

**Texas Windstorm Insurance Association  
Residential Property - Wind & Hail  
2020 Rate Level Review**

**Texas Windstorm Insurance Association  
Residential Property - Wind & Hail  
Rate Level Review**

**Table of Contents**

<b>Main Heading</b>	<b>Sub-heading</b>	<b>Exhibit</b>	<b>Sheet</b>	<b>Tab label</b>
Summary of Indicated Rate Change	By Method for Projecting Hurricane Loss & LAE	Exhibit 1		1
Projected Ultimate Non-Hurricane Loss & LAE Ratio	All Territory Weighted Average	Exhibit 2	Sheet 1	2.1
Projected Ultimate Non-Hurricane Loss & LAE Ratio based on TWIA experience	Tier 1 -- Territory 8 (Galveston County)	Exhibit 2	Sheet 2a	2.2a
Projected Ultimate Non-Hurricane Loss & LAE Ratio based on TWIA experience	Tier 1 -- Territory 9 (Nueces County)	Exhibit 2	Sheet 2b	2.2b
Projected Ultimate Non-Hurricane Loss	Tier 1 -- Territory 10 (Other Tier 1)	Exhibit 2	Sheet 2c	2.2c
Projected Ultimate Non-Hurricane Loss & LAE Ratio based on TWIA experience	Tier 2 -- (Territories 1 and 11)	Exhibit 2	Sheet 2d	2.2d
Projected Ultimate Non-Hurricane Loss	Tier 1 -- Territory 8 (Galveston County)	Exhibit 2	Sheet 3a	2.3a
Projected Ultimate Non-Hurricane Loss	Tier 1 -- Territory 9 (Nueces County)	Exhibit 2	Sheet 3b	2.3b
Projected Ultimate Non-Hurricane Loss	Tier 1 -- Territory 10 (Other Tier 1)	Exhibit 2	Sheet 3c	2.3c
Projected Ultimate Non-Hurricane Loss	Tier 2 -- (Territories 1 and 11)	Exhibit 2	Sheet 3d	2.3d
Summary of TWIA Historical Paid Loss as of 12/31/19	Tier 1 -- Territory 8 (Galveston County)	Exhibit 2	Sheet 4a	2.4a
Summary of TWIA Historical Paid Loss as of 12/31/19	Tier 1 -- Territory 9 (Nueces County)	Exhibit 2	Sheet 4b	2.4b
Summary of TWIA Historical Paid Loss as of 12/31/19	Tier 1 -- Territory 10 (Other Tier 1)	Exhibit 2	Sheet 4c	2.4c
Summary of TWIA Historical Paid Loss as of 12/31/19	Tier 2 -- (Territories 1 and 11)	Exhibit 2	Sheet 4d	2.4d
Calculation of Net Trend Factors		Exhibit 2	Sheet 5	trend 2.5
Paid Loss Development Factors	Statewide Industry Extended Coverage Dwelling Paid Loss (excluding Hurricane Losses)	Exhibit 3	Sheet 1	ldf 3.1
Premium Trend Analysis	TWIA Residential Earned Premium at Present Rates	Exhibit 3	Sheet 2	3.2 premium trend
Loss Trend Analysis	Summary of Indices and Calculation of Prospective Loss Costs	Exhibit 3	Sheet 3a	3.3a
Loss Trend Analysis	Boeckh Residential Construction Index Trend (Statewide)	Exhibit 3	Sheet 3b	3.3b
Loss Trend Analysis	Boeckh Residential Construction Index Trend (Coastal)	Exhibit 3	Sheet 3c	3.3c
Loss Trend Analysis	Modified Consumer Price Index - External Trend	Exhibit 3	Sheet 3d	3.3d
Development of Non-hurricane LAE factor Using TWIA Commercial + Residential Experience		Exhibit 4	Sheet 1	4.1
Development of Hurricane LAE factor Using TWIA Commercial + Residential Experience		Exhibit 4	Sheet 2	4.2
Summary of Indicated Hurricane Loss & LAE Ratios		Exhibit 5		5
Industry Experience -- Residential Extended Coverage	1966 - 2019 -- Hurricane Years Only	Exhibit 6	Sheet 1	6.1
Industry Experience -- Residential Extended Coverage	1966 - 2019	Exhibit 6	Sheet 2	6.2
Industry Experience -- Residential Extended Coverage		Exhibit 6	Sheet 3	6.3
Industry Experience -- Residential Extended Coverage	Tier 1 -- Territory 8 (Galveston County)	Exhibit 6	Sheet 4	6.4
Industry Experience -- Residential Extended Coverage	Tier 1 -- Territory 9 (Nueces County)	Exhibit 6	Sheet 5	6.5
Industry Experience -- Residential Extended Coverage	Tier 1 -- Territory 10 (Other Tier 1)	Exhibit 6	Sheet 6	6.6
Industry Experience -- Residential Extended Coverage	Tier 2 -- (Territories 1 and 11)	Exhibit 6	Sheet 7	6.7
Hurricane Loss Ratio -- AIR Model		Exhibit 7		7
Hurricane Loss Ratio -- RMS Model		Exhibit 8		8
Texas Hurricanes 1850 - 2019		Exhibit 9		9
Calculation of TWIA Earned Premium at Present Rate Level	Tier 1 -- Territory 8 (Galveston County)	Exhibit 10	Sheet 1a	10.1a
Calculation of TWIA Earned Premium at Present Rate Level	Tier 1 -- Territory 9 (Nueces County)	Exhibit 10	Sheet 1b	10.1b
Calculation of TWIA Earned Premium at Present Rate Level	Tier 1 -- Territory 10 (Other Tier 1)	Exhibit 10	Sheet 1c	10.1c
Calculation of TWIA Earned Premium at Present Rate Level	Tier 2 -- (Territories 1 and 11)	Exhibit 10	Sheet 1d	10.1d
Calculation of TWIA Earned Premium at Present Rate Level		Exhibit 10	Sheet 2	10.2
Fixed Expenses and Variable Permissible Loss & LAE Ratios		Exhibit 11	Sheet 1	11.1
Development of Reinsurer Expense	Using Weighting of 50% AIR and 50% RMS Hurricane Models	Exhibit 11	Sheet 2	11.2
Reconciliation of Premium Data to Annual Statement		Exhibit 12		12

**Texas Windstorm Insurance Association**  
**Residential Property - Wind & Hail**  
**Rate Level Review**  
Summary of Indicated Rate Change  
By Method for Projecting Hurricane Loss & LAE

Hurricane Projection Method	Indicated Loss & LAE Ratio			Fixed Expenses	Total	Permissible LLAE Ratio	Indicated Rate Change
	Hurricane	Non-Hurricane					
(1)	(2)	(3)	(4)	(5)	(6)	(7)	
Using Experience and Models (50%/50%)	40.8%	14.9%	36.7%	92.4%	77.1%	+20%	
Using Actual Industry Experience	36.2%	14.9%	36.7%	87.8%	77.1%	+14%	
Using Hurricane Models (25% AIR, 75% RMS)	45.5%	14.9%	36.7%	97.1%	77.1%	+26%	
AIR Model	56.8%	14.9%	36.7%	108.4%	77.1%	+41%	
RMS Model	41.7%	14.9%	36.7%	93.3%	77.1%	+21%	

Notes:

- (2) Exhibit 5
- (3) Exhibit 2, Sheet 1
- (4) Exhibit 11, Sheet 1
- (5) = (2) + (3) + (4)
- (6) Exhibit 11, Sheet 1
- (7) = (5) / (6) - 1

**Texas Windstorm Insurance Association**

**Residential Property - Wind & Hail**

**Rate Level Review**

Projected Ultimate Non-Hurricane Loss & LAE Ratio

All Territory Weighted Average

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Territory	2019 Written Premium		Indicated Non-Hurricane Loss & LAE Ratio
	Amount	Share	
(1)	(2)	(3)	(4)
Tier 1 - Territory 8	108,030,247	34.4%	11.9%
Tier 1 - Territory 9	58,233,887	18.5%	16.4%
Tier 1 - Territory 10	143,774,114	45.7%	16.5%
Tier 2 - Territory 1 and	4,354,003	1.4%	15.3%
Total / Average	314,392,251	100.0%	14.9%

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Notes:

(2) TWIA data

(3) = (2) / (2) Total

(4) Exhibit 2, Sheet 2a - Sheet 2d

**Texas Windstorm Insurance Association**  
**Residential Property - Wind & Hail**  
**Rate Level Review**

Projected Ultimate Non-Hurricane Loss & LAE Ratio based on TWIA experience  
Tier 1 -- Territory 8 (Galveston County)

Accident Year Ending 9/30/xx	Ultimate Non-Hurricane Loss	LAE Factor	Net Trend Factor	Projected Non-Hurricane Loss & LAE	Earned Premium at Current TWIA Rate Level	Indicated Non-Hurricane Loss & LAE Ratio
(1)	(2)	(3)	(4)	(5)	(6)	(7)
2010	1,264,721	0.276	1.191	1,922,017	124,702,532	1.5%
2011	1,277,401	0.276	1.185	1,931,507	126,684,509	1.5%
2012	10,634,874	0.276	1.150	15,605,614	128,914,788	12.1%
2013	54,058,418	0.276	1.130	77,945,752	131,926,783	59.1%
2014	521,145	0.276	1.104	734,139	134,663,386	0.5%
2015	17,502,327	0.276	1.098	24,521,600	136,975,647	17.9%
2016	11,086,377	0.276	1.104	15,617,424	133,431,908	11.7%
2017	2,742,807	0.276	1.090	3,814,806	126,682,785	3.0%
2018	2,430,226	0.276	1.061	3,290,127	115,596,430	2.8%
2019	4,293,828	0.276	1.045	5,725,476	109,182,096	5.2%
<b>Total</b>	<b>105,812,124</b>			<b>151,108,462</b>	<b>1,268,760,864</b>	<b>11.9%</b>

Notes:

- (2) Exhibit 2, Sheet 3a
- (3) Exhibit 4, Sheet 1
- (4) Exhibit 2 Sheet 5
- (5) = (2) \* [1 + (3)] \* (4)
- (6) Exhibit 10, Sheet 1a
- (7) = (5) / (6)

**Texas Windstorm Insurance Association**  
**Residential Property - Wind & Hail**  
**Rate Level Review**

Projected Ultimate Non-Hurricane Loss & LAE Ratio based on TWIA experience  
Tier 1 -- Territory 9 (Nueces County)

Accident Year Ending 9/30/xx	Ultimate Non-Hurricane Loss	LAE Factor	Net Trend Factor	Projected Non-Hurricane Loss & LAE	Earned Premium at Current TWIA Rate Level	Indicated Non-Hurricane Loss & LAE Ratio
(1)	(2)	(3)	(4)	(5)	(6)	(7)
2010	3,445,556	0.276	1.191	5,236,267	69,035,414	7.6%
2011	19,199,535	0.276	1.185	29,030,849	69,387,124	41.8%
2012	20,626,638	0.276	1.150	30,267,529	70,391,274	43.0%
2013	6,175,709	0.276	1.130	8,904,631	71,513,690	12.5%
2014	1,619,343	0.276	1.104	2,281,175	74,528,934	3.1%
2015	9,451,559	0.276	1.098	13,242,088	77,646,885	17.1%
2016	9,626,035	0.276	1.104	13,560,234	76,688,491	17.7%
2017	7,858,360	0.276	1.090	10,929,721	72,582,595	15.1%
2018	1,180,751	0.276	1.061	1,598,543	65,531,943	2.4%
2019	825,982	0.276	1.045	1,101,381	59,870,593	1.8%
<b>Total</b>	<b>80,009,468</b>			<b>116,152,418</b>	<b>707,176,943</b>	<b>16.4%</b>

