

**Texas Windstorm Insurance Association
Commercial Property - Wind & Hail
2022 Rate Level Review**

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

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Summary of Indicated Rate Change

By Method for Projecting Hurricane Loss & LAE

Hurricane Projection Method (1)	Indicated Loss & LAE Ratio			Fixed Expenses (4)	Total (5)	Permissible LLAE Ratio (6)	Indicated Rate Change (7)
	Hurricane (2)	Non-Hurricane (3)					
Using Experience and Models	51.0%	6.7%		27.8%	85.5%	77.1%	11.0%
Using Actual Industry Experience	48.7%	6.7%		27.8%	83.2%	77.1%	8.0%
Average of All Models	53.3%	6.7%		27.8%	87.8%	77.1%	13.9%

Notes:

(2) Exhibit 5

(3) Exhibit 2, Sheet 1

(4) Exhibit 11

(5) = (2) + (3) + (4)

(6) Exhibit 11

(7) = (5) / (6) - 1

Selected

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Projected Ultimate Non-Hurricane Loss & LAE Ratio

Accident Year	Ultimate Non-Hurricane Loss	LAE Factor	Net Trend Factor	Projected Non-Hurricane Loss & LAE	Earned Premium at Current Rate Level	Indicated Non-Hurricane Loss & LAE Ratio
(1)	(2)	(3)	(4)	(5)	(6)	(7)
2012	14,459,642	0.278	1.093	20,198,009	144,413,320	14.0%
2013	7,351,329	0.278	1.114	10,466,028	146,084,496	7.2%
2014	1,056,281	0.278	1.089	1,470,071	135,603,583	1.1%
2015	18,672,896	0.278	1.068	25,486,710	120,726,959	21.1%
2016	2,601,698	0.278	1.065	3,541,093	105,842,224	3.3%
2017	2,039,206	0.278	1.040	2,710,349	87,703,816	3.1%
2018	256,887	0.278	0.996	326,988	73,508,956	0.4%
2019	928,337	0.278	1.026	1,217,261	65,530,795	1.9%
2020	676,596	0.278	1.096	947,700	62,711,660	1.5%
2021	765,705	0.278	1.000	978,571	64,939,142	1.5%
Total	48,808,577			67,342,780	1,007,064,951	6.7%

Notes:

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

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 Projected Ultimate Non-Hurricane Loss

Accident Year	TWIA Non-Hurricane Paid Loss	Development Factor	Ultimate Non-Hurricane Loss
(1)	(2)	(3)	(4)
2012	14,459,642	1.000	14,459,642
2013	7,351,329	1.000	7,351,329
2014	1,056,281	1.000	1,056,281
2015	18,672,896	1.000	18,672,896
2016	2,596,505	1.002	2,601,698
2017	1,999,222	1.020	2,039,206
2018	251,357	1.022	256,887
2019	886,664	1.047	928,337
2020	594,548	1.138	676,596
2021	560,545	1.366	765,705
Total	48,428,989		48,808,577

Notes:

- (2) Exhibit 2, Sheet 3, as of 12/31/21
- (3) Exhibit 3, Sheet 1
- (4) = (2) * (3)

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Summary of TWIA Historical Paid Loss as of 12/31/21

Accident Year	Paid Loss Excluding Expense			Total
	Non-Hurricane (1)	Hurricane (2)	(3)	
2012	14,459,642		0	14,459,642
2013	7,351,329		0	7,351,329
2014	1,056,281		0	1,056,281
2015	18,672,896		0	18,672,896
2016	2,596,505		0	2,596,505
2017	1,999,222	463,109,855		465,109,077
2018	251,357		0	251,357
2019	886,664		0	886,664
2020	594,548	5,268,000		5,862,548
2021	560,545	4,639,755		5,200,301
Total	48,428,989	473,017,609		521,446,599

Notes:

(2), (3) Provided by TWIA, includes commercial and farm

(4) = (2) + (3)

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Calculation of Net Trend Factors

Year / Quarter	Average Written premium Per house year At present rates		
(1)	(2)		
		(3) Current Average Earned Date	7/1/2021
		(4) Current Average Accident Date	7/1/2021
		(5) Prospective Average Earned / Accident Date	1/1/2024
		(6) Premium Trend Length	2.500
		(7) Loss Trend Length	2.500
		(8) Selected Premium Trend	3.5%
		(9) Selected Loss Trend	3.5%
2012 / 4	4,302.41		
2013 / 4	4,465.39		
2014 / 4	4,496.26		
2015 / 4	4,477.63		
2016 / 4	4,465.23		
2017 / 4	4,426.00		
2018 / 4	4,385.54		
2019 / 4	4,601.77		
2020 / 4	4,930.85		
2021 / 4	5,052.90		

Accident Year	Current Premium Trend	Current Loss Trend	Prospective Premium Trend	Prospective Loss Trend	Net Trend Factor
(10)	(11)	(12)	(13)	(14)	(15)
2012	1.174	1.283	1.090	1.090	1.093
2013	1.132	1.260	1.090	1.090	1.114
2014	1.124	1.224	1.090	1.090	1.089
2015	1.128	1.205	1.090	1.090	1.068
2016	1.132	1.205	1.090	1.090	1.065
2017	1.142	1.187	1.090	1.090	1.040
2018	1.152	1.148	1.090	1.090	0.996
2019	1.098	1.126	1.090	1.090	1.026
2020	1.025	1.123	1.090	1.090	1.096
2021	1.000	1.000	1.090	1.090	1.000

Notes:

- (2) Exhibit 3, Sheet 2 (7)
- (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 2021 / 4
- (12) Exhibit 3, Sheet 3a
- (13) = [1 + (8)] ^ (6)
- (14) = [1 + (9)] ^ (7)
- (15) = [(12) * (14)] / [(11) * (13)]

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Paid Loss Development Factors
TWIA Commercial Property Paid Loss

Accident Year	<u>Months of Development</u>							
	12 (1)	24 (2)	36 (3)	48 (4)	60 (5)	72 (6)	84 (7)	(8)
2012		8,512	11,404	13,135	13,284	13,309	14,460	14,460
2013		6,886	7,243	7,338	7,351	7,351	7,351	7,351
2014		641	875	1,015	1,056	1,056	1,056	1,056
2015		15,923	17,690	17,780	18,644	18,644	18,673	18,673
2016		2,055	2,479	2,584	2,597	2,597	2,597	
2017		1,599	1,963	1,979	1,999	1,999		
2018		165	187	238	251			
2019		807	875	887				
2020		393	595					
2021		561						

Accident Year	<u>Development Factors</u>							
	12 - 24 (1)	24 - 36 (2)	36 - 48 (3)	48 - 60 (4)	60 - 72 (5)	72 - 84 (6)	84 - Ult (7)	(8)
2012		1.340	1.152	1.011	1.002	1.086	1.000	
2013		1.052	1.013	1.002	1.000	1.000	1.000	
2014		1.365	1.160	1.040	1.000	1.000	1.000	
2015		1.111	1.005	1.049	1.000	1.002	1.000	
2016		1.206	1.042	1.005	1.000	1.000		
2017		1.228	1.008	1.010	1.000			
2018		1.133	1.273	1.055				
2019		1.084	1.014					
2020		1.514						

