

**North Carolina Mobile Homeowners
MH(C) Program**

Section C

Exhibits Supporting the Rate Indications

North Carolina Mobile Homeowners MH(C) Program

Exhibits Supporting the Rate Indications

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**North Carolina
Mobile Homeowners
MH(C)**

Determination of Statewide Indicated Rate Changes

	Mobile Home Structures	Adjacent Structures	Personal Effects	Liability
(1) Total Base Class Loss Cost	\$246.03	\$15.67	\$13.24	\$16.33
(2) (a) Fixed Expense per Policy	\$81.51	\$4.36	\$7.01	\$5.39
(b) Variable Expense per Policy	19.3%	19.3%	19.3%	19.3%
(c) Profit	6.0%	6.0%	6.0%	5.5%
(d) Contingencies	1.0%	1.0%	1.0%	1.0%
(e) Policyholder Dividends	0.5%	0.5%	0.5%	0.5%
(3) Base Rate excl. Reinsurance Cost; = [(1) + (2a)] / [1 - (2b) - (2c) - (2d) - (2e)]	\$447.46	\$27.37	\$27.66	\$29.46
(4) Compensation for Assessment Risk per Policy	\$7.31	\$0.43	\$0.69	N/A
(5) Net Cost of Reinsurance per Policy	\$174.63	\$11.51	\$10.23	N/A
(6) Indicated Manual Base Rate; = (3) + (4) + (5)	\$629.40	\$39.32	\$38.58	\$29.46
(7) Net Deviations	5.0%	5.0%	5.0%	5.0%
(8) Required Base Rate; = (6) / [1 - (7)]	\$662.53	\$41.39	\$40.61	\$31.01
(9) Average Current Base Rate	\$421.63	\$24.96	\$39.63	\$23.67
(10) Indicated Rate Change; = (8) / (9) - 1	57.1%	65.8%	2.5%	31.0%
(11) Proposed Rate Change - Year 1	17.9%	19.0%	0.5%	9.9%
(12) Proposed Base Rate - Year 1; = (9) x [1 + (11)]	\$497.11	\$29.69	\$39.83	\$26.01
(13) Proposed Rate Change - Year 2	16.0%	18.1%	0.7%	9.2%
(14) Proposed Base Rate - Year 2; = (12) x [1 + (13)]	\$576.53	\$35.08	\$40.09	\$28.40
(15) Proposed Rate Change - Year 3	14.9%	18.0%	1.3%	9.2%
(16) Proposed Base Rate - Year 3; = (14) x [1 + (15)]	\$662.53	\$41.39	\$40.61	\$31.01

(1) From Section C, Pages 2, 4, 6, and 8

(2a), (9) From Section C, Page 70

(2b) From Section C, Page 71

(2c) See pre-filed testimony from G. Zanjani for support of the Profit provision

(2d) See pre-filed testimony from P. Anderson for support of the Contingencies provision

(2e) From Section C, Page 73

(4) From Section C, Page 74

(5) From Section C, Pages 75, 76, and 77

(7) From Section C, Page 78

(11), (13), (15) Reflect selections by the North Carolina Rate Bureau

**North Carolina
Mobile Homeowners
MH(C) - Mobile Home Structures**

Determination of Base Class Loss Cost

	(1)	(2)	(3)	(4)	(5) = [(1) x (2)] / [(3) x (4)]	(6)	(7) = (5) / (6)	(8)
Accident Year	Non-Hurricane Ultimate Loss and LAE	Loss Trend Factor	Earned House Years	Premium Trend Factor	Trended Average Loss Cost	Average Rating Factor	Trended Base Class Loss Cost	Accident Year Weights
2018	\$25,316,676	1.967	81,078	1.369	\$448.44	1.900	\$236.07	10.0%
2019	20,418,667	1.774	79,103	1.317	347.71	1.954	177.97	15.0%
2020	27,881,044	1.600	81,697	1.266	431.18	2.016	213.92	20.0%
2021	26,145,470	1.443	82,761	1.217	374.37	2.076	180.36	25.0%
2022	32,129,316	1.301	89,364	1.171	399.63	2.240	178.40	30.0%

(9) Weighted Average Non-Hurricane Base Class Loss Cost: \$191.70

(10) Credibility: 100.0%

(11) Complement of Credibility: \$210.00

(12) Credibility-Weighted Loss Cost: \$191.70

(13) Modeled Hurricane Base Class Loss Cost: \$54.34

(14) Total Base Class Loss Cost: \$246.03

(1) From Section C, Page 3

(2) From Section C, Page 55

(3) Based on data provided by member companies

(4) From Section C, Page 63

(6) From Section C, Page 64

(9) Average of (7) based on the weights in (8)

(10) Based on the Square Root Rule using a Full-Credibility Standard of 20,000 earned house years

(11) From Section C, Page 67

(12) = (9) x (10) + (11) x [1 - (10)]

(13) From Section C, Page 68

(14) = (12) + (13)

**North Carolina
Mobile Homeowners
MH(C) - Mobile Home Structures**

Determination of Non-Hurricane Ultimate Loss & LAE

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8) = (6) x (7)	(9)	(10) = (8) x (9)
Accident Year	Non-Hurricane Incurred Loss & ALAE	Excess Wind Loss & ALAE	Excess Flood Loss & ALAE	Excess Wind Loss Factor	Excess Flood Loss Factor	Adjusted Non-Hurricane Incurred Loss & ALAE	Loss & ALAE Development Factor	Non-Hurricane Ultimate Loss Loss & ALAE	ULAE Factor	Non-Hurricane Ultimate Loss and LAE
2018	\$26,098,231	\$2,824,337	\$1,908,311	1.069	1.018	\$23,226,309	1.000	\$23,226,309	1.090	\$25,316,676
2019	18,470,480	1,219,257	19,232	1.069	1.018	18,732,722	1.000	18,732,722	1.090	20,418,667
2020	29,033,064	5,526,833	0	1.069	1.018	25,553,386	1.001	25,578,940	1.090	27,881,044
2021	22,104,973	0	236,930	1.069	1.018	23,772,527	1.009	23,986,670	1.090	26,145,470
2022	28,884,576	2,895,288	0	1.069	1.018	28,252,692	1.043	29,476,437	1.090	32,129,316

(1) Based on data provided by member companies

(2) From Section C, Page 44

(3) From Section C, Page 46

(4) From Section C, Page 43

(5) From Section C, Page 45

(6) = [(1) - (2) - (3)] x [(4) + (5) - 1]

(7) From Section C, Page 47

(9) From Section C, Page 72

**North Carolina
Mobile Homeowners
MH(C) - Adjacent Structures**

Determination of Base Class Loss Cost

	(1)	(2)	(3)	(4)	(5) = [(1) x (2)] / [(3) x (4)]	(6)	(7) = (5) / (6)	(8)
Accident Year	Non-Hurricane Ultimate Loss and LAE	Loss Trend Factor	Earned House Years	Premium Trend Factor	Trended Average Loss Cost	Average Rating Factor	Trended Base Class Loss Cost	Accident Year Weights
2018	\$1,714,433	3.914	71,830	1.617	\$57.76	2.728	\$21.17	10.0%
2019	1,021,798	3.131	69,961	1.521	30.06	2.866	10.49	15.0%
2020	1,651,817	2.505	71,674	1.431	40.33	3.010	13.40	20.0%
2021	1,616,106	2.004	72,482	1.346	33.18	3.164	10.49	25.0%
2022	2,270,710	1.603	77,934	1.267	36.88	3.519	10.48	30.0%
(9) Weighted Average Non-Hurricane Base Class Loss Cost:							\$12.14	
(10) Credibility:							100.0%	
(11) Complement of Credibility:							\$7.77	
(12) Credibility-Weighted Loss Cost:							\$12.14	
(13) Modeled Hurricane Base Class Loss Cost:							\$3.54	
(14) Total Base Class Loss Cost:							\$15.67	

(1) From Section C, Page 5

(2) From Section C, Page 55

(3) Based on data provided by member companies

(4) From Section C, Page 63

(6) From Section C, Page 64

(9) Average of (7) based on the weights in (8)

(10) Based on the Square Root Rule using a Full-Credibility Standard of 70,000 earned house years

(11) From Section C, Page 67

(12) = (9) x (10) + (11) x [1 - (10)]

(13) From Section C, Page 68

(14) = (12) + (13)

**North Carolina
Mobile Homeowners
MH(C) - Adjacent Structures**

Determination of Non-Hurricane Ultimate Loss & LAE

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8) = (6) x (7)	(9)	(10) = (8) x (9)
Accident Year	Non-Hurricane Incurred Loss & ALAE	Excess Wind Loss & ALAE	Excess Flood Loss & ALAE	Excess Wind Loss Factor	Excess Flood Loss Factor	Adjusted Non-Hurricane Incurred Loss & ALAE	Loss & ALAE Development Factor	Non-Hurricane Ultimate Loss Loss & ALAE	ULAE Factor	Non-Hurricane Ultimate Loss and LAE
2018	\$1,859,764	\$266,148	\$146,749	1.069	1.018	\$1,572,875	1.000	\$1,572,875	1.090	\$1,714,433
2019	968,558	104,293	1,937	1.069	1.018	937,429	1.000	937,429	1.090	1,021,798
2020	1,902,247	508,223	0	1.069	1.018	1,515,429	1.000	1,515,429	1.090	1,651,817
2021	1,470,073	0	121,028	1.069	1.018	1,466,534	1.011	1,482,666	1.090	1,616,106
2022	2,149,988	327,413	0	1.069	1.018	1,981,302	1.051	2,083,220	1.090	2,270,710

(1) Based on data provided by member companies

(2) From Section C, Page 44

(3) From Section C, Page 46

(4) From Section C, Page 43

(5) From Section C, Page 45

(6) = [(1) - (2) - (3)] x [(4) + (5) - 1]

(7) From Section C, Page 49

(9) From Section C, Page 72

**North Carolina
Mobile Homeowners
MH(C) - Personal Effects**

Determination of Base Class Loss Cost

	(1)	(2)	(3)	(4)	(5) = [(1) x (2)] / [(3) x (4)]	(6)	(7) = (5) / (6)	(8)
Accident Year	Non-Hurricane Ultimate Loss and LAE	Loss Trend Factor	Earned House Years	Premium Trend Factor	Trended Average Loss Cost	Average Rating Factor	Trended Base Class Loss Cost	Accident Year Weights
2018	\$4,356,883	1.125	80,271	1.580	\$38.64	3.176	\$12.17	10.0%
2019	3,159,379	1.129	78,468	1.492	30.47	3.319	9.18	15.0%
2020	4,124,044	1.133	81,301	1.409	40.79	3.473	11.74	20.0%
2021	3,371,885	1.137	82,489	1.331	34.94	3.648	9.58	25.0%
2022	3,690,506	1.142	88,235	1.257	38.00	4.043	9.40	30.0%

(9) Weighted Average Non-Hurricane Base Class Loss Cost: \$10.16

(10) Credibility: 100.0%

(11) Complement of Credibility: \$11.24

(12) Credibility-Weighted Loss Cost: \$10.16

(13) Modeled Hurricane Base Class Loss Cost: \$3.08

(14) Total Base Class Loss Cost: \$13.24

(1) From Section C, Page 7

(2) From Section C, Page 55

(3) Based on data provided by member companies

(4) From Section C, Page 63

(6) From Section C, Page 64

(9) Average of (7) based on the weights in (8)

(10) Based on the Square Root Rule using a Full-Credibility Standard of 110,000 earned house years

(11) From Section C, Page 67

(12) = (9) x (10) + (11) x [1 - (10)]

(13) From Section C, Page 68

(14) = (12) + (13)

**North Carolina
Mobile Homeowners
MH(C) - Personal Effects**

Determination of Non-Hurricane Ultimate Loss & LAE

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8) = (6) x (7)	(9)	(10) = (8) x (9)
Accident Year	Non-Hurricane Incurred Loss & ALAE	Excess Wind Loss & ALAE	Excess Flood Loss & ALAE	Excess Wind Loss Factor	Excess Flood Loss Factor	Adjusted Non-Hurricane Incurred Loss & ALAE	Loss & ALAE Development Factor	Non-Hurricane Ultimate Loss Loss & ALAE	ULAE Factor	Non-Hurricane Ultimate Loss and LAE
2018	\$4,596,407	\$230,427	\$689,062	1.069	1.018	\$3,997,141	1.000	\$3,997,141	1.090	\$4,356,883
2019	2,692,487	19,934	6,250	1.069	1.018	2,898,512	1.000	2,898,512	1.090	3,159,379
2020	3,688,392	207,975	0	1.069	1.018	3,783,526	1.000	3,783,526	1.090	4,124,044
2021	2,944,160	0	101,357	1.069	1.018	3,090,382	1.001	3,093,473	1.090	3,371,885
2022	3,170,149	74,200	0	1.069	1.018	3,365,575	1.006	3,385,786	1.090	3,690,506

(1) Based on data provided by member companies

(2) From Section C, Page 44

(3) From Section C, Page 46

(4) From Section C, Page 43

(5) From Section C, Page 45

(6) = [(1) - (2) - (3)] x [(4) + (5) - 1]

(7) From Section C, Page 51

(9) From Section C, Page 72

**North Carolina
Mobile Homeowners
MH(C) - Liability**

Determination of Base Class Loss Cost

	(1)	(2)	(3)	(4)	(5) = [(1) x (2)] / [(3) x (4)]	(6)	(7) = (5) / (6)	(8)
Accident Year	Ultimate Loss and LAE	Loss Trend Factor	Earned House Years	Premium Trend Factor	Trended Average Loss Cost	Average Rating Factor	Trended Basic Limits Loss Cost	Accident Year Weights
2018	\$1,240,258	1.706	79,828	1.062	\$24.94	1.326	\$18.81	10.0%
2019	1,289,170	1.597	77,924	1.053	25.09	1.338	18.76	15.0%
2020	1,103,882	1.495	80,681	1.043	19.60	1.352	14.49	20.0%
2021	1,406,017	1.399	81,870	1.034	23.24	1.363	17.04	25.0%
2022	1,443,868	1.310	87,745	1.025	21.03	1.372	15.32	30.0%

(9) Weighted Average Base Class Loss Cost: \$16.45

(10) Credibility: 45.6%

(11) Complement of Credibility: \$16.22

(12) Credibility-Weighted Loss Cost: \$16.33

(1) From Section C, Page 9

(2) From Section C, Page 56

(3) Based on data provided by member companies

(4) From Section C, Page 63

(6) From Section C, Page 65

(9) Average of (7) based on the weights in (8)

(10) Based on the Square Root Rule using a Full-Credibility Standard of 1,960,000 earned house years

(11) From Section C, Page 67

(12) = (9) x (10) + (11) x [1 - (10)]

**North Carolina
Mobile Homeowners
MH(C) - Liability**

Determination of Ultimate Loss & LAE

	(1)	(2)	(3) = (1) x (2)	(4)	(5) = (3) x (4)
Accident Year	Incurred Loss & ALAE	Loss & ALAE Development Factor	Ultimate Loss & ALAE	ULAE Factor	Ultimate Loss and LAE
2018	\$1,137,851	1.000	\$1,137,851	1.090	\$1,240,258
2019	1,181,543	1.001	1,182,725	1.090	1,289,170
2020	1,056,080	0.959	1,012,736	1.090	1,103,882
2021	1,235,198	1.044	1,289,924	1.090	1,406,017
2022	1,131,535	1.171	1,324,650	1.090	1,443,868

(1) Based on data provided by member companies

(2) From Section C, Page 53

(4) From Section C, Page 72

North Carolina
Mobile Homeowners
MH(C) - Mobile Home Structures

Determination of Indicated Rate Change by Territory Group

	(1)	(2)	(3) = (2)(Statewide) / (2) x (3)(Statewide)	(4)	(5)	(6) = [(1) + (3)] / [1 - (4)]	(7)	(8)	(9) = (6) + (7) + (8)	(10)	(11) = (9) + (10)	(12) = (11) / (5) - 1	(13)	(14)	(15)	(16)
Territory Group	Indicated Base Class Loss Cost	2022 Average Rating Factor	Trended Fixed Expenses	Variable Expenses	Average Current Base Rate	Indicated Net Base Rate	Compensation for Assessment Risk	Net Cost of Reinsurance	Indicated Base Rate Excluding Deviation	Net Deviation Per Exposure	Indicated Required Base Class Rate	Indicated Rate Change	Balanced Indicated Rate Change	Proposed Year 1 Rate Change	Proposed Year 2 Rate Change	Proposed Year 3 Rate Change
1	\$584.45	1.940	\$94.13	26.8%	\$881.42	\$927.02	\$15.29	\$791.71	\$1,734.02	\$91.26	\$1,825.28	107.1%	107.1%	28.0%	27.2%	27.2%
2	286.52	1.963	93.00	26.8%	718.17	518.47	12.46	465.89	996.81	52.46	1,049.28	46.1%	46.1%	20.9%	9.9%	9.9%
3	330.49	1.972	92.60	26.8%	532.08	577.99	9.23	387.83	975.05	51.32	1,026.37	92.9%	92.9%	28.0%	23.0%	22.6%
4	297.83	2.373	76.95	26.8%	491.52	512.00	8.53	251.71	772.23	40.64	812.88	65.4%	65.4%	20.0%	19.0%	15.8%
5	244.95	2.386	76.52	26.8%	418.12	439.17	7.25	171.78	618.21	32.54	650.74	55.6%	55.7%	17.0%	16.0%	14.7%
6	190.69	2.352	77.61	26.8%	333.90	366.53	5.79	59.95	432.28	22.75	455.03	36.3%	36.3%	12.0%	11.0%	9.6%
Statewide	\$246.03	2.240	\$81.51	26.8%	\$421.63	\$447.46	\$7.31	\$174.63	\$629.40	\$33.13	\$662.53	57.1%	57.1%	17.9%	16.0%	14.9%

(1) From Section C, Page 11
(2), (5) From Section C, Page 66
(3) Statewide from Section C, Page 1
(4) From Section C, Page 71. Includes Commission and Brokerage expense; Taxes, Licenses, and Fees; Profit; Contingencies; and Policyholder Dividends
(7) = (5) x 0.017; Reflects 1.4% Compensation for Assessment Risk provision, adjusted for expenses, from Section C, Page 74, Row (5)
(8) From Section C, Page 75
(10) = (9) / [1 - 0.05] - (9); Reflects 5% Net Deviation selected on Section C, Page 78
(12) Statewide based on premium-weighted average using the 2022 earned premium at current manual level
(13) = [1 + (12)] / [1 + (12) Statewide] x [1 + (13) Statewide]; Statewide (13) from Section C, Page 1
(14), (15), (16) From Section A, Page 2

**North Carolina
Mobile Homeowners
MH(C) - Mobile Home Structures**

Determination of Indicated Base Class Loss Cost by Territory Group

	(1)	(2)	(3)	(4)	(5)	(6) = (4) / (4) Statewide	(7)	(8)	(9) = (7) + (8)	(10) = (9) / (9) Statewide	(11)
				Credibility Weighted Non-Hurricane Base Class Loss Cost	2022 Earned House Years	Indicated Relativity	Indicated Non-Hurricane Base Class Loss Cost	Modeled Hurricane Base Class Loss Cost	Total Loss Cost	Indicated Relativity	Indicated Base Class Loss Cost
Territory Group	Non-Hurricane Base Class Loss Cost	Five Year Earned House Years	Credibility								
1	\$251.91	10,646	73.0%	\$235.63	2,114	1.248	\$239.25	\$351.65	\$590.90	2.375	\$584.45
2	102.30	15,817	88.9%	112.19	2,833	0.594	113.92	175.77	289.68	1.165	286.52
3	213.70	66,465	100.0%	213.70	14,552	1.132	216.99	117.15	334.14	1.343	330.49
4	227.93	50,046	100.0%	227.93	10,914	1.207	231.43	69.69	301.12	1.211	297.83
5	199.50	54,406	100.0%	199.50	11,761	1.057	202.57	45.09	247.66	0.996	244.95
6	171.90	216,622	100.0%	171.90	47,191	0.910	174.54	18.26	192.80	0.775	190.69
Statewide	\$191.70	414,003		\$188.80	89,364	1.000	\$191.70	\$54.34	\$248.75	1.000	\$246.03

(1) From Section C, Pages 13 through 18; Statewide from Section C, Page 2

(2), (5) Based on data provided by member companies

(3) Based on the Square Root Rule using a Full-Credibility Standard of 20,000 earned house years

(4) = (1) x (3) + (1) Statewide x [1 - (3)]

(7) = (6) x (7) Statewide; (7) Statewide From Section C, Page 2

(8) From Section C, Page 12

(11) = (10) x (11) Statewide; (11) Statewide From Section C, Page 2

**North Carolina
Mobile Homeowners
MH(C) - Mobile Home Structures**

Determination of Modeled Hurricane Base Class Loss Cost by Territory Group

	(1)	(2)	(3)	(4)	(5) = (1) / [(2) x (3) x (4)]
Territory Group	Trended Modeled Hurricane Loss & LAE	2022 Earned House Years	2022 Premium Trend Factor	2022 Average Rating Factor	Modeled Hurricane Base Class Loss Cost
1	\$1,687,725	2,114	1.171	1.940	\$351.65
2	1,144,298	2,833	1.171	1.963	175.77
3	3,933,764	14,549	1.171	1.972	117.15
4	2,112,042	10,911	1.171	2.373	69.69
5	1,481,268	11,761	1.171	2.386	45.09
6	2,372,516	47,186	1.171	2.352	18.26
Statewide	\$12,731,612	89,353	1.171	2.240	\$54.34

(1) Provided by Aon

(2) Based on data provided by member companies; excludes exposures where amount of insurance is unavailable

(3) From Section C, Page 63

(4) From Section C, Page 66

**North Carolina
Mobile Homeowners
MH(C) - Mobile Home Structures
Territory Group 1**

Determination of Non-Hurricane Base Class Loss Cost

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8) = (6) x (7)	(9)	(10) = (8) x (9)
Accident Year	Non-Hurricane Incurred Loss & ALAE	Excess Wind Loss & ALAE	Excess Flood Loss & ALAE	Excess Wind Loss Factor	Excess Flood Loss Factor	Adjusted Non-Hurricane Incurred Loss & ALAE	Loss & ALAE Development Factor	Non-Hurricane Ultimate Loss & ALAE	ULAE Factor	Non-Hurricane Ultimate Loss and LAE
2018	\$2,168,299	\$469,889	\$4,362	1.069	1.018	\$1,841,582	1.000	\$1,841,582	1.090	\$2,007,324
2019	413,413	18,497	0	1.069	1.018	429,309	1.000	429,309	1.090	467,947
2020	803,386	76,705	0	1.069	1.018	789,968	1.001	790,758	1.090	861,926
2021	594,161	0	0	1.069	1.018	645,906	1.009	651,725	1.090	710,380
2022	395,517	37,492	0	1.069	1.018	389,206	1.043	406,064	1.090	442,609
	(11)	(12)	(13)	(14) = [(10) x (11)] / [(12) x (13)]	(15)	(16)	(17) = (15) / (16)	(18) = (14) / (17)	(19)	
Accident Year	Loss Trend Factor	Earned House Years	Premium Trend Factor	Trended Average Loss Cost	Earned Premium at Current Manual Level	Earned Premium at Current Base	Average Rating Factor	Trended Base Class Loss Cost	Accident Year Weights	
2018	1.967	2,257	1.369	\$1,277.13	\$3,329,160	\$1,981,465	1.680	\$760.13	10.0%	
2019	1.774	2,158	1.317	292.07	3,274,881	1,892,894	1.730	168.82	15.0%	
2020	1.600	2,097	1.266	519.43	3,285,854	1,840,409	1.785	290.94	20.0%	
2021	1.443	2,021	1.217	416.59	3,276,549	1,774,098	1.847	225.56	25.0%	
2022	1.301	2,114	1.171	232.76	3,609,282	1,860,751	1.940	120.00	30.0%	

(20) Weighted Average Non-Hurricane Base Class Loss Cost: \$251.91

(1), (12) Based on data provided by member companies

(2) From Section C, Page 19

(3) From Section C, Page 20

(4) From Section C, Page 43

(5) From Section C, Page 45

(6) = [(1) - (2) - (3)] x [(4) + (5) - 1]

(7) From Section C, Page 47

(9) From Section C, Page 72

(11) From Section C, Page 55

(13) From Section C, Page 63

(15), (16) Based on data provided by member companies and the extension of exposures method

See Section E, Page 9 for more details as well as an example related to the calculation of premium at present (manual) rates.

See Explanatory Memorandum (Average Rating Factors) for definitions of the base class.

(20) Average of (18) based on the weights in (19)

**North Carolina
Mobile Homeowners
MH(C) - Mobile Home Structures
Territory Group 2**

Determination of Non-Hurricane Base Class Loss Cost

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8) = (6) x (7)	(9)	(10) = (8) x (9)
Accident Year	Non-Hurricane Incurred Loss & ALAE	Excess Wind Loss & ALAE	Excess Flood Loss & ALAE	Excess Wind Loss Factor	Excess Flood Loss Factor	Adjusted Non-Hurricane Incurred Loss & ALAE	Loss & ALAE Development Factor	Non-Hurricane Ultimate Loss & ALAE	ULAE Factor	Non-Hurricane Ultimate Loss and LAE
2018	\$822,996	\$137,230	\$4,173	1.069	1.018	\$740,953	1.000	\$740,953	1.090	\$807,639
2019	561,274	40,874	0	1.069	1.018	565,721	1.000	565,721	1.090	616,636
2020	508,025	128,977	0	1.069	1.018	412,059	1.001	412,471	1.090	449,594
2021	300,091	0	0	1.069	1.018	326,226	1.009	329,164	1.090	358,789
2022	342,273	36,851	0	1.069	1.018	332,022	1.043	346,403	1.090	377,580

	(11)	(12)	(13)	(14) = [(10) x (11)] / [(12) x (13)]	(15)	(16)	(17) = (15) / (16)	(18) = (14) / (17)	(19)
Accident Year	Loss Trend Factor	Earned House Years	Premium Trend Factor	Trended Average Loss Cost	Earned Premium at Current Manual Level	Earned Premium at Current Base	Average Rating Factor	Trended Base Class Loss Cost	Accident Year Weights
2018	1.967	3,620	1.369	\$320.37	\$4,513,514	\$2,593,125	1.741	\$184.06	10.0%
2019	1.774	3,296	1.317	252.02	4,216,969	2,359,280	1.787	141.00	15.0%
2020	1.600	3,131	1.266	181.40	4,133,914	2,243,731	1.842	98.46	20.0%
2021	1.443	2,937	1.217	144.76	3,978,521	2,243,731	1.773	81.64	25.0%
2022	1.301	2,833	1.171	148.16	3,987,660	2,031,151	1.963	75.47	30.0%

(20) Weighted Average Non-Hurricane Base Class Loss Cost: \$102.30

(1), (12) Based on data provided by member companies

(2) From Section C, Page 19

(3) From Section C, Page 20

(4) From Section C, Page 43

(5) From Section C, Page 45

(6) = [(1) - (2) - (3)] x [(4) + (5) - 1]

(7) From Section C, Page 47

(9) From Section C, Page 72

(11) From Section C, Page 55

(13) From Section C, Page 63

(15), (16) Based on data provided by member companies and the extension of exposures method

See Section E, Page 9 for more details as well as an example related to the calculation of premium at present (manual) rates.

See Explanatory Memorandum (Average Rating Factors) for definitions of the base class.

(20) Average of (18) based on the weights in (19)

**North Carolina
Mobile Homeowners
MH(C) - Mobile Home Structures
Territory Group 3**

Determination of Non-Hurricane Base Class Loss Cost

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8) = (6) x (7)	(9)	(10) = (8) x (9)
Accident Year	Non-Hurricane Incurred Loss & ALAE	Excess Wind Loss & ALAE	Excess Flood Loss & ALAE	Excess Wind Loss Factor	Excess Flood Loss Factor	Adjusted Non-Hurricane Incurred Loss & ALAE	Loss & ALAE Development Factor	Non-Hurricane Ultimate Loss & ALAE	ULAE Factor	Non-Hurricane Ultimate Loss and LAE
2018	\$5,598,044	\$557,688	\$1,448,607	1.069	1.018	\$3,904,554	1.000	\$3,904,554	1.090	\$4,255,963
2019	2,671,540	175,635	0	1.069	1.018	2,713,273	1.000	2,713,273	1.090	2,957,467
2020	4,601,682	904,247	0	1.069	1.018	4,019,444	1.001	4,023,464	1.090	4,385,576
2021	3,341,701	0	0	1.069	1.018	3,632,730	1.009	3,665,453	1.090	3,995,344
2022	4,742,362	512,569	0	1.069	1.018	4,598,166	1.043	4,797,332	1.090	5,229,092
	(11)	(12)	(13)	(14) = [(10) x (11)] / [(12) x (13)]	(15)	(16)	(17) = (15) / (16)	(18) = (14) / (17)	(19)	
Accident Year	Loss Trend Factor	Earned House Years	Premium Trend Factor	Trended Average Loss Cost	Earned Premium at Current Manual Level	Earned Premium at Current Base	Average Rating Factor	Trended Base Class Loss Cost	Accident Year Weights	
2018	1.967	12,995	1.369	\$470.34	\$11,501,175	\$6,900,674	1.667	\$282.20	10.0%	
2019	1.774	12,533	1.317	317.87	11,314,506	6,655,755	1.700	186.99	15.0%	
2020	1.600	13,017	1.266	425.66	12,227,641	6,917,569	1.768	240.81	20.0%	
2021	1.443	13,368	1.217	354.18	12,973,412	7,105,795	1.826	193.99	25.0%	
2022	1.301	14,552	1.171	399.41	15,261,671	7,740,721	1.972	202.58	30.0%	

(20) Weighted Average Non-Hurricane Base Class Loss Cost: \$213.70

(1), (12) Based on data provided by member companies

(2) From Section C, Page 19

(3) From Section C, Page 20

(4) From Section C, Page 43

(5) From Section C, Page 45

(6) = [(1) - (2) - (3)] x [(4) + (5) - 1]

(7) From Section C, Page 47

(9) From Section C, Page 72

(11) From Section C, Page 55

(13) From Section C, Page 63

(15), (16) Based on data provided by member companies and the extension of exposures method

See Section E, Page 9 for more details as well as an example related to the calculation of premium at present (manual) rates.

See Explanatory Memorandum (Average Rating Factors) for definitions of the base class.

(20) Average of (18) based on the weights in (19)

**North Carolina
Mobile Homeowners
MH(C) - Mobile Home Structures
Territory Group 4**

Determination of Non-Hurricane Base Class Loss Cost

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8) = (6) x (7)	(9)	(10) = (8) x (9)
Accident Year	Non-Hurricane Incurred Loss & ALAE	Excess Wind Loss & ALAE	Excess Flood Loss & ALAE	Excess Wind Loss Factor	Excess Flood Loss Factor	Adjusted Non-Hurricane Incurred Loss & ALAE	Loss & ALAE Development Factor	Non-Hurricane Ultimate Loss & ALAE	ULAE Factor	Non-Hurricane Ultimate Loss and LAE
2018	\$3,773,761	\$360,962	\$235,739	1.069	1.018	\$3,453,749	1.000	\$3,453,749	1.090	\$3,764,587
2019	3,464,656	303,075	0	1.069	1.018	3,436,923	1.000	3,436,923	1.090	3,746,246
2020	4,549,614	869,261	0	1.069	1.018	4,000,874	1.001	4,004,875	1.090	4,365,314
2021	2,839,244	0	0	1.069	1.018	3,086,514	1.009	3,114,317	1.090	3,394,606
2022	4,669,682	524,059	0	1.069	1.018	4,506,665	1.043	4,701,868	1.090	5,125,036
	(11)	(12)	(13)	(14) = [(10) x (11)] / [(12) x (13)]	(15)	(16)	(17) = (15) / (16)	(18) = (14) / (17)	(19)	
Accident Year	Loss Trend Factor	Earned House Years	Premium Trend Factor	Trended Average Loss Cost	Earned Premium at Current Manual Level	Earned Premium at Current Base	Average Rating Factor	Trended Base Class Loss Cost	Accident Year Weights	
2018	1.967	9,785	1.369	\$552.50	\$9,832,031	\$4,799,898	2.048	\$269.73	10.0%	
2019	1.774	9,606	1.317	525.32	9,912,129	4,711,749	2.104	249.71	15.0%	
2020	1.600	9,864	1.266	559.12	10,466,511	4,840,426	2.162	258.57	20.0%	
2021	1.443	9,876	1.217	407.33	10,780,289	4,847,244	2.224	183.15	25.0%	
2022	1.301	10,914	1.171	521.94	12,720,044	5,361,239	2.373	219.99	30.0%	

(20) Weighted Average Non-Hurricane Base Class Loss Cost: \$227.93

(1), (12) Based on data provided by member companies

(2) From Section C, Page 19

(3) From Section C, Page 20

(4) From Section C, Page 43

(5) From Section C, Page 45

(6) = [(1) - (2) - (3)] x [(4) + (5) - 1]

(7) From Section C, Page 47

(9) From Section C, Page 72

(11) From Section C, Page 55

(13) From Section C, Page 63

(15), (16) Based on data provided by member companies and the extension of exposures method

See Section E, Page 9 for more details as well as an example related to the calculation of premium at present (manual) rates.

See Explanatory Memorandum (Average Rating Factors) for definitions of the base class.

(20) Average of (18) based on the weights in (19)

**North Carolina
Mobile Homeowners
MH(C) - Mobile Home Structures
Territory Group 5**

Determination of Non-Hurricane Base Class Loss Cost

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8) = (6) x (7)	(9)	(10) = (8) x (9)
Accident Year	Non-Hurricane Incurred Loss & ALAE	Excess Wind Loss & ALAE	Excess Flood Loss & ALAE	Excess Wind Loss Factor	Excess Flood Loss Factor	Adjusted Non-Hurricane Incurred Loss & ALAE	Loss & ALAE Development Factor	Non-Hurricane Ultimate Loss & ALAE	ULAE Factor	Non-Hurricane Ultimate Loss and LAE
2018	\$2,925,907	\$358,763	\$98,607	1.069	1.018	\$2,683,521	1.000	\$2,683,521	1.090	\$2,925,038
2019	3,063,004	271,542	1,020	1.069	1.018	3,033,462	1.000	3,033,462	1.090	3,306,474
2020	4,044,577	835,383	0	1.069	1.018	3,488,683	1.001	3,492,172	1.090	3,806,467
2021	3,270,227	0	0	1.069	1.018	3,555,031	1.009	3,587,055	1.090	3,909,890
2022	4,499,855	479,242	0	1.069	1.018	4,370,767	1.043	4,560,084	1.090	4,970,491

	(11)	(12)	(13)	(14) = [(10) x (11)] / [(12) x (13)]	(15)	(16)	(17) = (15) / (16)	(18) = (14) / (17)	(19)
Accident Year	Loss Trend Factor	Earned House Years	Premium Trend Factor	Trended Average Loss Cost	Earned Premium at Current Manual Level	Earned Premium at Current Base	Average Rating Factor	Trended Base Class Loss Cost	Accident Year Weights
2018	1.967	10,649	1.369	\$394.49	\$9,014,582	\$4,437,580	2.031	\$194.19	10.0%
2019	1.774	10,349	1.317	430.39	8,996,793	4,313,626	2.086	206.36	15.0%
2020	1.600	10,730	1.266	448.20	9,578,868	4,474,865	2.141	209.38	20.0%
2021	1.443	10,918	1.217	424.37	10,030,070	4,555,688	2.202	192.75	25.0%
2022	1.301	11,761	1.171	469.77	11,725,914	4,914,417	2.386	196.88	30.0%

(20) Weighted Average Non-Hurricane Base Class Loss Cost: \$199.50

(1), (12) Based on data provided by member companies

(2) From Section C, Page 19

(3) From Section C, Page 20

(4) From Section C, Page 43

(5) From Section C, Page 45

(6) = [(1) - (2) - (3)] x [(4) + (5) - 1]

(7) From Section C, Page 47

(9) From Section C, Page 72

(11) From Section C, Page 55

(13) From Section C, Page 63

(15), (16) Based on data provided by member companies and the extension of exposures method

See Section E, Page 9 for more details as well as an example related to the calculation of premium at present (manual) rates.

See Explanatory Memorandum (Average Rating Factors) for definitions of the base class.

(20) Average of (18) based on the weights in (19)

**North Carolina
Mobile Homeowners
MH(C) - Mobile Home Structures
Territory Group 6**

Determination of Non-Hurricane Base Class Loss Cost

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8) = (6) x (7)	(9)	(10) = (8) x (9)
Accident Year	Non-Hurricane Incurred Loss & ALAE	Excess Wind Loss & ALAE	Excess Flood Loss & ALAE	Excess Wind Loss Factor	Excess Flood Loss Factor	Adjusted Non-Hurricane Incurred Loss & ALAE	Loss & ALAE Development Factor	Non-Hurricane Ultimate Loss & ALAE	ULAE Factor	Non-Hurricane Ultimate Loss and LAE
2018	\$10,721,259	\$939,805	\$116,823	1.069	1.018	\$10,506,323	1.000	\$10,506,323	1.090	\$11,451,892
2019	8,256,437	409,635	18,212	1.069	1.018	8,510,381	1.000	8,510,381	1.090	9,276,315
2020	14,503,322	2,712,261	0	1.069	1.018	12,817,943	1.001	12,830,761	1.090	13,985,530
2021	11,698,465	0	236,930	1.069	1.018	12,459,718	1.009	12,571,956	1.090	13,703,432
2022	14,219,918	1,305,076	0	1.069	1.018	14,039,594	1.043	14,647,709	1.090	15,966,002

	(11)	(12)	(13)	(14) = [(10) x (11)] / [(12) x (13)]	(15)	(16)	(17) = (15) / (16)	(18) = (14) / (17)	(19)
Accident Year	Loss Trend Factor	Earned House Years	Premium Trend Factor	Trended Average Loss Cost	Earned Premium at Current Manual Level	Earned Premium at Current Base	Average Rating Factor	Trended Base Class Loss Cost	Accident Year Weights
2018	1.967	41,771	1.369	\$393.73	\$27,576,427	\$13,909,051	1.983	\$198.59	10.0%
2019	1.774	41,161	1.317	303.58	28,006,664	13,706,827	2.043	148.58	15.0%
2020	1.600	42,857	1.266	412.30	30,040,120	14,278,979	2.104	195.98	20.0%
2021	1.443	43,641	1.217	372.11	31,756,976	14,543,434	2.184	170.41	25.0%
2022	1.301	47,191	1.171	376.06	37,042,667	15,746,200	2.352	159.86	30.0%

(20) Weighted Average Non-Hurricane Base Class Loss Cost: \$171.90

(1), (12) Based on data provided by member companies

(2) From Section C, Page 19

(3) From Section C, Page 20

(4) From Section C, Page 43

(5) From Section C, Page 45

(6) = [(1) - (2) - (3)] x [(4) + (5) - 1]

(7) From Section C, Page 47

(9) From Section C, Page 72

(11) From Section C, Page 55

(13) From Section C, Page 63

(15), (16) Based on data provided by member companies and the extension of exposures method

See Section E, Page 9 for more details as well as an example related to the calculation of premium at present (manual) rates.

See Explanatory Memorandum (Average Rating Factors) for definitions of the base class.

(20) Average of (18) based on the weights in (19)

**North Carolina
Mobile Homeowners
MH(C) - Mobile Home Structures**

Allocation of Excess Wind Loss & ALAE to Territory Group

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Distribution of Wind & Hail Loss by Territory Group by Year						
Accident Year	Territory Group 1	Territory Group 2	Territory Group 3	Territory Group 4	Territory Group 5	Territory Group 6	Statewide
2018	16.637%	4.859%	19.746%	12.780%	12.703%	33.275%	100.000%
2019	1.517%	3.352%	14.405%	24.857%	22.271%	33.597%	100.000%
2020	1.388%	2.334%	16.361%	15.728%	15.115%	49.074%	100.000%
2021	1.675%	0.762%	14.369%	15.747%	19.387%	48.059%	100.000%
2022	1.295%	1.273%	17.704%	18.100%	16.552%	45.076%	100.000%
	(8)	(9)	(10)	(11)	(12)	(13)	(14)
		= (1) x (8)	= (2) x (8)	= (3) x (8)	= (4) x (8)	= (5) x (8)	= (6) x (8)
	Excess Wind Loss & ALAE						
Accident Year	Statewide	Territory Group 1	Territory Group 2	Territory Group 3	Territory Group 4	Territory Group 5	Territory Group 6
2018	\$2,824,337	\$469,889	\$137,230	\$557,688	\$360,962	\$358,763	\$939,805
2019	1,219,257	18,497	40,874	175,635	303,075	271,542	409,635
2020	5,526,833	76,705	128,977	904,247	869,261	835,383	2,712,261
2021	0	0	0	0	0	0	0
2022	2,895,288	37,492	36,851	512,569	524,059	479,242	1,305,076

(1) - (6) Based on data provided by member companies

(7) = Sum of (1) through (6)

(8) From Section C, Page 44

**North Carolina
Mobile Homeowners
MH(C) - Mobile Home Structures**

Allocation of Excess Flood Loss & ALAE to Territory Group

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Distribution of Flood Loss by Territory Group by Year							
Accident Year	Territory Group 1	Territory Group 2	Territory Group 3	Territory Group 4	Territory Group 5	Territory Group 6	Statewide
2018	0.229%	0.219%	75.910%	12.353%	5.167%	6.122%	100.000%
2019	0.000%	0.000%	0.000%	0.000%	5.303%	94.697%	100.000%
2020	0.000%	0.000%	10.119%	39.335%	2.094%	48.452%	100.000%
2021	0.000%	0.000%	0.000%	0.000%	0.000%	100.000%	100.000%
2022	18.181%	0.000%	10.103%	0.000%	0.000%	71.716%	100.000%
	(8)	(9) = (1) x (8)	(10) = (2) x (8)	(11) = (3) x (8)	(12) = (4) x (8)	(13) = (5) x (8)	(14) = (6) x (8)
Excess Flood Loss & ALAE							
Accident Year	Statewide	Territory Group 1	Territory Group 2	Territory Group 3	Territory Group 4	Territory Group 5	Territory Group 6
2018	\$1,908,311	\$4,362	\$4,173	\$1,448,607	\$235,739	\$98,607	\$116,823
2019	19,232	0	0	0	0	1,020	18,212
2020	0	0	0	0	0	0	0
2021	236,930	0	0	0	0	0	236,930
2022	0	0	0	0	0	0	0

(1) - (6) Based on data provided by member companies

(7) = Sum of (1) through (6)

(8) From Section C, Page 46

**North Carolina
Mobile Homeowners
MH(C) - Adjacent Structures**

Determination of Indicated Rate Change by Territory Group

	(1)	(2)	(3) = (2)(Statewide) / (2) x (3)(Statewide)	(4)	(5)	(6) = [(1) + (3)] / [1 - (4)]	(7)	(8)	(9) = (6) + (7) + (8)	(10)	(11) = (9) + (10)	(12) = (11) / (5) - 1	(13)	(14)	(15)	(16)
Territory Group	Indicated Base Class Loss Cost	2022 Average Rating Factor	Trended Fixed Expenses	Variable Expenses	Average Current Base Rate	Indicated Net Base Rate	Compensation for Assessment Risk	Net Cost of Reinsurance	Indicated Base Rate Excluding Deviation	Net Deviation Per Exposure	Indicated Required Base Class Rate	Indicated Rate Change	Balanced Indicated Rate Change	Proposed Year 1 Rate Change	Proposed Year 2 Rate Change	Proposed Year 3 Rate Change
1	\$38.11	2.606	\$5.89	26.8%	\$57.83	\$60.11	\$1.00	\$53.73	\$114.84	\$6.04	\$120.88	109.0%	109.0%	28.0%	27.8%	27.8%
2	21.18	2.952	5.20	26.8%	51.14	36.03	0.89	31.84	68.76	3.62	72.38	41.5%	41.5%	18.9%	9.1%	9.1%
3	21.05	3.099	4.95	26.8%	31.81	35.52	0.55	27.25	63.33	3.33	66.66	109.6%	109.5%	28.0%	27.9%	27.9%
4	16.68	3.895	3.94	26.8%	28.55	28.18	0.50	16.74	45.41	2.39	47.80	67.4%	67.4%	20.0%	19.0%	17.2%
5	14.53	3.898	3.94	26.8%	24.92	25.22	0.43	11.25	36.91	1.94	38.85	55.9%	55.9%	17.0%	16.0%	14.9%
6	13.05	3.658	4.20	26.8%	19.54	23.57	0.34	4.12	28.02	1.47	29.50	50.9%	50.9%	15.0%	14.5%	14.5%
Statewide	\$15.67	3.519	\$4.36	26.8%	\$24.96	\$27.37	\$0.43	\$11.51	\$39.32	\$2.07	\$41.39	65.9%	65.8%	19.0%	18.1%	18.0%

(1) From Section C, Page 22
(2), (5) From Section C, Page 66
(3) Statewide from Section C, Page 1
(4) From Section C, Page 71. Includes Commission and Brokerage expense; Taxes, Licenses, and Fees; Profit; Contingencies; and Policyholder Dividends
(7) = (5) x 0.017; Reflects 1.4% Compensation for Assessment Risk provision, adjusted for expenses, from Section C, Page 74, Row (5)
(8) From Section C, Page 76
(10) = (9) / [1 - 0.05] - (9); Reflects 5% Net Deviation selected on Section C, Page 78
(12) Statewide based on premium-weighted average using the 2022 earned premium at current manual level
(13) = [1 + (12)] / [1 + (12) Statewide] x [1 + (13) Statewide]; Statewide (13) from Section C, Page 1
(14), (15), (16) From Section A, Page 2

**North Carolina
Mobile Homeowners
MH(C) - Adjacent Structures**

Determination of Indicated Base Class Loss Cost by Territory Group

	(1)	(2)	(3)	(4)	(5)	(6) = (4) / (4) Statewide	(7)	(8)	(9) = (7) + (8)	(10) = (9) / (9) Statewide	(11)
				Credibility Weighted Non-Hurricane Base Class Loss Cost	2022 Earned House Years	Indicated Relativity	Indicated Non-Hurricane Base Class Loss Cost	Modeled Hurricane Base Class Loss Cost	Total Loss Cost	Indicated Relativity	Indicated Base Class Loss Cost
Territory Group	Non-Hurricane Base Class Loss Cost	Five Year Earned House Years	Credibility								
1	\$19.03	8,158	34.1%	\$14.49	1,580	1.217	\$14.77	\$23.85	\$38.61	2.432	\$38.11
2	5.69	13,439	43.8%	9.31	2,366	0.782	9.49	11.96	21.46	1.351	21.18
3	12.92	54,442	88.2%	12.83	11,999	1.077	13.07	8.25	21.33	1.343	21.05
4	12.02	44,197	79.5%	12.04	9,545	1.011	12.27	4.63	16.90	1.065	16.68
5	11.40	46,444	81.5%	11.54	10,018	0.969	11.76	2.96	14.72	0.927	14.53
6	11.75	197,200	100.0%	11.75	42,426	0.987	11.98	1.25	13.23	0.833	13.05
Statewide	\$12.14	363,881		\$11.91	77,934	1.000	\$12.14	\$3.54	\$15.88	1.000	\$15.67

(1) From Section C, Pages 24 through 29; Statewide from Section C, Page 4

(2), (5) Based on data provided by member companies

(3) Based on the Square Root Rule using a Full-Credibility Standard of 70,000 earned house years

(4) = (1) x (3) + (1) Statewide x [1 - (3)]

(7) = (6) x (7) Statewide; (7) Statewide From Section C, Page 4

(8) From Section C, Page 23

(11) = (10) x (11) Statewide; (11) Statewide From Section C, Page 4

**North Carolina
Mobile Homeowners
MH(C) - Adjacent Structures**

Determination of Modeled Hurricane Base Class Loss Cost by Territory Group

	(1)	(2)	(3)	(4)	(5) = (1) / [(2) x (3) x (4)]
Territory Group	Trended Modeled Hurricane Loss & LAE	2022 Earned House Years	2022 Premium Trend Factor	2022 Average Rating Factor	Modeled Hurricane Base Class Loss Cost
1	\$124,286	1,579	1.267	2.606	\$23.85
2	105,775	2,364	1.267	2.952	11.96
3	388,507	11,991	1.267	3.099	8.25
4	218,103	9,544	1.267	3.895	4.63
5	146,236	10,011	1.267	3.898	2.96
6	245,036	42,413	1.267	3.658	1.25
Statewide	\$1,227,943	77,902	1.267	3.519	\$3.54

(1) Provided by Aon

(2) Based on data provided by member companies; excludes exposures where amount of insurance is unavailable

(3) From Section C, Page 63

(4) From Section C, Page 66

**North Carolina
Mobile Homeowners
MH(C) - Adjacent Structures
Territory Group 1**

Determination of Non-Hurricane Base Class Loss Cost

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8) = (6) x (7)	(9)	(10) = (8) x (9)
Accident Year	Non-Hurricane Incurred Loss & ALAE	Excess Wind Loss & ALAE	Excess Flood Loss & ALAE	Excess Wind Loss Factor	Excess Flood Loss Factor	Adjusted Non-Hurricane Incurred Loss & ALAE	Loss & ALAE Development Factor	Non-Hurricane Ultimate Loss & ALAE	ULAE Factor	Non-Hurricane Ultimate Loss and LAE
2018	\$223,831	\$57,158	\$0	1.069	1.018	\$181,188	1.000	\$181,188	1.090	\$197,495
2019	1,710	0	0	1.069	1.018	1,859	1.000	1,859	1.090	2,026
2020	29,427	10,899	0	1.069	1.018	20,141	1.000	20,141	1.090	21,953
2021	13,872	0	0	1.069	1.018	15,080	1.011	15,246	1.090	16,618
2022	20,477	2,149	0	1.069	1.018	19,925	1.051	20,950	1.090	22,836

	(11)	(12)	(13)	(14) = [(10) x (11)] / [(12) x (13)]	(15)	(16)	(17) = (15) / (16)	(18) = (14) / (17)	(19)
Accident Year	Loss Trend Factor	Earned House Years	Premium Trend Factor	Trended Average Loss Cost	Earned Premium at Current Manual Level	Earned Premium at Current Base	Average Rating Factor	Trended Base Class Loss Cost	Accident Year Weights
2018	3.914	1,788	1.617	\$267.33	\$214,967	\$103,257	2.082	\$128.41	10.0%
2019	3.131	1,673	1.521	2.49	207,104	96,478	2.147	1.16	15.0%
2020	2.505	1,597	1.431	24.05	207,183	92,180	2.248	10.70	20.0%
2021	2.004	1,521	1.346	16.26	201,352	87,663	2.297	7.08	25.0%
2022	1.603	1,580	1.267	18.29	237,780	91,226	2.606	7.02	30.0%

(20) Weighted Average Non-Hurricane Base Class Loss Cost: \$19.03

(1), (12) Based on data provided by member companies

(2) From Section C, Page 30

(3) From Section C, Page 31

(4) From Section C, Page 43

(5) From Section C, Page 45

(6) = [(1) - (2) - (3)] x [(4) + (5) - 1]

(7) From Section C, Page 49

(9) From Section C, Page 72

(11) From Section C, Page 55

(13) From Section C, Page 63

(15), (16) Based on data provided by member companies and the extension of exposures method

See Section E, Page 9 for more details as well as an example related to the calculation of premium at present (manual) rates.

See Explanatory Memorandum (Average Rating Factors) for definitions of the base class.

(20) Average of (18) based on the weights in (19)

**North Carolina
Mobile Homeowners
MH(C) - Adjacent Structures
Territory Group 2**

Determination of Non-Hurricane Base Class Loss Cost

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8) = (6) x (7)	(9)	(10) = (8) x (9)
Accident Year	Non-Hurricane Incurred Loss & ALAE	Excess Wind Loss & ALAE	Excess Flood Loss & ALAE	Excess Wind Loss Factor	Excess Flood Loss Factor	Adjusted Non-Hurricane Incurred Loss & ALAE	Loss & ALAE Development Factor	Non-Hurricane Ultimate Loss & ALAE	ULAE Factor	Non-Hurricane Ultimate Loss and LAE
2018	\$55,456	\$13,537	\$0	1.069	1.018	\$45,570	1.000	\$45,570	1.090	\$49,671
2019	24,132	2,162	0	1.069	1.018	23,883	1.000	23,883	1.090	26,033
2020	23,146	7,321	0	1.069	1.018	17,203	1.000	17,203	1.090	18,751
2021	11,710	0	0	1.069	1.018	12,730	1.011	12,870	1.090	14,028
2022	21,738	4,152	0	1.069	1.018	19,118	1.051	20,101	1.090	21,910

	(11)	(12)	(13)	(14) = [(10) x (11)] / [(12) x (13)]	(15)	(16)	(17) = (15) / (16)	(18) = (14) / (17)	(19)
Accident Year	Loss Trend Factor	Earned House Years	Premium Trend Factor	Trended Average Loss Cost	Earned Premium at Current Manual Level	Earned Premium at Current Base	Average Rating Factor	Trended Base Class Loss Cost	Accident Year Weights
2018	3.914	3,139	1.617	\$38.29	\$377,212	\$160,661	2.348	\$16.31	10.0%
2019	3.131	2,829	1.521	18.94	360,796	144,803	2.492	7.60	15.0%
2020	2.505	2,654	1.431	12.36	354,665	135,846	2.611	4.74	20.0%
2021	2.004	2,451	1.346	8.52	340,704	125,400	2.717	3.14	25.0%
2022	1.603	2,366	1.267	11.72	357,192	120,986	2.952	3.97	30.0%

(20) Weighted Average Non-Hurricane Base Class Loss Cost: \$5.69

(1), (12) Based on data provided by member companies

(2) From Section C, Page 30

(3) From Section C, Page 31

(4) From Section C, Page 43

(5) From Section C, Page 45

(6) = [(1) - (2) - (3)] x [(4) + (5) - 1]

(7) From Section C, Page 49

(9) From Section C, Page 72

(11) From Section C, Page 55

(13) From Section C, Page 63

(15), (16) Based on data provided by member companies and the extension of exposures method

See Section E, Page 9 for more details as well as an example related to the calculation of premium at present (manual) rates.

See Explanatory Memorandum (Average Rating Factors) for definitions of the base class.

(20) Average of (18) based on the weights in (19)

**North Carolina
Mobile Homeowners
MH(C) - Adjacent Structures
Territory Group 3**

Determination of Non-Hurricane Base Class Loss Cost

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8) = (6) x (7)	(9)	(10) = (8) x (9)
Accident Year	Non-Hurricane Incurred Loss & ALAE	Excess Wind Loss & ALAE	Excess Flood Loss & ALAE	Excess Wind Loss Factor	Excess Flood Loss Factor	Adjusted Non-Hurricane Incurred Loss & ALAE	Loss & ALAE Development Factor	Non-Hurricane Ultimate Loss & ALAE	ULAE Factor	Non-Hurricane Ultimate Loss and LAE
2018	\$415,343	\$65,854	\$114,979	1.069	1.018	\$254,933	1.000	\$254,933	1.090	\$277,877
2019	123,452	13,156	0	1.069	1.018	119,901	1.000	119,901	1.090	130,692
2020	252,216	64,738	0	1.069	1.018	203,805	1.000	203,805	1.090	222,148
2021	148,540	0	0	1.069	1.018	161,477	1.011	163,253	1.090	177,946
2022	344,433	56,573	0	1.069	1.018	312,929	1.051	329,026	1.090	358,639

	(11)	(12)	(13)	(14) = [(10) x (11)] / [(12) x (13)]	(15)	(16)	(17) = (15) / (16)	(18) = (14) / (17)	(19)
Accident Year	Loss Trend Factor	Earned House Years	Premium Trend Factor	Trended Average Loss Cost	Earned Premium at Current Manual Level	Earned Premium at Current Base	Average Rating Factor	Trended Base Class Loss Cost	Accident Year Weights
2018	3.914	10,612	1.617	\$63.37	\$798,083	\$337,688	2.363	\$26.81	10.0%
2019	3.131	10,222	1.521	26.31	802,431	325,275	2.467	10.67	15.0%
2020	2.505	10,657	1.431	36.48	885,723	339,112	2.612	13.97	20.0%
2021	2.004	10,952	1.346	24.18	965,391	348,512	2.770	8.73	25.0%
2022	1.603	11,999	1.267	37.83	1,182,687	381,648	3.099	12.21	30.0%

(20) Weighted Average Non-Hurricane Base Class Loss Cost: \$12.92

(1), (12) Based on data provided by member companies

(2) From Section C, Page 30

(3) From Section C, Page 31

(4) From Section C, Page 43

(5) From Section C, Page 45

(6) = [(1) - (2) - (3)] x [(4) + (5) - 1]

(7) From Section C, Page 49

(9) From Section C, Page 72

(11) From Section C, Page 55

(13) From Section C, Page 63

(15), (16) Based on data provided by member companies and the extension of exposures method

See Section E, Page 9 for more details as well as an example related to the calculation of premium at present (manual) rates.

See Explanatory Memorandum (Average Rating Factors) for definitions of the base class.

(20) Average of (18) based on the weights in (19)

**North Carolina
Mobile Homeowners
MH(C) - Adjacent Structures
Territory Group 4**

Determination of Non-Hurricane Base Class Loss Cost

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8) = (6) x (7)	(9)	(10) = (8) x (9)
Accident Year	Non-Hurricane Incurred Loss & ALAE	Excess Wind Loss & ALAE	Excess Flood Loss & ALAE	Excess Wind Loss Factor	Excess Flood Loss Factor	Adjusted Non-Hurricane Incurred Loss & ALAE	Loss & ALAE Development Factor	Non-Hurricane Ultimate Loss & ALAE	ULAE Factor	Non-Hurricane Ultimate Loss and LAE
2018	\$161,327	\$27,122	\$12,439	1.069	1.018	\$132,370	1.000	\$132,370	1.090	\$144,283
2019	205,672	30,354	0	1.069	1.018	190,587	1.000	190,587	1.090	207,740
2020	226,188	60,175	0	1.069	1.018	180,471	1.000	180,471	1.090	196,713
2021	160,700	0	0	1.069	1.018	174,695	1.011	176,617	1.090	192,512
2022	357,462	55,198	0	1.069	1.018	328,588	1.051	345,491	1.090	376,585

	(11)	(12)	(13)	(14) = [(10) x (11)] / [(12) x (13)]	(15)	(16)	(17) = (15) / (16)	(18) = (14) / (17)	(19)
Accident Year	Loss Trend Factor	Earned House Years	Premium Trend Factor	Trended Average Loss Cost	Earned Premium at Current Manual Level	Earned Premium at Current Base	Average Rating Factor	Trended Base Class Loss Cost	Accident Year Weights
2018	3.914	8,691	1.617	\$40.17	\$779,060	\$248,087	3.140	\$12.79	10.0%
2019	3.131	8,537	1.521	50.08	800,939	243,700	3.287	15.24	15.0%
2020	2.505	8,708	1.431	39.53	853,971	248,528	3.436	11.50	20.0%
2021	2.004	8,716	1.346	32.87	886,644	248,690	3.565	9.22	25.0%
2022	1.603	9,545	1.267	49.93	1,061,223	272,481	3.895	12.82	30.0%

(20) Weighted Average Non-Hurricane Base Class Loss Cost: \$12.02

(1), (12) Based on data provided by member companies

(2) From Section C, Page 30

(3) From Section C, Page 31

(4) From Section C, Page 43

(5) From Section C, Page 45

(6) = [(1) - (2) - (3)] x [(4) + (5) - 1]

(7) From Section C, Page 49

(9) From Section C, Page 72

(11) From Section C, Page 55

(13) From Section C, Page 63

(15), (16) Based on data provided by member companies and the extension of exposures method

See Section E, Page 9 for more details as well as an example related to the calculation of premium at present (manual) rates.

See Explanatory Memorandum (Average Rating Factors) for definitions of the base class.

(20) Average of (18) based on the weights in (19)

**North Carolina
Mobile Homeowners
MH(C) - Adjacent Structures
Territory Group 5**

Determination of Non-Hurricane Base Class Loss Cost

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8) = (6) x (7)	(9)	(10) = (8) x (9)
Accident Year	Non-Hurricane Incurred Loss & ALAE	Excess Wind Loss & ALAE	Excess Flood Loss & ALAE	Excess Wind Loss Factor	Excess Flood Loss Factor	Adjusted Non-Hurricane Incurred Loss & ALAE	Loss & ALAE Development Factor	Non-Hurricane Ultimate Loss & ALAE	ULAE Factor	Non-Hurricane Ultimate Loss and LAE
2018	\$181,292	\$27,606	\$6,728	1.069	1.018	\$159,757	1.000	\$159,757	1.090	\$174,135
2019	154,650	16,798	0	1.069	1.018	149,858	1.000	149,858	1.090	163,345
2020	169,034	40,025	0	1.069	1.018	140,244	1.000	140,244	1.090	152,866
2021	234,154	0	0	1.069	1.018	254,546	1.011	257,346	1.090	280,507
2022	308,528	46,919	0	1.069	1.018	284,392	1.051	299,021	1.090	325,933

	(11)	(12)	(13)	(14) = [(10) x (11)] / [(12) x (13)]	(15)	(16)	(17) = (15) / (16)	(18) = (14) / (17)	(19)
Accident Year	Loss Trend Factor	Earned House Years	Premium Trend Factor	Trended Average Loss Cost	Earned Premium at Current Manual Level	Earned Premium at Current Base	Average Rating Factor	Trended Base Class Loss Cost	Accident Year Weights
2018	3.914	9,127	1.617	\$46.17	\$702,683	\$227,427	3.090	\$14.94	10.0%
2019	3.131	8,882	1.521	37.85	712,927	221,338	3.221	11.75	15.0%
2020	2.505	9,127	1.431	29.31	762,492	227,421	3.353	8.74	20.0%
2021	2.004	9,290	1.346	44.94	805,344	231,486	3.479	12.92	25.0%
2022	1.603	10,018	1.267	41.18	972,726	249,527	3.898	10.56	30.0%

(20) Weighted Average Non-Hurricane Base Class Loss Cost: \$11.40

(1), (12) Based on data provided by member companies

(2) From Section C, Page 30

(3) From Section C, Page 31

(4) From Section C, Page 43

(5) From Section C, Page 45

(6) = [(1) - (2) - (3)] x [(4) + (5) - 1]

(7) From Section C, Page 49

(9) From Section C, Page 72

(11) From Section C, Page 55

(13) From Section C, Page 63

(15), (16) Based on data provided by member companies and the extension of exposures method

See Section E, Page 9 for more details as well as an example related to the calculation of premium at present (manual) rates.

See Explanatory Memorandum (Average Rating Factors) for definitions of the base class.

(20) Average of (18) based on the weights in (19)

**North Carolina
Mobile Homeowners
MH(C) - Adjacent Structures
Territory Group 6**

Determination of Non-Hurricane Base Class Loss Cost

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8) = (6) x (7)	(9)	(10) = (8) x (9)
Accident Year	Non-Hurricane Incurred Loss & ALAE	Excess Wind Loss & ALAE	Excess Flood Loss & ALAE	Excess Wind Loss Factor	Excess Flood Loss Factor	Adjusted Non-Hurricane Incurred Loss & ALAE	Loss & ALAE Development Factor	Non-Hurricane Ultimate Loss & ALAE	ULAE Factor	Non-Hurricane Ultimate Loss and LAE
2018	\$816,871	\$74,870	\$12,603	1.069	1.018	\$792,921	1.000	\$792,921	1.090	\$864,284
2019	458,942	41,823	1,937	1.069	1.018	451,341	1.000	451,341	1.090	491,961
2020	1,200,659	325,064	0	1.069	1.018	951,850	1.000	951,850	1.090	1,037,517
2021	894,499	0	121,028	1.069	1.018	840,833	1.011	850,082	1.090	926,589
2022	1,087,296	162,423	0	1.069	1.018	1,005,420	1.051	1,057,139	1.090	1,152,281

	(11)	(12)	(13)	(14) = [(10) x (11)] / [(12) x (13)]	(15)	(16)	(17) = (15) / (16)	(18) = (14) / (17)	(19)
Accident Year	Loss Trend Factor	Earned House Years	Premium Trend Factor	Trended Average Loss Cost	Earned Premium at Current Manual Level	Earned Premium at Current Base	Average Rating Factor	Trended Base Class Loss Cost	Accident Year Weights
2018	3.914	38,473	1.617	\$54.36	\$2,117,937	\$751,774	2.817	\$19.30	10.0%
2019	3.131	37,817	1.521	26.77	2,190,430	738,970	2.964	9.03	15.0%
2020	2.505	38,931	1.431	46.64	2,364,929	760,746	3.109	15.00	20.0%
2021	2.004	39,553	1.346	34.86	2,542,702	772,913	3.290	10.60	25.0%
2022	1.603	42,426	1.267	34.37	3,032,545	829,011	3.658	9.40	30.0%

(20) Weighted Average Non-Hurricane Base Class Loss Cost: \$11.75

(1), (12) Based on data provided by member companies

(2) From Section C, Page 30

(3) From Section C, Page 31

(4) From Section C, Page 43

(5) From Section C, Page 45

(6) = [(1) - (2) - (3)] x [(4) + (5) - 1]

(7) From Section C, Page 49

(9) From Section C, Page 72

(11) From Section C, Page 55

(13) From Section C, Page 63

(15), (16) Based on data provided by member companies and the extension of exposures method

See Section E, Page 9 for more details as well as an example related to the calculation of premium at present (manual) rates.

See Explanatory Memorandum (Average Rating Factors) for definitions of the base class.

(20) Average of (18) based on the weights in (19)

**North Carolina
Mobile Homeowners
MH(C) - Adjacent Structures**

Allocation of Excess Wind Loss & ALAE to Territory Group

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Distribution of Wind & Hail Loss by Territory Group by Year							
Accident Year	Territory Group 1	Territory Group 2	Territory Group 3	Territory Group 4	Territory Group 5	Territory Group 6	Statewide
2018	21.476%	5.086%	24.743%	10.191%	10.372%	28.131%	100.000%
2019	0.000%	2.073%	12.615%	29.104%	16.106%	40.101%	100.000%
2020	2.145%	1.441%	12.738%	11.840%	7.876%	63.961%	100.000%
2021	1.381%	0.301%	12.733%	13.756%	15.982%	55.846%	100.000%
2022	0.656%	1.268%	17.279%	16.859%	14.330%	49.608%	100.000%
	(8)	(9)	(10)	(11)	(12)	(13)	(14)
		= (1) x (8)	= (2) x (8)	= (3) x (8)	= (4) x (8)	= (5) x (8)	= (6) x (8)
Excess Wind Loss & ALAE							
Accident Year	Statewide	Territory Group 1	Territory Group 2	Territory Group 3	Territory Group 4	Territory Group 5	Territory Group 6
2018	\$266,148	\$57,158	\$13,537	\$65,854	\$27,122	\$27,606	\$74,870
2019	104,293	0	2,162	13,156	30,354	16,798	41,823
2020	508,223	10,899	7,321	64,738	60,175	40,025	325,064
2021	0	0	0	0	0	0	0
2022	327,413	2,149	4,152	56,573	55,198	46,919	162,423

(1) - (6) Based on data provided by member companies

(7) = Sum of (1) through (6)

(8) From Section C, Page 44

**North Carolina
Mobile Homeowners
MH(C) - Adjacent Structures**

Allocation of Excess Flood Loss & ALAE to Territory Group

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Distribution of Flood Loss by Territory Group by Year							
Accident Year	Territory Group 1	Territory Group 2	Territory Group 3	Territory Group 4	Territory Group 5	Territory Group 6	Statewide
2018	0.000%	0.000%	78.351%	8.477%	4.585%	8.588%	100.000%
2019	0.000%	0.000%	0.000%	0.000%	0.000%	100.000%	100.000%
2020	0.000%	0.000%	12.583%	17.923%	0.000%	69.494%	100.000%
2021	0.000%	0.000%	0.000%	0.000%	0.000%	100.000%	100.000%
2022	48.767%	0.000%	0.000%	0.000%	0.000%	51.233%	100.000%
	(8)	(9) = (1) x (8)	(10) = (2) x (8)	(11) = (3) x (8)	(12) = (4) x (8)	(13) = (5) x (8)	(14) = (6) x (8)
Excess Flood Loss & ALAE							
Accident Year	Statewide	Territory Group 1	Territory Group 2	Territory Group 3	Territory Group 4	Territory Group 5	Territory Group 6
2018	\$146,749	\$0	\$0	\$114,979	\$12,439	\$6,728	\$12,603
2019	1,937	0	0	0	0	0	1,937
2020	0	0	0	0	0	0	0
2021	121,028	0	0	0	0	0	121,028
2022	0	0	0	0	0	0	0

(1) - (6) Based on data provided by member companies

(7) = Sum of (1) through (6)

(8) From Section C, Page 46

**North Carolina
Mobile Homeowners
MH(C) - Personal Effects**

Determination of Indicated Rate Change by Territory Group

	(1)	(2)	(3) = (2)(Statewide) / (2) x (3)(Statewide)	(4)	(5)	(6) = [(1) + (3)] / [1 - (4)]	(7)	(8)	(9) = (6) + (7) + (8)	(10)	(11) = (9) + (10)	(12) = (11) / (5) - 1	(13)	(14)	(15)	(16)
Territory Group	Indicated Base Class Loss Cost	2022 Average Rating Factor	Trended Fixed Expenses	Variable Expenses	Average Current Base Rate	Indicated Net Base Rate	Compensation for Assessment Risk	Net Cost of Reinsurance	Indicated Base Rate Excluding Deviation	Net Deviation Per Exposure	Indicated Required Base Class Rate	Indicated Rate Change	Balanced Indicated Rate Change	Proposed Year 1 Rate Change	Proposed Year 2 Rate Change	Proposed Year 3 Rate Change
1	\$50.74	2.848	\$9.95	26.8%	\$96.65	\$82.90	\$1.68	\$102.62	\$187.20	\$9.85	\$197.05	103.9%	105.4%	28.0%	26.7%	26.7%
2	26.72	3.112	9.10	26.8%	72.22	48.94	1.25	55.32	105.51	5.55	111.07	53.8%	54.9%	24.5%	11.6%	11.6%
3	17.07	3.577	7.92	26.8%	48.13	34.15	0.83	22.51	57.49	3.03	60.51	25.7%	26.7%	12.5%	6.1%	6.1%
4	13.88	4.443	6.38	26.8%	39.91	27.67	0.69	11.88	40.25	2.12	42.37	6.2%	6.9%	3.4%	1.7%	1.7%
5	11.42	4.336	6.53	26.8%	36.87	24.53	0.64	7.32	32.49	1.71	34.20	-7.2%	-6.5%	-3.3%	-1.7%	-1.7%
6	10.00	4.322	6.56	26.8%	33.34	22.61	0.58	2.53	25.72	1.35	27.07	-18.8%	-18.2%	-8.0%	-5.7%	-5.7%
Statewide	\$13.24	4.043	\$7.01	26.8%	\$39.63	\$27.66	\$0.69	\$10.23	\$38.58	\$2.03	\$40.61	1.7%	2.5%	0.5%	0.7%	1.3%

(1) From Section C, Page 33
(2), (5) From Section C, Page 66
(3) Statewide from Section C, Page 1
(4) From Section C, Page 71. Includes Commission and Brokerage expense; Taxes, Licenses, and Fees; Profit; Contingencies; and Policyholder Dividends
(7) = (5) x 0.017; Reflects 1.4% Compensation for Assessment Risk provision, adjusted for expenses, from Section C, Page 74, Row (5)
(8) From Section C, Page 77
(10) = (9) / [1 - 0.05] - (9); Reflects 5% Net Deviation selected on Section C, Page 78
(12) Statewide based on premium-weighted average using the 2022 earned premium at current manual level
(13) = [1 + (12)] / [1 + (12) Statewide] x [1 + (13) Statewide]; Statewide (13) from Section C, Page 1
(14), (15), (16) From Section A, Page 2

**North Carolina
Mobile Homeowners
MH(C) - Personal Effects**

Determination of Indicated Base Class Loss Cost by Territory Group

	(1)	(2)	(3)	(4)	(5)	(6) = (4) / (4) Statewide	(7)	(8)	(9) = (7) + (8)	(10) = (9) / (9) Statewide	(11)
				Credibility Weighted Non-Hurricane Base Class Loss Cost	2022 Earned House Years	Indicated Relativity	Indicated Non-Hurricane Base Class Loss Cost	Modeled Hurricane Base Class Loss Cost	Total Loss Cost	Indicated Relativity	Indicated Base Class Loss Cost
Territory Group	Non-Hurricane Base Class Loss Cost	Five Year Earned House Years	Credibility								
1	\$13.88	10,278	30.6%	\$11.30	2,018	1.142	\$11.60	\$40.84	\$52.44	3.832	\$50.74
2	5.79	15,539	37.6%	8.51	2,759	0.861	8.74	18.87	27.61	2.018	26.72
3	11.46	64,623	76.6%	11.16	14,097	1.128	11.46	6.19	17.64	1.289	17.07
4	11.32	49,663	67.2%	10.94	10,765	1.106	11.24	3.11	14.35	1.048	13.88
5	9.46	53,301	69.6%	9.67	11,493	0.978	9.93	1.87	11.80	0.862	11.42
6	9.34	217,360	100.0%	9.34	47,103	0.945	9.60	0.73	10.33	0.755	10.00
Statewide	\$10.16	410,764		\$9.89	88,235	1.000	\$10.16	\$3.08	\$13.68	1.000	\$13.24

(1) From Section C, Pages 35 through 40; Statewide from Section C, Page 6

(2), (5) Based on data provided by member companies

(3) Based on the Square Root Rule using a Full-Credibility Standard of 110,000 earned house years

(4) = (1) x (3) + (1) Statewide x [1 - (3)]

(7) = (6) x (7) Statewide; (7) Statewide From Section C, Page 6

(8) From Section C, Page 34

(11) = (10) x (11) Statewide; (11) Statewide From Section C, Page 6

**North Carolina
Mobile Homeowners
MH(C) - Personal Effects**

Determination of Modeled Hurricane Base Class Loss Cost by Territory Group

	(1)	(2)	(3)	(4)	(5) = (1) / [(2) x (3) x (4)]
Territory Group	Trended Modeled Hurricane Loss & LAE	2022 Earned House Years	2022 Premium Trend Factor	2022 Average Rating Factor	Modeled Hurricane Base Class Loss Cost
1	\$294,995	2,018	1.257	2.848	\$40.84
2	203,646	2,759	1.257	3.112	18.87
3	392,095	14,097	1.257	3.577	6.19
4	186,959	10,765	1.257	4.443	3.11
5	116,969	11,493	1.257	4.336	1.87
6	187,659	47,103	1.257	4.322	0.73
Statewide	\$1,382,323	88,235	1.257	4.043	\$3.08

(1) Provided by Aon

(2) Based on data provided by member companies; excludes exposures where amount of insurance is unavailable

(3) From Section C, Page 63

(4) From Section C, Page 66

**North Carolina
Mobile Homeowners
MH(C) - Personal Effects
Territory Group 1**

Determination of Non-Hurricane Base Class Loss Cost

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8) = (6) x (7)	(9)	(10) = (8) x (9)
Accident Year	Non-Hurricane Incurred Loss & ALAE	Excess Wind Loss & ALAE	Excess Flood Loss & ALAE	Excess Wind Loss Factor	Excess Flood Loss Factor	Adjusted Non-Hurricane Incurred Loss & ALAE	Loss & ALAE Development Factor	Non-Hurricane Ultimate Loss & ALAE	ULAE Factor	Non-Hurricane Ultimate Loss and LAE
2018	\$362,459	\$72,083	\$0	1.069	1.018	\$315,664	1.000	\$315,664	1.090	\$344,074
2019	28,510	184	0	1.069	1.018	30,792	1.000	30,792	1.090	33,564
2020	100,039	3,791	0	1.069	1.018	104,630	1.000	104,630	1.090	114,046
2021	55,753	0	0	1.069	1.018	60,609	1.001	60,670	1.090	66,130
2022	45,230	232	0	1.069	1.018	48,917	1.006	49,211	1.090	53,640

	(11)	(12)	(13)	(14) = [(10) x (11)] / [(12) x (13)]	(15)	(16)	(17) (15) / (16)	(18) (14) / (17)	(19)
Accident Year	Loss Trend Factor	Earned House Years	Premium Trend Factor	Trended Average Loss Cost	Earned Premium at Current Manual Level	Earned Premium at Current Base	Average Rating Factor	Trended Base Class Loss Cost	Accident Year Weights
2018	1.125	2,188	1.580	\$111.96	\$530,902	\$210,738	2.519	\$44.44	10.0%
2019	1.129	2,091	1.492	12.14	515,262	201,237	2.560	4.74	15.0%
2020	1.133	2,027	1.409	45.26	509,354	195,114	2.611	17.34	20.0%
2021	1.137	1,954	1.331	28.92	500,781	188,088	2.662	10.86	25.0%
2022	1.142	2,018	1.257	24.15	554,867	194,798	2.848	8.48	30.0%

(20) Weighted Average Non-Hurricane Base Class Loss Cost: \$13.88

(1), (12) Based on data provided by member companies

(2) From Section C, Page 41

(3) From Section C, Page 42

(4) From Section C, Page 43

(5) From Section C, Page 45

(6) = [(1) - (2) - (3)] x [(4) + (5) - 1]

(7) From Section C, Page 51

(9) From Section C, Page 72

(11) From Section C, Page 55

(13) From Section C, Page 63

(15), (16) Based on data provided by member companies and the extension of exposures method

See Section E, Page 9 for more details as well as an example related to the calculation of premium at present (manual) rates.