Notes:

- (2) Exhibit 2, Sheet 3b
- (3) Exhibit 4, Sheet 1
- (4) Exhibit 2 Sheet 5
- (5) = (2) \* [1 + (3)] \* (4)
- (6) Exhibit 10, Sheet 1b
- (7) = (5) / (6)

**Texas Windstorm Insurance Association**  
**Residential Property - Wind & Hail**  
**Rate Level Review**

Projected Ultimate Non-Hurricane Loss & LAE Ratio based on TWIA experience  
Tier 1 -- Territory 10 (Other Tier 1)

Accident Year Ending 9/30/xx	Ultimate Non-Hurricane Loss	LAE Factor	Net Trend Factor	Projected Non-Hurricane Loss & LAE	Earned Premium at Current TWIA Rate Level	Indicated Non-Hurricane Loss & LAE Ratio
(1)	(2)	(3)	(4)	(5)	(6)	(7)
2010	6,663,982	0.276	1.191	10,127,360	185,336,084	5.5%
2011	56,124,736	0.276	1.185	84,863,968	193,033,699	44.0%
2012	18,946,421	0.276	1.150	27,801,978	209,220,809	13.3%
2013	4,828,213	0.276	1.130	6,961,704	215,695,773	3.2%
2014	2,847,431	0.276	1.104	4,011,187	222,006,785	1.8%
2015	86,695,348	0.276	1.098	121,464,344	226,666,349	53.6%
2016	12,296,413	0.276	1.104	17,322,006	216,365,340	8.0%
2017	22,417,655	0.276	1.090	31,179,371	197,982,407	15.7%
2018	7,114,851	0.276	1.061	9,632,341	171,091,403	5.6%
2019	10,943,641	0.276	1.045	14,592,470	151,980,115	9.6%
<b>Total</b>	<b>228,878,691</b>			<b>327,956,729</b>	<b>1,989,378,764</b>	<b>16.5%</b>

Notes:

- (2) Exhibit 2, Sheet 3c
- (3) Exhibit 4, Sheet 1
- (4) Exhibit 2 Sheet 5
- (5) = (2) \* [1 + (3)] \* (4)
- (6) Exhibit 10, Sheet 1c
- (7) = (5) / (6)

**Texas Windstorm Insurance Association**  
**Residential Property - Wind & Hail**  
**Rate Level Review**

Projected Ultimate Non-Hurricane Loss & LAE Ratio based on TWIA experience  
Tier 2 -- (Territories 1 and 11)

Accident Year Ending 9/30/xx	Ultimate Non-Hurricane Loss	LAE Factor	Net Trend Factor	Projected Non-Hurricane Loss & LAE	Earned Premium at Current TWIA Rate Level	Indicated Non-Hurricane Loss & LAE Ratio
(1)	(2)	(3)	(4)	(5)	(6)	(7)
2010	182,872	0.276	1.191	277,914	3,606,426	7.7%
2011	54,382	0.276	1.185	82,229	3,878,435	2.1%
2012	259,290	0.276	1.150	380,482	4,306,581	8.8%
2013	502,759	0.276	1.130	724,918	4,573,701	15.8%
2014	30,779	0.276	1.104	43,359	4,650,368	0.9%
2015	324,129	0.276	1.098	454,120	4,748,938	9.6%
2016	451,360	0.276	1.104	635,833	4,776,381	13.3%
2017	495,555	0.276	1.090	689,238	4,657,598	14.8%
2018	301,949	0.276	1.061	408,789	4,410,916	9.3%
2019	2,268,507	0.276	1.045	3,024,873	4,296,061	70.4%
<b>Total</b>	<b>4,871,582</b>			<b>6,721,755</b>	<b>43,905,405</b>	<b>15.3%</b>

Notes:

- (2) Exhibit 2, Sheet 3d
- (3) Exhibit 4, Sheet 1
- (4) Exhibit 2 Sheet 5
- (5) = (2) \* [1 + (3)] \* (4)
- (6) Exhibit 10, Sheet 1d
- (7) = (5) / (6)



**Texas Windstorm Insurance Association**  
**Residential Property - Wind & Hail**  
**Rate Level Review**

Projected Ultimate Non-Hurricane Loss  
Tier 1 -- Territory 8 (Galveston County)

Accident Year	TWIA Non-Hurricane Paid Loss	Development Factor	Ultimate Non-Hurricane Loss
(1)	(2)	(3)	(4)
2010	1,264,721	1.000	1,264,721
2011	1,277,401	1.000	1,277,401
2012	10,634,874	1.000	10,634,874
2013	54,058,418	1.000	54,058,418
2014	520,624	1.001	521,145
2015	17,432,597	1.004	17,502,327
2016	10,965,754	1.011	11,086,377
2017	2,662,919	1.030	2,742,807
2018	2,271,239	1.070	2,430,226
2019	3,407,800	1.260	4,293,828
<b>Total</b>	<b>104,496,347</b>		<b>105,812,124</b>

Notes:

- (2) Exhibit 2, Sheet 4a, as of 12/31/19
- (3) Exhibit 3, Sheet 1
- (4) = (2) \* (3)

**Texas Windstorm Insurance Association**  
**Residential Property - Wind & Hail**  
**Rate Level Review**

Projected Ultimate Non-Hurricane Loss  
Tier 1 -- Territory 9 (Nueces County)

Accident Year	TWIA Non-Hurricane Paid Loss	Development Factor	Ultimate Non-Hurricane Loss
(1)	(2)	(3)	(4)
2010	3,445,556	1.000	3,445,556
2011	19,199,535	1.000	19,199,535
2012	20,626,638	1.000	20,626,638
2013	6,175,709	1.000	6,175,709
2014	1,617,725	1.001	1,619,343
2015	9,413,903	1.004	9,451,559
2016	9,521,301	1.011	9,626,035
2017	7,629,476	1.030	7,858,360
2018	1,103,506	1.070	1,180,751
2019	655,541	1.260	825,982
<b>Total</b>	<b>79,388,890</b>		<b>80,009,468</b>

Notes:

- (2) Exhibit 2, Sheet 4b, as of 12/31/19
- (3) Exhibit 3, Sheet 1
- (4) = (2) \* (3)

**Texas Windstorm Insurance Association**  
**Residential Property - Wind & Hail**  
**Rate Level Review**

Projected Ultimate Non-Hurricane Loss  
Tier 1 -- Territory 10 (Other Tier 1)

Accident Year	TWIA Non-Hurricane Paid Loss	Development Factor	Ultimate Non-Hurricane Loss
(1)	(2)	(3)	(4)
2010	6,663,982	1.000	6,663,982
2011	56,124,736	1.000	56,124,736
2012	18,946,421	1.000	18,946,421
2013	4,828,213	1.000	4,828,213
2014	2,844,586	1.001	2,847,431
2015	86,349,948	1.004	86,695,348
2016	12,162,624	1.011	12,296,413
2017	21,764,714	1.030	22,417,655
2018	6,649,393	1.070	7,114,851
2019	8,685,429	1.260	10,943,641
<b>Total</b>	<b>225,020,046</b>		<b>228,878,691</b>

Notes:

- (2) Exhibit 2, Sheet 4c, as of 12/31/19
- (3) Exhibit 3, Sheet 1
- (4) = (2) \* (3)

**Texas Windstorm Insurance Association**  
**Residential Property - Wind & Hail**  
**Rate Level Review**

Projected Ultimate Non-Hurricane Loss  
Tier 2 -- (Territories 1 and 11 )

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Accident Year	TWIA Non-Hurricane Paid Loss	Development Factor	Ultimate Non-Hurricane Loss
(1)	(2)	(3)	(4)
2010	182,872	1.000	182,872
2011	54,382	1.000	54,382
2012	259,290	1.000	259,290
2013	502,759	1.000	502,759
2014	30,748	1.001	30,779
2015	322,838	1.004	324,129
2016	446,449	1.011	451,360
2017	481,121	1.030	495,555
2018	282,195	1.070	301,949
2019	1,800,402	1.260	2,268,507
Total	4,363,056		4,871,582

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Notes:

- (2) Exhibit 2, Sheet 4d, as of 12/31/19
- (3) Exhibit 3, Sheet 1
- (4) = (2) \* (3)

**Texas Windstorm Insurance Association**  
**Residential Property - Wind & Hail**  
**Rate Level Review**

Summary of TWIA Historical Paid Loss as of 12/31/19  
Tier 1 -- Territory 8 (Galveston County)

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Accident Year	Paid Loss Excluding Expense			Total
	Non-Hurricane	Hurricane		
(1)	(2)	(3)	(4)	
2010	1,264,721	0	1,264,721	
2011	1,277,401	0	1,277,401	
2012	10,634,874	0	10,634,874	
2013	54,058,418	0	54,058,418	
2014	520,624	0	520,624	
2015	17,432,597	0	17,432,597	
2016	10,965,754	0	10,965,754	
2017	2,662,919	33,808,487	36,471,406	
2018	2,271,239	0	2,271,239	
2019	3,407,800	0	3,407,800	
Total	104,496,347	33,808,487	138,304,834	

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Notes:

(2), (3) Source: TICO. Accident years ending 9/30/xx

(4) = (2) + (3)

**Texas Windstorm Insurance Association**  
**Residential Property - Wind & Hail**  
**Rate Level Review**

Summary of TWIA Historical Paid Loss as of 12/31/19  
Tier 1 -- Territory 9 (Nueces County)

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Accident Year	Paid Loss Excluding Expense			Total
	Non-Hurricane	Hurricane		
(1)	(2)	(3)	(4)	
2010	3,445,556	187,854		3,633,410
2011	19,199,535	0		19,199,535
2012	20,626,638	0		20,626,638
2013	6,175,709	0		6,175,709
2014	1,617,725	0		1,617,725
2015	9,413,903	0		9,413,903
2016	9,521,301	0		9,521,301
2017	7,629,476	240,658,023		248,287,499
2018	1,103,506	0		1,103,506
2019	655,541	0		655,541
Total	79,388,890	240,845,877		320,234,767

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Notes:

(2), (3) Source: TICO. Accident years ending 9/30/xx  
(4) = (2) + (3)

**Texas Windstorm Insurance Association**  
**Residential Property - Wind & Hail**  
**Rate Level Review**

Summary of TWIA Historical Paid Loss as of 12/31/19  
Tier 1 -- Territory 10 (Other Tier 1)

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Accident Year	Paid Loss Excluding Expense			Total
	(1)	(2)	(3)	
2010		6,663,982	1,063,585	7,727,567
2011		56,124,736	0	56,124,736
2012		18,946,421	0	18,946,421
2013		4,828,213	0	4,828,213
2014		2,844,586	0	2,844,586
2015		86,349,948	0	86,349,948
2016		12,162,624	0	12,162,624
2017		21,764,714	607,746,813	629,511,527
2018		6,649,393	0	6,649,393
2019		8,685,429	0	8,685,429
Total		225,020,046	608,810,398	833,830,444

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Notes:

(2), (3) Source: TICO. Accident years ending 9/30/xx  
(4) = (2) + (3)

**Texas Windstorm Insurance Association**  
**Residential Property - Wind & Hail**  
**Rate Level Review**

Summary of TWIA Historical Paid Loss as of 12/31/19  
Tier 2 -- (Territories 1 and 11)