Average		1.226	1.083	1.025	1.000	1.018	1.000	
Avg x hi / lo		1.210	1.065	1.023	1.000	1.001	1.000	
Avg 3 Year		1.244	1.098	1.023	1.000	1.001	1.000	
Avg 5 Year		1.233	1.068	1.032	1.000	1.018	1.000	
Prior		1.200	1.091	1.024	1.004	1.018	1.003	1.000
Selected		1.200	1.087	1.024	1.002	1.018	1.002	1.000
Cumulative		1.366	1.138	1.047	1.022	1.020	1.002	1.000

Notes:

Provided by TWIA, includes commercial and farm
Excludes hurricanes Brett (1999), Claudette (2003), Rita (2005), Humberto (2007), Dolly (2008)
Ike (2008), Harvey (2017), Hanna (2020), Laura (2020), Delta (2020), and Nicholas (2021)

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Premium Trend Analysis

TWIA Commercial Earned Premium at Present Rates

Year / Quarter	Exposure Written	Written Premium	On-Level Factors	Written	Average	Average Written	Exponential Fitted Trends			
				Premium at Present Rates	Written Premium at Present Rates	Premium at Present Rates	Quarter Ending	All-Year	5-Year	4-Year
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
2012 / 1	7,909	24,771,378	1.340	33,196,016	4,197					
2012 / 2	9,232	32,088,566	1.340	43,001,747	4,658					
2012 / 3	10,836	32,876,434	1.340	44,057,566	4,066					
2012 / 4	7,698	24,799,106	1.340	33,233,174	4,317	4,302				
2013 / 1	7,144	24,974,712	1.276	31,874,764	4,462	4,359	4,338			
2013 / 2	9,194	32,706,056	1.276	41,742,136	4,540	4,327	4,350			
2013 / 3	10,002	35,220,808	1.276	44,951,668	4,494	4,460	4,362			
2013 / 4	7,133	24,211,988	1.276	30,901,314	4,332	4,465	4,373			
2014 / 1	6,329	23,028,882	1.216	27,991,750	4,423	4,458	4,385			
2014 / 2	8,964	35,219,745	1.216	42,809,820	4,776	4,522	4,397			
2014 / 3	8,292	29,887,118	1.216	36,327,979	4,381	4,493	4,409			
2014 / 4	6,088	21,627,063	1.216	26,287,830	4,318	4,496	4,420			
2015 / 1	6,464	24,808,373	1.158	28,718,793	4,443	4,500	4,432			
2015 / 2	7,870	33,339,199	1.158	38,594,290	4,904	4,525	4,444			
2015 / 3	7,657	28,055,666	1.158	32,477,940	4,242	4,490	4,456			
2015 / 4	4,802	17,430,504	1.158	20,177,987	4,202	4,478	4,468			
2016 / 1	5,512	22,487,925	1.103	24,792,937	4,498	4,491	4,480			
2016 / 2	6,522	28,623,450	1.103	31,557,354	4,839	4,451	4,492			
2016 / 3	6,507	25,417,054	1.103	28,022,302	4,306	4,479	4,504			
2016 / 4	4,047	14,955,154	1.103	16,488,057	4,074	4,465	4,516			
2017 / 1	4,263	17,482,209	1.103	19,274,135	4,521	4,468	4,528	4,303.80		
2017 / 2	5,717	25,224,489	1.103	27,809,999	4,864	4,461	4,540	4,335.17		
2017 / 3	5,172	19,050,031	1.103	21,002,659	4,061	4,405	4,552	4,366.78		
2017 / 4	3,489	13,077,837	1.103	14,418,315	4,133	4,426	4,564	4,398.61		
2018 / 1	3,663	15,807,970	1.050	16,598,369	4,531	4,425	4,577	4,430.67	4,324.91	
2018 / 2	5,108	22,862,777	1.050	24,005,916	4,700	4,361	4,589	4,462.97	4,367.55	
2018 / 3	4,612	17,927,115	1.050	18,823,471	4,081	4,377	4,601	4,495.51	4,410.61	
2018 / 4	3,109	12,284,401	1.050	12,898,621	4,149	4,386	4,613	4,528.28	4,454.09	
2019 / 1	2,933	14,759,154	1.050	15,497,112	5,284	4,519	4,626	4,561.29	4,498.00	4,490.65
2019 / 2	4,431	20,959,587	1.050	22,007,566	4,967	4,589	4,638	4,594.54	4,542.35	4,536.40
2019 / 3	3,993	14,943,999	1.050	15,691,199	3,930	4,569	4,651	4,628.03	4,587.13	4,582.61
2019 / 4	2,966	12,109,737	1.050	12,715,224	4,287	4,602	4,663	4,661.77	4,632.35	4,629.29
2020 / 1	2,719	14,566,185	1.050	15,294,494	5,625	4,657	4,675	4,695.76	4,678.02	4,676.44
2020 / 2	3,982	18,776,705	1.050	19,715,540	4,951	4,642	4,688	4,729.99	4,724.14	4,724.08
2020 / 3	3,970	15,951,658	1.050	16,749,241	4,219	4,728	4,700	4,764.47	4,770.71	4,772.20
2020 / 4	2,710	13,543,203	1.050	14,220,363	5,247	4,931	4,713	4,799.20	4,817.74	4,820.81
2021 / 1	2,521	12,672,604	1.050	13,306,234	5,278	4,854	4,726	4,834.19	4,865.24	4,869.91
2021 / 2	4,228	20,348,072	1.050	21,365,476	5,053	4,888	4,738	4,869.43	4,913.21	4,919.52
2021 / 3	3,892	16,793,147	1.050	17,632,804	4,531	4,983	4,751	4,904.92	4,961.64	4,969.63
2021 / 4	3,112	16,369,478	1.050	17,187,952	5,523	5,053	4,764	4,940.68	5,010.56	5,020.25
(14) Average Annual Change							1.1%	2.9%	4.0%	4.1%
(15) Correlation Coefficient							49.7%	83.3%	94.0%	92.2%
(16) Selected Premium Trend										3.5%

- Notes:
- (2) Provided by TWIA
 - (3) Provided by TWIA
 - (4) Factor to bring written premium to current rate level
 - (5) = (3) * (4)
 - (6) = (5) / (2)
 - (7) annualized average written premium
 - (8) - (11) fitted to an exponential distribution
 - (14) Fitted average annual change
 - (15) Evaluates the predictability of the fitted curve
 - (16) Selected based on judgment

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Loss Trend Analysis

Summary of Indices and Calculation of Prospective Loss Costs

Calendar Year Ending 12/31/xx	<u>Commercial</u>		<u>Residential</u>		Modified CPI	Weighted Average
	Statewide Boeckh	Coastal Boeckh	Statewide Boeckh	Coastal Boeckh		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
2012	1.330	1.338	1.310	1.321	1.117	1.283
2013	1.304	1.310	1.270	1.278	1.111	1.260
2014	1.268	1.267	1.231	1.230	1.096	1.224
2015	1.247	1.245	1.200	1.201	1.085	1.205
2016	1.252	1.251	1.208	1.209	1.068	1.205
2017	1.224	1.228	1.195	1.195	1.065	1.187
2018	1.175	1.179	1.151	1.150	1.054	1.148
2019	1.157	1.157	1.125	1.115	1.032	1.126
2020	1.142	1.144	1.117	1.112	1.061	1.123
2021	1.000	1.000	1.000	1.000	1.000	1.000