See Explanatory Memorandum (Average Rating Factors) for definitions of the base class.

(20) Average of (18) based on the weights in (19)

**North Carolina
Mobile Homeowners
MH(C) - Personal Effects
Territory Group 2**

Determination of Non-Hurricane Base Class Loss Cost

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8) = (6) x (7)	(9)	(10) = (8) x (9)
Accident Year	Non-Hurricane Incurred Loss & ALAE	Excess Wind Loss & ALAE	Excess Flood Loss & ALAE	Excess Wind Loss Factor	Excess Flood Loss Factor	Adjusted Non-Hurricane Incurred Loss & ALAE	Loss & ALAE Development Factor	Non-Hurricane Ultimate Loss & ALAE	ULAE Factor	Non-Hurricane Ultimate Loss and LAE
2018	\$151,806	\$27,570	\$1,520	1.069	1.018	\$133,404	1.000	\$133,404	1.090	\$145,410
2019	38,689	2,984	0	1.069	1.018	38,815	1.000	38,815	1.090	42,308
2020	44,982	6,935	0	1.069	1.018	41,361	1.000	41,361	1.090	45,084
2021	58,329	0	0	1.069	1.018	63,409	1.001	63,472	1.090	69,185
2022	44,159	872	0	1.069	1.018	47,057	1.006	47,339	1.090	51,600

	(11)	(12)	(13)	(14) = [(10) x (11)] / [(12) x (13)]	(15)	(16)	(17) (15) / (16)	(18) (14) / (17)	(19)
Accident Year	Loss Trend Factor	Earned House Years	Premium Trend Factor	Trended Average Loss Cost	Earned Premium at Current Manual Level	Earned Premium at Current Base	Average Rating Factor	Trended Base Class Loss Cost	Accident Year Weights
2018	1.125	3,577	1.580	\$28.94	\$699,315	\$258,045	2.710	\$10.68	10.0%
2019	1.129	3,244	1.492	9.87	655,679	233,957	2.803	3.52	15.0%
2020	1.133	3,079	1.409	11.77	643,839	222,045	2.900	4.06	20.0%
2021	1.137	2,879	1.331	20.54	612,413	207,526	2.951	6.96	25.0%
2022	1.142	2,759	1.257	16.99	619,455	199,023	3.112	5.46	30.0%

(20) Weighted Average Non-Hurricane Base Class Loss Cost: \$5.79

(1), (12) Based on data provided by member companies

(2) From Section C, Page 41

(3) From Section C, Page 42

(4) From Section C, Page 43

(5) From Section C, Page 45

(6) = [(1) - (2) - (3)] x [(4) + (5) - 1]

(7) From Section C, Page 51

(9) From Section C, Page 72

(11) From Section C, Page 55

(13) From Section C, Page 63

(15), (16) Based on data provided by member companies and the extension of exposures method

See Section E, Page 9 for more details as well as an example related to the calculation of premium at present (manual) rates.

See Explanatory Memorandum (Average Rating Factors) for definitions of the base class.

(20) Average of (18) based on the weights in (19)

**North Carolina
Mobile Homeowners
MH(C) - Personal Effects
Territory Group 3**

Determination of Non-Hurricane Base Class Loss Cost

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8) = (6) x (7)	(9)	(10) = (8) x (9)
Accident Year	Non-Hurricane Incurred Loss & ALAE	Excess Wind Loss & ALAE	Excess Flood Loss & ALAE	Excess Wind Loss Factor	Excess Flood Loss Factor	Adjusted Non-Hurricane Incurred Loss & ALAE	Loss & ALAE Development Factor	Non-Hurricane Ultimate Loss & ALAE	ULAE Factor	Non-Hurricane Ultimate Loss and LAE
2018	\$1,308,969	\$59,594	\$565,082	1.069	1.018	\$743,887	1.000	\$743,887	1.090	\$810,837
2019	417,551	5,246	0	1.069	1.018	448,213	1.000	448,213	1.090	488,552
2020	525,243	19,862	0	1.069	1.018	549,394	1.000	549,394	1.090	598,840
2021	490,859	0	0	1.069	1.018	533,608	1.001	534,142	1.090	582,214
2022	457,751	9,671	0	1.069	1.018	487,103	1.006	490,028	1.090	534,131

	(11)	(12)	(13)	(14) = [(10) x (11)] / [(12) x (13)]	(15)	(16)	(17) (15) / (16)	(18) (14) / (17)	(19)
Accident Year	Loss Trend Factor	Earned House Years	Premium Trend Factor	Trended Average Loss Cost	Earned Premium at Current Manual Level	Earned Premium at Current Base	Average Rating Factor	Trended Base Class Loss Cost	Accident Year Weights
2018	1.125	12,565	1.580	\$45.94	\$1,727,303	\$604,398	2.858	\$16.08	10.0%
2019	1.129	12,142	1.492	30.45	1,719,442	584,053	2.944	10.34	15.0%
2020	1.133	12,746	1.409	37.78	1,886,348	613,102	3.077	12.28	20.0%
2021	1.137	13,073	1.331	38.07	2,023,460	628,809	3.218	11.83	25.0%
2022	1.142	14,097	1.257	34.42	2,426,277	678,353	3.577	9.62	30.0%

(20) Weighted Average Non-Hurricane Base Class Loss Cost: \$11.46

(1), (12) Based on data provided by member companies

(2) From Section C, Page 41

(3) From Section C, Page 42

(4) From Section C, Page 43

(5) From Section C, Page 45

(6) = [(1) - (2) - (3)] x [(4) + (5) - 1]

(7) From Section C, Page 51

(9) From Section C, Page 72

(11) From Section C, Page 55

(13) From Section C, Page 63

(15), (16) Based on data provided by member companies and the extension of exposures method

See Section E, Page 9 for more details as well as an example related to the calculation of premium at present (manual) rates.

See Explanatory Memorandum (Average Rating Factors) for definitions of the base class.

(20) Average of (18) based on the weights in (19)

**North Carolina
Mobile Homeowners
MH(C) - Personal Effects
Territory Group 4**

Determination of Non-Hurricane Base Class Loss Cost

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8) = (6) x (7)	(9)	(10) = (8) x (9)
Accident Year	Non-Hurricane Incurred Loss & ALAE	Excess Wind Loss & ALAE	Excess Flood Loss & ALAE	Excess Wind Loss Factor	Excess Flood Loss Factor	Adjusted Non-Hurricane Incurred Loss & ALAE	Loss & ALAE Development Factor	Non-Hurricane Ultimate Loss & ALAE	ULAE Factor	Non-Hurricane Ultimate Loss and LAE
2018	\$621,799	\$17,670	\$29,735	1.069	1.018	\$624,418	1.000	\$624,418	1.090	\$680,615
2019	362,339	1,750	0	1.069	1.018	391,993	1.000	391,993	1.090	427,272
2020	576,566	24,169	0	1.069	1.018	600,506	1.000	600,506	1.090	654,551
2021	302,082	0	0	1.069	1.018	328,391	1.001	328,719	1.090	358,304
2022	578,498	6,040	0	1.069	1.018	622,313	1.006	626,050	1.090	682,394
	(11)	(12)	(13)	(14) = [(10) x (11)] / [(12) x (13)]	(15)	(16)	(17) (15) / (16)	(18) (14) / (17)	(19)	
Accident Year	Loss Trend Factor	Earned House Years	Premium Trend Factor	Trended Average Loss Cost	Earned Premium at Current Manual Level	Earned Premium at Current Base	Average Rating Factor	Trended Base Class Loss Cost	Accident Year Weights	
2018	1.125	9,694	1.580	\$49.98	\$1,382,076	\$386,673	3.574	\$13.98	10.0%	
2019	1.129	9,549	1.492	33.86	1,419,485	380,906	3.727	9.08	15.0%	
2020	1.133	9,808	1.409	53.67	1,524,202	391,137	3.897	13.77	20.0%	
2021	1.137	9,847	1.331	31.10	1,591,796	392,659	4.054	7.67	25.0%	
2022	1.142	10,765	1.257	57.59	1,908,275	429,472	4.443	12.96	30.0%	

(20) Weighted Average Non-Hurricane Base Class Loss Cost: \$11.32

(1), (12) Based on data provided by member companies

(2) From Section C, Page 41

(3) From Section C, Page 42

(4) From Section C, Page 43

(5) From Section C, Page 45

(6) = [(1) - (2) - (3)] x [(4) + (5) - 1]

(7) From Section C, Page 51

(9) From Section C, Page 72

(11) From Section C, Page 55

(13) From Section C, Page 63

(15), (16) Based on data provided by member companies and the extension of exposures method

See Section E, Page 9 for more details as well as an example related to the calculation of premium at present (manual) rates.

See Explanatory Memorandum (Average Rating Factors) for definitions of the base class.

(20) Average of (18) based on the weights in (19)

**North Carolina
Mobile Homeowners
MH(C) - Personal Effects
Territory Group 5**

Determination of Non-Hurricane Base Class Loss Cost

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8) = (6) x (7)	(9)	(10) = (8) x (9)
Accident Year	Non-Hurricane Incurred Loss & ALAE	Excess Wind Loss & ALAE	Excess Flood Loss & ALAE	Excess Wind Loss Factor	Excess Flood Loss Factor	Adjusted Non-Hurricane Incurred Loss & ALAE	Loss & ALAE Development Factor	Non-Hurricane Ultimate Loss & ALAE	ULAE Factor	Non-Hurricane Ultimate Loss and LAE
2018	\$450,742	\$9,306	\$67,091	1.069	1.018	\$406,947	1.000	\$406,947	1.090	\$443,573
2019	324,872	2,731	0	1.069	1.018	350,196	1.000	350,196	1.090	381,714
2020	416,444	28,816	0	1.069	1.018	421,386	1.000	421,386	1.090	459,311
2021	413,874	0	0	1.069	1.018	449,918	1.001	450,368	1.090	490,901
2022	460,753	10,688	0	1.069	1.018	489,262	1.006	492,200	1.090	536,498

	(11)	(12)	(13)	(14) = [(10) x (11)] / [(12) x (13)]	(15)	(16)	(17) (15) / (16)	(18) (14) / (17)	(19)
Accident Year	Loss Trend Factor	Earned House Years	Premium Trend Factor	Trended Average Loss Cost	Earned Premium at Current Manual Level	Earned Premium at Current Base	Average Rating Factor	Trended Base Class Loss Cost	Accident Year Weights
2018	1.125	10,374	1.580	\$30.44	\$1,304,297	\$382,160	3.413	\$8.92	10.0%
2019	1.129	10,134	1.492	28.50	1,326,129	373,308	3.552	8.02	15.0%
2020	1.133	10,540	1.409	35.05	1,432,218	388,205	3.689	9.50	20.0%
2021	1.137	10,759	1.331	39.00	1,526,728	396,334	3.852	10.12	25.0%
2022	1.142	11,493	1.257	42.41	1,836,572	423,576	4.336	9.78	30.0%

(20) Weighted Average Non-Hurricane Base Class Loss Cost: \$9.46

(1), (12) Based on data provided by member companies

(2) From Section C, Page 41

(3) From Section C, Page 42

(4) From Section C, Page 43

(5) From Section C, Page 45

(6) = [(1) - (2) - (3)] x [(4) + (5) - 1]

(7) From Section C, Page 51

(9) From Section C, Page 72

(11) From Section C, Page 55

(13) From Section C, Page 63

(15), (16) Based on data provided by member companies and the extension of exposures method

See Section E, Page 9 for more details as well as an example related to the calculation of premium at present (manual) rates.

See Explanatory Memorandum (Average Rating Factors) for definitions of the base class.

(20) Average of (18) based on the weights in (19)

**North Carolina
Mobile Homeowners
MH(C) - Personal Effects
Territory Group 6**

Determination of Non-Hurricane Base Class Loss Cost

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8) = (6) x (7)	(9)	(10) = (8) x (9)
Accident Year	Non-Hurricane Incurred Loss & ALAE	Excess Wind Loss & ALAE	Excess Flood Loss & ALAE	Excess Wind Loss Factor	Excess Flood Loss Factor	Adjusted Non-Hurricane Incurred Loss & ALAE	Loss & ALAE Development Factor	Non-Hurricane Ultimate Loss & ALAE	ULAE Factor	Non-Hurricane Ultimate Loss and LAE
2018	\$1,669,154	\$44,204	\$25,633	1.069	1.018	\$1,738,600	1.000	\$1,738,600	1.090	\$1,895,074
2019	1,518,280	7,038	6,250	1.069	1.018	1,636,062	1.000	1,636,062	1.090	1,783,307
2020	2,023,206	124,403	0	1.069	1.018	2,064,170	1.000	2,064,170	1.090	2,249,945
2021	1,614,188	0	101,357	1.069	1.018	1,644,583	1.001	1,646,228	1.090	1,794,388
2022	1,582,338	46,697	0	1.069	1.018	1,669,380	1.006	1,679,404	1.090	1,830,551
	(11)	(12)	(13)	(14) = [(10) x (11)] / [(12) x (13)]	(15)	(16)	(17) (15) / (16)	(18) (14) / (17)	(19)	
Accident Year	Loss Trend Factor	Earned House Years	Premium Trend Factor	Trended Average Loss Cost	Earned Premium at Current Manual Level	Earned Premium at Current Base	Average Rating Factor	Trended Base Class Loss Cost	Accident Year Weights	
2018	1.125	41,873	1.580	\$32.22	\$4,637,414	\$1,394,704	3.325	\$9.69	10.0%	
2019	1.129	41,307	1.492	32.67	4,814,892	1,375,787	3.500	9.33	15.0%	
2020	1.133	43,101	1.409	41.98	5,276,102	1,435,617	3.675	11.42	20.0%	
2021	1.137	43,976	1.331	34.88	5,702,031	1,464,756	3.893	8.96	25.0%	
2022	1.142	47,103	1.257	35.30	6,784,859	1,569,962	4.322	8.17	30.0%	

(20) Weighted Average Non-Hurricane Base Class Loss Cost: \$9.34

(1), (12) Based on data provided by member companies

(2) From Section C, Page 41

(3) From Section C, Page 42

(4) From Section C, Page 43

(5) From Section C, Page 45

(6) = [(1) - (2) - (3)] x [(4) + (5) - 1]

(7) From Section C, Page 51

(9) From Section C, Page 72

(11) From Section C, Page 55

(13) From Section C, Page 63

(15), (16) Based on data provided by member companies and the extension of exposures method

See Section E, Page 9 for more details as well as an example related to the calculation of premium at present (manual) rates.

See Explanatory Memorandum (Average Rating Factors) for definitions of the base class.

(20) Average of (18) based on the weights in (19)

**North Carolina
Mobile Homeowners
MH(C) - Personal Effects**

Allocation of Excess Wind Loss & ALAE to Territory Group

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Distribution of Wind & Hail Loss by Territory Group by Year						
Accident Year	Territory Group 1	Territory Group 2	Territory Group 3	Territory Group 4	Territory Group 5	Territory Group 6	Statewide
2018	31.282%	11.965%	25.862%	7.669%	4.038%	19.184%	100.000%
2019	0.925%	14.969%	26.318%	8.778%	13.702%	35.308%	100.000%
2020	1.823%	3.334%	9.550%	11.621%	13.856%	59.816%	100.000%
2021	6.564%	0.072%	3.863%	12.049%	11.571%	65.881%	100.000%
2022	0.312%	1.175%	13.033%	8.141%	14.404%	62.935%	100.000%
	(8)	(9)	(10)	(11)	(12)	(13)	(14)
		= (1) x (8)	= (2) x (8)	= (3) x (8)	= (4) x (8)	= (5) x (8)	= (6) x (8)
	Excess Wind Loss & ALAE						
Accident Year	Statewide	Territory Group 1	Territory Group 2	Territory Group 3	Territory Group 4	Territory Group 5	Territory Group 6
2018	\$230,427	\$72,083	\$27,570	\$59,594	\$17,670	\$9,306	\$44,204
2019	19,934	184	2,984	5,246	1,750	2,731	7,038
2020	207,975	3,791	6,935	19,862	24,169	28,816	124,403
2021	0	0	0	0	0	0	0
2022	74,200	232	872	9,671	6,040	10,688	46,697

(1) - (6) Based on data provided by member companies

(7) = Sum of (1) through (6)

(8) From Section C, Page 44

**North Carolina
Mobile Homeowners
MH(C) - Personal Effects**

Allocation of Excess Flood Loss & ALAE to Territory Group

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Distribution of Flood Loss by Territory Group by Year							
Accident Year	Territory Group 1	Territory Group 2	Territory Group 3	Territory Group 4	Territory Group 5	Territory Group 6	Statewide
2018	0.000%	0.221%	82.008%	4.315%	9.737%	3.720%	100.000%
2019	0.000%	0.000%	0.000%	0.000%	0.000%	100.000%	100.000%
2020	0.000%	0.000%	7.266%	15.650%	0.000%	77.084%	100.000%
2021	0.000%	0.000%	0.000%	0.000%	0.000%	100.000%	100.000%
2022	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
	(8)	(9) = (1) x (8)	(10) = (2) x (8)	(11) = (3) x (8)	(12) = (4) x (8)	(13) = (5) x (8)	(14) = (6) x (8)
Excess Flood Loss & ALAE							
Accident Year	Statewide	Territory Group 1	Territory Group 2	Territory Group 3	Territory Group 4	Territory Group 5	Territory Group 6
2018	\$689,062	\$0	\$1,520	\$565,082	\$29,735	\$67,091	\$25,633
2019	6,250	0	0	0	0	0	6,250
2020	0	0	0	0	0	0	0
2021	101,357	0	0	0	0	0	101,357
2022	0	0	0	0	0	0	0

(1) - (6) Based on data provided by member companies

(7) = Sum of (1) through (6)

(8) From Section C, Page 46

**North Carolina
Mobile Homeowners
MH(C)**

Derivation of Excess Wind Loss Factor (Excluding Hurricane)

	(1)	(2)	(3)	(4) = (1) - (2) - (3)	(5) = (2) / (4)	(6) = Min [(5), (13)]	(7) = (6) - Avg (6)	(8) = (4) x (7)	(9) = (5) - (6)	(10) = (4) x (9)	(11) = (8) + (10)
Accident Year	Total Incurred Losses Excl Liability	Incurred Wind Losses	Incurred Flood Losses	Total Losses Excl Wind & Flood	Wind Losses / Total Losses Excl Wind & Flood	Capped Wind Ratio	Capped Excess Wind Ratio	Capped Excess Wind Losses	Excess Wind Ratio Above Cap	Excess Wind Losses Above Cap	Total Non-Hurricane Excess Wind Losses
2004	\$21,994,189	\$5,717,246	\$400,177	\$15,876,766	0.360	0.360	0.000	\$0	0.000	\$0	\$0
2005	14,884,753	2,200,881	123,350	12,560,522	0.175	0.175	0.000	0	0.000	0	0
2006	14,847,200	1,908,553	109,405	12,829,241	0.149	0.149	0.000	0	0.000	0	0
2007	17,149,469	3,051,562	60,372	14,037,535	0.217	0.217	0.000	0	0.000	0	0
2008	20,610,416	5,211,614	50,725	15,348,077	0.340	0.340	0.000	0	0.000	0	0
2009	21,475,822	5,048,405	78,870	16,348,547	0.309	0.309	0.000	0	0.000	0	0
2010	20,149,390	4,373,515	612,421	15,163,454	0.288	0.288	0.000	0	0.000	0	0
2011	34,053,302	18,092,295	272,375	15,688,632	1.153	1.153	0.656	10,291,742	0.000	0	10,291,742
2012	24,098,406	8,442,937	34,345	15,621,124	0.540	0.540	0.043	671,708	0.000	0	671,708
2013	22,528,121	6,957,160	503,488	15,067,473	0.462	0.462	0.000	0	0.000	0	0
2014	23,231,413	6,353,558	35,923	16,841,932	0.377	0.377	0.000	0	0.000	0	0
2015	23,379,659	8,478,127	28,725	14,872,807	0.570	0.570	0.073	1,085,715	0.000	0	1,085,715
2016	31,666,613	11,938,312	2,398,334	17,329,967	0.689	0.689	0.192	3,327,354	0.000	0	3,327,354
2017	18,941,629	7,056,782	31,665	11,853,182	0.595	0.595	0.098	1,161,612	0.000	0	1,161,612
2018	27,642,809	10,200,343	2,600,861	14,841,605	0.687	0.687	0.190	2,819,905	0.000	0	2,819,905
2019	18,990,068	6,994,724	229,748	11,765,596	0.595	0.595	0.098	1,153,028	0.000	0	1,153,028
2020	29,556,959	13,289,083	262,385	16,005,492	0.830	0.830	0.333	5,329,829	0.000	0	5,329,829
2021	23,413,563	7,133,356	682,130	15,598,077	0.457	0.457	0.000	0	0.000	0	0
2022	30,345,228	12,003,079	61,037	18,281,112	0.657	0.657	0.160	2,924,978	0.000	0	2,924,978
Total	\$438,959,010	\$144,451,532	\$8,576,338	\$285,931,140	0.505			\$28,765,871		\$0	\$28,765,871
Average:					0.497	0.497	0.097		0.000		
(12) Median of Column (5):					0.462						
(13) 5 x Median of Column (5):					2.310						
(14) Excess Wind Loss Factor:					1.069						

(1), (2), (3) Based on data provided by member companies

(14) = 1 + [(Avg(7) + Avg(9)) / (1.0 + Avg(6) - Avg(7))]

**North Carolina
Mobile Homeowners
MH(C)**

Derivation of Excess Wind Loss & ALAE by Coverage (Excluding Hurricane)

	(1)	(2)	(3)	(4)	(5) = (2) + (3) + (4)	(6) = (2) / (5)	(7) = (3) / (5)	(8) = (4) / (5)	(9)	(10)	(11) = (10) / (9)	(12) = (1) x (6) x (11)	(13) = (1) x (7) x (11)	(14) = (1) x (8) x (11)
Accident Year	Total Non-Hurricane Excess Wind Losses	Mobile Home Structures	Incurring Wind Losses Adjacent Structures	Personal Effects	Total	Mobile Home Structures	Distribution of Wind Losses by Coverage Adjacent Structures	Personal Effects	Total Incurred Losses Excl Liability	Total Incurred Loss & ALAE Excl Liability	Non-Hurricane ALAE Factor	Allocated Non-Hurricane Excess Wind Loss & ALAE by Coverage Mobile Home Structures	Adjacent Structures	Personal Effects
2018	\$2,819,905	\$8,675,088	\$817,486	\$707,769	\$10,200,343	85.0%	8.0%	6.9%	\$27,642,809	\$32,554,052	1.178	\$2,824,337	\$266,148	\$230,427
2019	1,153,028	6,347,952	542,990	103,782	6,994,724	90.8%	7.8%	1.5%	18,990,068	22,126,809	1.165	1,219,257	104,293	19,934
2020	5,329,829	11,764,564	1,081,818	442,701	13,289,083	88.5%	8.1%	3.3%	29,556,959	34,621,188	1.171	5,526,833	508,223	207,975
2021	0	6,440,702	578,946	113,708	7,133,356	90.3%	8.1%	1.6%	23,413,563	26,517,556	1.133	0	0	0
2022	2,924,978	10,540,921	1,192,019	270,139	12,003,079	87.8%	9.9%	2.3%	30,345,228	34,203,748	1.127	2,895,288	327,413	74,200
Total	\$12,227,740	\$43,769,228	\$4,213,258	\$1,638,099	\$49,620,585				\$129,948,628	\$150,023,352		\$12,465,715	\$1,206,077	\$532,535

(1) From Section C, Page 43, Column (11)

(2), (3), (4), (9), (10) Based on data provided by member companies

**North Carolina
Mobile Homeowners
MH(C)**

Derivation of Excess Flood Loss Factor (Excluding Hurricane)

	(1)	(2)	(3)	(4) = (1) - (2) - (3)	(5) = (3) / (4)	(6) = Min [(5), (13)]	(7) = (6) - Avg (6)	(8) = (4) x (7)	(9) = (5) - (6)	(10) = (4) x (9)	(11) = (8) + (10)
Accident Year	Total Incurred Losses Excl Liability	Incurred Wind Losses	Incurred Flood Losses	Total Losses Excl Wind & Flood	Flood Losses / Total Losses Excl Wind & Flood	Capped Flood Ratio	Capped Excess Flood Ratio	Capped Excess Flood Losses	Excess Flood Ratio Above Cap	Excess Flood Losses Above Cap	Total Non-Hurricane Excess Flood Losses
2004	\$21,994,189	\$5,717,246	\$400,177	\$15,876,766	0.025	0.025	0.007	\$111,137	0.000	\$0	\$111,137
2005	14,884,753	2,200,881	123,350	12,560,522	0.010	0.010	0.000	0	0.000	0	0
2006	14,847,200	1,908,553	109,405	12,829,241	0.009	0.009	0.000	0	0.000	0	0
2007	17,149,469	3,051,562	60,372	14,037,535	0.004	0.004	0.000	0	0.000	0	0
2008	20,610,416	5,211,614	50,725	15,348,077	0.003	0.003	0.000	0	0.000	0	0
2009	21,475,822	5,048,405	78,870	16,348,547	0.005	0.005	0.000	0	0.000	0	0
2010	20,149,390	4,373,515	612,421	15,163,454	0.040	0.040	0.022	333,596	0.000	0	333,596
2011	34,053,302	18,092,295	272,375	15,688,632	0.017	0.017	0.000	0	0.000	0	0
2012	24,098,406	8,442,937	34,345	15,621,124	0.002	0.002	0.000	0	0.000	0	0
2013	22,528,121	6,957,160	503,488	15,067,473	0.033	0.033	0.015	226,012	0.000	0	226,012
2014	23,231,413	6,353,558	35,923	16,841,932	0.002	0.002	0.000	0	0.000	0	0
2015	23,379,659	8,478,127	28,725	14,872,807	0.002	0.002	0.000	0	0.000	0	0
2016	31,666,613	11,938,312	2,398,334	17,329,967	0.138	0.050	0.032	554,559	0.088	1,525,037	2,079,596
2017	18,941,629	7,056,782	31,665	11,853,182	0.003	0.003	0.000	0	0.000	0	0
2018	27,642,809	10,200,343	2,600,861	14,841,605	0.175	0.050	0.032	474,931	0.125	1,855,201	2,330,132
2019	18,990,068	6,994,724	229,748	11,765,596	0.020	0.020	0.002	23,531	0.000	0	23,531
2020	29,556,959	13,289,083	262,385	16,005,492	0.016	0.016	0.000	0	0.000	0	0
2021	23,413,563	7,133,356	682,130	15,598,077	0.044	0.044	0.026	405,550	0.000	0	405,550
2022	30,345,228	12,003,079	61,037	18,281,112	0.003	0.003	0.000	0	0.000	0	0
Total	\$438,959,010	\$144,451,532	\$8,576,338	\$285,931,140	0.030			\$2,129,317		\$3,380,238	\$5,509,555
Average:					0.029	0.018	0.007		0.011		
(12) Median of Column (5):					0.010						
(13) 5 x Median of Column (5):					0.050						
(14) Excess Flood Loss Factor:					1.018						

(1), (2), (3) Based on data provided by member companies

(14) = 1 + [(Avg(7) + Avg(9)) / (1.0 + Avg(6) - Avg(7))]

North Carolina
Mobile Homeowners
MH(C)

Derivation of Excess Flood Loss & ALAE by Coverage (Excluding Hurricane)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
					= (2) + (3) + (4)	= (2) / (5)	= (3) / (5)	= (4) / (5)			= (10) / (9)	= (1) x (6) x (11)	= (1) x (7) x (11)	= (1) x (8) x (11)
	Total Non-Hurricane	Incurred Flood Losses				Distribution of Flood Losses by Coverage			Total Incurred Losses	Total Incurred Loss & ALAE	Non-Hurricane ALAE Factor	Allocated Non-Hurricane Excess Flood Loss & ALAE by Coverage		
Accident Year	Excess Flood Losses	Mobile Home Structures	Adjacent Structures	Personal Effects	Total	Mobile Homes	Adjacent Structures	Personal Effects	Excl Liability	Excl Liability		Mobile Home Structures	Adjacent Structures	Personal Effects
2018	\$2,330,132	\$1,808,685	\$139,088	\$653,088	\$2,600,861	69.5%	5.3%	25.1%	\$27,642,809	\$32,554,052	1.178	\$1,908,311	\$146,749	\$689,062
2019	23,531	161,152	16,228	52,368	229,748	70.1%	7.1%	22.8%	18,990,068	22,126,809	1.165	19,232	1,937	6,250
2020	0	121,087	57,141	84,157	262,385	46.1%	21.8%	32.1%	29,556,959	34,621,188	1.171	0	0	0
2021	405,550	351,866	179,739	150,525	682,130	51.6%	26.3%	22.1%	23,413,563	26,517,556	1.133	236,930	121,028	101,357
2022	0	40,531	20,506	0	61,037	66.4%	33.6%	0.0%	30,345,228	34,203,748	1.127	0	0	0
Total	\$2,759,213	\$2,483,322	\$412,702	\$940,137	\$3,836,161				\$129,948,628	\$150,023,352		\$2,164,473	\$269,713	\$796,668

(1) From Section C, Page 45, Column (11)
(2), (3), (4), (9), (10) Based on data provided by member companies

**North Carolina
Mobile Homeowners
MH(C) - Mobile Home Structures**

Derivation of Non-Catastrophe Incurred Loss and ALAE Development Factors - All Companies Combined

[illegible][illegible]

[illegible]

**North Carolina
Mobile Homeowners
MH(C)**

Derivation of Loss Trend Factors

Mobile Home Structures

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
			= (2) - (1), in years		= (4) - (2), in years			
Accident Year	Average Date of Claim	End Date of Experience Period	Experience Period	Trend-to Date	Projection Period	Selected Experience Period Loss Trend	Selected Projection Period Loss Trend	Loss Trend Factor
2018	7/1/2018	12/31/2022	4.50	10/1/2025	2.75	10.9%	8.0%	1.967
2019	7/1/2019	12/31/2022	3.50	10/1/2025	2.75	10.9%	8.0%	1.774
2020	7/1/2020	12/31/2022	2.50	10/1/2025	2.75	10.9%	8.0%	1.600
2021	7/1/2021	12/31/2022	1.50	10/1/2025	2.75	10.9%	8.0%	1.443
2022	7/1/2022	12/31/2022	0.50	10/1/2025	2.75	10.9%	8.0%	1.301

Adjacent Structures

	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
			= (10) - (9), in years		= (12) - (10), in years			
Accident Year	Average Date of Claim	End Date of Experience Period	Experience Period	Trend-to Date	Projection Period	Selected Experience Period Loss Trend	Selected Projection Period Loss Trend	Loss Trend Factor
2018	7/1/2018	12/31/2022	4.50	10/1/2025	2.75	25.0%	14.0%	3.914
2019	7/1/2019	12/31/2022	3.50	10/1/2025	2.75	25.0%	14.0%	3.131
2020	7/1/2020	12/31/2022	2.50	10/1/2025	2.75	25.0%	14.0%	2.505
2021	7/1/2021	12/31/2022	1.50	10/1/2025	2.75	25.0%	14.0%	2.004
2022	7/1/2022	12/31/2022	0.50	10/1/2025	2.75	25.0%	14.0%	1.603

Personal Effects

	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
			= (18) - (17), in years		= (20) - (18), in years			
Accident Year	Average Date of Claim	End Date of Experience Period	Experience Period	Trend-to Date	Projection Period	Selected Experience Period Loss Trend	Selected Projection Period Loss Trend	Loss Trend Factor
2018	7/1/2018	12/31/2022	4.50	10/1/2025	2.75	-0.4%	5.0%	1.125
2019	7/1/2019	12/31/2022	3.50	10/1/2025	2.75	-0.4%	5.0%	1.129
2020	7/1/2020	12/31/2022	2.50	10/1/2025	2.75	-0.4%	5.0%	1.133
2021	7/1/2021	12/31/2022	1.50	10/1/2025	2.75	-0.4%	5.0%	1.137
2022	7/1/2022	12/31/2022	0.50	10/1/2025	2.75	-0.4%	5.0%	1.142

(4), (12), (20) Based on a proposed effective date of October 1, 2024; rates assumed to be in effect for 1 year

(6), (7), (14), (15), (22), (23) From Section C, Pages 57, 58, and 59

(8) = [1 + (6)] ^ (3) x [1 + (7)] ^ (5)

(16) = [1 + (14)] ^ (11) x [1 + (15)] ^ (13)

(24) = [1 + (22)] ^ (19) x [1 + (23)] ^ (21)

**North Carolina
Mobile Homeowners
MH(C)**

Derivation of Loss Trend Factors

Liability								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
			= (2) - (1), in years		= (4) - (2), in years			
Accident Year	Average Date of Claim	End Date of Experience Period	Experience Period	Trend-to Date	Projection Period	Selected Experience Period Loss Trend	Selected Projection Period Loss Trend	Loss Trend Factor
2018	7/1/2018	12/31/2022	4.50	10/1/2025	2.75	6.8%	9.0%	1.706
2019	7/1/2019	12/31/2022	3.50	10/1/2025	2.75	6.8%	9.0%	1.597
2020	7/1/2020	12/31/2022	2.50	10/1/2025	2.75	6.8%	9.0%	1.495
2021	7/1/2021	12/31/2022	1.50	10/1/2025	2.75	6.8%	9.0%	1.399
2022	7/1/2022	12/31/2022	0.50	10/1/2025	2.75	6.8%	9.0%	1.310

(4) Based on a proposed effective date of October 1, 2024; rates assumed to be in effect for 1 year

(6), (7) From Section C, Page 60

(8) = [1 + (6)] ^ (3) x [1 + (7)] ^ (5)

**North Carolina
Mobile Homeowners
MH(C) - Mobile Home Structures**

Determination of Non-Catastrophe Loss and ALAE Trends

	(1)	(2)	(3)	(4) = (2) x (3) / (1)	(5)	(6)	(7) = (5) x (6) / [(2) x (3)]	
Accident Year Ending	Earned Exposures	Reported Claims	Development Factor to Ultimate	Ultimate Frequency	Incurred Loss & ALAE	Development Factor to Ultimate	Ultimate Severity	
2017-4	83,202	5,464	1.000	6.57%	\$16,668,050	1.000	\$3,051	
2018-1	82,627	5,322	1.000	6.44%	16,227,304	1.000	3,049	
2018-2	82,075	5,211	1.000	6.35%	15,633,384	1.000	3,000	
2018-3	81,552	5,314	1.000	6.52%	15,889,328	1.000	2,990	
2018-4	81,031	5,591	1.000	6.90%	16,371,509	1.000	2,928	
2019-1	80,539	5,416	1.000	6.73%	15,465,501	1.000	2,855	
2019-2	80,000	5,406	1.000	6.76%	15,959,469	1.000	2,951	
2019-3	79,435	5,165	1.001	6.51%	15,784,478	1.000	3,054	
2019-4	79,063	4,907	1.001	6.21%	15,115,810	1.000	3,077	
2020-1	79,234	5,013	1.002	6.34%	16,364,845	1.000	3,260	
2020-2	79,722	5,198	1.002	6.53%	17,516,623	1.000	3,365	
2020-3	80,712	5,457	1.003	6.78%	19,666,839	1.001	3,598	
2020-4	81,690	5,748	1.003	7.06%	21,945,926	1.001	3,810	
2021-1	82,228	5,927	1.005	7.24%	23,065,154	1.003	3,884	
2021-2	82,651	5,576	1.007	6.79%	23,201,222	1.005	4,153	
2021-3	82,671	5,267	1.009	6.43%	22,991,901	1.007	4,357	
2021-4	82,758	4,855	1.011	5.93%	21,723,933	1.009	4,466	
2022-1	83,980	4,787	1.021	5.82%	22,496,459	1.017	4,681	
2022-2	85,694	5,014	1.032	6.04%	24,377,970	1.026	4,834	
2022-3	87,680	5,175	1.043	6.15%	25,071,783	1.035	4,807	
2022-4	89,354	5,378	1.053	6.34%	25,996,973	1.043	4,787	
				Annual Exponential Trend			Annual Exponential Trend	
		21-Point Trend (2017-4 to 2022-4):		-1.2%	21-Point Trend (2017-4 to 2022-4):		12.6%	
		17-Point Trend (2018-4 to 2022-4):		-2.4%	17-Point Trend (2018-4 to 2022-4):		16.4%	
		13-Point Trend (2019-4 to 2022-4):		-2.7%	13-Point Trend (2019-4 to 2022-4):		17.3%	
		(8) Credibility:		100.0%		(9) Credibility:	100.0%	
				Selected Frequency Trend			Selected Severity Trend	Pure Premium Trend
		Experience Period:		-1.0%		Experience Period:	12.0%	10.9%
		Projection Period:		0.0%		Projection Period:	8.0%	8.0%

(1), (2), (5) Based on data provided by member companies

(2), (5) Adjusted to exclude catastrophe losses

(3), (6) From Section C, Page 61

(8) Based on 497,098 exposures in the experience period, a full credibility standard of 20,000 exposures, and the square root rule

(9) Based on 31,943 claims during the experience period, a full credibility standard of 1,082 claims, and the square root rule

**North Carolina
Mobile Homeowners
MH(C) - Adjacent Structures**

Determination of Non-Catastrophe Loss and ALAE Trends

	(1)	(2)	(3)	(4) = (2) x (3) / (1)	(5)	(6)	(7) = (5) x (6) / [(2) x (3)]	
Accident Year Ending	Earned Exposures	Reported Claims	Development Factor to Ultimate	Ultimate Frequency	Incurred Loss & ALAE	Development Factor to Ultimate	Ultimate Severity	
2017-4	73,696	338	1.000	0.46%	\$674,075	1.000	\$1,994	
2018-1	73,241	280	1.000	0.38%	575,371	1.000	2,055	
2018-2	72,790	253	1.000	0.35%	523,742	1.000	2,070	
2018-3	72,329	270	1.000	0.37%	543,902	1.000	2,014	
2018-4	71,829	317	1.000	0.44%	688,457	1.000	2,172	
2019-1	71,347	337	1.000	0.47%	725,487	1.000	2,153	
2019-2	70,842	357	1.000	0.50%	813,566	1.000	2,279	
2019-3	70,333	324	1.000	0.46%	749,472	1.000	2,313	
2019-4	69,959	268	1.000	0.38%	654,005	1.000	2,440	
2020-1	70,015	284	1.000	0.41%	707,334	1.000	2,491	
2020-2	70,295	324	1.000	0.46%	710,453	1.000	2,193	
2020-3	70,972	400	1.000	0.56%	786,260	1.000	1,966	
2020-4	71,673	499	1.000	0.70%	916,289	1.000	1,836	
2021-1	72,057	618	1.002	0.86%	1,162,943	1.003	1,882	
2021-2	72,381	645	1.005	0.90%	1,252,064	1.005	1,942	
2021-3	72,403	667	1.007	0.93%	1,352,477	1.008	2,029	
2021-4	72,482	615	1.010	0.86%	1,277,955	1.011	2,080	
2022-1	73,432	605	1.020	0.84%	1,328,942	1.021	2,198	
2022-2	74,802	695	1.031	0.96%	1,476,135	1.031	2,124	
2022-3	76,443	734	1.042	1.00%	1,566,370	1.041	2,133	
2022-4	77,902	755	1.052	1.02%	1,595,409	1.051	2,111	
				Annual Exponential Trend			Annual Exponential Trend	
		21-Point Trend (2017-4 to 2022-4):		25.4%	21-Point Trend (2017-4 to 2022-4):		-0.5%	
		17-Point Trend (2018-4 to 2022-4):		29.4%	17-Point Trend (2018-4 to 2022-4):		-2.4%	
		13-Point Trend (2019-4 to 2022-4):		39.1%	13-Point Trend (2019-4 to 2022-4):		-2.4%	
		(8) Credibility:		100.0%	(9) Credibility:		100.0%	
				Selected Frequency Trend			Selected Severity Trend	Pure Premium Trend
		Experience Period:		25.0%	Experience Period:		0.0%	25.0%
		Projection Period:		14.0%	Projection Period:		0.0%	14.0%

(1), (2), (5) Based on data provided by member companies

(2), (5) Adjusted to exclude catastrophe losses

(3), (6) From Section C, Page 61

(8) Based on 437,542 exposures in the experience period, a full credibility standard of 170,000 exposures, and the square root rule

(9) Based on 2,792 claims during the experience period, a full credibility standard of 1,082 claims, and the square root rule

**North Carolina
Mobile Homeowners
MH(C) - Personal Effects**

Determination of Non-Catastrophe Loss and ALAE Trends

	(1)	(2)	(3)	(4) = (2) x (3) / (1)	(5)	(6)	(7) = (5) x (6) / [(2) x (3)]	
Accident Year Ending	Earned Exposures	Reported Claims	Development Factor to Ultimate	Ultimate Frequency	Incurred Loss & ALAE	Development Factor to Ultimate	Ultimate Severity	
2017-4	81,963	1,199	1.000	1.46%	\$2,961,464	1.000	\$2,470	
2018-1	81,562	1,162	1.000	1.42%	2,988,800	1.000	2,572	
2018-2	81,158	1,143	1.000	1.41%	3,060,643	1.000	2,678	
2018-3	80,743	1,215	1.000	1.50%	3,140,468	1.000	2,585	
2018-4	80,271	1,229	1.000	1.53%	2,860,907	1.000	2,328	
2019-1	79,815	1,214	1.000	1.52%	2,698,361	1.000	2,223	
2019-2	79,300	1,165	1.000	1.47%	2,677,593	1.000	2,298	
2019-3	78,782	1,060	1.000	1.35%	2,591,216	1.000	2,445	
2019-4	78,468	1,013	1.000	1.29%	2,597,748	1.000	2,564	
2020-1	78,697	998	1.000	1.27%	2,777,816	1.000	2,783	
2020-2	79,249	983	1.000	1.24%	2,688,210	1.000	2,735	
2020-3	80,286	1,002	1.000	1.25%	2,840,942	1.000	2,835	
2020-4	81,301	1,017	1.000	1.25%	3,122,663	1.000	3,070	
2021-1	81,879	1,019	1.000	1.24%	2,955,976	1.000	2,902	
2021-2	82,334	995	1.000	1.21%	2,975,571	1.000	2,992	
2021-3	82,397	936	1.000	1.14%	2,863,198	1.001	3,061	
2021-4	82,489	891	1.000	1.08%	2,781,341	1.001	3,125	
2022-1	83,581	921	1.004	1.11%	3,189,717	1.002	3,457	
2022-2	85,083	966	1.008	1.14%	3,205,965	1.003	3,302	
2022-3	86,798	1,008	1.013	1.18%	3,121,074	1.005	3,072	
2022-4	88,236	1,059	1.017	1.22%	3,007,309	1.006	2,809	
				Annual Exponential Trend			Annual Exponential Trend	
		21-Point Trend (2017-4 to 2022-4):		-6.0%	21-Point Trend (2017-4 to 2022-4):		6.4%	
		17-Point Trend (2018-4 to 2022-4):		-6.8%	17-Point Trend (2018-4 to 2022-4):		9.2%	
		13-Point Trend (2019-4 to 2022-4):		-3.8%	13-Point Trend (2019-4 to 2022-4):		5.6%	
		(8) Credibility:		100.0%		(9) Credibility:	100.0%	
				Selected Frequency Trend			Selected Severity Trend	Pure Premium Trend
		Experience Period:		-6.0%		Experience Period:	6.0%	-0.4%
		Projection Period:		0.0%		Projection Period:	5.0%	5.0%

(1), (2), (5) Based on data provided by member companies

(2), (5) Adjusted to exclude catastrophe losses

(3), (6) From Section C, Page 61

(8) Based on 492,729 exposures in the experience period, a full credibility standard of 80,000 exposures, and the square root rule

(9) Based on 6,408 claims during the experience period, a full credibility standard of 1,082 claims, and the square root rule

**North Carolina
Mobile Homeowners
MH(C) - Liability**

Determination of Loss and ALAE Trends

	(1)	(2)	(3)	(4) = (2) x (3) / (1)	(5)	(6)	(7) = (5) x (6) / [(2) x (3)]	(8)	
Accident Year Ending	Earned Exposures	Reported Claims	Development Factor to Ultimate	Ultimate Frequency	Incurred Loss & ALAE	Development Factor to Ultimate	Ultimate Severity	CPI Medical Care	
2017-4	81,562	156	1.000	0.19%	\$797,050	1.000	\$5,109	106.9	
2018-1	81,137	164	1.000	0.20%	841,361	1.000	5,130	108.0	
2018-2	80,722	168	1.000	0.21%	1,021,956	1.000	6,083	108.6	
2018-3	80,303	174	1.000	0.22%	1,107,183	1.000	6,363	108.5	
2018-4	79,828	163	1.000	0.20%	1,137,851	1.000	6,981	108.9	
2019-1	79,358	150	1.000	0.19%	1,190,081	1.000	7,936	110.0	
2019-2	78,819	130	1.000	0.16%	826,625	1.000	6,362	110.7	
2019-3	78,272	113	1.000	0.14%	1,234,027	1.001	10,929	111.9	
2019-4	77,924	107	1.000	0.14%	1,181,543	1.001	11,054	113.7	
2020-1	78,117	103	1.001	0.13%	1,197,786	0.990	11,505	115.0	
2020-2	78,643	113	1.002	0.14%	1,502,316	0.980	13,000	116.2	
2020-3	79,668	113	1.003	0.14%	1,154,304	0.969	9,872	117.0	
2020-4	80,682	115	1.004	0.14%	1,050,410	0.959	8,724	116.3	
2021-1	81,263	132	1.009	0.16%	1,223,141	0.980	8,997	117.2	
2021-2	81,722	122	1.014	0.15%	1,106,199	1.001	8,949	117.3	
2021-3	81,781	116	1.019	0.14%	1,231,909	1.022	10,654	117.5	
2021-4	81,870	116	1.024	0.15%	1,235,198	1.044	10,859	118.4	
2022-1	82,949	108	1.045	0.14%	1,415,046	1.075	13,477	120.3	
2022-2	84,451	106	1.066	0.13%	1,229,265	1.106	12,032	121.7	
2022-3	86,209	108	1.087	0.14%	1,048,557	1.138	10,160	123.8	
2022-4	87,745	103	1.109	0.13%	1,130,407	1.171	11,584	123.6	
				Annual Exponential Trend			Annual Exponential Trend	Annual Exponential Trend	Credibility- Weighted Trend
		21-Point Trend (2017-4 to 2022-4):		-8.6%	21-Point Trend (2017-4 to 2022-4):		16.5%	2.9%	14.3%
		17-Point Trend (2018-4 to 2022-4):		-6.4%	17-Point Trend (2018-4 to 2022-4):		9.8%	3.0%	8.7%
		13-Point Trend (2019-4 to 2022-4):		-1.5%	13-Point Trend (2019-4 to 2022-4):		2.0%	2.6%	2.1%
		(9) Credibility:		83.6%	(10) Credibility:		83.8%		
				Selected Frequency Trend			Selected Severity Trend		Pure Premium Trend
		Experience Period:		-2.0%		Experience Period:	9.0%		6.8%
		Projection Period:		0.0%		Projection Period:	9.0%		9.0%

(1), (2), (5) Based on data provided by member companies

(3), (6) From Section C, Page 61

(8) From Bureau of Labor Statistics - Consumer Price Index for All Urban Consumers - U.S City Average; Medical Care indexed to 2012 (i.e., 2012 index = 100)

(9) Based on 489,612 exposures in the experience period, a full credibility standard of 700,000 exposures, and the square root rule

(10) Based on 760 claims during the experience period, a full credibility standard of 1,082 claims, and the square root rule

**North Carolina
Mobile Homeowners
MH(C)**

Interpolation of Cumulative Development Factors

Accident Year Ending	Months of Development	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
		Mobile Home Structures				Adjacent Structures				Personal Effects				Liability			
		Cumulative Incurred Loss & ALAE Development Factor		Cumulative Reported Claims Development Factor		Cumulative Incurred Loss & ALAE Development Factor		Cumulative Reported Claims Development Factor		Cumulative Incurred Loss & ALAE Development Factor		Cumulative Reported Claims Development Factor		Cumulative Incurred Loss & ALAE Development Factor		Cumulative Reported Claims Development Factor	
		Selected	Interpolated	Selected	Interpolated	Selected	Interpolated	Selected	Interpolated	Selected	Interpolated	Selected	Interpolated	Selected	Interpolated	Selected	Interpolated
2017-4	75	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2018-1	72		1.000		1.000		1.000		1.000		1.000		1.000		1.000		1.000
2018-2	69		1.000		1.000		1.000		1.000		1.000		1.000		1.000		1.000
2018-3	66		1.000		1.000		1.000		1.000		1.000		1.000		1.000		1.000
2018-4	63	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2019-1	60		1.000		1.000		1.000		1.000		1.000		1.000		1.000		1.000
2019-2	57		1.000		1.000		1.000		1.000		1.000		1.000		1.000		1.000
2019-3	54		1.000		1.001		1.000		1.000		1.000		1.000		1.001		1.000
2019-4	51	1.000	1.000	1.001	1.001	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.001	1.001	1.000	1.000
2020-1	48		1.000		1.002		1.000		1.000		1.000		1.000		0.990		1.001
2020-2	45		1.000		1.002		1.000		1.000		1.000		1.000		0.980		1.002
2020-3	42		1.001		1.003		1.000		1.000		1.000		1.000		0.969		1.003
2020-4	39	1.001	1.001	1.003	1.003	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.959	0.959	1.004	1.004
2021-1	36		1.003		1.005		1.003		1.002		1.000		1.000		0.980		1.009
2021-2	33		1.005		1.007		1.005		1.005		1.000		1.000		1.001		1.014
2021-3	30		1.007		1.009		1.008		1.007		1.001		1.000		1.022		1.019
2021-4	27	1.009	1.009	1.011	1.011	1.011	1.011	1.010	1.010	1.001	1.001	1.000	1.000	1.044	1.044	1.024	1.024
2022-1	24		1.017		1.021		1.021		1.020		1.002		1.004		1.075		1.045
2022-2	21		1.026		1.032		1.031		1.031		1.003		1.008		1.106		1.066
2022-3	18		1.035		1.043		1.041		1.042		1.005		1.013		1.138		1.087
2022-4	15	1.043	1.043	1.053	1.053	1.051	1.051	1.052	1.052	1.006	1.006	1.017	1.017	1.171	1.171	1.109	1.109

(1), (3), (5), (7), (9), (11), (13), (15) From Section C, Pages 47 - 54

(2), (4), (6), (8), (10), (12), (14), (16) Exponentially interpolated

**North Carolina
Mobile Homeowners
MH(C)**

Determination of Exposure Trends

	(1)	(2)	(3)
	Average Amount of Insurance per Policy		
Calendar Year Ending	Mobile Home Structures	Adjacent Structures	Personal Effects
2017-4	\$49,445	\$5,355	\$18,992
2018-1	49,825	5,403	19,206
2018-2	50,187	5,450	19,410
2018-3	50,559	5,501	19,616
2018-4	50,945	5,558	19,826
2019-1	51,350	5,617	20,043
2019-2	51,795	5,683	20,279
2019-3	52,283	5,755	20,533
2019-4	52,801	5,829	20,797
2020-1	53,327	5,903	21,059
2020-2	53,862	5,975	21,326
2020-3	54,373	6,044	21,581
2020-4	54,880	6,110	21,837
2021-1	55,374	6,175	22,091
2021-2	55,892	6,243	22,358
2021-3	56,494	6,323	22,662
2021-4	57,239	6,420	23,024
2022-1	58,202	6,549	23,505
2022-2	59,432	6,709	24,120
2022-3	60,914	6,897	24,859
2022-4	62,626	7,112	25,701
21-Point Trend (2017-4 to 2022-4):	4.4%	5.4%	5.7%
17-Point Trend (2018-4 to 2022-4):	4.8%	5.8%	6.1%
13-Point Trend (2019-4 to 2022-4):	5.4%	6.3%	6.8%
9-Point Trend (2020-4 to 2022-4):	6.7%	7.7%	8.3%
	Selected Exposure Trends		
Projection Period (from 7/1/22 to 4/1/25):	6.0%	6.5%	6.5%

(1), (2), (3) Based on data provided by member companies

Note: Selected Exposure Trends are used to project the latest year's exposure file to the midpoint of the projected experience period for the development of modeled hurricane losses, based on a proposed effective date of October 1, 2024

**North Carolina
Mobile Homeowners
MH(C)**

Derivation of Premium Trend Factors

Mobile Home Structures

	(1)	(2)	(3) = (2) - (1), in years	(4)	(5) = (4) - (2), in years	(6)	(7)	(8)
Accident Year	Average Written Date	End Date of Experience Period	Experience Period	Trend-to Date	Projection Period	Selected Experience Period Premium Trend	Selected Projection Period Premium Trend	Premium Trend Factor
2018	1/1/2018	12/31/2022	5.00	4/1/2025	2.25	4.0%	5.4%	1.369
2019	1/1/2019	12/31/2022	4.00	4/1/2025	2.25	4.0%	5.4%	1.317
2020	1/1/2020	12/31/2022	3.00	4/1/2025	2.25	4.0%	5.4%	1.266
2021	1/1/2021	12/31/2022	2.00	4/1/2025	2.25	4.0%	5.4%	1.217
2022	1/1/2022	12/31/2022	1.00	4/1/2025	2.25	4.0%	5.4%	1.171

Adjacent Structures

	(9)	(10)	(11) = (10) - (9), in years	(12)	(13) = (12) - (10), in years	(14)	(15)	(16)
Accident Year	Average Written Date	End Date of Experience Period	Experience Period	Trend-to Date	Projection Period	Selected Experience Period Premium Trend	Selected Projection Period Premium Trend	Premium Trend Factor
2018	1/1/2018	12/31/2022	5.00	4/1/2025	2.25	6.3%	8.1%	1.617
2019	1/1/2019	12/31/2022	4.00	4/1/2025	2.25	6.3%	8.1%	1.521
2020	1/1/2020	12/31/2022	3.00	4/1/2025	2.25	6.3%	8.1%	1.431
2021	1/1/2021	12/31/2022	2.00	4/1/2025	2.25	6.3%	8.1%	1.346
2022	1/1/2022	12/31/2022	1.00	4/1/2025	2.25	6.3%	8.1%	1.267

Personal Effects

	(17)	(18)	(19) = (18) - (17), in years	(20)	(21) = (20) - (18), in years	(22)	(23)	(24)
Accident Year	Average Written Date	End Date of Experience Period	Experience Period	Trend-to Date	Projection Period	Selected Experience Period Premium Trend	Selected Projection Period Premium Trend	Premium Trend Factor
2018	1/1/2018	12/31/2022	5.00	4/1/2025	2.25	5.9%	7.9%	1.580
2019	1/1/2019	12/31/2022	4.00	4/1/2025	2.25	5.9%	7.9%	1.492
2020	1/1/2020	12/31/2022	3.00	4/1/2025	2.25	5.9%	7.9%	1.409
2021	1/1/2021	12/31/2022	2.00	4/1/2025	2.25	5.9%	7.9%	1.331
2022	1/1/2022	12/31/2022	1.00	4/1/2025	2.25	5.9%	7.9%	1.257

Liability

	(25)	(26)	(27) = (26) - (25), in years	(28)	(29) = (28) - (26), in years	(30)	(31)	(32)
Accident Year	Average Written Date	End Date of Experience Period	Experience Period	Trend-to Date	Projection Period	Selected Experience Period Premium Trend	Selected Projection Period Premium Trend	Premium Trend Factor
2018	1/1/2018	12/31/2022	5.00	4/1/2025	2.25	0.9%	0.7%	1.062
2019	1/1/2019	12/31/2022	4.00	4/1/2025	2.25	0.9%	0.7%	1.053
2020	1/1/2020	12/31/2022	3.00	4/1/2025	2.25	0.9%	0.7%	1.043
2021	1/1/2021	12/31/2022	2.00	4/1/2025	2.25	0.9%	0.7%	1.034
2022	1/1/2022	12/31/2022	1.00	4/1/2025	2.25	0.9%	0.7%	1.025

(4), (12), (20), (28) Based on a proposed effective date of October 1, 2024; rates assumed to be in effect for 1 year

(6), (7), (14), (15), (22), (23), (30), (31) From Section C, Page 64

(8) = [1 + (6)] ^ (3) x [1 + (7)] ^ (5)

(16) = [1 + (14)] ^ (11) x [1 + (15)] ^ (13)

(24) = [1 + (22)] ^ (19) x [1 + (23)] ^ (21)

(32) = [1 + (30)] ^ (27) x [1 + (31)] ^ (29)

**North Carolina
Mobile Homeowners
MH(C)**

Determination of Statewide Average Rating Factors and Premium Trends

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
			= (1) / (2)			= (4) / (5)			= (7) / (8)		
	Mobile Home Structures			Adjacent Structures			Personal Effects			Liability	
Accident Year	Earned Premium at Current Manual Level	Earned Premium at Current Base Class	Average Rating Factor	Earned Premium at Current Manual Level	Earned Premium at Current Base Class	Average Rating Factor	Earned Premium at Current Manual Level	Earned Premium at Current Base Class	Average Rating Factor	Average Liability Limit	Average Rating Factor
2018	\$65,766,889	\$34,621,793	1.900	\$4,989,942	\$1,828,894	2.728	\$10,281,307	\$3,236,720	3.176	\$125,561	1.326
2019	65,721,942	33,640,131	1.954	5,074,627	1,770,563	2.866	10,450,889	3,149,248	3.319	130,154	1.338
2020	69,732,908	34,595,978	2.016	5,428,963	1,803,833	3.010	11,272,063	3,245,221	3.473	135,985	1.352
2021	72,795,817	35,069,990	2.076	5,742,137	1,814,665	3.164	11,957,209	3,278,173	3.648	140,448	1.363
2022	84,347,238	37,654,479	2.240	6,844,153	1,944,879	3.519	14,130,305	3,495,183	4.043	143,788	1.372
			Annual Exponential Trend			Annual Exponential Trend			Annual Exponential Trend		Annual Exponential Trend
		5 Years:	4.0%		5 Years:	6.3%		5 Years:	5.9%	5 Years:	0.9%
		4 Years:	4.5%		4 Years:	6.9%		4 Years:	6.6%	4 Years:	0.9%
		3 Years:	5.4%		3 Years:	8.1%		3 Years:	7.9%	3 Years:	0.7%
			Selected Premium Trends			Selected Premium Trends			Selected Premium Trends		Selected Premium Trends
Experience Period:			4.0%			6.3%			5.9%		0.9%
Projection Period:			5.4%			8.1%			7.9%		0.7%

(1), (4) and (7) Calculated based on data provided by member companies and the extension of exposures method.

See Section E, Page 11 for more details as well as an example related to the calculation of premium at present (manual) rates.

(2), (5) and (8) Calculated based on data provided by member companies and the extension of exposures method.

See Explanatory Memorandum (Average Rating Factors) for definitions of the base class.

(10) From Section C, Page 65; Sum product of the distribution in (3) through (8) and the corresponding liability limits above each column

(11) From Section C, Page 65

**North Carolina
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Determination of Statewide Average Liability Rating Factors

		Liability Limit						
		\$25,000	\$50,000	\$100,000	\$200,000	\$250,000	\$300,000	
(1) Current Rate:		\$23.67	\$26.99	\$31.24	\$36.44	\$38.58	\$40.48	
(2) Current Increased Limit Factor:		1.000	1.140	1.320	1.540	1.630	1.710	
	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Distribution of Earned House Years								
Accident Year	Liability Limit						Total	Liability Average Rating Factor
	\$25,000	\$50,000	\$100,000	\$200,000	\$250,000	\$300,000		
2018	10.0%	32.1%	33.3%	0.1%	0.0%	24.5%	100.0%	1.326
2019	9.2%	30.8%	33.8%	0.1%	0.0%	26.2%	100.0%	1.338
2020	8.3%	28.4%	35.0%	0.1%	0.0%	28.1%	100.0%	1.352
2021	7.7%	27.0%	35.4%	0.1%	0.0%	29.8%	100.0%	1.363
2022	7.0%	25.3%	36.7%	0.2%	0.0%	30.8%	100.0%	1.372

(1) From current MH(C) rate manual, page MHC-R-7

(2) = (1) / \$23.67, where \$23.67 is the current rate for \$25,000 of Liability coverage

(3) through (8) Based on data provided by member companies

(9) = (3) + (4) + (5) + (6) + (7) + (8)

(10) Sum product of the distribution in (3) through (8) and the increased limit factors in (2)

**North Carolina
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Determination of Average Rating Factors and Average Current Base Rates by Territory Group

	(1)	(2)	(3)	(4) = (1) / (2)	(5) = (2) / (3)	(6)	(7)	(8)	(9) = (6) / (7)	(10) = (7) / (8)	(11)	(12)	(13)	(14) = (11) / (12)	(15) = (12) / (13)
Territory Group	Mobile Home Structures					Adjacent Structures					Personal Effects				
	2022 Earned Premium at Current Manual Level	2022 Earned Premium at Current Base	2022 Earned House Years	Average Rating Factor	Average Current Base Rate	2022 Earned Premium at Current Manual Level	2022 Earned Premium at Current Base	2022 Earned House Years	Average Rating Factor	Average Current Base Rate	2022 Earned Premium at Current Manual Level	2022 Earned Premium at Current Base	2022 Earned House Years	Average Rating Factor	Average Current Base Rate
1	\$3,609,282	\$1,860,751	2,111	1.940	\$881.42	\$237,780	\$91,226	1,577	2.606	\$57.83	\$554,867	\$194,798	2,016	2.848	\$96.65
2	3,987,660	2,031,151	2,828	1.963	718.17	357,192	120,986	2,366	2.952	51.14	619,455	199,023	2,756	3.112	72.22
3	15,261,671	7,740,721	14,548	1.972	532.08	1,182,687	381,648	11,998	3.099	31.81	2,426,277	678,353	14,094	3.577	48.13
4	12,720,044	5,361,239	10,908	2.373	491.52	1,061,223	272,481	9,542	3.895	28.55	1,908,275	429,472	10,761	4.443	39.91
5	11,725,914	4,914,417	11,754	2.386	418.12	972,726	249,527	10,015	3.898	24.92	1,836,572	423,576	11,489	4.336	36.87
6	37,042,667	15,746,200	47,159	2.352	333.90	3,032,545	829,011	42,419	3.658	19.54	6,784,859	1,569,962	47,089	4.322	33.34
Total	\$84,347,238	\$37,654,479	89,307	2.240	\$421.63	\$6,844,153	\$1,944,879	77,918	3.519	\$24.96	\$14,130,305	\$3,495,183	88,205	4.043	\$39.63

(1), (6) and (11) Calculated based on data provided by member companies and the extension of exposures method; excludes exposures where amount of insurance is unavailable or deductible is invalid.

See Section E, Page 11 for more details as well as an example related to the calculation of premium at present (manual) rates.

(2), (7) and (12) Calculated based on data provided by member companies and the extension of exposures method.

See Explanatory Memorandum (Average Rating Factors) for definitions of the base class.