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Accident Year	Paid Loss Excluding Expense			Total
	(1)	(2)	(3)	
2010		182,872	0	182,872
2011		54,382	0	54,382
2012		259,290	0	259,290
2013		502,759	0	502,759
2014		30,748	0	30,748
2015		322,838	0	322,838
2016		446,449	0	446,449
2017		481,121	3,233,870	3,714,991
2018		282,195	0	282,195
2019		1,800,402	0	1,800,402
Total		4,363,056	3,233,870	7,596,926

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Notes:

(2), (3) Source: TICO. Accident years ending 9/30/xx  
(4) = (2) + (3)



**Texas Windstorm Insurance Association**  
**Residential Property - Wind & Hail**  
**Rate Level Review**  
Calculation of Net Trend Factors

Year / Quarter	Average Written premium Per house year At present rates		
(1)	(2)	(3) Current Average Earned Date	7/1/2019
2011 / 4	1,640.91	(4) Current Average Accident Date	4/1/2019
2012 / 4	1,626.20	(5) Prospective Average Earned / Accident Date	1/1/2022
2013 / 4	1,640.94	(6) Premium Trend Length	2.500
2014 / 4	1,655.17	(7) Loss Trend Length	2.750
2015 / 4	1,680.32	(8) Selected Premium Trend	0.1%
2016 / 4	1,686.41	(9) Selected Loss Trend	1.7%
2017 / 4	1,683.69		
2018 / 4	1,689.86		
2019 / 4	1,711.99		

Accident Year	Current Premium Trend	Current Loss Trend	Prospective Premium Trend	Prospective Loss Trend	Net Trend Factor
(10)	(11)	(12)	(13)	(14)	(15)
2010	1.043	1.189	1.003	1.047	1.191
2011	1.043	1.183	1.003	1.047	1.185
2012	1.053	1.159	1.003	1.047	1.150
2013	1.043	1.129	1.003	1.047	1.130
2014	1.034	1.093	1.003	1.047	1.104
2015	1.019	1.071	1.003	1.047	1.098
2016	1.015	1.073	1.003	1.047	1.104
2017	1.017	1.061	1.003	1.047	1.090
2018	1.013	1.029	1.003	1.047	1.061
2019	1.000	1.000	1.003	1.047	1.045

Notes:

- (2) Exhibit 3, Sheet 2 (6)
- (3) Latest Year / Quarter Ending Date - 6 Months
- (4) Latest Accident Year Ending Date - 6 Months
- (5) Rate Effective Date + 12 Months
- (6) = (5) - (3)
- (7) = (5) - (4)
- (8) Exhibit 3, Sheet 2
- (9) Exhibit 3, Sheet 3a
- (11) = (2) Indexed to 2019 / 4
- (12) Exhibit 3, Sheet 3a
- (13) = [1 + (8)] ^ (6)
- (14) = [1 + (9)] ^ (7)
- (15) = [(12) \* (14)] / [(11) \* (13)]

**Texas Windstorm Insurance Association**  
**Residential Property - Wind & Hail**

Exhibit 3  
 Sheet 1

**Rate Level Review**

Paid Loss Development Factors

Statewide Industry Extended Coverage Dwelling Paid Loss (excluding Hurricane Losses)

Accident Year	Months of Development (\$'000)									
	15 (1)	27 (2)	39 (3)	51 (4)	63 (5)	75 (6)	87 (7)	99 (8)	111 (9)	111 (10)
2010		63,706	70,824	72,510	73,282	73,407	73,508	73,530	73,536	73,536
2011		137,269	154,006	156,583	157,456	157,929	157,995	158,032	158,046	158,071
2012		162,844	196,788	232,373	242,523	245,227	246,785	247,419	247,577	
2013		124,050	143,359	151,995	154,466	156,218	156,541	156,580		
2014		151,510	178,253	187,490	191,068	191,825	192,297			
2015		173,851	200,069	206,343	208,327	209,063				
2016		486,124	553,332	561,570	563,807					
2017		634,033	775,472	803,355						
2018		181,011	216,648							
2019		272,311								

Accident Year	Development Factors									
	15 - 27 (1)	27 - 39 (2)	39 - 51 (3)	51 - 63 (4)	63 - 75 (5)	75 - 87 (6)	87 - 99 (7)	99 - 111 (8)	111 - Ult (9)	111 - Ult (10)
2010		1.112	1.024	1.011	1.002	1.001	1.000	1.000	1.000	
2011		1.122	1.017	1.006	1.003	1.000	1.000	1.000	1.000	
2012		1.208	1.181	1.044	1.011	1.006	1.003	1.001		
2013		1.156	1.060	1.016	1.011	1.002	1.000			
2014		1.177	1.052	1.019	1.004	1.002				
2015		1.151	1.031	1.010	1.004					
2016		1.138	1.015	1.004						
2017		1.223	1.036							
2018		1.197								

Average		1.165	1.052	1.016	1.006	1.003	1.001	1.000	1.000	
Avg 5 Year		1.177	1.039	1.019	1.007	1.003	1.001	1.000	1.000	
Prior		1.163	1.052	1.021	1.012	1.004	1.001	1.000	1.000	1.000
Selected		1.177	1.039	1.019	1.007	1.003	1.001	1.000	1.000	1.000
Selected Cumulative		1.260	1.070	1.030	1.011	1.004	1.001	1.000	1.000	1.000

Notes:

Data provided by TICO. Accident years ending 9/30/xx

**Texas Windstorm Insurance Association**  
**Residential Property - Wind & Hail**

**Rate Level Review**

Premium Trend Analysis

TWIA Residential Earned Premium at Present Rates

Year / Quarter	Exposure Written	Written Premium	On- Level Factors	Written Premium at Present Rates	Average Written Premium at Present Rates Quarterly	Average Written Premium at Present Rates Four Quarter Ending	Exponential Fitted Trends			
							All-Year	5-Year	4-Year	3-Year
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
2010 / 2	72,174	82,603,320	1.407	116,231,166	1,610					
2010 / 3	80,037	91,866,506	1.407	129,265,399	1,615					
2010 / 4	50,797	58,863,267	1.407	82,826,528	1,631					
2011 / 1	49,776	59,951,748	1.340	80,341,076	1,614	1,617	1607.7			
2011 / 2	75,601	90,742,856	1.340	121,604,106	1,608	1,616	1609.4			
2011 / 3	82,435	99,110,457	1.340	132,817,491	1,611	1,615	1611.1			
2011 / 4	54,497	66,729,933	1.340	89,424,492	1,641	1,617	1612.8			
2012 / 1	54,769	68,658,174	1.276	87,627,162	1,600	1,614	1614.5			
2012 / 2	77,155	96,214,511	1.276	122,796,806	1,592	1,609	1616.2			
2012 / 3	89,431	112,131,482	1.276	143,111,343	1,600	1,606	1617.9			
2012 / 4	54,952	70,018,382	1.276	89,363,170	1,626	1,603	1619.6			
2013 / 1	54,742	71,740,155	1.216	87,200,607	1,593	1,602	1621.2			
2013 / 2	82,182	108,632,729	1.216	132,043,761	1,607	1,606	1622.9			
2013 / 3	83,114	111,540,208	1.216	135,577,820	1,631	1,615	1624.6			
2013 / 4	60,544	81,734,680	1.216	99,349,014	1,641	1,619	1626.3			
2014 / 1	55,592	77,867,785	1.158	90,141,695	1,621	1,624	1628.0			
2014 / 2	79,155	111,616,003	1.158	129,209,475	1,632	1,632	1629.7			
2014 / 3	89,874	128,096,479	1.158	148,287,687	1,650	1,638	1631.5			
2014 / 4	60,646	86,711,448	1.158	100,379,340	1,655	1,641	1633.2			
2015 / 1	57,651	85,327,979	1.103	94,074,097	1,632	1,643	1634.9	1650.5		
2015 / 2	82,158	122,581,230	1.103	135,145,806	1,645	1,646	1636.6	1650.8		
2015 / 3	84,402	127,421,809	1.103	140,482,544	1,664	1,650	1638.3	1651.2		
2015 / 4	57,308	87,342,988	1.103	96,295,644	1,680	1,655	1640.0	1651.6		
2016 / 1	54,113	84,557,230	1.050	88,785,092	1,641	1,657	1641.7	1652.0	1655.2	
2016 / 2	79,991	125,845,764	1.050	132,138,052	1,652	1,659	1643.4	1652.3	1655.2	
2016 / 3	77,932	123,784,247	1.050	129,973,459	1,668	1,660	1645.2	1652.7	1655.3	
2016 / 4	51,030	81,959,449	1.050	86,057,421	1,686	1,661	1646.9	1653.1	1655.3	
2017 / 1	50,991	79,037,984	1.050	82,989,883	1,628	1,659	1648.6	1653.4	1655.3	1648.9
2017 / 2	73,614	114,547,681	1.050	120,275,065	1,634	1,654	1650.3	1653.8	1655.3	1649.8
2017 / 3	68,864	108,614,623	1.050	114,045,354	1,656	1,650	1652.1	1654.2	1655.3	1650.7
2017 / 4	45,960	73,697,340	1.050	77,382,207	1,684	1,648	1653.8	1654.6	1655.4	1651.7
2018 / 1	44,101	71,679,332	1.000	71,679,332	1,625	1,649	1655.5	1654.9	1655.4	1652.6
2018 / 2	63,851	104,163,394	1.000	104,163,394	1,631	1,649	1657.3	1655.3	1655.4	1653.5
2018 / 3	61,408	101,951,681	1.000	101,951,681	1,660	1,650	1659.0	1655.7	1655.4	1654.4
2018 / 4	40,418	68,300,637	1.000	68,300,637	1,690	1,650	1660.7	1656.0	1655.4	1655.4
2019 / 1	39,758	65,036,872	1.000	65,036,872	1,636	1,652	1662.5	1656.4	1655.4	1656.3
2019 / 2	60,805	99,948,528	1.000	99,948,528	1,644	1,656	1664.2	1656.8	1655.5	1657.2
2019 / 3	57,547	97,063,357	1.000	97,063,357	1,687	1,664	1665.9	1657.2	1655.5	1658.2
2019 / 4	38,375	65,697,652	1.000	65,697,652	1,712	1,668	1667.7	1657.5	1655.5	1659.1

(12) Average Annual Change 0.4%

(13) Correlation Coefficient 75.6%

(14) Selected Premium Trend 0.1%

- Notes: (2) Provided by TWIA (7) annualized average written premium  
 (3) Provided by TWIA (8) - (11) = (6) fitted to an exponential distribution  
 (4) Cumulative effect of annual rate changes (12) Fitted average annual change  
 (5) = (3) \* (4) Indexed to 2019 / 4 (13) Evaluates the predictability of the fitted curve  
 (6) = (5) / (2) (14) Selected based on judgment

**Texas Windstorm Insurance Association**

**Residential Property - Wind & Hail**

**Rate Level Review**

Loss Trend Analysis

Summary of Indices and Calculation of Prospective Loss Costs

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Calendar Year	Statewide	Coastal	Modified	Weighted
Ending	Boeckh	Boeckh	CPI	Average
9/30/xx	(1)	(2)	(4)	(5)
2010	1.204	1.212	1.118	1.189
2011	1.189	1.208	1.106	1.183
2012	1.164	1.185	1.082	1.159
2013	1.128	1.147	1.074	1.129
2014	1.094	1.103	1.064	1.093
2015	1.066	1.077	1.051	1.071
2016	1.073	1.085	1.035	1.073
2017	1.061	1.072	1.028	1.061
2018	1.023	1.032	1.021	1.029
2019	1.000	1.000	1.000	1.000