Factors to Adjust For Prospective Loss Costs

(8) Fitted Trend	3.4%	3.5%	3.6%	3.7%	0.7%	3.5%
(9) Cost Factor	1.088	1.089	1.092	1.095	1.018	1.090

Notes:

- (2) = Exhibit 3, Sheet 3b trended forward to 12/31/2021
- (3) = Exhibit 3, Sheet 3c trended forward to 12/31/2021
- (4) = Residential Exhibit 3, Sheet 3b trended forward to 12/31/2021
- (5) = Residential Exhibit 3, Sheet 3c trended forward to 12/31/2021
- (6) = Exhibit 3, Sheet 3d
- (7) = 25% CPI and 75% Boeckh (most appropriate available by year)
- (8) = (2) - (7) fitted to an exponential curve using 5 years' data (where available)
- (9) = [1 + (8)] ^ 2.5 (trended from 7/1/2021 to 1/1/2024)

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Loss Trend Analysis
Boeckh Commercial Construction Index Trend (Statewide)

Calendar Year Ending	Texas	Fitted Trends	
	Statewide Index	All Years Linear	Exponential
(1)	(2)	(3)	(4)
3/31/2012	2240.48		
6/30/2012	2263.10		
9/30/2012	2282.01		
12/31/2012	2298.24		
3/31/2013	2310.88		
6/30/2013	2321.18		
9/30/2013	2332.17		
12/31/2013	2342.58	2307.40	2318.12
3/31/2014	2355.26	2322.55	2331.70
6/30/2014	2373.47	2337.70	2345.35
9/30/2014	2390.56	2352.85	2359.08
12/31/2014	2409.00	2368.00	2372.90
3/31/2015	2427.52	2383.15	2386.79
6/30/2015	2439.22	2398.30	2400.77
9/30/2015	2447.29	2413.45	2414.83
12/31/2015	2450.95	2428.60	2428.97
3/31/2016	2448.94	2443.75	2443.19
6/30/2016	2444.56	2458.90	2457.50
9/30/2016	2440.90	2474.05	2471.89
12/31/2016	2440.56	2489.20	2486.36
3/31/2017	2446.89	2504.35	2500.92
6/30/2017	2460.32	2519.50	2515.57
9/30/2017	2478.57	2534.65	2530.30
12/31/2017	2496.25	2549.80	2545.11
3/31/2018	2515.35	2564.95	2560.02
6/30/2018	2538.61	2580.10	2575.01
9/30/2018	2566.72	2595.25	2590.08
12/31/2018	2599.91	2610.40	2605.25
3/31/2019	2627.77	2625.55	2620.51
6/30/2019	2641.74	2640.70	2635.85
9/30/2019	2644.70	2655.85	2651.29
12/31/2019	2641.83	2671.00	2666.81
3/31/2020	2639.30	2686.15	2682.43
6/30/2020	2643.99	2701.30	2698.13
9/30/2020	2652.72	2716.45	2713.93
12/31/2020	2676.19	2731.60	2729.82
3/31/2021	2711.53	2746.75	2745.81
6/30/2021	2775.76	2761.90	2761.89
9/30/2021	2918.59	2777.05	2778.06
12/31/2021	3055.70	2792.20	2794.33
Annual Trend		2.2%	3.4%
R-Squared		0.833	0.859

Notes:

- (2) = Average Index for Austin, Corpus Christi, Dallas, El Paso, Fort Worth, Houston, Odessa, and San Antonio
- (3) - (4) = (2) fitted to linear and exponential distributions

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Loss Trend Analysis
Boeckh Commercial Construction Index Trend (Coastal)

Calendar Year Ending	Texas	Fitted Trends	
	Coastal Index	All Years Linear	Exponential
(1)	(2)	(3)	(4)
3/31/2010			
6/30/2010			
9/30/2010			
12/31/2010			
3/31/2011			
6/30/2011			
9/30/2011			
12/31/2011	2220.60	2239.22	2252.35
3/31/2012	2252.16	2253.86	2265.29
6/30/2012	2277.36	2268.50	2278.29
9/30/2012	2299.43	2283.14	2291.37
12/31/2012	2320.37	2297.78	2304.53
3/31/2013	2337.98	2312.43	2317.76
6/30/2013	2349.49	2327.07	2331.07
9/30/2013	2359.78	2341.71	2344.46
12/31/2013	2370.49	2356.35	2357.92
3/31/2014	2388.19	2370.99	2371.46
6/30/2014	2411.34	2385.64	2385.07
9/30/2014	2431.12	2400.28	2398.77
12/31/2014	2450.88	2414.92	2412.54
3/31/2015	2465.88	2429.56	2426.39
6/30/2015	2477.55	2444.20	2440.32
9/30/2015	2486.84	2458.85	2454.34
12/31/2015	2492.85	2473.49	2468.43
3/31/2016	2493.63	2488.13	2482.60
6/30/2016	2490.89	2502.77	2496.86
9/30/2016	2485.91	2517.41	2511.19
12/31/2016	2482.14	2532.06	2525.61
3/31/2017	2484.26	2546.70	2540.11
6/30/2017	2494.82	2561.34	2554.70
9/30/2017	2509.93	2575.98	2569.36
12/31/2017	2528.31	2590.62	2584.12
3/31/2018	2547.16	2605.27	2598.95
6/30/2018	2569.79	2619.91	2613.88
9/30/2018	2597.57	2634.55	2628.89
12/31/2018	2632.34	2649.19	2643.98
3/31/2019	2664.51	2663.83	2659.16
6/30/2019	2680.28	2678.48	2674.43
9/30/2019	2686.96	2693.12	2689.79
12/31/2019	2682.59	2707.76	2705.23
3/31/2020	2677.51	2722.40	2720.76
6/30/2020	2680.49	2737.04	2736.38
9/30/2020	2689.00	2751.69	2752.10
12/31/2020	2713.08	2766.33	2767.90
3/31/2021	2750.06	2780.97	2783.79
6/30/2021	2818.86	2795.61	2799.77
9/30/2021	2957.69	2810.26	2815.85
12/31/2021	3104.22	2824.90	2832.02
Annual Trend		2.1%	3.5%
R-Squared		0.890	0.913