(3), (8) and (13) Based on data provided by member companies

**North Carolina
Mobile Homeowners
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Derivation of Complement of Credibility

	Mobile Home Structures	Adjacent Structures	Personal Effects	Liability
(1) Credibility-Wtd Non-Hurricane Base-Class Loss Cost from Prior Filing	\$203.70	\$7.27	\$11.63	\$14.69
(2) Premium Trend Rate	5.4%	8.1%	7.9%	0.7%
(3) Premium Trend Factor	1.068	1.102	1.100	1.009
(4) Loss Trend Rate	8.0%	14.0%	5.0%	9.0%
(5) Loss Trend Factor	1.101	1.178	1.063	1.114
(6) Complement of Credibility	\$210.00	\$7.77	\$11.24	\$16.22

(1) From 2022 NCRB Mobile Homeowners MH(C) rate filing, Section C, Pages 2, 4, 6, and 8

(2) From Section C, Page 64

(3) = $[1 + (2)]^{15 / 12}$; Trended 15 months from the trend-to date from the 2022 NCRB Mobile Homeowners MH(C) rate filing, Section C, Page 63 (1/1/2024) to the average written data for the period in which the rates are to be in effect (4/1/2025)

(4) From Section C, Pages 57 through 60

(5) = $[1 + (4)]^{15 / 12}$; Trended 15 months from the trend-to date from the 2022 NCRB Mobile Homeowners MH(C) rate filing, Section C, Pages 55 and 56 (7/1/2024) to the average accident date for the period in which the proposed rates are to be in effect (10/1/2025)

(6) = (1) x (5) / (3)

**North Carolina
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Derivation of Modeled Hurricane Base Class Loss Cost

	Mobile Home Structures	Adjacent Structures	Personal Effects
(1) Trended Modeled Hurricane Loss & LAE	\$12,731,612	\$1,227,943	\$1,382,323
(2) 2022 Earned House Years	89,353	77,902	88,235
(3) 2022 Average Rating Factor	2.240	3.519	4.043
(4) 2022 Premium Trend Factor	1.171	1.267	1.257
(5) Modeled Hurricane Base Class Loss Cost; = (1) / [(2) x (3) x (4)]	\$54.34	\$3.54	\$3.08

(1) Provided by Aon

(2) Based on data provided by member companies; excludes exposures where amount of insurance is unavailable

(3) From Section C, Page 64

(4) From Section C, Page 63

**North Carolina
Mobile Homeowners
MH(C)**

Determination of Expense Trend

	(1)	(2)	(3)	
Quarter Ending	Quarterly Avg CPI: All Items	Quarterly Avg CPI: All Items Less Energy	Quarterly Compensation Cost Index (CCI)	
9/30/2018	106.4	106.0	108.8	
12/31/2018	106.3	106.4	108.7	
3/31/2019	106.7	107.2	110.4	
6/30/2019	108.0	107.8	111.4	
9/30/2019	108.3	108.3	111.8	
12/31/2019	108.5	108.7	111.8	
3/31/2020	109.0	109.5	112.6	
6/30/2020	108.4	109.6	114.1	
9/30/2020	109.6	110.5	114.3	
12/31/2020	109.9	110.9	114.5	
3/31/2021	111.0	111.5	115.8	
6/30/2021	113.6	113.5	116.6	
9/30/2021	115.4	115.0	117.2	
12/31/2021	117.2	116.5	117.8	
3/31/2022	119.9	118.7	120.2	
6/30/2022	123.4	121.0	122.8	
9/30/2022	125.1	123.1	123.6	
12/31/2022	125.5	124.3	124.2	
3/31/2023	126.8	126.0	126.4	
6/30/2023	128.3	127.6	128.1	
9/30/2023	129.5	128.5	128.6	
	(4)			
	Fitted Annual Trends (Exponential)			Blended CPI and CCI Trends
21-point (2018-2023):	4.4%	4.1%	3.4%	3.9%
17-point (2019-2023):	5.3%	4.8%	3.8%	4.4%
13-point (2020-2023):	6.4%	5.7%	4.4%	5.2%
9-point (2021-2023):	5.9%	5.9%	5.0%	5.5%
Selected Experience Period Expense Trend:				5.0%
Selected Projection Period Expense Trend:				5.0%

(1), (2) From Bureau of Labor Statistics - Consumer Price Index for All Urban Consumers - U.S. City Average; each expenditure indexed to 2015 (i.e., 2015 index = 100)

(3) From Bureau of Labor Statistics - Employment Cost Index for Insurance Carriers and Related Activities

(4) = (1) x 25% + (2) x 25% + (3) x 50%

**North Carolina
Mobile Homeowners
MH(C)**

Derivation of Fixed Expense Per Policy

	Mobile Home Structures	Adjacent Structures	Personal Effects	Liability
(1) Experience Period Expense Trend	5.0%	5.0%	5.0%	5.0%
(2) Projection Period Expense Trend	5.0%	5.0%	5.0%	5.0%
(3) (a) Average Date of Expenses	7/1/2021	7/1/2021	7/1/2021	7/1/2021
(b) End Date of Experience Period	12/31/2022	12/31/2022	12/31/2022	12/31/2022
(c) Experience Period (Years) = (3b) - (3a)	1.500	1.500	1.500	1.500
(4) (a) Trend-to Date	4/1/2025	4/1/2025	4/1/2025	4/1/2025
(b) Projection Period (Years) = (4a) - (3b)	2.250	2.250	2.250	2.250
(5) Expense Trend Factor	1.201	1.201	1.201	1.201
(6) Fixed Expenses	19.6%	19.6%	19.6%	19.6%
(7) 2021 Premium Trend Factor	1.217	1.346	1.331	1.034
(8) Trended Fixed Expenses	19.3%	17.5%	17.7%	22.8%
(9) 2022 Manual-Level Base Premium	\$37,654,479	\$1,944,879	\$3,495,183	\$2,075,853
(10) 2022 Earned Exposures	89,307	77,918	88,205	87,700
(11) Average Current Base Premium	\$421.63	\$24.96	\$39.63	\$23.67
(12) Fixed Expense Per Policy	\$81.51	\$4.36	\$7.01	\$5.39

(1), (2) From Section C, Page 69

(3a), (3b) Based on experience period used to select expenses

(4a) Based on a proposed effective date of 10/1/2024

(5) = $[1 + (1)] \wedge (3c) \times [1 + (2)] \wedge (4b)$

(6) From Section C, Page 71

(7) From Section C, Page 63

(8) = (5) x (6) / (7)

(9) Calculated based on data provided by member companies and the extension of exposures method

See Section E, Page 9 for more details on the rate order calculation

See Explanatory Memorandum (Average Rating Factors) for definitions of the base class

(10) Based on data provided by member companies; excludes exposure where amount of insurance is unavailable

(11) = (9) / (10)

(12) = (8) x (11)

**North Carolina
Mobile Homeowners
MH(C)**

Derivation of Underwriting Expense Ratios
Data Restated to Reflect Member Companies Currently Writing Policies in this Mobile Home Program

	2018		2019		2020		2021		2022		Average: 2020-2022	Selected
	\$	%	\$	%	\$	%	\$	%	\$	%		
(1) Direct Premiums Written	\$77,376,263	xxx	\$77,698,006	xxx	\$83,173,530	xxx	\$86,563,914	xxx	\$92,673,880	xxx		
(2) Direct Premiums Earned	77,502,647	xxx	77,108,786	xxx	80,953,547	xxx	84,700,507	xxx	91,266,851	xxx		
(3) Commission & Brokerage	\$13,769,580	17.8%	\$13,230,484	17.0%	\$13,816,064	16.6%	\$14,183,992	16.4%	\$14,339,126	15.5%	16.2%	16.2%
(4) Taxes, Licenses, & Fees	2,598,096	3.4%	2,459,009	3.2%	2,895,763	3.5%	2,749,952	3.2%	2,417,873	2.6%	3.1%	3.1%
(5) Other Acquisition	9,946,241	12.8%	9,960,953	12.9%	9,363,514	11.6%	9,156,993	10.8%	9,868,803	10.8%	11.1%	11.1%
(6) General Expenses	6,330,468	8.2%	6,842,130	8.9%	7,232,561	8.9%	6,934,889	8.2%	7,550,749	8.3%	8.5%	8.5%
(7) Total		42.2%		42.0%		40.6%		38.6%		37.2%	38.8%	38.9%
(8) Variable Expenses		21.2%		20.2%		20.1%		19.6%		18.1%	19.2%	19.3%
(9) Fixed Expenses		21.0%		21.8%		20.5%		19.0%		19.1%	19.5%	19.6%

(1) through (6) Provided by the North Carolina Rate Bureau

(3) & (4) Relative to written premium

(5) & (6) Relative to earned premium

(7) = (3) + (4) + (5) + (6)

(8) = (3) + (4)

(9) = (5) + (6)

**North Carolina
Mobile Homeowners
MH(C)**

Derivation of Ratio of Unallocated Loss Adjustment Expense (ULAE) to Loss & Allocated Loss Adjustment Expense (ALAE)
Data Restated to Reflect Member Companies Currently Writing Policies in this Mobile Home Program

	(1)	(2)	(3) = (1) / (2)	(4)
Calendar Year	Incurred ULAE	Incurred Loss & ALAE	Ratio of Incurred ULAE to Incurred Loss & ALAE	Distribution of Incurred Hurricane Loss & ALAE as % of Total
2018	\$5,883,577	\$73,010,837	8.1%	55.0%
2019	2,263,497	23,143,043	9.8%	6.0%
2020	3,064,940	32,158,303	9.5%	6.1%
2021	3,007,559	29,839,515	10.1%	1.5%
2022	2,433,659	36,019,213	6.8%	5.0%
Total	\$16,653,232	\$194,170,911	8.6%	
		Average (2018-2022):	8.8%	
		Average (excluding 2018):	9.0%	
		Selected Ratio of ULAE to Loss & ALAE (Non-Hurricane):	9.0%	
		Selected Ratio of LAE to Loss (Hurricane):	6.0%	

(1) = Adjusting & Other Expenses

(2) = Incurred Loss + Defense & Cost Containment Expenses

(1), (2) Provided by the North Carolina Rate Bureau

(4) Based on data provided by member companies

Note: See pre-filed testimony of M. Mao for support of the Catastrophe LAE Ratio, which is applied by Aon to the modeled hurricane wind and storm surge losses

**North Carolina
Mobile Homeowners
MH(C)**

Derivation of Policyholder Dividends

	(1)	(2)	(3) = (2) / (1)
Calendar Year	Total Written Premium: Homeowners (\$000)	Dividends (\$000)	Dividends as Percent of Total Written Premium
2018	\$2,710,120	\$11,678	0.4%
2019	2,887,386	17,986	0.6%
2020	3,105,409	15,534	0.5%
2021	3,322,162	14,368	0.4%
2022	3,732,563	14,448	0.4%
Total	\$15,757,640	\$74,015	0.5%
Average (2018-2022):			0.5%
Average (2018-2022 excluding High & Low):			0.5%
Selected Policyholder Dividends:			0.5%

(1), (2) From industry Annual Statements, Statutory Page 14, Homeowners Multiple Peril

**North Carolina
Mobile Homeowners
MH(C)**

Derivation of Compensation for Assessment Risk per Policy

	Mobile Home Structures	Adjacent Structures	Personal Effects
(1) Average Current Base Premium	\$421.63	\$24.96	\$39.63
(2) Compensation for Assessment Risk	1.4%	1.4%	1.4%
(3) Commission & Brokerage	16.2%	16.2%	16.2%
(4) Taxes, Licenses, & Fees	3.1%	3.1%	3.1%
(5) Compensation for Assessment Risk (Adj for Expenses)	1.7%	1.7%	1.7%
(6) Compensation for Assessment Risk per Policy	\$7.31	\$0.43	\$0.69

(1) From Section C, Page 70

(2) See pre-filed testimony from M. Mao for support of Compensation for Assessment Risk provision

(3), (4) From Section C, Page 71

(5) = (2) / [1 - (3) - (4)]

(6) = (1) x (5)

**North Carolina
Mobile Homeowners
MH(C) - Mobile Home Structures**

Derivation of Base Class Net Cost of Reinsurance by Territory Group

	(1)	(2)	(3) = (1) / (2)	(4)	(5)	(6)	(7) = (3) / {(4) x (5) x [1-(6)]}
<u>Territory Group</u>	<u>Estimated Net Cost of Reinsurance</u>	<u>2022 House Years</u>	<u>Average Net Cost of Reinsurance</u>	<u>2022 Average Rating Factor</u>	<u>2022 Premium Trend Factor</u>	<u>Variable Expenses</u>	<u>Base Class Net Cost of Reinsurance</u>
1	\$2,781,394	2,114	\$1,315.93	1.940	1.171	0.268	\$791.71
2	2,220,225	2,833	783.78	1.963	1.171	0.268	465.89
3	9,532,743	14,549	655.24	1.972	1.171	0.268	387.83
4	5,583,897	10,911	511.74	2.373	1.171	0.268	251.71
5	4,130,692	11,761	351.23	2.386	1.171	0.268	171.78
6	5,702,938	47,186	120.86	2.352	1.171	0.268	59.95
Statewide	\$29,951,889	89,353	\$335.21	2.240	1.171	0.268	\$174.63

(1) Provided by Aon

(2) Based on data provided by member companies; excludes exposures where amount of insurance is unavailable

(4) From Section C, Page 66

(5) From Section C, Page 63

(6) From Section C, Page 1. Includes Commission and Brokerage expense; Taxes, Licenses, and Fees; Profit; Contingencies; and Policyholder Dividends

**North Carolina
Mobile Homeowners
MH(C) - Adjacent Structures**

Derivation of Base Class Net Cost of Reinsurance by Territory Group

	(1)	(2)	(3) = (1) / (2)	(4)	(5)	(6)	(7) = (3) / {(4) x (5) x [1-(6)]}
<u>Territory Group</u>	<u>Estimated Net Cost of Reinsurance</u>	<u>2022 House Years</u>	<u>Average Net Cost of Reinsurance</u>	<u>2022 Average Rating Factor</u>	<u>2022 Premium Trend Factor</u>	<u>Variable Expenses</u>	<u>Base Class Net Cost of Reinsurance</u>
1	\$204,993	1,579	\$129.84	2.606	1.267	0.268	\$53.73
2	206,037	2,364	87.15	2.952	1.267	0.268	31.84
3	938,912	11,991	78.30	3.099	1.267	0.268	27.25
4	576,973	9,544	60.45	3.895	1.267	0.268	16.74
5	407,074	10,011	40.66	3.898	1.267	0.268	11.25
6	592,706	42,413	13.97	3.658	1.267	0.268	4.12
Statewide	\$2,926,696	77,902	\$37.57	3.519	1.267	0.268	\$11.51

(1) Provided by Aon

(2) Based on data provided by member companies; excludes exposures where amount of insurance is unavailable

(4) From Section C, Page 66

(5) From Section C, Page 63

(6) From Section C, Page 1. Includes Commission and Brokerage expense; Taxes, Licenses, and Fees; Profit; Contingencies; and Policyholder Dividends

**North Carolina
Mobile Homeowners
MH(C) - Personal Effects**

Derivation of Base Class Net Cost of Reinsurance by Territory Group

	(1)	(2)	(3) = (1) / (2)	(4)	(5)	(6)	(7) = (3) / {(4) x (5) x [1-(6)]}
<u>Territory Group</u>	<u>Estimated Net Cost of Reinsurance</u>	<u>2022 House Years</u>	<u>Average Net Cost of Reinsurance</u>	<u>2022 Average Rating Factor</u>	<u>2022 Premium Trend Factor</u>	<u>Variable Expenses</u>	<u>Base Class Net Cost of Reinsurance</u>
1	\$542,592	2,018	\$268.86	2.848	1.257	0.268	\$102.62
2	437,033	2,759	158.38	3.112	1.257	0.268	55.32
3	1,043,918	14,097	74.05	3.577	1.257	0.268	22.51
4	522,739	10,765	48.56	4.443	1.257	0.268	11.88
5	335,703	11,493	29.21	4.336	1.257	0.268	7.32
6	473,767	47,103	10.06	4.322	1.257	0.268	2.53
Statewide	\$3,355,752	88,235	\$38.03	4.043	1.257	0.268	\$10.23

(1) Provided by Aon

(2) Based on data provided by member companies; excludes exposures where amount of insurance is unavailable

(4) From Section C, Page 66

(5) From Section C, Page 63

(6) From Section C, Page 1. Includes Commission and Brokerage expense; Taxes, Licenses, and Fees; Profit; Contingencies; and Policyholder Dividends

**North Carolina
Mobile Homeowners
MH(C)**

Derivation of Net Deviations

	(1)	(2)	(3) = (1) + (2)	(4)	(5)	(6) = (4) + (5)	(7) = (4) / (6)	(8) = 1 - (1) / (4)	(9) = 1 - (2) / (5)	(10) = 1 - (3) / (6)
Calendar Year	Direct Written Premium (Including Net Deviations)			Manual Premium (Excluding Net Deviations)				Deviation from Manual Premium		
	Standard	Non-Standard	Total	Standard	Non-Standard	Total	% Standard	Standard	Non-Standard	Total
2018	\$67,139,601	\$0	\$67,139,601	\$71,174,173	\$0	\$71,174,173	100.0%	5.7%	N/A	5.7%
2019	68,239,118	0	68,239,118	78,365,841	0	78,365,841	100.0%	12.9%	N/A	12.9%
2020	73,937,467	28,273	73,965,740	87,400,493	20,932	87,421,425	100.0%	15.4%	-35.1%	15.4%
2021	76,146,820	3,515,672	79,662,492	90,834,717	3,127,151	93,961,868	96.7%	16.2%	-12.4%	15.2%
2022	75,217,194	17,371,601	92,588,795	90,732,307	15,526,488	106,258,795	85.4%	17.1%	-11.9%	12.9%
Total	\$360,680,200	\$20,915,546	\$381,595,746	\$418,507,531	\$18,674,571	\$437,182,102	95.7%	13.8%	-12.0%	12.7%
							Average (2018-2022):			12.4%
							Average (2018-2022 excluding High & Low):			13.7%
							Average (2020-2022):			14.5%
							Selected Net Deviations:			5.0%

(1), (2), (4), (5) Provided by the North Carolina Rate Bureau

**North Carolina Mobile Homeowners
MH(C) Program**

Section D

Exhibits Supporting the Rating Plan Revisions

North Carolina Mobile Homeowners
MH(C) Program

Exhibits Supporting the Rating Plan Revisions

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**North Carolina
Mobile Homeowners
MH(C)**

Derivation of Wind Exclusion Credits

	Territory Group 1			Territory Group 2		
	Mobile Home Structures	Adjacent Structures	Personal Effects	Mobile Home Structures	Adjacent Structures	Personal Effects
(1) Indicated Required Base Class Rate	\$1,825.27	\$120.83	\$196.88	\$1,050.72	\$72.51	\$111.20
(2) Loss Cost Underlying Indicated Rate Change	\$584.42	\$38.08	\$50.70	\$287.12	\$21.21	\$26.75
(3) Non-Wind Portion of Losses	33.52%	22.62%	47.35%	32.10%	23.73%	56.17%
(4) Fixed Expenses per Policy	\$94.14	\$5.89	\$9.94	\$93.09	\$5.21	\$9.12
(5) Variable Expense per Policy	26.80%	26.80%	26.80%	26.80%	26.80%	26.80%
(6) Non-Wind Base Rate excl. Reinsurance Cost; = [(2) x (3) + (4)] / [1.0 - (5)]	\$396.19	\$19.81	\$46.38	\$253.07	\$14.00	\$32.98
(7) Compensation for Assessment Risk per Policy	\$15.29	\$1.00	\$1.68	\$12.46	\$0.89	\$1.25
(8) Compensation for Assessment Risk Adjustment Factor	0.427	0.330	0.560	0.487	0.388	0.673
(9) Adjusted Compensation for Assessment Risk; = (7) x (8)	\$6.54	\$0.33	\$0.94	\$6.07	\$0.34	\$0.84
(10) Net Cost of Reinsurance (Non-Wind Perils Only)	\$109.75	\$7.29	\$38.93	\$75.57	\$5.16	\$29.26
(11) Net Deviations	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
(12) Indicated Wind Exclusion Credit	70.4%	76.1%	53.9%	66.5%	71.7%	40.3%
(13) Current Wind Exclusion Credit	64.3%	57.0%	45.3%	60.0%	53.9%	38.5%
(14) Proposed Wind Exclusion Credit	67.4%	66.5%	49.6%	63.2%	62.8%	39.4%

(1), (2), (4), (5), (7) From Section C, Pages 10, 21, and 32

(3) = $X / (X + Y + Z)$; where X = 5-year average annual non-wind losses + 2022 modeled storm surge losses, Y = 2022 modeled hurricane wind losses, and Z = 5-year average annual non-hurricane wind losses

(8) = [(2) x (3) + (4)] / [(2) + (4)]

(10) Based on data provided by Aon

(11) From Section C, Page 1

(12) = { (1) - [(6) + (9) + (10)] / [1 - (11)] } / (1)

(13) From NCRB MH(C) Rate Manual

(14) Based on average of (12) and (13)

**North Carolina Mobile Homeowners
MH(C) Program**

Section E

Supplemental Information

North Carolina Mobile Homeowners MH(C) Program

Supplemental Exhibits Responses to North Carolina Administrative Code Title 11, Chapter 10.1105

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**North Carolina
Mobile Homeowners
MH(C)**

North Carolina Administrative Code (NCAC) Title 11, Chapter 10.1105, Section (1)
Summary of Earned Premium by Coverage and Year

Earned Premium at Actual (i.e. Collected) Level

	(1)	(2)	(3)	(4) = (1) + (2) + (3)	(5)	(6) = (4) + (5)
	Property Coverages					
Calendar / Accident Year	Mobile Home Structures	Adjacent Structures	Personal Effects	Sub-Total Property	Liability	Total MH(C)
2018	\$43,491,972	\$4,573,961	\$10,772,087	\$58,838,020	\$2,249,312	\$61,087,332
2019	43,553,318	4,657,307	10,955,453	59,166,077	2,217,849	61,383,927
2020	46,291,403	5,027,402	11,950,390	63,269,195	2,327,987	65,597,182
2021	48,377,336	5,432,431	12,470,944	66,280,711	2,370,767	68,651,477
2022	55,185,420	6,240,837	13,603,830	75,030,087	2,459,348	77,489,435
Total	\$236,899,448	\$25,931,938	\$59,752,704	\$322,584,090	\$11,625,263	\$334,209,353

Earned Premium at Current (i.e. Manual) Rate Level

	(7)	(8)	(9)	(10) = (7) + (8) + (9)	(11)	(12) = (10) + (11)
	Property Coverages					
Calendar / Accident Year	Mobile Home Structures	Adjacent Structures	Personal Effects	Sub-Total Property	Liability	Total MH(C)
2018	\$65,766,889	\$4,989,942	\$10,281,307	\$81,038,138	\$2,501,904	\$83,540,042
2019	65,721,942	5,074,627	10,450,889	81,247,458	2,463,352	83,710,810
2020	69,732,908	5,428,963	11,272,063	86,433,934	2,578,980	89,012,914
2021	72,795,817	5,742,137	11,957,209	90,495,163	2,638,188	93,133,351
2022	84,347,238	6,844,153	14,130,305	105,321,696	2,848,866	108,170,562
Total	\$358,364,794	\$28,079,822	\$58,091,773	\$444,536,389	\$13,031,290	\$457,567,679

Note: based on data provided by member companies; earned premiums at current (manual) rate level are calculated using the extension of exposures method

**North Carolina
Mobile Homeowners
MH(C)**

North Carolina Administrative Code (NCAC) Title 11, Chapter 10.1105, Section (1)
Summary of Paid Losses and Allocated Loss Adjustment Expenses (ALAE) by Coverage and Year

Paid Losses						
	(1)	(2)	(3)	(4) = (1) + (2) + (3)	(5)	(6) = (4) + (5)
Calendar / Accident Year	Property Coverages			Sub-Total Property	Liability	Total MH(C)
	Mobile Home Structures	Adjacent Structures	Personal Effects			
2018	\$52,929,157	\$4,199,732	\$7,606,889	\$64,735,778	\$908,577	\$65,644,355
2019	17,026,713	893,618	2,348,134	20,268,466	1,072,324	21,340,790
2020	26,648,354	1,656,224	3,203,503	31,508,081	932,891	32,440,972
2021	19,911,128	1,253,729	2,599,675	23,764,531	854,536	24,619,067
2022	26,969,874	1,926,383	2,716,030	31,612,286	632,531	32,244,817
Total	\$143,485,225	\$9,929,686	\$18,474,232	\$171,889,143	\$4,400,859	\$176,290,002

Paid ALAE						
	(7)	(8)	(9)	(10) = (7) + (8) + (9)	(11)	(12) = (10) + (11)
Calendar / Accident Year	Property Coverages			Sub-Total Property	Liability	Total MH(C)
	Mobile Home Structures	Adjacent Structures	Personal Effects			
2018	\$6,992,003	\$591,141	\$1,260,838	\$8,843,982	\$230,544	\$9,074,526
2019	2,789,540	140,995	415,172	3,345,707	104,219	3,449,925
2020	4,428,323	404,734	556,401	5,389,458	108,261	5,497,719
2021	2,557,428	244,016	363,400	3,164,844	82,962	3,247,806
2022	3,328,360	380,745	423,087	4,132,191	70,604	4,202,795
Total	\$20,095,653	\$1,761,631	\$3,018,897	\$24,876,181	\$596,590	\$25,472,771

Notes:

Losses and ALAE based on data provided by member companies and include actual hurricane losses.

All amounts shown exclude Unallocated Loss Adjustment Expenses (ULAE).

ULAE was accounted for in the rate indication via a 9.0% ULAE factor applied to Non-Hurricane Losses and a 6.0% LAE factor applied to Hurricane Losses (see Section C, Page 72). For Non-Hurricane losses, the ULAE factors are applied on Section C, Pages 3, 5, 7, and 9. For Hurricane losses, the LAE factor is applied by Aon.

**North Carolina
Mobile Homeowners
MH(C)**

North Carolina Administrative Code (NCAC) Title 11, Chapter 10.1105, Section (1)
Summary of Incurred Losses and Allocated Loss Adjustment Expenses (ALAE) by Coverage and Year

Incurred Losses						
	(1)	(2)	(3)	(4) = (1) + (2) + (3)	(5)	(6) = (4) + (5)
Calendar / Accident Year	Property Coverages			Sub-Total Property	Liability	Total MH(C)
	Mobile Home Structures	Adjacent Structures	Personal Effects			
2018	\$52,932,157	\$4,200,232	\$7,606,889	\$64,739,278	\$908,577	\$65,647,855
2019	17,026,713	893,618	2,348,134	20,268,466	1,077,324	21,345,790
2020	26,648,354	1,656,224	3,203,503	31,508,081	948,541	32,456,622
2021	19,916,628	1,253,729	2,599,675	23,770,031	1,152,236	24,922,267
2022	27,194,254	1,929,383	2,803,625	31,927,261	1,058,481	32,985,742
Total	\$143,718,105	\$9,933,186	\$18,561,827	\$172,213,118	\$5,145,159	\$177,358,277

Incurred ALAE						
	(7)	(8)	(9)	(10) = (7) + (8) + (9)	(11)	(12) = (10) + (11)
Calendar / Accident Year	Property Coverages			Sub-Total Property	Liability	Total MH(C)
	Mobile Home Structures	Adjacent Structures	Personal Effects			
2018	\$6,991,703	\$591,141	\$1,260,838	\$8,843,682	\$230,544	\$9,074,226
2019	2,789,540	140,995	415,172	3,345,707	104,219	3,449,925
2020	4,428,323	404,734	556,401	5,389,458	108,261	5,497,719
2021	2,557,428	244,016	363,400	3,164,844	82,962	3,247,806
2022	3,331,780	380,745	424,607	4,137,131	73,054	4,210,185
Total	\$20,098,773	\$1,761,631	\$3,020,417	\$24,880,821	\$599,040	\$25,479,861

Notes:

Losses and ALAE based on data provided by member companies and include actual hurricane losses.

All amounts shown exclude Unallocated Loss Adjustment Expenses (ULAE).

ULAE was accounted for in the rate indication via a 9.0% ULAE factor applied to Non-Hurricane Losses and a 6.0% LAE factor applied to Hurricane Losses (see Section C, Page 72). For Non-Hurricane losses, the ULAE factors are applied on Section C, Pages 3, 5, 7, and 9. For Hurricane losses, the LAE factor is applied by Aon.

**North Carolina
Mobile Homeowners
MH(C)**

North Carolina Administrative Code (NCAC) Title 11, Chapter 10.1105, Section (1)
Summary of Incurred Losses by Coverage and Year

Anticipated Loss Ratio

The following were the anticipated loss and LAE ratios in the prior filings:

Coverage	Anticipated Loss Ratio				
	Eff. 10/1/2023	Eff. 5/1/2022	Eff. 6/1/2020	Eff 10/1/2015	Eff. Prior to 10/1/2015
Mobile Home Structures	22.9%	25.6%	22.9%	33.6%	38.9%
Adjacent Structures	19.2%	22.4%	18.6%	33.6%	38.9%
Personal Effects	32.7%	35.9%	40.4%	33.6%	38.9%
Liability	51.5%	54.7%	54.7%	53.9%	49.5%

Note:

See explanatory filing memorandum and Section C in Exhibit RB-1 for additional information about expenses.

**North Carolina
Mobile Homeowners
MH(C)**

North Carolina Administrative Code (NCAC) Title 11, Chapter 10.1105, Section (1a)
Summary of Exposure Data by Coverage and Year

Earned House Years

	(1)	(2)	(3)	(4)
	Property Coverages			
Calendar / Accident Year	Mobile Home Structures	Adjacent Structures	Personal Effects	Liability
2018	81,078	71,830	80,271	79,828
2019	79,103	69,961	78,468	77,924
2020	81,697	71,674	81,301	80,681
2021	82,761	72,482	82,489	81,870
2022	89,364	77,934	88,235	87,745
Total	414,004	363,881	410,765	408,049

Excluded Companies:

- No companies were excluded from the premium, loss, and exposure data used to develop the rate level, loss development, trend, relativity, and investment income calculations.
- No companies were excluded from the underwriting expense, loss adjustment expense, and deviation data used to develop the rate level calculations.

**North Carolina
Mobile Homeowners
MH(C)**

North Carolina Administrative Code (NCAC) Title 11, Chapter 10.1105, Section (1b)

Not applicable to Mobile Homeowners rate filings.

**North Carolina
Mobile Homeowners
MH(C)**

North Carolina Administrative Code (NCAC) Title 11, Chapter 10.1105, Section (1c)
Summary of Data Adjustments

(1) Hurricane Losses

Actual hurricane losses were removed from the experience period data and replaced with modeled (i.e. expected) hurricane losses developed by Aon. Additionally, because storm surge is included in the modeled losses, flood losses in territories 110, 120, 130, 140, 150, and 160 associated with hurricanes were also removed. The tables below show, by accident year for each coverage, the proportion of the total losses and claim counts removed from the analysis due to hurricanes and storm surge:

Mobile Home Structures

Territory	Proportion of Loss & ALAE Due to Hurricanes					Proportion of Claims Due to Hurricanes				
	Accident Year					Accident Year				
	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022
110	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
120	86.4%	46.1%	23.4%	1.2%	12.4%	75.2%	27.8%	31.0%	2.7%	11.5%
130	68.1%	88.5%	32.9%	1.8%	0.0%	62.8%	60.3%	18.8%	9.1%	0.0%
140	100.0%	0.0%	100.0%	0.0%	0.0%	100.0%	0.0%	100.0%	0.0%	0.0%
150	81.4%	25.5%	11.5%	2.6%	0.8%	59.9%	28.9%	13.6%	2.2%	4.0%
160	26.2%	100.0%	14.0%	0.0%	0.0%	65.0%	100.0%	20.0%	0.0%	0.0%
170	7.7%	1.4%	24.0%	0.0%	5.6%	7.3%	3.1%	13.6%	0.0%	6.6%
180	54.8%	17.8%	17.7%	2.7%	3.6%	43.1%	16.9%	13.6%	3.8%	4.4%
190	62.1%	13.5%	22.7%	2.9%	2.4%	56.9%	16.7%	12.8%	1.7%	4.5%
200	84.4%	9.9%	4.6%	0.0%	47.6%	80.5%	11.4%	8.3%	0.0%	30.0%
210	28.2%	7.8%	4.5%	0.2%	3.3%	20.5%	6.7%	3.7%	0.9%	7.0%
220	71.5%	9.2%	1.8%	0.2%	6.2%	64.4%	11.4%	2.7%	1.2%	8.8%
230	80.9%	18.5%	3.1%	0.6%	22.5%	72.5%	12.1%	4.9%	1.7%	28.1%
240	25.0%	1.4%	4.0%	1.2%	7.3%	24.1%	1.3%	3.0%	1.8%	6.2%
250	47.4%	0.5%	1.0%	0.2%	7.1%	48.3%	1.9%	4.2%	0.7%	13.5%
260	13.7%	1.6%	1.1%	0.8%	2.9%	13.2%	0.7%	1.9%	0.6%	3.8%
270	29.9%	0.8%	2.8%	1.9%	13.0%	20.9%	1.1%	2.7%	1.6%	6.4%
280	22.6%	0.0%	6.7%	1.3%	5.2%	18.1%	0.0%	5.8%	1.7%	12.4%
290	60.9%	6.2%	2.6%	1.5%	28.5%	60.2%	3.8%	2.5%	2.1%	23.4%
300	68.9%	0.0%	1.7%	4.4%	6.1%	52.4%	0.0%	2.7%	3.8%	9.9%
310	15.8%	0.0%	5.7%	0.1%	3.9%	12.1%	0.0%	6.7%	0.2%	4.0%
320	10.3%	0.0%	3.5%	0.6%	3.2%	13.3%	0.0%	2.7%	0.4%	5.4%
330	1.2%	0.0%	5.2%	6.0%	0.0%	4.7%	0.0%	6.8%	2.6%	0.0%
340	11.7%	0.3%	6.4%	2.2%	3.1%	13.4%	0.3%	5.1%	1.6%	3.6%
350	7.5%	0.1%	4.0%	0.8%	0.4%	8.2%	0.3%	4.7%	0.9%	1.5%
360	3.6%	0.0%	6.6%	1.1%	0.5%	3.8%	0.2%	4.2%	1.8%	1.5%
370	0.5%	0.0%	0.0%	0.0%	0.0%	2.7%	0.0%	0.0%	0.0%	0.0%
380	0.1%	0.0%	3.6%	13.7%	0.0%	1.3%	0.0%	3.4%	9.7%	0.0%
390	1.2%	0.0%	2.0%	0.0%	0.0%	1.6%	0.0%	2.7%	0.0%	0.0%

**North Carolina
Mobile Homeowners
MH(C)**

North Carolina Administrative Code (NCAC) Title 11, Chapter 10.1105, Section (1c)
Summary of Data Adjustments

(1) Hurricane Losses

Actual hurricane losses were removed from the experience period data and replaced with modeled (i.e. expected) hurricane losses developed by Aon. Additionally, because storm surge is included in the modeled losses, flood losses in territories 110, 120, 130, 140, 150, and 160 associated with hurricanes were also removed. The tables below show, by accident year for each coverage, the proportion of the total losses and claim counts removed from the analysis due to hurricanes and storm surge:

Adjacent Structures:

Territory	Proportion of Loss & ALAE Due to Hurricanes					Proportion of Claims Due to Hurricanes				
	Accident Year					Accident Year				
	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022
110	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
120	81.9%	94.8%	43.6%	0.0%	20.6%	80.7%	94.7%	54.1%	0.0%	44.4%
130	80.3%	90.3%	38.9%	0.0%	0.0%	75.9%	80.0%	50.0%	0.0%	0.0%
140	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
150	85.8%	48.8%	31.8%	0.0%	11.8%	83.7%	46.7%	33.3%	0.0%	6.7%
160	41.2%	0.0%	0.0%	0.0%	0.0%	55.6%	0.0%	0.0%	0.0%	0.0%
170	0.0%	0.0%	14.4%	0.0%	0.0%	0.0%	0.0%	14.8%	0.0%	0.0%
180	67.4%	24.2%	23.3%	0.0%	2.1%	59.2%	32.4%	20.7%	0.0%	6.5%
190	60.1%	8.9%	45.5%	0.0%	1.3%	65.0%	20.0%	27.6%	0.0%	6.7%
200	90.9%	26.3%	18.0%	0.0%	54.9%	92.4%	50.0%	14.3%	0.0%	50.0%
210	58.3%	0.5%	2.5%	0.0%	1.2%	41.2%	5.3%	5.1%	0.0%	5.4%
220	70.6%	0.0%	8.2%	0.0%	17.6%	71.8%	0.0%	11.1%	0.0%	17.4%
230	89.5%	1.5%	0.0%	0.7%	51.1%	87.8%	12.5%	0.0%	6.3%	48.4%
240	37.7%	0.0%	5.3%	0.4%	6.8%	41.3%	0.0%	4.2%	1.6%	9.0%
250	73.3%	0.0%	2.8%	0.0%	29.1%	63.6%	0.0%	5.0%	0.0%	27.3%
260	13.7%	0.0%	0.0%	0.0%	1.3%	17.3%	0.0%	0.0%	0.0%	5.8%
270	24.4%	0.0%	4.3%	0.8%	12.7%	31.0%	0.0%	7.7%	5.3%	10.3%
280	0.0%	0.0%	0.0%	0.0%	11.1%	0.0%	0.0%	0.0%	0.0%	20.0%
290	81.3%	0.0%	0.0%	0.0%	15.4%	88.9%	0.0%	0.0%	0.0%	26.7%
300	57.6%	0.0%	5.3%	0.0%	15.8%	78.6%	0.0%	9.1%	0.0%	16.7%
310	11.4%	0.0%	3.4%	0.0%	3.1%	18.4%	0.0%	8.4%	0.0%	5.1%
320	11.4%	0.0%	1.7%	0.6%	4.7%	18.3%	0.0%	4.7%	1.1%	8.0%
330	0.0%	0.0%	7.4%	0.0%	0.0%	0.0%	0.0%	9.1%	0.0%	0.0%
340	5.9%	0.0%	3.3%	0.0%	0.3%	20.4%	0.0%	6.1%	0.0%	1.4%
350	12.4%	0.0%	6.8%	0.0%	0.4%	11.8%	0.0%	8.2%	0.0%	1.0%
360	1.9%	0.0%	1.9%	11.3%	0.0%	3.9%	0.0%	6.5%	7.2%	0.0%
370	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
380	0.0%	0.0%	0.0%	3.2%	0.0%	0.0%	0.0%	0.0%	12.5%	0.0%
390	0.0%	0.0%	10.9%	0.0%	0.0%	0.0%	0.0%	10.5%	0.0%	0.0%

[illegible]

**North Carolina
Mobile Homeowners
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North Carolina Administrative Code (NCAC) Title 11, Chapter 10.1105, Section (1c)
Summary of Data Adjustments

(2) Catastrophe Losses

Losses and claim counts used in the loss trend analysis were adjusted to remove catastrophe losses. This was done to prevent the volatile nature of catastrophe losses from impacting historical and projected trend selections. Because catastrophe losses other than hurricane and flood were not explicitly identified in the data provided by member companies, weekly claim data was reviewed by peril (water and wind) in order to identify catastrophe events. For each peril, weeks during the experience period which had reported claim counts that were greater than two times the standard deviation of weekly reported claims were identified as having catastrophe events. The claims and losses for each peril that occurred during those weeks were excluded from the loss trend analysis. The tables below show, by accident year for each coverage, the proportion of the total losses and claim counts removed from the analysis due to catastrophes:

Accident Year	Proportion of Losses Due to Catastrophes				Proportion of Claims Due to Catastrophes			
	Mobile Home Structures	Adjacent Structures	Personal Effects	Liability	Mobile Home Structures	Adjacent Structures	Personal Effects	Liability
2018	72.7%	85.6%	67.7%	0.0%	60.4%	86.2%	66.6%	0.0%
2019	23.7%	36.8%	6.0%	0.0%	16.3%	44.6%	8.8%	0.0%
2020	29.4%	55.5%	16.9%	0.0%	28.5%	52.7%	24.8%	0.0%
2021	3.3%	14.7%	6.1%	0.0%	2.5%	6.8%	3.6%	0.0%
2022	14.8%	30.9%	6.8%	0.0%	16.1%	29.4%	12.3%	0.0%

(3) Excess Wind Losses

Non-hurricane wind losses have been smoothed using an excess wind procedure. See the prefiled testimony of P. Anderson.

(4) Excess Flood Losses

Non-hurricane flood losses have been smoothed using an excess flood procedure. See the prefiled testimony of P. Anderson.

(5) Allocation of Data to Territory Groups

Because data provided by member companies only included zip code, the exposure, premium, and loss data needed to be allocated to the current territory definitions in instances where zip codes are located in multiple territories and the rated territory is unavailable from the member company. The allocation in these instances was determined based on the number of mobile homes in each county/zip code/census block combination, as determined from census data. In the affected zip codes, each county/zip code/census block combination was mapped to a territory. Then, for each territory, the proportion of mobile homes within the territory out of the total mobile homes within the zip code was determined. These proportions within each territory were then used to allocate the exposure, premium, and loss data.

(6) Loss Development

Losses were developed to ultimate using loss development factors. See the prefiled testimony of P. Anderson.

(7) Loss Trend

Losses were trended to the average accident date of the policy period in which the rates are proposed to be in effect in order to bring all historical losses to a common projected cost level. See the prefiled testimony of P. Anderson.

(8) Expenses

The historical expense data was restated to reflect the member companies currently writing policies in this Mobile Homeowners program. The need for the restatement is due to one member company transferring its MH(F) policies to the MH(C) policy form during 2022.

**North Carolina
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MH(C)**

North Carolina Administrative Code (NCAC) Title 11, Chapter 10.1105, Section (1d)
Calculation of Premium at Current Rate Level

-- See Section E, Page 1, which provides the actual earned premiums and earned premiums at present rates.

-- Earned premium at present rates were calculated based on the following rate order calculation formula:

Property (Mobile Home Structures, Adjacent Structures, and Personal Effects):

Earned Premium = [Base Rate for Given Amount of Insurance x Territory Factor x (1 - Tie-Down Credit) + Deductible Credit] x Earned Exposure

Liability:

Premium = Rate for Given Limit x Earned Exposure

-- The following demonstrates a sample calculation for the earned premium at present rates for a single insured with Mobile Home Structures coverage of \$30,000 and a \$500 deductible, where the mobile home is located in territory group 1 and qualifies for the tie-down credit:

(1) Base Rate for \$30,000 of coverage	\$815.50
(2) Territory Group 1 Surcharge	1.646
(3) Tie-Down Credit	10%
(4) Deductible Credit for \$500 deductible	(72.25)
(5) Earned Exposure	1.000
(6) Premium at Present (Manual) Rates	\$1,135.83

Notes:

(1) Assumes comprehensive coverage and that the mobile home is the insured's primary residence

(6) = [(1) x (2) x {1 - (3)} + (4)] x (5)

**North Carolina
Mobile Homeowners
MH(C)**

North Carolina Administrative Code (NCAC) Title 11, Chapter 10.1105, Section (1e)
Premium Data for Largest Writers of Mobile Home Insurance in North Carolina

	Company	2022 Written Premium	2022 Written Premium Market Share	2022 Earned Premium	2022 Earned Premium Market Share
1	Foremost Insurance Company Grand Rapids MI	\$52,169,873	56.3%	\$49,860,775	54.7%
2	American Modern Property and Casualty Insurance Company	\$22,384,750	24.2%	\$13,820,363	15.2%
3	American Bankers Insurance Company of Florida	\$13,073,846	14.1%	\$12,882,126	14.1%
4	Foremost Property & Casualty Insurance Company	\$3,653,609	3.9%	\$3,528,321	3.9%
5	Tower Hill Prime Insurance Company	\$1,054,204	1.1%	\$759,228	0.8%
6	Aegis Security Insurance Company	\$521,427	0.6%	\$651,846	0.7%
7	American Modern Home Insurance Company	-\$129,100	-0.1%	\$4,089,798	4.5%
8	American Family Home Insurance Company	-\$139,814	-0.2%	\$5,599,779	6.1%
	Total	\$92,588,795	100.0%	\$91,192,236	100.0%

Note:

Fewer than ten companies are listed above because only companies with 2022 earned premium greater than \$0 are included.

**North Carolina
Mobile Homeowners
MH(C)**

North Carolina Administrative Code (NCAC) Title 11, Chapter 10.1105, Section (1f)

Not applicable to Mobile Homeowners rate filings.

**North Carolina
Mobile Homeowners
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North Carolina Administrative Code (NCAC) Title 11, Chapter 10.1105, Section (1g)

Not applicable to Mobile Homeowners rate filings.

**North Carolina
Mobile Homeowners
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North Carolina Administrative Code (NCAC) Title 11, Chapter 10.1105, Section (1h)

Not applicable to Mobile Homeowners rate filings.

**North Carolina
Mobile Homeowners
MH(C)**

North Carolina Administrative Code (NCAC) Title 11, Chapter 10.1105, Section (1i)
Experience Period Loss Data by Coverage and Year

Mobile Home Structures

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9) = (5) x (6) x (7) x (8)	(10)
Accident Year	Paid Claims	Outstanding Claims	Paid Loss & ALAE	Case Outstanding Loss & ALAE	Incurred Loss & ALAE	Loss & ALAE Development Factor	ULAE Factor	Loss Trend Factor	Trended Incurred Loss & LAE	Expected Loss Ratio
2018	14,106	2	\$59,921,160	\$2,700	\$59,923,860	1.000	1.090	1.967	\$128,463,894	22.9%
2019	5,862	0	19,816,253	0	19,816,253	1.000	1.090	1.774	38,313,305	22.9%
2020	8,042	0	31,076,677	0	31,076,677	1.001	1.090	1.600	54,242,977	22.9%
2021	4,981	1	22,468,555	5,500	22,474,055	1.009	1.090	1.443	35,661,344	22.9%
2022	6,376	31	30,298,234	227,800	30,526,034	1.043	1.090	1.301	45,170,402	22.9%
Total	39,367	34	\$163,580,878	\$236,000	\$163,816,878				\$301,851,923	22.9%

Adjacent Structures

	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19) = (15) x (16) x (17) x (18)	(20)
Accident Year	Paid Claims	Outstanding Claims	Paid Loss	Case Outstanding	Incurred Losses	Loss & ALAE Development Factor	ULAE Factor	Loss Trend Factor	Trended Incurred Loss & LAE	Expected Loss Ratio
2018	2,299	1	\$4,790,873	\$500	\$4,791,373	1.000	1.090	3.914	\$20,439,483	19.2%
2019	484	0	1,034,613	0	1,034,613	1.000	1.090	3.131	3,530,839	19.2%
2020	1,054	0	2,060,958	0	2,060,958	1.000	1.090	2.505	5,626,767	19.2%
2021	660	0	1,497,745	0	1,497,745	1.011	1.090	2.004	3,307,264	19.2%
2022	1,067	2	2,307,127	3,000	2,310,127	1.051	1.090	1.603	4,244,145	19.2%
Total	5,564	3	\$11,691,316	\$3,500	\$11,694,816				\$37,148,499	19.2%

Personal Effects

	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29) = (25) x (26) x (27) x (28)	(30)
Accident Year	Paid Claims	Outstanding Claims	Paid Loss	Case Outstanding	Incurred Losses	Loss & ALAE Development Factor	ULAE Factor	Loss Trend Factor	Trended Incurred Loss & LAE	Expected Loss Ratio
2018	3,681	0	\$8,867,727	\$0	\$8,867,727	1.000	1.090	1.125	\$10,875,798	32.7%
2019	1,111	0	2,763,306	0	2,763,306	1.000	1.090	1.129	3,401,294	32.7%
2020	1,353	0	3,759,904	0	3,759,904	1.000	1.090	1.133	4,644,705	32.7%
2021	924	0	2,963,075	0	2,963,075	1.001	1.090	1.137	3,677,260	32.7%
2022	1,201	6	3,139,117	89,115	3,228,232	1.006	1.090	1.142	4,040,906	32.7%
Total	8,270	6	\$21,493,129	\$89,115	\$21,582,244				\$26,639,963	32.7%

Note: Loss & ALAE and claims based on data provided by member companies; losses include actual hurricane losses

(6), (16), (26) from Section C, Pages 47, 49 and 51, respectively

(7), (17), (27) from Section C, Page 72

(8), (18), (28) from Section C, Page 55

(10), (20), (30) from Section E, Page 4

**North Carolina
Mobile Homeowners
MH(C)**

North Carolina Administrative Code (NCAC) Title 11, Chapter 10.1105, Section (1i)
Experience Period Loss Data by Coverage and Year

Liability										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
									= (5) x (6) x (7) x (8)	
Accident Year	Paid Claims	Outstanding Claims	Paid Loss & ALAE	Case Outstanding Loss & ALAE	Incurred Loss & ALAE	Loss & ALAE Development Factor	ULAE Factor	Loss Trend Factor	Trended Incurred Loss & LAE	Expected Loss Ratio
2018	169	0	\$1,139,121	\$0	\$1,139,121	1.000	1.090	1.706	\$2,117,658	51.5%
2019	107	1	1,176,543	5,000	1,181,543	1.001	1.090	1.597	2,058,340	51.5%
2020	119	1	1,041,152	15,650	1,056,802	0.959	1.090	1.495	1,651,102	51.5%
2021	110	6	937,498	297,700	1,235,198	1.044	1.090	1.399	1,967,398	51.5%
2022	90	15	703,135	428,400	1,131,535	1.171	1.090	1.310	1,891,371	51.5%
Total	595	23	\$4,997,449	\$746,750	\$5,744,199				\$9,685,869	51.5%

Note: Loss & ALAE and claims based on data provided by member companies; losses include actual hurricane losses

(6) from Section C, Page 53

(7) from Section C, Page 72

(8) from Section C, Page 56

(10) from Section E, Page 4

**North Carolina
Mobile Homeowners
MH(C)**

North Carolina Administrative Code (NCAC) Title 11, Chapter 10.1105, Section (1j)

Not applicable to Mobile Homeowners rate filings.

**North Carolina
Mobile Homeowners
MH(C)**

North Carolina Administrative Code (NCAC) Title 11, Chapter 10.1105, Section (1k)

See explanatory filing memorandum in Exhibit RB-1 and prefiled testimony of P. Anderson and M. Mao.

**North Carolina
Mobile Homeowners
MH(C)**

North Carolina Administrative Code (NCAC) Title 11, Chapter 10.1105, Section (1I)
Summary of Loss & ALAE Data by Cause of Loss

Mobile Home Structures

Accident Year	Incurred Loss & ALAE by Peril									
	Fire, Lightning & Removal	Liability	Theft	Non-Flood Water	Flood	Non-Hurricane Wind & Hail	Hurricane	Vandalism	All Other	Total
2018	\$4,558,691	\$350	\$206,772	\$7,510,849	\$1,873,173	\$10,362,628	\$33,825,629	\$193,219	\$1,392,549	\$59,923,860
2019	3,998,529	4,717	165,741	5,595,995	169,262	7,381,681	1,345,773	151,475	1,003,078	19,816,253
2020	5,405,375	2,515	99,236	7,346,084	135,088	13,961,434	2,043,612	249,811	1,833,521	31,076,677
2021	4,453,057	1,650	86,841	8,194,384	381,040	7,314,543	369,083	127,686	1,545,772	22,474,055
2022	5,497,737	966	102,052	9,236,229	46,390	11,897,096	1,641,457	343,941	1,760,166	30,526,034
Total	\$23,913,389	\$10,197	\$660,643	\$37,883,540	\$2,604,953	\$50,917,382	\$39,225,555	\$1,066,132	\$7,535,087	\$163,816,878

Adjacent Structures

Accident Year	Incurred Loss & ALAE by Peril									
	Fire, Lightning & Removal	Liability	Theft	Non-Flood Water	Flood	Non-Hurricane Wind & Hail	Hurricane	Vandalism	All Other	Total
2018	\$158,770	\$0	\$3,501	\$398,282	\$152,745	\$991,133	\$2,931,610	\$0	\$155,333	\$4,791,373
2019	156,580	0	9,740	59,985	18,542	646,057	66,055	17,315	60,339	1,034,613
2020	175,724	0	9,614	76,075	63,881	1,363,683	158,711	24,795	188,474	2,060,958
2021	276,605	0	7,553	61,794	192,119	709,672	27,671	6,518	215,813	1,497,745
2022	458,447	0	11,880	39,341	21,496	1,438,960	160,139	11,157	168,707	2,310,127
Total	\$1,226,126	\$0	\$42,287	\$635,476	\$448,783	\$5,149,506	\$3,344,187	\$59,785	\$788,666	\$11,694,816

Personal Effects

Accident Year	Incurred Loss & ALAE by Peril									
	Fire, Lightning & Removal	Liability	Theft	Non-Flood Water	Flood	Non-Hurricane Wind & Hail	Hurricane	Vandalism	All Other	Total
2018	\$1,629,213	\$0	\$679,196	\$402,402	\$676,248	\$994,724	\$4,271,320	\$57,060	\$157,563	\$8,867,727
2019	1,617,170	0	526,933	153,010	55,038	173,774	70,819	42,020	124,544	2,763,306
2020	2,047,719	0	333,580	244,044	92,721	635,731	71,512	95,433	239,164	3,759,904
2021	1,926,796	0	299,527	181,638	162,819	166,635	18,915	34,398	172,347	2,963,075
2022	1,943,412	0	322,843	170,136	660	372,176	58,083	60,498	300,424	3,228,232
Total	\$9,164,310	\$0	\$2,162,078	\$1,151,230	\$987,486	\$2,343,040	\$4,490,649	\$289,410	\$994,042	\$21,582,244

Liability

Accident Year	Incurred Losses by Peril									
	Fire, Lightning & Removal	Liability	Theft	Non-Flood Water	Flood	Non-Hurricane Wind & Hail	Hurricane	Vandalism	All Other	Total
2018	\$0	\$1,133,091	\$0	\$0	\$0	\$0	\$1,270	\$0	\$4,760	\$1,139,121
2019	0	1,065,279	0	0	0	0	0	0	116,264	1,181,543
2020	13,463	360,482	332	378	0	6,426	722	1,134	673,864	1,056,802
2021	25,203	438,314	290	0	0	4,559	0	0	766,832	1,235,198
2022	223,550	301,171	0	660	0	10,801	0	990	594,363	1,131,535
Total	\$262,216	\$3,298,337	\$622	\$1,038	\$0	\$21,786	\$1,992	\$2,124	\$2,156,083	\$5,744,199

Note: based on data provided by member companies

**North Carolina
Mobile Homeowners
MH(C)**

North Carolina Administrative Code (NCAC) Title 11, Chapter 10.1105, Section (2)
Credibility Factor Development and Application

See explanatory filing memorandum in Exhibit RB-1 and prefiled testimony of P. Anderson.

**North Carolina
Mobile Homeowners
MH(C)**

North Carolina Administrative Code (NCAC) Title 11, Chapter 10.1105, Section (3)

Not applicable to Mobile Homeowners rate filings.

**North Carolina
Mobile Homeowners
MH(C)**

North Carolina Administrative Code (NCAC) Title 11, Chapter 10.1105, Section (4)
Loss Trend Factor Development and Application

(4a) See Section C, Pages 55 through 61 and prefiled testimony of P. Anderson.

(4b) Not applicable (no external indices used for loss trending purposes)

(4c) Not applicable to Mobile Homeowners rate filings.

**North Carolina
Mobile Homeowners
MH(C)**

North Carolina Administrative Code (NCAC) Title 11, Chapter 10.1105, Section (5)
Changes in Premium Base resulting from Rating Exposure Trend

(5a) See Section C, Pages 62 through 64 and prefiled testimony of P. Anderson.

(5b) Not applicable to Mobile Homeowners rate filings.

**North Carolina
Mobile Homeowners
MH(C)**

North Carolina Administrative Code (NCAC) Title 11, Chapter 10.1105, Section (6)
Limitations

(6a) No limitations were placed on the loss data provided by member companies included in the filing.

(6b) Limitations were applied to the rate changes by coverage. The filed overall rate level changes for Mobile Home Structures, Adjacent Structures, Personal Effects, and Liability are 17.9%, 19.0%, 0.5%, and 9.9% in Year 1; 16.0%, 18.1%, 0.7%, and 9.2% in Year 2; and 14.9%, 18.0%, 1.3%, and 9.2% in Year 3, respectively.

There were no limitations on the extent of the rate level change by coverage amount, by form, by protection class, by construction, or by deductible

(6c) Limitations were applied to the territorial rate changes as follows:

Proposed Rate Change - Year 1					
Territory Group	Mobile Home Structures	Adjacent Structures	Personal Effects	Liability	Total
1	28.0%	28.0%	28.0%	9.9%	27.7%
2	20.9%	18.9%	24.5%	9.9%	21.0%
3	28.0%	28.0%	12.5%	9.9%	25.6%
4	20.0%	20.0%	3.4%	9.9%	17.8%
5	17.0%	17.0%	-3.3%	9.9%	14.3%
6	12.0%	15.0%	-8.0%	9.9%	9.3%

Proposed Rate Change - Year 2					
Territory Group	Mobile Home Structures	Adjacent Structures	Personal Effects	Liability	Total
1	27.2%	27.8%	26.7%	9.2%	27.0%
2	9.9%	9.1%	11.6%	9.2%	10.1%
3	23.0%	27.9%	6.1%	9.2%	21.1%
4	19.0%	19.0%	1.7%	9.2%	17.0%
5	16.0%	16.0%	-1.7%	9.2%	14.0%
6	11.0%	14.5%	-5.7%	9.2%	9.2%

Proposed Rate Change - Year 3					
Territory Group	Mobile Home Structures	Adjacent Structures	Personal Effects	Liability	Total
1	27.2%	27.8%	26.7%	9.2%	27.0%
2	9.9%	9.1%	11.6%	9.2%	10.1%
3	22.6%	27.9%	6.1%	9.2%	21.0%
4	15.8%	17.2%	1.7%	9.2%	14.5%
5	14.7%	14.9%	-1.7%	9.2%	13.1%
6	9.6%	14.5%	-5.7%	9.2%	8.4%

Note:

Territory Group 1 (Territories 110, 120, 130, and 140)

Territory Group 2 (Territories 150 and 160)

Territory Group 3 (Territories 180, 190, 200, 210, 220, and 230)

Territory Group 4 (Territories 170, 240, and 250)

Territory Group 5 (Territories 260, 270, 280, 290, and 300)

Territory Group 6 (Territories 310, 320, 330, 340, 350, 360, 370, 380, and 390)

(6d) There were no limitations other than those mentioned above.

**North Carolina
Mobile Homeowners
MH(C)**

North Carolina Administrative Code (NCAC) Title 11, Chapter 10.1105, Section (7)
Overhead and Underwriting Expenses

(7a) See Section C, Pages 69 through 71 and prefiled testimony of P. Anderson.

(7b) Not applicable to Mobile Homeowners rate filings.

(7c) Not applicable to Mobile Homeowners rate filings.

**North Carolina
Mobile Homeowners
MH(C)**

North Carolina Administrative Code (NCAC) Title 11, Chapter 10.1105, Section (8)
Percent Rate Change

(8a) See Section A, Page 1

(8b) The proposed rate changes are based on the indicated rate changes, which reflect an assumed effective date of 10/1/2024 and the assumption that the proposed rates will be in effect for one year. However, the Rate Bureau Governing Committee elected to spread the proposed rate changes over three years, with a proposed effective date of 11/1/2024 for the year 1 change, an effective date of 11/1/2025 for the year 2 change, and an effective date of 11/1/2026 for the year 3 change.

To the extent the actual implementation date is later than the assumed effective date for the year 1 change, the indicated and proposed rate changes would be impacted, as the change in the proposed effective date would impact the loss and premium trend periods used in the filing. Changes in trend periods would impact projected losses, premiums, and fixed expenses used to calculate the rate level indications.

If the effective date were to change, advance notice of 105 days is required for an orderly implementation of the change in rates.

(8c) Not applicable

**North Carolina
Mobile Homeowners
MH(C)**

North Carolina Administrative Code (NCAC) Title 11, Chapter 10.1105, Section (9)
Final Proposed Rates

(9a) The proposed rates and rating factors can be found in Section B of Exhibit RB-1 accompanying this filing.

(9b) Not applicable

**North Carolina
Mobile Homeowners
MH(C)**

North Carolina Administrative Code (NCAC) Title 11, Chapter 10.1105, Section (10)
Investment Earnings

(10a) See Investment Income calculations on Section E, Pages 30 and 31.

Note: The Investment Income calculations reflect data for the entire statutory line of business, Homeowners Multiple Peril, rather than only Mobile Homeowners policies since the investment income information is from Statutory Page 14 of the Annual Statement.

(10b) Not applicable to Mobile Homeowners rate filings.

(10c) Not applicable to Mobile Homeowners rate filings.

**North Carolina
Mobile Homeowners
MH(C)**

North Carolina Administrative Code (NCAC) Title 11, Chapter 10.1105, Section (10a)
Investment Earnings

	Calendar Year				
	2018	2019	2020	2021	2022
Direct Earned Premium					
(1) Direct Earned Premium	\$2,580,906,277	\$2,748,738,904	\$2,927,843,779	\$3,117,849,262	\$3,418,913,643
Unearned Premium Reserve (UPR)					
(2) Prior Year UPR as of 12/31	\$1,306,548,706	\$1,386,288,967	\$1,469,475,147	\$1,585,491,577	\$1,703,096,979
(3) Current Year UPR as of 12/31	1,386,288,967	1,469,475,147	1,585,491,577	1,703,096,979	1,910,955,876
(4) Average UPR; = [(2) + (3)] / 2	1,346,418,837	1,427,882,057	1,527,483,362	1,644,294,278	1,807,026,428
(5) Total Prepaid Expenses; = (5a) + (5b) + (5c) + (5d)	31.7%	31.1%	30.3%	29.1%	27.6%
(5a) Commission & Brokerage	17.8%	17.0%	16.6%	16.4%	15.5%
(5b) Taxes, Licenses & Fees	3.4%	3.2%	3.5%	3.2%	2.6%
(5c) General Expenses / 2	4.1%	4.4%	4.5%	4.1%	4.1%
(5d) Other Acquisition / 2	6.4%	6.5%	5.8%	5.4%	5.4%
(6) Deduction for Prepaid Expenses; = (4) x (5)	426,196,758	443,908,759	463,485,686	477,858,926	499,188,929
(7) Net UPR Subject to Investment; = (4) - (6)	\$920,222,079	\$983,973,298	\$1,063,997,676	\$1,166,435,352	\$1,307,837,498
Delayed Remission of Premium (Agents' Balances)					
(8) Agents' Balances - premium due < 90 days (% of net written premium)	16.25%	15.62%	15.19%	14.48%	14.32%
(9) Factor for Agents' Balances due > 90 days	1.021	1.021	1.021	1.021	1.020
(10) Delayed Remission; = (1) x (8) x (9)	\$428,204,613	\$438,369,430	\$454,078,999	\$460,945,329	\$499,380,202
Loss and Loss Adjustment Expense (LAE) Reserve					
(11) Expected Loss and LAE Expense Ratio	50.35%	50.52%	51.91%	53.94%	55.33%
(12) Expected Incurred Loss and LAE; = (1) x (11)	\$1,299,361,307	\$1,388,544,297	\$1,519,742,357	\$1,681,739,028	\$1,891,750,552
(13) Expected Loss and LAE Reserve Ratio; = (13d / 13a) x (1 + 13e) / (1 + 13f)	25.34%	42.64%	31.09%	37.09%	32.62%
(13a) Current Calendar Year Incurred Losses	\$2,349,919,704	\$1,561,396,362	\$1,861,156,269	\$1,592,119,157	\$2,316,094,568
(13b) Prior Year Loss Reserves as of 12/31	398,416,653	732,364,300	526,638,529	583,782,316	560,103,530
(13c) Current Year Loss Reserves as of 12/31	732,364,300	526,638,529	583,782,316	560,103,530	896,965,689
(13d) Average Loss Reserves; = [(13b) + (13c)] / 2	565,390,477	629,501,415	555,210,423	571,942,923	728,534,610
(13e) Ratio of LAE Reserves to Loss Reserves	18.7%	21.3%	18.8%	17.2%	17.6%
(13f) Ratio of Incurred LAE to Incurred Losses	12.7%	14.7%	14.0%	13.5%	13.4%
(14) Expected Average Loss and LAE Reserves; = (12) x (13)	\$329,270,027	\$592,025,849	\$472,450,516	\$623,831,752	\$617,095,013
Total Net Reserves Subject to Investment					
(15) Total Net Subject to Investment; = (7) - (10) + (14)	\$821,287,493	\$1,137,629,717	\$1,082,369,193	\$1,329,321,774	\$1,425,552,309
Average Rate of Return					
(16) Net Investment Income Earned	\$57,671,857	\$57,196,089	\$54,400,669	\$56,623,677	\$72,872,018
(17) Average Cash and Invested Assets	1,734,094,329	1,824,395,370	1,976,949,891	2,156,812,439	2,252,298,716
(18) Average Rate of Return; = (16) / (17)	3.33%	3.14%	2.75%	2.63%	3.24%
(19) Investment Earnings on Net Subject to Investment; = (15) x (18)	\$27,314,071	\$35,665,499	\$29,784,067	\$34,899,227	\$46,123,044
(20) Average Rate of Return as % of Direct Earned Premium; = (19) / (1)	1.06%	1.30%	1.02%	1.12%	1.35%
(21) Federal Income Tax Rate; From Section E, Page 31	14.9%	15.9%	15.6%	15.6%	16.8%
(22) Average Rate of Return after Federal Income Tax; = (20) * [1 - (21)]	0.90%	1.09%	0.86%	0.94%	1.12%

(1), (2), (3), (8), (13a), (13b), (13c), (16), (17) Aggregate North Carolina Homeowners information from Statutory Page 14 of Annual Statement

(5), (11) from NCRB's selected expense, profit, contingency, and dividend ratios

(9) Based on data provided by A.M. Best

(13e), (13f) From A.M. Best Aggregate Insurance Expense Exhibit

**North Carolina
Mobile Homeowners
MH(C)**

North Carolina Administrative Code (NCAC) Title 11, Chapter 10.1105, Section (10a)
Federal Income Tax Rate

	2018		2019		2020		2021		2022	
	Investment Income	Tax Rate	Investment Income	Tax Rate	Investment Income	Tax Rate	Investment Income	Tax Rate	Investment Income	Tax Rate
Federal Income Tax Rate										
(1) Taxable Bonds	\$26,161,755	21.0%	\$29,410,180	21.0%	\$28,339,436	21.0%	\$27,544,890	21.0%	\$31,344,552	21.0%
(2) Non-Taxable Bonds	8,708,550	0.0%	7,801,848	0.0%	7,246,012	0.0%	6,758,330	0.0%	6,002,744	0.0%
(3) Sub-total / Weighted Average	\$34,870,305	15.8%	\$37,212,028	16.6%	\$35,585,448	16.7%	\$34,303,220	16.9%	\$37,347,296	17.6%
(4) Taxable Stocks	\$7,974,536	10.5%	\$8,917,321	10.5%	\$8,494,491	10.5%	\$9,209,605	10.5%	\$10,535,257	10.5%
(5) Non-Taxable Stocks	4,005,063	0.0%	1,595,409	0.0%	2,429,550	0.0%	3,215,338	0.0%	3,239,275	0.0%
(6) Sub-total / Weighted Average	\$11,979,599	7.0%	\$10,512,730	8.9%	\$10,924,041	8.2%	\$12,424,943	7.8%	\$13,774,532	8.0%
(7) Mortgage Loans	\$908,739	21.0%	\$996,462	21.0%	\$1,029,624	21.0%	\$1,149,755	21.0%	\$1,409,516	21.0%
(8) Real Estate	1,937,053	21.0%	2,035,516	21.0%	1,999,576	21.0%	1,995,897	21.0%	1,933,525	21.0%
(9) Collateral Loans	5,854	21.0%	202	21.0%	17,597	21.0%	91	21.0%	202	21.0%
(10) Cash on Deposit	1,985,735	21.0%	2,501,850	21.0%	820,107	21.0%	139,788	21.0%	1,968,882	21.0%
(11) Short-term Investments	(116,536)	21.0%	(92,602)	21.0%	(183,091)	21.0%	46,945	21.0%	112,071	21.0%
(12) All Other	12,020,161	21.0%	9,880,010	21.0%	10,043,526	21.0%	12,669,731	21.0%	22,739,012	21.0%
(13) Sub-total / Weighted Average	\$16,741,006	21.0%	\$15,321,438	21.0%	\$13,727,339	21.0%	\$16,002,207	21.0%	\$28,163,208	21.0%
(14) Total; = (3) + (6) + (13)	\$63,590,910	15.5%	\$63,046,196	16.4%	\$60,236,828	16.1%	\$62,730,370	16.1%	\$79,285,036	17.2%
(15) Investment Deductions	\$5,919,053	21.0%	\$5,850,107	21.0%	\$5,836,159	21.0%	\$6,106,693	21.0%	\$6,413,018	21.0%
(16) Net Investment Income Earned	\$57,671,857		\$57,196,089		\$54,400,669		\$56,623,677		\$72,872,018	
(17) Federal Income Tax Rate		14.9%		15.9%		15.6%		15.6%		16.8%

All investment income and investment deductions based on A.M. Best's Aggregates and Averages; Underwriting & Investment Exhibit, Part 1, Col. 8

(4) = Only 50% of dividend income from held securities is subject to tax, hence the tax rate on stocks = 21% x 0.50 = 10.5%

(17) weighted average of (14) and (15)

**North Carolina
Mobile Homeowners
MH(C)**

North Carolina Administrative Code (NCAC) Title 11, Chapter 10.1105, Section (11)
Statistical Plans & Programs

(11a) The list below identifies the applicable data calls and the data utilized:

Data Calls

North Carolina Rate Bureau 2023 Mobile Homeowners Data Call
Annual Statement for Calendar Year 2022
Insurance Expense Exhibit for Calendar Year 2022
RB Calls for 2022 North Carolina Expense Experience
Mobile Home Census Data

- (11b) The North Carolina Rate Bureau certifies that there is no evidence known to it or, insofar as it is aware following reasonable inquiry, to Milliman that the data which were collected under the data calls identified in response (11)(a) above and used in the filing are not materially true and accurate representations of the experience of the companies whose data underlie such experience. While the Rate Bureau is aware that the collected data sometimes require corrections or adjustments, the Rate Bureau's review of the data, the data collection process, and the ratemaking process indicates that the aggregate data are reasonable and reliable for ratemaking purposes. See also the prefiled testimony of P. Anderson.
- (11c)
1. After receiving the data provided by each member company, each data set is checked to verify that all fields represented as part of each plan are included in the data and that the values for each record are appropriate for the given field. For instance, numeric fields are checked to make sure that only numeric data is reported.
 2. Record count and exposure distributions are then summarized for every field included in each dataset to identify unusual, unexpected, or missing values as well as unintuitive distributional relationships.
 3. Univariate statistical summaries are then run on all numeric fields, such as premiums, losses, and exposures, to identify outliers or unusual values.
 4. When appropriate, records with missing values are overridden to an appropriate null or missing value. For instance, for numeric fields such as claim counts and losses, records with missing values are set to 0. For text fields, records with missing values might be set to "Missing."
 5. Loss, premium, and exposure data by individual company was then summarized and compared to data provided by member companies from the most recent Mobile Homeowners MH(C) filing for consistency. When inconsistencies are noted, the member companies are subsequently notified so that the inconsistencies can be verified.
 6. Incurred loss, written and earned premium, and exposure data was aggregated across all member companies and summarized by calendar / accident year to compare against data from the most recent Mobile Homeowners MH(C) filing for consistency.
 7. The average written premium, average earned premium, average incurred severity, frequency, and incurred pure premium are summarized by member company and in aggregate for each field included in each dataset. These metrics are also summarized for each field by calendar / accident year, policy form, and coverage. The summaries are also compared to data summaries from the most recent Mobile Homeowners MH(C) filing for consistency, to the extent that prior data is available. These summaries were reviewed to identify inconsistencies in the data. When inconsistencies are noted, the member companies are subsequently notified so that the inconsistencies can be verified.

**North Carolina
Mobile Homeowners
MH(C)**

North Carolina Administrative Code (NCAC) Title 11, Chapter 10.1105, Section (12)

Not applicable to Mobile Homeowners rate filings.

**North Carolina
Mobile Homeowners
MH(C)**

North Carolina Administrative Code (NCAC) Title 11, Chapter 10.1105, Section (13)
Required Surplus

- (13a) The weighted average premium to surplus ratios (weighted by North Carolina Mobile Homeowners Direct Premiums Written) for the calendar years 2013-2022 for the company groups that wrote the coverages in each of those years, based on data from the North Carolina Rate Bureau and S&P Global Market Intelligence, are:

Calendar Year	Premium to Surplus Ratio
2013	1.20
2014	1.24
2015	1.23
2016	1.25
2017	1.38
2018	1.45
2019	1.36
2020	1.27
2021	1.34
2022	1.52

- (13b) The expected weighted average premium to surplus ratio for all companies writing Mobile Homeowners insurance during the years the proposed rates are expected to be in effect is estimated to be 1.32. See the prefiled testimony of G. Zanjani.
- (13c) The necessary level of capital and surplus to support particular coverages varies by line, and the Rate Bureau regards the ratios shown in (a) as indicative of levels typical within the industry for the lines of business covered by this filing. The actual level of capital and surplus needed to support premium writings without endangering the solvency of a company is dependent upon (among others) the financial structure and investments unique to each company, the relationship of the company with affiliated companies as a group (and the experience of the affiliated companies), the mix of business of each company, and the conditions of the economy as they affect each company's individual circumstances. The Rate Bureau is advised that the National Association of Insurance Commissioners, as one of several criteria, generally considers that a premium to surplus ratio for an individual company of 3 to 1 warrants close regulatory attention and monitoring with respect to the company's solvency position.
- (13d) The Rate Bureau has determined the premium to surplus ratios for Mobile Homeowners insurance in North Carolina based on the weighted average premium to surplus ratios for insurance groups writing Mobile Homeowners insurance in North Carolina, where the weights are the actual premiums written. The premium to surplus ratios of the insurers actually writing this business in North Carolina are representative of the leverage relevant for this line and state. The Rate Bureau has not further allocated surplus within these insurers across lines and states in this or other filings in North Carolina.

**North Carolina
Mobile Homeowners
MH(C)**

North Carolina Administrative Code (NCAC) Title 11, Chapter 10.1105, Section (14)
Additional Information Requested by the Commissioner

(14a) See pre-filed testimony of G. Zanjani and P. Anderson.

(14b) Not applicable to Mobile Homeowners rate filings.

(14c) Not applicable to Mobile Homeowners rate filings.

(14d) The items below summarize the changes in methodology, approach, or presentation from that used in the Rate Bureau's 2022 Mobile Homeowners rate filing:

- (1) The historical expense data was restated to reflect the member companies currently writing policies in this Mobile Homeowners program. The need for the restatement is due to one member company transferring its MH(F) policies to the MH(C) policy form during 2022.
- (2) In this filing, the Rate Bureau determined the compensation for assessment risk provision in a different manner than in the 2022 mobile homeowners MH(C) filing. In prior filings, the Rate Bureau retained Milliman to develop the compensation for assessment risk provision. Due to the lack of availability of the detailed data required for the 2022 filing, Milliman relied on data from prior Rate Bureau property rate filings to determine the provision for the 2022 filing. With this filing, Aon confirmed that they had access to the necessary detailed data and, as such, the Rate Bureau retained Aon to develop the compensation for assessment risk provision. Aon used simulated event-level hurricane losses based on the most recent exposure year and replicated the methodology used by Milliman in the 2018 mobile homeowners MH(C) filing. To reflect that some insurance companies no longer retain exposure to assessments from the Beach and FAIR Plans pursuant to the companies' respective reinsurance agreements, Aon then modified the calculated compensation for assessment risk provision by multiplying it by 50%.

See also prefiled testimony of P. Anderson.

North Carolina

Mobile Homeowners Policy

MH(C) Program

**MOBILE HOMEOWNERS POLICY: MH(C) PROGRAM
RULES****NORTH CAROLINA**

1. Definitions

A mobile home is defined as a factory fabricated, transportable permanent housing unit, which is at least 8 body feet in width or 32 body feet in length, built on a chassis and designed to be used as a dwelling with or without a permanent foundation when connected to the required utilities. It may be equipped with one or more room sections that fold, collapse or telescope into the principal unit when being transported and which can be expanded at the site to provide additional living area. Running gear consisting of wheels and tires may be removed while it is being lived in, but can be readily re-installed.

2. Policy and Forms

Coverage will be written on the Mobile Home Owner Policy MH(C) Form which will consist of:

- a. Mobile Home Owner Policy MH(C), plus
- b. Mobile Home Owner Policy - Page One, or;
- c. Required endorsements, if any.

3. Terms Rule

The policy may be written for a maximum of seven years (84 months) at the Term Factors shown in the Rate Section. If a policy is issued for a period of less than twelve months and for a term not shown in the Term Factor chart it will be written short rate and the premium for the policy shall be computed in accordance with the short rate table, except that in the following circumstances the premium will be computed pro rata:

- a. When coverage is afforded to secure a common inception date with other coverages or lines of insurance.
- b. To replace an outstanding policy of a company in liquidation, provided a new policy is based upon the rules and rates in effect at the time replacement is made and will be in effect for a period equal to the unexpired term of the outstanding policy.

If a policy is issued for a period of more than twelve months and for a term not shown in the Term Factor chart, it will be computed at the full premium for each full year and pro rata for any portion of a year.

4. Premium Rules (General)

The premium will be rounded to the nearest whole dollar. A premium involving \$0.50 or over will be rounded to the next whole dollar.

The procedure will apply to all interim premium adjustments including endorsements, or cancellations at the request of the insured. In the case of cancellation by the Company, the return premium may be carried to the next higher whole dollar.

Any rating discrepancy involving a premium of \$2.00 or less may be waived except, that an overcharge shall be refunded, regardless of amount, if requested by the insured.

5. Minimum Written Premium Rule

No policy may be written for less than \$30.00 regardless of the term. The Trip Coverage premium and the Secured Interest Protection premium are in addition to the \$30.00 Minimum Written Premium. No additional premium charge will be less than \$6.00.

6. Minimum Earned Premium Rule

The Minimum Short Rate Earned Premium will not be less than \$30.00. Trip Coverage premium shall be fully earned.

MOBILE HOMEOWNERS POLICY: MH(C) PROGRAM

7. Changes

- a. All changes requiring adjustments of premium shall be computed pro rata.
- b. If a mobile home or a form of coverage that was cancelled from a policy at the request of the insured is reinstated within 30 days, the premium will be the same as the amount that was returned at the time of cancellation.
- c. Minimum Premiums: If an outstanding policy is amended and results in a premium adjustment, that adjustment shall not be less than \$6.00, except that the actual return premium will be allowed at the request of the insured.

8. Cancellation Rule

Cancellation may be effected as follows:

- a. The insured can cancel the policy by mailing to the Company a written notice telling the Company the future date cancellation is to be effective. If a lien holder is named on Page One of the policy, the Company will mail to the lien holder ten days written notice of cancellation of the lien holder's interest in this policy.
- b. When a lien holder named in the policy has repossessed or has otherwise acquired ownership of the mobile home, the lien holder may, for the account of all parties at interest under the policy, cancel the policy by surrendering it to the Company.
- c. The Company can cancel the policy for any reason during the first 60 days. The Company can cancel the policy after the first 60 days only if the insured or his representative:
 - Conceal, omit or misrepresent any material facts or circumstances, or make a false or fraudulent claim, or
 - Fail to comply with any governmental requirement regulating mobile home tie-down or anchoring systems, or
 - Have knowledge of any change that substantially increases the risk assumed by the Company without notifying the Company, and paying any required premium for the increased risk, or
 - Has not paid the premium.
 - The Company will mail a cancellation notice to the insured at least 30 days (non-payment 10 days) before the policy is cancelled. The Company will mail a cancellation notice to the insured's last address known to the Company or the agent. The Company will also give the same notice to the lien holder.
- d. Computation
 - (1) Cancellation by the named insured on any policy within one year of its inception date will be computed short rate, using the appropriate short rate chart. All other cancellations will be pro rata.
 - (2) Cancellation by any other party at interest will be pro rata regardless of policy term.
 - (3) No endorsement will have the effect of violating the Written or Earned Premium rules.

9. Tenants Coverage Rule

The Mobile Home Owner Policy MH(C) may also be issued to a tenant (non-owner) of a mobile home, for any of the following coverages:

- a. Comprehensive Personal Effects;
- b. Comprehensive or Named Perils Adjacent Structures;
- c. Liability.

If the policy includes Comprehensive Personal Effects Coverage, Mobile Home Tenants Coverage Endorsement is to be attached automatically affording the following additional policy coverages:

- a. Additional Living Expense;
- b. Fire Department service;
- c. Credit Card and Depositors Forgery.

The additional coverages are excess over any other collectible insurance.

MOBILE HOMEOWNERS POLICY: MH(C) PROGRAM

10. Natural Disaster Protection Rules

Coverage may be afforded under each policy insuring a financed mobile home. It amends the amount of the Company's liability to the outstanding principal balance of the loan or the amount which would be recoverable under the policy, whichever is greater, if total loss results from Perils covered. For rate information, refer to the Rate Section.

11. Seasonal/Vacation Mobile Home Rule

A seasonal/vacation mobile home is defined as a mobile home that is not the primary residence of the insured, but one that is used on an intermittent basis by the insured and his (her) immediate family. It may not be rented to others. Mobile homes that are rented to others for seasonal or vacation use are not eligible for the Mobile Home Owner Policy MH(C). A minimum deductible of \$250 shall automatically apply to Comprehensive or Named Perils Mobile Home Structures Coverage, Comprehensive Personal Effects Coverage, and Comprehensive or Named Perils Adjacent Structures Coverage.

12. Deductible Rule

The basic rates in the Rate Section contemplate a \$100 deductible for *Comprehensive* Primary Residence and Tenants, \$0 deductible for *Named Perils* Primary Residence and Tenants, and \$250 deductible for *Comprehensive and Named Perils* Seasonal/Vacation. This deductible amount may be modified as provided for in the rate section.

In Territories 110, 120, 130, 140, 150, and 160, the Mobile Homeowners Policy may be endorsed to provide an optional Windstorm or Hail Deductible used in conjunction with the deductibles applicable to All Other Perils. This option provides for higher dollar deductible amounts of \$1,000, \$2,000, \$5,000, 1%, 2%, or 5% when the higher deductible amount selected exceeds the deductible applicable to All Other Perils.

In Territories 110, 120, 130, 140, 150, and 160, the Mobile Homeowners Policy may be endorsed to provide a Named Storm Percentage Deductible of 1%, 2%, or 5% of the Mobile Home Structures, Adjacent Structures, or Comprehensive Personal Effects limit of liability, whichever is greatest, when the dollar amount of the percentage deductible exceeds the deductible applicable to All Other Perils. Use **MH(C)-320** Named Storm Percentage Deductible.

13. Fire Department Service Charge

The \$100 Fire Department Service Charge may be increased for an additional premium as provided for in the Rate Section.

14. Radio and Television Antenna Coverage

The \$50 Radio and Antenna Coverage may be increased for an additional premium as provided for in the Rate Section.

15. Inflation Coverage

This form may be attached to the policy when the mobile home is used as the primary residence or as a seasonal/vacation residence. For rate information, refer to the Rate Section.

16. Rentals

A Mobile Home Owner Policy MH(C) may be written to cover the interest of the owners of a rented mobile home.

17. Tie-Down:

When the mobile home is properly secured in accordance with the regulations of the North Carolina Building Code Council as set forth in the State of North Carolina Regulations for mobile homes, a credit of 10% shall be deducted from the rates applicable to the following coverages:

- a. Comprehensive or Named Perils Mobile Home Structures Coverage
- b. Comprehensive Personal Effects Coverage

18. Personal Effects Replacement Cost

For an additional premium your policy may be extended to cover the full cost of repair or replacement without deduction for depreciation of your personal effects. For rate information see Rate Section.

Attach Comprehensive Personal Effects Replacement Cost Endorsement.