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Factors to Adjust For Prospective Loss Costs

(6) Fitted Trend	1.7%	1.9%	1.1%	1.7%
(7) Cost Factor	1.047	1.053	1.031	1.047

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Notes:

(2) = Exhibit 3, Sheet 3b

(3) = Exhibit 3, Sheet 3c

(4) = Exhibit 3, Sheet 3d

(5) = 25% CPI and 75% Coastal Boeckh (most appropriate available by year)

(6) = (2) - (5) fitted to an exponential curve using 5 years' data

(7) =  $[1 + (6)]^{2.75}$  (trended from 4/1/2019 to 1/1/2022)

**Texas Windstorm Insurance Association**  
**Residential Property - Wind & Hail**  
**Rate Level Review**

Loss Trend Analysis

Boeckh Residential Construction Index Trend (Statewide)

Calendar Year Ending	Texas Statewide Index	Fitted Trends		5 Years		4 Years		3 Years	
		All Years Linear	Exponential	Linear	Exponential	Linear	Exponential	Linear	Exponential
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
3/31/2010	2047.26	2025.39	2031.85						
6/30/2010	2046.15	2036.74	2042.17						
9/30/2010	2050.53	2048.10	2052.55						
12/31/2010	2057.95	2059.45	2062.97						
3/31/2011	2065.10	2070.81	2073.45						
6/30/2011	2070.21	2082.16	2083.99						
9/30/2011	2075.77	2093.52	2094.57						
12/31/2011	2083.16	2104.88	2105.21						
3/31/2012	2092.69	2116.23	2115.90						
6/30/2012	2103.68	2127.59	2126.65						
9/30/2012	2121.46	2138.94	2137.46						
12/31/2012	2139.97	2150.30	2148.31						
3/31/2013	2155.46	2161.65	2159.23						
6/30/2013	2172.56	2173.01	2170.19						
9/30/2013	2188.33	2184.37	2181.22						
12/31/2013	2202.66	2195.72	2192.30						
3/31/2014	2219.67	2207.08	2203.43						
6/30/2014	2239.01	2218.43	2214.63						
9/30/2014	2257.42	2229.79	2225.88						
12/31/2014	2275.56	2241.14	2237.18						
3/31/2015	2293.59	2252.50	2248.55	2263.67	2265.51				
6/30/2015	2307.55	2263.85	2259.97	2273.85	2275.22				
9/30/2015	2316.02	2275.21	2271.45	2284.04	2284.98				
12/31/2015	2319.90	2286.57	2282.99	2294.22	2294.78				
3/31/2016	2316.44	2297.92	2294.58	2304.40	2304.62	2269.92	2271.59		
6/30/2016	2308.41	2309.28	2306.24	2314.59	2314.51	2283.69	2284.76		
9/30/2016	2301.26	2320.63	2317.96	2324.77	2324.44	2297.46	2298.01		
12/31/2016	2296.54	2331.99	2329.73	2334.95	2334.41	2311.23	2311.34		
3/31/2017	2299.40	2343.34	2341.56	2345.14	2344.42	2325.00	2324.74	2297.47	2298.43
6/30/2017	2309.77	2354.70	2353.46	2355.32	2354.47	2338.77	2338.22	2315.33	2315.68
9/30/2017	2326.30	2366.05	2365.41	2365.50	2364.57	2352.54	2351.77	2333.20	2333.05
12/31/2017	2343.81	2377.41	2377.43	2375.69	2374.71	2366.31	2365.41	2351.06	2350.55
3/31/2018	2363.74	2388.77	2389.51	2385.87	2384.90	2380.09	2379.12	2368.92	2368.19
6/30/2018	2386.99	2400.12	2401.64	2396.05	2395.13	2393.86	2392.92	2386.78	2385.95
9/30/2018	2413.52	2411.48	2413.84	2406.24	2405.40	2407.63	2406.79	2404.64	2403.85
12/31/2018	2441.12	2422.83	2426.11	2416.42	2415.72	2421.40	2420.75	2422.51	2421.89
3/31/2019	2459.13	2434.19	2438.43	2426.60	2426.08	2435.17	2434.78	2440.37	2440.05
6/30/2019	2468.96	2445.54	2450.82	2436.79	2436.49	2448.94	2448.90	2458.23	2458.36
9/30/2019	2469.01	2456.90	2463.26	2446.97	2446.94	2462.71	2463.10	2476.09	2476.80
12/31/2019	2466.82	2468.25	2475.78	2457.15	2457.43	2476.48	2477.38	2493.96	2495.38
Annual Trend		1.8%	2.0%	1.7%	1.7%	2.2%	2.3%	2.9%	3.0%
R-Squared		0.967	0.967	0.806	0.808	0.895	0.896	0.961	0.961

Notes:

- (2) = Average Index for Austin, Corpus Christi, Dallas, El Paso, Fort Worth, Houston, Odessa, and San Antonio
- (3) - (10) = (2) fitted to linear and exponential distributions

**Texas Windstorm Insurance Association**  
**Residential Property - Wind & Hail**  
**Rate Level Review**

Loss Trend Analysis

Boeckh Residential Construction Index Trend (Coastal)

Calendar Year Ending	Texas Coastal Index	Fitted Trends		5 Years		4 Years		3 Years	
		All Years Linear	Exponential	Linear	Exponential	Linear	Exponential	Linear	Exponential
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
3/31/2010	2075.10	2028.38	2035.95						
6/30/2010	2072.76	2040.30	2046.71						
9/30/2010	2070.98	2052.21	2057.53						
12/31/2010	2070.61	2064.13	2068.41						
3/31/2011	2073.42	2076.05	2079.34						
6/30/2011	2074.47	2087.97	2090.34						
9/30/2011	2078.09	2099.89	2101.39						
12/31/2011	2083.46	2111.81	2112.49						
3/31/2012	2089.96	2123.73	2123.66						
6/30/2012	2099.33	2135.64	2134.89						
9/30/2012	2118.82	2147.56	2146.18						
12/31/2012	2139.88	2159.48	2157.52						
3/31/2013	2157.74	2171.40	2168.93						
6/30/2013	2175.63	2183.32	2180.39						
9/30/2013	2189.62	2195.24	2191.92						
12/31/2013	2203.37	2207.15	2203.51						
3/31/2014	2227.71	2219.07	2215.16						
6/30/2014	2252.63	2230.99	2226.87						
9/30/2014	2275.00	2242.91	2238.64						
12/31/2014	2296.77	2254.83	2250.47						
3/31/2015	2310.58	2266.75	2262.37	2270.81	2273.22				
6/30/2015	2322.52	2278.66	2274.33	2282.34	2284.14				
9/30/2015	2330.38	2290.58	2286.35	2293.86	2295.12				
12/31/2015	2333.26	2302.50	2298.44	2305.39	2306.15				
3/31/2016	2328.65	2314.42	2310.59	2316.91	2317.24	2275.62	2277.89		
6/30/2016	2320.80	2326.34	2322.81	2328.44	2328.37	2291.45	2292.93		
9/30/2016	2313.59	2338.26	2335.09	2339.97	2339.56	2307.28	2308.06		
12/31/2016	2308.17	2350.18	2347.43	2351.49	2350.81	2323.11	2323.30		
3/31/2017	2311.24	2362.09	2359.84	2363.02	2362.11	2338.94	2338.63	2305.74	2307.14
6/30/2017	2323.79	2374.01	2372.32	2374.54	2373.46	2354.77	2354.07	2326.48	2327.04
9/30/2017	2340.80	2385.93	2384.86	2386.07	2384.87	2370.59	2369.61	2347.23	2347.12
12/31/2017	2360.09	2397.85	2397.46	2397.60	2396.33	2386.42	2385.25	2367.98	2367.36
3/31/2018	2380.33	2409.77	2410.14	2409.12	2407.84	2402.25	2400.99	2388.73	2387.79
6/30/2018	2404.16	2421.69	2422.88	2420.65	2419.42	2418.08	2416.84	2409.48	2408.38
9/30/2018	2433.32	2433.60	2435.69	2432.17	2431.05	2433.91	2432.79	2430.22	2429.16
12/31/2018	2467.60	2445.52	2448.56	2443.70	2442.73	2449.74	2448.85	2450.97	2450.11
3/31/2019	2494.19	2457.44	2461.51	2455.22	2454.47	2465.57	2465.01	2471.72	2471.25
6/30/2019	2508.16	2469.36	2474.52	2466.75	2466.27	2481.40	2481.28	2492.47	2492.57
9/30/2019	2510.44	2481.28	2487.60	2478.28	2478.12	2497.22	2497.66	2513.21	2514.07
12/31/2019	2504.07	2493.20	2500.75	2489.80	2490.03	2513.05	2514.14	2533.96	2535.76
Annual Trend		1.9%	2.1%	1.9%	1.9%	2.5%	2.7%	3.3%	3.5%
R-Squared		0.955	0.957	0.794	0.796	0.895	0.896	0.966	0.966

Notes:

- (2) = Average Index for Corpus Christi and Houston
- (3) - (10) = (2) fitted to linear and exponential distributions

Rate Level Review

Loss Trend Analysis

Modified Consumer Price Index - External Trend

Calendar Year Ending	Modified CPI	Fitted Trends		5 Years		4 Years		3 Years	
		All Years Linear	Exponential	Linear	Exponential	Linear	Exponential	Linear	Exponential
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
9/30/2009	179.30	177.20	177.41						
12/31/2009	178.80	177.74	177.91						
3/31/2010	178.46	178.28	178.42						
6/30/2010	178.56	178.81	178.93						
9/30/2010	178.59	179.35	179.44						
12/31/2010	178.72	179.88	179.95						
3/31/2011	178.97	180.42	180.47						
6/30/2011	179.61	180.96	180.98						
9/30/2011	180.52	181.49	181.50						
12/31/2011	181.55	182.03	182.01						
3/31/2012	182.78	182.56	182.53						
6/30/2012	183.87	183.10	183.05						
9/30/2012	184.57	183.64	183.58						
12/31/2012	185.03	184.17	184.10						
3/31/2013	185.38	184.71	184.63						
6/30/2013	185.51	185.24	185.15						
9/30/2013	185.82	185.78	185.68						
12/31/2013	186.03	186.31	186.21						
3/31/2014	186.43	186.85	186.74						
6/30/2014	186.87	187.39	187.27						
9/30/2014	187.59	187.92	187.81						
12/31/2014	188.62	188.46	188.34						
3/31/2015	189.46	188.99	188.88	189.11	189.16				
6/30/2015	189.59	189.53	189.42	189.64	189.67				
9/30/2015	190.03	190.07	189.96	190.17	190.19				
12/31/2015	190.50	190.60	190.50	190.69	190.70				
3/31/2016	190.95	191.14	191.05	191.22	191.22	191.21	191.24		
6/30/2016	192.03	191.67	191.59	191.75	191.74	191.74	191.76		
9/30/2016	192.82	192.21	192.14	192.27	192.26	192.27	192.28		
12/31/2016	193.56	192.75	192.69	192.80	192.78	192.80	192.80		
3/31/2017	193.86	193.28	193.24	193.33	193.31	193.33	193.32	192.86	192.89
6/30/2017	194.07	193.82	193.79	193.86	193.83	193.85	193.85	193.45	193.47
9/30/2017	194.20	194.35	194.34	194.38	194.36	194.38	194.37	194.05	194.05
12/31/2017	194.18	194.89	194.90	194.91	194.89	194.91	194.90	194.64	194.64
3/31/2018	194.71	195.42	195.45	195.44	195.42	195.44	195.42	195.23	195.23
6/30/2018	195.24	195.96	196.01	195.97	195.95	195.97	195.95	195.83	195.82
9/30/2018	195.63	196.50	196.57	196.49	196.48	196.50	196.48	196.42	196.41
12/31/2018	196.26	197.03	197.13	197.02	197.01	197.03	197.02	197.01	197.00
3/31/2019	197.08	197.57	197.69	197.55	197.55	197.56	197.55	197.60	197.59
6/30/2019	198.20	198.10	198.26	198.08	198.09	198.09	198.09	198.20	198.19
9/30/2019	199.66	198.64	198.82	198.60	198.62	198.62	198.62	198.79	198.79
12/31/2019	200.38	199.18	199.39	199.13	199.16	199.14	199.16	199.38	199.39
Annual Trend		1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.2%	1.2%
R-Squared		0.987	0.987	0.962	0.963	0.930	0.932	0.902	0.905