Notes:
(2) = Average Index for Corpus Christi and Houston
(3) - (4) = (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)
9/30/2011	180.52	182.36	182.49						
12/31/2011	181.55	182.82	182.94						
3/31/2012	182.78	183.29	183.38						
6/30/2012	183.87	183.76	183.83						
9/30/2012	184.57	184.22	184.28						
12/31/2012	185.03	184.69	184.73						
3/31/2013	185.38	185.16	185.18						
6/30/2013	185.51	185.62	185.63						
9/30/2013	185.82	186.09	186.08						
12/31/2013	186.03	186.56	186.54						
3/31/2014	186.43	187.02	186.99						
6/30/2014	186.87	187.49	187.45						
9/30/2014	187.59	187.96	187.90						
12/31/2014	188.62	188.42	188.36						
3/31/2015	189.46	188.89	188.82						
6/30/2015	189.59	189.36	189.28						
9/30/2015	190.03	189.82	189.74						
12/31/2015	190.50	190.29	190.21						
3/31/2016	190.95	190.76	190.67						
6/30/2016	192.03	191.23	191.13						
9/30/2016	192.82	191.69	191.60						
12/31/2016	193.56	192.16	192.07						
3/31/2017	193.85	192.63	192.54	193.69	193.72				
6/30/2017	194.07	193.09	193.01	194.04	194.07				
9/30/2017	194.14	193.56	193.48	194.40	194.42				
12/31/2017	194.10	194.03	193.95	194.76	194.76				
3/31/2018	194.71	194.49	194.42	195.11	195.11	195.29	195.31		
6/30/2018	195.27	194.96	194.90	195.47	195.46	195.63	195.64		
9/30/2018	195.59	195.43	195.37	195.82	195.81	195.97	195.97		
12/31/2018	196.20	195.89	195.85	196.18	196.16	196.30	196.31		
3/31/2019	197.06	196.36	196.32	196.53	196.52	196.64	196.64	197.22	197.24
6/30/2019	198.22	196.83	196.80	196.89	196.87	196.98	196.97	197.48	197.49
9/30/2019	199.74	197.29	197.28	197.25	197.22	197.32	197.30	197.73	197.73
12/31/2019	200.26	197.76	197.76	197.60	197.57	197.66	197.63	197.98	197.98
3/31/2020	199.74	198.23	198.25	197.96	197.93	197.99	197.97	198.24	198.23
6/30/2020	197.71	198.69	198.73	198.31	198.28	198.33	198.30	198.49	198.47
9/30/2020	195.95	199.16	199.21	198.67	198.64	198.67	198.64	198.75	198.72
12/31/2020	194.81	199.63	199.70	199.02	198.99	199.01	198.97	199.00	198.96
3/31/2021	194.38	200.10	200.19	199.38	199.35	199.35	199.31	199.26	199.21
6/30/2021	197.57	200.56	200.68	199.74	199.71	199.69	199.65	199.51	199.46
9/30/2021	201.27	201.03	201.17	200.09	200.06	200.02	199.98	199.76	199.71
12/31/2021	206.73	201.50	201.66	200.45	200.42	200.36	200.32	200.02	199.96
Annual Trend		0.9%	1.0%	0.7%	0.7%	0.7%	0.7%	0.5%	0.5%
R-Squared		0.909	0.912	0.422	0.424	0.253	0.252	0.076	0.072

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 LAE factor Using TWIA Commercial + Residential Experience

Accident Year	Projected Ultimate Loss	Projected Ultimate LAE	Ultimate LAE to Loss Ratio	Hurricane Indicator
(1)	(2)	(3)	(4)	(5)
1980	12,911	1,318	0.102	H
1981	2,512	543	0.216	
1982	796	565	0.710	
1983	148,999	9,127	0.061	H
1984	999	324	0.324	
1985	512	297	0.580	
1986	881	505	0.573	H
1987	1,897	1,056	0.557	
1988	1,160	357	0.308	
1989	12,296	3,528	0.287	H
1990	335	225	0.672	
1991	1,217	729	0.599	
1992	489	554	1.133	
1993	3,375	1,375	0.407	
1994	679	507	0.747	
1995	2,977	903	0.303	
1996	1,166	582	0.499	
1997	2,964	1,343	0.453	
1998	22,401	4,732	0.211	
1999	8,773	2,388	0.272	H
2000	6,227	1,885	0.303	
2001	24,605	1,880	0.076	
2002	5,167	5,226	1.011	
2003	155,001	5,122	0.033	H
2004	5,167	1,471	0.285	
2005	154,981	20,235	0.131	H
2006	4,276	1,110	0.260	
2007	15,745	4,941	0.314	H
2008	2,583,017	346,615	0.134	H
2009	10,407	2,219	0.213	
2010	18,005	4,274	0.237	
2011	96,073	15,108	0.157	
2012	67,492	15,833	0.235	
2013	70,874	13,839	0.195	
2014	7,012	6,825	0.973	
2015	138,780	39,990	0.288	
2016	28,428	15,398	0.542	
2017	1,420,232	281,401	0.198	H
2018	11,936	6,663	0.558	
2019	17,307	9,357	0.541	
2020	63,200	28,028	0.443	H
2021	60,359	22,171	0.367	H
All Years Total	5,191,630	880,549	0.170	
Hurricane Years Total	4,636,395	725,379	0.156	
Non-Hurricane Years				
Total	555,235	155,170	0.279	
10 Year	466,314	129,506	0.278	

Notes:

- (2) Exhibit 4, Sheet 2
- (3) Exhibit 4, Sheet 4
- (4) = (3) / (2)
- (5) "H" indicates hurricane year

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

Exhibit 4
Sheet 2

Ultimate Loss (TWIA All Lines)
\$000 Omitted

Accident Year	Incurred Loss at 12/31/21	Development Factor	Indicated Ultimate Loss
(1)	(2)	(3)	(4)
1980			12911
1981			2,512
1982			796
1983			148,999
1984			999
1985			512
1986			881
1987			1,897
1988			1,160
1989			12,296
1990			335
1991			1,217
1992			489
1993			3,375
1994			679
1995			2,977
1996			1,166
1997			2,964
1998			22,401
1999			8,773
2000			6,227
2001			24,605
2002			5,167
2003			155,001
2004			5,167
2005			154,981
2006			4,276
2007			15,745
2008			2,583,017
2009			10,407
2010			18,005
2011			96,073
2012	67,492	1.000	67,492
2013	70,874	1.000	70,874
2014	7,012	1.000	7,012
2015	138,780	1.000	138,780
2016	28,456	0.999	28,428
2017	1,421,854	0.999	1,420,232
2018	12,069	0.989	11,936
2019	17,624	0.982	17,307
2020	64,821	0.975	63,200
2021	61,907	0.975	60,359

Notes:

- (2) Exhibit 4, Sheet 3
- (3) Exhibit 4, Sheet 3
- (4) 2012 - 2021: (2) * (3); 1980 - 2011: from prior TWIA annual statements

Texas Windstorm Insurance Association

Commercial Property - Wind & Hail

Rate Level Review

Incurred Loss Development Factors

TWIA Schedule P Incurred Loss (Including IBNR)

Accident Year	<u>Months of Development</u>							
	12 (1)	24 (2)	36 (3)	48 (4)	60 (5)	72 (6)	84 (7)	(8)
2012		62,722	69,764	67,287	66,724	66,328	67,658	67,492
2013		77,204	75,204	72,860	71,823	71,286	71,068	70,874
2014		6,739	7,854	7,298	7,261	7,068	7,012	7,012
2015		147,927	139,955	140,459	139,777	138,801	138,733	138,780
2016		31,292	29,612	28,908	28,523	28,457	28,456	
2017		1,278,467	1,373,877	1,445,588	1,447,150	1,421,854		
2018		13,197	12,326	12,193	12,069			
2019		18,155	17,949	17,624				
2020		87,095	64,821					
2021		61,907						

Accident Year	<u>Development Factors</u>							
	12 - 24 (1)	24 - 36 (2)	36 - 48 (3)	48 - 60 (4)	60 - 72 (5)	72 - 84 (6)	84 - Ult (7)	(8)
2012		1.112	0.964	0.992	0.994	1.020	0.998	
2013		0.974	0.969	0.986	0.993	0.997	0.997	
2014		1.165	0.929	0.995	0.973	0.992	1.000	
2015		0.946	1.004	0.995	0.993	1.000	1.000	
2016		0.946	0.976	0.987	0.998	1.000		
2017		1.075	1.052	1.001	0.983			
2018		0.934	0.989	0.990				
2019		0.989	0.982					
2020		0.744						
Average		0.987	0.983	0.992	0.989	1.002	0.999	
Avg x hi / lo		0.997	0.981	0.992	0.991	0.999	0.999	
Avg 3 Year		0.889	1.008	0.993	0.991	0.997	0.999	
Avg 5 Year		0.938	1.001	0.994	0.988	1.002	0.999	
Prior		1.005	0.991	0.993	0.990	0.999	0.998	1.000
Selected		1.000	0.993	0.993	0.990	1.000	0.999	1.000
Cumulative		0.975	0.975	0.982	0.989	0.999	0.999	1.000