MOBILE HOMEOWNERS POLICY: MH(C) PROGRAM

19. Replacement Cost Coverage

For an additional premium your policy may be extended to cover the cost of repair or replacement without deduction for depreciation of your mobile home. For rate information see Rate Section.

Attach MH(C) Mobile Home Replacement Cost Coverage (Ed. 8-85).

20. Additional Living Expense Coverage

For an additional premium the \$10 per day coverage for a maximum of 60 days may be increased. For rate information see Rate Section.

21. Windstorm or Hail Exclusion - Territories 110, 120, 130, 140, 150, and 160 only

The perils of windstorm or hail may be excluded from coverage if the insured purchases a separate policy for windstorm or hail from the North Carolina Insurance Underwriting Association at the premium credit developed from the Premium Section of this manual.

The Peril of Windstorm or Hail may be excluded if:

- a. The property is located in an area eligible for such coverage from the North Carolina Insurance Underwriting Association; and
- b. A Windstorm or Hail Rejection Form is secured and maintained by the Company.

Attach Endorsement **MH(C)-306** Windstorm or Hail Exclusion Endorsement.

When Endorsement **MH(C)-306** is attached to the policy, enter the following on the Declarations Page:

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

22. Installment Payment Plan

When a 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. An additional charge of \$3.00 shall be made for each installment.
- c. 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 policy to the due date of the next installment.

23. Stated Value Loss Settlement

For an additional premium, your policy may be changed to reflect a stated value for the covered mobile home. For rate information, see Rate Section.

Attach **MH(C)-310** (Ed. 9-97)

24. 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; owned real estate; household composition; and good student/education.

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- c. Dwelling characteristics not otherwise recognized in this manual. Examples include: Gated community; retirement community; limited access community; mobile home community; revitalized/renovated mobile home; security, safety or loss deterrent systems or devices; age of mobile home; occupancy; fire protection/distance to fire department; 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.

25. Scheduled Personal Property

Coverage may be provided against all risks of physical loss with certain exceptions on scheduled personal property subject to the rules and rates filed by or on behalf of the Company.

Attach endorsement **MH(C)-2598** Scheduled Personal Property and **MH(C)-4344** Valuable Personal Property List.

26. Territory Groups

For rating purposes, territories are grouped as follows:

Territory Group 1: Territories 110, 120, 130, and 140

Territory Group 2: Territories 150 and 160

Territory Group 3: Territories 180, 190, 200, 210, 220, and 230

Territory Group 4: Territories 170, 240, and 250

Territory Group 5: Territories 260, 270, 280, 290, and 300

Territory Group 6: Territories 310, 320, 330, 340, 350, 360, 370, 380, and 390

**MOBILE HOMEOWNERS POLICY: MH(C) PROGRAM
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NORTH CAROLINA

COMPREHENSIVE MOBILE HOME STRUCTURES		
TERRITORY GROUP 3; \$100 DEDUCTIBLE		
	Premiums	
Amount of Insurance	Primary Residence	Rental
1 - 3,999	\$323.23	\$553.71
4,000 - 4,999	344.86	590.76
5,000 - 5,999	362.68	621.28
6,000 - 6,999	381.56	653.62
7,000 - 7,999	400.69	686.40
8,000 - 8,999	419.90	719.30
9,000 - 9,999	440.15	753.97
10,000 - 10,999	459.32	786.82
11,000 - 11,999	475.52	814.58
12,000 - 12,999	491.73	842.35
13,000 - 13,999	507.43	869.24
14,000 - 14,999	523.12	896.11
15,000 - 15,999	540.91	926.59
16,000 - 16,999	560.10	959.47
17,000 - 17,999	578.87	991.63
18,000 - 18,999	597.53	1,023.58
19,000 - 19,999	617.97	1,058.60
20,000 - 20,999	637.19	1,091.52
21,000 - 21,999	652.55	1,117.83
22,000 - 22,999	667.91	1,144.13
23,000 - 23,999	684.14	1,171.95
24,000 - 24,999	700.60	1,200.14
25,000 - 25,999	718.32	1,230.50
26,000 - 26,999	737.02	1,262.52
27,000 - 27,999	755.42	1,294.06
28,000 - 28,999	773.71	1,325.37
29,000 - 29,999	794.24	1,360.53
30,000 - 30,999	815.50	1,396.97
31,000 - 31,999	831.47	1,424.33
32,000 - 32,999	847.00	1,450.91
33,000 - 33,999	862.51	1,477.50
34,000 - 34,999	880.08	1,507.59
35,000 - 35,999	897.90	1,538.11
36,000 - 36,999	915.71	1,568.62
37,000 - 37,999	933.53	1,599.14
38,000 - 38,999	951.34	1,629.66
39,000 - 39,999	969.15	1,660.18
40,000 - 40,999	986.97	1,690.70
41,000 - 41,999	1,004.78	1,721.21

COMPREHENSIVE MOBILE HOME STRUCTURES		
TERRITORY GROUP 3; \$100 DEDUCTIBLE		
	Premiums	
Amount of Insurance	Primary Residence	Rental
42,000 - 42,999	\$1,022.60	\$1,751.73
43,000 - 43,999	1,040.41	1,782.25
44,000 - 44,999	1,058.23	1,812.77
45,000 - 45,999	1,076.04	1,843.29
46,000 - 46,999	1,093.86	1,873.80
47,000 - 47,999	1,111.67	1,904.32
48,000 - 48,999	1,129.49	1,934.84
49,000 - 49,999	1,147.30	1,965.36
50,000 - 50,999	1,165.12	1,995.88
51,000 - 51,999	1,182.93	2,026.38
52,000 - 52,999	1,200.76	2,056.90
53,000 - 53,999	1,218.56	2,087.42
54,000 - 54,999	1,236.37	2,117.94
55,000 - 55,999	1,254.20	2,148.45
56,000 - 56,999	1,272.00	2,178.97
57,000 - 57,999	1,289.83	2,209.49
58,000 - 58,999	1,307.64	2,240.01
59,000 - 59,999	1,325.46	2,270.53
60,000 - 60,999	1,343.27	2,301.04
61,000 - 61,999	1,361.09	2,331.56
62,000 - 62,999	1,378.90	2,362.08
63,000 - 63,999	1,396.72	2,392.60
64,000 - 64,999	1,414.53	2,423.12
65,000 - 65,999	1,432.35	2,453.63
66,000 - 66,999	1,450.16	2,484.15
67,000 - 67,999	1,467.98	2,514.67
68,000 - 68,999	1,485.79	2,545.19
69,000 - 69,999	1,503.60	2,575.71
70,000 - 70,999	1,521.42	2,606.22
71,000 - 71,999	1,539.23	2,636.74
72,000 - 72,999	1,557.05	2,667.26
73,000 - 73,999	1,574.86	2,697.78
74,000 - 74,999	1,592.68	2,728.30
75,000 - 75,999	1,610.49	2,758.80
76,000 - 76,999	1,628.31	2,789.32
77,000 - 77,999	1,646.12	2,819.84
78,000 - 78,999	1,663.94	2,850.36
79,000 - 79,999	1,681.75	2,880.88
Each Add'l \$1,000	\$17.81	\$30.52

Territory Group 1	Surcharge	64.6%
Territory Group 2	Surcharge	34.1%
Territory Group 4	Discount	-7.7%
Territory Group 5	Discount	-21.5%
Territory Group 6	Discount	-37.3%

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NORTH CAROLINA

NAMED PERILS MOBILE HOME STRUCTURES		
TERRITORY GROUP 3; \$0 DEDUCTIBLE		
	Premiums	
Amount of Insurance	Primary Residence	Rental
1 - 3,999	\$288.09	\$518.57
4,000 - 4,999	307.37	553.28
5,000 - 5,999	323.25	581.86
6,000 - 6,999	340.09	612.16
7,000 - 7,999	357.13	642.85
8,000 - 8,999	374.25	673.66
9,000 - 9,999	392.30	706.14
10,000 - 10,999	409.40	736.91
11,000 - 11,999	423.83	762.90
12,000 - 12,999	438.28	788.91
13,000 - 13,999	452.28	814.10
14,000 - 14,999	466.26	839.27
15,000 - 15,999	482.12	867.80
16,000 - 16,999	499.22	898.60
17,000 - 17,999	515.95	928.72
18,000 - 18,999	532.58	958.65
19,000 - 19,999	550.79	991.44
20,000 - 20,999	567.93	1,022.27
21,000 - 21,999	581.62	1,046.92
22,000 - 22,999	595.31	1,071.55
23,000 - 23,999	609.78	1,097.60
24,000 - 24,999	624.45	1,124.01
25,000 - 25,999	640.24	1,152.43
26,000 - 26,999	656.91	1,182.44
27,000 - 27,999	673.31	1,211.96
28,000 - 28,999	689.60	1,241.29
29,000 - 29,999	707.90	1,274.21
30,000 - 30,999	726.86	1,308.35
31,000 - 31,999	741.09	1,333.96
32,000 - 32,999	754.93	1,358.87
33,000 - 33,999	768.75	1,383.77
34,000 - 34,999	784.41	1,411.94
35,000 - 35,999	800.29	1,440.53
36,000 - 36,999	816.17	1,469.11
37,000 - 37,999	832.05	1,497.69
38,000 - 38,999	847.93	1,526.28
39,000 - 39,999	863.81	1,554.85
40,000 - 40,999	879.69	1,583.43
41,000 - 41,999	895.57	1,612.02

NAMED PERILS MOBILE HOME STRUCTURES		
TERRITORY GROUP 3; \$0 DEDUCTIBLE		
	Premiums	
Amount of Insurance	Primary Residence	Rental
42,000 - 42,999	\$911.45	\$1,640.60
43,000 - 43,999	927.33	1,669.18
44,000 - 44,999	943.21	1,697.77
45,000 - 45,999	959.08	1,726.34
46,000 - 46,999	974.96	1,754.92
47,000 - 47,999	990.84	1,783.51
48,000 - 48,999	1,006.71	1,812.09
49,000 - 49,999	1,022.59	1,840.67
50,000 - 50,999	1,038.47	1,869.24
51,000 - 51,999	1,054.35	1,897.83
52,000 - 52,999	1,070.23	1,926.41
53,000 - 53,999	1,086.11	1,954.99
54,000 - 54,999	1,101.98	1,983.58
55,000 - 55,999	1,117.86	2,012.16
56,000 - 56,999	1,133.74	2,040.73
57,000 - 57,999	1,149.62	2,069.32
58,000 - 58,999	1,165.50	2,097.90
59,000 - 59,999	1,181.38	2,126.48
60,000 - 60,999	1,197.26	2,155.07
61,000 - 61,999	1,213.14	2,183.65
62,000 - 62,999	1,229.02	2,212.22
63,000 - 63,999	1,244.90	2,240.81
64,000 - 64,999	1,260.78	2,269.39
65,000 - 65,999	1,276.65	2,297.97
66,000 - 66,999	1,292.53	2,326.56
67,000 - 67,999	1,308.41	2,355.14
68,000 - 68,999	1,324.29	2,383.71
69,000 - 69,999	1,340.17	2,412.30
70,000 - 70,999	1,356.04	2,440.88
71,000 - 71,999	1,371.92	2,469.46
72,000 - 72,999	1,387.80	2,498.04
73,000 - 73,999	1,403.68	2,526.63
74,000 - 74,999	1,419.55	2,555.20
75,000 - 75,999	1,435.43	2,583.78
76,000 - 76,999	1,451.31	2,612.37
77,000 - 77,999	1,467.19	2,640.95
78,000 - 78,999	1,483.07	2,669.53
79,000 - 79,999	1,498.95	2,698.12
Each Add'l \$1,000	\$15.88	\$28.59

Territory Group 1	Surcharge	64.6%
Territory Group 2	Surcharge	34.1%
Territory Group 4	Discount	-7.7%
Territory Group 5	Discount	-21.5%
Territory Group 6	Discount	-37.3%

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NORTH CAROLINA

SEASONAL/VACATION MOBILE HOME STRUCTURES		
TERRITORY GROUP 3; \$250 DEDUCTIBLE		
	Premiums	
Amount of Insurance	Comprehensive	Named Perils
1 - 3,999	\$323.23	\$288.09
4,000 - 4,999	344.86	307.37
5,000 - 5,999	362.68	323.25
6,000 - 6,999	381.56	340.09
7,000 - 7,999	400.69	357.13
8,000 - 8,999	419.90	374.25
9,000 - 9,999	440.15	392.30
10,000 - 10,999	459.32	409.40
11,000 - 11,999	475.52	423.83
12,000 - 12,999	491.73	438.28
13,000 - 13,999	507.43	452.28
14,000 - 14,999	523.12	466.26
15,000 - 15,999	540.91	482.12
16,000 - 16,999	560.10	499.22
17,000 - 17,999	578.87	515.95
18,000 - 18,999	597.53	532.58
19,000 - 19,999	617.97	550.79
20,000 - 20,999	637.19	567.93
21,000 - 21,999	652.55	581.62
22,000 - 22,999	667.91	595.31
23,000 - 23,999	684.14	609.78
24,000 - 24,999	700.60	624.45
25,000 - 25,999	718.32	640.24
26,000 - 26,999	737.02	656.91
27,000 - 27,999	755.42	673.31
28,000 - 28,999	773.71	689.60
29,000 - 29,999	794.24	707.90
30,000 - 30,999	815.50	726.86
31,000 - 31,999	831.47	741.09
32,000 - 32,999	847.00	754.93
33,000 - 33,999	862.51	768.75
34,000 - 34,999	880.08	784.41
35,000 - 35,999	897.90	800.29
36,000 - 36,999	915.71	816.17
37,000 - 37,999	933.53	832.05
38,000 - 38,999	951.34	847.93
39,000 - 39,999	969.15	863.81
40,000 - 40,999	986.97	879.69
41,000 - 41,999	1,004.78	895.57

SEASONAL/VACATION MOBILE HOME STRUCTURES		
TERRITORY GROUP 3; \$250 DEDUCTIBLE		
	Premiums	
Amount of Insurance	Comprehensive	Named Perils
42,000 - 42,999	\$1,022.60	\$911.45
43,000 - 43,999	1,040.41	927.33
44,000 - 44,999	1,058.23	943.21
45,000 - 45,999	1,076.04	959.08
46,000 - 46,999	1,093.86	974.96
47,000 - 47,999	1,111.67	990.84
48,000 - 48,999	1,129.49	1,006.71
49,000 - 49,999	1,147.30	1,022.59
50,000 - 50,999	1,165.12	1,038.47
51,000 - 51,999	1,182.93	1,054.35
52,000 - 52,999	1,200.76	1,070.23
53,000 - 53,999	1,218.56	1,086.11
54,000 - 54,999	1,236.37	1,101.98
55,000 - 55,999	1,254.20	1,117.86
56,000 - 56,999	1,272.00	1,133.74
57,000 - 57,999	1,289.83	1,149.62
58,000 - 58,999	1,307.64	1,165.50
59,000 - 59,999	1,325.46	1,181.38
60,000 - 60,999	1,343.27	1,197.26
61,000 - 61,999	1,361.09	1,213.14
62,000 - 62,999	1,378.90	1,229.02
63,000 - 63,999	1,396.72	1,244.90
64,000 - 64,999	1,414.53	1,260.78
65,000 - 65,999	1,432.35	1,276.65
66,000 - 66,999	1,450.16	1,292.53
67,000 - 67,999	1,467.98	1,308.41
68,000 - 68,999	1,485.79	1,324.29
69,000 - 69,999	1,503.60	1,340.17
70,000 - 70,999	1,521.42	1,356.04
71,000 - 71,999	1,539.23	1,371.92
72,000 - 72,999	1,557.05	1,387.80
73,000 - 73,999	1,574.86	1,403.68
74,000 - 74,999	1,592.68	1,419.55
75,000 - 75,999	1,610.49	1,435.43
76,000 - 76,999	1,628.31	1,451.31
77,000 - 77,999	1,646.12	1,467.19
78,000 - 78,999	1,663.94	1,483.07
79,000 - 79,999	1,681.75	1,498.95
Each Add'l \$1,000	\$17.81	\$15.88

Territory Group 1	Surcharge	64.6%
Territory Group 2	Surcharge	34.1%
Territory Group 4	Discount	-7.7%
Territory Group 5	Discount	-21.5%
Territory Group 6	Discount	-37.3%

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ADJACENT STRUCTURES		
TERRITORY GROUP 3		
	Premiums	
Amount of Insurance	Comprehensive	Named Perils
100 - 199	N/A	\$2.81
200 - 299	N/A	4.44
300 - 399	\$7.04	6.07
400 - 499	8.93	7.70
500 - 599	10.82	9.34
600 - 699	12.71	10.97
700 - 799	14.60	12.60
800 - 899	16.50	14.23
900 - 999	18.39	15.86
1,000 - 1,099	20.28	17.49
1,100 - 1,199	22.17	19.13
1,200 - 1,299	24.06	20.76
1,300 - 1,399	25.96	22.39
1,400 - 1,499	27.85	24.02
1,500 - 1,599	29.74	25.65
1,600 - 1,699	31.63	27.28
1,700 - 1,799	33.53	28.91
1,800 - 1,899	35.42	30.55
1,900 - 1,999	37.31	32.18
2,000 - 2,099	39.20	33.81
2,100 - 2,199	41.09	35.44
2,200 - 2,299	42.99	37.07
2,300 - 2,399	44.88	38.70
2,400 - 2,499	46.77	40.33
2,500 - 2,599	48.66	41.97
2,600 - 2,699	50.55	43.60
2,700 - 2,799	52.45	45.23
2,800 - 2,899	54.34	46.86
2,900 - 2,999	56.23	48.49
3,000 - 3,099	58.12	50.12
3,100 - 3,199	60.02	51.76
3,200 - 3,299	61.91	53.39
3,300 - 3,399	63.80	55.02
3,400 - 3,499	65.69	56.65
3,500 - 3,599	67.58	58.28

ADJACENT STRUCTURES		
TERRITORY GROUP 3		
	Premiums	
Amount of Insurance	Comprehensive	Named Perils
3,600 - 3,699	\$69.48	\$59.91
3,700 - 3,799	71.37	61.54
3,800 - 3,899	73.26	63.18
3,900 - 3,999	75.15	64.81
4,000 - 4,099	77.04	66.44
4,100 - 4,199	78.94	68.07
4,200 - 4,299	80.83	69.70
4,300 - 4,399	82.72	71.33
4,400 - 4,499	84.61	72.97
4,500 - 4,599	86.50	74.60
4,600 - 4,699	88.40	76.23
4,700 - 4,799	90.29	77.86
4,800 - 4,899	92.18	79.49
4,900 - 4,999	94.07	81.12
5,000 - 5,099	95.97	82.75
5,100 - 5,199	97.86	84.39
5,200 - 5,299	99.75	86.02
5,300 - 5,399	101.64	87.65
5,400 - 5,499	103.53	89.28
5,500 - 5,599	105.43	90.91
5,600 - 5,699	107.32	92.54
5,700 - 5,799	109.21	94.17
5,800 - 5,899	111.10	95.81
5,900 - 5,999	112.99	97.44
6,000 - 6,099	114.89	99.07
6,100 - 6,199	116.78	100.70
6,200 - 6,299	118.67	102.33
6,300 - 6,399	120.56	103.96
6,400 - 6,499	122.45	105.60
6,500 - 6,599	124.35	107.23
6,600 - 6,699	126.24	108.86
6,700 - 6,799	128.13	110.49
6,800 - 6,899	130.02	112.12
6,900 - 6,999	131.92	113.75
Each Add'l \$100	\$1.89	\$1.63

	Base Deductible	
	Comprehensive	Named Perils
Primary Residence	\$100 Deductible	No Deductible
Seasonal/Vacation	\$250 Deductible	\$250 Deductible
Tenants	\$100 Deductible	No Deductible

Note: Rates shown applicable to all occupancy types

Territory Group 1	Surcharge	80.8%
Territory Group 2	Surcharge	59.9%
Territory Group 4	Discount	-10.3%
Territory Group 5	Discount	-21.7%
Territory Group 6	Discount	-38.6%

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COMPREHENSIVE PERSONAL EFFECTS	
TERRITORY GROUP 3	
Amount of Insurance	Premium
500 - 599	\$21.04
600 - 699	21.87
700 - 799	22.70
800 - 899	23.53
900 - 999	24.36
1,000 - 1,099	25.20
1,100 - 1,199	26.03
1,200 - 1,299	26.86
1,300 - 1,399	27.69
1,400 - 1,499	28.52
1,500 - 1,599	29.35
1,600 - 1,699	30.18
1,700 - 1,799	31.01
1,800 - 1,899	31.84
1,900 - 1,999	32.68
2,000 - 2,099	33.51
2,100 - 2,199	34.34
2,200 - 2,299	35.17
2,300 - 2,399	36.00
2,400 - 2,499	36.83
2,500 - 2,599	37.66
2,600 - 2,699	38.49
2,700 - 2,799	39.32
2,800 - 2,899	40.15
2,900 - 2,999	40.99
3,000 - 3,099	41.82
3,100 - 3,199	42.65
3,200 - 3,299	43.48
3,300 - 3,399	44.31
3,400 - 3,499	45.14
3,500 - 3,599	45.97
3,600 - 3,699	46.80
3,700 - 3,799	47.63

	Base Deductible
Primary Residence	\$100 Deductible
Seasonal/Vacation	\$250 Deductible
Tenants	\$100 Deductible

Note: Rates shown applicable to all occupancy types

COMPREHENSIVE PERSONAL EFFECTS	
TERRITORY GROUP 3	
Amount of Insurance	Premium
3,800 - 3,899	\$48.47
3,900 - 3,999	49.30
4,000 - 4,099	50.13
4,100 - 4,199	50.96
4,200 - 4,299	51.79
4,300 - 4,399	52.62
4,400 - 4,499	53.45
4,500 - 4,599	54.28
4,600 - 4,699	55.11
4,700 - 4,799	55.95
4,800 - 4,899	56.78
4,900 - 4,999	57.61
5,000 - 5,099	58.44
5,100 - 5,199	59.27
5,200 - 5,299	60.10
5,300 - 5,399	60.93
5,400 - 5,499	61.76
5,500 - 5,599	62.59
5,600 - 5,699	63.43
5,700 - 5,799	64.26
5,800 - 5,899	65.09
5,900 - 5,999	65.92
6,000 - 6,099	66.75
6,100 - 6,199	67.58
6,200 - 6,299	68.41
6,300 - 6,399	69.24
6,400 - 6,499	70.07
6,500 - 6,599	70.90
6,600 - 6,699	71.74
6,700 - 6,799	72.57
6,800 - 6,899	73.40
6,900 - 6,999	74.23
Each Add'l \$100	\$0.83

Territory Group 1	Surcharge	97.1%
Territory Group 2	Surcharge	47.2%
Territory Group 4	Discount	-17.2%
Territory Group 5	Discount	-23.5%
Territory Group 6	Discount	-30.8%

**MOBILE HOMEOWNERS POLICY: MH(C) PROGRAM
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DEDUCTIBLE – COMPREHENSIVE COVERAGE

Primary Residence:

Deductible Amount	Coverage		Territory Group 1	Territory Group 2	Territory Group 3	Territory Group 4	Territory Group 5	Territory Group 6
None	Mobile Home Structures	Add	\$34.55	\$28.09	\$23.09	\$21.06	\$17.92	\$14.33
	Adjacent Structures	Add	2.18	1.91	1.31	1.19	1.03	0.81
	Personal Effects	Add	11.12	8.28	6.19	5.09	4.70	4.26
\$50	Mobile Home Structures	Add	\$15.71	\$12.78	\$10.53	\$9.60	\$8.15	\$6.52
	Adjacent Structures	Add	1.08	0.97	0.66	0.58	0.51	0.39
	Personal Effects	Add	5.57	4.14	3.09	2.54	2.35	2.14
\$100	Mobile Home Structures	Included						
	Adjacent Structures	Included						
	Personal Effects	Included						
\$250	Mobile Home Structures	Subtract	\$28.27	\$22.99	\$18.90	\$17.24	\$14.67	\$11.73
	Adjacent Structures	Subtract	2.18	1.91	1.31	1.19	1.03	0.81
	Personal Effects	Subtract	11.12	8.28	6.19	5.09	4.70	4.26
\$500	Mobile Home Structures	Subtract	\$72.25	\$58.75	\$48.32	\$44.05	\$37.49	\$29.98
	Adjacent Structures	Subtract	17.37	15.33	10.51	9.43	8.22	6.45
	Personal Effects	Subtract	16.68	12.42	9.27	7.63	7.05	6.40
\$750	Mobile Home Structures	Subtract	\$110.41	\$89.77	\$73.86	\$67.33	\$57.30	\$45.82
	Adjacent Structures	Subtract	29.32	25.87	17.74	15.90	13.86	10.88
	Personal Effects	Subtract	21.13	15.74	11.73	9.67	8.93	8.10
\$1,000	Mobile Home Structures	Subtract	\$141.15	\$114.76	\$94.41	\$86.07	\$73.26	\$58.58
	Adjacent Structures	Subtract	37.13	32.76	22.48	20.14	17.54	13.79
	Personal Effects	Subtract	24.30	18.10	13.49	11.12	10.28	9.31
\$2,000	Mobile Home Structures	Subtract	\$237.69	\$193.22	\$159.02	\$144.95	\$123.40	\$98.66
	Adjacent Structures	Subtract	61.55	54.29	37.25	33.37	29.07	22.88
	Personal Effects	Subtract	35.14	26.18	19.48	16.09	14.85	13.46
\$5,000	Mobile Home Structures	Subtract	\$474.56	\$385.76	\$317.53	\$289.43	\$246.41	\$197.01
	Adjacent Structures	Subtract	121.34	107.01	73.42	65.76	57.26	45.12
	Personal Effects	Subtract	64.25	47.89	35.60	29.43	27.18	24.61

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Seasonal/Vacation Residence:

Deductible Amount	Coverage		Territory Group 1	Territory Group 2	Territory Group 3	Territory Group 4	Territory Group 5	Territory Group 6
\$250	Mobile Home Structures	Included						
	Adjacent Structures	Included						
	Personal Effects	Included						
\$500	Mobile Home Structures	Subtract	\$43.99	\$35.78	\$29.40	\$26.80	\$22.80	\$18.24
	Adjacent Structures	Subtract	15.20	13.40	9.21	8.25	7.21	5.64
	Personal Effects	Subtract	5.57	4.14	3.09	2.54	2.35	2.14
\$750	Mobile Home Structures	Subtract	\$82.14	\$66.77	\$54.95	\$50.08	\$42.64	\$34.09
	Adjacent Structures	Subtract	27.14	23.95	16.43	14.71	12.82	10.07
	Personal Effects	Subtract	10.02	7.46	5.54	4.58	4.23	3.84
\$1,000	Mobile Home Structures	Subtract	\$112.88	\$91.76	\$75.51	\$68.83	\$58.60	\$46.85
	Adjacent Structures	Subtract	34.95	30.84	21.16	18.95	16.51	12.98
	Personal Effects	Subtract	13.19	9.83	7.30	6.04	5.57	5.05
\$2,000	Mobile Home Structures	Subtract	\$209.42	\$170.23	\$140.11	\$127.70	\$108.72	\$86.93
	Adjacent Structures	Subtract	59.37	52.38	35.94	32.18	28.02	22.08
	Personal Effects	Subtract	24.02	17.90	13.30	11.00	10.15	9.20
\$5,000	Mobile Home Structures	Subtract	\$446.29	\$362.78	\$298.63	\$272.19	\$231.74	\$185.29
	Adjacent Structures	Subtract	119.16	105.09	72.10	64.58	56.23	44.31
	Personal Effects	Subtract	53.13	39.61	29.41	24.34	22.46	20.35

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DEDUCTIBLE – NAMED PERILS COVERAGE

Deductible Amount	Coverage		Territory Group 1	Territory Group 2	Territory Group 3	Territory Group 4	Territory Group 5	Territory Group 6
None	Mobile Home Structures	Included						
	Adjacent Structures	Included						
	Personal Effects	Included						
\$50	Mobile Home Structures	Subtract	\$15.71	\$12.78	\$10.53	\$9.60	\$8.15	\$6.52
	Adjacent Structures	Subtract	1.08	0.96	0.65	0.58	0.51	0.40
	Personal Effects	Subtract	4.63	3.46	2.58	2.12	1.96	1.78
\$100	Mobile Home Structures	Subtract	\$29.85	\$24.27	\$19.93	\$18.19	\$15.47	\$12.38
	Adjacent Structures	Subtract	2.18	1.91	1.32	1.19	1.04	0.81
	Personal Effects	Subtract	9.27	6.90	5.15	4.25	3.92	3.56
\$250	Mobile Home Structures	Subtract	\$53.39	\$43.42	\$35.72	\$32.56	\$27.71	\$22.16
	Adjacent Structures	Subtract	3.26	2.88	1.98	1.77	1.54	1.21
	Personal Effects	Subtract	18.54	13.80	10.31	8.48	7.84	7.10
\$500	Mobile Home Structures	Subtract	\$88.01	\$71.57	\$58.90	\$53.71	\$45.69	\$36.52
	Adjacent Structures	Subtract	4.96	4.40	3.02	2.67	2.34	1.83
	Personal Effects	Subtract	32.28	24.04	17.94	14.76	13.65	12.36
\$750	Mobile Home Structures	Subtract	\$116.49	\$94.74	\$77.99	\$71.10	\$60.48	\$48.35
	Adjacent Structures	Subtract	6.52	5.80	3.99	3.51	3.08	2.40
	Personal Effects	Subtract	43.72	32.56	24.29	19.99	18.48	16.74
\$1,000	Mobile Home Structures	Subtract	\$137.72	\$112.00	\$92.22	\$84.08	\$71.51	\$57.17
	Adjacent Structures	Subtract	7.91	7.07	4.85	4.26	3.73	2.91
	Personal Effects	Subtract	52.41	39.03	29.11	23.96	22.16	20.05
\$2,000	Mobile Home Structures	Subtract	\$200.39	\$162.98	\$134.21	\$122.42	\$104.08	\$83.21
	Adjacent Structures	Subtract	13.24	11.88	8.12	7.11	6.22	4.83
	Personal Effects	Subtract	82.80	61.65	45.95	37.84	34.99	31.67
\$5,000	Mobile Home Structures	Subtract	\$349.56	\$284.31	\$234.17	\$213.66	\$181.60	\$145.19
	Adjacent Structures	Subtract	28.62	25.81	17.56	15.36	13.43	10.40
	Personal Effects	Subtract	165.27	123.03	91.66	75.51	69.80	63.16

**WINDSTORM OR HAIL DEDUCTIBLES
TERRITORY GROUPS 1 AND 2 ONLY**

The Windstorm or Hail Deductible options are used in conjunction with the deductibles applicable to All Other Perils. This option provides for higher dollar deductible amounts of \$1,000, \$2,000, \$5,000, 1%, 2%, or 5% when the higher deductible amount selected exceeds the deductible applicable to All Other Perils.

An endorsement is not required. Separately enter on the policy declarations the deductible amounts that apply to Windstorm or Hail and All Other Perils. For example: Deductible - \$500 except \$1,000 for Windstorm or Hail.

The factors displayed 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.

COMPREHENSIVE

The Windstorm or Hail Deductible factor applies to the \$100 Deductible rate.

\$1,000 WINDSTORM OR HAIL DEDUCTIBLE**	
ALL OTHER PERILS DEDUCTIBLE AMOUNT	DEDUCTIBLE FACTOR
\$ 50	1.08
100	0.99
250	0.92
500	0.85
750	0.79
**The amount of insurance on the structure must be at least \$10,000.	

The maximum \$1,000 Windstorm or Hail Deductible credits by Territory Group are:

Territory Group 1 \$588.14
Territory Group 2 \$565.03

\$2,000 WINDSTORM OR HAIL DEDUCTIBLE**	
ALL OTHER PERILS DEDUCTIBLE AMOUNT	DEDUCTIBLE FACTOR
\$ 50	1.03
100	0.95
250	0.88
500	0.82
750	0.77
1,000	0.72
**The amount of insurance on the structure must be at least \$20,000.	

The maximum \$2,000 Windstorm or Hail Deductible credits by Territory Group are:

Territory Group 1 \$1,176.29
Territory Group 2 \$1,130.06

\$5,000 WINDSTORM OR HAIL DEDUCTIBLE**	
ALL OTHER PERILS DEDUCTIBLE AMOUNT	DEDUCTIBLE FACTOR
\$ 50	0.99
100	0.93
250	0.85
500	0.80
750	0.75
1,000	0.70
2,000	0.53
**The amount of insurance on the structure must be at least \$50,000.	

The maximum \$5,000 Windstorm or Hail Deductible credits by Territory Group are

Territory Group 1 \$1,882.07
Territory Group 2 \$1,808.10

1% WINDSTORM OR HAIL DEDUCTIBLE**	
ALL OTHER PERILS DEDUCTIBLE AMOUNT	DEDUCTIBLE FACTOR
\$50	1.11
100	1.01
250	0.94
500	0.86
**The amount of insurance on the structure must be at least \$25,000 for all other peril deductibles below 500 and \$50,000 for an all other peril deductible equal to 500	

The maximum 1% Windstorm or Hail Deductible credits by Territory Group are

Territory Group 1 \$235.25
Territory Group 2 \$226.01

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2% WINDSTORM OR HAIL DEDUCTIBLE**	
ALL OTHER PERILS DEDUCTIBLE AMOUNT	DEDUCTIBLE FACTOR
\$50	1.07
100	0.98
250	0.91
500	0.84
750	0.78
1,000	0.73
2,000	0.54
**The amount of insurance on the structure must be at least \$50,000 for all other peril deductibles below 2,000 and \$100,000 for an all other peril deductible equal to 2,000	

The maximum 1% Windstorm or Hail Deductible credits by Territory Group are

Territory Group 1 \$735.18
Territory Group 2 \$706.29

5% WINDSTORM OR HAIL DEDUCTIBLE**	
ALL OTHER PERILS DEDUCTIBLE AMOUNT	DEDUCTIBLE FACTOR
\$50	1.01
100	0.94
250	0.86
500	0.81
750	0.76
1,000	0.70
2,000	0.53
5,000	0.36
**The amount of insurance on the structure must be at least \$50,000 for all other peril deductibles below 2,000 and \$100,000 for any other all other peril deductibles	

The maximum 1% Windstorm or Hail Deductible credits by Territory Group are

Territory Group 1 \$1,588.00
Territory Group 2 \$1,525.58

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NAMED PERILS

The Windstorm or Hail Deductible factor applies to the \$0 Deductible rate.

\$1,000 WINDSTORM OR HAIL DEDUCTIBLE**	
ALL OTHER PERILS DEDUCTIBLE AMOUNT	DEDUCTIBLE FACTOR
\$ 50	1.03
100	0.95
250	0.88
500	0.80
750	0.73
**The amount of insurance on the structure must be at least \$10,000.	

The maximum \$1,000 Windstorm or Hail Deductible credits by Territory Group are:

Territory Group 1 \$588.14
Territory Group 2 \$565.03

\$2,000 WINDSTORM OR HAIL DEDUCTIBLE**	
ALL OTHER PERILS DEDUCTIBLE AMOUNT	DEDUCTIBLE FACTOR
\$ 50	0.99
100	0.91
250	0.85
500	0.77
750	0.71
1,000	0.65
**The amount of insurance on the structure must be at least \$20,000.	

The maximum \$2,000 Windstorm or Hail Deductible credits by Territory Group are:

Territory Group 1 \$1,176.29
Territory Group 2 \$1,130.06

\$5,000 WINDSTORM OR HAIL DEDUCTIBLE**	
ALL OTHER PERILS DEDUCTIBLE AMOUNT	DEDUCTIBLE FACTOR
\$ 50	0.95
100	0.89
250	0.82
500	0.75
750	0.70
1,000	0.64
2,000	0.46
**The amount of insurance on the structure must be at least \$50,000.	

The maximum \$5,000 Windstorm or Hail Deductible credits by Territory Group are:

Territory Group 1 \$1,882.07
Territory Group 2 \$1,808.10

1% WINDSTORM OR HAIL DEDUCTIBLE**	
ALL OTHER PERILS DEDUCTIBLE AMOUNT	DEDUCTIBLE FACTOR
\$50	1.05
100	0.97
250	0.90
500	0.81
**The amount of insurance on the structure must be at least \$25,000 for all other peril deductibles below 500 and \$50,000 for an all other peril deductible equal to 500	

The maximum 1% Windstorm or Hail Deductible credits by Territory Group are

Territory Group 1 \$235.25
Territory Group 2 \$226.01

2% WINDSTORM OR HAIL DEDUCTIBLE**	
ALL OTHER PERILS DEDUCTIBLE AMOUNT	DEDUCTIBLE FACTOR
\$50	1.02
100	0.94
250	0.87
500	0.79
750	0.72
1,000	0.66
2,000	0.47
**The amount of insurance on the structure must be at least \$50,000 for all other peril deductibles below 2,000 and \$100,000 for an all other peril deductible equal to 2,000	

The maximum 2% Windstorm or Hail Deductible credits by Territory Group are

Territory Group 1 \$735.18
Territory Group 2 \$706.29

5% WINDSTORM OR HAIL DEDUCTIBLE**	
ALL OTHER PERILS DEDUCTIBLE AMOUNT	DEDUCTIBLE FACTOR
\$50	0.97
100	0.90
250	0.83
500	0.76
750	0.70
1,000	0.64
2,000	0.46
5,000	0.30
**The amount of insurance on the structure must be at least \$50,000 for all other peril deductibles below 2,000 and \$100,000 for any other all other peril deductibles	

The maximum 5% Windstorm or Hail Deductible credits by Territory Group are

Territory Group 1 \$1,588.00
Territory Group 2 \$1,525.58

OPTIONAL NAMED STORM PERCENTAGE DEDUCTIBLE
TERRITORY GROUPS 1 AND 2 ONLY

DEDUCTIBLE COMPREHENSIVE COVERAGE

The surcharges/credits displayed incorporate the surcharges/credits for the All Perils Deductibles. Do not use the surcharges/credits for the All Perils Deductibles when rating a policy with a higher Named Storm Percentage Deductible. For Comprehensive Coverage Primary Residence, the 1%, 2%, or 5% Named Storm Deductible surcharge/credit applies to the \$100 deductible rate. For Comprehensive Coverage Seasonal/Vacation Residence, the 1%, 2%, or 5% Named Storm Deductible credit applies to the \$250 deductible rate.

1% Named Storm Deductible

All Other Perils Deductible Amount	Coverage		Primary Residence		Seasonal/Vacation Residence	
			Territory Group 1	Territory Group 2	Territory Group 1	Territory Group 2
None	Mobile Home Structures	Add	\$24.26	\$19.74	---	---
	Adjacent Structures	Add	1.46	1.28	---	---
	Personal Effects	Add	9.91	7.38	---	---
\$50	Mobile Home Structures	Add	\$5.62	\$4.58	---	---
	Adjacent Structures	Add	0.38	0.34	---	---
	Personal Effects	Add	4.41	3.28	---	---
\$100	Mobile Home Structures	Subtract	\$9.92	\$8.08	---	---
	Adjacent Structures	Subtract	0.69	0.61	---	---
	Personal Effects	Subtract	1.10	0.82	---	---
\$250	Mobile Home Structures	Subtract	\$37.93	\$30.85	\$9.92	\$8.08
	Adjacent Structures	Subtract	2.83	2.50	0.69	0.61
	Personal Effects	Subtract	12.11	9.02	1.10	0.82
\$500	Mobile Home Structures	Subtract	\$81.46	\$66.23	\$53.49	\$43.50
	Adjacent Structures	Subtract	17.90	15.79	15.73	13.88
	Personal Effects	Subtract	17.61	13.12	6.62	4.93

2% Named Storm Deductible

All Other Perils Deductible Amount	Coverage		Primary Residence		Seasonal/Vacation Residence	
			Territory Group 1	Territory Group 2	Territory Group 1	Territory Group 2
None	Mobile Home Structures	Add	\$13.99	\$11.37	---	---
	Adjacent Structures	Add	0.74	0.66	---	---
	Personal Effects	Add	8.70	6.48	---	---
\$50	Mobile Home Structures	Subtract	\$4.46	\$3.62	---	---
	Adjacent Structures	Subtract	0.33	0.29	---	---
	Personal Effects	Add	3.24	2.41	---	---
\$100	Mobile Home Structures	Subtract	\$19.86	\$16.15	---	---
	Adjacent Structures	Subtract	1.39	1.23	---	---
	Personal Effects	Subtract	2.20	1.63	---	---
\$250	Mobile Home Structures	Subtract	\$47.57	\$38.69	\$19.86	\$16.15
	Adjacent Structures	Subtract	3.49	3.10	1.39	1.23
	Personal Effects	Subtract	13.10	9.76	2.20	1.63
\$500	Mobile Home Structures	Subtract	\$90.67	\$73.72	\$62.99	\$51.23
	Adjacent Structures	Subtract	18.22	16.07	15.94	14.07
	Personal Effects	Subtract	18.55	13.82	7.67	5.71

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\$750	Mobile Home Structures	Subtract	\$129.76	\$105.49	\$102.95	\$83.71
	Adjacent Structures	Subtract	31.30	27.59	28.96	25.56
	Personal Effects	Subtract	22.80	16.99	12.49	9.31
\$1,000	Mobile Home Structures	Subtract	\$163.77	\$133.14	\$138.61	\$112.71
	Adjacent Structures	Subtract	42.16	37.16	39.89	35.21
	Personal Effects	Subtract	25.68	19.15	16.44	12.25
\$2,000	Mobile Home Structures	Subtract	\$290.87	\$236.44	\$272.85	\$221.84
	Adjacent Structures	Subtract	81.31	71.63	79.39	70.08
	Personal Effects	Subtract	35.39	26.42	30.66	22.84

5% Named Storm Deductible

All Other Perils Deductible Amount	Coverage		Primary Residence		Seasonal/Vacation Residence	
			Territory Group 1	Territory Group 2	Territory Group 1	Territory Group 2
None	Mobile Home Structures	Subtract	\$16.84	\$13.70		
	Adjacent Structures	Subtract	1.41	1.22		
	Personal Effects	Add	5.07	3.77		
\$50	Mobile Home Structures	Subtract	\$34.73	\$28.22		
	Adjacent Structures	Subtract	2.44	2.17		
	Personal Effects	Subtract	0.24	0.20		
\$100	Mobile Home Structures	Subtract	\$49.64	\$40.38		
	Adjacent Structures	Subtract	3.46	3.07		
	Personal Effects	Subtract	5.50	4.08		
\$250	Mobile Home Structures	Subtract	\$76.52	\$62.24	\$49.64	\$40.38
	Adjacent Structures	Subtract	5.45	4.87	3.46	3.07
	Personal Effects	Subtract	16.07	11.99	5.50	4.08
\$500	Mobile Home Structures	Subtract	\$118.29	\$96.18	\$91.50	\$74.40
	Adjacent Structures	Subtract	20.02	17.65	17.84	15.78
	Personal Effects	Subtract	21.35	15.92	10.83	8.07
\$750	Mobile Home Structures	Subtract	\$155.27	\$126.23	\$129.35	\$105.16
	Adjacent Structures	Subtract	32.86	28.91	30.61	27.06
	Personal Effects	Subtract	25.27	18.86	15.34	11.45
\$1,000	Mobile Home Structures	Subtract	\$186.47	\$151.58	\$162.20	\$131.84
	Adjacent Structures	Subtract	43.42	38.16	41.21	36.42
	Personal Effects	Subtract	27.74	20.70	18.86	14.09
\$2,000	Mobile Home Structures	Subtract	\$308.16	\$250.48	\$290.65	\$236.18
	Adjacent Structures	Subtract	82.21	72.14	80.29	70.93
	Personal Effects	Subtract	36.86	27.52	32.29	24.16
\$5,000	Mobile Home Structures	Subtract	\$666.52	\$541.69	\$669.22	\$543.69
	Adjacent Structures	Subtract	190.67	167.14	187.64	165.69
	Personal Effects	Subtract	62.94	47.01	71.13	53.28

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DEDUCTIBLE NAMED PERILS COVERAGE

The surcharges/credits displayed incorporate the surcharges/credits for the All Perils Deductibles. Do not use the surcharges/credits for the All Perils Deductibles when rating a policy with a higher Named Storm Percentage Deductible. For Named Perils Coverage, the 1%, 2%, or 5% Named Storm Deductible credit applies to the \$0 deductible rate.

1% Named Storm Deductible

All Other Perils Deductible Amount	Coverage		Primary Residence	
			Territory Group 1	Territory Group 2
None	Mobile Home Structures	Subtract	\$17.71	\$14.39
	Adjacent Structures	Subtract	1.18	1.04
	Personal Effects	Subtract	2.21	1.65
\$50	Mobile Home Structures	Subtract	\$33.13	\$26.94
	Adjacent Structures	Subtract	2.25	2.00
	Personal Effects	Subtract	6.75	5.02
\$100	Mobile Home Structures	Subtract	\$46.96	\$38.19
	Adjacent Structures	Subtract	3.34	2.94
	Personal Effects	Subtract	11.30	8.42
\$250	Mobile Home Structures	Subtract	\$70.05	\$56.96
	Adjacent Structures	Subtract	4.38	3.86
	Personal Effects	Subtract	20.36	15.17
\$500	Mobile Home Structures	Subtract	\$108.53	\$88.25
	Adjacent Structures	Subtract	6.12	5.41
	Personal Effects	Subtract	35.46	26.42

2% Named Storm Deductible

All Other Perils Deductible Amount	Coverage		Primary Residence	
			Territory Group 1	Territory Group 2
None	Mobile Home Structures	Subtract	\$35.42	\$28.80
	Adjacent Structures	Subtract	2.36	2.09
	Personal Effects	Subtract	4.43	3.31
\$50	Mobile Home Structures	Subtract	\$50.54	\$41.10
	Adjacent Structures	Subtract	3.42	3.03
	Personal Effects	Subtract	8.87	6.59
\$100	Mobile Home Structures	Subtract	\$64.06	\$52.09
	Adjacent Structures	Subtract	4.50	3.96
	Personal Effects	Subtract	13.33	9.93
\$250	Mobile Home Structures	Subtract	\$86.70	\$70.50
	Adjacent Structures	Subtract	5.50	4.85
	Personal Effects	Subtract	21.82	16.26
\$500	Mobile Home Structures	Subtract	\$120.70	\$98.13
	Adjacent Structures	Subtract	6.82	6.02
	Personal Effects	Subtract	34.18	25.47
\$750	Mobile Home Structures	Subtract	\$150.05	\$121.98
	Adjacent Structures	Subtract	7.73	6.84
	Personal Effects	Subtract	44.21	32.94
\$1,000	Mobile Home Structures	Subtract	\$174.02	\$141.45
	Adjacent Structures	Subtract	8.23	7.26
	Personal Effects	Subtract	51.53	38.39

RATE PAGES

\$2,000	Mobile Home Structures	Subtract	\$261.82	\$212.78
	Adjacent Structures	Subtract	9.69	8.53
	Personal Effects	Subtract	76.76	57.18

5% Named Storm Deductible

All Other Perils Deductible Amount	Coverage		Primary Residence	
			Territory Group 1	Territory Group 2
None	Mobile Home Structures	Subtract	\$88.53	\$71.99
	Adjacent Structures	Subtract	5.92	5.22
	Personal Effects	Subtract	11.07	8.27
\$50	Mobile Home Structures	Subtract	\$102.78	\$83.58
	Adjacent Structures	Subtract	6.94	6.12
	Personal Effects	Subtract	15.22	11.30
\$100	Mobile Home Structures	Subtract	\$115.37	\$93.83
	Adjacent Structures	Subtract	7.96	7.02
	Personal Effects	Subtract	19.43	14.48
\$250	Mobile Home Structures	Subtract	\$136.65	\$111.11
	Adjacent Structures	Subtract	8.86	7.81
	Personal Effects	Subtract	27.67	20.64
\$500	Mobile Home Structures	Subtract	\$166.94	\$135.72
	Adjacent Structures	Subtract	9.82	8.67
	Personal Effects	Subtract	39.33	29.36
\$750	Mobile Home Structures	Subtract	\$191.32	\$155.53
	Adjacent Structures	Subtract	10.25	9.05
	Personal Effects	Subtract	48.44	36.18
\$1,000	Mobile Home Structures	Subtract	\$209.23	\$170.07
	Adjacent Structures	Subtract	10.37	9.15
	Personal Effects	Subtract	55.25	41.28
\$2,000	Mobile Home Structures	Subtract	\$280.86	\$228.25
	Adjacent Structures	Subtract	10.82	9.48
	Personal Effects	Subtract	80.02	59.82
\$5,000	Mobile Home Structures	Subtract	\$495.73	\$402.79
	Adjacent Structures	Subtract	12.18	10.35
	Personal Effects	Subtract	151.23	113.12

**MOBILE HOMEOWNERS POLICY: MH(C) PROGRAM
RATE PAGES**

NORTH CAROLINA

TERRITORY GROUP SURCHARGE/DISCOUNT

Mobile Home Structures	
Territory Group 1	64.6%
Territory Group 2	34.1%
Territory Group 3	0.0%
Territory Group 4	-7.7%
Territory Group 5	-21.5%
Territory Group 6	-37.3%

Adjacent Structures	
Territory Group 1	80.8%
Territory Group 2	59.9%
Territory Group 3	0.0%
Territory Group 4	-10.3%
Territory Group 5	-21.7%
Territory Group 6	-38.6%

Comprehensive Personal Effects	
Territory Group 1	97.1%
Territory Group 2	47.2%
Territory Group 3	0.0%
Territory Group 4	-17.2%
Territory Group 5	-23.5%
Territory Group 6	-30.8%

TRIP COVERAGE

30 Day Trip; \$100 Deductible = \$25

NATURAL DISASTER PROTECTION COVERAGE

A \$3.00 premium charge per mobile home shall apply

FIRE DEPARTMENT SERVICE CHARGE

Additional Amounts of Insurance:

\$2.00 per \$100 of Insurance
Maximum additional Amount of Insurance = \$400

RADIO AND TELEVISION ANTENNA COVERAGE

Additional Amounts of Insurance:

\$5.00 per \$100 of Insurance
Maximum additional Amount of Insurance = \$2,500

MEDICAL PAYMENTS TO OTHERS

Additional Limit	Premium
\$1,000	\$3.00

LIABILITY

\$500 Medical Payments to Others Coverage and \$250 Damage to Property of Others automatically included.

Personal Liability Coverages	
Limits	Premium
\$25,000	\$23.67
50,000	26.99
100,000	31.24
200,000	36.44
250,000	38.58
300,000	40.48

INFLATION COVERAGE

\$5.00 per mobile home

DETERMINATION OF TERM PREMIUMS

Multiply the 1 year unrounded premium for the specific coverage by the term factor then total and round total of all coverages.

TERM FACTORS

Apply to all Coverages:

Term	1 Year	2 Year	3 Year	4 Year	5 Year	6 Year	7 Year
Factor	1.00	2.00	3.00	3.85	4.65	5.35	6.00

PERSONAL EFFECTS REPLACEMENT COST ENDORSEMENT

\$0.30 per \$100 of Insurance
The Minimum Additional Premium is \$15.00

REPLACEMENT COST COVERAGE

When coverage is provided on a replacement cost basis, charge 5% of the premium from the premium rate table.

MOBILE HOME ADDITIONAL LIVING EXPENSE COVERAGE

\$25 per day = \$6 per mobile home
\$50 per day = \$16 per mobile home

WINDSTORM OR HAIL EXCLUSION

(Territories 110, 120, 130, 140, 150, 160)

	Territory Group 1	Territory Group 2
Mobile Home Structures	64.3%	60.0%
Adjacent Structures	57.0%	53.9%
Comprehensive Personal Effects	45.3%	38.5%

STATED VALUE LOSS SETTLEMENT

When coverage is provided on a stated value basis, charge 3% of the premium from the premium rate table.

**MOBILE HOMEOWNERS POLICY
TERRITORY PAGES**

NORTH CAROLINA

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. 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
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

County of

Code

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
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 known 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

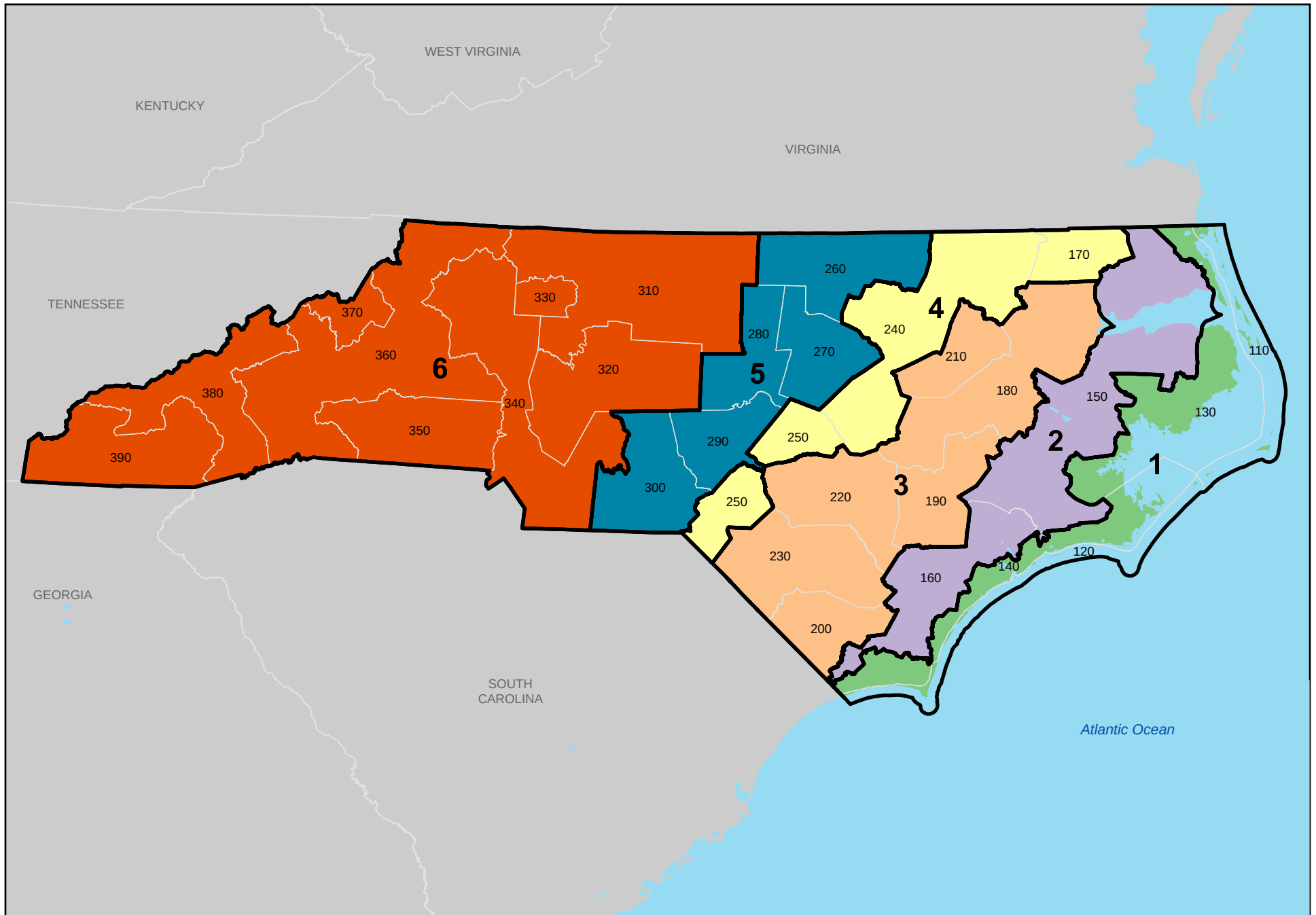
ZIP Code	USPS ZIP Code Name	Code
28403	Wilmington	140
28404	Wilmington	140
28405	Wilmington	140
28406	Wilmington	140
28407	Wilmington	140
28408	Wilmington	140
28409	Wilmington	140
28410	Wilmington	140
28411	Wilmington	140
28412	Wilmington	140
28422	Bolivia	140
28428	Carolina Beach	140
28443	Hampstead	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

ZIP Code	USPS ZIP Code Name	Code
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

North Carolina
Mobile Homeowners MH(F) and MH(C)
Territories and Territory Groups Effective June 1, 2020



**PRE-FILED TESTIMONY
OF
JOANNA BILIOURIS**

APRIL 2024

**2024 NORTH CAROLINA MOBILE HOMEOWNERS MH(C) INSURANCE RATE
FILING BY THE NORTH CAROLINA RATE BUREAU**

Q. Would you state your full name and business address?

A. My name is Joanna Biliouris. My business address is 2910 Sumner Blvd, Raleigh, North Carolina 27616.

Q. Are you employed by the North Carolina Rate Bureau ("Bureau")?

A. Yes.

Q. In what capacity?

A. I am the General Manager.

Q. What is the Bureau's function with respect to rates for Mobile Homeowners MH(C) insurance?

A. The Bureau promulgates rates and rules for residential property insurance in North Carolina, including this MH(C) program.

Q. Can you identify Exhibits RB-1 through RB-24?

A. Yes. Exhibit RB-1 sets forth the revised rates for the MH(C) market in North Carolina, as well as the data and calculations underlying those rates and the MH(C) rate manual changes that accompany the filed rate changes. RB-1 also includes the supplemental data and exhibits required by statute and by regulation for this filing. Exhibit RB-2 is the current MH(C) rate manual. Exhibits RB-3 through RB-24 contain the required accompanying pre-filed testimony and exhibits. Together, these materials constitute a filing (the "Filing") that is dated April 8, 2024, submitted by the Bureau to the Honorable Mike Causey, Commissioner of Insurance, with respect to MH(C) rates in North Carolina.

Q. Do you know how the expense data underlying the Filing were compiled?

A. Yes. The underwriting expense provisions included in the Filing were derived from the results of a special call for expense experience that is issued on an annual basis to all member companies of the Bureau. The responses received from that special call were compiled, reviewed, and furnished to Milliman for incorporation into the Filing. The Bureau also furnished to Milliman certain information appearing in the Annual Statements and the Insurance Expense Exhibits of Bureau member

companies, which are filed by those companies with the Department of Insurance ("DOI") and are part of the DOI's official records.

Q. Was the information you described above, which was furnished to Milliman and utilized in the Filing, correct and accurate to the best of your knowledge, information and belief?

A. Yes.

Q. Can you identify the document (Exhibit RB-2) entitled the North Carolina Mobile Homeowners Policy MH(C) Program?

A. Yes. The North Carolina Mobile Homeowners Policy MH(C) Program is a manual of the rules, rates and classifications used to write Mobile Homeowners MH(C) insurance in North Carolina. This manual and any approved amendments are on file with the North Carolina Department of Insurance and a copy is maintained at the offices of the Bureau.

Q. Do you know how the exposure and loss experience data underlying the Filing were compiled?

A. Yes. The exposure and loss experience data included in the Filing were derived from the results of a special call for experience that was issued to all companies writing MH(C) insurance. Milliman conducted that call on behalf of the Rate Bureau and incorporated that data into the filing.

Q. To the extent that actuarial expertise was necessary in the preparation of this Filing, where did the Bureau obtain that expertise?

A. Actuarial expertise was obtained from Milliman. Milliman is retained by the Bureau to provide actuarial services for, among numerous other tasks, preparation of this Filing. Many of the individual company representatives serving on the Bureau's Mobile Home and Property Rating Subcommittees are also actuaries. The Bureau's Subcommittees reviewed the data underlying the Filing and made recommendations to the Property Committee, which then made recommendations to the Bureau's Governing Committee as to the items contained in the Filing. In addition, the Bureau has an actuary on its staff who assisted in the review and the preparation of the Filing.

Q. What is the proposed effective date of the rates in the Filing?

A. The rate review proposes that the indicated rate changes be implemented in three phases over a three-year period. The Bureau proposes that the new rates for Year 1 apply to all policies becoming effective on or after November 1, 2024, the new rates for Year 2 apply to all policies becoming effective on or after November 1, 2025, and the new rates for Year 3 apply to all policies becoming effective on or after November 1, 2026.

Q. Does the Filing submitted to the Commissioner include, to the extent available, the information to be furnished in connection with filings under Article 36 of Chapter 58 of the General Statutes?

A. Yes. Those data that were available have been submitted to the Commissioner as part of the Filing. As shown and explained in that submission, some data were not collected or, if collected, were not retrievable in the form requested. The individual circumstances with respect to such data are explained in the submission.

Q. Does that conclude your pre-filed testimony?

A. Yes.

**PREFILED TESTIMONY
OF
PAUL D. ANDERSON**

**2024 MOBILE HOMEOWNERS MH(C) INSURANCE 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 17335 Golf Parkway, Brookfield, WI 53045.

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 served on several committees of the Casualty Actuarial Society, including the following:

- Syllabus & Examination Committee: April 2004 to July 2006;
- Volunteer Support Task Force: February 2012 to April 2013;
- Volunteer Resources Committee: April 2013 to March 2020;
- Vehicle Technology & Impact on Loss Trends Planning Committee: October 2017 to August 2018;
- Participation Survey Task Force: January 2018 to January 2019;
- Crash Course in Vehicle Technology & Driverless Cars Committee (chairperson): February 2020 to November 2021;
- Volunteer Resources Advisory Committee: June 2020 to November 2021;
- Crash Course Seminar Task Force (volunteer chairperson): November 2021 to Present; and
- Volunteer Resources Task Force: November 2021 to Present.

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 providers of actuarial, risk management, and related technology and data solutions. 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 4,800 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 or Bureau) in relation to its 2024 mobile homeowners MH(C) rate filing?

A. Yes, I was.

Q. What work did Milliman perform in connection with the rate review and this rate filing?

A. Milliman was engaged to provide actuarial ratemaking services directly to the Rate Bureau to assist in the preparation of the 2024 mobile homeowners MH(C) rate review. As such, I was involved in several aspects of the preparation of this filing.

First, under the direction and administration of the Rate Bureau, Milliman developed a Mobile Homeowners Data Call. In response to this data call, Milliman received data from Bureau member companies that write mobile homeowners insurance in North Carolina. Milliman compiled the data and reviewed the data for reasonability and consistency. In addition to data from the data call, Milliman received and evaluated expense-related data that the Rate Bureau collected from its member companies. During the course of our analysis for this filing, Milliman also received modeled hurricane data, compensation for assessment risk data, and net cost of reinsurance data from Aon. Milliman aggregated all of this data and reviewed each component and the aggregate for reasonability.

Second, I and other Milliman staff under my direction compiled the ratemaking data and, along with the Rate Bureau's other consultants, completed a rate review to be reviewed by the Rate Bureau's Mobile Home Subcommittee, Property Rating Subcommittee, Property Committee, and Governing Committee in preparation for this rate filing.

Third, Milliman staff under my direction assembled the majority of the data and performed all of the calculations contained in Exhibits RB-1 and RB-7. This work was performed under the ultimate direction of the Rate Bureau committees.

Finally, I reviewed the filed rates to determine whether they are calculated in accordance with applicable actuarial standards and reasonable actuarial methodologies. In conducting this review and making this determination, I adhered to the American Academy of Actuaries' *Code of Professional Conduct*. Based on the guidance of Precept 3 in the *Code of Professional Conduct*, which states that actuarial services shall satisfy applicable standards of practice, I conducted my review in accordance with all Actuarial Standards of Practice (ASOPs) that relate to this filing. A few examples of the ASOPs that I applied during my review include ASOP No. 13, *Trending Procedures in Property/Casualty Insurance*; ASOP No. 29, *Expense Provisions in Property/Casualty Insurance Ratemaking*; ASOP No. 39, *Treatment of Catastrophe Losses in Property/Casualty Insurance Ratemaking*;

and ASOP No. 53, *Estimating Future Costs for Prospective Property/Casualty Risk Transfer and Risk Retention*.

I also conducted my review in accordance with ASOP No. 17, *Expert Testimony by Actuaries*. In addition, I applied the rate standards set forth in the North Carolina General Statutes, including G.S. 58-36-10, which provides that rates must not be excessive, inadequate, or unfairly discriminatory and that certain statutory rating factors must be considered.

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 this filing?

A. No, it is not.

Q. Were there any constraints placed on your analysis, such as limited or delayed access to data or limited time, that may have hindered your complete analysis?

A. No, I was provided all the data and information necessary for my work, and I had adequate time for a complete analysis. My analysis was not limited in any way.

Q. What is the source of the data evaluated in Exhibit RB-1?

A. The ratemaking data reflected in Exhibit RB-1 was, in general, supplied by the individual insurance companies that write mobile homeowners insurance policies in North Carolina on the MH(C) policy form. Those companies submitted their data in response to the mobile homeowners data call described above. Data received in response to the data call included the following:

- Premium data – 7 years of policy-level data with rating characteristics needed to calculate mobile homeowners premium;
- Claims data – 7 years of claims-level data, including cause of loss;
- Summarized loss data – at least 15 years of summarized losses for non-hurricane wind, hurricane, flood, and all (non-liability) perils combined; and
- Loss development data – 12 years of summarized loss and claim data by accident year evaluated at successive evaluation dates.

After receiving the data from the individual insurance companies, Milliman reviewed and verified each company's data and then consolidated the data for use in the rate review analysis.

The individual insurance companies that write mobile homeowners policies in North Carolina on the MH(C) policy form also submitted expense-related data to

the North Carolina Rate Bureau. The Rate Bureau reviewed the expense data for reasonability and aggregated the data before providing it to Milliman for final review and consolidation.

During the rate review analysis, Milliman also received modeled hurricane losses, compensation for assessment risk data, and net cost of reinsurance data from Aon. After receiving the data from Aon, Milliman reviewed the modeled hurricane losses, the results of the compensation for assessment risk analysis, and reinsurance costs for reasonability.

After consolidating the data from the member companies, the Rate Bureau, and Aon, Milliman produced various exhibits of the combined data in a format and detail necessary for review by the Rate Bureau committees and ultimately for use in this rate filing.

Q. What exposure and loss experience data supporting this filing are contained in Exhibit RB-1?

- A. In general, the supporting data for the indicated and proposed rate changes are contained in Sections C and D. The most recent five years of loss experience are summarized and displayed in Section C. The experience used in this filing includes accident year experience for the years ending December 31, 2018 through December 31, 2022. To clarify what is meant by “accident year,” the losses for the accident year ending December 31, 2022 include all losses resulting from claims caused by events that occurred between January 1, 2022 and December 31, 2022, even if the loss was paid or a reserve established on or after January 1, 2023.

Similar to Section C, the information underlying Section D is also based on accident year experience for the years 2018 through 2022. That information supports changes to the wind exclusion credits, which are one of the mobile homeowners rating variables.

Q. Why are five years of loss experience used to determine the indicated rate changes?

- A. The objective of ratemaking is to establish rates that are sufficient to cover all expected losses and expenses and to provide a reasonable margin for profit. Rates are prospective and, as such, are developed for the time period during which they will be in effect. The rate review underlying this filing was performed with the assumption that the effective date would be October 1, 2024, and that the proposed rates would be in effect for one year beginning from that date. However, based on the submission date of this filing, and in order to mitigate the effect of the rate increase on policyholders, the Rate Bureau Governing Committee elected to spread the proposed rate change over three years, with a proposed effective date of November 1, 2024 for the year 1 change, an effective date of November 1, 2025

for the year 2 change, and an effective date of November 1, 2026 for the year 3 change.

Historical loss experience is evaluated for the purpose of projecting expected future losses. For insured losses, including flood losses, but not including hurricane losses (for which hurricane models are used) and not including non-hurricane catastrophic wind losses and flood losses (for which a separate excess wind procedure and a separate excess flood procedure, respectively, are applied), five years of data are considered to be reasonable and appropriate. Using five years of loss experience to evaluate non-catastrophic types of losses balances the overall stability of the rates with the responsiveness of the rates to current market conditions. Additionally, North Carolina statutes allow the Rate Bureau to review five years of experience in its rate filings in addition to other factors that are to be considered. Note that, for the purposes of this filing, “hurricane losses” include wind and storm surge losses from hurricanes.

Previous North Carolina mobile homeowners rate filings submitted by the Rate Bureau have relied on five years of experience with weights of 10%, 15%, 20%, 25%, and 30% applied to each year respectively as a way to balance stability and responsiveness of the proposed rates. In this filing, we use those same weights for the property coverages and the liability coverage being evaluated. These weights are frequently used and generally accepted in all jurisdictions within the United States.

Q. What is the overall indicated and proposed change in mobile homeowners MH(C) rates in this filing?

- A. This filing shows the indicated need for an overall 49.9% statewide average rate increase for mobile homeowners MH(C) policies. This includes an indicated 57.1% change to Mobile Home Structures rates, an indicated 65.8% change to Adjacent Structures rates, an indicated 2.5% change to Personal Effects rates, and an indicated 31.0% change to Liability rates.

Based on these indicated rate changes, the Rate Bureau’s Governing Committee decided to implement the indicated rates over a three-year period. Section A, Page 1 shows the proposed statewide rate changes for each MH(C) coverage separately for years 1, 2, and 3. The proposed rate changes were selected so that the annual rate change within a territory group for any coverage was 28.0% or less, and so that the overall annual rate change for any coverage was 19.0% or less. Due to proposed rate changes by territory group and by coverage that vary slightly across the three years, the overall proposed rate changes across all territory groups and all coverages will also vary slightly.

As a result of this implementation approach, this filing proposes an overall 15.5% statewide average rate increase in year 1, an overall 14.2% statewide average rate increase in year 2, and an overall 13.6% statewide average rate increase in year

3. Allocating those rate changes by coverage, the year 1 rate change includes a proposed 17.9% change to Mobile Home Structures rates, a proposed 19.0% change to Adjacent Structures rates, a proposed 0.5% change to Personal Effects rates, and a proposed 9.9% change to Liability rates. The year 2 rate change includes a proposed 16.0% change to Mobile Home Structures rates, a proposed 18.1% change to Adjacent Structures rates, a proposed 0.7% change to Personal Effects rates, and a proposed 9.2% change to Liability rates. Lastly, the year 3 rate change includes a proposed 14.9% change to Mobile Home Structures rates, a proposed 18.0% change to Adjacent Structures rates, a proposed 1.3% change to Personal Effects rates, and a proposed 9.2% change to Liability rates.

Q. Please describe the overall ratemaking methodology that underlies the filing.

- A. The approach in this filing is generally consistent with prior mobile homeowners MH(C) filings submitted by the Rate Bureau. Consistent with ASOP No. 53, *Estimating Future Costs for Prospective Property/Casualty Risk Transfer and Risk Retention* as published by the Actuarial Standards Board, the indicated rates reflect the expected costs associated with insuring mobile homeowners MH(C) policies. These expected future costs include claims, claim settlement expenses, operational and administrative expenses, and a fair and reasonable profit.

The statewide rate indications for mobile homeowners MH(C) policies are developed based on a loss cost methodology (instead of a loss ratio methodology). The indicated rate change is calculated for each coverage (i.e., Mobile Home Structures, Adjacent Structures, Personal Effects, and Liability) by comparing the required base rate per policy to the current base rate. This comparison of the required and current base rates is consistent with ASOP No. 53 referenced above, is commonly used throughout the industry, and 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. The 2024 mobile homeowners MH(C) filing is generally consistent with prior filings, but there are a couple components of this filing that rely on different approaches as compared to the 2022 mobile homeowners MH(C) filing.

First, in our review of the expense data supporting this filing, we noted that one of the member companies transferred its mobile homeowners MH(F) policies to the MH(C) policy form during 2022. As a result, in order to determine expense provisions that accurately reflect the expected future expenses based on the distribution of member companies, we restated historical expense data to reflect the member companies currently writing MH(C) policies. In prior filings, we used the expense data as it was received from the Rate Bureau, and we did not restate historical expense data.

Second, in this filing, the Rate Bureau determined the compensation for assessment risk provision in a different manner than in the 2022 mobile homeowners MH(C) filing. In prior filings, the Rate Bureau retained Milliman to develop the compensation for assessment risk provision. Due to the lack of availability of the detailed data required for the 2022 filing, Milliman relied on data from prior Rate Bureau property rate filings to determine the provision for the 2022 filing. With this filing, Aon confirmed that they had access to the necessary detailed data and, as such, the Rate Bureau retained Aon to develop the compensation for assessment risk provision. Aon used simulated event-level hurricane losses based on the most recent exposure year and replicated the methodology used by Milliman in the 2018 mobile homeowners MH(C) filing. To reflect that some insurance companies no longer retain exposure to assessments from the Beach and FAIR Plans pursuant to the companies' respective reinsurance agreements, Aon then modified the calculated compensation for assessment risk provision by multiplying it by 50%.

This approach, though a change from the 2022 mobile homeowners MH(C) filing, was used by the Rate Bureau in its dwelling insurance rate filing submitted in July, 2023, and its homeowners insurance rate filing submitted in January, 2024.

Both of the changes in ratemaking methodology identified above are reasonable, actuarially sound, and have minimal impact on the rate-level indications.

Q. Looking at Section C, page 1, what is shown on this exhibit?

- A. Section C, page 1 shows the statewide indicated rate changes for the major coverages offered in the North Carolina mobile homeowners MH(C) program. The data shown on this page reflects all MH(C) business written in the state. The MH(C) program consists of four major types of coverages. Overall, the perils insured against by MH(C) policies are similar to those insured against under homeowners policies except that MH(C) policies also provide coverage for losses caused by the perils of earthquake, flood, and landslide.

Q. Referring to row 1 on page 1 of Section C, what is the *total base class loss cost*?

- A. The *total base class loss cost* is the average amount of projected loss per exposure, including both non-hurricane and hurricane losses, for the risk identified as the base class for each respective MH(C) coverage. The calculations underlying the *total base class loss cost* for each coverage are included later in the discussion of Section C, pages 2, 4, 6, and 8.

Q. Please explain each of the items shown in row 2 of Section C, page 1, including the *fixed expense per policy*, *variable expense per policy*, *profit*, *contingencies*, and *policyholder dividends*.

- A. Row 2a shows the *fixed expense per policy* for each MH(C) coverage. These amounts reflect the average costs for general expenses and other acquisition expenses that were expected, for purposes of the rate review, to be paid to service policies written between October 1, 2024 and September 30, 2025. General expenses include overhead expenses such as equipment, rent, and salaries. Other acquisition expenses include costs required to issue a policy, excluding commission and brokerage and including such items as advertising fees, postage, and telephone charges. General expenses and other acquisition expenses are fixed expenses in that they do not vary directly in proportion to the amount of premium charged or collected. As a result, the amounts shown in row 2a (e.g., \$81.51 for Mobile Home Structures) are applicable to each mobile homeowners policy that includes the respective MH(C) coverages.