Notes:

(2) = Weighted average of CPI for Lodging, Apparel, Furnishings, and Medical Care

(3) - (10) = (2) fitted to linear and exponential distributions

**Texas Windstorm Insurance Association**  
**Commercial Property - Wind & Hail**  
**Rate Level Review**

Development of Non-hurricane LAE factor Using TWIA Commercial + Residential Experience

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Accident Year	Paid Loss (\$000)	Paid ALAE (\$000)	Paid ULAE (\$000)
(1)	(2)	(3)	(4)
2010	18,005	323	3,951
2011	96,089	725	14,386
2012	66,741	829	14,961
2013	70,811	901	12,922
2014	7,002	1,017	5,796
2015	138,583	2,679	37,109
2016	28,409	484	14,882
2017	1,338,484	6,905	249,300
2018	11,663	117	6,280
2019	12,936	7	7,053

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Total (Excluding 2017)	450,239	7,082	117,340
Paid ALAE to Loss ratio			0.016
Paid ULAE to Loss ratio			0.261
Selected Non-Hurricane LAE ratio			0.276

Notes:

- (2) = Cumulative Loss Payments as of 12/31/19 from TWIA's 2019 Schedule P
- (3) = Cumulative DCC Payments as of 12/31/19 from TWIA's 2019 Schedule P
- (4) = Cumulative AAO Payments as of 12/31/19 from TWIA's 2019 Schedule P
- Selected Non-Hurricane LAE ratio = ((3)Total+(4)Total)/(2)Total
- Excluded 2017 in Non-Hurricane LAE calculation as 2017 was a hurricane year (Harvey)



**Texas Windstorm Insurance Association**  
**Commercial Property - Wind & Hail**  
**Rate Level Review**

Development of Hurricane LAE factor Using TWIA Commercial + Residential Experience

Hurricane (Year)	Loss	ALAE	ULAE	LAE Ratio
(1)	(2)	(3)	(4)	(5)
Ike (2008)	1,950,833,975	186,293,648	127,269,430	16.1%
Harvey (2017)	1,336,923,861	144,947,255	106,821,442	18.8%
<b>Total</b>	<b>3,287,757,836</b>	<b>331,240,903</b>	<b>234,090,872</b>	
Paid ALAE to Loss ratio				0.101
Paid ULAE to Loss ratio				0.071
Selected Hurricane LAE ratio				0.172

Notes:

- (2) = Cumulative Loss Payments as of 06/30/2020; Ike Losses reflect TWIA's estimated Residential & Commercial Hurricane Ike litigation cost reduction of \$306,292,226 stemming from House Bill 3
- (3) = Cumulative ALAE Payments as of 06/30/2020
- (4) = Cumulative ALAE Payments as of 06/30/2020
- (5) = ((3)+(4))/(2)

**Texas Windstorm Insurance Association**  
**Residential Property - Wind & Hail**  
**Rate Level Review**  
 Summary of Indicated Hurricane Loss & LAE Ratios

Basis for Hurricane Loss Ratio	Indicated Loss Ratio	LAE Factor	Indicated Loss & LAE Ratio	Selected Model Weight
(1)	(2)	(3)	(4)	(5)
Industry Experience	30.9%	0.172	36.2%	
<u>Hurricane Models</u>				
AIR Model	48.5%	0.172	56.8%	25%
RMS Model	35.6%	0.172	41.7%	75%
Weighted Average of Models	38.8%	0.172	45.5%	

Notes:

- (2) Exhibit 6 - Exhibit 8, Sheet 1
- (3) Exhibit 4, Sheet 2
- (4) = (2) \* [1 + (3)]

**Texas Windstorm Insurance Association**

**Residential Property - Wind & Hail**

**Rate Level Review**

Industry Experience -- Residential Extended Coverage

1966 - 2019 -- Hurricane Years Only

Accident Year	Earned Premium at Current TWIA Rate Level	Incurred Loss Ratio
(1)	(2)	(3)
1968	33,975,804	32.9%
1970	34,658,928	60.0%
1971	34,539,514	65.8%
1980	58,664,250	74.8%
1983	75,333,571	430.2%
1986	95,974,159	9.3%
1989	109,248,693	7.0%
1990	105,685,439	17.0%
1999	184,177,966	8.5%
2003	225,873,236	20.1%
2005	248,665,748	111.6%
2007	384,632,941	5.1%
2008	477,636,241	419.9%
2017	559,948,822	218.7%
<hr/>		
(4) Simple Average Loss Ratio for Hurricane Years		105.8%
(5) Selected Non-Hurricane Loss Ratio		9.1%
(6) Average Hurricane Loss Ratio for Hurricane Years		96.7%
(7) Historical Hurricane Frequency		
(a) 54-Year (1/1/1966 - 12/31/2019)		0.241 (1 Hurricane year every 4.1 years)
(a) 169-Year (1/1/1851 - 12/31/2019)		0.320 (1 Hurricane year every 3.1 years)
Selected Frequency		0.320 (1 Hurricane every year 3.1 years)
(8) Indicated Hurricane Loss Ratio		30.9%

Notes:

- (2) Exhibit 6, Sheet 2.
- (3) Exhibit 6, Sheet 2.
- (4) = Average of (3)
- (5) Exhibit 6, Sheet 2
- (6) = (4) - (5)
- (7) Exhibit 9
- (8) = (6) \* (7) Selected

**Texas Windstorm Insurance Association**

**Residential Property - Wind & Hail**

**Rate Level Review**

Industry Experience -- Residential Extended Coverage

1966 - 2019

Accident Year	Earned Premium	Earned Premium at CMR	Earned Premium at Current TWIA Rate Level	Incurred Losses	Incurred Loss Ratio	Hurricane Indicator
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1966		13,011,528	34,051,169	1,178,131	3.5%	
1967		13,130,860	34,363,461	663,024	1.9%	
1968		12,982,730	33,975,804	11,171,683	32.9%	H
1969		12,499,176	32,710,344	3,218,757	9.8%	
1970		13,243,763	34,658,928	20,786,468	60.0%	H
1971	10,640,335	13,198,133	34,539,514	22,731,206	65.8%	H
1972	12,302,040	13,902,740	36,383,471	2,242,093	6.2%	
1973	12,935,382	12,724,690	33,300,514	4,933,261	14.8%	
1974	12,794,652	11,637,700	30,455,861	2,293,219	7.5%	
1975	13,633,616	12,392,309	32,430,673	3,062,897	9.4%	
1976	17,088,846	13,884,831	36,336,603	1,522,489	4.2%	
1977	23,643,216	17,474,220	45,730,034	972,383	2.1%	
1978	28,157,329	19,320,941	50,562,903	1,449,823	2.9%	
1979	32,867,536	21,563,567	56,431,855	3,940,899	7.0%	
1980	32,179,994	22,416,603	58,664,250		74.8%	H
1981	30,817,037	29,693,419	77,707,678		3.2%	
1982	28,140,159	32,398,474	84,786,806		2.3%	
1983	28,786,234	39,817,626	75,333,571		430.2%	H
1984	20,078,668	34,626,400	52,545,874		12.1%	
1985	30,043,452	53,801,222	78,623,714		5.2%	
1986	36,673,352		95,974,159		9.3%	H
1987	41,598,709		108,863,822		2.4%	
1988	45,044,392		117,881,171		10.1%	
1989	41,745,774		109,248,693		7.0%	H
1990	40,384,195		105,685,439		17.0%	H
1991	46,237,137		121,002,587		70.0%	
1992	44,512,572		116,489,401		6.3%	
1993	50,741,120		132,789,511		10.3%	
1994	57,584,585		150,698,860		4.9%	
1995	60,740,049		158,956,709		6.8%	
1996	71,865,572		188,072,203		3.5%	
1997	79,154,547		207,147,450		4.3%	
1998	80,238,260		209,983,525		19.2%	
1999	71,026,552		184,177,966		8.5%	H
2000	75,114,174		179,188,154		5.3%	
2001	74,726,401		150,433,000		7.4%	
2002	86,289,350		173,710,570		17.2%	
2003	112,200,741		225,873,236		20.1%	H
2004	123,050,217		236,207,042		1.7%	
2005	135,380,924		248,665,748		111.6%	H
2006	154,699,767		283,468,384		2.0%	
2007	219,914,305		384,632,941		5.1%	H
2008	289,558,186		477,636,241		419.9%	H
2009	327,305,758		490,534,995		1.9%	
2010	355,219,215		499,964,244		3.8%	
2011	370,875,863		509,107,482		18.5%	
2012	406,981,851		532,077,164		13.7%	
2013	440,952,159		549,111,155		17.2%	
2014	477,983,216		567,000,312		2.3%	
2015	517,579,765		584,847,630		24.2%	
2016	541,982,800		583,476,869		8.6%	
2017	533,284,592		559,948,822		218.7%	H
2018	516,732,311		529,931,693		3.5%	
2019	509,619,292		509,619,292		5.4%	
Total / Average	7,371,106,199	413,720,932	11,235,999,499		34.1%	
Average of Non-Hurricane Years Selected					9.1%	
					9.1%	

Notes: (2), (3) Source: TDI. Accident years ending 9/30/xx as of 12/31/2019  
 (4) 1983 - 2019: Sum of Exhibit 6, Sheet 4 - Sheet 7, (4); 1966 - 1982: (3) \* 2.6  
 (5) Provided by TDI. Accident years ending 9/30/xx as of 12/31/2010  
 (6) 1983 - 2019: Exhibit 6, Sheet 3; 1966 - 1981: (5) / (4)  
 (7) "H" indicates occurrence of hurricane(s) during the time period (years ending 9/30/xx)