Texas Windstorm Insurance Association
Commercial Property - Wind & Hail
Rate Level Review
Ultimate LAE (TWIA All Lines)

Accident Year	Incurred DCC at 12/31/21	Development Factor	Indicated Ultimate DCC	Incurred AAO	Incurred LAE
(1)	(2)	(3)	(4)	(5)	(6)
1980					1318
1981					543
1982					565
1983					9,127
1984					324
1985					297
1986				270	505
1987				652	1,056
1988				235	357
1989				2,727	3,528
1990				119	225
1991				403	729
1992				270	554
1993				806	1,375
1994				192	507
1995				698	903
1996				355	582
1997				892	1,343
1998				3,920	4,732
1999				1,757	2,388
2000				1,209	1,885
2001				1,207	1,880
2002				3,643	5,226
2003				3,239	5,122
2004				844	1,471
2005				15,229	20,235
2006				860	1,110
2007				2,489	4,941
2008	99,668	1.000	99,668	246,947	346,615
2009	223	1.000	223	1,996	2,219
2010	323	1.000	323	3,951	4,274
2011	725	1.000	725	14,383	15,108
2012	869	1.000	869	14,964	15,833
2013	901	1.000	901	12,938	13,839
2014	1,028	1.000	1,028	5,797	6,825
2015	2,847	1.000	2,847	37,143	39,990
2016	524	0.980	514	14,884	15,398
2017	17,745	0.957	16,982	264,419	281,401
2018	319	0.920	293	6,370	6,663
2019	706	0.930	657	8,700	9,357
2020	1,654	1.142	1,889	26,139	28,028
2021	776	1.713	1,329	20,842	22,171

Notes:

- (2) Exhibit 4, Sheet 5
- (3) Exhibit 4, Sheet 5
- (4) 2008 - 2021: (2) * (3); 1986 - 2007: from TWIA's annual statements
- (5) From TWIA's annual statements
- (6) 1986 - 2021: (4) + (5); prior years from prior TWIA annual statements

Texas Windstorm Insurance Association

Commercial Property - Wind & Hail

Rate Level Review

Incurred ALAE Development Factors

TWIA Schedule P Incurred DCC (Including IBNR)

Accident Year	<u>Months of Development</u>							
	12 (1)	24 (2)	36 (3)	48 (4)	60 (5)	72 (6)	84 (7)	(8)
2011		515	592	609	682	629	745	725
2012		516	679	719	632	917	880	869
2013		802	806	715	1,089	991	971	901
2014		516	493	1,085	1,266	1,077	1,028	1,028
2015		973	1,818	2,355	2,749	2,944	2,838	2,847
2016		412	678	746	571	542	524	
2017		891	16,490	21,865	21,700	17,745		
2018		301	361	352	319			
2019		48	471	706				
2020		295	1,654					
2021		776						

Accident Year	<u>Development Factors</u>							
	12 - 24 (1)	24 - 36 (2)	36 - 48 (3)	48 - 60 (4)	60 - 72 (5)	72 - 84 (6)	84 - Ult (7)	(8)
2011		1.150	1.029	1.120	0.922	1.184	0.973	
2012		1.316	1.059	0.879	1.451	0.960	0.988	
2013		1.005	0.887	1.523	0.910	0.980	0.928	
2014		0.955	2.201	1.167	0.851	0.955	1.000	
2015		1.868	1.295	1.167	1.071	0.964	1.003	
2016		1.646	1.100	0.765	0.949	0.967		
2017		18.507	1.326	0.992	0.818			
2018		1.199	0.975	0.906				
2019		9.813	1.499					
2020		5.607						
Average		4.31	1.26	1.07	1.00	1.00	0.98	
Avg x hi / lo		2.95	1.18	1.04	0.94	0.97	0.99	
Avg 3 Year		5.54	1.27	0.89	0.95	0.96	0.98	
Avg 5 Year		7.35	1.24	1.00	0.92	0.96	0.98	
Prior		1.50	1.19	1.06	1.01	0.99	0.98	1.00
Selected		1.50	1.23	1.01	0.96	0.98	0.98	1.00
Cumulative		1.71	1.14	0.93	0.92	0.96	0.98	1.00

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

Basis for Hurricane Loss Ratio	Indicated Loss Ratio (1)	LAE Factor (3)	Indicated Loss & LAE Ratio (4)
Industry Experience	42.1%	0.156	48.7%
<u>Hurricane Models</u>			
AIR Model	59.6%	0.156	68.9%
RMS Model	54.8%	0.156	63.3%
IF Model	33.7%	0.156	39.0%
CoreLogic RQE Model	36.4%	0.156	42.1%
Average of Models	46.1%	0.156	53.3%

Notes:

(2) Exhibit 6, Sheet 1 & Exhibit 7, Sheet 1 - Sheet 4

(3) Exhibit 4, Sheet 1

(4) = (2) * [1 + (3)]

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

Industry Experience -- Commercial Extended Coverage
1970 - 2021 -- Hurricane Years Only

Accident Year	Earned Premium at Current TWIA Rate Level (1)	Number of Hurricanes During the Year (2)	Hurricane Year Incurred Loss Ratio (3)	Per Hurricane Loss Ratio (4)	Net Trend Factor (5)
1970	53,332,058	1	43.3%	33.6%	
1971	57,612,751	1	97.0%	87.3%	
1980	64,012,158	1	60.0%	50.3%	
1983	37,553,182	1	405.2%	395.5%	
1986	48,392,653	1	7.9%	0.0%	
1989	76,691,720	2	7.1%	0.0%	
1999	175,855,164	1	7.9%	0.0%	
2003	200,738,407	1	20.7%	11.0%	
2005	265,866,745	1	155.7%	146.0%	
2007	345,796,968	1	15.1%	5.4%	1.51
2008	313,442,675	2	444.2%	217.3%	1.46
2017	211,377,127	1	470.2%	460.5%	1.04
2020	204,135,345	3	9.4%	0.0%	1.10
2021	212,079,062	1	14.8%	5.1%	1.00
Simple Average Loss Ratio Per Hurricane Year			125.6%	100.9%	
(5) Derived from current and previous year's Exhibit 2, Sheet 5					
(6) Selected Non-Hurricane Loss Ratio			9.7%		
(7) a Average Hurricane Loss Ratio Per Hurricane			100.9%		
(7) b Selected Avg Hurricane Loss Ratio Per Hurricane			100.9%		
(8) Historical Hurricane Frequency					
(a) 52.0-Year (1/1/1970 - 12/31/2021)			0.346 (1 Hurricane Every 2.9 years)		
(b) 171-Year (1/1/1851 - 12/31/2021)			0.398 (1 Hurricane Every 2.5 years)		
Selected Frequency			0.398 (1 Hurricane Every 2.5 years)		
(9) Indicated Hurricane Loss Ratio			40.1%		
(10) Inflation Adjusted Indicated Hurricane Loss Ratio			42.1%		