The *fixed expense per policy* for each coverage is calculated on page 70 of Section C and further supported by data found on pages 69 and 71 of Section C. We began by evaluating historical expense information provided by the Rate Bureau and calculating the ratio of general expenses and other acquisition expenses to earned premium for each year from 2018 through 2022. In our review of the expense data, we noted that one of the member companies transferred its mobile homeowners MH(F) policies to the MH(C) policy form during 2022. As a result, in order to determine expense provisions that accurately reflect the expected future expenses based on the distribution of companies, we restated historical data to reflect the member companies currently writing MH(C) policies. Although we considered the same five years of experience as used in the overall rate indications, the selected expense ratios were based on the most recent three years in order to best reflect any recent shifts in the expense ratios. The selected general expense ratio is 8.5% and the selected other acquisition expense ratio is 11.1%, resulting in a total fixed expense ratio of 19.6%. Because these selections were based on the average expense ratios from 2020 through 2022, the selected 19.6% fixed expense ratio corresponds to the fixed expenses observed at the midpoint of that experience period, or July 1, 2021.

Row 2b shows the *variable expense per policy* for each MH(C) coverage. Unlike fixed expenses, variable expenses vary directly in proportion to the amount of premium charged or collected. As a result, the variable expenses are included in the indicated rate change calculations as percentages relative to the written premium rather than dollar amounts. The variable expense percentage for each MH(C) coverage includes a provision for commission and brokerage and a provision for premium taxes, licenses, and fees. These provisions are supported by data found on page 71 of Section C. Similar to our analysis of the fixed expenses, we evaluated historical expense information and calculated the ratio of commission and brokerage expenses and taxes, licenses, and fees to written premium for each year from 2018 through 2022. As noted above in the discussion of fixed expenses, the historical variable expense data was also restated to reflect the member companies currently writing MH(C) policies. We considered the same five years of experience as used in the overall rate indications; however the

selected expense ratios were based on the most recent three years in order to best reflect any recent shifts in the expense ratios. The selected commission and brokerage expense ratio is 16.2% and the selected taxes, licenses, and fees expense ratio is 3.1%, resulting in a total variable expense ratio of 19.3%.

Similar to the variable expense ratio, rows 2c, 2d, and 2e contain three additional provisions that vary directly in proportion to the written premium. Row 2c includes a provision for *profit*, row 2d contains a provision for *contingencies*, and row 2e contains a provision for *policyholder dividends*. Each of these selected provisions is a consistent percentage across the various MH(C) coverages, except for profit, which differs for liability coverage, as noted below.

- The underwriting profit provisions used in this filing are 6.0% for the three major property coverages and 5.5% for liability coverage. These provisions were selected by the Rate Bureau based on an analysis completed by Dr. Zanjani.
- The selected contingency provision in this filing is 1.0%, which is consistent with the prior mobile homeowners MH(C) filing and other Rate Bureau property insurance filings.
- The provision for policyholder dividends is supported by data on page 73 of Section C. To determine the provision for policyholder dividends, we evaluated historical annual statement information for companies writing Homeowners Multiple Peril premium in North Carolina. (Similar information specific to mobile homeowners insurance is not available.) We calculated the ratio of total dividends to total written premium for homeowners for each year from 2018 through 2022 and observed that companies consistently paid dividends to policyholders during that time period. Because of the consistency of these dividends during the historical experience, the Rate Bureau concluded that a provision for expected policyholder dividends is appropriate and, as such, selected a provision of 0.5% in this filing.

Q. In your opinion, are the provisions for general expenses and for other acquisition expenses reasonable?

A. Yes, the general expenses provision and the other acquisition expenses provision are reasonable. It is common practice in the industry to rely on historical experience and to calculate a three-year average expense ratio to determine provisions for general expenses and for other acquisition expenses.

Q. In your opinion, are the provisions for commission and brokerage and for taxes, licenses, and fees reasonable?

A. Yes, the commission and brokerage provision and the taxes, licenses, and fees provision are reasonable. It is common practice in the industry to rely on historical experience and to calculate a three-year average expense ratio to determine provisions for commission and brokerage and for taxes, licenses, and fees.

Q. Is the provision for contingencies included in this filing reasonable?

- A. Yes, the selected 1.0% provision for contingencies is reasonable to include in this filing. In addition to being consistent with prior Rate Bureau mobile homeowners MH(C) filings, the use of a contingency provision is common within the property and casualty insurance industry. According to *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. For these reasons, among others, a contingency provision is appropriate and necessary in my opinion.

Included with this filing as Exhibit RB-7 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 obtaining rate changes, whether caused by the regulatory review process or other delays inherent in the filing process, is merely one of several items listed above that supports the use of a contingency provision in a rate-level indication. Exhibit RB-7 lists the 21 property rate filings submitted by the Rate Bureau between 2008 and 2022. For each filing, I compared 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 0 months in the 2019 dwelling filing, to 22 months in the 2011 dwelling filing. After determining the length of delay for each filing, I applied 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 21 filings, ranging from -1.9% in the 2021 MH(C) mobile homeowners filing to +5.9% in the 2008 MH(C) mobile homeowners filing, with an average impact of +1.0%.

Based on prior filings submitted by the Rate Bureau, my experience with property filings submitted by insurance companies in other states, and the 1.0% estimated impact of delays in the North Carolina filing process, it is my opinion that a 1.0% contingency provision is reasonable, consistent with common actuarial practice, and appropriate based on fundamental actuarial principles. Again, the impact of delays in the filing process is only one of many reasons that justifies a contingency provision.

Q. Is the provision for policyholder dividends included in this filing reasonable?

- A. Yes, as described above, the Rate Bureau evaluated five years of historical experience and selected a 0.5% provision for policyholder dividends based on a five-year average ratio of the total policyholder dividends issued by homeowners insurers in North Carolina to the total direct written premium of those same companies.

The North Carolina ratemaking statutes (N.C. Gen. Stat. § 58-36-10(2)) require that policyholder dividends be considered in setting rates. Also, 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 provides that indicated rates should reflect the expected costs associated with insuring mobile homeowners policies, including all operating expenses. As such, since policyholder dividends are classified as an operating expense, 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. Moreover, 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. If dividends were not reflected in the Bureau's rates, the profit level in the filing would not be achieved because of dividends paid to policyholders.

By reviewing five years of historical experience to determine a provision for policyholder dividends, the Rate Bureau is complying with the statutes and ASOP No. 29 by considering the dividend payment history and ensuring that the selected provision is a reasonably expected expense.

- Q. Referring to row 3 on page 1 of Section C, what is the *base rate excluding reinsurance cost*?**

- A. The *base rate excluding reinsurance cost* is the average base rate for each coverage before reflecting additional adjustments for the compensation for assessment risk, the net cost of reinsurance, and net deviations. The *base rate excluding reinsurance cost* is calculated based on the following formula:

$$\frac{(\text{total base class loss cost} + \text{fixed expense per policy})}{(1 - \text{variable expense ratio} - \text{profit} - \text{contingencies} - \text{policyholder dividends})}$$

- Q. Please explain the item shown in row 4 of Section C, page 1, identified as the *compensation for assessment risk per policy*.**

- A. There is considerable risk to primary insurers (i.e., the member companies of the Rate Bureau for whom rates are being made in this filing) as a result of 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 and dwelling insurance in the 18 coastal counties that it covers.

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 (and any applicable reinsurance) 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 per year, but the potential assessment from the FAIR Plan is unlimited. If losses in the Beach Plan exceed its retained surplus, the \$1 billion industry assessment, and any other resources of the Beach Plan (including applicable reinsurance), any additional losses are passed through directly to residential property insurance policyholders in North Carolina in the form of a catastrophe recovery charge of up to 10% of premium per year.

This risk of potential assessments by the Beach Plan and 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, the Rate Bureau includes a compensation for assessment risk provision in the mobile homeowners MH(C) rates.

Q. What is the source of the amounts shown in row 4 of Section C, page 1, labeled as the *compensation for assessment risk per policy*?

A. The source of the compensation for assessment risk for each MH(C) coverage is an analysis completed for the Rate Bureau by Aon. It is my understanding that Aon was retained by the Rate Bureau based on their ability to access the necessary detailed data to develop the compensation for assessment risk provision. This is consistent with the most recent dwelling insurance and homeowners insurance rate filings submitted by the Rate Bureau.

In Aon's analysis, they used simulated event-level hurricane losses based on the most recent exposure year and replicated the methodology used by Milliman in the 2018 mobile homeowners MH(C) filing. To reflect that some insurance companies no longer retain exposure to assessments from the Beach and FAIR Plans pursuant to the companies' respective reinsurance agreements, Aon then modified the calculated compensation for assessment risk provision by multiplying it by 50%. More details of Aon's analysis are included in Ms. Mao's testimony and exhibits.

To determine the *compensation for assessment risk per policy* found in row 4 of Section C, page 1, the compensation for assessment risk provision is first adjusted for expenses by dividing by 100% minus the sum of the commission and brokerage expense ratio and the taxes, licenses, and fees expense ratio. The adjusted compensation for assessment risk provision is then multiplied by the average current base premium for each of Mobile Home Structures coverage, Adjacent Structures coverage, and Personal Effects coverage. These calculations can be found on page 74 of Section C. To develop territory level provisions per policy, a similar calculation (multiplying the adjusted compensation for assessment risk provision by the average current base rate) is done for each territory group for each property coverage. The compensation for assessment risk per policy is not included in the calculation of the MH(C) Liability indicated rate change.

Q. In your opinion, is it appropriate to include a provision for the compensation for assessment risk in mobile homeowners rates in North Carolina?

A. Yes. Insurance companies writing mobile homeowners 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, for those insurance companies that retain this exposure, they are entitled to receive fair compensation for bearing that risk and it is appropriate to include that compensation in the mobile homeowners rates. The current provision is based on a methodology developed by Milliman that has been used in prior Rate Bureau property rate filings and that relies on a widely accepted measure of compensation that will fairly compensate insurers for bearing this additional risk to their capital. Moreover, the North Carolina statutes (N.C. Gen. Stat. § 58-45-5(6c)) provide that

prospective exposure to non-recoupable assessments shall be considered as an appropriate factor in the making of rates by the Rate Bureau.

Q. What is the source of the amounts shown in row 5 of Section C, page 1, labeled as the *net cost of reinsurance per policy*?

- A. The source of the net cost of reinsurance for each MH(C) coverage is an analysis completed for the Rate Bureau by Aon. In addition to Aon's analysis to support the compensation for assessment risk (described above), Aon was also retained by the Rate Bureau based on their ability to access relevant data and experience from the reinsurance market, their expertise with catastrophe-related issues, and their prominence with respect to the reinsurance industry. This is consistent with other recent property rate filings submitted by the Rate Bureau.

In Aon's analysis, they used their experience and expertise as a reinsurance broker to develop layers of reinsurance coverage that are representative of typical amounts of reinsurance coverage purchased by the property insurance industry. Using data, catastrophe models, and other information available to Aon, they estimated the reinsurance premium associated with each layer of coverage, determined the expected losses within each layer, and calculated the net cost of reinsurance as the difference between the reinsurance premium and the expected losses in each layer. In this manner, Aon determined the expected net cost of reinsurance for the composite one company writing mobile homeowners insurance in North Carolina. These premium amounts, losses, and net costs of reinsurance were developed separately by peril and by territory for each MH(C) coverage so that they could be summarized appropriately to develop a statewide or territory indicated rate change. More details of Aon's analysis are included in Ms. Mao's testimony and exhibits.

To determine the *net cost of reinsurance per policy* found in row 5 of Section C, page 1, the total reinsurance cost for each MH(C) coverage is first divided by the corresponding number of 2022 earned house years. The resulting average reinsurance cost is further adjusted by dividing by the 2022 average rating factor, the 2022 premium trend factor, and the expected loss and fixed expense ratio. These calculations can be found on pages 75, 76, and 77 of Section C for Mobile Home Structures, Adjacent Structures, and Personal Effects, respectively. These supporting pages show the development of the statewide net cost of reinsurance per policy as well as the net cost of reinsurance for each territory group. Similar to the compensation for assessment risk, the net cost of reinsurance per policy is not included in the calculation of the MH(C) Liability indicated rate change.

Q. Can you please explain why a provision for the net cost of reinsurance is necessary in this filing?

- A. Yes. Mobile homeowners insurance is one of several types of coverages that has exposure to potential catastrophic events. In such coverages (mobile

homeowners, 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. 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, 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 mobile homeowners rates in North Carolina?

A. Yes. Insurance companies writing mobile homeowners policies in North Carolina incur a significant cost for bearing the risk of insuring 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 ASOP No. 29 regarding *Expense Provisions in Property/Casualty Insurance Ratemaking*, and the North Carolina statutes (N.C. Gen. Stat. § 58-36-10(7)) provide for inclusion of the cost of reinsurance in rates. The net cost of reinsurance is a legitimate cost of the risk transfer inherent in the purchase of property insurance, and as such, the net cost of reinsurance should be included in the North Carolina mobile homeowners rates.

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 for bearing that risk should be allocated proportional to the measurement of risk. In their analysis of reinsurance costs for this filing, Aon provided the statewide provision for the net cost of reinsurance and, as mentioned above, also allocated the reinsurance costs to each MH(C) coverage 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. Please explain the amounts shown in row 6 of Section C, page 1, identified as the *indicated manual base rate*.

A. The dollar amounts shown in row 6 are the sum of the base rate excluding reinsurance cost (row 3), the compensation for assessment risk per policy (row 4), and the net cost of reinsurance per policy (row 5) for each coverage. These amounts represent the average base rate for each MH(C) coverage after reflecting reasonable provisions for all expected losses, expenses, profit, and contingencies quantified in this filing. If insurance companies did not deviate from the manual

premiums, the *indicated manual base rate* would represent the appropriate, actuarially sound base rate for each coverage.

Q. What is the source of the percentages shown in row 7 of Section C, page 1, labeled as *net deviations*?

A. As included in the prior mobile homeowners MH(C) rate filing, the Rate Bureau has selected a provision for *net deviations* of 5%. In making this selection, we evaluated historical written premium and manual premium for each year from 2018 through 2022, and we considered the magnitude of both downward deviations and upward surcharges through consent to rate. The data supporting this analysis can be found on page 78 of Section C. In an attempt to be conservative and to be consistent with the prior mobile homeowners MH(C) filing, the Rate Bureau retained the same selected provision for net deviations of 5%.

Q. In your opinion, is it appropriate to include a provision for net deviations in mobile homeowners rates in North Carolina?

A. Yes. The difference between the direct premium written by insurance companies and the manual premium should be considered when determining the actuarially sound indicated manual premium. The manual premium must be adjusted upward such that the deviated premium charged by insurance companies will be adequate. In my opinion, the selected provision for net deviations of 5% is a conservative estimate that only partially recognizes the significant deviations we expect to be applied by mobile homeowners insurance companies.

Q. Please explain the amounts shown in row 8 of Section C, page 1, identified as the *required base rate*.

A. The dollar amounts shown in row 8 are the indicated manual base rate for each coverage (row 6) adjusted for the net deviations (row 7). As mentioned above, if insurance companies were not anticipated to deviate from the manual premiums, the indicated manual base rate for each coverage (row 6) would be adequate and appropriate. However, because historical experience shows that mobile homeowners insurance companies consistently deviate by significant amounts each year, the indicated manual base rate for each coverage is divided by 100% minus the provision for net deviations to determine the *required base rate*. The *required base rate* for each coverage represents the appropriate base rate such that, if insurance companies apply net deviations of 5%, the charged premiums will be sufficient to cover all expected costs associated with the transfer of risk related to mobile homeowners insurance.

Q. Would you explain the amounts shown in row 9 of Section C, page 1, labeled as the *average current base rate*?

A. Row 9 displays the current base rate for each coverage, averaged across all policies from 2022 included in our analysis. The average statewide base rate for each coverage assumes each policyholder purchases the base coverage and has the same characteristics as the base risk.

Q. Please explain row 10 of Section C, page 1, identified as the *indicated rate change*.

A. The percentages shown in row 10 represent the needed changes to the current base rate for each coverage so that the mobile homeowners rates will be adequate for the cost levels expected to prevail in the one-year period following the effective date of this filing. The *indicated rate change* is calculated as the required base rate (row 8) divided by the current average base rate (row 9) minus 1. The resulting indicated rate change for each coverage is as follows:

- Mobile Home Structures = 57.1%
- Adjacent Structures = 65.8%
- Personal Effects = 2.5%
- Liability = 31.0%

The overall indicated rate change across all MH(C) coverages, as summarized on page 1 of Section A, is 49.9%.

Q. Would you explain the percentages shown in row 11 of Section C, page 1, labeled as the *proposed rate change - year 1*?

A. Due to the wide range of indicated rate changes across the territory groups and MH(C) coverages, the Rate Bureau's Governing Committee decided to implement the indicated rates over a three-year period. The resulting proposed rate change in year 1 for each coverage is as follows:

- Mobile Home Structures = 17.9%
- Adjacent Structures = 19.0%
- Personal Effects = 0.5%
- Liability = 9.9%

The overall proposed rate change across all MH(C) coverages for year 1, as summarized on page 1 of Section A, is 15.5%.

Q. Please explain row 12 of Section C, page 1, identified as the *proposed base rate - year 1*.

A. The dollar amounts shown in row 12 represent the *proposed year 1 base rate* for each coverage, averaged across all policies from 2022 included in our analysis. Similar to the average current base rate, the average statewide proposed year 1 base rate for each coverage assumes each policyholder purchases the base

coverage and has the same characteristics as the base risk. The proposed year 1 base rate for each coverage was calculated as the average current base rate (row 9) multiplied by 1 plus the proposed year 1 rate change (row 11).

Q. Would you explain the percentages shown in row 13 of Section C, page 1, labeled as the *proposed rate change - year 2*?

A. As mentioned above, the Rate Bureau's Governing Committee decided to implement the indicated rates over a three-year period. The resulting proposed rate change in year 2 for each coverage is as follows:

- Mobile Home Structures = 16.0%
- Adjacent Structures = 18.1%
- Personal Effects = 0.7%
- Liability = 9.2%

The overall proposed rate change across all MH(C) coverages for year 2, as summarized on page 1 of Section A, is 14.2%.

Q. Please explain row 14 of Section C, page 1, identified as the *proposed base rate - year 2*.

A. Similar to the amounts shown in row 12, the dollar amounts shown in row 14 represent the *proposed year 2 base rate* for each coverage, averaged across all policies from 2022 included in our analysis. The average statewide proposed year 2 base rate for each coverage assumes each policyholder purchases the base coverage and has the same characteristics as the base risk. The proposed year 2 base rate for each coverage was calculated as the proposed year 1 base rate (row 12) multiplied by 1 plus the proposed year 2 rate change (row 13).

Q. Would you explain the percentages shown in row 15 of Section C, page 1, labeled as the *proposed rate change - year 3*?

A. As mentioned above, the Rate Bureau's Governing Committee decided to implement the indicated rates over a three-year period. The resulting proposed rate change in year 3 for each coverage is as follows:

- Mobile Home Structures = 14.9%
- Adjacent Structures = 18.0%
- Personal Effects = 1.3%
- Liability = 9.2%

The overall proposed rate change across all MH(C) coverages for year 3, as summarized on page 1 of Section A, is 13.6%.

Q. Please explain row 16 of Section C, page 1, identified as the *proposed base rate - year 3*.

A. Similar to the amounts shown in rows 12 and 14, the dollar amounts shown in row 16 represent the *proposed year 3 base rate* for each coverage, averaged across all policies from 2022 included in our analysis. The average statewide proposed year 3 base rate for each coverage assumes each policyholder purchases the base coverage and has the same characteristics as the base risk. The proposed year 3 base rate for each coverage was calculated as the proposed year 2 base rate (row 14) multiplied by 1 plus the proposed year 3 rate change (row 15).

Q. What is the difference between the indicated rate change and the proposed rate changes in years 1 through 3?

A. The indicated rate change is the actuarially sound and correct rate at a statewide level or by territory group for each mobile homeowners MH(C) coverage. It is the indicated rate change (statewide or by territory group) that is needed to sufficiently cover the expected losses and expenses while still providing a fair and reasonable profit. The indicated rate is also the rate that complies with the statutory requirement that rates not be excessive, inadequate, or unfairly discriminatory.

In order to mitigate the impact of these indicated rate changes on policyholders, the Rate Bureau decided to implement the indicated rates over a three-year period in order to reduce the annual impact of the proposed rate change for each MH(C) coverage. Based on the selections of the Rate Bureau's Governing Committee, the proposed statewide rate change for each coverage differs slightly between years 1, 2, and 3. The proposed rate changes were selected so that the annual rate change within a territory group for any coverage was 28.0% or less, and so that the overall annual rate change for any coverage was 19.0% or less.

In my opinion, the Rate Bureau's proposed three-year implementation of the indicated rate change for each MH(C) coverage is reasonable and is an effective strategy to reduce the impact of this filing.

Q. In an earlier question discussing the *total base class loss cost* found in row 1 of Section C, page 1, your response made reference to Section C, pages 2, 4, 6, and 8. Looking at Section C, page 2, what is shown on this exhibit?

A. Section C, page 2 shows the determination of the statewide base class loss cost for Mobile Home Structures coverage. More specifically, this exhibit aggregates non-hurricane losses and loss adjustment expenses for the years 2018 through 2022 and combines these amounts with a modeled hurricane loss cost to develop the total base class loss cost. The specific calculations used to aggregate the non-hurricane and hurricane loss experience will be discussed later. Pages 4, 6, and 8 show similar calculations for the other MH(C) coverages: Adjacent Structures,

Personal Effects, and Liability (though there are no modeled hurricane losses corresponding to Liability coverage).

Q. Referring to column 1 on page 2 of Section C, what is the source for the *non-hurricane ultimate loss and LAE* (loss adjustment expense)?

A. The *non-hurricane ultimate loss and LAE* shown in column 1 is developed on page 3 of Section C for each year from 2018 through 2022. As implied by the column label, the amounts in column 1 have been developed to ultimate and adjusted to include a provision for expected loss adjustment expenses. Those calculations, as well as adjustments to include expected rather than actual excess wind losses and expected rather than actual flood losses, can be found in more detail on page 3 of Section C.

Q. If we turn our attention to Section C, page 3, what is shown on this exhibit?

A. As mentioned in the prior response, Section C, page 3 shows the determination of the *non-hurricane ultimate loss and LAE* for Mobile Home Structures coverage. Column 1 on this exhibit contains incurred loss and ALAE for the years 2018 through 2022 from all causes of loss except those losses caused by hurricanes. As noted previously, the mobile homeowners MH(C) policy includes coverage for flood losses, so any flood losses other than storm surge resulting from a hurricane would be included in the historical loss experience (though such losses may be limited by the excess flood procedure).

Q. Please explain columns 2 and 4 of Section C, page 3, which both contain data related to excess wind.

A. The incurred loss and ALAE amounts in column 1 reflect all non-hurricane losses, including actual wind losses that may have resulted from very severe storms such as tornados, thunderstorms, or hailstorms. In order to smooth out any potential volatility of severe non-hurricane wind losses, we used the same excess wind methodology as used in prior Rate Bureau property filings. The calculations supporting this excess wind methodology can be found on pages 43 and 44 of Section C. Based on the results of the excess wind methodology, a portion of the wind loss and ALAE included in column 1 is determined to be excess wind loss and ALAE and is removed from the historical loss experience for the purpose of calculating a reasonable provision for expected non-hurricane losses. Column 2 shows the amount of excess wind loss and ALAE incurred under the Mobile Home Structures coverage that is being removed from the incurred loss and ALAE in column 1. In place of the actual excess wind loss and ALAE in column 2, an excess wind loss factor is applied to each year of experience, as shown in column 4. By applying an excess wind loss factor, the Rate Bureau is able to smooth out potentially volatile historical loss experience and reflect a consistent provision for long-term excess wind loss and ALAE.

Q. Please describe the excess wind methodology found on pages 43 and 44 of Section C in more detail.

A. The excess wind methodology used in this filing and in prior Rate Bureau property filings relies on a longer history of loss experience than the five years used to support most of the other components of this filing. Although the mobile homeowners excess wind loss experience is not as extensive as in homeowners, the Rate Bureau was able to aggregate 19 years of mobile homeowners non-hurricane losses for this filing in order to evaluate excess wind losses. Page 43 of Section C shows non-hurricane losses by year from 2004 through 2022. Among the non-hurricane (and non-liability) losses, the wind losses and flood losses are shown separately from the total non-hurricane losses excluding wind and flood. The ratio of wind losses to total non-hurricane losses excluding wind and flood is calculated for each year and, based on calculations consistent with prior Rate Bureau property filings, the amount of non-hurricane excess wind losses is determined for each year. In addition to determining the excess wind losses by year, the yearly ratios of wind losses to total non-hurricane losses excluding wind and flood are used to calculate an excess wind loss factor of 1.069. This excess wind loss factor represents the provision needed to incorporate the long-term average excess wind losses in the adjusted non-hurricane loss experience.

The excess wind losses determined with this methodology reflect all MH(C) coverages combined. As a result, the total MH(C) excess wind losses are allocated by coverage for each year based on the distribution of incurred non-hurricane wind losses among the coverages within each year. In addition to allocating the excess wind losses, a non-hurricane ALAE factor is calculated for each year based on the ratio of total non-hurricane (and non-liability) loss and ALAE to total non-hurricane (and non-liability) losses. The resulting non-hurricane ALAE factors are applied to the by-coverage excess wind losses within each year to determine the excess wind loss and ALAE by coverage. That allocation process and application of a non-hurricane ALAE factor can be seen on page 44 of Section C.

Q. Please explain columns 3 and 5 of Section C, page 3, which both contain data related to excess flood.

A. Similar to the above discussion related to excess wind losses, the incurred loss and ALAE amounts in column 1 reflect all non-hurricane losses, including actual flood losses that may have resulted from severe thunderstorms, heavy rainfalls, or extensive snow runoff. In order to smooth out any potential volatility of severe non-hurricane flood losses, we used the same excess flood methodology as described above for excess wind losses. The calculations supporting this excess flood methodology can be found on pages 45 and 46 of Section C. Based on the results of the excess flood methodology, a portion of the flood loss and ALAE included in column 1 is determined to be excess flood loss and ALAE and are removed from the historical loss experience for the purpose of calculating a reasonable provision for expected non-hurricane losses. Column 3 shows the amount of excess flood

loss and ALAE incurred under the Mobile Home Structures coverage that is being removed from the incurred loss and ALAE in column 1. In place of the actual excess flood loss and ALAE in column 3, an excess flood loss factor is applied to each year of experience, as shown in column 5. By applying an excess flood loss factor, the Rate Bureau is able to smooth out potentially volatile historical loss experience and reflect a consistent provision for long-term excess flood loss and ALAE.

Q. Please describe the excess flood methodology found on pages 45 and 46 of Section C in more detail.

- A. The excess flood methodology used in this filing and in prior Rate Bureau mobile homeowners filings relies on a longer history of loss experience than the five years used to support most of the other components of this filing. Like the excess wind methodology described above, the Rate Bureau was able to aggregate 19 years of mobile homeowners non-hurricane losses for this filing in order to evaluate excess flood losses. Page 45 of Section C shows non-hurricane losses by year from 2004 through 2022. Among the non-hurricane (and non-liability) losses, the wind losses and flood losses are shown separately from the total non-hurricane losses excluding wind and flood. The ratio of flood losses to total non-hurricane losses excluding wind and flood is calculated for each year and, based on calculations consistent with the excess wind methodology, the amount of non-hurricane excess flood losses is determined for each year. In addition to determining the excess flood losses by year, the yearly ratios of flood losses to total non-hurricane losses excluding wind and flood are used to calculate an excess flood loss factor of 1.018. This excess flood loss factor represents the provision needed to incorporate the long-term average excess flood losses in the adjusted non-hurricane loss experience.

The excess flood losses determined with this methodology reflect all MH(C) coverages combined. As a result, the total MH(C) excess flood losses are allocated by coverage for each year based on the distribution of incurred non-hurricane flood losses among the coverages within each year. In addition to allocating the excess flood losses, a non-hurricane ALAE factor is calculated for each year based on the ratio of total non-hurricane (and non-liability) loss and ALAE to total non-hurricane (and non-liability) losses. The resulting non-hurricane ALAE factors are applied to the by-coverage excess flood losses within each year to determine the excess flood loss and ALAE by coverage. That allocation process and application of a non-hurricane ALAE factor can be seen on page 46 of Section C.

Q. How are the results of the excess wind methodology and excess flood methodology applied to the Mobile Home Structures loss experience on page 3 of Section C?

- A. Based on the wind and flood allocation processes described above, column 2 on page 3 of Section C shows the amount of excess wind loss and ALAE allocated to

the Mobile Home Structures coverage for each year, and column 3 shows the amount of excess flood loss and ALAE allocated for each year. In addition, the excess wind loss factor is shown in column 4 and the excess flood loss factor is shown in column 5. Column 6 on this exhibit adjusts the non-hurricane incurred loss and ALAE in column 1 by removing the excess wind loss and ALAE (column 2) and excess flood loss and ALAE (column 3), and then multiplying the result by the sum of the excess wind loss factor (column 4) and excess flood factor (column 5) minus 1.00. This calculation produces the *adjusted non-hurricane incurred loss and ALAE* for each year.

Q. Is the adjusted non-hurricane incurred loss and ALAE shown in column 6 adjusted in any other way?

A. Yes. After adjusting for excess wind loss and ALAE and excess flood loss and ALAE, the amounts in column 6 are further adjusted for loss development and to include a provision for expected unallocated loss adjustment expenses (ULAE).

Based on data collected in response to the Rate Bureau's mobile homeowners data call, we evaluated historical loss development data and historical claim development data for each mobile homeowners MH(C) coverage. Details of that analysis can be found on pages 47 through 54 of Section C, and the resulting loss and ALAE development factors are included in column 7 on page 3 of Section C. Column 8 on this same exhibit calculates the *non-hurricane ultimate loss and ALAE* for each year by multiplying the adjusted non-hurricane incurred loss and ALAE (column 6) by the corresponding loss and ALAE development factor (column 7).

In addition to evaluating historical loss and ALAE development data, we also compared the ratio of incurred ULAE to incurred loss and ALAE for each of the five years of experience used in the overall rate indications. This analysis of historical ULAE can be found on page 72 of Section C. As noted above in the discussion of fixed and variable expenses, the historical ULAE data was also restated to reflect the member companies currently writing MH(C) policies. Based on the average ratio of incurred ULAE to incurred loss and ALAE, the Rate Bureau selected a ULAE provision of 9.0%. Through the use of a ULAE factor equal to 1.090, the selected ULAE provision is added to non-catastrophe mobile homeowners loss and ALAE evaluated in the rate indications.

Referring back to page 3 of Section C, column 10 calculates the *non-hurricane ultimate loss and LAE* for each year by multiplying the non-hurricane ultimate loss and ALAE (column 8) by the ULAE factor, which is shown in column 9.

Q. In your opinion, is the provision for unallocated loss adjustment expense included in this filing reasonable?

A. Yes, the unallocated loss adjustment expense provision is reasonable. It is common practice in the industry to use an average of historical experience to determine an unallocated loss adjustment expense provision.

Q. Are the non-hurricane ultimate loss and LAE amounts on page 3 of Section C the same as the amounts shown on page 2 of Section C?

A. Yes. After determining the non-hurricane ultimate loss and LAE on page 3 of Section C, those amounts are copied into column 1 on page 2 so that additional adjustments and calculations can be completed.

Q. What other adjustments must be made to the non-hurricane losses and LAE?

A. The losses need to be adjusted by a loss trend factor to reflect the cost levels expected to prevail during the period that the proposed rates are anticipated to be in effect. The calculations in the rate review and in this filing assumed an effective date of October 1, 2024. To the extent the filing is effective on a date later than the October 1, 2024 assumed effective date, then the rate indications would be different than those presented in this filing.

Q. Please describe how the loss trend factors are developed and applied.

A. Loss trend data was evaluated separately for each MH(C) coverage in an analysis on pages 55 through 61 of Section C. For each property coverage, only member company data was considered, but for liability coverage, both member company data and external cost index data were considered.

The member company data included quarterly ultimate claim frequencies and quarterly ultimate loss severities evaluated on a 12-month moving basis from the 4th quarter of 2017 to the 4th quarter of 2022. The reported claims and incurred loss and ALAE were developed to ultimate using interpolated quarterly development factors found on page 61 of Section C. The external cost index data that was considered for liability coverage included quarterly index values of the medical care component of the Consumer Price Index (CPI).

After compiling the member company-based frequencies and severities and the external cost index (only for liability coverage), several different exponential trends were fit to the data in order to evaluate the historical trends and to project potential future trends.

The Rate Bureau reviewed the exponential trends fit to the member company data as well as the exponential trends fit to the external cost index that was considered for liability coverage. Based on the fitted trends, the Rate Bureau selected frequency and severity trends for two separate time periods. Trends were selected for the historical experience period and separate trends were selected for the projection period. This two-period trend approach is commonly used throughout

the industry because it allows companies to reflect the latest changes in trends as historical experience is projected into the future.

The experience period trends were applied to adjust losses from the midpoint of each historical year to the end date of the most recent experience period (i.e., 12/31/2022). Following this, the projection period trends were applied from the end date of the most recent experience period (i.e., 12/31/2022) to the average claim date for the time period that the proposed rates are anticipated to be in effect (i.e., 10/1/2025). The selected experience period loss trends and projection period loss trends were each applied for the appropriate number of years and the combined effect of these trends was calculated to determine loss trend factors for each year in the historical experience period. The calculation of the loss trend factors for the MH(C) property coverages can be found on page 55 of Section C and the calculation of the MH(C) Liability loss trend factors can be found on page 56 of Section C.

Q. After loss trend factors are applied, what other adjustments are made to the non-hurricane ultimate loss and LAE amounts?

- A. The calculated loss trend factors discussed above can be found in column 2 on page 2 of Section C. In column 5 on the same exhibit, the *trended average loss cost* is calculated for each year based on multiplying the non-hurricane ultimate loss and LAE (column 1) by the loss trend factor (column 2), and then dividing by the earned house years (column 3) and the premium trend factor (column 4). The losses need to be offset (i.e., adjusted downward) by a premium trend factor to reflect the fact that higher cost levels are partially the result of higher amounts of coverage being purchased in each subsequent year. These higher amounts of coverage generally correspond to higher average premiums, and the trend in those higher average premiums should be reflected to mitigate the impact of the loss trend factors.

Q. Please describe how the premium trend factors are developed and applied.

- A. Premium trend data was evaluated separately for each mobile homeowners MH(C) coverage in an analysis on pages 63 through 65 of Section C.

For each of the property coverages, we calculated the average rating factor by year. The average rating factors were calculated as the ratio of the earned premium at current manual level (using each policy's rating characteristics) to the earned premium at current base class level. The earned premium calculations were completed using the extension of exposures method, as described in Section E. For liability coverage, we calculated the average rating factor by year to be equal to the average increased limit factor. The calculation of the liability average rating factors can be found on page 65 of Section C. After compiling the average rating factors by year, several different exponential trends were fit to the data in order to evaluate the historical trends and to project potential future trends.

The Rate Bureau reviewed the exponential trends fit to the average rating factors and selected trends for two separate time periods. Similar to the loss trend analysis, premium trends were selected for the historical experience period and separate trends were selected for the projection period. As mentioned previously, this two-period trend approach is commonly used throughout the industry because it allows companies to reflect the latest changes in trends as historical experience is projected into the future.

The experience period trends were applied to adjust premiums from the average written date of each historical year to the end date of the most recent experience period (i.e., 12/31/2022). Following this, the projection period trends were applied from the end date of the most recent experience period (i.e., 12/31/2022) to the average written date for the time period that the proposed rates are anticipated to be in effect (i.e., 4/1/2025). The selected experience period premium trends and projection period premium trends were each applied for the appropriate number of years and the combined effect of these trends was calculated to determine premium trend factors for each year.

Q. After premium trend factors are applied, are the trended average loss costs shown in column 5 on page 2 of Section C adjusted in any other way?

A. Yes. The trended average loss costs in column 5 are divided by the average rating factor for each year (column 6) to determine the *trended base class loss cost* as shown in column 7. The average rating factor for each year is calculated as the ratio of the average premium at current manual level to the average current base rate. This ratio represents the relative difference in premium between the average mobile homeowners policy and the base class. To the extent the average policyholder purchases different amounts of coverage, purchases different deductibles, or resides in a different territory group than the base class, the average rating factor will reflect these differences. The average rating factors by year in column 6 are the same factors as were used to develop the premium trends on page 64 of Section C.

Q. Please explain how the trended base class loss costs in column 7 on page 2 of Section C are used after they are calculated for each year in the experience period.

A. The trended base class loss costs shown in column 7 are aggregated using the accident year weights in column 8 to determine the *weighted average non-hurricane base class loss cost* (row 9).

The credibility of the weighted average non-hurricane base class loss cost is evaluated for each MH(C) coverage based on coverage-specific full-credibility standards. To the extent the weighted average non-hurricane base class loss cost is not fully credible, the complement of credibility is determined based on loss cost estimates from the prior MH(C) rate filing and updated trends from this filing. More

specifically, the credibility-weighted loss cost from the prior filing is trended to the proposed effective date of this filing using the selected loss trend and premium trend for the projection period in order to calculate the complement of credibility. The calculation of the complement of credibility for each MH(C) coverage can be found on page 67 of Section C. Using the weighted average non-hurricane base class loss cost (row 9), the credibility of that loss cost (row 10), and the complement of credibility (row 11), the *credibility-weighted loss cost* is calculated as shown in row 12.

Q. How is credibility determined in this filing?

A. The credibility calculated in row 10 on page 2 of Section C is based on a consistent claims standard for full credibility (i.e., 271 claims) for each of the MH(C) coverages. However, that claims standard for full credibility is adjusted based on the frequency of claims for each coverage and the variability of the size of those claims. More details on this credibility procedure can be found in the Explanatory Memorandum included in Exhibit RB-1. The result of this adjustment for claims frequency and variability is a full-credibility standard using earned house years that is unique to each coverage. The resulting full-credibility standards for each of the MH(C) coverages, rounded up to the nearest 10,000 earned house years, are as follows:

- Mobile Home Structures = 20,000
- Adjacent Structures = 70,000
- Personal Effects = 110,000
- Liability = 1,960,000

To determine the credibility shown in row 10, the number of earned house years during the five-year experience period is compared to the coverage's full-credibility standard and, if a coverage's historical experience is not fully credible, the square root rule is applied. Among the MH(C) coverages, only the Liability weighted average base class loss cost is not fully credible, with a credibility of 45.6%.

The above full-credibility standards for the MH(C) coverages are also applied in determining the indicated base class loss cost by territory group, which is discussed later in this testimony.

Q. Please explain the amount shown in row 13 on page 2 of Section C, labeled as the *modeled hurricane base class loss cost*.

A. The amount shown in row 13 is the provision for prospective hurricane losses related to the coverage afforded by the MH(C) Mobile Home Structures coverage. The credibility-weighted loss cost shown in row 12 includes only non-hurricane losses, so an additional provision is necessary to account for the exposure to hurricane losses on a mobile homeowners policy.

Q. What is the source of the *modeled hurricane base class loss cost* shown in row 13 of Section C, page 2?

A. The source of the modeled hurricane losses for each MH(C) coverage is an analysis completed for the Rate Bureau by Aon. In addition to Aon's analyses to support the compensation for assessment risk and the net cost of reinsurance (described previously), Aon was also retained by the Rate Bureau to provide the statewide modeled hurricane losses for each of the MH(C) coverages as well as modeled hurricane losses for each territory. It should be noted that the modeled hurricane losses for Mobile Home Structures coverage include modeled hurricane losses attributable to Additional Living Expense (ALE) coverage since ALE coverage is automatically included when a policyholder purchases Mobile Home Structures coverage. This analysis from Aon is consistent with other recent property rate filings submitted by the Rate Bureau, except that the models were run with storm surge losses to reflect the fact that the mobile homeowners MH(C) policy covers flood losses. It is for this reason, as noted earlier, that when the filing and my testimony refer to "hurricane losses," that term includes hurricane wind and storm surge losses, but not inland flood losses. In order to avoid double counting hurricane losses, historical hurricane wind and hurricane storm surge losses were removed from the data underlying our analysis. More details of Aon's analysis, including support for the catastrophe LAE provision of 6.0%, are included in Ms. Mao's testimony and exhibits.

To determine the *modeled hurricane base class loss cost* found in row 13 of Section C, page 2, the trended modeled hurricane loss and LAE for each MH(C) property coverage is divided by the corresponding number of 2022 earned house years, the 2022 average rating factor, and the 2022 premium trend factor. These calculations can be found on page 68 of Section C for each of the MH(C) property coverages.

Similar to the compensation for assessment risk and the net cost of reinsurance, a modeled hurricane base class loss cost is not included in the calculation of the MH(C) Liability indicated rate change.

Q. Can you please explain why hurricane models are used to estimate the hurricane losses?

A. Yes. Hurricane models are used to estimate the expected hurricane losses because they provide a more accurate way of quantifying the exposure to hurricanes than using prior insurance ratemaking methodologies. In addition, hurricane models include a storm surge component, which allows us to more accurately quantify the expected losses from storm surge caused by hurricanes as well as the expected hurricane wind losses. Hurricanes are highly variable in their frequency, severity, and place of occurrence. By simulating thousands of possible hurricane events, hurricane models provide a more complete perspective on the distribution of the types of hurricanes that could occur and avoid the volatility that

could result from using actual hurricane losses. If only five years of historical experience were used to evaluate hurricane losses, similar to what we are using for the non-hurricane component of this rate indication, it would be feasible to have a five-year period with no hurricane losses or a five-year period with multiple severe hurricane events. Neither of those scenarios provides a reasonable representation of the expected exposure to hurricane losses in the prospective policy period and, as such, it would not be actuarially appropriate to rely on such a methodology. The use of hurricane models alleviates this issue and provides a more accurate estimate of expected hurricane losses.

Q. Did the Rate Bureau consider actual hurricane losses?

- A. Yes. The actual hurricane losses during the five years of historical experience were reviewed and considered; however, as has been done in prior Rate Bureau property filings, those losses were excluded from the historical losses used in the filing and were replaced by modeled hurricane losses.

Q. What data did Milliman provide to Aon to enable Aon to perform its analysis?

- A. Milliman provided Aon with a dataset containing all of the North Carolina mobile homeowners MH(C) insurance exposures. This data included the number of earned house years and the amount of trended earned insurance years for the most recent year in the experience period (i.e., 2022). The dataset also included several important risk characteristics such as the territory (and county and city, if available), occupancy code, MH(C) coverage, and whether the mobile home is tied down. The data provided to Aon by Milliman was correct to the best of my knowledge and information.

Q. Please describe how the exposure trend factors are developed and applied.

- A. Exposure trend data was evaluated separately for each of the property coverages in an analysis on page 62 of Section C.

For each of the property coverages, we calculated the average amount of insurance per policy on a 12-month moving basis from the 4th quarter of 2017 to the 4th quarter of 2022. After compiling the average amount of insurance by quarter, several different exponential trends were fit to the data in order to project potential future trends. Because the exposure trends were only needed to trend the MH(C) exposures into the future in order to be used as inputs in the hurricane models, the Rate Bureau did not select trends for the historical experience period.

The Rate Bureau reviewed the exponential trends fit to the average amounts of insurance and selected trends for the projection period. The projection period trends were then applied from the average written date of the most recent calendar year (i.e., 7/1/2022) to the average written date for the time period that the proposed rates are anticipated to be in effect (i.e., 4/1/2025) to determine exposure

trend factors for each coverage. The exposure trend factors were applied to the amount of earned insurance years on each policy in effect during the most recent year in the experience period (i.e., 2022).

Q. What model versions and modeling assumptions were used to develop estimated hurricane losses?

- A. The current AIR model is Touchstone v10 and the current RMS model is RiskLink v23. 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 event sets when developing expected hurricane losses for 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 costs of labor, materials, and services after a very large hurricane occurs. 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 filings, and is the common practice by insurance companies when developing rates based on modeled hurricane losses.

As discussed previously, the modeled hurricane losses also include losses from storm surge due to the fact that the mobile homeowners MH(C) policy includes coverage for flood losses.

Q. Were any other calculations applied to the hurricane losses derived from the models?

- A. Yes. Before providing the blended hurricane losses, Aon applied a hurricane-specific provision for loss adjustment expense. As noted previously, more details of Aon's analysis, including support for the catastrophe LAE provision of 6.0%, are included in Ms. Mao's testimony and exhibits.

Q. In your opinion, is it appropriate to allocate modeled hurricane losses within North Carolina in a way that is proportional to risk?

- A. Yes. The risk associated with insuring properties exposed to hurricane events varies geographically within North Carolina. As such, the cost for bearing that risk should be allocated proportional to the measurement of risk. In their analysis of modeled hurricane losses for this filing, Aon provided the statewide modeled

hurricane losses and also allocated the modeled hurricane losses to each MH(C) coverage 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. Please explain the amount shown in row 14 on page 2 of Section C, labeled as the *total base class loss cost*.

A. The amount shown in row 14, that is the *total base class loss cost*, is the average amount of projected loss per exposure, including both non-hurricane and hurricane losses, for the risk identified as the base class for each respective MH(C) coverage. It is calculated as the sum of the credibility-weighted loss cost shown in row 12 and the modeled hurricane base class loss cost shown in row 13. Because a modeled hurricane base class loss cost is not included in the MH(C) Liability calculations, the total base class loss cost is equal to the credibility-weighted loss cost for this coverage.

As noted at the beginning of my testimony, it is the total base class loss cost that begins the calculation of the indicated rate change on page 1 of Section C. The total base class loss cost is copied into row 1 on page 1 so that additional adjustments and calculations can be completed to develop the statewide indicated rate change for each MH(C) coverage.

Q. Up until now, your testimony has focused on the calculations on pages 1 through 3 of Section C. Please explain how pages 4 through 9 compare to pages 1 through 3.

A. As described in my testimony above, page 1 of Section C develops the statewide indicated rate changes for the major coverages offered in the mobile homeowners MH(C) program. As noted previously, those coverages include Mobile Home Structures, Adjacent Structures, Personal Effects, and Liability. The calculations to develop the indicated rate change for each coverage begin with the *total base class loss cost*, which is derived on pages 2, 4, 6, and 8 of Section C, depending on the coverage. My testimony above discussed the calculations on page 2, which are further supported by additional calculations on page 3. The calculations on pages 2 and 3 of Section C all relate to Mobile Home Structures.

Pages 4 through 9 of Section C display comparable calculations for the three remaining MH(C) coverages: Adjacent Structures is documented on pages 4 and 5, Personal Effects is documented on pages 6 and 7, and Liability is documented on pages 8 and 9. The calculations and methodology on pages 4 and 6 are identical to the calculations and methodology on page 2 (except for the differences noted above in the exposure-based standards for full credibility). Similarly, the calculations and methodology on pages 5 and 7 are identical to the calculations and methodology on page 3.

The Liability calculations on page 8 are similar to page 2 with one exception – a *modeled hurricane base class loss cost* is not included in the calculation of the Liability *total base class loss cost* since modeled hurricane losses only relate to property coverages. As a result, the calculations on page 8 conclude with the *credibility-weighted loss cost*, which is conceptually equivalent to the *total base class loss cost* that can be found as the final calculation on pages 2, 4, and 6 for the MH(C) property coverages.

Similar to page 8, the Liability calculations on page 9 are comparable to page 3 except that adjustments for excess wind and excess flood loss and ALAE are not necessary. As a result, page 9 documents the application of loss and ALAE development factors and ULAE factors for each year in the experience period in order to derive the ultimate loss and LAE.

Q. Does the filing review the indicated rate changes by territory or territory group?

- A. Yes. The mobile homeowners MH(C) territory definitions are consistent with the territory definitions currently in use in homeowners and dwelling insurance in North Carolina. To increase the credibility and stability of the rates being evaluated, six territory groups are used in the mobile homeowners program. It should be noted that the rates for MH(C) Liability do not vary by territory group, but instead, a statewide base rate is used for all policies purchasing Liability coverage.

Beginning on page 10 of Section C, the Rate Bureau develops indicated rate changes by territory group for each MH(C) property coverage using a similar methodology as the statewide indication. Pages 10 through 20 document the Mobile Home Structures indicated rate changes by territory group, and the indicated rate changes by territory group for Adjacent Structures and Personal Effects are documented on pages 21 through 31 and pages 32 through 42, respectively.

For each of these MH(C) property coverages, a non-hurricane base class loss cost is calculated by territory group using the historical loss experience. A credibility value is assigned to each territory group for each coverage based on the number of house years underlying each loss cost and the same credibility standards discussed above. Using the credibility for each territory group, a credibility-weighted non-hurricane base class loss cost is determined by territory group. In addition, a modeled hurricane base class loss cost is developed by territory group for each coverage. The non-hurricane loss costs and modeled hurricane loss costs are combined to develop the indicated base class loss cost by territory group for each coverage. Additional calculations are applied to each territory group to reflect expenses, policyholder dividends, compensation for assessment risk, net cost of reinsurance, and net deviations in a similar manner as applied at a statewide level. The result of these calculations is an indicated rate change by territory group for each MH(C) property coverage.

Columns 14 through 16 on pages 10 (Mobile Home Structures), 21 (Adjacent Structures), and 32 (Personal Effects) of Section C show the proposed rate changes by territory group, as selected by the Rate Bureau in proposing to implement those changes over three years.

In my opinion, the methodology used to develop the indicated rate-level change by territory group and by MH(C) property coverage is reasonable and is consistent with widely-used actuarial ratemaking practices.

Q. Does the filing review the wind exclusion credits?

- A. Yes. Based on the rates being proposed with this filing in territory groups 1 and 2 for each MH(C) property coverage, the wind exclusion credits are being updated in a corresponding manner, as can be seen on page 1 of Section D. Using the underlying formula for the statewide rate indication, an adjustment is made to the appropriate components of the indication formula to calculate the non-wind losses as a percentage 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 group.

Q. Does the filing include proposed changes to any rating variables used in the mobile homeowners MH(C) rating plan?

- A. Yes. With this filing, the Rate Bureau is proposing revisions to the wind exclusion credits as discussed above and revisions to the additive deductible debits and credits that correspond to the proposed base rate changes.

Q. I understand that you are not providing an opinion concerning the underwriting profit (profit) provision, the compensation for assessment risk (CAR) provision, or the net cost of reinsurance (NCOR) provision. If I ask you to assume that the provisions for profit, CAR, and NCOR are reasonable and actuarially sound, then, in your opinion, is the overall rate-level indication shown in the mobile homeowners MH(C) filing by the North Carolina Rate Bureau reasonable and actuarially sound?

- A. Yes, if I assume that the provisions for profit, CAR, and NCOR are reasonable, then, in my opinion, the overall mobile homeowners MH(C) rate-level indication shown by the Rate Bureau, and the rate-level indications for each coverage and each territory group, are reasonable and actuarially sound.

Q. Assuming that the provisions for profit, CAR, and NCOR are reasonable, do you have an opinion on whether the proposed rates reasonably provide for the expected costs for mobile homeowners MH(C) insurance in North Carolina?

A. Yes, if I assume that the provisions for profit, CAR, and NCOR are reasonable, then, in my opinion, the proposed rates in this filing reasonably reflect the expected costs for mobile homeowners MH(C) insurance in North Carolina, except to the extent that the proposed rates are implemented over three years instead of one year. However, to the extent the loss trends and premium trends are not projected to the time period reflected by the year 2 and year 3 rate changes, the proposed rates may not reflect all expected costs for years 2 and 3. The expected costs for years 2 and 3 can be quantified by projecting the loss trends and premium trends to dates further in the future that correspond to years 2 and 3, and by comparing the resulting indicated rate changes to the rate changes included in this filing.

Q. Assuming that the provisions for profit, CAR, and NCOR are reasonable, what is your opinion on whether the proposed mobile homeowners MH(C) rates are not excessive, not inadequate, and not unfairly discriminatory?

A. If I assume that the provisions for profit, CAR, and NCOR are reasonable, then, in my opinion, the proposed mobile homeowners MH(C) rates in this filing are not excessive or unfairly discriminatory. However, to the extent the loss trends and premium trends are not projected to the time period reflected by the year 2 and year 3 rate changes, and to the extent the selected projection period trends remain appropriate for years 2 and 3, the proposed rates will be slightly inadequate at the time the year 2 and year 3 changes are implemented.

Q. Does this conclude your testimony?

A. Yes, it does.

PAUL D. ANDERSON, FCAS, CSPA, MAAA
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Brookfield, WI 53045
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SUMMARY

Property & Casualty (P&C) actuary with more than 30 years of experience in actuarial applications and related fields including ratemaking, product development, predictive modeling, state pricing, field proposals, rate filings, actuarial and statistical research, classification analysis, data analytics, and economic modeling. Experienced in Private Passenger Automobile (including preferred, standard, and non-standard), Personal Property (including homeowners, renters, condominium owners, mobile home, and dwelling), other miscellaneous Personal Lines (including boats, motorcycles, recreational vehicles, and personal umbrella), and various Commercial Lines of Business. Has sound knowledge of product development, product pricing, product implementation, and project management for Personal Lines products. Has working knowledge of other key insurance functions including claims, corporate finance, marketing, reinsurance, sales, and underwriting. Has demonstrated the ability to lead and manage teams of employees to achieve desired business results in various capacities. Has unique combination of analytic ability, business intuition, project management, leadership, and communication skills.

EMPLOYMENT HISTORY

Milliman, Inc. Brookfield, Wisconsin	2007 - Present
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Principal and Consulting Actuary

Specialize in personal lines insurance company clients and predictive analytics of both personal and commercial lines of insurance. Experience has included ratemaking and pricing analyses for insurance companies, product development and implementation, classification analysis using multivariate statistical techniques, catastrophe reinsurance analysis, loss reserving, segmentation analysis to support sales and marketing initiatives, impact analysis of proposed state and federal legislation, and merger and acquisition analysis. Has also provided expert testimony to support Auto and Property regulatory issues.

Allstate Insurance Company Northbrook, Illinois	1993 - 2007
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Senior Manager – Auto & Property Pricing (2006-2007)

Oversaw and directed all personal lines Auto and Property pricing, rate filings, and other actuarial work related to the pricing function for 10 states accounting for over \$4 billion of premium. Assisted in the oversight of all personal lines actuarial work related to the pricing function for an additional 12 states. Served as the primary department expert on all Property pricing initiatives. Directly managed a staff of 10 to 12 employees and participated in the leadership team that oversaw the management of a department with more than 130 employees.

Team Leader – Property & Specialty Lines Research (2005-2006)

Managed all research projects for personal lines Property and for Specialty Lines, all of which were completed using multivariate statistical analyses. Measured the impact of rating algorithm changes as they were implemented in various states. Oversaw the enhancement and improvement of analysis techniques used within the team. Led a team of 8 to 10 staff.

Research Manager (1999-2001, 2003-2005)

At different times, managed research teams for personal lines Auto, Economics & Modeling, and personal lines Property. Oversaw the development of countrywide pricing models based on multivariate statistical techniques, the evaluation of risk characteristics to be used as new rating elements, and the development of implementation tools to be used by pricing teams. Oversaw the development of Auto and Property economic models that measured the lifetime profitability of personal lines insurance customers. Led teams of staff ranging in size from 3 to 6 analysts.

Pricing Manager (1997-1999, 2001-2003)

Managed all personal lines Auto and Property pricing, rate filings, and other actuarial work related to the pricing function for California. Managed all personal lines Property pricing, rate filings, and other actuarial work related to the pricing function for 14 states including Alabama, Florida, Louisiana, and Mississippi. Led teams of staff ranging in size from 3 to 6 analysts.

Pricing Analyst, Research Analyst (1993-1997)

Produced rate proposals, rate filings, and quarterly rate-level indications for various states. Retrieved, manipulated, and analyzed large volumes of data to evaluate countrywide rating plans using multivariate statistical analyses.

EXPERT WITNESS EXPERIENCE

Pre-filed Expert Testimony – Various Private Passenger Automobile and Residential Property Insurance

Rate Filings submitted by the North Carolina Rate Bureau

- 2024 Homeowners Insurance Filing
- 2023 Dwelling Insurance Filing
- 2023 Private Passenger Automobile Insurance Filing
- 2022 Mobile Homeowners MH(C) Insurance Filing
- 2022 Mobile Homeowners MH(F) Insurance Filing
- 2022 Dwelling Insurance Filing
- 2021 Mobile Homeowners MH(C) Insurance Filing
- 2021 Mobile Homeowners MH(F) Insurance Filing
- 2020 Dwelling Insurance Filing
- 2020 Homeowners Insurance Filing
- 2019 Dwelling Insurance Filing
- 2019 Mobile Homeowners MH(C) Insurance Filing
- 2019 Mobile Homeowners MH(F) Insurance Filing
- 2019 Private Passenger Automobile Insurance Filing
- 2018 Homeowners Insurance Filing
- 2018 Dwelling Insurance Filing
- 2017 Homeowners Insurance Filing
- 2016 Dwelling Insurance Filing

EDUCATION

BS in Actuarial Science from Drake University, Des Moines, Iowa

PROFESSIONAL QUALIFICATIONS

Certified Specialist in Predictive Analytics (CSPA), 2018
Fellow of the Casualty Actuarial Society (FCAS), 2002
Member of the American Academy of Actuaries (MAAA), 2002
Associate of the Casualty Actuarial Society (ACAS), 1998
Member of the Midwest Actuarial Forum, 1998

PROFESSIONAL ACTIVITIES

Volunteer Chairperson, CAS Crash Course Seminar Task Force, 2021 - Present
Member, CAS Volunteer Resources Task Force, 2021 - Present
Chairperson, CAS Crash Course in Vehicle Technology & Driverless Cars Committee, 2020 - 2021
Member, CAS Volunteer Resources Advisory Committee, 2020 - 2021
Member, CAS Participation Survey Task Force, 2018 - 2019
Member, Vehicle Technology & Impact on Loss Trends Planning Committee, 2017 - 2018
Member, iCAS Predictive Analytics Syllabus Committee, 2017 - 2018
Member, CAS Volunteer Resources Committee, 2013 - 2020
Member, CAS Volunteer Support Task Force, 2012 - 2013
Member, CAS Examination Committee, 2004 - 2006

PUBLICATIONS

"Keep on trucking: COVID-19 and its impact on commercial auto", Milliman Insight, April 2020.
"PIP PIP hooray! The changing Michigan auto market", Milliman Insight, April 2020.
"Nowhere to drive: The impact of COVID-19 on the auto insurance industry", Milliman Insight, March 2020.
"Better Visibility: Predictive modeling helps to steady medical malpractice underwriting", Best's Review, February 2008.

PRESENTATIONS

Numerous presentations at Casualty Actuarial Society (CAS) and other Property & Casualty insurance industry meetings and seminars from 2007 through the present with a focus on personal lines Auto and Property issues, as well as predictive analytics topics.

**NORTH CAROLINA
MOBILE HOMEOWNERS INSURANCE**

Estimated Impact of Delays in Rate Filing Process

			(1)	(2)	(3)	(4)	(5)	(6)
NCRB Rate Filing	Policy Type / Coverage	Premium Weight	Assumed Effective Date	Actual Effective Date	# of Months of Delay	Selected Loss Trend	Selected Premium Trend	Estimated Impact of Delay in Filing Process
2022 MH(C)	Mobile Home Structures	\$64,510,959	7/1/23	10/1/23	3	12.0%	3.2%	2.1%
	Adjacent Structures	5,337,948	7/1/23	10/1/23	3	6.0%	5.0%	0.2%
	Personal Effects	11,872,318	7/1/23	10/1/23	3	2.8%	4.8%	-0.5%
	Liability	2,467,108	7/1/23	10/1/23	3	8.0%	1.0%	1.7%
	Total	\$84,188,333						1.6%
2022 MH(F)	Owners	\$47,454,596	7/1/23	10/1/23	3	9.0%	3.8%	1.2%
	Tenants	114,906	7/1/23	10/1/23	3	2.8%	1.2%	0.4%
	Total	\$47,569,502						1.2%
2022 Dwelling	Fire	\$71,710,360	2/1/23	6/1/23	4	6.5%	5.0%	0.5%
	EC	246,871,993	2/1/23	6/1/23	4	7.0%	5.0%	0.6%
	Total	\$318,582,353						0.6%
2020 HO	Owners	\$2,161,073,789	8/1/21	6/1/22	10	6.0%	1.1%	4.0%
	Tenants	76,318,464	8/1/21	6/1/22	10	0.5%	-2.0%	2.1%
	Condos	31,251,398	8/1/21	6/1/22	10	5.0%	0.0%	4.1%
	Total	\$2,268,643,651						4.0%
2021 MH(C)	Mobile Home Structures	\$55,402,780	11/1/21	5/1/22	6	-2.0%	2.7%	-2.3%
	Adjacent Structures	4,435,898	11/1/21	5/1/22	6	10.2%	4.4%	2.7%
	Personal Effects	10,600,963	11/1/21	5/1/22	6	-2.0%	4.4%	-3.1%
	Liability	2,198,331	11/1/21	5/1/22	6	8.0%	0.7%	3.5%
	Total	\$72,637,972						-1.9%
2021 MH(F)	Owners	\$41,984,133	11/1/21	5/1/22	6	1.0%	2.7%	-0.8%
	Tenants	95,516	11/1/21	5/1/22	6	-2.0%	1.0%	-1.5%
	Total	\$42,079,649						-0.8%
2020 Dwelling	Fire	\$71,555,474	9/1/21	11/1/21	2	0.0%	1.2%	-0.2%
	EC	229,061,439	9/1/21	11/1/21	2	9.0%	1.5%	1.2%
	Total	\$300,616,913						0.9%
2019 Dwelling	Fire	\$83,923,771	7/1/20	7/1/20	0	2.0%	1.1%	0.0%
	EC	241,506,295	7/1/20	7/1/20	0	3.2%	0.8%	0.0%
	Total	\$325,430,066						0.0%
2019 MH(C)	Mobile Home Structures	\$52,069,226	2/1/20	6/1/20	4	3.5%	1.6%	0.6%
	Adjacent Structures	4,212,665	2/1/20	6/1/20	4	4.0%	2.8%	0.4%
	Personal Effects	10,255,303	2/1/20	6/1/20	4	2.0%	4.1%	-0.7%
	Liability	2,410,058	2/1/20	6/1/20	4	5.0%	n/a	1.6%
	Total	\$68,947,252						0.5%
2019 MH(F)	Owners	\$51,661,941	2/1/20	6/1/20	4	0.7%	-0.5%	0.4%
	Tenants	66,881	2/1/20	6/1/20	4	2.0%	2.1%	0.0%
	Total	\$51,728,822						0.4%
2018 HO	Owners	\$2,017,285,314	10/1/19	5/1/20	7	4.6%	1.0%	2.0%
	Tenants	72,370,871	10/1/19	5/1/20	7	-3.1%	-1.4%	-1.0%
	Condos	29,047,171	10/1/19	5/1/20	7	1.9%	0.2%	1.0%
	Total	\$2,118,703,356						1.9%
2018 Dwelling	Fire	\$102,088,428	6/1/18	2/1/19	8	0.2%	2.3%	-1.3%
	EC	187,663,877	6/1/18	2/1/19	8	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	4	3.1%	1.1%	0.7%
	Tenants	62,551,401	6/1/18	10/1/18	4	-3.1%	-1.0%	-0.7%
	Condos	24,591,783	6/1/18	10/1/18	4	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	11	5.3%	2.3%	2.7%
	Tenants	45,065,871	7/1/14	6/1/15	11	2.9%	-1.0%	3.6%
	Condos	22,629,842	7/1/14	6/1/15	11	5.4%	0.0%	5.0%
	Total	\$2,325,666,302						2.7%

**NORTH CAROLINA
MOBILE HOMEOWNERS INSURANCE**

Estimated Impact of Delays in Rate Filing Process

			(1)	(2)	(3)	(4)	(5)	(6)
NCRB Rate Filing	Policy Type / Coverage	Premium Weight	Assumed Effective Date	Actual Effective Date	# of Months of Delay	Selected Loss Trend	Selected Premium Trend	Estimated Impact of Delay in Filing Process
2014 MH(C)	Property	\$77,349,418	6/1/15	10/1/15	4	3.0%	2.8%	0.1%
	Liability	1,546,804	6/1/15	10/1/15	4	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	4.6%	2.2%	0.8%
	Tenants	100,658	6/1/15	10/1/15	4	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	1	5.4%	3.0%	0.2%
	Tenants	32,405,190	6/1/13	7/1/13	1	4.0%	0.0%	0.3%
	Condos	18,252,996	6/1/13	7/1/13	1	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	22	3.6%	2.9%	1.3%
	EC	150,823,062	6/1/11	4/1/13	22	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	4.4%	3.9%	0.2%
	Tenants	24,074,875	1/1/09	5/1/09	4	0.2%	2.7%	-0.8%
	Condos	13,213,524	1/1/09	5/1/09	4	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	14	7.5%	2.4%	5.9%
	Liability	1,161,840	10/1/07	12/1/08	14	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	14	6.6%	5.8%	0.9%
	Tenants	158,638	10/1/07	12/1/08	14	0.4%	-4.1%	5.5%
	Total	\$43,817,818						0.9%

Average Estimated Impact of Delays in Filing Process: 1.0%

(1), (4), (5) From historical NCRB rate filings

(2) From historical NCRB settlement agreements or circulars

(6) = $\{[1 + (4)] / [1 + (5)]\}^{\{[(2) - (1)]/365\}} - 1$

PRE-FILED DIRECT TESTIMONY OF MINCHONG MAO

2024 MOBILE HOMEOWNERS INSURANCE RATE FILINGS

by the

NORTH CAROLINA RATE BUREAU

Q. Please state your full name and business address for the record.

A. My name is Minchong Mao. 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 the North Carolina Rate Bureau (NCRB) to provide catastrophe modeling and reinsurance analytics with respect to the expected hurricane losses, net cost of reinsurance provisions, and compensation for assessment risk utilized in the NCRB 2024 Mobile Homeowners Insurance MH(C) and MH(F) rate filings. I manage the catastrophe analytics team at Aon that performs these services.

Q. What is Aon?

A. Aon is a leading global professional services firm that provides advice and solutions to clients focused on risk, retirement, and health. Aon is one of the

1 world's largest reinsurance brokers and has extensive experience in catastrophe
2 modeling.

3

4 **Q. What are your primary responsibilities for Aon?**

5

6 A. I am a Senior Managing Director and a Catastrophe Actuary at Aon's
7 Reinsurance Solutions - Catastrophe Risk Analytics group. I manage an analytics
8 group within the Catastrophe Management area that focuses on catastrophe
9 actuarial and predictive analytics as it relates to ratemaking and underwriting.

10 I advise clients on catastrophe actuarial services, such as rate indications, rate
11 filing strategy, underwriting strategy, and use of catastrophe models in risk
12 management. I am responsible for Aon's compliance with ASOP 38 regarding
13 use of catastrophe models. I am a consulting actuary for Aon's in-house model,
14 Impact Forecasting, LLC. I work with a group of catastrophe modelers to provide
15 catastrophe modeling support for reinsurance placements. Our client services
16 include but are not limited to: support for multi-model analytics, customized view
17 of risks, catastrophe pricing, catastrophe risk selections, data augmentation,
18 model evaluation, real-time event response, portfolio optimization, actuarial
19 support, reinsurance cost allocations, and rating agency questionnaire support.

20

21 **Q. Describe your professional and educational background.**

22

23 A. I have been with Aon since September 2018. Prior to joining Aon, I worked at
24 State Farm Insurance Companies for over 17 years from 2001 to 2018 where I

1 led the catastrophe modeling functions since 2005. During my tenure at State
2 Farm, I was responsible for State Farm's use of catastrophe models in pricing,
3 underwriting, claims, reinsurance, securitization, enterprise risk management,
4 and rating agency reporting.

5
6
7 I had 2 years of ratemaking experience as a pricing actuary for Homeowner lines
8 at State Farm. I am familiar with the development and implementation of
9 property insurance rates and rules. I understand the challenges for an insurer to
10 balance rate adequacy and competitiveness and to meet financial objectives at
11 the same time.

12
13 I have a Bachelor's degree in Biochemical Engineering from Beijing University of
14 Chemical Technology, a Master's degree in Chemistry from Eastern Illinois
15 University, and a Master's degree in Computer Science from the University of
16 Missouri - Columbia.

17
18 **Q. Are you a member of any professional actuarial organizations?**

19
20 A. Yes. I am a Fellow of the Casualty Actuarial Society (FCAS) and a Member of
21 the American Academy of Actuaries (MAAA). I am a Certified Catastrophe Risk
22 Management Professional (CCRMP), a new designation created by the CAS
23 Institute (iCAS) and International Society of Catastrophe Managers (ISCM). I am

1 currently serving on the Casualty Actuarial Society's Climate Change Committee
2 and on the advisory board for CCRMP designation. I served on the American
3 Academy of Actuaries' Extreme Event Risk Committee and on the advisory board
4 for CCRMP designation from 2016 to 2023. I am in good standing with the
5 requirements of all of these organizations.

6
7 I was part of a working group that authored the following monographs for the
8 American Academy of Actuaries:

- 9 • The National Flood Insurance Program: Challenges and Solutions (2017)
- 10 • Uses of Catastrophe Model Output (2018)
- 11 • Wildfire: An Issue Paper - Lessons Learned from the 2017–2018
12 California Events (2019)

13 I am one of the recipients of the Casualty Actuarial Society's Above and Beyond
14 Achievement Award in 2019 to recognize my leadership and contributions in
15 establishing the CCRMP designation for the insurance industry.

16
17 **Q. Please describe your relevant experience and qualifications for this**
18 **proceeding.**

19
20 A. My CV is included with the filing as Exhibit RB-9. I started practicing in the
21 catastrophe risk management field in 2005. During my tenure at State Farm, I
22 managed State Farm's catastrophe modeling function from 2005 to 2018. I
23 managed vendor relationships with AIR, EQECAT, ARA, and RMS. I provided

1 filing support and helped my employer through many regulatory challenges
2 related to the use of models in insurance operations. I provided actuarial
3 opinions on State Farm's use of catastrophe models. I established the due
4 diligence and model validation framework to ensure catastrophe modeling
5 practices at State Farm met the actuarial standards and complied with laws and
6 regulatory requirements. My team provided various catastrophe risk measures
7 and analytics for State Farm Fire and affiliates for ratemaking, exposure
8 management, claims, ERM, rating agency reporting, reinsurance and
9 securitization purposes.

10
11 From 2010 to 2013, I was a member of an advisory group to the Insurance
12 Bureau of Canada (IBC) and the Office of the Superintendent of Financial
13 Institutions (OSFI) to provide expert opinions on insurance and the economic
14 impact of major earthquakes in Canada. From 2011 to 2013, I was a member of
15 an advisory group for IBC and OSFI to revise OSFI Guideline B-9 (Earthquake
16 Exposure Management Sound Practice Guideline for insurance companies). I
17 led a State Farm team to establish the compliance framework to meet OSFI B-9
18 regulation requirements.

19
20 In January 2015, I was appointed by Florida CFO Jeff Atwater to serve on the
21 Florida Commission on Hurricane Loss Projection Methodology (FCHLPM) as
22 the industry actuary. From January 2015 to September 2018, I represented the
23 property insurance industry on the FCHLPM to review and accept hurricane

1 models for use in ratemaking in the State of Florida. My term on the FCHLPM
2 ended in September 2018 due to my job change.

3

4 **Q. What does the FCHLPM do?**

5

6 A. FCHLPM scrutinizes hurricane models and authorizes their use in Florida rate
7 filings and has done so over many years. FCHLPM retains experts in relevant
8 fields who review the meteorological, wind engineering, damageability, claims,
9 statistical, computer programming, economic and other aspects of modeling in
10 great detail. Over the years, FCHLPM has recognized advancements in various
11 scientific disciplines related to hurricane modeling and has required modelers to
12 incorporate such advancements. FCHLPM approves only those models that
13 meet its rigorous standards.

14

15 **Q. Are the hurricane models used in these filings certified by the FCHLPM?**

16

17 A. Yes. The hurricane models used for these rate filings, Verisk (also known as
18 and hereinafter referred to as "AIR") Touchstone V10 (a.k.a Touchstone 2022)
19 and RMS RiskLink V23, are both certified by FCHLPM.

20

21 **Q. Please describe how ASOP 38 is applicable in these rate filings?**

22

23 A. The Actuarial Standard of Practice Number 38 (ASOP 38, included as Exhibit
24 RB-11) has been in effect since December 2000. ASOP 38 was created, to

1 some extent, to address the use of stochastic computer hurricane simulation
2 models in the insurance ratemaking process. ASOP 38 established certain
3 requirements for actuaries who use output from a model that is outside of that
4 actuary's area of expertise. Hurricane models are developed by a group of
5 experts including meteorologists, structural engineers, actuaries, statisticians,
6 and computer scientists. Some model components are outside of the area of
7 expertise of actuaries. Due to the models' complexity and reliance on different
8 science disciplines, as well as their relative novelty in establishing property
9 insurance rates at the time, many actuaries are not as knowledgeable about
10 these models as they are about the traditional ratemaking methodologies.

11
12 Hurricane models are utilized to establish the hurricane loss costs and
13 reinsurance cost allocations for these NCRB filings. Therefore, compliance with
14 ASOP 38 is relevant to these filings.

15
16 **Q. Is Aon's use of catastrophe models in compliance with ASOP 38?**

17
18 A. Yes. Aon's catastrophe modeling practice in general and as it relates to these
19 NCRB filings is in compliance with ASOP 38. ASOP 38 provides guidance to the
20 actuary in using models that incorporate specialized knowledge outside the
21 actuary's own areas of expertise when developing an actuarial work product and
22 has been included as Exhibit RB-11. When using such a model, the standard
23 requires that the actuary perform five specific tasks:

1

- 2 a. Determine the appropriate level of reliance on experts;
- 3 b. Have a basic understanding of the catastrophe model;
- 4 c. Evaluate whether the catastrophe model is appropriate for the intended
- 5 purpose;
- 6 d. Determine that appropriate validation of the catastrophe model and output has
- 7 occurred; and
- 8 e. Determine the appropriate use of the catastrophe model and output.

9

10 In addition to relying on vendors' experts, Aon has an in-house model evaluation
11 team. This team consists of members with advanced degrees in meteorology,
12 structural engineering, and statistics. Soon after models are released, the model
13 evaluation team performs sensitivity testing to identify key drivers of model
14 changes and potential anomalies. I work closely with the model evaluation team
15 at Aon to ensure the sensitivity testing covers all aspects of ASOP 38
16 requirements. I review the testing results through an analytics dashboard. I
17 document my reviews for each peril model. Upon completion of the review, I sign
18 an ASOP 38 attestation. Copies of the current ASOP 38 attestations for the AIR
19 and RMS models are included in these filings as Exhibits RB-12 and RB-13,
20 respectively.

21

1 **Q. Describe the role of Aon Reinsurance Solutions Analytics and**
2 **Catastrophe Risk Analytics.**

3
4 A. Aon Reinsurance Solutions Analytics (a.k.a Reinsurance Analytics) provides
5 consultative services to Aon's clients who place catastrophe reinsurance through
6 Aon. These clients are primary insurers selling property insurance products in
7 catastrophe prone areas. Aon Reinsurance Analytics provides value-added
8 service that is above and beyond reinsurance brokering transactions. Our client
9 services include but are not limited to support for multi-model analytics,
10 customized view of risks, catastrophe pricing, catastrophe risk selections, data
11 augmentation, model evaluation, real-time event response, portfolio optimization,
12 reinsurance cost allocations, actuarial support, and rating agency questionnaire
13 support.