Accident Year	<u>Loss Ratios by Territory / Tier</u>					Weighted Loss Ratio	Selected Loss Ratio
	Territory 8	Territory 9	Territory 10	Tier 2			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	
1983	1052.2%	6.2%	142.5%	145.2%	430.2%	430.2%	
1984	3.2%	5.8%	20.8%	33.1%	12.1%	12.1%	
1985	1.7%	7.1%	6.9%	11.1%	5.2%	5.2%	
1986	1.0%	2.4%	18.2%	12.1%	9.3%	9.3%	
1987	0.5%	3.5%	3.2%	6.3%	2.4%	2.4%	
1988	4.9%	6.0%	15.8%	6.4%	10.1%	10.1%	
1989	5.5%	5.7%	8.3%	15.3%	7.0%	7.0%	
1990	28.9%	10.4%	10.6%	21.3%	17.0%	17.0%	
1991	58.5%	12.9%	103.5%	15.4%	70.0%	70.0%	
1992	1.2%	11.4%	7.7%	17.5%	6.3%	6.3%	
1993	12.5%	11.0%	8.0%	21.4%	10.3%	10.3%	
1994	2.3%	5.7%	6.4%	7.6%	4.9%	4.9%	
1995	2.8%	8.6%	8.6%	22.5%	6.8%	6.8%	
1996	1.3%	4.7%	4.4%	9.0%	3.5%	3.5%	
1997	1.7%	4.0%	6.3%	7.7%	4.3%	4.3%	
1998	17.6%	9.9%	24.4%	9.3%	19.2%	19.2%	
1999	2.0%	17.2%	9.8%	9.8%	8.5%	8.5%	
2000	0.9%	2.4%	9.7%	10.9%	5.3%	5.3%	
2001	5.4%	7.8%	7.9%	35.6%	7.4%	7.4%	
2002	24.4%	5.8%	16.5%	10.6%	17.2%	17.2%	
2003	5.1%	8.2%	36.5%	10.3%	20.1%	20.1%	
2004	1.3%	1.9%	1.9%	3.9%	1.7%	1.7%	
2005	51.1%	2.7%	203.6%	37.2%	111.6%	111.6%	
2006	1.0%	1.7%	2.8%	4.9%	2.0%	2.0%	
2007	2.7%	1.6%	8.3%	4.9%	5.1%	5.1%	
2008	694.6%	2.2%	382.2%	418.4%	419.9%	419.9%	
2009	2.9%	0.9%	1.3%	9.4%	1.9%	1.9%	
2010	1.2%	5.6%	4.8%	10.9%	3.8%	3.8%	
2011	1.0%	27.3%	28.4%	6.0%	18.5%	18.5%	
2012	8.3%	28.9%	9.5%	85.0%	13.7%	13.7%	
2013	40.7%	9.1%	2.8%	19.6%	17.2%	17.2%	
2014	0.5%	2.5%	3.1%	17.7%	2.3%	2.3%	
2015	12.7%	12.2%	37.5%	35.1%	24.2%	24.2%	
2016	8.3%	12.7%	6.4%	35.8%	8.6%	8.6%	
2017	30.9%	339.8%	315.9%	60.2%	218.7%	218.7%	
2018	2.4%	2.2%	4.6%	10.4%	3.5%	3.5%	
2019	4.1%	1.6%	7.3%	26.8%	5.4%	5.4%	
Average	56.7%	16.5%	40.4%	33.1%	41.5%	41.5%	

TWIA 2019 Written Premium by Territory / Tier

	Territory 8	Territory 9	Territory 10	Tier 2	Total
(8) Amount	108,030,247	58,233,887	143,774,114	4,354,003	314,392,251
(9) % Share	34.4%	18.5%	45.7%	1.4%	100.0%

Notes:

- (2) Exhibit 6, Sheet 4
- (3) Exhibit 6, Sheet 5
- (4) Exhibit 6, Sheet 6
- (5) Exhibit 6, Sheet 7
- (6) = Weighted average of (2) to (5), using (9)
- (7) = (6)
- (8) Provided by TWIA
- (9) = (8) / (8) Total

**Texas Windstorm Insurance Association**

**Residential Property - Wind & Hail**

**Rate Level Review**

Industry Experience -- Residential Extended Coverage

Tier 1 -- Territory 8 (Galveston County)

Accident Year	Earned Premium	Factor to TWIA Rate Level	Earned Premium at Current TWIA Rate Level	Incurred Loss	Incurred Loss Ratio
(1)	(2)	(3)	(4)	(5)	(6)
1983	4,317,605	2.617	11,299,172	118,889,570	1052.2%
1984	3,512,853	2.617	9,193,136	292,543	3.2%
1985	6,066,870	2.617	15,876,999	265,705	1.7%
1986	6,846,710	2.617	17,917,840	187,218	1.0%
1987	7,738,740	2.617	20,252,283	111,242	0.5%
1988	8,043,378	2.617	21,049,520	1,026,666	4.9%
1989	8,149,957	2.617	21,328,437	1,163,813	5.5%
1990	7,816,199	2.617	20,454,993	5,908,943	28.9%
1991	8,645,208	2.617	22,624,509	13,225,287	58.5%
1992	5,826,467	2.617	15,247,863	180,484	1.2%
1993	5,825,916	2.617	15,246,422	1,900,088	12.5%
1994	6,996,874	2.617	18,310,819	420,038	2.3%
1995	8,737,576	2.617	22,866,237	644,169	2.8%
1996	11,652,672	2.617	30,495,044	406,004	1.3%
1997	12,573,252	2.617	32,904,201	573,343	1.7%
1998	13,838,930	2.617	36,216,480	6,371,206	17.6%
1999	14,103,814	2.593	36,572,406	742,130	2.0%
2000	15,784,218	2.386	37,653,943	324,948	0.9%
2001	17,776,666	2.013	35,786,511	1,947,817	5.4%
2002	20,514,469	2.013	41,298,029	10,059,284	24.4%
2003	25,868,450	2.013	52,076,220	2,672,918	5.1%
2004	30,357,860	1.920	58,274,910	731,759	1.3%
2005	36,780,457	1.837	67,557,818	34,527,644	51.1%
2006	43,562,211	1.832	79,822,419	813,430	1.0%
2007	59,282,257	1.749	103,685,428	2,757,645	2.7%
2008	73,789,694	1.650	121,718,652	845,466,768	694.6%
2009	81,999,709	1.499	122,893,429	3,581,024	2.9%
2010	89,665,314	1.407	126,202,213	1,451,547	1.2%
2011	93,230,854	1.373	127,979,548	1,329,886	1.0%
2012	99,629,727	1.307	130,253,235	10,756,644	8.3%
2013	107,104,250	1.245	133,375,327	54,316,145	40.7%
2014	114,784,032	1.186	136,160,810	691,708	0.5%
2015	122,782,019	1.130	138,739,529	17,655,480	12.7%
2016	127,007,324	1.077	136,730,973	11,291,643	8.3%
2017	126,002,753	1.050	132,302,891	40,819,572	30.9%
2018	122,707,170	1.026	125,841,595	2,980,015	2.4%
2019	121,969,675	1.000	121,969,675	4,945,341	4.1%
<b>Total</b>	<b>1,671,292,130</b>		<b>2,398,179,516</b>	<b>1,201,429,667</b>	<b>50.1%</b>

Notes:

(2) Provided by TDI. Accident years ending 9/30/xx as of 12/31/2019

(3) 1998 and prior judgementally selected; 1999 - 2019 based on TWIA on-level factors

(4) = (2) \* (3)

(5) Provided by TDI. Accident yrs ending 9/30/xx as of 12/31/2019; 2008 lke incurred loss was adjusted down by \$206,858,309 to incorporate the statutory limitations on litigation cost that House Bill 3 provides

(6) = (5) / (4)

**Texas Windstorm Insurance Association**

**Residential Property - Wind & Hail**

**Rate Level Review**

Industry Experience -- Residential Extended Coverage

Tier 1 -- Territory 9 (Nueces County)

Accident Year	Earned Premium	Factor to TWIA Rate Level	Earned Premium at Current TWIA Rate Level	Incurred Loss	Incurred Loss Ratio
(1)	(2)	(3)	(4)	(5)	(6)
1983	2,331,938	2.617	6,102,682	377,010	6.2%
1984	1,632,317	2.617	4,271,774	249,086	5.8%
1985	2,505,564	2.617	6,557,061	467,721	7.1%
1986	2,977,992	2.617	7,793,405	189,449	2.4%
1987	3,639,667	2.617	9,525,009	335,212	3.5%
1988	3,971,251	2.617	10,392,764	626,491	6.0%
1989	3,702,536	2.617	9,689,537	550,215	5.7%
1990	3,519,306	2.617	9,210,024	955,271	10.4%
1991	4,065,190	2.617	10,638,602	1,367,254	12.9%
1992	3,907,712	2.617	10,226,482	1,170,578	11.4%
1993	4,552,395	2.617	11,913,617	1,312,776	11.0%
1994	5,710,806	2.617	14,945,180	856,369	5.7%
1995	6,908,552	2.617	18,079,679	1,552,987	8.6%
1996	8,568,168	2.617	22,422,896	1,061,115	4.7%
1997	8,425,344	2.617	22,049,126	882,561	4.0%
1998	8,803,621	2.617	23,039,077	2,289,890	9.9%
1999	8,465,256	2.593	21,951,137	3,778,386	17.2%
2000	8,437,094	2.386	20,127,058	485,581	2.4%
2001	8,894,552	2.013	17,905,774	1,394,445	7.8%
2002	10,534,795	2.013	21,207,776	1,227,528	5.8%
2003	13,881,847	2.013	27,945,784	2,295,803	8.2%
2004	15,458,506	1.920	29,674,129	569,877	1.9%
2005	17,471,646	1.837	32,091,670	872,451	2.7%
2006	19,888,512	1.832	36,443,263	621,501	1.7%
2007	29,704,042	1.749	51,952,751	833,793	1.6%
2008	40,565,108	1.650	66,913,548	1,468,028	2.2%
2009	46,363,445	1.499	69,485,158	615,469	0.9%
2010	51,529,115	1.407	72,526,243	4,059,049	5.6%
2011	52,931,755	1.373	72,660,303	19,843,778	27.3%
2012	56,334,273	1.307	73,649,919	21,286,940	28.9%
2013	60,101,696	1.245	74,843,747	6,825,640	9.1%
2014	65,642,137	1.186	77,866,986	1,913,725	2.5%
2015	72,124,134	1.130	81,497,832	9,916,873	12.2%
2016	76,436,084	1.077	82,288,012	10,418,298	12.7%
2017	77,008,517	1.050	80,858,943	274,719,455	339.8%
2018	77,031,486	1.026	78,999,174	1,701,043	2.2%
2019	76,490,369	1.000	76,490,369	1,230,125	1.6%
<b>Total</b>	<b>960,516,727</b>		<b>1,364,236,488</b>	<b>380,321,773</b>	<b>27.9%</b>

Notes:

(2) Provided by TDI. Accident years ending 9/30/xx as of 12/31/2019

(3) 1998 and prior judgementally selected; 1999 - 2019 based on TWIA on-level factors

(4) = (2) \* (3)

(5) Provided by TDI. Accident yrs ending 9/30/xx as of 12/31/2019

(6) = (5) / (4)

**Texas Windstorm Insurance Association**

**Residential Property - Wind & Hail**

**Rate Level Review**

Industry Experience -- Residential Extended Coverage

Tier 1 -- Territory 10 (Other Tier 1)