Notes:

- (1) Exhibit 6, Sheet 2. 1999 year ending 12/31/99; all other accident years ending 9/30/xx
- (3) Exhibit 6, Sheet 2. 1999 year ending 12/31/99; all other accident years ending 9/30/xx
- (4) = MAX((3)-(5),0)/(2)
- (6) Exhibit 6, Sheet 2
- (7) a = Average of (4)
- (7) b = Selected
- (8) Exhibit 9
- (9) = (7) b * (8) Selected
- (10) = (9)*Selected Net Trending Factor of 1.05, 1.05 is judgemently selected based on Net Trend Factor(5)

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

Industry Experience -- Commercial Extended Coverage
1970 - 2021

Accident Year	Earned Premium	Earned Premium at 1992 CMR	Earned Premium at Current Rates	Incurred Losses	Incurred Loss Ratio	Hurricane Indicator
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1970	10,874,210	18,835,352	53,332,058	23,092,142	43.3%	H
1971	13,340,143	20,347,170	57,612,751	55,893,676	97.0%	H
1972	18,906,678	24,314,307	68,845,649	8,704,522	12.6%	
1973	21,737,541	23,257,532	65,853,404	3,837,493	5.8%	
1974	22,348,193	22,844,661	64,684,365	2,193,087	3.4%	
1975	24,396,629	24,958,305	70,669,121	3,943,412	5.6%	
1976	26,795,934	24,109,943	68,266,995	2,218,115	3.2%	
1977	30,910,821	27,119,226	76,787,741	1,898,346	2.5%	
1978	32,709,599	26,415,338	74,794,691	2,535,872	3.4%	
1979	31,306,685	24,514,306	69,411,943	4,535,147	6.5%	
1980	28,751,765	22,607,257	64,012,158	38,431,071	60.0%	H
1981	24,129,384	21,398,588	60,589,828	4,272,728	7.1%	
1982	18,505,004	17,523,231	49,616,804		3.4%	
1983	12,680,397	13,262,706	37,553,182		405.2%	H
1984	12,736,031	14,992,627	42,451,431		8.2%	
1985	15,169,575	16,422,895	46,501,216		4.0%	
1986	21,130,682	17,090,896	48,392,653		7.9%	H
1987	31,114,529	26,771,157	75,802,188		1.4%	
1988	25,065,531	24,117,319	68,287,879		9.1%	
1989	24,167,085	27,085,314	76,691,720		7.1%	H
1990	19,677,404	23,041,233	65,240,956		107.9%	
1991	21,794,680	25,534,881	72,301,688		54.0%	
1992	23,737,753	26,950,473	76,309,919		1.4%	
1993	21,990,182		71,537,276		6.2%	
1994	16,604,950		54,018,329		7.7%	
1995	32,374,229		105,318,098		18.3%	
1996	55,367,089		180,117,233		2.3%	
1997	53,196,024		173,054,441		3.7%	
1998	53,986,058		178,299,022		14.9%	
1999	52,435,243		175,855,164		7.9%	H
2000	41,739,697		133,956,823		6.4%	
2001	42,330,042		127,689,113		5.5%	
2002	69,156,402		199,609,188		13.9%	
2003	78,368,305		200,738,407		20.7%	H
2004	112,957,791		276,540,371		1.9%	
2005	119,598,806		265,866,745		155.7%	H
2006	148,019,940		299,356,477		2.1%	
2007	186,207,969		345,796,968		15.1%	H
2008	177,673,659		313,442,675		444.2%	H
2009	185,204,697		296,283,945		2.6%	
2010	193,721,394		286,320,340		3.7%	
2011	192,278,480		277,463,924		14.6%	
2012	209,676,871		287,748,652		17.8%	
2013	230,742,247		301,713,881		6.8%	
2014	241,198,767		300,709,919		1.4%	
2015	233,987,819		277,585,690		13.4%	
2016	217,429,417		245,627,038		3.6%	
2017	191,725,285		211,377,127		470.2%	H
2018	192,510,517		207,054,923		1.4%	
2019	189,806,187		199,296,497		3.2%	
2020	194,414,614		204,135,345		9.4%	H
2021	201,980,059		212,079,062		14.8%	H
Total / Average	4,448,668,993		7,862,603,014		41.3%	
Average of Non-Hurricane Years					10.3%	
Average of Non-Hurricane Years Excluding 1991					9.1%	
Selected					9.7%	

Notes: (2) Provided by TDI. 1983 - 1995 are year ending 9/30/xx as of 12/31/99; 1996 - 2021 are year ending 12/31/xx as of 12/31/21
(3) Provided by TDI (1992 MR = 1992 manual rates)
(4) 1993 - 2021: Sum of Exhibit 6, Sheet 4 - 7, (5); 1970 - 1992: (3) * 2.831,1992 on-level factor to bring industry premium to TWIA curr't rate lvl
(5) Provided by TDI. 1970 - 1982 are year ending 9/30/xx as of 12/31/99; 1983 - 2021 are year ending 12/31/xx as of 12/31/21
(6) 1983 - 2021: Exhibit 6, Sheet 3; 1970 - 1982: (5) / (4)
(7) "H" indicates occurrence of hurricane(s) during the time period (years ending 12/31/xx)

Accident Year (1)	<u>Loss Ratios by Territory / Tier</u>				Weighted Loss Ratio (6)	Devel't Wtd Loss Ratio (7)
	Territory 8 (2)	Territory 9 (3)	Territory 10 (4)	Tier 2 (5)		
1983	961.4%	4.1%	44.7%	161.1%	405.2%	405.2%
1984	8.2%	4.1%	10.6%	15.4%	8.2%	8.2%
1985	4.0%	2.7%	4.7%	8.6%	4.0%	4.0%
1986	3.2%	1.1%	17.4%	13.6%	7.9%	7.9%
1987	0.5%	1.8%	2.2%	3.3%	1.4%	1.4%
1988	12.6%	3.7%	8.8%	5.2%	9.1%	9.1%
1989	14.6%	1.9%	2.1%	5.9%	7.1%	7.1%
1990	257.7%	2.7%	9.7%	7.4%	107.9%	107.9%
1991	23.3%	23.0%	109.3%	5.0%	54.0%	54.0%
1992	0.8%	1.1%	2.3%	4.1%	1.4%	1.4%
1993	12.9%	1.7%	1.7%	5.4%	6.2%	6.2%
1994	0.3%	3.5%	18.7%	7.5%	7.7%	7.7%
1995	7.4%	9.8%	35.8%	19.6%	18.3%	18.3%
1996	1.4%	2.7%	3.0%	6.3%	2.3%	2.3%
1997	5.0%	1.9%	3.4%	8.6%	3.7%	3.7%
1998	19.7%	13.1%	10.9%	8.6%	14.9%	14.9%
1999	2.6%	12.0%	11.1%	8.5%	7.9%	7.9%
2000	2.0%	1.9%	13.2%	56.1%	6.4%	6.4%
2001	6.7%	3.0%	5.4%	27.3%	5.5%	5.5%
2002	11.1%	29.8%	6.8%	9.2%	13.9%	13.9%
2003	2.4%	8.3%	48.9%	31.0%	20.7%	20.7%
2004	2.7%	0.6%	1.9%	3.0%	1.9%	1.9%
2005	63.4%	1.6%	359.9%	48.4%	155.7%	155.7%
2006	2.2%	1.0%	2.5%	5.6%	2.1%	2.1%
2007	1.5%	53.8%	5.6%	9.4%	15.1%	15.1%
2008	665.8%	34.6%	458.8%	465.7%	444.2%	444.2%
2009	2.4%	4.5%	1.5%	9.2%	2.6%	2.6%
2010	1.4%	4.4%	5.8%	3.2%	3.7%	3.7%
2011	3.7%	28.8%	17.7%	18.4%	14.6%	14.6%
2012	18.0%	22.9%	14.5%	10.0%	17.8%	17.8%
2013	13.5%	4.0%	1.1%	6.8%	6.8%	6.8%
2014	0.5%	3.2%	1.2%	4.3%	1.4%	1.4%
2015	11.5%	4.1%	21.5%	13.3%	13.4%	13.4%
2016	0.8%	7.5%	3.6%	30.1%	3.6%	3.6%
2017	75.3%	1174.8%	440.9%	123.5%	461.0%	470.2%
2018	0.6%	2.1%	1.7%	13.8%	1.4%	1.4%
2019	1.0%	0.8%	6.6%	16.9%	3.1%	3.2%
2020	2.5%	7.7%	14.8%	24.8%	8.3%	9.4%
2021	20.5%	0.6%	6.2%	21.1%	10.8%	14.8%
Average	57.6%	38.2%	44.5%	31.9%	48.2%	48.6%