14
15 Within the Reinsurance Analytics division, there is a team specialized in
16 catastrophe risk analytics. I am part of the catastrophe risk analytics team that
17 provides clients with catastrophe risk management information and assists
18 clients with their reinsurance purchasing decisions.

19
20 **Q. Describe your experience with catastrophe models.**

21
22 A. As I noted earlier, for much of my tenure at State Farm, I led the catastrophe
23 modeling functions and was responsible for the company's use of catastrophe
24 models in pricing, underwriting, claims, reinsurance, securitization, enterprise risk

1 management, and rating agency reporting. From 2005 to 2006, I performed the
2 catastrophe modeling analyst's role at State Farm, which includes hands-on
3 experience with multiple models - from data preparation to running the models to
4 post model aggregation. My daily work involved data preparation and converting
5 exposure data into model input files. I gained knowledge about how different
6 models handle building characteristics and insurance terms. I used RMS, AIR,
7 and EQECAT models on a daily basis. I developed an understanding of the
8 models' back-end database and output. I performed post-model analysis and
9 wrote computer programs to develop risk metrics such as probable maximum
10 loss (PMLs), average annual losses (AALs), and total value at risk (TVaR) to help
11 State Farm assess and manage catastrophe risks. Later in my career, I
12 assembled a team and supervised many modeling tasks delegated to my
13 colleagues. I continued to provide guidance and managed the day-to-day work
14 of the catastrophe modeling unit. At Aon, I have continued to work extensively
15 with catastrophe models, as I indicated earlier, because the models are integral
16 to the work of Aon's Reinsurance Solutions – Catastrophe Risk Analytics group.

17
18 **Q. Describe your experience with catastrophe reinsurance.**

19
20 A. My experience with reinsurance started in 2005 at State Farm. State Farm is
21 a reinsurance buyer, and I was a part of the company's reinsurance buying team.
22 I supported the reinsurance function at multiple levels. My work included using
23 catastrophe model output and financial information to help my employer in
24 structuring reinsurance, conducting technical pricing, drafting and reviewing

1 reinsurance contracts, and participating in reinsurance buying trips. I evaluated
2 catastrophe risks and cost of capital for both ceding and assuming parties. I
3 worked closely with our reinsurance broker to validate our view of risks using
4 external benchmarks. At Aon, I work directly with our clients who are seeking to
5 purchase catastrophe reinsurance. Output from models is used by our brokers,
6 clients, and capital markets to determine the reinsurance structure and pricing.
7 We customize reinsurance solutions based on clients' risk appetite and risk
8 profile.

9
10 **Q. Do you speak on topics pertaining to catastrophe modeling?**

11
12 A. Yes. I have presented at CAS Ratemaking, Product and Modeling
13 Conferences. I am a frequent speaker at the Reinsurance Association of
14 America's annual catastrophe modeling conference. My topics have included
15 model blending, model regulation, and wildfire modeling, among others. From
16 2012 to present, I have been a visiting instructor at the Illinois State University
17 Math Department Actuarial Science program where I present catastrophe
18 modeling and regulatory topics to actuarial students. From 2016 to 2018, I was a
19 member of the planning committee for the Reinsurance Association of America's
20 annual catastrophe modeling conference. I organized and moderated panels
21 and engaged speakers to cover a variety of catastrophe topics.

22
23 **Q. Would you please explain why you are providing this testimony?**

1 A. I manage Aon's Catastrophe Actuarial and Predictive Analytics group that
2 developed the provisions for the modeled hurricane losses, the net cost of
3 reinsurance, and the compensation for assessment risk used in these filings. I
4 am responsible for the work products provided to NCRB on those items for these
5 filings.

6

7 **Q. What was Aon's role in these filings with respect to expected hurricane**
8 **losses?**

9

10 A. Using exposure data provided to Aon by NCRB, Aon performed data
11 validation and shared control totals with NCRB; Aon's catastrophe modelers ran
12 the AIR Touchstone V10 (a.k.a Touchstone V2022) and RMS RiskLink V23
13 models based on the validated exposure data; Aon blended the model results for
14 NCRB based on well-established methodology and provided the modeled
15 average annual loss to NCRB; Aon conducted industry research and
16 recommended and applied catastrophe loss adjustment factors for NCRB.

17

18 Let me add that the storm surge components of the models were included for
19 these filings. This is appropriate because the Mobile Homeowners MH(C) and
20 MH(F) programs provide insurance coverage for the flood peril.

21

22 **Q. Are catastrophe simulation models commonly used by insurers for**
23 **ratemaking in catastrophe-exposed lines and jurisdictions?**

24

1 A. Yes, catastrophe models have become the standard method of estimating
2 catastrophe risk in rate filings and reinsurance. Hurricane losses are so extreme
3 and volatile that, for many years now, the accepted actuarial procedure for
4 estimating catastrophe risk in rate filings and in the reinsurance market has been
5 through the use of catastrophe models rather than the use of actual hurricane
6 losses. Such volatility is greatly compounded in hurricane prone states such as
7 North Carolina. In North Carolina and other hurricane prone states, a significant
8 percentage of the prospective long-term average annual losses in certain
9 territories of the state are caused by intense hurricanes, which are relatively
10 infrequent but are devastating when they do occur. It would be actuarially
11 unsound to rely on a few years of actual hurricane losses to estimate prospective
12 hurricane losses because of the volatility of these losses, which is driven by low
13 frequency and high severity. We have provided data and analysis from the use
14 of catastrophe models for Aon clients to use in their rate filings in multiple states.

15
16 **Q. Did the NCRB ask Aon to run the AIR and RMs models?**

17
18 A. Yes. Aon ran AIR Touchstone and RMS RiskLink for the NCRB under the
19 NCRB's direction. AIR and RMS are the most commonly used catastrophe
20 models in the insurance and reinsurance industries. Aon runs these two models
21 on all of Aon clients' exposure data pertinent to reinsurance transactions. The
22 majority of Aon's clients use either one or both of these two models when
23 evaluating their catastrophe risk.

1 **Q. Why did the NCRB ask Aon to run two models?**

2

3 A. My understanding is that the NCRB has been using two models since 2016.

4 Running two models also complies with N.C.G.S. 58-36-10(3), which became

5 effective in 2017 and requires the NCRB to present data from more than one

6 model if modeled hurricane losses are based upon a commercial hurricane

7 simulation model.

8

9 **Q. How are losses from the two models blended?**

10

11 A. We run the individual models independently and determine the appropriate

12 loss costs and reinsurance cost allocation for each model. The blended results

13 from the two models are derived by taking the straight average, thus weighting

14 the models equally.

15

16 **Q. Is it common that modeled losses will differ between the various model**
17 **vendors?**

18

19 A. Yes. Catastrophe models are complex. When modeling vendors develop a

20 hurricane model, they start with similar underlying information, such as the

21 National Hurricane Center's historical hurricane dataset, land use/land cover

22 database, similar wind engineering principles and statistical theories. However,

23 there are differences between modeling vendors in their approaches to

24 interpreting and supplementing the data to build a robust model. Different

1 assumptions and judgments are made by model developers. Vendors may also
2 use claims data from different data sources to calibrate their model. These
3 varying assumptions, judgments, and methodologies will result in different model
4 results. Model results deviate more at location level than at the state level.
5 When models generate different results, it does not necessarily mean any model
6 is wrong. The spread among different views of the same risk reflects the
7 inherent uncertainties of catastrophe modeling.

8

9 Given the number of variables involved in the development of a catastrophe
10 model and the degree of uncertainty associated with each variable, we would not
11 expect that two independently developed models would generate the same
12 output or conclusions on a given set of data.

13

14 **Q. Does the use of catastrophe models produce artificially high rate levels?**

15

16 A. No. Models help stabilize rate levels. Without modeling, rate levels would
17 fluctuate wildly following the occurrence or non-occurrence of significant
18 hurricanes. Modeling is relied upon by all stakeholders in insurance,
19 reinsurance, catastrophe bond, and other financial transactions to give the best
20 and most unbiased projection of future hurricane losses. Different parties to
21 those transactions often have opposing economic interests, but they all rely on
22 models in their negotiations with each other.

23

1 **Q. How do the models change over time?**

2

3 A. Catastrophe models are built based on state-of-the-art science and
4 technology. As science continues to evolve and computing powers continue to
5 advance, modeling technology is updated and improved. In addition, research
6 into historical and recent events, updates to building practices and building
7 codes, and data from engineering experiments also provide insights to enable
8 model developers to enhance their models. Each modeling vendor takes a
9 different approach on how frequently it updates its models and which perils and
10 regions will be updated. As noted above, because different assumptions and
11 judgements are made when information is applied, the impact of an update could
12 vary greatly between models. Changes due to model updates are to be
13 expected.

14

15 **Q. Is using multiple models to determine catastrophe risk actuarially**
16 **sound?**

17

18 A. Yes. Using multiple models allows users to incorporate different views of risk
19 into their exposure management. Using multiple models can effectively mitigate
20 modeling volatility and smooth out significant model changes. Using multiple
21 models is a practice endorsed by major rating agencies such as AM Best and
22 S&P.

23

24 **Q. How does the NCRB exposure data impact model output?**

25

1 A. The following data factors would impact model output:

- 2 • Changes in coverage and/or policy conditions such as deductible and
- 3 limits, and the number of underlying policies-in-force
- 4 • Changes in portfolio composition, such as geographic concentration
- 5 • Changes in building characteristics, such as loss mitigation features and
- 6 age of roof
- 7 • Changes in data quality, such as replacing unknown building
- 8 characteristics with known building characteristics

9

10 **Q. Please describe the client data that was employed as input for the model**
11 **runs?**

12

13 A. The underlying exposure data was provided to Aon by the NCRB. To the best
14 of my knowledge, the data was compiled on behalf of the NCRB by Milliman, Inc.
15 NCRB's exposure data sent to Aon consisted of the aggregate exposure
16 information for all residential Mobile Home risks in North Carolina at program, zip
17 code, county and territory levels. Data with invalid zip codes or county
18 designations was disaggregated and reassigned to valid zip codes/counties
19 within the given territory using mobile home unit count by CBG (census block
20 group) from the 2020 American Community Survey maintained by the United
21 States Census Bureau. Territory was populated, except for data that was part of
22 zip codes split across two territories, and the exposure in the split zip code was
23 proportionally assigned to territories based on mobile home unit count by CBG.
24 The number of risks was derived from accrued earned exposures with partial

1 numbers. Any partial numbers of risk count that were greater than zero were
2 rounded to at least 1 because the models require the number of risks to be input
3 as an integer. Rounding up resulted in a slight increase in the risk count.
4 Exposure data provided to Aon was already trended by Milliman. NCRB
5 instructed Aon to run the models using the aggregate data at zip code and
6 territory levels for the entire North Carolina portfolio in a single model run. Model
7 results were aggregated at the territory level.

8
9
10 **Q. Please describe what Aon Reinsurance Solutions then did with the data**
11 **provided by the NCRB.**

12
13 A. We reviewed the data received from the NCRB for completeness and
14 reasonableness before we input it into the AIR and RMS models. Since the two
15 models have different formats for inputting data, we worked with the NCRB to
16 assure that the exposure data was properly and consistently mapped in the
17 required format for each model. NCRB provided earned insurance years (EIY),
18 which is the sum of primary coverage amount expressed in thousands, and
19 earned house years (EHY), which is the number of risks. Limit by coverage is
20 calculated from EIY and EHY as instructed by the NCRB. A comparison of the
21 data in these filings with the data in the last Mobile Homeowners filings was
22 conducted. Any anomalies were investigated.

1 The next step was to input the data and run the models. We ran the AIR
2 Standard model using the 100K event catalogue and the RMS Historical model
3 (both are long-term views of the hurricane risk) to determine the modeled
4 hurricane loss cost. We also ran the AIR Warm Sea Surface Temperature
5 (WSST) model using the 10K event catalogue and the RMS Medium Term Rate
6 model (both are near-term views of hurricane risk) to analyze the cost of
7 reinsurance. It is a standard practice throughout the reinsurance industry to rely
8 upon the models we used to determine modeled hurricane loss cost and
9 reinsurance placements, and this has been true since the 1990s.

10
11 After the models were run, we reviewed each model's output separately to
12 ensure data integrity. We then blended the results of the two models by taking a
13 straight average of the results. Additional reviews were conducted of the
14 blended results to ensure that the blending procedures were correctly performed
15 and that the blended results were reasonable. Model results were aggregated by
16 territory, policy form, and coverage. The blended modeled hurricane loss results
17 were provided to the NCRB for use in its Mobile Homeowners rate review. The
18 NCRB Mobile Homeowners rate review includes separate filings for MH(C) and
19 MH(F), and the model results were utilized for both filings. At the NCRB's
20 request, we also provided the results to Milliman for its use in its work as part of
21 the NCRB's Mobile Homeowners MH(C) and MH(F) rate reviews. Exhibit RB-10
22 sets forth the blended modeled hurricane losses resulting from the work I have
23 described. Based on my knowledge and experience, and the input data provided

1 by the NCRB, these modeled hurricane losses are reasonable and appropriate
2 projections of expected hurricane losses for use by the NCRB in its Mobile
3 Homeowners rate reviews and rate filings for MH(C) and MH(F).

4
5 Also, we employed the modeled hurricane losses as part of our work in
6 determining and allocating the cost of reinsurance for these rate reviews and rate
7 filings.

8
9 **Q. What are the differences and similarities between using the AIR
10 Touchstone's 10K event set and the 100K event set?**

11
12 A. AIR Touchstone's 10K hurricane event set is a subset of the 100K event set.
13 These two event sets are designed to have the same theoretical frequency and
14 intensity distributions in coastal segments, and to produce similar results with
15 minimal variability. Using the 10K event set provides benefits in performance and
16 storage. AIR Touchstone's 10K event set is standard for use in a majority of
17 catastrophe modeling exercises – including reinsurance renewal data distribution
18 for quoting and placement purposes. The 100K event set is used to determine
19 hurricane loss costs for ratemaking purposes.

20
21 **Q. Did Aon adjust the modeled results?**

1 A. Yes. A 6% catastrophe loss adjustment expense (LAE) factor was applied to
2 modeled losses. This factor was recommended by Aon based on a broad
3 industry study at the state level. The results of that study are shown in Exhibit
4 RB-16. The application of the LAE factor was reviewed and approved by the
5 NCRB, and the 6% catastrophe LAE factor was selected by the NCRB.

6
7 **Q. What is demand surge?**

8
9 A. Demand surge is a social economic phenomenon defined by the Actuarial
10 Standards Board as “a sudden and usually temporary increase in the cost of
11 materials, services and labor due to the increased demand for them following a
12 catastrophe.” Demand surge usually occurs after large-scale disasters such as
13 earthquakes, tsunamis, cyclones, or flooding. The models incorporate demand
14 surge into their loss estimates.

15
16 **Q. Should model output in the NCRB filings for MH(C) and MH(F) include**
17 **demand surge?**

18
19 A. Yes. All applications of catastrophe model output should reflect demand
20 surge. Demand surge is a real social economic phenomenon. There is no
21 reason to underestimate the impact of large events by ignoring the increase in
22 demand for labor and materials as a result of those events. In our experience,
23 the vast majority of insurance companies run the models with demand surge. In

1 fact, the only times we have ever run a model without demand surge at Aon are
2 to measure the impact of demand surge for testing purposes and where
3 specifically requested. Insurance companies' claims experience includes the
4 effect of demand surge. Excluding demand surge would underestimate
5 catastrophe losses.

6

7 **Q. Does the model output for the NCRB MH(C) and MH(F) filings include**
8 **demand surge?**

9

10 A. Yes. As is the customary and accepted practice in the insurance, reinsurance,
11 and catastrophe bond industries, the models were run with aggregate demand
12 surge (AIR) and loss amplification (RMS) included. The FCHLPM has approved
13 the use of aggregate demand surge and loss amplification for the AIR and RMS
14 models, respectively. These aspects of the models account for the expected
15 additional cost for supplies and labor if a very large hurricane event or series of
16 events occurs. Experience demonstrates that when such catastrophic events
17 have occurred, there is significant increase in demand for the limited supply of
18 plywood, shingles, labor, hotel rooms, and other necessities. The high demand
19 for specialized labor often requires contractors to come in from out of state.
20 Fundamental economic principles dictate that such a spike in demand increases
21 prices, and, consequently, results in larger than normal claims payments in the
22 aggregate. Additionally, there are delays in repairing properties, which can
23 directly lead to longer stays in hotels, and there are other increased costs beyond

1 those that occur after smaller hurricanes. Loss amplification also factors in
2 claims inflation. Claims adjusters may not investigate every claim if it is under a
3 certain threshold, given the volume of claims they have to settle post-event in a
4 limited amount of time.

5
6 **Q. Does any state prohibit the inclusion of demand surge in modeled**
7 **losses for rate filings?**

8
9 A. I am not aware of any prohibitions against the use of demand surge in rate
10 filings in any jurisdiction. The South Carolina Department of Insurance Bulletin
11 2014-03 states "Demand surge may be included in the modeled results as long
12 as the company provides the impact it has on the modeled losses." The Florida
13 Commission on Hurricane Loss Projection Methodologies' actuarial standards
14 require hurricane models to incorporate demand surge based on relevant data
15 and actuarially sound methods and assumptions.

16
17 **Q. North Carolina has laws prohibiting "price gouging" following a**
18 **hurricane. Does that eliminate demand surge?**

19
20 A. No. Florida has a similar law (Fla. Stat. § Title XXXIII 501.160). Demand
21 surge can and does occur due to supply and demand economics in situations
22 that would not be considered price gouging and/or that would not be prevented
23 by statutes prohibiting price gouging.

1 **Q. Does it make sense for North Carolina hurricane losses to include**
2 **demand surge for very large events impacting other states even if those**
3 **events were less significant in North Carolina?**

4
5 A. Yes, the intent of the model is to reflect economic conditions that will influence
6 construction prices and other aspects of insured losses (such as, for example,
7 the increased period of time a carrier has to pay for hotel rooms for insureds
8 while their damaged homes are repaired) in the time period shortly after a
9 catastrophe event occurs. Since labor and material resources are exchanged by
10 people across state lines, we believe the demand surge effect on prices in other
11 states will have an effect in North Carolina and therefore should be considered.

12
13
14 **Q. Is the net cost of reinsurance considered in the Filings?**

15
16 A. Yes. Large catastrophe losses present a very real risk to the long-term viability
17 of Mobile Homeowners insurers and their ability to follow through on their
18 promise to policyholders to pay losses when they occur. There are numerous
19 scenarios where the potential losses due to a single hurricane are far greater
20 than the total annual premium collected by all the companies for the entire state
21 of North Carolina. To remain viable long-term and to protect against insolvency,
22 and thereby to keep their commitment to policyholders, the industry must
23 purchase reinsurance to help cover this risk. The costs associated with such
24 reinsurance are costs of doing business in the state. To reflect the portion of

1 those costs that is not already covered in the MH(C) and MH(F) filings, a
2 provision for the net cost of reinsurance is included in both filings.

3
4 **Q. What is reinsurance?**

5
6 A. Simply, reinsurance is insurance for insurers. When insurers are aware of
7 scenarios in which the potential losses are greater than the company is willing to
8 tolerate or able to absorb, they will frequently purchase reinsurance to mitigate
9 the risk in those situations. Additionally, insurers may issue catastrophe bonds to
10 protect themselves in those situations. Essentially the insurers will use a portion
11 of the premium to purchase reinsurance. This is common across the industry.

12
13 **Q. What was your role in these filings with respect to net cost of**
14 **reinsurance?**

15
16 A. I worked with my colleagues within the Aon Catastrophe Actuarial team to
17 determine a suitable provision for the net cost of reinsurance for the state overall
18 and an allocation of that cost by territory. The net cost of reinsurance provision
19 used exposure data from all the Mobile Home risks in the state, so that a cost
20 provision would be appropriate to use in a uniform rate schedule applicable to all
21 insurers in the state.

22
23 **Q. What is catastrophe reinsurance, who buys it, and why do they buy it?**

1 A. Catastrophe reinsurance is a contract purchased by a primary insurance
2 company and sold by a reinsurer, or a group of reinsurers, to transfer risk from
3 loss due to large catastrophic events. The most common type of contract used
4 for catastrophe risk is called "Portfolio Excess of Loss" ("Portfolio XOL"), or just
5 "XOL." A single XOL contract has an "attachment" and a "limit." An XOL covers
6 the amount of portfolio loss caused by a single event in the amount which
7 exceeds the XOL attachment with a maximum equal to the XOL limit. In some
8 instances, there is co-participation, which means that only a percentage of the
9 amount of loss in the XOL layer is covered. Portfolio XOL contracts, which are
10 often referred to as "treaties" since there are typically multiple reinsurers
11 involved, cover the first event within a year of coverage. It is standard for treaties
12 to include a provision for the primary carrier to automatically purchase a
13 "reinstatement" if it has a loss which triggers a reinsurance payment. The
14 reinstatement premium allows for the full limit to be reinstated after the first event
15 exhausts the limit provided. There are cases where a limit is provided, and if an
16 event exhausts that limit, then there is no coverage available for the remainder of
17 the contract period. It is typical for primary carriers to buy multiple treaties that
18 stack on top of each other. In other words, a treaty will have an attachment
19 equal to the attachment plus limit of another treaty. Primary carriers select
20 reinsurance programs that best fit their particular needs and buy reinsurance to
21 ensure that money is available to pay claims and remain financially viable after
22 very large and uncommon to rare events.

23

1 **Q. Are the reasons that member companies purchase reinsurance similar**
2 **to the reasons that the hypothetical one company must purchase**
3 **reinsurance?**

4
5 A. Yes. The hypothetical one company for which the NCRB makes rates in North
6 Carolina must purchase reinsurance for the same reasons that individual carriers
7 purchase reinsurance. That hypothetical one company is faced with numerous
8 realistic hurricane loss scenarios that far exceed its ability to pay.

9
10 The annual earned premium at current manual level for the two filings combined
11 is about \$205.2 million for the hypothetical one company. There are many
12 scenarios in which hurricane losses are projected to be many multiples of that
13 amount. If an individual company experienced a loss many multiples of its
14 collected premium, it would first look to its surplus and reinsurance to meet its
15 obligations to policyholders. If the surplus and reinsurance were not sufficient,
16 then that company would become insolvent. There has been a history of
17 company insolvencies following major hurricanes in the United States. Following
18 Hurricane Hugo that hit Charleston, South Carolina and Hurricane Andrew that
19 hit Florida, there were multiple insolvencies. There have been at least two
20 insolvencies since Hurricane Ian in Florida in late September, 2022.

21
22 It would be irresponsible and imprudent for the hypothetical one company not to
23 purchase reinsurance. The net cost of reinsurance analysis prepared by Aon

1 reflects the need for that hypothetical one company to purchase and maintain
2 reinsurance.

3

4

5

6 **Q. Please describe how the reinsurance program was designed and priced**
7 **for purposes of NCRB rate filings? Do you think it is reasonable?**

8

9 A. The Aon Catastrophe Actuarial team designed the reinsurance program for
10 this rate filing. I manage this team and I am responsible for its work product.

11 The reinsurance program structure and pricing are determined by an analysis of
12 reinsurance programs placed by Aon for its reinsurance clients, and I believe it is
13 reasonable and appropriate. Three components of the analysis are described
14 here.

15

16 **Program attachment and total limit** describes the total amount of reinsurance
17 coverage. Since companies vary substantially in size, so do their limit purchase
18 and attachment for their bottom layers. To normalize for company size, we
19 looked at the frequency with which a single event would trigger a recovery and
20 the frequency with which a single event would exhaust the limit of the entire
21 program for each company. This was calculated separately for the AIR and the
22 RMS models. We then calculated the median attachment and exhaustion
23 (exhaustion = bottom layer attachment + total program limit) frequencies by
24 model and by region (Southeast and Nationwide). The frequencies for

1 attachment and exhaustion were averaged across the regions, which resulted in
2 attachment and exhaustion frequency by model. Using portfolio loss distributions
3 by model for the portfolio in the filing, we calculated the dollar amount of
4 attachment and exhaustion (and therefore limit) by model. The attachment of the
5 reinsurance program in the filing is the average of the AIR indicated attachment
6 and RMS indicated attachment. The exhaustion of the reinsurance program in
7 the filing is the average of the AIR indicated exhaustion and the RMS indicated
8 exhaustion.

9 **Reinsurance Market Pricing Model** For AIR and RMS, a log-linear regression
10 model was built to calculate fitted reinsurance price based on modeled expected
11 ceded loss. Using these regression models, an indicated price for any layer can
12 be calculated based on each catastrophe model (AIR and RMS). The selected
13 prices by layer used in this rate filing are the averages of the AIR indicated prices
14 and the RMS indicated prices.

15
16 Note: Because insight into reinsurance market pricing is an important proprietary
17 asset for Aon, the log-linear models are considered a trade secret and therefore
18 not disclosed in this public filing.

19
20 **Program Structure.** After the market pricing model is determined along with the
21 program's attachment and limit, the program is then broken into layers. We run
22 an optimization analysis to find the five-layer catastrophe program that has the
23 lowest deposit premium. The method is designed to calculate an indicated

1 reinsurance premium that is as low as possible, subject to the market pricing
2 model and program attachment and limit specifications.

3

4 The reinsurance structure determined by the method described above is shown
5 in Exhibit RB-14. The pricing with loss analysis is shown in Exhibit RB-15.

6

7 **Q. Have you seen reinsurance costs going up in recent years?**

8

9 A. The global reinsurance market has experienced some extraordinary volatilities
10 since 2019. Reinsurance prices have increased significantly in the U.S. for the
11 past three years. This increase was initially driven by Florida in the Southeast
12 region, but the significant increase has now been seen countrywide since 2021.

13

14 **Q. How was the reinsurance premium allocated?**

15

16 A. Reinsurance premium by layer is allocated to a territory based on that
17 territory's share of expected ceded loss and loss adjustment expense (LAE) by
18 layer. Exhibit RB-15 shows the total expected ceded loss and LAE by layer and
19 Exhibit RB-17 shows the proportion of hurricane peril reinsurance premium,
20 ceded average annual loss, and reinsurance margin (a.k.a. "net cost of
21 reinsurance") allocated to each territory segment for each layer. Other perils
22 were used in the calculation, but because they contributed such a small amount
23 of expected ceded loss they were not shown on the exhibits. Exhibit RB-17

1 shows the dollar amount of reinsurance margin allocated by territory and policy
2 form.

3
4 **Q. How was the net cost of reinsurance calculated?**

5
6 Net cost of reinsurance is Deposit Premium + Expected Reinstatement Premium
7 - Expected Ceded Loss & LAE. The reinsurance program, the loss distribution
8 from the portfolio as determined by event loss tables (ELTs) from catastrophe
9 models, and the LAE assumptions are input into a DFA (Dynamic Financial
10 Analysis) program to calculate the average ceded loss and LAE and average
11 reinstatement premium over a specified number of simulated years. The loss
12 distribution which is produced by the AIR model is already in the form of
13 simulated loss experience for 100,000 years. The DFA program calculates for
14 each year the total reinsurance recoveries and reinstatement premium paid. The
15 program then calculates the average annual ceded loss & LAE and the average
16 reinstatement premium. The loss distribution from RMS models is a list of
17 possible catastrophic events. Instead of providing a specific year and amount of
18 loss from each event, each event has a parametric distribution for frequency and
19 severity. The DFA program creates a simulation of 1,000,000 years of loss
20 experience to make a table containing year, event ID, and specific amount of
21 loss. From that point the calculation works the same as for the AIR model.

22
23 For the NCRB filings combined, our analysis shows that the expected
24 reinsurance premium is \$87,553,368, the expected ceded loss & LAE is

1 \$16,925,905, and the net cost of reinsurance is \$70,627,463, as shown on
2 Exhibits RB-15 and RB-18. Allocation by territory is done using the method
3 described in response to the previous question. The net cost of reinsurance
4 amounts for the separate filings are as follows: \$36,234,337 for MH(C) and
5 \$34,393,126 for MH(F).

6
7 **Q. Given your experience in catastrophe reinsurance, do you find this**
8 **approach to be reasonable?**

9
10 A. Yes. Aon's approach is based on detailed information on current reinsurance
11 market rates and the underlying model output.

12
13 **Q. Do you know whether the Rate Bureau has used in its 2024 Mobile**
14 **Homeowners filings the Aon net cost of reinsurance results you provided?**

15
16 A. Yes. I am advised that the Rate Bureau has used in the filings both our
17 statewide net cost of reinsurance results and those results allocated to the
18 territory level.

19
20 **Q. Are you aware of the following provisions in the North Carolina statutes,**
21 **in N.C.G.S. 58-36-10(7):**

22 *Property insurance rates established under this Article may include a provision to*
23 *reflect the cost of reinsurance to protect against catastrophic exposure within this*
24 *State. Amounts to be paid to reinsurers, ceding commissions paid or to be paid*
25 *to insurers by reinsurers, expected reinsurance recoveries, North Carolina*
26 *exposure to catastrophic events relative to other states' exposure, and any other*

1 *relevant information may be considered when determining the provision to reflect*
2 *the cost of reinsurance.*

3
4 A. Yes, I am. This NC statute provision is consistent with ASOP 53, Estimating
5 Future Costs of Prospective Property/Casualty Risk Transfer and Risk Retention,
6 which “applies to actuaries when performing actuarial services with respect to
7 developing or reviewing future cost estimates (commonly known as actuarial
8 indications) for prospective property/casualty risk transfer and risk retention. For
9 example, this standard applies when actuaries are developing future cost
10 estimates underlying product prices, estimating funding requirements for self-
11 insured programs and captives, and developing reinsurance prices.”

12
13 **Q. Do you have an opinion on whether the analysis you and Aon have**
14 **performed on behalf of the Rate Bureau on the net cost of reinsurance for**
15 **this filing has taken into consideration the provisions of that statute?**

16
17 A. Yes. Based on my experience with hurricane models and using modeled
18 hurricane losses, along with my experience with catastrophe reinsurance and
19 determining catastrophe reinsurance costs for rate filings, it is my opinion that the
20 net cost of reinsurance analysis for this filing properly considers all of the items
21 set forth by the statute. Further, based on my experience in the actual
22 marketplace, it is my opinion that a reasonable and appropriate provision for the
23 net cost of reinsurance must be incorporated into Mobile Homeowner insurance
24 rates in North Carolina for those rates to properly reflect and protect against the
25 catastrophe exposure in this state.

1

2 **Q. Do you have an opinion regarding the appropriateness of the net cost of**
3 **reinsurance provision incorporated into these Mobile Home filings?**

4

5 A. Yes. Based on my experience with hurricane models and using modeled
6 hurricane losses, along with my experience with catastrophe reinsurance and
7 determining catastrophe reinsurance costs for rate filings, it is my opinion that the
8 provision for the net cost of reinsurance in these filings, at the statewide and
9 territory levels, is reasonable and appropriate.

10

11 **Q. Can you please describe the issues related to the compensation for**
12 **assessment risk?**

13

14 A. Property insurance written in the residual market in North Carolina presents
15 considerable risk for primary insurers that write property insurance. The North
16 Carolina Insurance Underwriting Association (i.e., the Coastal Property Insurance
17 Pool, or "Beach Plan") and the North Carolina Joint Underwriting Association
18 (i.e., the "FAIR Plan") together serve as that residual market. The Beach Plan
19 and FAIR Plan provide property insurance when policyholders are unable to
20 purchase insurance coverage from companies in the voluntary market. In states
21 like North Carolina with significant exposure to catastrophic events and/or where
22 the availability of insurance is limited in the voluntary market, property insurance
23 residual markets may grow to represent a sizable portion of the total insured risk.

24

1 Similar to insurance companies writing voluntary business, the Beach and FAIR
2 Plans use the premiums collected from policies they issue to fund the losses and
3 expenses attributable to the coverages they insure. When premiums are greater
4 than losses and expenses during a given year, the Beach Plan and the FAIR
5 Plan accumulate surplus. That surplus is available to pay future losses and
6 expenses in the event that they exceed collected premiums plus investment
7 income. However, if the surplus of either the Beach Plan or FAIR Plan is
8 exhausted, the additional costs of that entity are then, by statute, passed on to
9 property insurers in North Carolina in the form of an assessment. The potential
10 overall industry assessment from the Beach Plan for any single year is capped at
11 \$1 billion, but the potential assessment from the FAIR Plan is unlimited. If losses
12 in the Beach Plan exceed the retained surplus, the \$1 billion industry
13 assessment, and any other resources of the Beach Plan (such as reinsurance),
14 any additional losses are passed through directly to residential property
15 insurance policyholders in North Carolina.

16
17 This risk of potential assessment by the Beach Plan and/or FAIR Plan on
18 property insurers in North Carolina requires that those companies be
19 compensated for the additional risk to their capital. To quantify this risk, Aon has
20 applied a procedure previously developed by Milliman and adopted by NCRB to
21 incorporate a provision in property insurance rates (homeowners insurance,
22 dwelling insurance, and mobile home insurance) that compensates insurers for
23 that risk.

1

2 **Q. Can you please explain the procedure you used to determine the needed**
3 **compensation for assessment risk?**

4

5 A. Yes. There are two steps in the methodology to quantify the compensation for
6 assessment risk. The first step is to calculate the magnitude of the exposure
7 itself, and the second step is to determine the fair compensation to be paid to
8 insurers for being required to bear that risk.

9

10 To quantify the magnitude of the exposure, it is necessary to estimate the
11 expected value of the assessments on insurers arising from catastrophic losses
12 incurred by the Beach Plan and/or FAIR Plan. Because an assessment on
13 insurers results only after either the Beach Plan or FAIR Plan has exhausted
14 other resources available to pay losses, we needed to determine the likelihood of
15 that occurring as well as the amount by which the losses exceed those other
16 resources.

17

18 Aon quantified the risk of assessment by the Beach Plan and FAIR Plan using a
19 methodology similar to that developed by Milliman and presented in previous
20 filings. First, Aon collected the Beach Plan's and FAIR Plan's exposures at the
21 county level from the Beach Plan's and FAIR Plan's websites for the 2023-2024
22 storm season. Then we reviewed the Beach Plan's and FAIR Plan's reinsurance
23 programs in place for the 2023-2024 storm season, along with assumptions of

1 the Beach Plan's and FAIR Plan's accumulated surplus available for the season.
2 The accumulated surplus and available reinsurance are the "other resources"
3 that are available to pay for hurricane losses during the 2023-2024 storm season.
4 Aon then ran the AIR and RMS hurricane models on the Beach Plan's and FAIR
5 Plan's exposures for the 2023-2024 storm season, calibrated modeled event
6 losses based on the published PML information available on the Beach Plan's
7 and FAIR Plan's websites, and evaluated the impact of reinsurance on each
8 modeled event. Aon utilized its in-house dynamic simulation model ReMetrica to
9 calculate the Beach Plan and FAIR Plan deficits after applying their reinsurance
10 and surplus. For each adjusted modeled loss, ReMetrica determined the amount
11 of loss that would be covered by reinsurance and the remaining losses that
12 would be funded either from the Beach Plan's or FAIR Plan's accumulated
13 surplus, through assessments on property insurers in the state, or ultimately
14 through assessments on North Carolina property insurance policyholders. We
15 subtracted the accumulated surplus of the Beach Plan and FAIR Plan from the
16 losses remaining after reinsurance, limited the assessable losses due to the
17 Beach Plan exposures to \$1 billion, and calculated the average assessment on
18 property insurers across all events simulated by the models. This average
19 assessment on property insurers is equal to the expected value of the losses that
20 would be funded through assessments on North Carolina property insurers.

21
22 As I mentioned earlier, this calculation produces a measure of the magnitude of
23 the assessment exposure. That is, it represents the risk to insurers' capital that

1 is associated with the exposure to Beach Plan or FAIR Plan assessments. The
2 next step is to use the method previously developed by Milliman to measure the
3 fair compensation to insurers for bearing this risk.

4
5 **Q. Can you please explain how you measured the compensation needed for**
6 **bearing this risk?**

7
8 A. Yes. To measure the fair compensation for bearing this risk of assessment,
9 we relied on publicly available data that quantifies the market price of
10 catastrophe risk, taken from recently issued insurance linked securities.
11 Insurance linked securities (ILS) are securities such as catastrophe bonds which
12 have conditional payoffs that are very similar to reinsurance. Investors purchase
13 these securities at significant yield premiums compared to risk-free bonds
14 because the investors are exposed to loss of principal and interest if certain
15 “insured events” occur.

16
17 **Q. What kind of ILS data are available and how is this information used to**
18 **determine the compensation for assessment risk?**

19
20 A. We relied on insurance linked security yield information to price the
21 Compensation for Assessment Risk. Lane Financial, LLC is a firm that has
22 specialized in the analysis of insurance linked securities. In the past, Lane
23 published a table of data each year that summarized a variety of information that

1 can be used to evaluate the fair compensation for bearing catastrophe risk. For
2 each ILS in the table, Lane published the following data: the yield on the
3 security; the excess return over the risk-free rate; the probability that the security
4 will suffer a loss; and the expected value of loss anticipated on the security.
5 These data elements provide the foundation for the analysis of the proper
6 compensation for bearing the risk of Beach Plan or FAIR Plan assessments.
7 However, Lane has not published the insurance linked securities table since
8 March 2022.

9
10 Aon also collects and aggregates insurance linked securities information similar
11 to the information published by Lane. For each insurance linked security in Aon's
12 table, the following data are available: the peril and region the insurance linked
13 security covers; the yield on the security; the excess return over the risk-free
14 rate; the probability that the security will be attaching; and the expected value of
15 loss anticipated on the security. For the 2023 CAR study, the 2013 – 2021
16 information utilized was from Lane Financial and the 2022 data utilized was from
17 Aon.

18
19 There are a number of defined terms that are useful in describing the mechanics
20 of the compensation for assessment risk analysis.

- 21 ▪ The "*yield spread*" is the difference between the yield on a particular ILS and
22 the risk-free rate. If a \$100 million bond is issued with a yield spread of 10%,
23 this implies that the insurer issuing the bond would pay \$10 million in interest

1 in excess of the interest at the risk-free rate to encourage investors to
2 purchase such a security.

3 ■ Continuing with the example of the \$100 million bond above, now assume
4 that the distribution of hurricane losses is such that, based on the probability
5 and amount of potential hurricane losses, an investor would anticipate having
6 an average loss of \$2 million per year. This amount is identified as the
7 “expected loss.”

8 ■ Since the investor in this example receives compensation of \$10 million in
9 excess of the risk-free rate for bearing the risk of loss, the “expected profit” to
10 the investor is \$8 million (i.e., \$10 million in interest in excess of the interest at
11 the risk-free rate minus \$2 million of expected losses).

12 ■ Finally, the “profit multiple” is the ratio of expected profit to expected loss. In
13 the above example, the profit multiple would be \$8 million of expected profit
14 divided by \$2 million of expected loss, or a profit multiple of 4.0.

15 The profit multiples derived from insurance linked securities provide an estimate
16 of the compensation that investors require to bear catastrophe risk. This
17 information tells us what investment returns are required by capital providers to
18 take on the risk of loss from a catastrophic event. One particularly important
19 feature of this metric is that it is a measure of compensation per dollar of
20 expected loss. As a result, because the first step of our analysis determines the
21 expected value of losses that would be funded through assessments, the profit
22 multiple can be applied to those expected values to develop an estimate of the
23 fair compensation for bearing such risk. This is the measure of risk we relied

1 upon in evaluating the fair compensation for property insurers whose capital is
2 exposed to Beach Plan and/or FAIR Plan assessments.

3

4 **Q. Generally speaking, which insurance linked securities have larger risk**
5 **premiums and higher profit multiples?**

6

7 A. For exposures such as catastrophic events, securities that have a lower
8 probability of incurring a loss have greater volatility and, as a result, have larger
9 risk premiums. Securities with larger risk premiums have a larger ratio of
10 expected profit to expected loss and, as such, have higher profit multiples.

11

12 **Q. Have you developed any exhibits that summarize the calculations used**
13 **to develop the fair compensation to insurers for bearing the risk of Beach**
14 **Plan and/or FAIR Plan assessments?**

15

16 A. Yes. Exhibit RB-19 contains ten pages of information required to develop the
17 fair compensation for bearing Beach Plan and FAIR Plan assessment risk.

18 ▪ Page 1 of Exhibit RB-19 shows the curve fit to the ILS profit multiples
19 based on all catastrophe-related securities issued in the last ten years. As
20 I explained earlier, nine years of ILS data came from Lane and one year of
21 ILS data came from Aon. This exhibit also includes the equation of the
22 fitted curve, which can be used to determine the profit multiple for any
23 layer to which insurer capital is exposed.

- 1 ▪ Page 2 of Exhibit RB-19 shows a summary of the Beach Plan's
2 reinsurance program, and Page 6 shows a similar summary of the FAIR
3 Plan's reinsurance program, both for the 2023-2024 season. These
4 summaries include the various layers of reinsurance purchased and the
5 coverage levels within those layers.
- 6 ▪ Pages 3 and 7 display the profit multiples calculated for each layer of the
7 Beach Plan's and FAIR Plan's loss distributions, based on the equation
8 shown on Page 1. In order to determine the fair compensation to
9 voluntary insurers for bearing the risk of assessments, we need to
10 determine which layers contain losses that will be funded by assessments,
11 as well as the corresponding expected losses within those layers. The
12 profit multiples can then be applied to the expected losses to determine
13 the appropriate compensation per dollar of expected loss in each layer.
- 14 ▪ Pages 4 and 8 illustrate how potential losses for the Beach Plan
15 Residential Account and FAIR Plan are funded. (The Beach Plan
16 determines losses and assesses voluntary insurers separately for each
17 account, while the FAIR Plan has only one account.) Because of the \$1
18 billion annual cap on Beach Plan assessments, any amounts needed to
19 pay claims in excess of the assessable amounts are to be collected
20 through surcharges on property insurance policyholders statewide. For
21 each event simulated by the hurricane models, losses are separated by
22 account (Beach Plan Residential, Beach Plan Commercial, Coastal Plan
23 Residential, Coastal Plan Commercial, and FAIR Plan. The losses for

1 each account are then divided into layers based on the source of funding
2 for those losses – Beach Plan or FAIR Plan surplus, assessments on
3 voluntary insurers, private reinsurance, and ultimately any additional
4 amounts in the Beach Plan to be covered by policyholder surcharges.
5 Finally, the losses associated with each event are accumulated in each of
6 the loss layers to determine expected values.

- 7 ▪ Pages 4 and 8 illustrate the funding of potential losses within each layer.
8 Since the purpose of this analysis is to determine the fair compensation
9 for the risk of assessments on private insurers, the analysis must take into
10 account the probability of losses occurring within each layer and the
11 expected value of the losses that will be borne by private insurers. Pages
12 5 and 9 of Exhibit RB-19 provide that analysis. Those pages show the
13 expected value of the losses that would be covered by the Beach Plan
14 Residential and FAIR Plan accounts, and the average annual amount of
15 those losses that would be assessed to private insurers. Pages 5 and 9
16 also display the average profit multiples associated with each layer of the
17 loss distribution, and the product of the indicated profit multiples times the
18 expected losses within each layer. The sum of those values is the
19 indicated compensation for assessment risk for each account.
20 ▪ The final step in the calculation is to determine the appropriate provision to
21 be included in the mobile homeowner insurance rates to compensate
22 insurers for the risk of Beach Plan and/or FAIR Plan assessments. This
23 provision is expressed as a percent of premium and is developed on Page

1 10 of Exhibit RB-19. Since assessments for Beach Plan and/or FAIR Plan
2 losses are applied to all property insurance lines in the state, the table on
3 Exhibit RB-19, Page 10 shows the development of a provision that will
4 produce an amount of revenue equal to the total required compensation of
5 \$130.62 million when incorporated into the rates for homeowners, dwelling
6 and mobile home insurance in North Carolina. As shown on this exhibit,
7 that provision is 2.8% of total property insurance premium in the state.

8 **Q. Did you make any adjustments to the 2.8% compensation for**
9 **assessment risk provision for North Carolina property insurance?**

10

11 A. Yes. Consistent with other recent property filings, the Rate Bureau is aware
12 that some reinsurance contracts provide coverage for residual market
13 assessments, including the potential non-recoupable assessments from the
14 Beach Plan and FAIR Plan. As a result, it is possible that the reinsurance
15 contracts purchased by North Carolina property insurance companies may
16 include some coverage for assessments such that the exposure to Beach Plan
17 and/or FAIR Plan assessments is no longer fully retained by the primary carrier.
18 Given this information and the information that not all companies buy reinsurance
19 that includes coverage for residual market assessments, the Rate Bureau made
20 the assumption that 50% of the North Carolina property insurance companies'
21 exposure to assessments from the Beach Plan and/or FAIR Plan is retained by
22 the companies.

23

1 As a result, we multiplied this expected 50% market share by the 2.8% full
2 compensation for assessment risk provision to determine an overall
3 compensation for assessment risk provision of 1.4%.

4
5 **Q. In your opinion, is it appropriate to include a 1.4% provision for the**
6 **compensation for assessment risk in mobile homeowner insurance rates in**
7 **North Carolina?**

8
9 A. Yes. Insurance companies writing mobile homeowner policies in North
10 Carolina are exposed to the risk of Beach Plan and FAIR Plan assessments as a
11 result of writing voluntary market property insurance in the state. Those
12 insurance companies are entitled to receive fair compensation for bearing that
13 risk, and it is appropriate to include that compensation in the mobile homeowner
14 rates. The compensation for assessment risk methodology we used here relies
15 on a widely accepted measure of compensation to determine a provision that will
16 fairly compensate insurers for bearing this additional risk to their capital.
17 Moreover, the North Carolina statutes provide that prospective exposure to non-
18 recoupable assessments shall be considered as an appropriate factor in the
19 making of rates by the Rate Bureau.

20
21 **Q. Are you aware of North Carolina Senate Bill 452's provision that**
22 **increased the Beach Plan's coverage limits?**

1 A. Yes, SB 452 was enacted into law as Session Law 2023-133 in October 2023.
2 SB 452 increased the Beach Plan's coverage limits from \$750,000 to \$1 million
3 on habitational property. SB 452 also increased the Beach Plan's coverage limits
4 from \$3 million to \$4 million on commercial property, and from \$6 million to \$10
5 million on structures with multiple firewall divisions.

6

7 **Q. Do you have an opinion on how SB 452's new coverage limits on Beach**
8 **Plan policies would impact the hurricane, net cost of reinsurance, and**
9 **compensation for assessment risk provisions in the NCRB Mobile**
10 **Homeowners Filings?**

11

12 A. The new coverage limits on Beach Plan policies could potentially increase the
13 exposure in the Beach Plan and increase the compensation for assessment risk
14 provision. This stems from two potential exposure changes: 1) more policies will
15 be eligible for coverage in the Beach Plan and these policies may move from the
16 voluntary market to the Beach Plan; and 2) some Beach Plan existing policies
17 that were capped at the previous limits are now eligible for a higher coverage
18 limit. The magnitude of the increases of the NCRB property rate filings' hurricane
19 provision and net cost of reinsurance provision depends on how policies shift
20 from the voluntary markets to the Beach Plan and the number of limit policies in
21 the Beach Plan.

22

23 **Q. Do you have an opinion on whether NCRB should make any**
24 **adjustments to this filing to account for the passage of SB 452?**

25

1 A. It is unclear how many policies in the Beach Plan will be subject to the new
2 limits, and it is likewise unclear whether and how many additional policies would
3 be written by the Beach Plan due to SB 452. It is also unclear how the Beach
4 Plan's PML and reinsurance program will be impacted by SB 452. Therefore, the
5 impact of SB 452 is not quantifiable at this time. Currently, I don't recommend
6 any adjustments to account for SB 452 in these 2024 NCRB Mobile Homeowners
7 Filings.

8

9 **Q. Does that conclude your testimony?**

10

11 A. Yes.

Minchong Mao, FCAS, CCRMP, MAAA, Actuary

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Summary

- Over twenty years of experience with insurance, reinsurance, catastrophe risk management, actuarial pricing and management at State Farm Insurance Companies and Aon plc
- Commission Member, actuary representing the property insurance industry on the Florida Commission on Hurricane Loss Projection Methodology (FCHLPM) 2015-2018
- Strong leadership, work ethic, communication and teamwork skills
- Deep knowledge and experience in Insurance operations, including Actuary, Underwriting, and Claims.
- Extensive experience and understanding with catastrophe models, underlying science and methodologies

Experience**Senior Managing Director, Actuary****Aon Reinsurance Solutions**

April 2021– Present

Managing Director, Actuary**Aon Reinsurance Solutions**

September 2018– April 2021

Major Responsibilities include:

- Manage the catastrophe actuarial and predictive analytics group within Aon Reinsurance Solutions which focuses on supporting Aon clients' ratemaking and underwriting needs.
- Implement and sign off Aon's ASOP 38 compliance framework.
- Provide rate filing support for Aon's clients through regulatory challenges.
- Serve on Impact Forecasting leadership steering committee to oversee Impact Forecasting's product strategies and priorities.
- Serve as Aon Impact Forecasting's signatory actuary during Florida Commission on Hurricane Loss Projection Methodology submissions.
- Manage Homeowner Return on Equity (ROE) Outlook study. Aon's Homeowners ROE Outlook calculates risk-adjusted returns for the US homeowners industry, provides the insurance industry with market reality diagnostics and profitability insights.
- Manage Residual Market Industry study. This product provides a holistic view of the residual market's impact on the property insurance industry and the individual company's risk profile.
- Serve as Aon's key corporate contact for China business development and expansion.

**Catastrophe Modeling Manager, Actuary
State Farm Insurance Companies**

Feb. 2005– Sept. 2018

Major Responsibilities included:

- Manage State Farm’s catastrophe modeling unit. State Farm’s catastrophe modeling practice grew into the industry’s leading practice with high quality and productivity under my leadership.
- Manage vendor relationships with AIR, EQECAT, ARA, and RMS. Negotiate contract terms and conditions, engage vendors’ support through regulatory challenges.
- Provide Actuarial opinions on State Farm’s use of catastrophe models. Oversee the due diligence and model validation work to ensure catastrophe modeling practices at State Farm meet the Actuarial Standards and comply with laws and regulatory requirements.
- Serve as a resource to the Corporate Law department for litigation and legislative issues.
- Provide various catastrophe risk measures and analytics (PML, TVaR, Standard Deviations, etc.) for State Farm Fire and Affiliates for exposure management and reinsurance purposes.
- Provide catastrophe information to rating agencies such as AM Best, S&P and Moody’s.
- Develop and deploy hazard analysis tools across the Enterprise for exposure underwriting and management.
- Utilize catastrophe data in Dynamic Financial Analysis projects to analyze capital adequacy and capital allocation; develop simulation tools to incorporate catastrophe risk into Enterprise Risk Management.
- Provide exposure information, technical support, risk analysis and documentation reviews for all State Farm’s issuances of catastrophe bonds.
- Lead State Farm’s compliance work to meet Office of the Superintendent of Financial Institutions (OSFI) B-9 - Earthquake Sound Practice requirements.
- Monitor modeling regulations in several jurisdictions (FL, LA, SC, HI, MD, etc.). Work with State Farm counsel to provide revisions to bills related to coastal issues and catastrophe risk management during legislative sessions.
- Represent the Actuarial department on State Farm Enterprise Catastrophe Response Team. Provide real time analysis for actual catastrophe events to assist Catastrophe Claims’ resources deployment, Catastrophe Reserving and communicate with Senior Management about the potential impact.
- Serve as a homeowner pricing manager for Mississippi for two years, with major responsibilities including:
 - Manage the development and implementation of rates and rules for several personal lines which satisfy the financial objectives of the enterprise.
 - Coordinate the analyses of actuarial ratemaking process
 - Review rate proposals.
 - Serve as a key Actuarial resource for Market Areas and regulators.

Actuarial/Statistics/Modeling Analyst

Jan 2001– Feb. 2005

- Conducted homeowner rate revisions for Maine, Kansas, and Mississippi.
- Developed and maintained State Farm’s rate revision tool for property lines.

Other Professional Activities

- 2015 – 2018, Commission Member, Industry Actuary, Florida Commission on

Hurricane Loss Projection Methodology (FCHLPM). I was appointed by Florida CFO Jeff Atwater to this position in Jan. 2015.

- 2010 – 2013, advisory group member to the Insurance Bureau of Canada (IBC) and Office of the Superintendent of Financial Institutions (OSFI) to provide expert opinions on a study for insurance and economic impact of major earthquakes in Canada.
- 2011- 2013, advisory group member for the Insurance Bureau of Canada (IBC) and Office of the Superintendent of Financial Institutions (OSFI) to revise OSFI Guideline B-9 (Earthquake Exposure Management Sound Practice Guideline for insurance companies).
- 2012-2016, organized nine State Farm senior executives delegation (including State Farm's CEO, COO, CFO, CMO, General Counsel, CTO, CSO) visits to China. Established relationship and set up meetings with Chinese regulators and senior executives of top Chinese insurance companies. Participated in discussions, served as advisor and interpreter for State Farm delegations.
- 2012-2018, visiting instructor for Illinois State University Math Department Actuarial Science program. Present catastrophe modeling and regularity topics to actuarial graduate students.
- 2014- 2018, board member of the International Society of Catastrophe Managers (ISCM). Promote education and career development for Catastrophe Modeling professionals.
- 2016- Present, co-chair of a taskforce to create a credential and certificate program for catastrophe risk management professionals on behalf of Institute of Casualty Actuarial Society (iCAS) and International Society of Catastrophe Managers (ISCM).
- 2016- 2023, Member of Property /Casualty Extreme Events Committee, American Academy of Actuaries. This committee identifies issues relevant to the treatment of extreme catastrophe risks including sizing, insurability, pricing, funding, reserving, capital management, and loss mitigation. The committee also monitors federal and state catastrophe legislation and interacts with NAIC on these issues.
- 2016 – 2018, member of planning committee for the Reinsurance Association of America's annual catastrophe modeling conference.
- 2016 – Present, member of CAS Climate Change Committee. This committee recommends, supports and performs research on climate change and assesses the potential risk management implications for the insurance industry.
- 2023, I was invited to participate in the Insurance, Climate and AI forum at the Kennedy School of Government, Harvard University. The forum was initiated by President Obama's advisor on Science and Technology, Dr. Daniel Schrag. I provided key insights from insurance perspectives during the forum.

Designations

- Fellow of Casualty Actuarial Society (FCAS, 2007)
- Certified Catastrophe Risk Management Professional (CCRMP, 2019)
- Associate of Society of Actuaries (ASA, 2010) Currently, I am not an active member at SOA.
- Member of American Academy of Actuaries (MAAA, 2005)
- Microsoft Certified Solution Developer (MCS D)
- Microsoft Certified Professional (MCP)

Education

- Master's degree in Computer Science, University of Missouri-Columbia, 2000
- Master's degree in Chemistry, Eastern Illinois University, 1997

- Bachelor's degree in Chemical Engineering, Beijing University of Chemical Technology, 1993

Award

- Special Achievement awards for excellent performance and exceptional business achievements, Property and Casualty Actuarial Department, State Farm Insurance in 2002, 2009, 2011, 2012, 2014, 2015, and 2016.
- Casualty Actuarial Society (CAS) Above and Beyond Achievement Award in 2019 to recognize my leadership role to establish Certified Catastrophe Risk Management Professional (CCRMP) designation for CAS Institute. The "Above & Beyond Achievement Award" is made annually, to one or more members of the CAS, who have made extraordinary contributions to the society.

Publications

- As a member of the American Academy of Actuaries Flood Working Group, I am one of the authors for the **Monograph on Issues Surrounding National Flood Insurance Program - The National Flood Insurance Program: Challenges and Solutions**. *American Academy of Actuaries*, April, 2017
- Akram Hazeen, Yan Zhang, **Minchong Mao**, Kraig A. Wheeler,a and Mark E. McGuire, 6-[(4-Hydroxy-phen-yl)diaz-enyl]-1,10-phenanthroline-1-ium chloride monohydrate, *US National Library of Medicine, National Institutes of Health (NIH)*, Dec. 1, 2011.
- As a member of the American Academy of Actuaries Flood Working Group, I am one of the authors of the following Monographs:

The National Flood Insurance Program: Challenges and Solutions (2017)
American Academy of Actuaries, April, 2017

Uses of Catastrophe Model Output (2018). American Academy of Actuaries, July, 2018

Wildfire: An Issue Paper - Lessons Learned from the 2017–2018 California Events (2019), American Academy of Actuaries, June, 2019

Reference

- Available upon request.

**NCRB CY 2022 Mobile Homeowners
Gross Modeled Hurricane Expected Losses
Including Cat LAE and Trend
Including Demand Surge and including Storm Surge**

Territory	MH(C)-A+D	MH(C)-B	MH(C)-C	MH(C)-Total	MH(F)-O	MH(F)-R	MH(F)-Total	MH C+F Total
110	92,185	6,027	23,688	121,900	1,698	4	180,734	302,634
120	268,190	15,484	48,180	331,854	19,547	7	1,366,856	1,698,710
130	163,347	13,811	44,499	221,657	3,264	2	365,413	587,070
140	1,164,004	88,963	178,627	1,431,594	26,972	46	2,823,318	4,254,912
150	586,864	54,971	125,184	767,019	3,602	13	555,358	1,322,377
160	557,434	50,804	78,462	686,700	4,161	5	602,726	1,289,426
170	137,145	13,877	13,801	164,823	586	1	128,239	293,063
180	1,278,716	125,935	131,035	1,535,687	8,126	86	1,227,261	2,762,948
190	724,158	81,986	79,373	885,517	5,852	78	767,771	1,653,288
200	285,172	24,555	27,477	337,204	4,431	NA	593,579	930,783
210	396,547	42,449	36,339	475,335	2,337	27	406,047	881,382
220	631,897	58,520	60,459	750,876	4,713	12	746,668	1,497,543
230	617,274	55,063	57,412	729,749	7,880	13	1,206,867	1,936,615
240	1,456,590	152,463	126,902	1,735,956	5,711	101	933,019	2,668,975
250	518,306	51,763	46,256	616,326	4,053	95	602,644	1,218,969
260	583,507	64,032	44,600	692,139	1,559	7	334,404	1,026,542
270	416,331	39,041	34,958	490,329	1,330	33	246,258	736,587
280	146,731	15,215	12,139	174,085	408	7	90,148	264,233
290	209,401	17,807	15,810	243,018	1,675	19	290,652	533,670
300	125,297	10,141	9,463	144,901	1,237	14	217,476	362,378
310	476,787	50,137	38,634	565,558	1,670	15	403,343	968,901
320	589,369	63,024	48,107	700,500	1,965	32	411,850	1,112,350
330	32,303	3,717	2,757	38,777	168	1	33,208	71,985
340	474,105	49,654	38,509	562,267	1,532	26	290,378	852,646
350	328,537	33,100	25,296	386,933	938	21	213,205	600,137
360	351,969	34,520	26,419	412,907	1,252	21	298,508	711,415
370	11,136	944	691	12,772	41	0	10,736	23,508
380	61,532	5,387	4,042	70,961	146	1	41,787	112,748
390	46,777	4,552	3,206	54,535	150	2	36,445	90,980
Total	12,731,612	1,227,943	1,382,323	15,341,878	117,006	691	15,424,897	30,766,775

Modeled hurricane expected losses for North Carolina Rate Bureau, net of limits and deductibles. Results include demand surge and storm surge. Losses represent 50/50 blend of AIRv10 100k Standard event set and RMSv23 Historical event set. Results also include provisions for LAE and loss trend.



ACTUARIAL STANDARDS BOARD

**Actuarial Standard
of Practice
No. 38**

Revised Edition

**Catastrophe Modeling
(for All Practice Areas)**

**Developed by the
Catastrophe Modeling Task Force of the
General Committee of the
Actuarial Standards Board**

**Adopted by the
Actuarial Standards Board
July 2021**

Doc. No. 201

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July 2021

TO: Members of Actuarial Organizations Governed by the Standards of Practice of the Actuarial Standards Board and Other Persons Interested in Catastrophe Modeling (for All Practice Areas)

FROM: Actuarial Standards Board (ASB)

SUBJ: Actuarial Standard of Practice (ASOP) No. 38

This document contains the revision of ASOP No. 38, *Catastrophe Modeling (for All Practice Areas)*.

History of the Standard

The ASB first began work on a standard for modeling in the late 1990s. Motivated primarily to address the role catastrophe modeling of earthquakes and hurricanes played in casualty ratemaking, this work was focused on the use of specialized models where the actuary would have to rely on a model that was developed by professionals other than actuaries. As a result of this work, the ASB approved ASOP No. 38, *Using Models Outside the Actuary's Area of Expertise*, in June 2000 with the scope of the standard limited to the Property/Casualty area of practice. At the time, this was the only ASOP that specifically addresses modeling.

Over the ensuing years, the number and importance of modeling applications in actuarial science has increased, with the results of actuarial models often entering financial statements directly. Recognizing this trend, the ASB asked the Life Committee in 2010 to begin work on an ASOP focused on modeling. The Life Committee formed a task force to address this issue and, in February 2012, a discussion draft titled *Modeling in Life Insurance and Annuities* was released. Nineteen comment letters were received.

Based upon this feedback and numerous other discussions on the topic of modeling, in December 2012 the ASB created two multidisciplinary task forces under the direction of the General Committee: i) a general Modeling Task Force, charged with developing an ASOP to address modeling applications in all practice areas, and ii) a Task Force to consider expanding ASOP No. 38 to all practice areas while focusing exclusively on using catastrophe models.

An exposure draft titled *Modeling* was released in June 2013 with a scope that provides guidance to actuaries when selecting, designing, building, modifying, developing, or using models when performing actuarial services. ASOP No. 56, *Modeling*, was adopted by the ASB in December 2019. Changes have been made to this exposure draft of ASOP No. 38 to be consistent with ASOP No. 56 and other recent ASOPs.

The exposure draft of this revision of ASOP No. 38 was the work of the Catastrophe Modeling Task Force, whose membership has experience in life insurance, health insurance, property/casualty insurance, and enterprise risk management.

At the direction of the ASB, this standard was developed to apply to all practice areas and all forms of catastrophe models, including natural catastrophes such as hurricanes, earthquakes, and severe convective storms, and other catastrophes such as terrorist acts and pandemics.

Exposure Draft

The exposure draft was approved in September 2020 with a comment deadline of January 15, 2021. Four comment letters were received and considered in making changes that were reflected in the final ASOP.

Notable Changes from the Exposure Draft

Notable changes made to the exposure draft are summarized below. Additional changes were made to improve readability, clarity, or consistency.

1. Section 1.2, Scope, was revised to provide additional guidance to actuaries whose actuarial services involve reviewing or evaluating models.
2. In section 2, Definitions, the definition of “catastrophe model” was expanded to include a definition of model.
3. Section 3.2, Appropriate Reliance on Experts (now titled Catastrophe Models Developed by Experts), was revised to adopt language from ASOP No. 56, section 3.5(b).
4. An existing ASOP No. 38 example regarding validation to evaluate results derived from other models was reinserted into section 3.5.
5. A disclosure requirement for the extent of reliance on experts was added to section 4.1(b) and (c).

Notable Changes from the Existing ASOP

A cumulative summary of the notable changes from the existing ASOP are summarized below. Notable changes do not include additional changes made to improve readability, clarity, or consistency.

1. The ASOP was revised to apply to catastrophe models only and to all practice areas.
2. The scope was expanded to include the activities “selecting, reviewing, and evaluating” models in addition to the existing activity of “using” a model when performing actuarial services.
3. The scope was expanded to clarify that if the actuary determines that the guidance in the ASOP conflicts with the guidance in ASOP No. 56, the guidance of this ASOP will govern.

4. A new section specifically addressing reliance on data or other information supplied by others (section 3.8) was added.
5. The guidance on documentation (section 3.9) was updated and expanded to be consistent with current ASOPs.

The ASB thanks everyone who took the time to contribute comments and suggestions on the exposure draft.

The ASB would like to posthumously thank Martin M. Simons for his contribution to the ASOP No. 38 task force.

The ASB voted in July 2021 to adopt this standard.

Catastrophe Modeling Task Force

Shawna S. Ackerman, Chairperson

David A. Brentlinger

Bradley J. Davis

General Committee of the ASB

Susan E. Pantely, Chairperson

Geoff Bridges

Brian J. Mullen

Andrew M. Erman

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Darrell D. Knapp, Chairperson

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Robert M. Damler

Kathleen A. Riley

Kevin M. Dyke

Judy K. Stromback

David E. Neve

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The Actuarial Standards Board (ASB) sets standards for appropriate actuarial practice in the United States through the development and promulgation of Actuarial Standards of Practice (ASOPs). These ASOPs describe the procedures an actuary should follow when performing actuarial services and identify what the actuary should disclose when communicating the results of those services.

ACTUARIAL STANDARD OF PRACTICE NO. 38

**CATASTROPHE MODELING
(FOR ALL PRACTICE AREAS)**

STANDARD OF PRACTICE

Section 1. Purpose, Scope, Cross References, and Effective Date

- 1.1 Purpose—This actuarial standard of practice (ASOP or standard) provides guidance to actuaries when performing actuarial services with respect to selecting, using, reviewing, or evaluating **catastrophe models**.
- 1.2 Scope—This ASOP applies to actuaries in any practice area when performing actuarial services with respect to selecting, using, reviewing, or evaluating **catastrophe models** to assess risk, including but not limited to **models** of hurricanes, earthquakes, severe convective storms, terrorist acts, and pandemics. This standard applies to the selection, use, review, or evaluation of **catastrophe models**, whether or not they are proprietary in nature.

If the actuary's actuarial services involve reviewing or evaluating **catastrophe models**, the reviewing or evaluating actuary should apply the guidance in this standard to the extent practicable within the scope of the actuary's assignment.

In addition to this standard, the actuary should follow the guidance in ASOP No. 56, *Modeling*, when selecting, using, reviewing, or evaluating **catastrophe models**. If the actuary determines that the guidance in this ASOP conflicts with the guidance in ASOP No. 56, the guidance of this ASOP will govern.

This standard does not apply to **models** of operational risks. This standard also does not apply to **models** of economic risks that deal with instances of extreme events such as hyperinflation or a stock market collapse.

This standard also does not apply when the actuary is only designing, developing, or modifying a **catastrophe model** (or a portion of a **catastrophe model**).

If the actuary departs from the guidance set forth in this ASOP in order to comply with applicable law (statutes, regulations, and other legally binding authority), or for any other reason, the actuary should refer to section 4. If a conflict exists between this standard and applicable law, the actuary should comply with applicable law.

- 1.3 Cross References—When this ASOP refers to the provisions of other documents, the reference includes the referenced documents as they may be amended or restated in the future, and any successor to them, by whatever name called. If any amended or restated document differs materially from the originally referenced document, the actuary should consider the guidance in this ASOP to the extent it is applicable and appropriate.
- 1.4 Effective Date—This standard is effective for work performed on or after December 1, 2021.

Section 2. Definitions

The terms below are defined for use in this actuarial standard of practice and appear in bold throughout the ASOP.

- 2.1 Assumption—A type of explicit **input** to a **catastrophe model** that is derived from **data**, represents possibilities based on professional judgment, or may be prescribed by law or others. When derived from **data**, an **assumption** may be statistical, financial, economic, mathematical, or scientific in nature, and may be described as a **parameter**.
- 2.2 Catastrophe Model—A **model** of low-frequency events with high-severity or widespread potential effects. **Catastrophe models** may be used to explain a system, to study effects of different components, or to derive estimates.
- 2.3 Data—Facts or information that are either direct **input** to a **catastrophe model** or inform the selection of **input**. **Data** may be collected from sources such as records, experience, experiments, surveys, observations, benefit plan or policy provisions, or **output** from other **models**.
- 2.4 Expert—One who is qualified by knowledge, skill, experience, training, or education to render an opinion concerning the matter at hand.
- 2.5 Input—**Data** or **assumptions** used in a **catastrophe model** to produce **output**.
- 2.6 Intended Purpose—The goal or question, whether generalized or specific, addressed by the **catastrophe model** within the context of the assignment.
- 2.7 Model—A simplified representation of relationships among real world variables, entities, or events using statistical, financial, economic, mathematical, non-quantitative, or scientific concepts and equations. A **model** consists of three components: an information **input** component, which delivers **data** and **assumptions** to the **model**; a processing

component, which transforms **input** into **output**; and a results component, which translates the **output** into useful business information.

- 2.8 Output—The results of the **catastrophe model** including, but not limited to, point estimates, likely or possible ranges, and **data** or **assumptions** (as **input** for other **models**), behavioral expectations, or qualitative criteria on which decisions could be based.
- 2.9 Parameter—A type of statistical, financial, economic, mathematical, or scientific value that is used as **input** to **catastrophe models**. Examples of **parameters** include expected values in probability distributions and coefficients of formula variables.

Section 3. Analysis of Issues and Recommended Practices

- 3.1 Introduction—In performing actuarial services, the actuary may find it appropriate to select, use, review, or evaluate **catastrophe models**. When selecting, using, reviewing or evaluating a **catastrophe model**, the actuary should do the following:
- a. determine the appropriate level of reliance on **experts**;
 - b. have a basic understanding of the **catastrophe model**;
 - c. evaluate whether the **catastrophe model** is appropriate for the **intended purpose**;
 - d. determine that appropriate validation of the **catastrophe model** and **output** has occurred; and
 - e. determine the appropriate use of the **catastrophe model** and **output**.

The actuary's level of effort in understanding and evaluating a **catastrophe model** should be consistent with the **intended purpose** and the **catastrophe model output's** materiality to the results of the actuarial analysis.

- 3.2 Catastrophe Models Developed by Experts—When selecting, using, reviewing, or evaluating a **catastrophe model** developed by **experts**, the actuary should take into account the following:
- a. whether the individual or individuals who developed the **catastrophe model** are **experts** in the applicable field;
 - b. the extent to which the **catastrophe model** has been reviewed or validated by **experts** in the applicable field, including known differences of opinion among

experts concerning aspects of the **catastrophe model** that could be material to the actuary's use of the **catastrophe model**; and

- c. whether there are industry or regulatory standards that apply to the **catastrophe model** or to the testing or validation of the **catastrophe model**, and whether the **catastrophe model** has been certified as having met such standards.

The actuary may rely on **experts** in the applicable field in the evaluation of items in section 3.2(a)-(c) and should disclose the extent of such reliance.

- 3.3 Understanding of the Catastrophe Model—The actuary should be familiar with the basic components of the **catastrophe model** and understand both the user **input** and the **catastrophe model output**, as discussed below.

- 3.3.1 Catastrophe Model Components—The actuary should be familiar with the basic components of the **catastrophe model** and have an understanding of how such components interrelate within the **catastrophe model**. In addition, the actuary should identify which fields of expertise were used in developing or updating the **catastrophe model** and should make a reasonable effort to determine if the **catastrophe model** is based on generally accepted practices within the applicable fields of expertise. The actuary should also be familiar with how the **catastrophe model** was tested or validated and the level of independent **expert** review and testing.

- 3.3.2 User Input—The actuary should take reasonable steps to confirm that the precision and accuracy of the user **input** are consistent with the **intended purpose** and should refer, as applicable, to ASOP No. 23, *Data Quality*, when selecting, using, or evaluating **data** used in the **catastrophe model**. Certain user **input** may be required to produce **catastrophe model output** for the specific application. User **input** can include **assumptions** or **data**. If the **catastrophe model** requires user **input**, the actuary should evaluate the reasonableness of the user **input** and should have an understanding of the relationship between the user **input** and **catastrophe model output**.

- 3.3.3 Catastrophe Model Output—The actuary should determine that the **catastrophe model output** is consistent with the **intended purpose**.

- 3.4 Appropriateness of the Catastrophe Model for the Intended Purpose—The actuary should evaluate whether the **catastrophe model** is appropriate for the **intended purpose** and take into account the following:

- 3.4.1. Applicability of Historical Data—To the extent historical **data** are used in the development of the **catastrophe model** or the establishment of **catastrophe model parameters**, the actuary should take into account the adequacy of the historical **data** in representing the range of reasonably expected outcomes consistent with current knowledge about the phenomena being analyzed.
- 3.4.2. Developments in Relevant Fields—The actuary should make a reasonable effort to be aware of significant developments in relevant fields of expertise that are likely to materially affect the **catastrophe model**.
- 3.5 Output Validation— The actuary should validate that the **output** reasonably represents that which is being modeled. Depending on the **intended purpose**, **output** validation may include the following:
- a. comparing **output** to those of an alternative **model(s)**, where appropriate;
 - b. comparing the **output** produced by the **catastrophe model** with historical observations, if applicable;
 - c. comparing the consistency and reasonableness of relationships within the **output**; and
 - d. evaluating the reasonableness of changes in the **output** due to variations in the user **input**.
- 3.6 Appropriate Use of the Catastrophe Model and Output—The actuary should evaluate the reasonableness of the **catastrophe model output**, considering the **input** and the **intended purpose**. The actuary should take into account the limitations of the **catastrophe model** and use professional judgment to determine whether it is appropriate to use the **catastrophe model output**. The actuary should also use professional judgment to determine whether any adjustments to the **catastrophe model output** are needed to meet the **intended purpose**. The actuary should disclose any such adjustments in accordance with section 4.1.
- 3.7 Reliance on Another Actuary—The actuary may rely on another actuary who has selected, used, reviewed, or evaluated the **catastrophe model**. However, the relying actuary should be reasonably satisfied that the other actuary is qualified to select, use, review, or evaluate the **catastrophe model** in accordance with applicable ASOPs, and the **catastrophe model** is appropriate for the **intended purpose**. The actuary should disclose the extent of any such reliance.

- 3.8 Reliance on Data or Other Information Supplied by Others—When relying on **data** or other information supplied by others, the actuary should refer to ASOP No. 23 and ASOP No. 41, *Actuarial Communications*, for guidance.
- 3.9 Documentation—The actuary should consider preparing and retaining documentation to support compliance with the requirements of section 3 and the disclosure requirements of section 4. If preparing documentation, the actuary should prepare such documentation in a form such that another actuary qualified in the same practice area could assess the reasonableness of the actuary's work and should document the steps taken to comply with this standard in light of proprietary aspects of the **catastrophe model**, if any. The degree of such documentation should be based on the professional judgment of the actuary and may vary with the complexity and purpose of the actuarial services. In addition, the actuary should refer to ASOP No. 41 for guidance related to the retention of file material other than that which is to be disclosed under section 4.

