutory return on net worth implied by the selected 8.5% underwriting profit factor was 6.55% (not including investment income on surplus): The expected total return on net worth was 10.12% (including investment income on surplus). After reviewing and analyzing the cost of capital estimates for the industry produced by Dr. Vander Weide and others, I found the expected returns on net worth resulting from the selected underwriting profit factors to be consistent with a reasonable and not excessive return on invested capital. Thus, I believe that the selected underwriting profit factors are reasonable and not excessive.

An important caveat to this analysis, however, is that all conclusions are predicated on the assumption that the underlying rate level reflects adequate loss and expense costs. In this filing, the Bureau elected to cap the requested rate level changes in certain territories. Therefore, if the original indications reflect the best actuarial estimates of the underlying costs and thus the required rate levels, capping reduces the expected underwriting profit below 8.5% and the returns on net worth to levels well below the lower bound of Dr. Vander Weide's range for the cost of equity. Thus, explicitly accounting for the capping would obviously reinforce the conclusion that the implied expected underwriting profit embedded in the rate is not excessive.

	Pre-Tax	Tax Liability	Post-Tax
NCRB - Pro Forma Statutory Rate of Return			
Dwelling Fire			
1 Premiums	100.00%		
Loss & LAE	61.40%		
Commissions	10.90%		
Other Acquisition & General	13.34%		
Taxes, Licenses, & Fees	2.80%		
Policyholder Dividends	0.40%		
Compensation for Assessment Risk	2.66%		
2 Pro Forma Underwriting Profit	8.50%		
3 Installment Fee Income	0.63%		
4 Regular Tax		1.92%	
5 Additional Tax Due to IRS Treatment of Reserves		-0.07%	
6 Total Return from Underwriting Post-Tax			7.28%
7 Investment Gain on Insurance Transaction	3.78%		
Less Investment Income on Agents Balances	0.78%		
Net Investment Gain on Insurance Transaction	3.00%	0.50%	2.50%
8 Total Return as a Percent of Premium (post-tax)			9.78%
9 Premium-to-Net Worth Ratio			0.81
10 Total Return as a Percent of Net Worth (post-tax)			7.88%

Lines (1) to (8) are expressed as a percentage of premium.

Assumptions and Parameters

(a)	Underwriting Income Tax Rate	21.00%
(b)	Investment Income Tax Rate	16.52%
(c)	Pre-tax Investment Yield	3.87%
(d)	Premium-to-Surplus Ratio	0.92
(e)	Net Worth-to-Surplus Ratio	1.14
(f)	Installment Fee Income	0.63%
(g)	Additional Tax Due to IRS Treatment of Loss Reserves and UEPR	-0.07%
(h)	Compensation for Assessment Risk	2.66%