Accident Year	Earned Premium	Factor to TWIA Rate Level	Earned Premium at Current TWIA Rate Level	Incurred Loss	Incurred Loss Ratio
(1)	(2)	(3)	(4)	(5)	(6)
1983	5,888,781	2.617	15,410,940	21,953,626	142.5%
1984	3,924,651	2.617	10,270,812	2,135,063	20.8%
1985	5,808,825	2.617	15,201,695	1,055,065	6.9%
1986	6,993,722	2.617	18,302,570	3,338,312	18.2%
1987	7,677,374	2.617	20,091,688	634,637	3.2%
1988	8,284,768	2.617	21,681,238	3,434,130	15.8%
1989	7,733,295	2.617	20,238,033	1,670,422	8.3%
1990	7,568,146	2.617	19,805,838	2,095,151	10.6%
1991	8,287,605	2.617	21,688,663	22,444,044	103.5%
1992	8,059,407	2.617	21,091,467	1,625,108	7.7%
1993	8,448,603	2.617	22,109,995	1,776,572	8.0%
1994	9,743,293	2.617	25,498,198	1,637,915	6.4%
1995	10,745,995	2.617	28,122,268	2,416,675	8.6%
1996	13,294,968	2.617	34,792,932	1,520,229	4.4%
1997	15,708,220	2.617	41,108,412	2,569,544	6.3%
1998	16,168,136	2.617	42,312,012	10,312,506	24.4%
1999	14,452,667	2.593	37,477,010	3,655,754	9.8%
2000	14,453,385	2.386	34,479,183	3,332,580	9.7%
2001	15,173,521	2.013	30,546,076	2,426,814	7.9%
2002	17,843,905	2.013	35,921,871	5,925,066	16.5%
2003	23,423,208	2.013	47,153,662	17,213,668	36.5%
2004	27,306,202	1.920	52,416,951	990,613	1.9%
2005	31,012,304	1.837	56,962,957	115,989,785	203.6%
2006	36,545,725	1.832	66,965,567	1,842,548	2.8%
2007	69,945,120	1.749	122,334,912	10,105,722	8.3%
2008	110,187,567	1.650	181,758,202	694,640,836	382.2%
2009	128,275,387	1.499	192,247,050	2,522,159	1.3%
2010	143,236,007	1.407	201,601,937	9,656,553	4.8%
2011	151,387,931	1.373	207,812,737	59,069,922	28.4%
2012	170,159,709	1.307	222,462,243	21,183,482	9.5%
2013	183,495,510	1.245	228,504,225	6,488,552	2.8%
2014	197,640,983	1.186	234,448,607	7,237,896	3.1%
2015	212,320,998	1.130	239,915,547	89,978,392	37.5%
2016	218,795,204	1.077	235,546,111	15,012,404	6.4%
2017	212,533,686	1.050	223,160,370	705,069,821	315.9%
2018	201,509,514	1.026	206,656,862	9,481,014	4.6%
2019	194,394,581	1.000	194,394,581	14,185,711	7.3%
<b>Total</b>	<b>2,518,428,904</b>		<b>3,430,493,424</b>	<b>1,876,628,291</b>	<b>54.7%</b>

Notes:

(2) Provided by TDI. Accident years ending 9/30/xx as of 12/31/2019

(3) 1998 and prior judgementally selected; 1999 - 2019 based on TWIA on-level factors

(4) = (2) \* (3)

(5) Provided by TDI. Accident yrs ending 9/30/xx as of 12/31/2019

(6) = (5) / (4)



**Texas Windstorm Insurance Association**

**Residential Property - Wind & Hail**

**Rate Level Review**

Industry Experience -- Residential Extended Coverage

Tier 2 -- (Territories 1 and 11)

Accident Year	Earned Premium	Factor to TWIA Rate Level	Earned Premium at Current TWIA Rate Level	Incurred Loss	Incurred Loss Ratio
(1)	(2)	(3)	(4)	(5)	(6)
1983	16,247,909	2.617	42,520,778	61,752,490	145.2%
1984	11,008,847	2.617	28,810,153	9,535,536	33.1%
1985	15,662,193	2.617	40,987,959	4,532,749	11.1%
1986	19,854,927	2.617	51,960,344	6,306,903	12.1%
1987	22,542,928	2.617	58,994,843	3,739,010	6.3%
1988	24,744,994	2.617	64,757,649	4,139,098	6.4%
1989	22,159,987	2.617	57,992,686	8,884,751	15.3%
1990	21,480,544	2.617	56,214,584	11,997,188	21.3%
1991	25,239,134	2.617	66,050,814	10,178,608	15.4%
1992	26,718,987	2.617	69,923,589	12,221,034	17.5%
1993	31,914,206	2.617	83,519,477	17,910,197	21.4%
1994	35,133,612	2.617	91,944,663	6,968,697	7.6%
1995	34,347,927	2.617	89,888,525	20,240,594	22.5%
1996	38,349,764	2.617	100,361,331	9,046,495	9.0%
1997	42,447,731	2.617	111,085,711	8,514,675	7.7%
1998	41,427,572	2.617	108,415,956	10,127,907	9.3%
1999	34,004,815	2.593	88,177,413	8,680,187	9.8%
2000	36,439,477	2.386	86,927,970	9,518,422	10.9%
2001	32,881,662	2.013	66,194,638	23,547,404	35.6%
2002	37,396,181	2.013	75,282,893	7,950,367	10.6%
2003	49,027,236	2.013	98,697,570	10,177,909	10.3%
2004	49,927,649	1.920	95,841,052	3,738,542	3.9%
2005	50,116,517	1.837	92,053,303	34,201,898	37.2%
2006	54,703,319	1.832	100,237,135	4,909,932	4.9%
2007	60,982,886	1.749	106,659,850	5,242,698	4.9%
2008	65,015,817	1.650	107,245,838	448,708,416	418.4%
2009	70,667,217	1.499	105,909,359	9,952,501	9.4%
2010	70,788,779	1.407	99,633,851	10,829,031	10.9%
2011	73,325,323	1.373	100,654,894	5,992,356	6.0%
2012	80,858,142	1.307	105,711,768	89,891,814	85.0%
2013	90,250,703	1.245	112,387,856	22,062,101	19.6%
2014	99,916,064	1.186	118,523,910	20,950,951	17.7%
2015	110,352,614	1.130	124,694,722	43,749,835	35.1%
2016	119,744,188	1.077	128,911,773	46,199,850	35.8%
2017	117,739,636	1.050	123,626,618	74,392,945	60.2%
2018	115,484,141	1.026	118,434,062	12,269,364	10.4%
2019	116,764,667	1.000	116,764,667	31,309,739	26.8%
<b>Total</b>	<b>1,965,668,294</b>		<b>3,296,000,203</b>	<b>1,130,372,194</b>	<b>34.3%</b>

Notes:

(2) Provided by TDI. Accident years ending 9/30/xx as of 12/31/2019

(3) 1998 and prior judgementally selected; 1999 - 2019 based on TWIA on-level factors

(4) = (2) \* (3)

(5) Provided by TDI. Accident yrs ending 9/30/xx as of 12/31/2019

(6) = (5) / (4)

**Texas Windstorm Insurance Association**  
**Residential Property - Wind & Hail**  
**Rate Level Review**  
Hurricane Loss Ratio -- AIR Model

Exhibit 7

County	TWIA Insured Limits (000s) as of 11/30/19	Average Annual Modeled Loss	Modeled Loss Cost
(1)	(2)	(3)	(4)
Aransas	1,560,360	4,048,156	2.594
Brazoria	9,623,822	16,605,942	1.726
Calhoun	884,611	2,815,402	3.183
Cameron	2,184,121	3,671,555	1.681
Chambers	1,407,119	2,339,692	1.663
Galveston	18,526,442	73,129,991	3.947
Harris	1,104,156	4,328,428	3.920
Jefferson	6,147,764	12,020,576	1.955
Kenedy	5,642	4,499	0.797
Kleberg	185,682	173,144	0.932
Matagorda	1,085,936	2,977,903	2.742
Nueces	10,223,620	25,988,473	2.542
Refugio	74,314	108,541	1.461
San Patricio	1,622,088	3,119,364	1.923
Willacy	76,748	170,637	2.223
<b>Total</b>	<b>54,712,424</b>	<b>151,502,303</b>	<b>2.769</b>
(5) Inforce-Premium as of Nov 30, 2019 at Present Rates			312,674,278
(6) Indicated Hurricane Loss Ratio			48.5%

Notes:

- (2) Provided by TWIA and Geo-coded by Willis Towers Watson
- (3) Modeled by Willis Towers Watson
- (4) = (3) / (2)
- (5) Provided by TWIA
- (6) = (3) Total / (5)

**Texas Windstorm Insurance Association**  
**Residential Property - Wind & Hail**  
**Rate Level Review**  
Hurricane Loss Ratio -- RMS Model

Exhibit 8

County	TWIA Insured Limits (000s) as of 11/30/19	Average Annual Modeled Loss	Modeled Loss Cost
(1)	(2)	(3)	(4)
Aransas	1,560,360	3,174,998	2.035
Brazoria	9,623,822	14,972,854	1.556
Calhoun	884,611	2,993,612	3.384
Cameron	2,184,121	3,818,134	1.748
Chambers	1,407,119	2,083,698	1.481
Galveston	18,526,442	46,177,197	2.493
Harris	1,104,156	3,072,939	2.783
Jefferson	6,147,764	11,115,980	1.808
Kenedy	5,642	7,857	1.393
Kleberg	185,682	263,633	1.420
Matagorda	1,085,936	2,962,256	2.728
Nueces	10,223,620	17,497,220	1.711
Refugio	74,314	142,951	1.924
San Patricio	1,622,088	2,739,079	1.689
Willacy	76,748	213,332	2.780
<b>Total</b>	<b>54,712,424</b>	<b>111,235,740</b>	<b>2.033</b>
(5) Inforce-Premium as of Nov 30, 2019 at Present Rates			312,674,278
(6) Indicated Hurricane Loss Ratio			35.6%

Notes:

- (2) Provided by TWIA and Geo-coded by Willis Towers Watson
- (3) Modeled by Willis Towers Watson
- (4) = (3) / (2)
- (5) Provided by TWIA
- (6) = (3) Total / (5)

**Texas Windstorm Insurance Association**  
**Residential Property - Wind & Hail**  
**Rate Level Review**  
Texas Hurricanes 1850 - 2019

<u>Landfall</u>			<u>Landfall</u>		
Year	Month	Name	Year	Month	Name
(1)	(2)		(1)	(2)	
1851	Jun		1929	Jun	
1854	Jun		1932	Aug	"Freeport"
1854	Sep	"Matagorda"	1933	Aug	
1865	Sep	"Sabine River-Lake Calcasieu"	1933	Sep	
1866	Jul		1934	Jul	
1867	Oct	"Galveston"	1936	Jun	
1869	Aug	"Lower Texas Coast"	1940	Aug	
1875	Sep		1941	Sep	
1879	Aug		1942	Aug	
1880	Aug		1942	Aug	
1882	Sep		1943	Jul	
1886	Jun		1945	Aug	
1886	Aug	"Indianola"	1947	Aug	
1886	Sep		1949	Oct	
1886	Oct		1957	Jun	Audrey
1887	Sep		1959	Jul	Debra
1888	Jun		1961	Sep	Carla
1891	Jul		1963	Sep	Cindy
1895	Aug		1967	Sep	Beulah
1897	Sep		1970	Aug	Celia
1900	Sep	"Galveston"	1971	Sep	Fern
1909	Jun		1980	Aug	Allen
1909	Jul	"Velasco"	1983	Aug	Alicia
1909	Aug		1986	Jun	Bonnie
1910	Sep		1989	Aug	Chantal
1912	Oct		1989	Oct	Jerry
1913	Jun		1999	Aug	Bret
1915	Aug	"Galveston"	2003	Jul	Claudette
1916	Aug		2005	Sep	Rita
1919	Sep		2007	Sep	Humberto
1921	Jun		2008	Jul	Dolly
			2008	Sep	Ike
			2017	Aug	Harvey

Frequency	Date Period	# of Hurricane	Years Period	Annual Frequency
54-Year	1/1/1966 - 12/31/2019	13	54	0.241
169-Year	1/1/1851 - 12/31/2019	54	169	0.320