TWIA 2021 Written Premium by Territory / Tier

	Territory 8	Territory 9	Territory 10	Tier 2	Total
(8) Amount	25,507,925	14,629,813	22,788,096	427,664	63,353,498
(9) % Share	40.26%	23.09%	35.97%	0.68%	100.00%

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) * loss development factors from Exhibit 2.2
- (8) Provided by TWIA

Texas Windstorm Insurance Association

Commercial Property - Wind & Hail

Rate Level Review

Industry Experience -- Commercial Extended Coverage

Tier 1 -- Territory 8 (Galveston County)

Accident Year	Earned Premium	Earned Premium at 1992 MR	TWIA Factor to Current Rate Level	Earned Premium at Current Rates	Incurred Loss	Incurred Loss Ratio
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1983	913,865	968,224	3.829	2,741,514	26,357,425	961.4%
1984	1,195,339	1,366,667	3.511	3,869,700	318,455	8.2%
1985	2,581,481	2,777,593	2.879	7,864,719	314,878	4.0%
1986	3,013,362	2,349,181	2.050	6,651,676	211,282	3.2%
1987	3,004,153	2,585,122	1.994	7,319,740	37,480	0.5%
1988	2,905,355	2,728,206	2.147	7,724,880	969,836	12.6%
1989	2,825,114	3,015,974	2.385	8,539,692	1,244,199	14.6%
1990	2,303,321	2,474,141	2.506	7,005,499	18,053,460	257.7%
1991	2,203,500	2,080,579	2.491	5,891,133	1,371,244	23.3%
1992	2,352,391	2,012,473	2.831	5,698,292	46,331	0.8%
1993	2,406,016		3.253	7,827,122	1,005,945	12.9%
1994	2,807,090		3.253	9,131,874	28,034	0.3%
1995	2,645,757		3.253	8,607,034	635,625	7.4%
1996	5,519,716		3.253	17,956,443	249,644	1.4%
1997	5,461,636		3.253	17,767,500	886,485	5.0%
1998	6,133,105		3.303	20,255,723	3,994,564	19.7%
1999	6,706,028		3.354	22,490,401	575,316	2.6%
2000	4,997,201		3.209	16,037,710	320,131	2.0%
2001	4,785,262		3.017	14,434,804	962,576	6.7%
2002	8,206,069		2.886	23,685,541	2,632,325	11.1%
2003	8,793,047		2.561	22,523,165	529,845	2.4%
2004	12,425,339		2.448	30,419,397	830,387	2.7%
2005	13,839,253		2.220	30,718,239	19,469,845	63.4%
2006	18,414,310		2.037	37,507,901	812,370	2.2%
2007	24,924,710		1.857	46,286,360	710,669	1.5%
2008	24,970,117		1.764	44,050,988	293,310,706	665.8%
2009	29,363,002		1.600	46,973,895	1,140,669	2.4%
2010	31,708,901		1.478	46,865,775	669,882	1.4%
2011	31,323,614		1.443	45,200,965	1,675,264	3.7%
2012	35,165,008		1.372	48,258,464	8,709,842	18.0%
2013	37,721,541		1.308	49,323,922	6,670,061	13.5%
2014	38,347,909		1.247	47,809,517	258,179	0.5%
2015	36,871,345		1.186	43,741,413	5,027,267	11.5%
2016	36,247,209		1.130	40,947,976	331,694	0.8%
2017	32,655,375		1.102	36,002,551	27,118,596	75.3%
2018	33,240,042		1.076	35,751,368	205,785	0.6%
2019	33,678,612		1.050	35,362,543	369,052	1.0%
2020	34,538,651		1.050	36,265,584	903,909	2.5%
2021	35,129,887		1.050	36,886,381	7,574,126	20.5%
Total	622,323,633			982,397,400	436,533,383	44.4%

Notes:

(2) Provided by TDI. 1983 - 1995 are year ending 9/30/xx as of 12/31/99; 1996 - 2020 are year ending 12/31/xx as of 12/31/21

(3) Provided by TDI (1992 MR = 1992 manual rates)

(4) Represents 8/1/80 through 6/30/22 rate changes for TWIA; factors assume uniform earning of written premium and that TWIA premium represents 82.5% of industry data in Tier 1 -- Territory 8

(5) = (3) * 2.831 for 1983 - 1992; (2) * (4) for 1993 - 2021

(6) Provided by TDI. 1983 - 1995 are year ending 9/30/xx as of 12/31/99; 1996 - 2011 are year ending 12/31/xx as of 12/31/19
2011 - 2021 are year ending 12/31/xx as of 12/31/2021; 2008 IKE incurred loss was adjusted down by \$99,433,917

(7) = (6) / (5)

Texas Windstorm Insurance Association

Commercial Property - Wind & Hail

Rate Level Review

Industry Experience -- Commercial Extended Coverage

Tier 1 -- Territory 9 (Nueces County)