Section 4. Communications and Disclosures

- 4.1 Required Disclosures in an Actuarial Report—When issuing an actuarial report to which this standard applies, the actuary should refer to ASOP Nos. 23, 41, and 56. In addition, the actuary should disclose the following in such actuarial reports, as appropriate:
- a. the **catastrophe model** used and the **intended purpose**;
 - b. the methodology used to validate the **catastrophe model** developed by **experts** (see section 3.2);
 - c. the extent of reliance on **experts** (see section 3.2);
 - d. a description of the user **input** that was incorporated into the **catastrophe model** (see section 3.3.2);
 - e. a description of adjustments made to the **catastrophe model output** (see section 3.6); and
 - f. the extent of any reliance placed upon the work of another actuary (see section 3.7).
- 4.2 Additional Disclosures in an Actuarial Report—The actuary also should include disclosures in accordance with ASOP No. 41 in an actuarial report for the following circumstances:
- a. if any material **assumption** or method was prescribed by applicable law;

- b. if the actuary states reliance on other sources and thereby disclaims responsibility for any material **assumption** or method selected by a party other than the actuary; and
 - c. if in the actuary's professional judgment, the actuary has deviated materially from the guidance of this ASOP.
- 4.3 Confidential Information—Nothing in this ASOP is intended to require the actuary to disclose confidential information.

Appendix 8

Background and Current Practices

Note: This appendix is provided for informational purposes and is not part of the standard of practice.

Background

Hurricane Andrew in 1992 and the Northridge Earthquake in 1994 led actuaries involved in evaluating hurricane and earthquake exposures to recognize the severe inadequacy of the traditional, empirical actuarial methods used for ratemaking for these exposures. Recognizing the need to replace these methods, many actuaries began using stochastic computer simulation models for their actuarial analysis of hurricane and earthquake exposure. Computer simulation models had been commonly used for some time by actuaries and others for the purpose of evaluating probable maximum loss but had not been widely used for ratemaking.

Over time, the output from catastrophe models became commonly used by property/casualty actuaries in developing rates for catastrophic perils as well as many other risk management purposes.

Current Practices

Catastrophe models are now widely used by actuaries in all practice areas for risk management analyses and calculating expected losses due to hurricanes, earthquakes, and terrorist acts. More recently, catastrophe models have also been developed to simulate wildfires, severe convective storms, tsunamis, and pandemics.

In addition, due to changes in regulations and financial reporting requirements, the number and importance of modeling applications in actuarial science has increased, with the results of actuarial models often entering financial statements directly.

Lastly, due to the evolution of enterprise risk management (ERM) practices and regulations, there has been increased use of catastrophe modeling as part of insurer stress testing and risk management across all practice areas. This trend is likely to continue to evolve and heighten in light of the emergence of the novel coronavirus and the COVID-19 pandemic.

Appendix 2

Comments on the Exposure Draft and Responses

The exposure draft of the proposed revision of ASOP No. 38, *Catastrophe Modeling (for All Practice Areas)*, was issued in September 2020 with a comment deadline of January 15, 2021. Four comment letters were received, some of which were submitted on behalf of multiple commentators, such as by firms or committees. For purposes of this appendix, the term “commentator” may refer to more than one person associated with a particular comment letter. The ASOP No. 38 Task Force carefully considered all comments received, and the ASB reviewed (and modified, where appropriate) the changes proposed by the ASOP No. 38 Task Force and the ASB General Committee.

Summarized below are the significant issues and questions contained in the comment letters and the responses. Minor wording or punctuation changes that were suggested but not significant are not reflected in the appendix, although they may have been adopted.

The term “reviewers” in appendix 2 includes the ASOP No. 38 Task Force, the ASB General Committee, and the ASB. Also, the section numbers and titles used in appendix 2 refer to those in the exposure draft, which are then cross referenced with those in the final ASOP.

SECTION 1. PURPOSE, SCOPE, CROSS REFERENCES, AND EFFECTIVE DATE	
Section 1.2, Scope	
Comment	One commentator requested a clearer definition of what is excluded from the scope of ASOP No. 38, noting that catastrophe models can be used to infer economic impacts beyond direct claims and that novel catastrophic perils may fall into a gray area in which ASOP No. 38 may or may not apply.
Response	The reviewers believe the guidance is appropriate and made no change in response to this comment. The reviewers note that section 1.2 does not limit the reason why a catastrophe model is used to perform actuarial services or whether the catastrophe model is a mature or novel catastrophe model.
Comment	One commentator suggested that section 1.2 should state that the guidance in the standard applies to the extent practicable within the scope of the actuary’s assignment when the actuary is reviewing or evaluating a catastrophe model.
Response	The reviewers agree and made the change.
Comment	One commentator suggested that “review or evaluation” be removed from the scope of the standard or alternatively that the scope be changed to exclude an actuary performing a regulatory review.
Response	The reviewers believe the revised guidance is appropriate and made no change in response to this comment.

Comment	One commentator recommended that section 1.2 should state that the application of the standard be based on the actuary’s professional judgement as to the materiality of the model output for the intended user.
Response	The reviewers believe the guidance is appropriate and made no change in response to this comment. The reviewers note that section 3.1 addresses materiality.
Comment	One commentator recommended that section 1.2 should state that the guidance in the standard applies only to the extent of the actuary’s responsibilities and adopt the language from ASOP No. 56 section 1.2.
Response	The reviewers believe the guidance is appropriate and made no change in response to this comment.
Comment	One commentator suggested that the scope of the standard be expanded to include elements similar to ASOP No. 56.
Response	The reviewers believe the revised guidance is appropriate and made no change in response to this comment.
Comment	Several commentators questioned what constituted a conflict between ASOP No. 38 and ASOP No. 56 versus what constituted a difference and asked how potential conflicts are meant to be resolved.
Response	The reviewers believe the revised guidance is appropriate and made no change in response to this comment. The reviewers note that ASOP No. 1, <i>Introductory Standard of Practice</i> , section 4.4, states, “When an actuary believes that multiple ASOPs have conflicting provisions when applied to a specific situation and none provide explicit guidance concerning which governs, the actuary should apply professional judgment and may wish to contact the ABCD for confidential guidance on appropriate practice.”
SECTION 2. DEFINITIONS	
Section 2.2, Catastrophe Model	
Comment	Two commentators suggested clarifying the definition of catastrophe model.
Response	The reviewers agree and made changes similar to those suggested by the commentators to improve clarity.
Comment	One commentator suggested a definition for “model” be added to ASOP No. 38.
Response	The reviewers agree and made the change.
SECTION 3. ANALYSIS OF ISSUES AND RECOMMENDED PRACTICES	
Section 3.1, Introduction	
Comment	One commentator suggested that the use of the term “validation” used in sections 3.1(d) and 3.5 be clarified to distinguish if the terms are being used differently.
Response	The reviewers believe the guidance is appropriate and made no change in response to this comment. The reviewers note section 3.1 introduces validation and section 3.5 provides details on the validation of catastrophe model output.

Section 3.2, Appropriate Reliance on Experts (now titled Catastrophe Models Developed by Experts)	
Comment	One commentator recommended changing “should consider” to “may consider” regarding the appropriate level of reliance on experts to be consistent with the corresponding language in ASOP No. 56, section 3.5.
Response	The reviewers believe the guidance is appropriate and made no change in response to this comment.
Comment	One commentator recommended changing the language in section 3.2(b) to mirror ASOP No. 56, section 3.5(b).
Response	The reviewers agree and made the change.
Comment	One commentator noted that this section, does not include the language of ASOP No. 56, section 3.5(d), which considers whether the science underlying the expertise is likely to produce useful models for the intended purpose.
Response	The reviewers believe the guidance is appropriate and made no change in response to this comment.
Comment	One commentator recommended that ASOP No. 38 be expanded to require disclosure of reliance on experts.
Response	The reviewers agree and made the change.
Comment	One commentator suggested that the ASOP be expanded to explicitly allow reliance on an expert to select, use, review, or evaluate the catastrophe model.
Response	The reviewers believe the guidance is appropriate and consistent with the suggestion, and made no change in response to this comment.
Section 3.5, Appropriate Validation (now titled Output Validation)	
Comment	One commentator requested that results derived from alternate models or methods, where available and appropriate, which is part of current ASOP No. 38, be added.
Response	The reviewers partially agree and modified the language.
Section 3.7, Reliance on Another Actuary	
Comment	One commentator suggested that ASOP No. 56 be added to the requirements for reliance on another actuary.
Response	The reviewers believe the revised guidance is appropriate and made no change in response to this comment.



Statement of Compliance with Actuarial Standard of Practice 38

Minchong Mao, FCAS, MAAA

Background

Actuarial Standard of Practice 38 provides guidance to the actuary in using models that incorporate specialized knowledge outside the actuary's own area of expertise when developing an actuarial work product. When using such a model, the standard requires that the actuary perform five specific tasks, as described below using the numbering system of the standard. This document certifies that Minchong Mao, FCAS, MAAA, has performed these tasks for the catastrophe loss model(s) relied upon in the actuarial work product to which it is attached. It is intended that actuaries utilizing the actuarial work product in their insurance ratemaking efforts can rely on my model evaluation in accordance with Section 3.7 of the standard of practice. In July 2021, Actuarial Standards Board(ASB) adopted revision of ASOP No. 38. This document reflected the most current requirements in the 2021 revision.

Model Versions Covered by this document

- AIR Hurricane model for the United States v18 utilized in Touchstone versions 2020 (TS V8), 2021 (TS V9) and later, released in 2021
- AIR Severe Thunderstorm Model for the United States implemented in Touchstone version 10 and later, released in 2022
- AIR Winter Storm Model for the United States v1.5 implemented in Touchstone version 5, 6, 7, 8, 9,10 and later
- AIR Wildfire Model for the United States v2 implemented in Touchstone version 6, 7, 8, 9,10 and later
- AIR Earthquake and Fire Following Model for the United States v10.1 implemented in Touchstone version 6, 7, 8, 9,10 and later. This version included Time Dependent Earthquake Hazard Adjustment.

3.2 Appropriate Reliance on Experts

Catastrophe Models Developed by Experts—When selecting, using, reviewing, or evaluating a catastrophe model developed by experts, the actuary should take into account the following:

- a. whether the individual or individuals who developed the catastrophe model are experts in the applicable field;*
- b. the extent to which the catastrophe model has been reviewed or validated by experts concerning aspects of the catastrophe model that could be material to the actuary's use of the catastrophe model;*
and



c. whether there are industry or regulatory standards that apply to the catastrophe model or to the testing or validation of the catastrophe model, and whether the catastrophe model has been certified as having met such standards.

For those aspects of the model that are outside my area of expertise, I have relied on the list of experts provided by the modeler. Please see the modeler's ASOP 38 document and supporting documentation for additional information.

a. The individuals listed as employees of the modeler appear to be experts in their respective fields.

b. The modeler has provided documentation of reviews by outside experts. Many of these reviewers are well-recognized experts in their fields. I have reviewed the findings of the outside experts and found no significant differences of opinion with respect to the validity of the model.

c. Standards for catastrophe loss models have been promulgated by a few states. Most notably, the Florida Commission on Hurricane Loss Projection Methodology was created to review catastrophe loss models. The model(s) used in this work product, or derivatives thereof, have been certified by the Florida Commission on Hurricane Loss Projection Methodology.

3.3 Understanding of the Model

The actuary should be familiar with the basic components of the catastrophe model and understand both the user input and the catastrophe model output, as discussed below.

I have reviewed the modeler's ASOP 38 document and supporting documentation describing the model's components, input, and output, as well as other documentation, to comply with this requirement. In addition, I have specialized in actuarial applications of catastrophe model output since 2005.

3.3.1 Catastrophe Model Components—The actuary should be familiar with the basic components of the catastrophe model and have an understanding of how such components interrelate within the catastrophe model. In addition, the actuary should identify which fields of expertise were used in developing or updating the catastrophe model and should make a reasonable effort to determine if the catastrophe model is based on generally accepted practices within the applicable fields of expertise. The actuary should also be familiar with how the catastrophe model was tested or validated and the level of independent expert review and testing.

I am reasonably familiar with the basic components of the model and have a basic understanding of how such components interrelate within the model. I have identified the fields of expertise used in developing and updating the model and have determined that the model is based on generally accepted practices within the applicable fields of expertise. I am reasonably familiar with how the model was validated and have reviewed the documentation of reviews by outside experts.

3.3.2 User Input—The actuary should take reasonable steps to confirm that the precision and accuracy of the user input are consistent with the intended purpose and should refer, as applicable, to ASOP No. 23, Data Quality, when selecting, using, or evaluating data used in the catastrophe model. Certain user input may be required to produce catastrophe model output for the specific application. User input can include assumptions or data. If the catastrophe model requires user input, the actuary should evaluate the reasonableness of the user input and should have an understanding of the relationship between the user input and catastrophe model output.



I understand the user input required to produce model output, including the level of detail required to produce results that are consistent with insurance ratemaking and risk management applications.

3.3.3 Catastrophe Model Output—The actuary should determine that the catastrophe model output is consistent with the intended purpose.

I have determined that the model output is consistent with the insurance ratemaking applications for which it was used. We most often use event loss detail in our work, so we are always careful that our results balance to the model's prepared exhibits.

3.4 Appropriateness of the Model for the Intended Application

The actuary should evaluate whether the catastrophe model is appropriate for the intended purpose and take into account the following:

3.4.1. Applicability of Historical Data—To the extent historical data are used in the development of the catastrophe model or the establishment of catastrophe model parameters, the actuary should take into account the adequacy of the historical data in representing the range of reasonably expected outcomes consistent with current knowledge about the phenomena being analyzed.

3.4.2. Developments in Relevant Fields—The actuary should make a reasonable effort to be aware of significant developments in relevant fields of expertise that are likely to materially affect the catastrophe model.

The catastrophe model(s) we have relied upon were developed for purposes related to the management of risk. I have evaluated the model(s) in light of available alternatives and determined that the catastrophe loss model is the most appropriate method of estimating expected catastrophe loss distributions for insurance ratemaking.

Some additional considerations include the following:

3.4.1. Applicability of Historical Data: Historical data is relied upon extensively in the development and validation of catastrophe loss models. Smoothing procedures are applied in cases where reasonably foreseeable events are underrepresented in the historical data.

3.4.2. Developments in Relevant Fields: Catastrophe loss models are typically updated on an annual basis in order to incorporate the most current scientific research and information from recent catastrophe events.

I have made a reasonable effort to be aware of significant developments in the relevant fields of expertise. In particular, meteorological studies related to the current period of elevated hurricane activity are important in determining which of a model's frequency assumptions should be utilized in insurance ratemaking applications involving hurricane-exposed risk portfolios. Aon maintains a documentation library containing current research in the science of catastrophe perils.



3.5 Output Validation

The actuary should validate that the output reasonably represents that which is being modeled. Depending on the intended purpose, output validation may include the following:

- a. comparing output to those of an alternative model(s), where appropriate;*
- b. comparing the output produced by the catastrophe model with historical observations, if applicable;*
- c. comparing the consistency and reasonableness of relationships within the output; and*
- d. evaluating the reasonableness of changes in the output due to variations in the user input.*

a. Aon conducts extensive testing of each model that we license whenever a new model is released. Output from Model output is checked for reasonability against other models and for consistency with the modeler's representations as to changes incorporated in the current version. I have reviewed the results of these tests and found the model used in this analysis to provide reasonable output.

b. Catastrophes, by their nature, involve significant uncertainty in the amount of insured losses they produce. In light of this uncertainty, the model has been shown to produce reasonable estimates of losses incurred from historical events.

I have reviewed the modeler's ASOP 38 document and supporting documentation describing comparisons of model output to historical observations and found that the model produces reasonable estimates.

c. I have reviewed the relationships among output results and found them to be consistent and reasonable.

d. Aon conducts extensive testing of each model that we license with respect to the sensitivity of model output to variations in the user input and model assumptions. I have reviewed the results of these tests and obtained an understanding of the model's sensitivity.

3.6 Appropriate Use of the Model

The actuary should evaluate the reasonableness of the catastrophe model output, considering the input and the intended purpose. The actuary should take into account the limitations of the catastrophe model and use professional judgment to determine whether it is appropriate to use the catastrophe model output. The actuary should also use professional judgment to determine whether any adjustments to the catastrophe model output are needed to meet the intended purpose. The actuary should disclose any such adjustments in accordance with section 4.1.

In my professional judgment, it is appropriate to use the model results, without adjustment, for the purposes of the actuarial work product to which this document is attached.



3.7 Reliance on Another Actuary

The actuary may rely on another actuary who has selected, used, reviewed, or evaluated the catastrophe model. However, the relying actuary should be reasonably satisfied that the other actuary is qualified to select, use, review, or evaluate the catastrophe model in accordance with applicable ASOPs, and the catastrophe model is appropriate for the intended purpose. The actuary should disclose the extent of any such reliance.

Actuaries utilizing the actuarial work product to which this document is attached can rely on my complete evaluation of the model(s) used as described above. In doing so, they should document the extent of such reliance in their work.

3.8 Reliance on Data or Other Information Supplied by Others

When relying on data or other information supplied by others, the actuary should refer to ASOP No. 23 and ASOP No. 41, Actuarial Communications, for guidance.

We have discussed the treatment of exposure data in 3.3.2, we have reviewed the cat modelers' data quality and investigation procedures and can attest to their procedures being in compliance with ASOP No. 23, Data Quality. We have properly communicated ASOP reviews with internal and external stakeholders, we can attest that we are in compliance with ASOP No. 41.

3.9 Documentation

The actuary should consider preparing and retaining documentation to support compliance with the requirements of section 3 and the disclosure requirements of section 4. If preparing documentation, the actuary should prepare such documentation in a form such that another actuary qualified in the same practice area could assess the reasonableness of the actuary's work and should document the steps taken to comply with this standard in light of proprietary aspects of the catastrophe model, if any.

The degree of such documentation should be based on the professional judgment of the actuary and may vary with the complexity and purpose of the actuarial services. In addition, the actuary should refer to ASOP No. 41 for guidance related to the retention of file material other than that which is to be disclosed under section 4.

We have retained documentation to support compliance with the requirements of section 3 and the disclosure requirements of section 4 in separate trade secret documents. The sensitivity testing to support section 3 involves detailed model results from several commercial vendors. Aon is required by our license agreements to protect modeling vendors' intellectual properties. The steps of Aon's ASOP 38 compliance work follow the ASOP 38 outline. I can attest that we are in compliance with ASOP No. 41.



Minchong Mao FCAS, MAAA

A handwritten signature in black ink, appearing to read "Minchong Mao".

May 2023



Statement of Compliance with Actuarial Standard of Practice 38

Minchong Mao, FCAS, MAAA

Background

Actuarial Standard of Practice 38 provides guidance to the actuary in using models that incorporate specialized knowledge outside the actuary's own area of expertise when developing an actuarial work product. When using such a model, the standard requires that the actuary perform five specific tasks, as described below using the numbering system of the standard. This document certifies that Minchong Mao, FCAS, MAAA, has performed these tasks for the catastrophe loss model(s) relied upon in the actuarial work product to which it is attached. It is intended that actuaries utilizing the actuarial work product in their insurance ratemaking efforts can rely on my model evaluation in accordance with Section 3.7 of the standard of practice.

Model Versions Covered by this document

- RMS North Atlantic Hurricane Model v23, released in 2023, implemented in RiskLink V23
- RMS North America Earthquake Model v17.0, released in 2017, implemented in RiskLink V17, V18, V18.1, V21, V23
- RMS Sever Convective Strom Model for the United States, released in 2014, implemented in RiskLink V17, V18, V18.1, V21, V23
- RMS Winter Storm Model for the United States, release in 2022, implemented in RiskLink V22, V23

3.2 Appropriate Reliance on Experts

An actuary may rely on experts concerning those aspects of a model that are outside of the actuary's own area of expertise. The experts relied upon may either be the experts who provided the model or other experts.

For those aspects of the model that are outside my area of expertise, I have relied on the list of experts provided by the modeler. Please see the modeler's ASOP 38 document and supporting documentation for additional information.

In determining the appropriate level of reliance, the actuary should consider the following:

a. whether the individual or individuals upon whom the actuary is relying are experts in the applicable field;

The individuals listed as employees of the modeler appear to be experts in their respective fields.

b. the extent to which the model has been reviewed or opined on by experts in the applicable field, including any known significant differences of opinion among experts concerning aspects of the model that could be material to the actuary's use of the model; and



The modeler has provided documentation of reviews by outside experts. Many of these reviewers are well-recognized experts in their fields. I have reviewed the findings of the outside experts and found no significant differences of opinion with respect to the validity of the model.

c. whether there are standards that apply to the model or to the testing or validation of the model, and whether the model has been certified as having met such standards.

Standards for catastrophe loss models have been promulgated by a few states. Most notably, the Florida Commission on Hurricane Loss Projection Methodology was created to review catastrophe loss models. The model(s) used in this work product, or derivatives thereof, have been certified by the Florida Commission on Hurricane Loss Projection Methodology.

3.3 Understanding of the Model

The actuary should be reasonably familiar with the basic components of the model and understand both the user input and the model output, as discussed below.

I have reviewed the modeler's ASOP 38 document and supporting documentation describing the model's components, input, and output, as well as other documentation, to comply with this requirement. In addition, I have specialized in actuarial applications of catastrophe model output since 2005.

3.3.1 Model Components—The actuary should be reasonably familiar with the basic components of the model and have a basic understanding of how such components interrelate within the model. In addition, the actuary should identify which fields of expertise were used in developing or updating the model, and should make a reasonable effort to determine if the model is based on generally accepted practices within the applicable fields of expertise. The actuary should also be reasonably familiar with how the model was tested or validated and the level of independent expert review and testing.

I am reasonably familiar with the basic components of the model and have a basic understanding of how such components interrelate within the model. I have identified the fields of expertise used in developing and updating the model and have determined that the model is based on generally accepted practices within the applicable fields of expertise. I am reasonably familiar with how the model was validated and have reviewed the documentation of reviews by outside experts.

3.3.2 User Input—Certain user input may be required to produce model output for the specific application. The actuary should understand the user input that is required to produce the model output. This understanding includes the level of detail required in the user input to produce results that are consistent with the intended use of the model.

I understand the user input required to produce model output, including the level of detail required to produce results that are consistent with insurance ratemaking and risk management applications.

3.3.3 Model Output—The actuary should determine that the model output is consistent with the actuary's intended use of the model.

I have determined that the model output is consistent with the insurance ratemaking applications for which it was used. We most often use event loss detail in our work, so we are always careful that our results balance to the model's prepared exhibits.



3.4 Appropriateness of the Model for the Intended Application

The actuary should evaluate whether the model is appropriate for the particular actuarial analysis, and consider limitations of the model, modifications to the model, and the assumptions needed in order to apply the model output.

The catastrophe model(s) we have relied upon were developed for purposes related to the management of risk. I have evaluated the model(s) in light of available alternatives and determined that the catastrophe loss model is the most appropriate method of estimating expected catastrophe loss distributions for insurance ratemaking.

Some additional considerations include the following:

a. Applicability of Historical Data—To the extent historical data are used in the development of the model or the establishment of model parameters, the actuary should consider the adequacy of the historical data in representing the range of reasonably expected outcomes consistent with current knowledge about the phenomena being analyzed.

Historical data is relied upon extensively in the development and validation of catastrophe loss models. Smoothing procedures are applied in cases where reasonably foreseeable events are underrepresented in the historical data.

b. Developments in Relevant Fields—The actuary should make a reasonable effort to be aware of significant developments in relevant fields of expertise. The actuary should evaluate whether such developments are likely to materially affect the current actuarial analysis.

Catastrophe loss models are typically updated on an annual basis in order to incorporate the most current scientific research and information from recent catastrophe events.

I have made a reasonable effort to be aware of significant developments in the relevant fields of expertise. In particular, meteorological studies related to the current period of elevated hurricane activity are important in determining which of a model's frequency assumptions should be utilized in insurance ratemaking applications involving hurricane-exposed risk portfolios. Aon maintains a documentation library containing current research in the science of catastrophe perils.

3.5 Appropriate Validation

The actuary should evaluate the user input and the reasonableness of the model output, as discussed below.

3.5.1 User Input—With respect to the quality and availability of the user input data to be used in the model, the actuary should refer to ASOP No. 23, Data Quality.

The model input data for this analysis was supplied by the client. The data was reviewed for reasonableness in accordance with ASOP 23.

3.5.2 Model Output—In view of the intended use of the model, the actuary should examine the model output for reasonableness, considering factors such as the following:

a. the results derived from alternate models or methods, where available and appropriate;



In addition, Aon conducts extensive testing of each model that we license whenever a new model is released. Output from Model output is checked for reasonability against other models and for consistency with the modeler's representations as to changes incorporated in the current version. I have reviewed the results of these tests and found the model used in this analysis to provide reasonable output.

b. how historical observations, if applicable, compare to results produced by the model;

Catastrophes, by their nature, involve significant uncertainty in the amount of insured losses they produce. In light of this uncertainty, the model has been shown to produce reasonable estimates of losses incurred from historical events.

I have reviewed the modeler's ASOP 38 document and supporting documentation describing comparisons of model output to historical observations and found that the model produces reasonable estimates.

c. the consistency and reasonableness of relationships among various output results; and

I have reviewed the relationships among output results and found them to be consistent and reasonable.

d. the sensitivity of the model output to variations in the user input and model assumptions.

Aon conducts extensive testing of each model that we license with respect to the sensitivity of model output to variations in the user input and model assumptions. I have reviewed the results of these tests and obtained an understanding of the model's sensitivity.

3.6 Appropriate Use of the Model

Having completed the analysis described in sections 3.2–3.5 above, the actuary should use his or her professional judgment to determine whether it is appropriate to use the model results, subject to any appropriate adjustments. The actuary should disclose any such adjustments in accordance with section 4.3.

In my professional judgment, it is appropriate to use the model results, without adjustment, for the purposes of the actuarial work product to which this document is attached.

3.7 Reliance on Model Evaluation by Another Actuary

The actuary may rely on another actuary who has, for a particular model, conducted some or all of the evaluations and processes described in this standard. However, the relying actuary should be satisfied that the other actuary's evaluation was performed in accordance with this standard and is appropriate for the intended application. The actuary should document the extent of such reliance in accordance with section 4.1.

Actuaries utilizing the actuarial work product to which this document is attached can rely on my complete evaluation of the model(s) used as described above. In doing so, they should document the extent of such reliance in their work.



Minchong Mao FCAS, MAAA

Minchong Mao

Dec.1 2023

**North Carolina Rate Bureau
Mobile Home Insurance Rate Filing
Support for Selected Reinsurance Structure**

Layer	Return Periods	
	Attachment	Exhaustion
264M XS 626M	168	362
200M XS 426M	83	168
150M XS 276M	43	83
100M XS 176M	25	43
100M XS 76M	11	25

The table above shows the All Peril 50/50 RMSv23/TSv10 blend attachment and exhaustion points with Catastrophe LAE for the North Carolina Rate Bureau portfolio, along with the selected reinsurance program.

**North Carolina Rate Bureau
Mobile Home Insurance Rate Filing
Reinsurance Program Summary**

Reinsurance Layer	Rate-On-Line	Deposit Premium	Reinstatement Premium	Expected Total Premium	Expected Ceded Loss	Net Cost of Reinsurance
264M XS 626M	5.75%	15,180,000	88,853	15,268,853	1,560,078	13,708,775
200M XS 426M	8.23%	16,460,000	182,102	16,642,102	2,243,453	14,398,650
150M XS 276M	11.32%	16,980,000	338,537	17,318,537	3,051,962	14,266,575
100M XS 176M	15.29%	15,290,000	521,147	15,811,147	3,514,376	12,296,771
100M XS 76M	21.19%	21,190,000	1,322,729	22,512,729	6,556,036	15,956,692
Total		85,100,000	2,453,368	87,553,368	16,925,905	70,627,463

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.

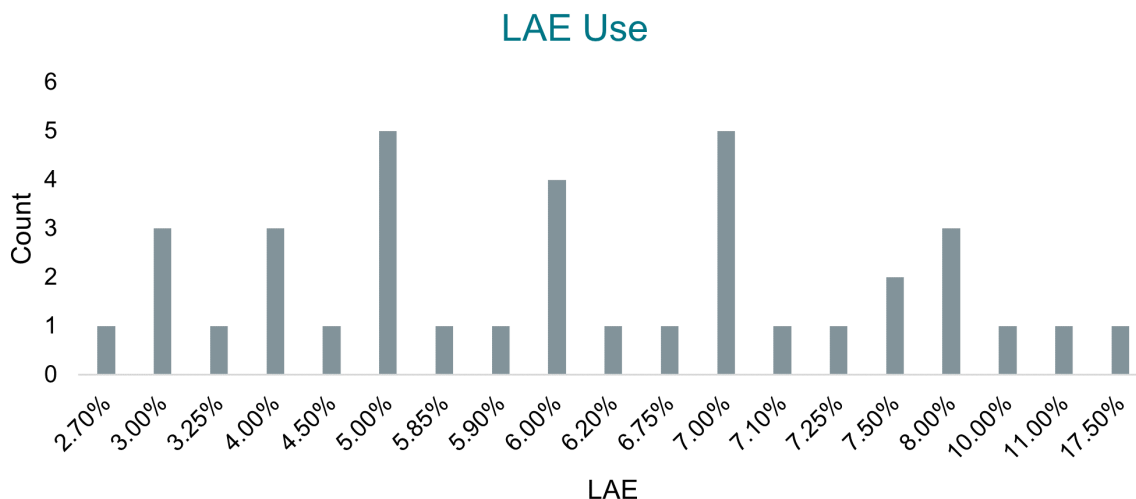
Deposit Premium is Rate-On-Line * Layer Limit

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
Mobile Home 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 2022.

- Factors were rounded to the nearest .05%
- 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 6.30%, the median is 6.00%, and the mode is 5.00% & 7.00%.

North Carolina Rate Bureau
Reinsurance Cost Allocation
CY 2022
RMSv23/TSv10

Layer 1: 100M XS 76M

Peril/territory	MH(C)			MH(F)		
	Premium	Ceded AAL	Reins Margin	Premium	Ceded AAL	Reins Margin
HU	46.83%	46.92%	46.79%	46.11%	46.38%	46.01%
110	0.14%	0.14%	0.14%	0.21%	0.21%	0.21%
120	0.72%	0.73%	0.72%	3.36%	3.46%	3.32%
130	0.37%	0.38%	0.37%	0.65%	0.66%	0.64%
140	3.91%	4.06%	3.85%	7.88%	8.20%	7.75%
150	1.74%	1.78%	1.72%	1.36%	1.40%	1.35%
160	2.00%	2.03%	1.99%	1.80%	1.83%	1.79%
170	0.49%	0.49%	0.49%	0.38%	0.39%	0.38%
180	5.13%	5.10%	5.15%	4.05%	4.04%	4.06%
190	3.01%	2.98%	3.02%	2.59%	2.57%	2.60%
200	1.15%	1.11%	1.16%	2.02%	1.96%	2.04%
210	1.63%	1.61%	1.63%	1.38%	1.37%	1.39%
220	2.49%	2.44%	2.52%	2.47%	2.43%	2.49%
230	2.41%	2.37%	2.43%	3.97%	3.90%	3.99%
240	5.81%	5.74%	5.84%	3.13%	3.09%	3.15%
250	2.02%	1.97%	2.04%	1.98%	1.92%	2.01%
260	2.24%	2.24%	2.24%	1.08%	1.08%	1.08%
270	1.59%	1.58%	1.60%	0.80%	0.79%	0.81%
280	0.53%	0.53%	0.53%	0.27%	0.27%	0.27%
290	0.77%	0.76%	0.78%	0.94%	0.91%	0.95%
300	0.45%	0.45%	0.46%	0.69%	0.68%	0.70%
310	1.65%	1.69%	1.64%	1.18%	1.20%	1.18%
320	2.09%	2.11%	2.07%	1.23%	1.24%	1.22%
330	0.11%	0.12%	0.11%	0.10%	0.10%	0.10%
340	1.70%	1.73%	1.69%	0.88%	0.89%	0.87%
350	1.16%	1.20%	1.14%	0.64%	0.66%	0.63%
360	1.18%	1.24%	1.15%	0.85%	0.90%	0.83%
370	0.04%	0.04%	0.03%	0.03%	0.03%	0.03%
380	0.17%	0.19%	0.17%	0.10%	0.11%	0.10%
390	0.11%	0.11%	0.10%	0.07%	0.08%	0.07%
EQFF	0.23%	0.20%	0.25%	0.00%	0.00%	0.00%
OW	1.04%	1.23%	0.96%	0.69%	0.81%	0.63%
SS	2.14%	1.92%	2.23%	2.61%	2.28%	2.74%
WT	0.21%	0.17%	0.23%	0.13%	0.10%	0.14%
Grand Total	50.46%	50.43%	50.47%	49.54%	49.57%	49.53%

North Carolina Rate Bureau
Reinsurance Cost Allocation
CY 2022
RMSv23/TSv10

Layer 2: 100M XS 176M

Peril/territory	MH(C)			MH(F)		
	Premium	Ceded AAL	Reins Margin	Premium	Ceded AAL	Reins Margin
HU	48.66%	48.93%	48.59%	46.60%	47.17%	46.44%
110	0.10%	0.10%	0.10%	0.14%	0.14%	0.14%
120	0.61%	0.64%	0.61%	2.89%	3.05%	2.85%
130	0.29%	0.30%	0.29%	0.50%	0.52%	0.50%
140	3.55%	3.79%	3.48%	7.26%	7.78%	7.11%
150	1.47%	1.53%	1.46%	1.18%	1.22%	1.16%
160	1.93%	2.01%	1.91%	1.75%	1.82%	1.73%
170	0.43%	0.42%	0.43%	0.33%	0.33%	0.33%
180	5.09%	5.08%	5.09%	3.98%	3.99%	3.98%
190	3.01%	3.02%	3.01%	2.61%	2.62%	2.60%
200	1.15%	1.11%	1.15%	2.01%	1.96%	2.03%
210	1.68%	1.67%	1.68%	1.43%	1.43%	1.44%
220	2.71%	2.66%	2.73%	2.68%	2.64%	2.69%
230	2.56%	2.53%	2.57%	4.22%	4.18%	4.23%
240	6.37%	6.29%	6.39%	3.40%	3.35%	3.41%
250	2.27%	2.20%	2.29%	2.22%	2.14%	2.25%
260	2.55%	2.54%	2.55%	1.25%	1.23%	1.25%
270	1.84%	1.82%	1.85%	0.93%	0.91%	0.93%
280	0.64%	0.64%	0.64%	0.33%	0.33%	0.33%
290	0.89%	0.87%	0.90%	1.09%	1.04%	1.10%
300	0.51%	0.50%	0.51%	0.77%	0.75%	0.78%
310	2.00%	2.03%	2.00%	1.44%	1.45%	1.44%
320	2.42%	2.44%	2.42%	1.45%	1.45%	1.45%
330	0.13%	0.13%	0.13%	0.11%	0.12%	0.11%
340	1.86%	1.88%	1.85%	0.97%	0.97%	0.96%
350	1.18%	1.22%	1.17%	0.65%	0.67%	0.64%
360	1.16%	1.23%	1.14%	0.84%	0.89%	0.82%
370	0.04%	0.04%	0.03%	0.03%	0.03%	0.03%
380	0.14%	0.16%	0.14%	0.09%	0.10%	0.09%
390	0.08%	0.08%	0.08%	0.05%	0.06%	0.05%
EQFF	0.19%	0.15%	0.21%	0.00%	0.00%	0.00%
OW	0.08%	0.10%	0.07%	0.04%	0.06%	0.04%
SS	1.95%	1.62%	2.04%	2.39%	1.91%	2.52%
WT	0.05%	0.03%	0.05%	0.03%	0.02%	0.03%
Grand Total	50.94%	50.84%	50.96%	49.06%	49.16%	49.04%

North Carolina Rate Bureau
Reinsurance Cost Allocation
CY 2022
RMSv23/TSv10

Layer 3: 150M XS 276M

Peril/territory	MH(C)			MH(F)		
	Premium	Ceded AAL	Reins Margin	Premium	Ceded AAL	Reins Margin
HU	49.40%	49.75%	49.32%	46.37%	47.10%	46.22%
110	0.07%	0.07%	0.07%	0.11%	0.11%	0.11%
120	0.53%	0.56%	0.52%	2.51%	2.70%	2.47%
130	0.24%	0.24%	0.24%	0.42%	0.43%	0.41%
140	3.22%	3.53%	3.15%	6.64%	7.32%	6.49%
150	1.29%	1.34%	1.28%	1.05%	1.09%	1.04%
160	1.84%	1.96%	1.82%	1.67%	1.78%	1.65%
170	0.39%	0.37%	0.39%	0.30%	0.29%	0.30%
180	4.98%	4.99%	4.98%	3.87%	3.89%	3.86%
190	2.97%	3.02%	2.96%	2.59%	2.63%	2.58%
200	1.12%	1.09%	1.13%	1.97%	1.93%	1.98%
210	1.68%	1.67%	1.69%	1.44%	1.44%	1.44%
220	2.84%	2.80%	2.85%	2.80%	2.78%	2.81%
230	2.65%	2.62%	2.66%	4.37%	4.33%	4.38%
240	6.65%	6.56%	6.67%	3.54%	3.48%	3.55%
250	2.43%	2.35%	2.45%	2.38%	2.27%	2.41%
260	2.73%	2.72%	2.74%	1.35%	1.32%	1.35%
270	1.99%	1.97%	2.00%	1.01%	0.99%	1.01%
280	0.72%	0.72%	0.72%	0.37%	0.37%	0.37%
290	0.98%	0.95%	0.99%	1.20%	1.14%	1.21%
300	0.55%	0.53%	0.55%	0.83%	0.79%	0.84%
310	2.27%	2.29%	2.27%	1.64%	1.63%	1.64%
320	2.66%	2.66%	2.66%	1.60%	1.59%	1.61%
330	0.14%	0.15%	0.14%	0.12%	0.13%	0.12%
340	1.95%	1.96%	1.95%	1.02%	1.02%	1.02%
350	1.15%	1.19%	1.15%	0.63%	0.65%	0.63%
360	1.12%	1.19%	1.10%	0.80%	0.85%	0.79%
370	0.03%	0.04%	0.03%	0.03%	0.03%	0.03%
380	0.12%	0.13%	0.12%	0.07%	0.08%	0.07%
390	0.06%	0.06%	0.06%	0.04%	0.05%	0.04%
EQFF	0.14%	0.08%	0.15%	0.00%	0.00%	0.00%
OW	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SS	1.80%	1.39%	1.89%	2.23%	1.65%	2.36%
WT	0.03%	0.02%	0.03%	0.02%	0.01%	0.02%
Grand Total	51.37%	51.24%	51.40%	48.63%	48.76%	48.60%

North Carolina Rate Bureau
Reinsurance Cost Allocation
CY 2022
RMSv23/TSv10

Layer 4: 200M XS 426M

Peril/territory	MH(C)			MH(F)		
	Premium	Ceded AAL	Reins Margin	Premium	Ceded AAL	Reins Margin
HU	49.93%	50.36%	49.86%	46.19%	46.93%	46.07%
110	0.06%	0.05%	0.06%	0.08%	0.08%	0.08%
120	0.47%	0.50%	0.46%	2.23%	2.42%	2.20%
130	0.20%	0.21%	0.20%	0.35%	0.36%	0.35%
140	2.96%	3.29%	2.91%	6.15%	6.87%	6.03%
150	1.15%	1.19%	1.14%	0.94%	0.98%	0.93%
160	1.77%	1.91%	1.75%	1.61%	1.73%	1.59%
170	0.36%	0.33%	0.36%	0.28%	0.26%	0.28%
180	4.86%	4.85%	4.86%	3.76%	3.77%	3.75%
190	2.92%	2.97%	2.91%	2.55%	2.60%	2.54%
200	1.11%	1.08%	1.11%	1.95%	1.90%	1.96%
210	1.68%	1.67%	1.68%	1.44%	1.43%	1.44%
220	2.93%	2.91%	2.93%	2.88%	2.89%	2.88%
230	2.72%	2.69%	2.72%	4.49%	4.45%	4.50%
240	6.88%	6.80%	6.90%	3.65%	3.58%	3.66%
250	2.56%	2.49%	2.57%	2.50%	2.38%	2.52%
260	2.89%	2.87%	2.89%	1.43%	1.40%	1.43%
270	2.12%	2.10%	2.12%	1.07%	1.06%	1.07%
280	0.78%	0.79%	0.78%	0.41%	0.41%	0.41%
290	1.05%	1.02%	1.05%	1.29%	1.22%	1.30%
300	0.58%	0.55%	0.58%	0.87%	0.82%	0.88%
310	2.49%	2.52%	2.49%	1.80%	1.80%	1.80%
320	2.84%	2.85%	2.84%	1.73%	1.71%	1.73%
330	0.15%	0.16%	0.15%	0.13%	0.13%	0.13%
340	2.00%	2.01%	2.00%	1.05%	1.05%	1.05%
350	1.13%	1.17%	1.12%	0.61%	0.63%	0.61%
360	1.09%	1.17%	1.08%	0.78%	0.83%	0.78%
370	0.03%	0.04%	0.03%	0.03%	0.03%	0.03%
380	0.11%	0.12%	0.11%	0.07%	0.07%	0.07%
390	0.05%	0.06%	0.05%	0.04%	0.04%	0.04%
EQFF	0.11%	0.06%	0.12%	0.00%	0.00%	0.00%
SS	1.66%	1.20%	1.73%	2.11%	1.45%	2.21%
WT	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Grand Total	51.70%	51.62%	51.71%	48.30%	48.38%	48.29%

North Carolina Rate Bureau
Reinsurance Cost Allocation
CY 2022
RMSv23/TSv10

Layer 5: 264M XS 626M

Peril/territory	MH(C)			MH(F)		
	Premium	Ceded AAL	Reins Margin	Premium	Ceded AAL	Reins Margin
HU	50.38%	50.90%	50.32%	45.98%	46.71%	45.89%
110	0.05%	0.04%	0.05%	0.07%	0.06%	0.07%
120	0.42%	0.45%	0.42%	2.02%	2.18%	2.00%
130	0.18%	0.18%	0.18%	0.31%	0.32%	0.31%
140	2.74%	3.06%	2.70%	5.71%	6.42%	5.63%
150	1.06%	1.09%	1.05%	0.87%	0.90%	0.87%
160	1.71%	1.87%	1.70%	1.56%	1.70%	1.54%
170	0.35%	0.31%	0.35%	0.27%	0.24%	0.27%
180	4.78%	4.75%	4.78%	3.69%	3.68%	3.69%
190	2.87%	2.93%	2.86%	2.51%	2.58%	2.51%
200	1.07%	1.03%	1.07%	1.89%	1.83%	1.89%
210	1.69%	1.66%	1.69%	1.46%	1.43%	1.46%
220	2.97%	3.01%	2.97%	2.94%	2.99%	2.93%
230	2.71%	2.70%	2.71%	4.50%	4.47%	4.50%
240	7.11%	6.99%	7.12%	3.77%	3.67%	3.79%
250	2.65%	2.61%	2.65%	2.58%	2.48%	2.59%
260	3.05%	3.00%	3.05%	1.52%	1.47%	1.52%
270	2.23%	2.22%	2.23%	1.13%	1.12%	1.13%
280	0.84%	0.85%	0.84%	0.44%	0.44%	0.44%
290	1.11%	1.09%	1.11%	1.36%	1.30%	1.37%
300	0.60%	0.57%	0.60%	0.90%	0.84%	0.91%
310	2.68%	2.72%	2.67%	1.94%	1.94%	1.94%
320	3.03%	3.05%	3.03%	1.86%	1.84%	1.86%
330	0.16%	0.17%	0.16%	0.14%	0.14%	0.14%
340	2.04%	2.06%	2.04%	1.08%	1.09%	1.08%
350	1.07%	1.13%	1.06%	0.58%	0.61%	0.58%
360	1.06%	1.16%	1.05%	0.76%	0.82%	0.75%
370	0.03%	0.04%	0.03%	0.03%	0.03%	0.03%
380	0.10%	0.11%	0.09%	0.06%	0.07%	0.06%
390	0.04%	0.05%	0.04%	0.03%	0.03%	0.03%
EQFF	0.13%	0.06%	0.13%	0.00%	0.00%	0.00%
SS	1.54%	1.06%	1.59%	1.98%	1.28%	2.06%
Grand Total	52.04%	52.01%	52.05%	47.96%	47.99%	47.95%

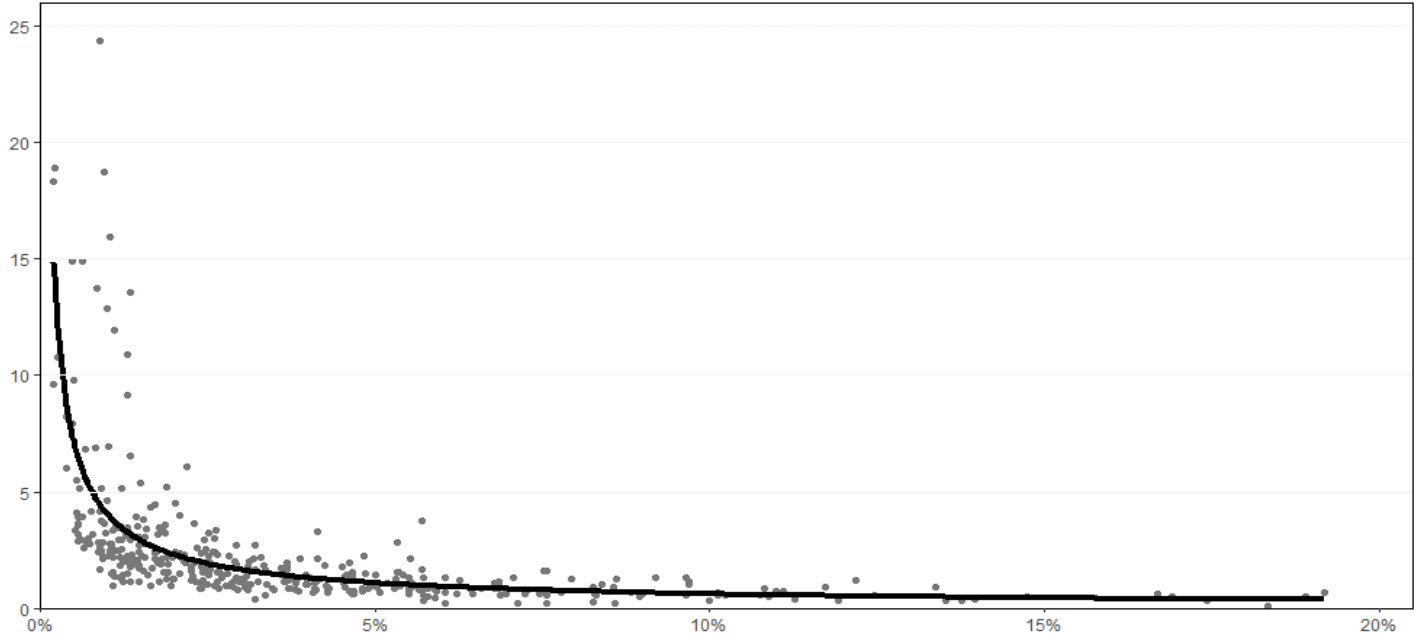
**North Carolina Rate Bureau
Reinsurance Margin Allocation
CY 2022
RMSv23/TSv10**

Territory	MH(C)-A+D	MH(C)-B	MH(C)-C	MH(C)-Total	MH(F)-O	MH(F)-R	MH(F)-Total	MH C+F Total
110	60,327	4,266	14,599	79,191	118,200	174	118,375	197,566
120	439,050	24,932	87,235	551,217	2,276,351	475	2,276,827	2,828,044
130	237,851	21,243	75,960	335,054	547,029	45	547,074	882,128
140	2,044,166	154,552	364,799	2,563,517	5,143,255	1,650	5,144,905	7,708,422
150	1,080,791	101,461	276,142	1,458,394	1,095,789	1,542	1,097,331	2,555,725
160	1,139,434	104,576	160,891	1,404,901	1,246,037	258	1,246,295	2,651,195
170	256,782	25,810	31,412	314,004	242,527	73	242,600	556,603
180	2,970,249	292,814	342,702	3,605,765	2,810,898	3,125	2,814,023	6,419,787
190	1,691,883	191,433	206,237	2,089,552	1,810,698	2,495	1,813,193	3,902,746
200	669,180	57,436	72,927	799,543	1,400,118	0	1,400,118	2,199,662
210	983,269	105,195	97,035	1,185,499	1,012,336	783	1,013,119	2,198,618
220	1,658,738	153,273	168,034	1,980,045	1,947,130	298	1,947,428	3,927,473
230	1,559,423	138,762	156,984	1,855,169	3,049,123	749	3,049,872	4,905,040
240	3,902,813	408,768	357,877	4,669,458	2,483,259	2,839	2,486,098	7,155,556
250	1,424,302	142,396	133,449	1,700,148	1,661,582	2,112	1,663,694	3,363,842
260	1,617,885	176,832	128,487	1,923,204	946,129	228	946,357	2,869,560
270	1,173,420	110,006	100,906	1,384,332	698,691	793	699,485	2,083,817
280	418,332	43,352	34,599	496,284	257,911	232	258,144	754,427
290	590,278	50,111	45,838	686,227	837,735	470	838,205	1,524,432
300	330,777	26,773	25,873	383,422	580,485	306	580,792	964,214
310	1,330,549	139,765	108,350	1,578,664	1,131,604	588	1,132,192	2,710,855
320	1,572,324	168,248	132,139	1,872,711	1,122,215	815	1,123,030	2,995,741
330	84,138	9,679	7,211	101,028	86,493	27	86,520	187,548
340	1,156,202	120,894	97,772	1,374,868	713,195	646	713,841	2,088,709
350	697,091	70,249	56,462	823,802	446,220	467	446,687	1,270,489
360	707,291	69,878	59,264	836,433	589,401	465	589,867	1,426,300
370	21,670	1,830	1,363	24,863	20,594	10	20,603	45,467
380	83,895	7,330	6,271	97,495	57,364	31	57,395	154,890
390	49,779	4,832	4,936	59,547	39,030	30	39,059	98,607
Total	29,951,889	2,926,696	3,355,752	36,234,337	34,371,398	21,727	34,393,126	70,627,463

North Carolina Insurance Underwriting Association (NCIUA) -- Beach Plan
North Carolina Joint Underwriting Association (NCJUA) -- FAIR Plan

Catastrophe Bond Profit Multiples

Profit Multiples by Probability of Loss



Source: Lane Financial LLC, Annual Securitization Reviews (<http://lanefinancialllc.com>) and Aon ILS Cat bond data.

Notes: Based on near-term cat bonds issued from January 2013 to March 2022.
Includes all U.S. bonds with a probability of first loss between 0.05% and 20.0%; excludes bonds with no stated profit multiples.

Equation of the fitted curve:

$$y = 0.09154 x^{-0.82495}$$

Equation to determine average Profit Multiple over specific interval:

$$\text{Avg PM} = \int_a^b 0.09154 x^{-0.82495} dx / (b - a)$$

North Carolina Insurance Underwriting Association (NCIUA) -- Beach Plan

Summary of 2023 Reinsurance Structure

Risk Finance Structure ⁽¹⁾	Attachment Point (\$ Millions)	Exhaustion Point (\$ Millions)	Coverage
Reinsurance Layer 1	\$1,875	\$2,100	85.5%
Reinsurance Layer 2	\$2,100	\$2,430	100.0%
Reinsurance Layer 3	\$2,430	\$2,630	100.0%
Reinsurance Layer 4	\$2,630	\$2,880	100.0%
Reinsurance Layer 5	\$2,880	\$3,380	100.0%
Reinsurance Layer 6	\$3,380	\$3,630	100.0%
Reinsurance Layer 7	\$3,630	\$3,805	100.0%

Source: https://www.nciua-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)

<u>Annual Aggregate Layer</u>	<u>Source of Funding</u>	<u>Total Beach Plan</u>		<u>Attachment Probability</u>	<u>Exhaustion Probability</u>	<u>Indicated Profit Multiple</u>
		<u>Layer Attachment</u>	<u>Layer Exhaustion</u> ⁽¹⁾			
\$0 to 908	Surplus	\$0	\$908	47.87%	6.84%	0.32
\$908 to 1,875	Company Assessments	\$908	\$1,875	6.84%	3.17%	1.12
\$1,875 to 2,100	Reinsurance Layer 1 + Company Assessments	\$1,875	\$2,100	3.17%	2.78%	1.66
\$2,100 to 2,430	Reinsurance Layer 2	\$2,100	\$2,430	2.78%	2.29%	1.90
\$2,430 to 2,630	Reinsurance Layer 3	\$2,430	\$2,630	2.29%	2.08%	2.15
\$2,630 to 2,880	Reinsurance Layer 4	\$2,630	\$2,880	2.08%	1.83%	2.35
\$2,880 to 3,380	Reinsurance Layer 5	\$2,880	\$3,380	1.83%	1.47%	2.71
\$3,380 to 3,630	Reinsurance Layer 6	\$3,380	\$3,630	1.47%	1.32%	3.11
\$3,630 to 3,805	Reinsurance Layer 7	\$3,630	\$3,805	1.32%	1.21%	3.37
\$3,805 & Higher	Policyholder Surcharges	\$3,805	\$47,504	1.21%	0.0010%	14.21

(1) The Layer Exhaustion for the highest layer assumes 100K year return period and is consistent with prior year's analysis.

**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)

<u>Annual Aggregate Layer</u>	<u>Total Beach Plan</u>			<u>Beach Plan: Residential Share of Layer</u>	<u>Hurricane Losses Funded by:</u>			
	<u>Layer Attachment</u>	<u>Layer Exhaustion</u>	<u>Total Losses in Layer</u>		<u>Beach Plan Surplus</u>	<u>Private Reinsurance</u>	<u>Assessment on Member Companies ⁽¹⁾</u>	<u>Policyholder Surcharges</u>
\$0 to 908	\$0	\$908	\$908	\$811.9	\$811.9	-	-	-
\$908 to 1,875	\$908	\$1,875	\$967	\$865.3	-	-	\$865.3	-
\$1,875 to 2,100	\$1,875	\$2,100	\$225	\$201.3	-	\$172.1	\$29.2	-
\$2,100 to 2,430	\$2,100	\$2,430	\$330	\$295.2	-	\$295.2	-	-
\$2,430 to 2,630	\$2,430	\$2,630	\$200	\$178.9	-	\$178.9	-	-
\$2,630 to 2,880	\$2,630	\$2,880	\$250	\$223.6	-	\$223.6	-	-
\$2,880 to 3,380	\$2,880	\$3,380	\$500	\$447.3	-	\$447.3	-	-
\$3,380 to 3,630	\$3,380	\$3,630	\$250	\$223.6	-	\$223.6	-	-
\$3,630 to 3,805	\$3,630	\$3,805	\$175	\$156.5	-	\$156.5	-	-
\$3,805 & Higher	\$3,805	\$47,504	\$43,699	\$39,089.9	-	-	-	\$39,089.9
Total					\$811.9	\$1697.3	\$894.5	\$39,089.9

(1) Total losses paid by Member Companies (\$894.5 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)

<u>Annual Aggregate Layer</u>	<u>Beach Plan: Residential Share of Layer</u>	<u>Potential Assessment Paid by Member Companies</u> ⁽¹⁾	<u>Expected Losses</u> ⁽²⁾		<u>Indicated Profit Multiple</u> ⁽⁴⁾	<u>Cost of Funding Assessments</u> ⁽⁵⁾
			<u>Total</u>	<u>Exposed</u> ⁽³⁾		
\$0 to 908	\$811.9	-	\$113.06	-	0.32	-
\$908 to 1,875	\$865.3	\$865.3	\$39.98	\$39.98	1.12	\$44.87
\$1,875 to 2,100	\$201.3	\$29.2	\$6.00	\$0.87	1.66	\$1.45
\$2,100 to 2,430	\$295.2	-	\$7.46	-	1.90	-
\$2,430 to 2,630	\$178.9	-	\$3.90	-	2.15	-
\$2,630 to 2,880	\$223.6	-	\$4.34	-	2.35	-
\$2,880 to 3,380	\$447.3	-	\$7.45	-	2.71	-
\$3,380 to 3,630	\$223.6	-	\$3.12	-	3.11	-
\$3,630 to 3,805	\$156.5	-	\$1.98	-	3.37	-
\$3,805 & Higher	\$39,089.9	-	\$33.19	-	14.21	-
Total		\$894.5	\$220.48	\$40.85		\$46.32

(1) Page 4.

(2) From AIR & RMS hurricane models.

(3) Expected loss subject to Beach Plan assessments of Voluntary Market.

(4) See Page 3.

(5) = Exposed Expected Losses x Profit Multiple (based on Cat Bond data).

North Carolina Joint Underwriting Association (NCJUA) -- FAIR Plan

Summary of 2023 Reinsurance Structure

Risk Structure (1)	Attachment Point (in million)	Exhaustion Point (in million)	Coverage
Reinsurance Layer 1	\$132	\$216	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)

<u>Annual Aggregate Layer</u>	<u>Source of Funding</u>	<u>Total FAIR Plan</u>		<u>Attachment Probability</u>	<u>Exhaustion Probability</u>	<u>Indicated Profit Multiple</u>
		<u>Layer Attachment</u>	<u>Layer Exhaustion ⁽¹⁾</u>			
\$0 to 17	Surplus	\$0	\$17	54.33%	22.20%	0.21
\$17 to 132	Company Assessments	\$17	\$132	22.20%	7.98%	0.46
\$132 to 216	Reinsurance	\$132	\$216	7.98%	5.17%	0.87
\$216 & Higher	Company Assessments	\$216	\$6,425	5.17%	0.0010%	4.68

(1) The Layer Exhaustion for the highest layer assumes 100K year return period and is consistent with prior year's analysis.

**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)

<u>Annual Aggregate Layer</u>	<u>Total FAIR Plan</u>			<u>FAIR Plan: Residential Share of Layer</u>	<u>Hurricane Losses Funded by:</u>		
	<u>Layer Attachment</u>	<u>Layer Exhaustion</u>	<u>Total Losses in Layer</u>		<u>FAIR Plan Surplus</u>	<u>Private Reinsurance</u>	<u>Assessment on Member Companies</u>
\$0 to 17	\$0	\$17	\$17	\$15.7	\$15.7	-	-
\$17 to 132	\$17	\$132	\$115	\$106.2	-	-	\$106.2
\$132 to 216	\$132	\$216	\$84	\$77.5	-	\$77.5	-
\$216 & Higher	\$216	\$6,425	\$6,209	\$5731.5	-	-	\$5,731.5
Total					\$15.7	\$77.5	\$5,837.7

**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)

<u>Annual Aggregate Layer</u>	<u>FAIR Plan: Residential Share of Layer</u>	<u>Potential Assessment Paid by Member Companies</u> ⁽¹⁾	<u>Expected Losses</u> ⁽²⁾		<u>Indicated Profit Multiple</u> ⁽⁴⁾	<u>Cost of Funding Assessments</u> ⁽⁵⁾
			<u>Total</u>	<u>Exposed</u> ⁽³⁾		
\$0 to 17	\$15.7	-	\$4.35	-	0.21	-
\$17 to 132	\$106.2	\$106.2	13.59	\$13.59	0.46	\$6.30
\$132 to 216	\$77.5	-	4.97	-	0.87	-
\$216 & Higher	\$5731.5	\$5731.5	16.68	16.68	4.68	\$78.00
Total		\$5837.7	\$39.60	\$30.28		\$84.30

(1) See Page 8.

(2) From AIR & RMS hurricane models.

(3) Expected loss subject to FAIR Plan assessments of Voluntary Market.

(4) See 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):	\$46.32
(2) Cost of Reinsurance Provided by the Voluntary Market to the Residential Accounts in the NCJUA (FAIR Plan):	\$84.30
(3) Total Cost of Reinsurance Provided by the Voluntary Market to the Residential Accounts in the NCIUA & NCJUA:	<u>\$130.62</u>

	(4) Estimated 2023 Industry Written Premium @ <u>Manual Rates</u>	(5) = (4) / Total (4) % of Total Industry <u>Premium</u>	(6) = (3) x (5) Allocated Compensation for Risk of <u>Assessment</u>	(7) = (6) / (4) Compensation for Assessment Risk as % of 2023 <u>Manual Premium</u>
<u>Policy Form</u>				
Homeowners	\$4,022.1	86.9%	\$113.49	2.8%
Dwelling Fire & EC	\$401.9	8.7%	\$11.34	2.8%
MobileHome	\$205.2	4.4%	\$5.79	2.8%
Total	\$4,629.1	100.0%	\$130.62	2.8%

(8) Estimated Market Share of Companies that Retain Assessment Risk

50%

(9) Retained Compensation for Assessment Risk Provision:

1.4%

(1) From Page 5.

(2) From Page 9.

(3) = (1) + (2)

(4) Industry Written Premium includes NCIUA and NCJUA.

(8) NCRB Property Rating Sub-Committee selection

(9) = (7) * (8)

**PREFILED TESTIMONY
OF
GEORGE ZANJANI**

**MOBILE HOMEOWNERS MH(C) INSURANCE RATE FILING
NORTH CAROLINA RATE BUREAU
APRIL, 2024**

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-21 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) previous 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* and as an associate editor for *Insurance: Mathematics and Economics*. 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.

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 three research projects 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 Banking and Finance*, the *Journal of Financial Economics*, the *Journal of Public Economics*, the *Journal of Risk and Insurance*, *Management Science*, *North American Actuarial Journal*, and *Variance*. 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), Massachusetts (2020, 2022, and 2023), and Virginia (2016). In addition, I have supplied testimony for various rate filings in North Carolina starting in 2019, including Workers Compensation, Private Passenger Auto, Homeowners, Mobile Homeowners, Flood, and Dwelling.

Q: What was the nature of your testimony in those previous cases?

A: In the Florida, Massachusetts, 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 in this proceeding?

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 satisfies North Carolina's statutory requirements.

Q: Please summarize the main findings of your testimony.

A: The first task was to determine the range for a reasonable rate of return on capital. I started by creating a set of estimates of the cost of insurance equity relevant for the North Carolina Mobile Homeowners insurance market. I consulted various third-party estimates of the cost of equity for the property-casualty insurance industry. I also generated my own estimates using a single-factor risk premium approach, where the cost of equity was determined by 1) the historical excess return of the overall stock market over bonds, 2) the historical correlation of the equity prices of the firms serving the North Carolina Mobile Homeowners market with the overall stock market, and 3) the current level of bond yields. Finally, I adjusted the cost of equity to account for the significant presence of private companies in the North Carolina market. The cost of equity estimates resulting from this exercise ranged from about 8.11% to 23.7%.

Next, I calculated a weighted average cost of capital (WACC) by estimating the fraction of debt in the typical insurance holding company capital structure and weighting together the cost of equity with cost of debt based on this fraction. The resulting range for the WACC was about 7.45% to 19.9%.

The next task was to determine the projected rate of return on capital associated with the selected underwriting profit provision. Using a pro forma return model similar to that used in previous filings, 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 for Mobile Homeowners MH(C) are detailed in Exhibits RB-22 and RB-23 and are summarized below:

Return Definition	Ex Liability	Liability
Statutory Return	7.16%	7.63%
Total Return	11.67%	12.21%

I next considered two adjustments to the model that I believe produce a more accurate representation of the rate of return produced by the selected underwriting profit factor. First, I adjusted the asset portfolio allocations (across bonds, stocks, and various other investments) to reflect the allocations actually supporting North Carolina Mobile Homeowners business, rather

than the overall average industry allocations. Second, I adjusted the prospective portfolio yields to reflect current market conditions, as opposed to the average of current market yields and embedded yields. The combined effect of these changes is to increase the statutory returns by approximately 5 to 10 basis points and the total return by approximately 20 to 25 basis points.

I then compared the projected returns on capital associated with the selected underwriting factor with the cost of equity and WACC ranges described above. For MH(C) excluding Liability insurance, the projected statutory return fell below the range of the cost of equity estimates and below the range of WACC estimates; the projected total return fell comfortably within both ranges. For MH(C) Liability insurance, the projected statutory return fell below the range of the cost of equity estimates and at the lower end of the range of WACC estimates; the projected total return fell comfortably within both ranges. These findings still hold after adjusting the portfolio allocations and prospective yields as described above. I therefore conclude that the expected returns implied by the underwriting profit provisions used in the filing are reasonable and not excessive when viewed on a total return basis, and not excessive when viewed on a statutory return basis.

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-22 and RB-23.

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. It is also my understanding that a revision to the ratemaking statutes will become effective after this filing is proposed to become effective providing that investment income on capital and surplus is to be considered. The information I present in my exhibits demonstrates that the selected underwriting profit provisions would comply with North Carolina law when that change in the law becomes effective.

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-22 and RB-23, Pages 1 and 1A), installment fee income (Line 3 of Exhibits RB-22 and RB-23, Pages 1 and 1A) and investment gain on insurance transaction (Line 7 of Exhibits RB-22 and RB-23, 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-22 and RB-23, 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 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-22 and RB-23, 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-22 and RB-23, 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-22 and RB-23, Pages 1 and 1A). Details of the calculation of these additional tax liabilities are found on Pages 4 to 6 of Exhibits RB-22 and RB-23.

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 calculated as the product of an investment yield and the average loss/LAE and unearned premium reserves that are actually held at the insurance company. 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). I also adjust for investment income on reinsurance

balances in the case of Mobile Homeowners MH(C) excluding Liability insurance, accounting for the additional income that the company receives on funds that have not yet been remitted to the reinsurer, as well as the investment income that it is not able to collect on funds that have not yet been recovered from the reinsurer. 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-22 and RB-23, with the adjustments for balances shown on Pages 1 and 1A. 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 investment portfolio.

Investment Gain on Surplus – This portion of the return would reflect 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 Mobile Homeowners insurance in North Carolina from Page 14 of Exhibits RB-22 and RB-23. 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 investment portfolio.

These components of after-tax return, all denominated as a percent of premium, are then summed and related to net worth. This is accomplished by multiplying the returns as a percent of premium by the product of the premium-to-surplus ratio from Page 14 of Exhibits RB-22 and RB-23 and the inverse of the industry-wide net worth-to-surplus ratio from Page 15 of Exhibits RB-22 and RB-23.

Q: Please explain how the investment yield is calculated.

A: My understanding is that the accepted 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 the analysis presented in Exhibits RB-22 and RB-23, though I contemplate the consequences of this convention in more detail later in my testimony.

For the current yield, I start with the overall weighted average invested asset portfolio for the North Carolina insurance market (using total North Carolina DPW for weights) 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-22 and RB-23. For each of the bond subcategories, I obtain a maturity distribution for the North Carolina 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 North Carolina industry portfolio. The overall pre-tax current yield on the industry portfolio as thus determined is 6.40%. The embedded yield calculations, based on the actual investment income reported by the overall property-casualty industry, are shown on Pages 12 and 13 of Exhibits RB-22 and RB-23; the pre-tax embedded yield is 3.86%. For the pro forma calculations, I average these two figures to obtain 5.13% (shown on Page 10 of Exhibits RB-22 and RB-23).

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 1998-2023 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-22 and RB-23 and the inverse of the industry-wide net worth-to-surplus ratio from Page 15 of Exhibits RB-22 and RB-23. This approach indicates that the selected underwriting profit factor of 6.0% for Mobile Homeowners MH(C) excluding Liability insurance, if achieved, would yield an expected statutory return on net worth of 7.16% (without including investment income on surplus) and a total return on net worth of 11.67% (when including investment income on surplus). For Mobile Homeowners MH(C) Liability insurance, the selected underwriting profit factor of 5.5%, if achieved, would yield an expected statutory return on net worth of 7.63% (without including investment income on surplus) and a total return on net worth of 12.21% (when including investment income on surplus).

Q: Have you considered the impact of any other alternative assumptions on your estimates?

A: Yes, I have considered the impact of an alternative investment yield calculation.

Specifically, I considered the combined impact of two changes.

First, I based the asset distribution on a premium-weighted average of the portfolio allocations used by the companies writing Mobile Homeowners insurance in North Carolina. The pro forma model relied on the weighted average invested asset distribution for the North Carolina insurance industry. While I have followed this convention in Exhibits RB-22 and RB-23, the assumption may not be suitable for the case of Mobile Homeowners because the North Carolina industry portfolio reflects heavy common stock allocations by certain personal lines carriers and other companies that do not underwrite Mobile Homeowners. The high common stock allocation tends to inflate the estimated investment yields, particularly current yields, where the expected rate of return on common stock is much higher than typical bond yields (see Page 11 of Exhibits RB-22 and RB-23). Basing the allocation assumption on the portfolios of the companies actually writing Mobile Homeowners business in North Carolina, in my opinion, offers a much closer approximation to the average investment portfolio supporting North Carolina Mobile Homeowners underwriting.

Second, I based the investment yield solely on the current yield. The practice of averaging embedded yields with current yields makes little difference when the yields are relatively close together. But there is a significant divergence between the current yields on investments and embedded yields, with the pre-tax current yield being more than 250 basis points higher than the embedded yield. The current yield, in my opinion, is the better indicator of investment

yields for a prospective ratemaking exercise, where the relevant questions concern the terms on which money will be invested today and in the future.

The combined effect of these two changes is to increase the statutory returns by 5 to 10 basis points and the total returns by 20 to 25 basis points.

Q: How was the underwriting profit factor determined?

A: The Bureau selected the 6.0% provision for Mobile Homeowners MH(C) excluding Liability insurance and the 5.5% provision for Mobile Homeowners MH(C) Liability insurance. I participated in the Bureau's Mobile Home 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 arrays 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 those arrays spanned the range for the cost of capital that I had provided. 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 established ranges for reasonable estimates of the cost of capital. I then compared the estimated statutory and total returns on net worth determined in Section II above to these cost of capital ranges.

Q: How did you establish ranges for reasonable estimates of the cost of capital?

A: The cost of capital for an industry is a difficult figure to pin down, and part of my approach is based on a belief in the wisdom of considering estimates from a variety of sources. I started by gathering various third-party estimates of the cost of capital for property-casualty firms associated with publicly traded holding companies. I also made an independent set of estimates of the same tailored specifically for the North Carolina Mobile Homeowners market. I then made adjustments to all of these estimates to account for the presence of private companies in the North Carolina market.

Q: Please describe the third-party estimate sources and methodologies.

A: Kroll (formerly Duff & Phelps) and Damodaran Online (an open-access website maintained by Aswath Damodaran, a valuation expert affiliated with New York University) both publish estimates for the property-casualty industry. Kroll updates the estimates quarterly (the estimates reported below are from 9/30/2023), while Damodaran Online updates the estimates annually (1/1/2024).

Kroll reports estimates from a variety of methodologies. Some estimates are produced using factor models, where the industry's sensitivity to a pricing factor (or sensitivities to a set of factors) are measured and used to generate a cost of capital. For example, single factor models

(such as the CAPM) typically mark the overall stock market return in excess of a “base” fixed income return as the pricing factor. The cost of capital is generated in this case by estimating a risk premium for each factor, adjusting that risk premium to account for the sensitivity of the industry in question to that factor, and then adding the adjusted risk premium to the current yield of the “base” fixed income instrument to produce a cost of capital. In addition to CAPM estimates, Kroll also reports a “CAPM + size premium” estimate to recognize the higher cost of capital endured by smaller firms and thus correct for the average size of firms within an industry. The “Buildup Method” employs a related approach, adding a size premium and an industry premium to the standard market risk premium. 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. Kroll also utilizes discounted cash flow (DCF) models, where free cash flow or dividends are forecasted into the future, with the cost of capital estimate being the implied discount rate on the future cash flows that explains the current equity valuation. In general, the two classes of methods---factor models and DCF models---are perhaps the two most widely accepted and widely deployed methods for estimating the cost of equity.

Damodaran reports estimates from a single-factor CAPM model. However, rather than estimating the risk premium associated with the stock market on the basis of simple averages of historical excess returns (as is typically done), he attempts to modify the premium to account for the current level of stock market valuation. This distinction is one example of the substantial variation in implementation of factor models, which can have significant effects on the estimates. There is also substantial methodological variation in implementation of the DCF model, which is estimated with different time period stages, with time-varying growth rates. All of this underscores the importance of consulting multiple sources of estimates and testing sensitivities where possible. Damodaran uses a 10-year Treasury yield as the risk-free rate in his model, and I set the rate to 4.253% (the three month average up to 1/3/2024) to be consistent with the other parts of the analysis.

The approaches described above all produce estimates of the cost of equity. This cost of equity is then weighted together with an estimated cost of debt for the industry to produce a WACC for publicly traded firms. The weights are based on the composition of the capital structure (equity versus debt) for the industry.

Q: Please describe how you derived your independent estimates of the cost of equity capital for publicly traded firms.

A: I used a single factor model, also referred to as a “risk premium” approach in previous filings in North Carolina. This approach estimates the cost of equity as

$$r + \beta * (ERP)$$

where r is the current yield on a reference fixed income instrument, ERP is the estimated expected excess return of the stock market over that fixed income yield, and β is the estimated covariation between the equity of the property-casualty industry and the overall stock market (more precisely, the covariance of property-casualty equities with the S&P 500, divided by the variance of the S&P 500).

For the reference interest rate, I tried four different fixed income assets---the 3-month Treasury Bill, the 10-year Treasury Note, the Moody's Seasoned Aaa Corporate Bond Index, and the Moody's Seasoned Baa Corporate Bond Index. In each case, I estimated the equity risk premium as the average excess return of the S&P 500 over the return on the reference fixed income asset over the 1928-2023 period. To calculate the average returns, I used the formula from Blume (1974)¹ by weighting together the arithmetic average and the geometric average, as in:

$$\left[\frac{N-T}{N-1} (1 + \pi_A) + \frac{T-1}{N-1} (1 + \pi_G) \right]^{\frac{1}{T}}$$

where N is the sample size, T is the return horizon (corresponding to the maturity of the fixed income asset), π_A is the arithmetic average return in the sample, and π_G is the geometric average return in the sample.

For β (beta), I estimated a weighted average beta for the North Carolina Mobile Homeowners market. For each publicly traded holding company associated with an operating subsidiary underwriting Mobile Homeowners insurance in North Carolina in 2022, I pulled the beta provided by S&P Global (based on 1-year and 3-year daily returns). I then calculated a weighted average based on 2022 North Carolina Mobile Homeowners DPW.

Given current yields for the reference fixed income assets and estimates for the equity risk premium and beta, I then calculate a cost of equity according to the formula given above.

Next, I estimated a WACC for the North Carolina market. For the capital structure, I estimated a weighted average debt percentage for the North Carolina Mobile Homeowners market. For each publicly traded holding company, I calculated the percentage of debt in the capital structure based on the latest fiscal year report. For the cost of debt, I used the figure from Damodaran Online, based on a 4.253% 10-year Treasury rate.

Q: What were the results?

A: The following table lists the cost of equity and the WACC for publicly traded companies, including the estimates I produced and those reported by Kroll and Damodaran Online for the property-casualty industry.

¹ Blume, M.E. (1974), "Unbiased Estimates of Long-Run Expected Rates of Return," *Journal of the American Statistical Association* (September), pp. 634-8.