Notes:  
(1), (2) from NOAA Technical Memorandum NWS NHC-6, updated with actual experience through 2019

**Texas Windstorm Insurance Association**  
**Residential Property - Wind & Hail**  
**Rate Level Review**

Calculation of TWIA Earned Premium at Present Rate Level  
Tier 1 -- Territory 8 (Galveston County)

Year	TWIA Earned Premium	Factor to Current Rate Level	Earned Premium at Current Rate Level
(1)	(2)	(3)	(4)
2010	88,599,807	1.407	124,702,532
2011	92,287,441	1.373	126,684,509
2012	98,605,959	1.307	128,914,788
2013	105,941,027	1.245	131,926,783
2014	113,521,698	1.186	134,663,386
2015	121,221,015	1.130	136,975,647
2016	123,942,872	1.077	133,431,908
2017	120,650,271	1.050	126,682,785
2018	112,717,188	1.026	115,596,430
2019	109,182,096	1.000	109,182,096
<b>Total</b>	<b>1,086,669,374</b>		<b>1,268,760,864</b>

Notes:

- (2) Provided by TDI
- (3) Provided by TWIA
- (4) = (2) \* (3)

**Texas Windstorm Insurance Association**  
**Residential Property - Wind & Hail**  
**Rate Level Review**

Calculation of TWIA Earned Premium at Present Rate Level  
Tier 1 -- Territory 9 (Nueces County)

Year	TWIA Earned Premium	Factor to Current Rate Level	Earned Premium at Current Rate Level
(1)	(2)	(3)	(4)
2010	49,048,919	1.407	69,035,414
2011	50,547,302	1.373	69,387,124
2012	53,841,760	1.307	70,391,274
2013	57,427,564	1.245	71,513,690
2014	62,828,148	1.186	74,528,934
2015	68,716,114	1.130	77,646,885
2016	71,234,774	1.077	76,688,491
2017	69,126,281	1.050	72,582,595
2018	63,899,693	1.026	65,531,943
2019	59,870,593	1.000	59,870,593
Total	606,541,148		707,176,943

Notes:

- (2) Provided by TDI
- (3) Provided by TWIA
- (4) = (2) \* (3)

**Texas Windstorm Insurance Association**  
**Residential Property - Wind & Hail**  
**Rate Level Review**

Calculation of TWIA Earned Premium at Present Rate Level  
Tier 1 -- Territory 10 (Other Tier 1)

Year	TWIA Earned Premium	Factor to Current Rate Level	Earned Premium at Current Rate Level
(1)	(2)	(3)	(4)
2010	131,679,293	1.407	185,336,084
2011	140,621,661	1.373	193,033,699
2012	160,031,435	1.307	209,220,809
2013	173,209,952	1.245	215,695,773
2014	187,152,484	1.186	222,006,785
2015	200,595,693	1.130	226,666,349
2016	200,978,477	1.077	216,365,340
2017	188,554,673	1.050	197,982,407
2018	166,829,909	1.026	171,091,403
2019	151,980,115	1.000	151,980,115
<b>Total</b>	<b>1,701,633,692</b>		<b>1,989,378,764</b>

Notes:

- (2) Provided by TDI
- (3) Provided by TWIA
- (4) = (2) \* (3)

**Texas Windstorm Insurance Association**  
**Residential Property - Wind & Hail**  
**Rate Level Review**

Calculation of TWIA Earned Premium at Present Rate Level  
 Tier 2 -- (Territories 1 and 11)

Year	TWIA Earned Premium	Factor to Current Rate Level	Earned Premium at Current Rate Level
(1)	(2)	(3)	(4)
2010	2,562,327	1.407	3,606,426
2011	2,825,372	1.373	3,878,435
2012	3,294,072	1.307	4,306,581
2013	3,672,814	1.245	4,573,701
2014	3,920,276	1.186	4,650,368
2015	4,202,726	1.130	4,748,938
2016	4,436,708	1.077	4,776,381
2017	4,435,808	1.050	4,657,598
2018	4,301,050	1.026	4,410,916
2019	4,296,061	1.000	4,296,061
<b>Total</b>	<b>37,947,214</b>		<b>43,905,405</b>

Notes:

- (2) Provided by TDI
- (3) Provided by TWIA
- (4) = (2) \* (3)



**Texas Windstorm Insurance Association**  
**Residential Property - Wind & Hail**  
**Rate Level Review**

Calculation of TWIA Earned Premium at Present Rate Level

Year	Earned Premium at Manual Rates	Factor to Current Rate Level	Earned Premium at Current Rate Level
(1)	(2)	(3)	(4)
2010	273,154,916	1.407	384,460,314
2011	292,239,327	1.373	401,161,797
2012	323,323,869	1.307	422,704,960
2013	346,955,938	1.245	432,059,062
2014	372,022,089	1.186	441,305,539
2015	403,803,905	1.130	456,284,757
2016	405,934,590	1.077	437,012,842
2017	376,421,384	1.050	395,242,454
2018	341,468,875	1.026	350,191,338
2019	322,259,386	1.000	322,259,386
Total	3,457,584,279		4,042,682,448

Notes:

- (2) Provided by TWIA
- (3) Based on historical rate changes
- (4) = (2) \* (3)

**Texas Windstorm Insurance Association**  
**Residential Property - Wind & Hail**  
**Rate Level Review**  
Fixed Expenses and Variable Permissible Loss & LAE Ratios

Expense Category	2017	2018	2019	Selected
(1) Direct Written Premium	\$423,074,138	\$395,551,679	\$372,016,601	
(2) Direct Earned Premium	451,347,130	409,954,258	381,571,182	
(3) Commission				
\$ Amount	67,661,211	63,280,811	59,474,929	
% of DWP	16.0%	16.0%	16.0%	16.0%
(4) Other Acquisition				
\$ Amount	\$0	\$0	\$0	
% of DWP	0.0%	0.0%	0.0%	0.0%
(5) General Expense				
Unadjusted \$ Amount	\$26,489,941	\$30,756,501	\$31,461,936	
% of DWP	6.3%	7.8%	8.5%	8.5%
(6) Taxes, Licenses & Fees				
\$ Amount	\$0	\$0	\$0	
% of DWP	0.0%	0.0%	0.0%	1.9%
(7) Reinsurance Expense				10.3%
(8) Outstanding Class 1 Public Security Repayment				17.9%
(9) Total Fixed Expenses				36.7%
(10) Total Variable Expenses				17.9%
(11) Underwriting Contingency & Uncertainty Provision				5.0%
(12) Permissible Loss & LAE Ratio				77.1%

Notes:

- (1) - (6) From TWIA's Statutory Annual Statements and Insurance Expense Exhibits
- (7) Exhibit 11, Sheet 2
- (8) Outstanding Class 1 Public Security issued in 2014, Security depleted due to Hurricane Harvey;  
0.179= Annual principal and interest payment of \$68.9M / Earned premium at present rate of \$384.7M
- (9) = (5) + (7) + (8)
- (10) = (3) + (4) + (6)
- (11) Underwriting Contingency & Uncertainty Provision selected judgmentally
- (12) = 100% - (10) - (11)

Texas Windstorm Insurance Association

Residential Property - Wind & Hail

Rate Level Review

Development of Reinsurer Expense

Using Weighting of 50% AIR and 50% RMS Hurricane Models

Exhibit 11

Sheet 2

	Net of Depop
(1) 2021 - 2022 Expected Reinsurance Premium	45,201,909
(2a) Expected Average Annual Loss by Reinsurance Layer (AIR) 100% of \$921M xs \$2.1B	13,992,572
Total	13,992,572
(2b) Expected Average Annual Loss by Reinsurance Layer (RMS) 100% of \$921M xs \$2.1B	6,574,517
Total	6,574,517
(2c) Selected Total Average Annual Loss	10,283,545
(2d) Selected Total Average Annual Loss+LAE	12,052,314
(3) Expected Net Cost of Reinsurance	33,149,595
(4) TWIA 2019 Earned Premium at Present Rates	322,259,386
(5) Indicated Reinsurance Expense %	10.3%

Notes:

(1) Developed by Willis Towers Watson for prospective reinsurance contract effective 6/1/2021 through 5/31/2022, but doesn't consider impact of reinsurance market conditions.

(2a) Developed by Willis Towers Watson, based on AIR model using TWIA exposures as of 11/30/2019

(2b) Developed by Willis Towers Watson, based on RMS model using TWIA exposures as of 11/30/2019

(2c) Selected based on a 50% RMS/50% AIR weighting

(2d) = (2c) \* 1.172; 1.172 is the selected loading for loss adjustment expenses

(3) = (1) - (2d)

(4) = Exhibit 10, Sheet 2, calendar year ending 12/31/2019

(5) = (3) / (4)

**Texas Windstorm Insurance Association**  
**Residential Property - Wind & Hail**  
**Rate Level Review**  
Reconciliation of Premium Data to Annual Statement

Calendar Year	TWIA Provided Written Premium			Annual Statement Gross	
	Commercial	Residential	Total	Written Premium	Difference
(1)	(2)	(3)	(4)	(5)	(6)
1995	12,865,905	19,259,265	32,125,170	32,419,287	(294,117)
1996	15,640,660	24,504,127	40,144,787	40,358,575	(213,788)
1997	16,536,186	25,783,455	42,319,641	42,462,844	(143,203)
1998	16,558,977	27,833,800	44,392,777	44,410,914	(18,137)
1999	17,394,142	27,168,992	44,563,134	44,581,218	(18,084)
2000	17,332,561	29,762,296	47,094,857	48,012,426	(917,569)
2001	17,544,251	36,220,623	53,764,874	54,630,727	(865,853)
2002	24,013,525	48,856,422	72,869,947	72,967,831	(97,884)
2003	29,220,514	58,573,191	87,793,705	87,987,279	(193,574)
2004	31,009,323	71,292,702	102,302,025	102,384,351	(82,326)
2005	35,740,174	78,094,458	113,834,632	113,927,701	(93,069)
2006	76,847,840	119,658,576	196,506,416	196,833,235	(326,819)
2007	110,951,718	203,561,196	314,512,914	315,139,307	(626,393)
2008	98,036,118	232,925,990	330,962,108	331,057,645	(95,537)
2009	111,269,573	269,535,059	380,804,632	382,342,402	(1,537,770)
2010	102,174,680	278,116,922	380,291,602	385,549,582	(5,257,980)
2011	100,017,021	307,494,236	407,511,257	403,748,164	3,763,093
2012	110,524,397	335,795,725	446,320,122	443,479,701	2,840,421
2013	112,904,624	360,838,081	473,742,705	472,739,474	1,003,231
2014	104,642,688	389,333,918	493,976,606	494,036,010	(59,404)
2015	98,715,934	407,969,846	506,685,780	503,824,316	2,861,464
2016	88,278,690	399,074,847	487,353,537	487,353,537	-
2017	70,749,081	352,368,052	423,117,133	423,074,138	42,995
2018	65,696,833	331,676,957	397,373,790	395,551,679	1,822,111
2019	59,123,729	314,907,159	374,030,888	372,016,601	2,014,287
<b>Total</b>	<b>1,543,789,143</b>	<b>4,750,605,895</b>	<b>6,294,395,038</b>	<b>6,290,888,944</b>	<b>3,506,094</b>

Notes:

- (2), (3) Provided by TWIA, as of 12/31/2019
- (4) = (2) + (3)
- (5) Based on TWIA Annual Statements
- (6) = (4) - (5)