Cost of Capital for Publicly Traded Companies							
Source	Method	Current Yield (1/3/2024)	Equity Risk Premium	Cost of Equity		WACC	
Kroll	CAPM			8.7%		7.9%	
Kroll	CAPM + Size Premium			9.1%		8.2%	
Kroll	Build-Up			9.7%		8.7%	
Kroll	Fama-French 5-factor			9.8%		8.8%	
Kroll	DCF (1-stage)			20.9%		17.6%	
Kroll	DCF (3-stage)			22.4%		18.8%	
Damodaran Online	Implied Premium			7.65%		7.07%	
				Low	High	Low	High
Zanjani	Risk Premium over T-Bill	5.49%	8.17%	11.24%	11.62%	10.08%	10.40%
Zanjani	Risk Premium over T-Note	4.25%	6.52%	8.84%	9.15%	8.09%	8.35%
Zanjani	Risk Premium over Aaa Bond	5.05%	5.64%	9.02%	9.28%	8.24%	8.46%
Zanjani	Risk Premium over Baa Bond	5.98%	4.40%	9.08%	9.29%	8.29%	8.46%

I have also shown the current yield and equity risk premium elements for each of my own estimates to facilitate reconstruction. Other parameters I used were calculated as described above: 1) the weighted average beta for the North Carolina industry (0.7034 to 0.7504), 2) the cost of debt (4.40%), and 3) the percentage of debt in the capital structure (16.86%).

To illustrate, the higher cost of equity for my “Risk Premium over T-Bill” method is:

$$5.49\% + 0.7504 \times 8.17\% = 11.62\%$$

and the WACC is:

$$(1 - .1686) \times 11.62\% + .1686 \times 4.40\% = 10.40\%.$$

Note that the estimates for capital structure and the cost of debt differ across sources, so the relationship between the cost of equity and the WACC for Kroll and Damodaran Online will not follow the exact formula listed above.

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 82.1% of the 2022 Mobile Homeowners direct premiums written for North Carolina. The remainder 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-24 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 somewhat below the average of the averages of the three groups in Exhibit RB-24 (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 17.9% market share for non-public companies, I calculate adjusted estimates of the private cost of equity and the public cost of equity:

$$17.9\% * \left(\frac{COE}{(1 - 0.25)} \right) + (82.1\%) * (COE),$$

where *COE* is the estimated cost of equity for public companies. The adjusted estimates are as follows:

Cost of Capital, Adjusted for Non-Public Ownership					
Source	Method	Cost of Equity		WACC	
Kroll	CAPM	9.2%		8.3%	
Kroll	CAPM + Size Premium	9.6%		8.6%	
Kroll	Build-Up	10.3%		9.2%	
Kroll	Fama-French 5-factor	10.4%		9.3%	
Kroll	DCF (1-stage)	22.1%		18.6%	
Kroll	DCF (3-stage)	23.7%		19.9%	
Damodaran Online	Implied Premium	8.11%		7.45%	
		Low	High	Low	High
Zanjani	Risk Premium over T-Bill	11.90%	12.31%	10.64%	10.98%
Zanjani	Risk Premium over T-Note	9.37%	9.69%	8.53%	8.80%
Zanjani	Risk Premium over Aaa Bond	9.55%	9.83%	8.68%	8.92%
Zanjani	Risk Premium over Baa Bond	9.62%	9.84%	8.74%	8.92%

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 considered in the cost of equity analysis. 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. Even before making the adjustments to the investment return projections that I believe are appropriate for the North Carolina Mobile Homeowners MH(C) excluding Liability insurance market, the projected total return of 11.67% is comfortably within the span of estimates, which range from 8.11% to 23.7%. If one instead focuses on the statutory return by excluding investment income on surplus, the projected return of 7.16% falls below the lower end of the range of estimates. Similar conclusions apply to Mobile Homeowners MH(C) Liability insurance, where the total return was 12.21% and the statutory return was 7.63%. When testing robustness by 1) adjusting the investment portfolio to the allocations matched to the North Carolina Mobile Homeowners market and 2) substituting current yields for embedded yields, the total returns and statutory returns increase slightly, but the findings on where the returns fall are essentially unchanged.

A second school of thought is that, although the capital of the operating subsidiaries may be fully financed by equity, the holding companies are the source of that equity. Thus, 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 significant 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 the WACC discussed above, which, as can be seen above, is typically lower than the cost of equity due to the lower cost of debt.

On the other hand, the market value of the capital of the holding company will be different from 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.

Stock market valuations at current levels put the market-to-net worth ratio of the public companies that own the major underwriters of Mobile Homeowners insurance in North Carolina, on average, well above one. However, even if one assumes that the market value of holding company capital is equal to the net worth of the operating subsidiaries, the table demonstrates that a total return on net worth of 11.67% for the Mobile Homeowners MH(C) excluding Liability insurance market is reasonable and not excessive; it falls comfortably within the span of estimates (7.45% to 19.9%). The statutory return on net worth of 7.16% falls below the lower end of the span of estimates and thus is not excessive. For the Mobile Homeowners MH(C) Liability insurance market, the total return of 12.21% falls comfortably within the span of estimates and thus is reasonable and not excessive. A similar conclusion applies to the statutory return of 7.63%, which falls toward the lower end of the range. The conclusions hold after adjusting projected returns to account for the investment portfolio of companies serving the North Carolina Mobile Homeowners market and the current level of investment yields.

In summary, the expected returns on net worth calculated in Section II are, in my opinion, consistent with a reasonable and not excessive return on invested capital when viewed on a total return basis and are not excessive when viewed on a statutory return basis.

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. Based on my pro forma return analysis detailed in Exhibits RB-22 and RB-23, I found that the expected statutory return on net worth implied by the selected 6.0% underwriting profit factor for Mobile Homeowners MH(C) excluding Liability insurance was 7.16% (not including investment income on surplus), and the expected total return on net worth was 11.67% (including investment income on surplus). The expected statutory return implied by the 5.5% underwriting profit factor for Mobile Homeowners MH(C) Liability insurance was 7.63%, and the total expected total return was 12.21%. When making adjustments that I regard as appropriate

to account for the asset distribution relevant for this line of business and the yields currently in the marketplace, the expected statutory and total returns rose by 5 to 10 basis points and 20 to 25 basis points, respectively. After reviewing the cost of capital estimates for the industry produced by third parties and producing my own estimates tailored to the North Carolina market, 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 when viewed on a total return basis and to be not excessive when viewed on a statutory return basis.

An important caveat to this analysis, however, is that all conclusions are predicated on the assumption that the indicated rate level is achieved. In the event that a lower rate level is implemented, the expected rate of return could be inadequate.

Q: Does that conclude your testimony?

A: Yes.

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Education

Ph.D., Economics, University of Chicago, 2000
ACAS, Casualty Actuarial Society, 1994
A.B./ B.S., Economics and Biology, Stanford University, 1990

Work Experience

University of Alabama (Tuscaloosa, Alabama)
Professor of Finance and Frank Park Samford Chair of Insurance, 2017-

University of Cologne
Gen Re Visiting Professor, 2023

Georgia State University (Atlanta, Georgia)
AAMGA Distinguished Chair in Risk Management & Insurance, 2011-2017
Associate Professor, 2008-2017

Nanyang Technological University (Singapore)
Visiting Senior Research Fellow, 2011-12, 2013-2014

Federal Reserve Bank of New York (New York, New York)
Senior Economist, 2006-2008
Economist, 2000-2006

Fireman's Fund Insurance Companies (Novato, California)
Senior Actuarial Analyst, 1993-94
Actuarial Analyst, 1991-1993
Assistant Actuarial Analyst, 1990-1991

Publications: Refereed Scholarly

"Pricing Insurance Risk: Reconciling Theory and Practice," (with Daniel Bauer and Richard D. Phillips), in *Handbook of Insurance* (3rd edition), Georges Dionne (ed.), New York: Springer (forthcoming)

- "Economic Capital and RAROC in a Dynamic Model," (with Daniel Bauer), *Journal of Banking and Finance*, 125: Article 106071, (2021) [Winner of Casualty Actuarial Society Hachemeister Prize, 2015]
- "Capital Allocation Techniques: Review and Comparison," (with Daniel Bauer and Qiheng Guo), *Variance*, 14(2), (2021)
- "Dynamic Capital Allocation with Irreversible Investments," (with Daniel Bauer, Shinichi Kamiya, and Xiaohu Ping), *Insurance: Mathematics and Economics* 85: 138-52, (2019)
- "What Drives Tort Reform Legislation? Economics and Politics of the State Decisions to Restrict Liability Torts," (with Yiling Deng), *Journal of Risk & Insurance* 85: 959-991, (2018)
- "Egalitarian Equivalent Capital Allocation," (with Shinichi Kamiya), *North American Actuarial Journal* 21: 382-96, (2017)
- "The Marginal Cost of Risk, Risk Measures, and Capital Allocation," (with Daniel Bauer), *Management Science* 62: 1431-1457 (2016)
- "Economic Analysis of Risk and Uncertainty Induced by Health Shocks: A Review and Extension," (with Tomas J. Philipson), in *Handbook of the Economics of Risk and Uncertainty*, Volume 1, Mark J. Machina and W. Kip Viscusi (eds.), North Holland: Elsevier (2014)
- "Capital Allocation and Its Discontents," (with Daniel Bauer), in *Handbook of Insurance* (2nd edition), Georges Dionne (ed.), New York: Springer (2013)
- "Financial Pricing of Insurance," (with Daniel Bauer and Richard D. Phillips), in *Handbook of Insurance* (2nd edition), Georges Dionne (ed.), New York: Springer (2013)
- "Insurance Risk, Risk Measures, and Capital Allocation: Navigating a Copernican Shift," (with Michael R. Powers), *Annual Review of Financial Economics* 5: 201-223 (2013)
- "Catastrophe Bonds, Reinsurance, and the Optimal Collateralization of Risk Transfer," (with Darius Lakdawalla), *Journal of Risk & Insurance* 79, pp. 449-76 (2012)
- "An Economic Approach to Capital Allocation," *Journal of Risk and Insurance* 77, pp. 523-549 (2010) [Winner of Casualty Actuarial Society ARIA Award, 2010]
- "Federal Financial Exposure to Catastrophic Risk," (with J. David Cummins and Michael Suher), in *Measuring and Managing Federal Financial Risk*, Deborah Lucas (ed.), Chicago: University of Chicago Press (2010)

- "Public versus Private Underwriting of Catastrophe Risk: Lessons from the California Earthquake Authority," in *Risking House and Home: Disasters, Cities, Public Policy*, John M. Quigley and Larry A. Rosenthal (eds.), Berkeley: Berkeley Public Policy Press (2008)
- "Regulation, Capital, and the Evolution of Organizational Form in U.S. Life Insurance," *American Economic Review* 97, pp. 973-983 (2007)
- "Insurance, Self Protection, and the Economics of Terrorism," (with Darius Lakdawalla), *Journal of Public Economics* 89, pp. 1891-1905 (2005)
- "Terrorism Insurance Policy and the Public Good," (with Darius Lakdawalla), *St. John's Journal of Legal Commentary* 18, pp. 463-469 (2004)
- "The Production and Regulation of Health Insurance: Limiting Opportunism in Proprietary and Non-Proprietary Organizations," (with Tomas Philipson) in *Individual Decisions for Health*, Bjorn Lindgren (ed.), pp. 194-206, Routledge International Studies in Health Economics, Routledge: London (2003)
- "Pricing and Capital Allocation in Catastrophe Insurance," *Journal of Financial Economics* 65, pp. 283-305 (2002) [reprinted in *Insurance and Risk Management Volume I: Economics of Insurance Markets*, Gregory Niehaus (ed.), Northampton: Edward Elgar Publishing, (2008)]

Publications: Professional/Practitioner

- Book review of "Moral Hazard in Health Insurance," *Journal of Economic Literature* 53, pp. 682-3 (2015)
- "Microinsurance Lessons from History," (with Rick Koven), *Microinsurance Learning and Knowledge (MILK)* (2013)
- "Institutional Investors and Asset Allocations: Accounting and Regulation of Private Defined Benefit Pension Plans and Other Institutional Investors in the United States, Mexico, and Australia," (with John Broadbent, Michael Palumbo, and Julio Santaella), *CGFS Publication No. 27, Working Group on Institutional Investors, Global Savings, and Asset Allocation* (2006)
- "An Overview of Political Risk Insurance" (with Kausar Hamdani and Elise Liebers), *CGFS Publication No. 22, Working Group on Foreign Direct Investment in the Financial Sector of Emerging Market Economies* (2005)

Work in Progress

- "Life Insurance and Annuity Pricing During the Financial Crisis, Revisited," (with Daniel Bauer, Lars Powell, and Boheng Su), working paper, 2024

- "Dynamic Capital Allocation in General Insurance," (with Daniel Bauer and Qiheng Guo), working paper, 2023
- "The Ignorance of Crowds: Understanding Reserving Errors in the Liability Crisis of 1997-2001," (with Eren Cifci, Qianlong Liu, Steve Mildenhall, Lars Powell, and Kenny Wunder), working paper, 2023
- "Market Discipline and Guaranty Funds in Life Insurance," (with Martin Grace, Shinichi Kamiya, and Robert W. Klein), working paper, 2023
- "The Effect of Government Guarantees on Market Discipline in the Property-Casualty Insurance Industry," (with Yiling Deng, Ty Leverty, and Kenny Wunder), working paper, 2023
- "An Integrated Approach to Measuring Asset and Liability Risks in Financial Institutions," (with Daniel Bauer), working paper, 2023
- "Optimal Insurance Contracts with Insurer Background Risk," (with Xiaohu Ping), working paper, 2015
- "The Effect of Banking Crises: Evidence from Non-Life Insurance Consumption," (with Shinichi Kamiya and Jackie Li), working paper, 2015
- "Bankruptcy in the Core and Periphery of Financial Groups: The Case of the Property-Casualty Insurance Industry" working paper, 2010
- "The Rise and Fall of the Fraternal Life Insurer: Law and Organizational Form in U.S. Life Insurance, 1870-1920," working paper, (*revise and resubmit, Journal of Law & Economics*), 2007
- "Organizational Form and the Underwriting Cycle: Theory with Evidence from the Pennsylvania Fire Insurance Market, 1873-1909," working paper, 2004
- "Consumption versus Production of Insurance," (with Tomas Philipson), *NBER Working Paper #6225*, 1997

External Research Projects and Consulting

- 2024 Expert Witness, Workers' Compensation Rate Filings, Massachusetts
- 2023 Using Industry Level Experience to Improve Company Loss Reserving, sponsored by CAS
- 2023 Expert Witness, Insurance Rate Filings, North Carolina
- 2023 Expert Witness, Workers' Compensation Rate Filings, Massachusetts
- 2022 Expert Witness, Insurance Rate Filings, North Carolina
- 2022 Expert Witness, Workers' Compensation Rate Filings, Massachusetts
- 2021 Expert Witness, *Golson v. Provident Life*, Alabama
- 2021 Expert Witness, Insurance Rate Filings, North Carolina

- 2020 Expert Witness, Insurance Rate Filings, North Carolina
- 2020 Expert Witness, Workers' Compensation Rate Filings, Massachusetts
- 2019 NCCI Review of Cost of Capital Methodology
- 2019 Expert Witness, Insurance Rate Filings, North Carolina
- 2018 NCCI Review of TCJA
- 2017 Expert Witness, Workers' Compensation Rate Hearing, Florida
- 2016 Expert Witness, Assigned Risk Workers' Compensation Rate Hearing, Virginia
- 2015 Expert Witness, Workers' Compensation Rate Hearing, Florida
- 2015 NCCI Revision of Underwriting Profit and Contingency Internal Rate of Return Model
- 2015 An Extension of the Project on the Costs of Holding Capital, sponsored by the CAS
- 2013 Microinsurance Centre Lessons from History Project
- 2012 Allocation of the Costs of Holding Capital, sponsored by the CAS,
- 2011 CRO Risk Index Project, co-sponsored by SOA and Bloomberg, co-founder
- 2009 "The Financial Crisis and Lessons for Insurers," \$50,000 SOA grant, role: report co-author

Papers Presented at Professional Meetings

- 2023 "Life Insurance and Annuity Pricing During the Financial Crisis, Revisited" EGRIE Annual Seminar, Malaga, Spain
- 2023 "Life Insurance and Annuity Pricing During the Financial Crisis, Revisited" IME Annual Conference, Edinburgh, UK
- 2023 "Understanding Loss Reserving Errors in the Liability Catastrophe of 1997-2001," IME Annual Conference, Edinburgh, UK
- 2023 "Understanding Loss Reserving Errors in the Liability Catastrophe of 1997-2001," Gen Re Seminar, Cologne, Germany
- 2022 "Understanding Loss Reserving Errors in the Liability Catastrophe of 1997-2001," Conference in Honor of J.David Cummins and Mary Weiss, Temple University, Philadelphia
- 2020 "Life Insurance and Annuity Pricing During the Financial Crisis, Revisited" WRIEC, virtual meeting
- 2019 "An Integrated Approach to Measuring Asset and Liability Risks in Financial Institutions," EGRIE Annual Meeting, Rome, Italy
- 2019 "An Integrated Approach to Measuring Asset and Liability Risks in Financial Institutions," ARIA Annual Meeting, San Francisco, CA
- 2019 "An Integrated Approach to Measuring Asset and Liability Risks in Financial Institutions," RTS Annual Seminar, Tuscaloosa, AL
- 2017 "The Effect of Government Guarantees on Market Discipline in the Property-Casualty Insurance Industry," NBER Insurance Project Workshop, Boston, MA
- 2015 "The Marginal Cost of Risk in a Multi-Period Model," NBER Insurance Project Workshop, Stanford, CA
- 2015 "The Marginal Cost of Risk in a Multi-Period Model," CAS Annual Meeting, Philadelphia, PA
- 2015 "Dynamic Capital Allocation," IME Annual Conference, Liverpool UK
- 2015 "What Drives Tort Reform Legislation? Economics and Politics of the State Decisions to Restrict Liability Torts," ASSA Annual Meeting, Boston, MA
- 2014 "The Marginal Cost of Risk in a Multi-Period Model," CAS Centennial, New York, NY
- 2014 "Market Discipline and Guaranty Funds in Life Insurance," EGRIE Annual Seminar, St. Gallen, CH
- 2014 "Dynamic Capital Allocation with Irreversible Investments," EGRIE Annual Seminar, St. Gallen, CH
- 2014 "What Drives Tort Reform Legislation? Economics and Politics of the State Decisions to Restrict Liability Torts," ARIA Annual Meeting, Seattle, WA
- 2014 "The Marginal Cost of Risk in a Multi-Period Model," ARIA Annual Meeting, Seattle, WA
- 2014 "Market Discipline and Guaranty Funds in Life Insurance," ARIA Annual Meeting, Seattle, WA
- 2014 "The Marginal Cost of Risk in a Multi-Period Model," IME Conference, Shanghai, CN
- 2014 "The Effect of Banking Crises: Evidence from Non-Life Insurance Consumption," Risk Theory Seminar, Munich, Germany
- 2013 "The Effect of Banking Crises: Evidence from Non-Life Insurance Consumption," ASSA Annual Meeting, Philadelphia, PA

- 2013 “Optimal Insurance Contracts with Insurer Background Risk,” EGRIE Annual Meeting, Paris, FR
- 2013 “The Effect of Banking Crises: Evidence from Non-Life Insurance Consumption,” ARIA Annual Meeting, Washington D.C.
- 2013 “The Marginal Cost of Risk, Risk Measures, and Capital Allocation,” IRFRC Catastrophe Risk Conference, Singapore
- 2013 “Optimal Insurance Contracts with Insurer Background Risk,” ARIA Annual Meeting, Washington D.C.
- 2013 “The Marginal Cost of Risk, Risk Measures, and Capital Allocation,” CEAR/ETH Indices of Risk and New Risk Measures Conference, Zurich, CH
- 2012 “The Marginal Cost of Risk, Risk Measures, and Capital Allocation,” CAS Spring Meeting, Phoenix, AZ
- 2012 “The Marginal Cost of Risk, Risk Measures, and Capital Allocation,” Symposium: Risk and Catastrophic Events, State College, PA
- 2012 “The Marginal Cost of Risk, Risk Measures, and Capital Allocation,” ASSA Annual Meeting, Chicago, IL
- 2011 “The Marginal Cost of Risk, Risk Measures, and Capital Allocation,” NBER Insurance Project Workshop, Cambridge, MA
- 2010 “Bankruptcy in the Core and Periphery of Financial Groups: The Case of the Property-Casualty Insurance Industry,” ASSA Annual Meeting, Atlanta, GA
- 2009 “Bankruptcy in the Core and Periphery of Financial Groups: The Case of the Property-Casualty Insurance Industry,” Risk Management and Corporate Governance Conference, Loyola University of Chicago
- 2009 “Bankruptcy in the Core and Periphery of Financial Groups: The Case of the Property-Casualty Insurance Industry,” ARIA Annual Meeting, Providence, RI
- 2008 “An Economic Approach to Capital Allocation,” Risk Theory Society, Annual Meeting, Fort Collins, CO
- 2007 “Federal Financial Exposure to Catastrophic Risk,” ARIA Annual Meeting, Quebec City, CA
- 2007 “Catastrophe Bonds, Reinsurance, and the Optimal Collateralization of Risk Transfer,” EFMA Annual Meeting, Vienna, AT
- 2007 “Catastrophe Bonds, Reinsurance, and the Optimal Collateralization of Risk Transfer,” 5th Infiniti Conference on International Financial Integration, Dublin, IE
- 2007 “Federal Financial Exposure to Catastrophic Risk,” NBER Conference on Measuring and Managing Federal Financial Risk, Evanston, IL
- 2006 Insuring Catastrophic Losses: The Status of TRIA and Proposed Natural Disaster Backstops, Wash., D.C.
- 2006 “Catastrophe Bonds, Reinsurance, and the Optimal Collateralization of Risk Transfer,” Risk Theory Society, Annual Meeting, Richmond, VA
- 2006 “Public versus Private Underwriting of Catastrophe Risk: Lessons from the California Earthquake Authority,” Berkeley Symposium on Real Estate, Catastrophic Risk, and Public Policy
- 2006 “Catastrophe Bonds, Reinsurance, and the Optimal Collateralization of Risk Transfer,” NBER Insurance Project Workshop, Cambridge, MA
- 2005 “Regulation, Capital, and the Evolution of Organizational Form in U.S. Life Insurance,” NBER Insurance Project Workshop, Cambridge, MA
- 2004 “The Rise and Fall of the Fraternal Life Insurer: Law and Organizational Form in U.S. Life Insurance,” NBER Insurance Project Workshop, Cambridge, MA
- 2004 “Regulation, Capital, and the Evolution of Organizational Form in U.S. Life Insurance,” American Finance Association, Annual Meeting, San Diego, CA
- 2003 “Insurance, Self-Protection, and the Economics of Terrorism,” Risk Theory Society, Annual Meeting, Atlanta, GA
- 2003 “Terrorism Insurance Policy and the Public Good,” St. John’s Journal of Legal Commentary 10th Annual Legal Symposium: Terrorism and its Impact on Insurance: Legislative Responses and Coverage Issues, Queens, NY
- 2003 “Insurance, Self-Protection, and the Economics of Terrorism,” NBER Insurance Project Workshop, Cambridge, MA
- 2002 “Pricing and Capital Allocation in Catastrophe Insurance,” CAS Risk and Capital Management Seminar, Toronto, CA
- 2002 “Market Discipline and Government Guarantees in U.S. Life Insurance,” Risk Theory Society, Annual Meeting, Urbana-Champaign, IL
- 2001 “Pricing and Capital Allocation in Catastrophe Insurance,” Risk Theory Society, Annual Meeting, Montreal

Other Conferences Talks and Panel Participation

2018 Surplus Lines Automation Conference, Florida
2017 International Conference on Business Sciences, Cairo University, Egypt
2016 IIF Insurance Colloquium, Basel, Switzerland
2016 Surplus Lines Association of California, California (keynote)
2014 Surplus Lines Automation Conference, Florida
2011 PRMIA Annual Risk Leadership Conference, Atlanta, GA
2011 7th International Microinsurance Conference, Rio de Janeiro, Brazil
2010 Property Loss Research Bureau Eastern Adjusters Conference, Atlanta, GA (keynote)
2008 NCOIL Annual Meeting, Duck Key, FL
2007 Capital Markets Symposium on Securitizing Insurance Risk, New York, NY
2006 Insuring Catastrophic Losses: The Status of TRIA and Proposed Natural Disaster Backstops, Wash., D.C.
2006 Catastrophe Bonds and Insurance Linked Securities Summit, New York, NY
2005 12th Annual International Conference Promoting Business Ethics, New York, NY

Service Activities in Academic and Professional Organizations

Senior Editor, *Journal of Risk and Insurance* (2019-)
Associate Editor, *Insurance: Mathematics and Economics* (2022-)
International Research Advisory Board, Risk and Insurance Research Center, NCCU, Taiwan
American Risk & Insurance Association President (2012-13)
Risk Theory Society President (2011-2012)
American Risk & Insurance Association Board Member (2007-2014)
Editorial Board, *Journal of Insurance Issues* (2012-2014)
Huebner Colloquium Panelist (2016-2019)

External Committees

American Risk & Insurance Association Program Committee, various years; ARIA Nominations Committee, 2015, 2016, 2018; Kulp-Wright Book Award Committee, 2005; ARIA Mehr Award Committee, 2024

Discussant: *EGRIE Annual Seminar, Malaga, 2023; ARIA Annual Meeting, Los Angeles, 2022; WRIEC 2020; EGRIE Annual Meeting, Rome, 2019; ARIA Annual Meeting, San Francisco, 2019; ARIA Annual Meeting, Chicago, 2018; ARIA Annual Meeting, Boston, 2016; SIFR Insurance Conference, Stockholm, 2015; EGRIE Annual Seminar, St. Gallen, 2014; ARIA Annual Meeting, Seattle, 2014; ARIA Annual Meeting, San Diego, 2011; CEAR Workshop on Insurance for the Poor, Atlanta, 2010; CEAR Workshop on Risk Perception and Subjective Beliefs, Atlanta, 2010; Midwest Finance Association Annual Meeting, Chicago, 2009; 5th Infiniti Conference, Dublin, 2007; EFMA Annual Meeting, Vienna, 2007; AEA Annual Meeting, San Diego, 2004*

Session Chair: *ARIA Annual Meeting, Chicago, 2018, ARC, Atlanta, 2017; IME, Atlanta, 2017; ARIA Annual Meeting, San Diego, 2011; Midwest Finance Association Annual Meeting, Chicago, 2009; ARIA Annual Meeting, Quebec City, 2007; EFMA Annual Meeting, Vienna, 2007;*

Referee for *Asia-Pacific Journal of Risk and Insurance, Astin Bulletin, Australian Social Monitor, Contemporary Economic Policy, Current Issues in Economics and Finance, Defense and Peace Economics, European Economic Review, Financial Review, Geneva Papers: Issues and Practice, Geneva Risk and Insurance Review, Health Affairs, Insurance: Mathematics and Economics, Journal of Banking and Finance, Journal of Business, Journal of Finance, Journal of Financial Intermediation,*

Journal of Financial Services Research, Journal of Law and Economics, Journal of Mathematical Economics, Journal of Money, Credit, and Banking, Journal of Political Economy, Journal of Risk and Insurance, Management Science, Mathematical Social Sciences, North American Actuarial Journal, Proceedings of the National Academy of Sciences, Review of Financial Studies, Risk Management and Insurance Review, Scandinavian Actuarial Journal, and Science.

Working Group Participation

Committee on the Global Financial System, Working Group on Institutional Investors, Global Savings, and Asset Allocation (2006); Presidential Working Group on Financial Markets, Working Group on Terrorism Insurance (2006)

Continuing Education Activities

- | | |
|-----------|--|
| 2004-2007 | Central Banking Seminar, Federal Reserve Bank of New York, Topics: Introduction to U.S. Financial Markets; Introduction to Non-bank Financial Institutions |
| 2009 | Texas Farm Bureau Program, Georgia State University, Topic: Securitization, the Insurance Industry, and the Panic of 2007 |
| 2009-2012 | Horst K. Jannott Visiting Fellows Program, Georgia State University, Topics: Securitization, the Insurance Industry, and the Panic of 2007; Introduction to Statistics |

NCRB - Pro Forma Statutory Rate of Return Mobile Homeowners MH(C) ex. Liability Insurance			
	Pre-Tax	Tax Liability	Post-Tax
1 Premiums	100.00%		
Loss & LAE	39.87%		
Commissions	16.20%		
Other Acquisition & General	13.14%		
Taxes, Licenses, & Fees	3.10%		
Policyholder Dividends	0.50%		
Net Cost of Reinsurance	20.31%		
Compensation for Assessment Risk	0.87%		
2 Pro Forma Underwriting Profit	6.00%		
3 Installment Fee Income	0.18%		
4 Regular Tax		1.30%	
5 Additional Tax Due to IRS Treatment of Reserves		0.06%	
6 Return from Underwriting Post-Tax			4.82%
7 Investment Gain on Insurance Transaction	2.19%		
Less Investment Income on Agent and Reinsurance	0.66%		
Net Investment Gain on Insurance Transaction	1.53%	0.26%	1.27%
8 Statutory Return as a Percent of Premium (post-tax)			6.09%
9 Premium-to-Net Worth Ratio			1.18
10 Statutory Return as a Percent of Net Worth (post-tax)			7.16%
<i>Lines (1) to (8) are expressed as a percentage of premium.</i>			

Assumptions and Parameters

(a) Underwriting Income Tax Rate	21.00%
(b) Investment Income Tax Rate	17.21%
(c) Pre-tax Investment Yield	5.13%
(d) Premium-to-Surplus Ratio	1.32
(e) Net Worth-to-Surplus Ratio	1.122
(f) Installment Fee Income	0.18%
(g) Additional Tax Due to IRS Treatment of Loss Reserves and UEPR	0.06%
(h) Net Cost of Reinsurance	20.31%
(i) Compensation for Assessment Risk	0.87%

Notes to Exhibit RB-22 Page 1

- 1 The expense provisions are those used in Exhibit RB-1, adjusted for the indicated rate change.
- 2 Selected by North Carolina Rate Bureau
- 3 See Exhibit RB-22, Page 3
- 4 $[(2) + (3)] \times (a)$
- 5 See Exhibit RB-22, Pages 4-6
- 6 $(2) + (3) - (4) - (5)$
- 7 Investment income on agents balances is calculated as $0.1517 \times 1.021 \times (c)$, where 0.1517 is a factor for agents balances held for less than 90 days and 1.021 is a factor to correct for overdue balances. The figures are based on the Homeowners line and are sourced from ISO. We then deduct investment income on net reinsurance balances, which we estimate at 0.105 of the total cost of reinsurance times (c). The estimate for net reinsurance balances is based on ceded balances payable plus funds held plus other amounts due reinsurers minus reinsurance recoverables. These amounts are taken from the aggregated Schedule F in the latest available edition of A.M. Best's Aggregates & Averages.
- 8 $(6) + (7)$
- 9 $(d) / (e)$
- 10 $(8) \times (9)$

Assumptions

- (a) Current corporate tax rate, based on the Tax Cut and Jobs Act of 2017.
- (b) See Exhibit RB-22, Pages 11-13. Calculated as 1- average post-tax yield/average pre-tax yield.
- (c) See Exhibit RB-22, Page 10
- (d) See Exhibit RB-22, Page 14
- (e) See Exhibit RB-22, Page 15
- (f) See Exhibit RB-22, Page 3
- (g) See Exhibit RB-22, Pages 4-6
- (h) Net Cost of Reinsurance based on the analysis of Aon and incorporated in the filing, adjusted for the indicated rate change.
- (i) Compensation for Assessment Risk based on the analysis of Milliman incorporated in the filing, adjusted for the indicated rate change.

NCRB - Pro Forma Total Rate of Return (Including Investment Income on Surplus) Mobile Homeowners MH(C) ex. Liability Insurance			
	Pre-Tax	Tax Liability	Post-Tax
1 Premiums	100.00%		
Loss & LAE	39.87%		
Commissions	16.20%		
Other Acquisition & General	13.14%		
Taxes, Licenses, & Fees	3.10%		
Policyholder Dividends	0.50%		
Net Cost of Reinsurance	20.31%		
Compensation for Assessment Risk	0.87%		
2 Pro Forma Underwriting Profit	6.00%		
3 Installment Fee Income	0.18%		
4 Regular Tax		1.30%	
5 Additional Tax Due to IRS Treatment of Reserves		0.06%	
6 Return from Underwriting Post-Tax			4.82%
7 Investment Gain on Insurance Transaction	2.19%		
Less Investment Income on Agent and Reinsurance Balances	0.66%		
Net Investment Gain on Insurance Transaction	1.53%	0.26%	1.27%
8 Investment Gain on Surplus	4.63%	0.80%	3.83%
9 Total Return as a Percent of Premium (post-tax)			9.92%
10 Premium-to-Net Worth Ratio			1.18
11 Total Return as a Percent of Net Worth (post-tax)			11.67%
<i>Lines (1) to (8) are expressed as a percentage of premium.</i>			

Assumptions and Parameters

(a) Underwriting Income Tax Rate	21.00%
(b) Investment Income Tax Rate	17.21%
(c) Pre-tax Investment Yield	5.13%
(d) Premium-to-Surplus Ratio	1.32
(e) Net Worth-to-Surplus Ratio	1.122
(f) Installment Fee Income	0.18%
(g) Additional Tax Due to IRS Treatment of Loss Reserves and UEPR	0.06%
(h) Net Cost of Reinsurance	20.31%
(i) Compensation for Assessment Risk	0.87%

Notes to Exhibit RB-22 Page 1A

- 1 The expense provisions are those used in Exhibit RB-1, adjusted for the indicated rate change.
- 2 Selected by North Carolina Rate Bureau
- 3 See Exhibit RB-22, Page 3
- 4 $[(2) + (3)] \times (a)$
- 5 See Exhibit RB-22, Pages 4-6
- 6 $(2) + (3) - (4) - (5)$
- 7 Investment income on agents balances is calculated as $0.1517 \times 1.021 \times (c)$, where 0.1517 is a factor for agents balances held for less than 90 days and 1.021 is a factor to correct for overdue balances. The figures are based on the Homeowners line and are sourced from ISO. We then deduct investment income on net reinsurance balances, which we estimate at 0.105 of the total cost of reinsurance times (c). The estimate for net reinsurance balances is based on ceded balances payable plus funds held plus other amounts due reinsurers minus reinsurance recoverables. These amounts are taken from the aggregated Schedule F in the latest available edition of A.M. Best's Aggregates & Averages.
- 8 $(c) \times [1 / (d) + 0.2535 \times 0.5685]$, where 0.2535 is the prepaid expense ratio minus the total cost of reinsurance from Page 7 and 0.5685 is the UEPR ratio from Page 7.
- 9 $(6) + (7) + (8)$
- 10 $(d) / (e)$
- 11 $(9) \times (10)$

Assumptions

- (a) Current corporate tax rate, based on the Tax Cut and Jobs Act of 2017.
- (b) See Exhibit RB-22, Pages 11-13. Calculated as 1- average post-tax yield/average pre-tax yield.
- (c) See Exhibit RB-22, Page 10
- (d) See Exhibit RB-22, Page 14
- (e) See Exhibit RB-22, Page 15
- (f) See Exhibit RB-22, Page 3
- (g) See Exhibit RB-22, Pages 4-6
- (h) Net Cost of Reinsurance based on the analysis of Aon and incorporated in the filing, adjusted for the indicated rate change.
- (i) Compensation for Assessment Risk based on the analysis of Milliman incorporated in the filing, adjusted for the indicated rate change.

NORTH CAROLINA
Mobile Homeowners MH(C) ex. Liability Insurance
INSTALLMENT PAYMENT INCOME

Year	Installment Charges	Mobile Home Written Premium	Percentage
2022	186,274	140,113,105	0.13%
2021	98,292	130,201,079	0.08%
2020	194,677	122,868,273	0.16%
2019	317,709	118,284,427	0.27%
2018	327,136	117,915,910	0.28%
Selected Value			0.18%

Source: NCRB

North Carolina
Mobile Homeowners MH(C) ex. Liability Insurance
Calculation of Additional Tax Liability

1. Collected Earned Premium for Current Year	100.00%
2. Unearned (Net) Premium Reserve 12/31/Current	44.93%
3. Unearned (Net) Premium Reserve 12/31/Prior	43.33%
4. Increase: (2) - (3)	1.60%
5. 20% of Increase = Taxable Income	0.32%
 6. Additional Tax Liability due to Unearned Premium Reserve	 0.07%
 7. Unpaid Loss Current Year	 10.57%
8. Discounted Unpaid Loss Prior Year	10.07%
 9. Unpaid Loss Prior Year	 10.19%
10. Discounted Unpaid Loss Prior Year	9.68%
 11. Additional Income	 -0.02%
12. Additional Tax Liability due to Loss Reserve Discounting	0.00%
 13. Total Additional Tax Liabilities (6) + (12)	 0.06%

NORTH CAROLINA
Mobile Homeowners MH(C) ex. Liability Insurance
Calculation of Taxable Income

Calculation of Unpaid Loss for Current Accident Year (AY)					Calculation of Discounted Unpaid Loss for Current AY			Calculation of Discounted Unpaid Loss for Prior AY			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
AY Avg Acc Date	AY Pay Pattern	Percent Unpaid	Total Losses	Unpaid Losses	AY at 12/31 yr t	Discount Factor	Discounted Unpaid Loss	AY at 12/31/yr t-1	Unpaid Losses	Discount Factor	Discounted Unpaid Loss
0.5	76.64%	23.36%	39.871	9.32	2022	0.957799	8.9220				
1.5	94.54%	5.46%	38.455	2.10	2021	0.938725	1.9704	2021	8.984	0.954554	8.5759
2.5	98.72%	1.28%	37.089	0.47	2020	0.937004	0.4432	2020	2.024	0.933939	1.8907
3.5	99.70%	0.30%	35.771	0.11	2019	0.928864	0.0990	2019	0.456	0.936815	0.4273
4.5	99.93%	0.07%	34.501	0.02	2018	0.914064	0.0220	2018	0.103	0.932041	0.0958
5.5	99.98%	0.02%	33.275	0.01	2017	0.916039	0.0050	2017	0.023	0.914064	0.0212
6.5	100.00%	0.00%	32.093	0.00	2016	0.913154	0.0011	2016	0.005	0.916039	0.0048
7.5	100.00%	0.00%	30.953	0.00	2015	0.910177	0.0000	2015	0.001	0.913154	0.0011
								2014	0.000	0.910177	0.0000
Totals					12.02			11.46			
								11.60			
								11.02			

Notes to Pages 4 and 5

Page 4

- 2 Page 8, line (2) divided by Page 8, line (1) times one minus the Cost of Reinsurance from Page 7
- 3 (2) divided by 1 plus the 10 year average growth rate of MHC premiums in North Carolina
- 4 (2) - (3)
- 5 (4) x 20%
- 6 (5) x current corporate tax rate
- 7 Unpaid current-year net losses at year-end as a percent of current year premium.
Sum of Page 5, Column (5) x (ratio of the net loss and LAE ratio from Page 7 to the direct loss and LAE ratio from Page 1)
- 8 Discounted unpaid current-year losses at year-end as a percent of current year premium.
Sum of Page 5, Column (8) x (ratio of the net loss and LAE ratio from Page 7 to the direct loss and LAE ratio from Page 1)
- 9 Unpaid prior-year losses at year-end as a percent of current year premium.
Sum of Page 5, Column (10) x (ratio of the net loss and LAE ratio from Page 7 to the direct loss and LAE ratio from Page 1)
- 10 Discounted unpaid prior-year losses at year-end as a percent of current year premium.
Sum of Page 5, Column (12) x (ratio of the net loss and LAE ratio from Page 7 to the direct loss and LAE ratio from Page 1)
- 11 Change in loss reserve discount: [(7) - (8)] - [(9) - (10)]
- 12 (11) x current corporate tax rate
- 13 (6) + (12)

Page 5

- 1 Midpoint of number of years since end of accident period
- 2 Homeowners accident year payout pattern developed from North Carolina policy year losses (Source: ISO)
- 3 1 - (2)
- 4 Latest period losses are based on projected loss ratio from Page 1. For previous years,
losses are detrended at the 10 year average premium growth rate for MHC in North Carolina.
- 5 (3) x (4)
- 6 Accident Year at current year end
- 7 IRS discount factors for Multiple Peril Lines from Revenue Procedure 2023-10
- 8 (5) x (7)
- 9 Accident Year at prior year end
- 10 Column (3), previous period x Column (4), current period
- 11 IRS discount factors for Multiple Peril Lines from Revenue Procedure 2021-54
- 12 (10) x (11)

NCRB Investment Income Calculation
Mobile Homeowners MH(C) ex. Liability Insurance

Projected Investment Earnings on Loss, Loss
Adjustment Expense and Unearned Premium Reserves

A. UNEARNED PREMIUM RESERVES

1. Direct Earned Premiums		1,000,000
2. Mean Unearned Premium Reserve	56.85%	568,515
3. Deductions for Prepaid Expenses		
Commissions & Brokerage	16.20%	
Taxes, Licenses, & Fees (5/6)	2.58%	
Other Acquisition & General (1/2)	6.57%	
Cost of Reinsurance	25.15%	
Total	50.50%	
4. Deduction for Prepaid Expense: (2) x (3)		287,127
5. Net Unearned Premium Reserve Subject to Investment (2) - (4)		281,388

B. Loss and Loss Expense Reserves

1. Direct Earned Premiums		1,000,000
2. Expected Net Incurred Loss & LAE-to- Direct Premium Ratio	35.03%	350,347
3. Expected Mean Loss and LAE Reserve-to-Incurred Ratio	41.44%	145,192

C. Net Policyholder Funds Subject to Investment (A5 + B3) 426,579

D. Average Rate of Return 5.13%

E. Investment Earnings from Net Reserves: (C) x (D) 21,891

F. Average Rate of Return as a Percent of Direct Earned Premiums: (E) / (A1) 2.19%

NORTH CAROLINA
Mobile Homeowners MH(C) ex. Liability Insurance

**ESTIMATED INVESTMENT EARNINGS ON UNEARNED
PREMIUM RESERVES AND ON LOSS RESERVES**

EXPLANATORY NOTES

Line A-1

Calculations displayed are per million of direct earned premiums.

Line A-2

The mean unearned premium reserve (UEPR) is determined by multiplying the direct earned premiums in line (1) by the ratio of the mean unearned premium reserve to the direct earned premium for the latest available calendar year. The data are for North Carolina Homeowners (NC HO) insurance (from statutory Page 14 of the Annual Statement) for all companies which wrote Mobile Homeowners C in the most recent calendar year. Volume amounts are in thousands of dollars.

1 NC HO Direct Earned Premium for most recent calendar year	137,443
2 NC HO UEPR at end of most recent calendar year	82,499
3 NC HO UEPR at end of previous calendar year	73,778
4 Mean NC HO UEPR	78,139
5 Ratio [(4) / (1)]	56.85%

Line A-3

Deduction for prepaid expenses

Certain production expenses, such as commissions and reinsurance, are assumed to be incurred when the policy is written and before the premium is paid. In addition, half of Other Acquisition and General expenses and 5/6 of Taxes, Licenses and Fees are assumed to be prepaid.

NORTH CAROLINA
Mobile Homeowners MH(C) ex. Liability Insurance

**ESTIMATED INVESTMENT EARNINGS ON UNEARNED
PREMIUM RESERVES AND ON LOSS RESERVES**

EXPLANATORY NOTES

Line B-2

Ratio is calculated as the expected direct loss and LAE ratio from Page 1 minus the difference between the total cost of reinsurance from Line A-3 and the net cost of reinsurance from Page 1.

Line B-3

The mean loss reserve is calculated by multiplying the incurred losses in (2) by the ratio for mean loss reserves to incurred losses. The latter figures are based on total statutory Page 14 figures for North Carolina Homeowners direct losses incurred and direct losses unpaid for all companies writing Mobile Homeowners C in North Carolina in each year. The adjustment for loss expense reserves is based on nationwide industry aggregates for the HO line. Volume amounts are in thousands of dollars.

6 Direct Losses Incurred	2018	122,751
7 Direct Losses Incurred	2019	36,245
8 Direct Losses Incurred	2020	49,336
9 Direct Losses Incurred	2021	44,890
10 Direct Losses Incurred	2022	58,579
11 Direct Losses Unpaid	2017	15,114
12 Direct Losses Unpaid	2018	26,592
13 Direct Losses Unpaid	2019	18,733
14 Direct Losses Unpaid	2020	18,553
15 Direct Losses Unpaid	2021	20,627
16 Direct Losses Unpaid	2022	23,354
17 Mean Loss Reserve	2018	20,853
18 Mean Loss Reserve	2019	22,663
19 Mean Loss Reserve	2020	18,643
20 Mean Loss Reserve	2021	19,590
21 Mean Loss Reserve	2022	21,991
22 Ratio	2018	16.99%
23 Ratio	2019	62.53%
24 Ratio	2020	37.79%
25 Ratio	2021	43.64%
26 Ratio	2022	37.54%
27 Average Loss Reserve		39.70%
28 Ratio of LAE Reserves to Loss Reserves		0.187
29 Ratio of Incurred LAE to Incurred Loss		0.137
30 Loss & LAE Reserve [(27) x (1+(28))/(1+(29))]		0.414

NORTH CAROLINA
Mobile Homeowners MH(C) ex. Liability Insurance

**ESTIMATED INVESTMENT EARNINGS ON UNEARNED
PREMIUM RESERVES AND ON LOSS RESERVES**

EXPLANATORY NOTES

Line E

The average rate of return is the average of the pretax current yield calculated on Page 11 and the pretax embedded yield. The embedded yield (see Page 12) is the sum of the ratio of investment income to invested assets for the most recent year plus the ten year average ratio of capital gains to invested assets (see Page 13). The current yield is the estimated currently available rate of return (including both income and capital gains) on the industry investment portfolio (see Page 11).

Embedded Yield	3.86%
Current Yield	6.40%
Average	5.13%

Portfolio Yield and Tax Rate - Current Yield					
Investable Asset	Percent of Assets	Estimated Prospective Pre-Tax Return	Tax Rate	Estimated Prospective Post-Tax Return	
Bonds					
US Gov't	9.73%	4.50%	21.00%	3.56%	
Municipal	21.05%	3.07%	5.25%	2.91%	
Industrial	34.16%	5.66%	21.00%	4.47%	
Preferred Stock	0.46%	7.01%	13.13%	6.09%	
Common Stock	18.38%	13.66%	19.55%	10.99%	
Mortgage Loans	1.32%	7.30%	21.00%	5.77%	
Real Estate	0.76%	6.61%	21.00%	5.22%	
Cash & Short-term Investments	5.43%	5.49%	21.00%	4.34%	
Other Long-Term Investments	8.71%	7.85%	18.69%	6.38%	
Rate of Return Before Expenses	100.00%	6.69%	18.66%	5.44%	
Investment Expenses		0.29%	21.00%	0.23%	
Portfolio Rate of Return		6.40%	18.55%	5.22%	

Sources

Preferred Stock	Current yield on iShares Preferred Stock Index ETF, 1/3/2024
Real Estate	REIT Sector WACC; source: Damodaran Online, using 4.253% for 10-year Treasury yield
Cash	3 month Treasury rate, averaged over 3 months (source: US Treasury)
Municipal	Maturity weighted average of 3 month average MBIS Investment Grade yield curve; linearly interpolated
Industrial	Three month average of HQM par yields (source: FRED); linearly interpolated
Treasury	Three month average of Treasury yields; linearly interpolated (source: US Treasury)
Common Stock	0.0817 ERP (source: Damodaran Online) plus 3 month average T-Bill Rate
Other LTI	Average of yields on bond portfolio, preferred stock, common stock, mortgages, and real estate.
Investment Expenses	Investment Expenses from statutory Page 12 of the Annual Statement (Exhibit of Net Investment Income) divided by Cash and Invested Assets from statutory Page 2 of the Annual Statement (Assets), as compiled in the 2023 edition of A.M. Best's Aggregates and Averages.

Portfolio Yield and Tax Rate Embedded Yield			
		Income	Tax Rate
Bonds			
	Taxable	31,319,900	21.00%
	Non-Taxable	6,002,714	5.25%
Stocks			
	Taxable	10,532,139	13.13%
	Non-Taxable	3,239,275	5.25%
Mortgage Loans		1,409,375	21.00%
Real Estate		1,933,499	21.00%
Contract Loans		202	21.00%
Cash & Short Term Inv		1,967,412	21.00%
All Other		22,850,110	21.00%
Total		79,254,626	18.12%
Inv. Expenses		6,410,961	21.00%
Net Inv. Income		72,843,665	17.87%
Mean Invested Assets		2,251,339,204	
Inv. Inc. Yield Rate		3.24%	17.87%
Capital Gains (10 yr. avg.) (% of Inv. Assets)		0.62%	0.00%
Invest. Yield Rate (pre-tax)		3.86%	14.98%
Invest. Yield Rate (post-tax)		3.28%	

Source: A.M. Best's Aggregates and Averages, 2023 Edition,
Page 12 - Exhibit of Net Investment Income (Column 2 - Earned
During Year). For capital gains, see Exhibit RB-22, Page 13.

**Realized Capital Gains or Losses
As a Percentage of Mean Invested Assets
(Amounts in Thousands of Dollars)**

Calendar Year	Mean Invested Assets	Realized Capital Gains	Percent
		Amount	
2013	1,473,600,834	12,163,890	0.83%
2014	1,543,882,375	12,093,078	0.78%
2015	1,567,611,077	9,887,732	0.63%
2016	1,596,937,470	8,086,268	0.51%
2017	1,676,831,258	15,725,303	0.94%
2018	1,733,729,297	10,825,733	0.62%
2019	1,822,857,949	11,238,484	0.62%
2020	1,975,605,647	10,933,304	0.55%
2021	2,156,355,790	18,153,320	0.84%
2022	2,251,339,204	2,090,986	0.09%
Total	17,798,750,898	111,198,098	0.62%

"Mean Invested Assets" is the average of current and prior year values for Total Invested Assets (Page 2). Source for data is 2013-2023 editions of A.M. Best's Aggregates and Averages. Figures are net of capital gains taxes.

North Carolina**Mobile Homeowners MH(C) ex. Liability Insurance****Premium-to-Surplus Ratios**

Year	Ratio
2022	1.52
2021	1.34
2020	1.27
2019	1.36
2018	1.45
2017	1.38
2016	1.25
2015	1.23
2014	1.24
2013	1.20
Average	1.32

Data from NAIC Statutory Filings and from A.M. Best's Aggregates and Averages, various years, for all groups writing Mobile Homeowners insurance in North Carolina, weighted by North Carolina Mobile Homeowners premiums.

North Carolina
Mobile Homeowners MH(C) ex. Liability Insurance
Calculation of Ratio of GAAP Net Worth to Statutory Surplus

	2018	2019	2020	2021	2022
Policyholder Surplus	742,079,084,495	847,278,658,173	910,066,482,410	1,028,834,642,825	958,964,082,808
+ Deferred Acquisition Costs	43,991,738,565	46,002,606,289	48,118,482,109	51,883,319,641	54,714,320,843
+ Non-Admitted DTA Provision	6,314,927,861	6,045,409,090	6,001,020,602	5,674,496,962	6,641,006,360
+ Non-admitted Assets (non-tax part)	46,502,063,197	50,520,441,190	51,971,123,366	62,815,925,708	54,765,183,036
+ Provision for Reinsurance	2,737,598,756	2,944,031,835	3,290,710,172	3,665,749,561	2,962,166,230
+ Provision for FASB 115(after-tax)	912,505,274	32,483,869,271	57,249,505,836	30,528,918,187	(69,664,596,475)
- Surplus Notes	(11,660,367,237)	(11,606,263,627)	(13,225,869,920)	(13,699,558,971)	(15,548,449,729)
GAAP-adjusted Net Worth	830,877,550,911	973,668,752,221	1,063,471,454,574	1,169,703,493,912	992,833,713,073
Ratio of Net Worth to Surplus	1.12	1.15	1.17	1.14	1.04
Five Year Average	1.122				

Source: ISO

NCRB - Pro Forma Statutory Rate of Return Mobile Homeowners MH(C) Liability Insurance			
	Pre-Tax	Tax Liability	Post-Tax
1 Premiums	100.00%		
Loss & LAE	56.56%		
Commissions	16.20%		
OA&G	18.14%		
TLF	3.10%		
Policyholder Dividends	0.50%		
2 Pro Forma Underwriting Profit	5.50%		
3 Installment Fee Income	0.18%		
4 Regular Tax		1.19%	
5 Additional Tax Due to IRS Treatment of Reserves		0.08%	
6 Return from Underwriting Post-Tax			4.40%
7 Investment Gain on Insurance Transaction	3.31%		
Less Investment Income on Agents Balances	0.79%		
Net Investment Gain on Insurance Transaction	2.51%	0.43%	2.08%
8 Statutory Return as a Percent of Premium (post-tax)			6.48%
9 Premium-to-Net Worth Ratio			1.18
10 Statutory Return as a Percent of Net Worth (post-tax)			7.63%
<i>Lines (1) to (8) are expressed as a percentage of premium.</i>			

Assumptions and Parameters

(a) Underwriting Income Tax Rate	21.00%
(b) Investment Income Tax Rate	17.21%
(c) Pre-tax Investment Yield	5.13%
(d) Premium-to-Surplus Ratio	1.32
(e) Net Worth-to-Surplus Ratio	1.122
(f) Installment Fee Income	0.18%
(g) Additional Tax Due to IRS Treatment of Loss Reserves and UEPR	0.08%

Notes to Exhibit RB-23 Page 1

- 1 The expense provisions are those used in Exhibit RB-1, adjusted for the indicated rate change.
- 2 Selected by North Carolina Rate Bureau
- 3 See Exhibit RB-23, Page 3
- 4 $[(2) + (3)] \times (a)$
- 5 See Exhibit RB-23, Pages 4-6
- 6 $(2) + (3) - (4) - (5)$
- 7 Investment income on agents balances is calculated as $0.1517 \times 1.021 \times (c)$, where 0.1517 is the factor for agents balances held for less than 90 days and 1.021 is a factor to correct for overdue balances. The figures are based on the Homeowners line and are sourced from ISO.
- 8 $(6) + (7)$
- 9 $(d) / (e)$
- 10 $(8) \times (9)$

Assumptions

- (a) Current corporate tax rate, based on the Tax Cut and Jobs Act of 2017.
- (b) See Exhibit RB-23, Pages 11-13. Calculated as $1 - \text{average post-tax yield} / \text{average pre-tax yield}$.
- (c) See Exhibit RB-23, Page 10
- (d) See Exhibit RB-23, Page 14
- (e) See Exhibit RB-23, Page 15
- (f) See Exhibit RB-23, Page 3
- (g) See Exhibit RB-23, Pages 4-6

NCRB - Pro Forma Total Rate of Return (Including Investment Income on Surplus) Mobile Homeowners MH(C) Liability Insurance			
	Pre-Tax	Tax Liability	Post-Tax
1 Premiums	100.00%		
Loss & LAE	56.56%		
Commissions	16.20%		
OA&G	18.14%		
TLF	3.10%		
Policyholder Dividends	0.50%		
2 Pro Forma Underwriting Profit	5.50%		
3 Installment Fee Income	0.18%		
4 Regular Tax		1.19%	
5 Additional Tax Due to TRA		0.08%	
6 Total Return from Underwriting Post-Tax			4.40%
7 Investment Gain on Insurance Transaction	3.31%		
Less Investment Income on Agents Balances	0.79%		
Net Investment Gain on Insurance Transaction	2.51%	0.43%	2.08%
8 Investment Gain on Surplus	4.70%	0.81%	3.89%
9 Total Return as a Percent of Premium (post-tax)			10.38%
10 Premium-to-Net Worth Ratio			1.18
11 Total Return as a Percent of Net Worth (post-tax)			12.21%
<i>Lines (1) to (8) are expressed as a percentage of premium.</i>			

Assumptions and Parameters

(a) Underwriting Income Tax Rate	21.00%
(b) Investment Income Tax Rate	17.21%
(c) Pre-tax Investment Yield	5.13%
(d) Premium-to-Surplus Ratio	1.32
(e) Net Worth-to-Surplus Ratio	1.122
(f) Installment Fee Income	0.18%
(g) Additional Tax Due to IRS Treatment of Loss Reserves and UEPR	0.08%

Notes to Exhibit RB-23 Page 1A

1 The expense provisions are those used in Exhibit RB-1, adjusted for the indicated rate change.

2 Selected by North Carolina Rate Bureau

3 See Exhibit RB-23, Page 3

4 $[(2) + (3)] \times (a)$

5 See Exhibit RB-23, Pages 4-6

6 $(2) + (3) - (4) - (5)$

7 Investment income on agents balances is calculated as $0.1517 \times 1.021 \times (c)$, where 0.1517 is the factor for agents balances held for less than 90 days and 1.021 is a factor to correct for overdue balances. The figures are based on the Homeowners line and are sourced from ISO.

8 $(c) \times [1 / (d) + 0.2785 \times 0.5685]$, where 0.2785 is the prepaid expense ratio from Page 7 and 0.5685 is the UEPR ratio from Page 7.

9 $(6) + (7) + (8)$

10 $(d) / (e)$

11 $(9) \times (10)$

Assumptions

(a) Current corporate tax rate, based on the Tax Cut and Jobs Act of 2017.

(b) See , Pages 11-13. Calculated as $1 - \text{average post-tax yield} / \text{average pre-tax yield}$.

(c) See Exhibit RB-23, Page 10

(d) See Exhibit RB-23, Page 14

(e) See Exhibit RB-23, Page 15

(f) See Exhibit RB-23, Page 3

(g) See Exhibit RB-23, Pages 4-6

NORTH CAROLINA
Mobile Homeowners MH(C) Liability Insurance
INSTALLMENT PAYMENT INCOME

Year	Installment Charges	Mobile Home Written Premium	Percentage
2022	186,274	140,113,105	0.13%
2021	98,292	130,201,079	0.08%
2020	194,677	122,868,273	0.16%
2019	317,709	118,284,427	0.27%
2018	327,136	117,915,910	0.28%
Selected Value			0.18%

Source: NCRB

**North Carolina
Mobile Homeowners MH(C) Liability Insurance
Calculation of Additional Tax Liability**

1. Collected Earned Premium for Current Year	100.00%
2. Unearned Premium Reserve 12/31/Current	60.02%
3. Unearned Premium Reserve 12/31/Prior	57.89%
4. Increase: (2) - (3)	2.13%
5. 20% of Increase = Taxable Income	0.43%
 6. Additional Tax Liability due to Unearned Premium Reserve	 0.09%
 7. Unpaid Loss Current Year	 17.06%
8. Discounted Unpaid Loss Prior Year	16.26%
 9. Unpaid Loss Prior Year	 16.45%
10. Discounted Unpaid Loss Prior Year	15.63%
 11. Additional Income	 -0.03%
12. Additional Tax Liability due to Loss Reserve Discounting	-0.01%
 13. Total Additional Tax Liabilities (6) + (12)	 0.08%

NORTH CAROLINA
Mobile Homeowners MH(C) Liability Insurance
Calculation of Taxable Income

Calculation of Unpaid Loss for Current Accident Year (AY)					Calculation of Discounted Unpaid Loss for Current AY			Calculation of Discounted Unpaid Loss for Prior AY			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
AY Avg Acc Date	AY Pay Pattern	Percent Unpaid	Total Losses	Unpaid Losses	AY at 12/31 yr t	Discount Factor	Discounted Unpaid Loss	AY at 12/31/yr t-1	Unpaid Losses	Discount Factor	Discounted Unpaid Loss
0.5	76.64%	23.36%	56.561	13.21	2022	0.957799	12.6567				
1.5	94.54%	5.46%	54.552	2.98	2021	0.938725	2.7952	2021	12.745	0.954554	12.1657
2.5	98.72%	1.28%	52.614	0.67	2020	0.937004	0.6287	2020	2.872	0.933939	2.6821
3.5	99.70%	0.30%	50.745	0.15	2019	0.928864	0.1404	2019	0.647	0.936815	0.6062
4.5	99.93%	0.07%	48.942	0.03	2018	0.914064	0.0311	2018	0.146	0.932041	0.1359
5.5	99.98%	0.02%	47.204	0.01	2017	0.916039	0.0070	2017	0.033	0.914064	0.0300
6.5	100.00%	0.00%	45.527	0.00	2016	0.913154	0.0016	2016	0.007	0.916039	0.0068
7.5	100.00%	0.00%	43.910	0.00	2015	0.910177	0.0000	2015	0.002	0.913154	0.0015
								2014	0.000	0.910177	0.0000
Totals							16.26		16.45		15.63

Notes to Pages 4 and 5Page 4

- 2 Page 8, line (2) divided by Page 8, line (1)
- 3 (2) divided by 1 plus the 10 year average growth rate of MHC premiums in North Carolina
- 4 (2) - (3)
- 5 (4) x 20%
- 6 (5) x current corporate tax rate
- 7 Unpaid current-year losses at year-end as a percent of current year premium.
Sum of Page 5, Column (5)
- 8 Discounted unpaid current-year losses at year-end as a percent of current year premium.
Sum of Page 5, Column (8)
- 9 Unpaid prior-year losses at year-end as a percent of current year premium.
Sum of Page 5, Column (10)
- 10 Discounted unpaid prior-year losses at year-end as a percent of current year premium.
Sum of Page 5, Column (12)
- 11 Change in loss reserve discount: [(7) - (8)] - [(9) - (10)]
- 12 (11) x current corporate tax rate
- 13 (6) + (12)

Page 5

- 1 Midpoint of number of years since end of accident period
- 2 Homeowners accident year payout pattern developed from North Carolina policy year losses (Source: ISO)
- 3 1 - (2)
- 4 Latest period losses are based on projected loss ratio from Page 1. For previous years,
losses are detrended at the 10 year average premium growth rate for MHC in North Carolina.
- 5 (3) x (4)
- 6 Accident Year at current year end
- 7 IRS discount factors for Multiple Peril Lines from Revenue Procedure 2023-10
- 8 (5) x (7)
- 9 Accident Year at prior year end
- 10 Column (3), previous period x Column (4), current period
- 11 IRS discount factors for Multiple Peril Lines from Revenue Procedure 2021-54
- 12 (10) x (11)

**NCRB Investment Income Calculation
Mobile Homeowners MH(C) Liability Insurance**

**Projected Investment Earnings on Loss, Loss
Adjustment Expense and Unearned Premium Reserves**

A. UNEARNED PREMIUM RESERVES

1. Direct Earned Premiums		1,000,000
2. Mean Unearned Premium Reserve	56.85%	568,515
3. Deductions for Prepaid Expenses		
Commissions & Brokerage	16.20%	
Taxes, Licenses, & Fees (5/6)	2.58%	
Other Acquisition & General (1/2)	9.07%	
Total	27.85%	
4. Deduction for Prepaid Expense: (2) x (3)		158,348
5. Net Unearned Premium Reserve Subject to Investment (2) - (4)		410,166

B. Loss and Loss Expense Reserves

1. Direct Earned Premiums		1,000,000
2. Expected Incurred Loss & LAE-to-Premium Ratio	56.56%	565,607
3. Expected Mean Loss and LAE Reserve-to-Incurred Ratio	41.44%	234,400

C. Net Policyholder Funds Subject to Investment (A5 + B3) 644,566

D. Average Rate of Return 5.13%

E. Investment Earnings from Net Reserves: (C) x (D) 33,077

F. Average Rate of Return as a Percent of Direct Earned Premiums: (E) / (A1) 3.31%

NORTH CAROLINA
Mobile Homeowners MH(C) Liability Insurance

**ESTIMATED INVESTMENT EARNINGS ON UNEARNED
PREMIUM RESERVES AND ON LOSS RESERVES**

EXPLANATORY NOTES

Line A-1

Calculations displayed are per million of direct earned premiums.

Line A-2

The mean unearned premium reserve (UEPR) is determined by multiplying the direct earned premiums in line (1) by the ratio of the mean unearned premium reserve to the direct earned premium for the latest available calendar year. The data are for North Carolina Homeowners (NC HO) insurance (from statutory Page 14 of the Annual Statement) for all companies which wrote Mobile Homeowners C in the most recent calendar year. Volume amounts are in thousands of dollars.

1 Direct Earned NC HO Premium for most recent calendar year	137,443
2 NC HO UEPR at end of most recent calendar year	82,499
3 NC HO UEPR at end of previous calendar year	73,778
4 Mean NC HO UEPR	78,139
5 Ratio [(4) / (1)]	56.85%

Line A-3

Deduction for prepaid expenses

Certain production expenses, such as commissions and reinsurance, are assumed to be incurred when the policy is written and before the premium is paid. In addition, half of Other Acquisition and General expenses and 5/6 of Taxes, Licenses and Fees are assumed to be prepaid.

**NORTH CAROLINA
Mobile Homeowners MH(C) Liability Insurance**

**ESTIMATED INVESTMENT EARNINGS ON UNEARNED
PREMIUM RESERVES AND ON LOSS RESERVES**

EXPLANATORY NOTES

Line B-2

The expected loss and loss adjustment expense ratio is consistent with the expense provisions used in the filing.

Line B-3

The mean loss reserve is calculated by multiplying the incurred losses in (2) by the ratio for mean loss reserves to incurred losses. The latter figures are based on total statutory Page 14 figures for North Carolina Homeowners direct losses incurred and direct losses unpaid for all companies writing Mobile Homeowners C in North Carolina in each year. The adjustment for loss expense reserves is based on nationwide industry aggregates for the HO line. Volume amounts are in thousands of dollars.

6 Direct Losses Incurred	2018	122,751
7 Direct Losses Incurred	2019	36,245
8 Direct Losses Incurred	2020	49,336
9 Direct Losses Incurred	2021	44,890
10 Direct Losses Incurred	2022	58,579
11 Direct Losses Unpaid	2017	15,114
12 Direct Losses Unpaid	2018	26,592
13 Direct Losses Unpaid	2019	18,733
14 Direct Losses Unpaid	2020	18,553
15 Direct Losses Unpaid	2021	20,627
16 Direct Losses Unpaid	2022	23,354
17 Mean Loss Reserve	2018	20,853
18 Mean Loss Reserve	2019	22,663
19 Mean Loss Reserve	2020	18,643
20 Mean Loss Reserve	2021	19,590
21 Mean Loss Reserve	2022	21,991
22 Ratio	2018	16.99%
23 Ratio	2019	62.53%
24 Ratio	2020	37.79%
25 Ratio	2021	43.64%
26 Ratio	2022	37.54%
27 Average Loss Reserve		39.70%
28 Ratio of LAE Reserves to Loss Reserves		0.187
29 Ratio of Incurred LAE to Incurred Loss		0.137
30 Loss & LAE Reserve [(27) x (1+(28))/(1+(29))]		0.414

**NORTH CAROLINA
Mobile Homeowners MH(C) Liability Insurance**

**ESTIMATED INVESTMENT EARNINGS ON UNEARNED
PREMIUM RESERVES AND ON LOSS RESERVES**

EXPLANATORY NOTES

Line E

The average rate of return is the average of the pretax current yield calculated on Page 11 and the pretax embedded yield. The embedded yield (see Page 12) is the sum of the ratio of investment income to invested assets for the most recent year plus the ten year average ratio of capital gains to invested assets (see Page 13). The current yield is the estimated currently available rate of return (including both income and capital gains) on the industry investment portfolio (see Page 11).

Embedded Yield	3.86%
Current Yield	6.40%
Average	5.13%

Portfolio Yield and Tax Rate - Current Yield					
Investable Asset	Percent of Assets	Estimated Prospective Pre-Tax Return	Tax Rate	Estimated Prospective Post-Tax Return	
Bonds					
US Gov't	9.73%	4.50%	21.00%	3.56%	
Municipal	21.05%	3.07%	5.25%	2.91%	
Industrial	34.16%	5.66%	21.00%	4.47%	
Preferred Stock	0.46%	7.01%	13.13%	6.09%	
Common Stock	18.38%	13.66%	19.55%	10.99%	
Mortgage Loans	1.32%	7.30%	21.00%	5.77%	
Real Estate	0.76%	6.61%	21.00%	5.22%	
Cash & Short-term Investments	5.43%	5.49%	21.00%	4.34%	
Other Long-Term Investments	8.71%	7.85%	18.69%	6.38%	
Rate of Return Before Expenses	100.00%	6.69%	18.66%	5.44%	
Investment Expenses		0.29%	21.00%	0.23%	
Portfolio Rate of Return		6.40%	18.55%	5.22%	

Sources

Preferred Stock	Current yield on iShares Preferred Stock Index ETF, 1/3/2024
Real Estate	REIT Sector WACC; source: Damodaran Online, using 4.253% for 10-year Treasury yield
Cash	3 month Treasury rate, averaged over 3 months (source: US Treasury)
Municipal	Maturity weighted average of 3 month average MBIS Investment Grade yield curve; linearly interpolated
Industrial	Three month average of HQM par yields (source: FRED); linearly interpolated
Treasury	Three month average of Treasury yields; linearly interpolated (source: US Treasury)
Common Stock	0.0817 ERP (source: Damodaran Online) plus 3 month average T-Bill Rate
Other LTI	Average of yields on bond portfolio, preferred stock, common stock, mortgages, and real estate.
Investment Expenses	Investment Expenses from statutory Page 12 of the Annual Statement (Exhibit of Net Investment Income) divided by Cash and Invested Assets from statutory Page 2 of the Annual Statement (Assets), as compiled in the 2023 edition of A.M. Best's Aggregates and Averages.

Portfolio Yield and Tax Rate Embedded Yield			
		Income	Tax Rate
Bonds			
	Taxable	31,319,900	21.00%
	Non-Taxable	6,002,714	5.25%
Stocks			
	Taxable	10,532,139	13.13%
	Non-Taxable	3,239,275	5.25%
Mortgage Loans		1,409,375	21.00%
Real Estate		1,933,499	21.00%
Contract Loans		202	21.00%
Cash & Short Term Inv		1,967,412	21.00%
All Other		22,850,110	21.00%
Total		79,254,626	18.12%
Inv. Expenses		6,410,961	21.00%
Net Inv. Income		72,843,665	17.87%
Mean Invested Assets		2,251,339,204	
Inv. Inc. Yield Rate		3.24%	17.87%
Capital Gains (10 yr. avg.) (% of Inv. Assets)		0.62%	0.00%
Invest. Yield Rate (pre-tax)		3.86%	14.98%
Invest. Yield Rate (post-tax)		3.28%	

Source: A.M. Best's Aggregates and Averages, 2023 Edition, Page 12 - Exhibit of Net Investment Income (Column 2 - Earned During Year). For capital gains, see Exhibit RB-23, Page 13.

**Realized Capital Gains or Losses
As a Percentage of Mean Invested Assets
(Amounts in Thousands of Dollars)**

Calendar Year	Mean Invested Assets	Realized Capital Gains	Percent
		Amount	
2013	1,473,600,834	12,163,890	0.83%
2014	1,543,882,375	12,093,078	0.78%
2015	1,567,611,077	9,887,732	0.63%
2016	1,596,937,470	8,086,268	0.51%
2017	1,676,831,258	15,725,303	0.94%
2018	1,733,729,297	10,825,733	0.62%
2019	1,822,857,949	11,238,484	0.62%
2020	1,975,605,647	10,933,304	0.55%
2021	2,156,355,790	18,153,320	0.84%
2022	2,251,339,204	2,090,986	0.09%
Total	17,798,750,898	111,198,098	0.62%

"Mean Invested Assets" is the average of current and prior year values for Total Invested Assets (Page 2). Source for data is 2013-2023 editions of A.M. Best's Aggregates and Averages. Figures are net of capital gains taxes.

North Carolina**Mobile Homeowners MH(C) Liability Insurance****Premium-to-Surplus Ratios**

Year	Ratio
2022	1.52
2021	1.34
2020	1.27
2019	1.36
2018	1.45
2017	1.38
2016	1.25
2015	1.23
2014	1.24
2013	1.20
Average	1.32

Data from NAIC Statutory Filings and from A.M. Best's
Aggregates and Averages, various years, for all groups writing
Mobile Homeowners insurance in North Carolina, weighted by
North Carolina Mobile Homeowners premiums.

North Carolina
Mobile Homeowners MH(C) Liability Insurance
Calculation of Ratio of GAAP Net Worth to Statutory Surplus

	2018	2019	2020	2021	2022
Policyholder Surplus	742,079,084,495	847,278,658,173	910,066,482,410	1,028,834,642,825	958,964,082,808
+ Deferred Acquisition Costs	43,991,738,565	46,002,606,289	48,118,482,109	51,883,319,641	54,714,320,843
+ Non-Admitted DTA Provision	6,314,927,861	6,045,409,090	6,001,020,602	5,674,496,962	6,641,006,360
+ Non-admitted Assets (non-tax part)	46,502,063,197	50,520,441,190	51,971,123,366	62,815,925,708	54,765,183,036
+ Provision for Reinsurance	2,737,598,756	2,944,031,835	3,290,710,172	3,665,749,561	2,962,166,230
+ Provision for FASB 115(after-tax)	912,505,274	32,483,869,271	57,249,505,836	30,528,918,187	(69,664,596,475)
- Surplus Notes	(11,660,367,237)	(11,606,263,627)	(13,225,869,920)	(13,699,558,971)	(15,548,449,729)
GAAP-adjusted Net Worth	830,877,550,911	973,668,752,221	1,063,471,454,574	1,169,703,493,912	992,833,713,073
Ratio of Net Worth to Surplus	1.12	1.15	1.17	1.14	1.04
Five Year Average	1.122				

Source: ISO

Sample of Findings on the Private Company Discount

Study	Years	Discount	Type
Emory (1994)	1992-1993	45%	IPO
Willamette Management Associates (various)	1975-1997	29% to 60%	IPO
Garland and Reilly (2004)	1998-2002	35%	IPO
Larcker et al. (2018)	2017	39% to 47%	IPO
Koeplin et al. (2000)	1984-1998	20% to 30%	Acquisitions
Block (2007)	1999-2006	20% to 25%	Acquisitions
Officer (2007)	1979-2003	15% to 30%	Acquisitions
Paglia and Harjoto (2010)	1993-2008	65% to 70%	Acquisitions
Jaffe et al. (2018)	1985-2014	0%	Acquisitions
Lohrey (2020)	2005-2015	48% to 62%	Acquisitions
Goetz (2021)	1997-2014	13%	Acquisitions
Silber (1991)	1981-1988	34%	Restricted Stock
Johnson (1999)	1991-1995	20%	Restricted Stock
Bajaj et al. (2001)	1990-1995	7%	Private placements
Comment (2012)	2004-2010	5% to 6%	Private placements
Finnerty (2013)	1991-1997	21%	Private placements
Finnerty (2013)	1997-2007	15%	Private placements
Chen et al. (2015)	1999-2012	10%	Private placements

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* The Willamette research studies were unpublished but reported in Business Valuation Discounts and Premiums, Chapter 5, by Shannon Pratt (New York: John Wiley & Sons, Inc., p. 85).