Accident Year	Earned Premium	Earned Premium at 1992 MR	TWIA Factor to Current Rate Level	Earned Premium at Current Rates	Incurred Loss	Incurred Loss Ratio
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1983	745,985	820,826	3.829	2,324,158	96,051	4.1%
1984	558,639	652,809	3.511	1,848,420	76,481	4.1%
1985	1,235,059	1,383,103	2.879	3,916,238	106,148	2.7%
1986	2,228,911	1,849,840	2.050	5,237,798	56,387	1.1%
1987	2,381,538	2,086,940	1.994	5,909,144	105,275	1.8%
1988	1,796,653	1,719,227	2.147	4,867,969	181,414	3.7%
1989	1,632,453	1,826,430	2.385	5,171,513	98,116	1.9%
1990	1,429,526	1,769,972	2.506	5,011,653	135,678	2.7%
1991	1,390,109	1,555,310	2.491	4,403,840	1,013,636	23.0%
1992	1,571,433	1,629,721	2.831	4,614,534	49,512	1.1%
1993	1,587,772		3.253	5,165,254	86,000	1.7%
1994	2,203,514		3.253	7,168,353	254,088	3.5%
1995	2,669,951		3.253	8,685,741	854,753	9.8%
1996	5,639,923		3.253	18,347,494	502,177	2.7%
1997	3,183,758		3.253	10,357,230	199,390	1.9%
1998	3,613,310		3.303	11,933,630	1,561,275	13.1%
1999	6,808,428		3.354	22,833,826	2,735,082	12.0%
2000	5,167,158		3.209	16,583,160	317,804	1.9%
2001	4,763,324		3.017	14,368,628	431,244	3.0%
2002	8,479,915		2.886	24,475,954	7,300,265	29.8%
2003	9,934,549		2.561	25,447,093	2,122,879	8.3%
2004	14,597,450		2.448	35,737,103	212,644	0.6%
2005	16,137,249		2.220	35,818,976	566,758	1.6%
2006	21,249,313		2.037	43,282,487	434,362	1.0%
2007	27,752,523		1.857	51,537,742	27,752,523	53.8%
2008	27,990,909		1.764	49,380,113	17,103,924	34.6%
2009	29,085,395		1.600	46,529,790	2,074,340	4.5%
2010	27,439,364		1.478	40,555,397	1,768,194	4.4%
2011	25,580,489		1.443	36,913,454	10,619,019	28.8%
2012	26,761,300		1.372	36,725,691	8,409,391	22.9%
2013	28,282,799		1.308	36,982,014	1,473,375	4.0%
2014	28,212,101		1.247	35,172,894	1,127,998	3.2%
2015	26,761,199		1.186	31,747,490	1,289,267	4.1%
2016	22,844,695		1.130	25,807,339	1,944,840	7.5%
2017	19,434,555		1.102	21,426,597	251,709,466	1174.8%
2018	18,783,125		1.076	20,202,213	425,147	2.1%
2019	16,953,738		1.050	17,801,425	147,300	0.8%
2020	16,723,739		1.050	17,559,926	1,347,750	7.7%
2021	17,804,798		1.050	18,695,038	107,660	0.6%
Total	481,416,649			810,547,319	346,797,613	42.8%

Notes:

(2) Provided by TDI. 1983 - 1995 are year ending 9/30/xx as of 12/31/99; 1996 - 2020 are year ending 1/0/xx as of 12/31/21

(3) Provided by TDI (1992 MR = 1992 manual rates)

(4) Represents 8/1/80 through 6/30/22 rate changes for TWIA; factors assume uniform earning of written premium and that TWIA premium represents 84.3% of industry data in Tier 1 -- Territory 9

(5) = (3) * (4) for 1983 - 1992; (2) * (4) for 1993 - 2021

(6) Provided by TDI. 1983 - 1995 are year ending 9/30/xx as of 12/31/99; 1996 - 2011 are year ending 12/31/xx as of 12/31/19
2012 - 2021 are year ending 12/31/xx as of 12/31/2021

(7) = (6) / (5)

Texas Windstorm Insurance Association

Commercial Property - Wind & Hail

Rate Level Review

Industry Experience -- Commercial Extended Coverage

Tier 1 -- Territory 10 (Other Tier 1)

Accident Year	Earned Premium	Earned Premium at 1992 MR	TWIA Factor to Current Rate Level	Earned Premium at Current Rates	Incurred Loss	Incurred Loss Ratio
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1983	3,769,988	4,139,464	3.829	11,720,839	5,242,728	44.7%
1984	4,835,650	5,883,059	3.511	16,657,806	1,759,233	10.6%
1985	3,637,366	3,997,227	2.879	11,318,097	534,724	4.7%
1986	4,787,352	3,948,102	2.050	11,179,000	1,943,819	17.4%
1987	5,996,981	5,352,970	1.994	15,156,866	338,938	2.2%
1988	5,872,305	5,768,621	2.147	16,333,776	1,442,599	8.8%
1989	5,125,436	5,918,163	2.385	16,757,203	349,413	2.1%
1990	3,842,130	4,624,825	2.506	13,095,133	1,263,817	9.7%
1991	4,253,902	4,765,878	2.491	13,494,522	14,752,702	109.3%
1992	4,034,147	4,187,015	2.831	11,855,479	276,158	2.3%
1993	4,540,606		3.253	14,771,255	245,603	1.7%
1994	5,145,260		3.253	16,738,283	3,130,886	18.7%
1995	9,324,050		3.253	30,332,497	10,852,486	35.8%
1996	15,331,047		3.253	49,874,137	1,478,175	3.0%
1997	17,116,368		3.253	55,682,047	1,911,482	3.4%
1998	17,623,413		3.303	58,204,607	6,340,723	10.9%
1999	15,019,386		3.354	50,371,400	5,614,569	11.1%
2000	11,756,138		3.209	37,729,428	4,969,254	13.2%
2001	11,140,104		3.017	33,604,266	1,824,700	5.4%
2002	20,528,832		2.886	59,253,278	4,053,342	6.8%
2003	23,885,668		2.561	61,182,527	29,908,218	48.9%
2004	31,412,192		2.448	76,902,524	1,462,655	1.9%
2005	34,104,704		2.220	75,700,360	272,418,664	359.9%
2006	46,246,638		2.037	94,199,258	2,315,133	2.5%
2007	71,922,575		1.857	133,563,609	7,479,422	5.6%
2008	66,558,177		1.764	117,418,492	538,764,477	458.8%
2009	64,583,344		1.600	103,318,157	1,576,316	1.5%
2010	63,606,679		1.478	94,010,711	5,423,427	5.8%
2011	63,551,427		1.443	91,706,718	16,247,025	17.7%
2012	68,482,322		1.372	93,981,257	13,608,787	14.5%
2013	73,364,153		1.308	95,929,478	1,092,322	1.1%
2014	68,380,026		1.247	85,251,481	1,006,584	1.2%
2015	62,569,816		1.186	74,228,161	15,940,273	21.5%
2016	57,332,653		1.130	64,767,914	2,363,193	3.6%
2017	46,726,681		1.102	51,516,166	227,131,350	440.9%
2018	44,772,885		1.076	48,155,532	818,025	1.7%
2019	43,372,779		1.050	45,541,418	3,024,495	6.6%
2020	43,731,560		1.050	45,918,138	6,780,921	14.8%
2021	44,175,616		1.050	46,384,397	2,856,668	6.2%
Total	1,192,460,356			2,043,806,217	1,218,543,306	59.6%

Notes:

(2) Provided by TDI. 1983 - 1995 are year ending 9/30/xx as of 12/31/99; 1996 - 2021 are year ending 12/31/xx as of 12/31/21

(3) Provided by TDI (1992 MR = 1992 manual rates)

(4) Represents 8/1/80 through 6/30/22 rate changes for TWIA; factors assume uniform earning of written premium and that TWIA premium represents 64.9% of industry data in Tier 1 -- Territory 10

(5) = (3) * (4) for 1983 - 1992; (2) * (4) for 1993 - 2021

(6) Provided by TDI. 1983 - 1995 are year ending 9/30/xx as of 12/31/99; 1996 - 2011 are year ending 12/31/xx as of 12/31/19
2012 - 2021 are year ending 12/31/xx as of 12/31/2021

(7) = (6) / (5)

Industry experience is for EC, where wind and hail related loss is predominant

Texas Windstorm Insurance Association

Commercial Property - Wind & Hail

Rate Level Review

Industry Experience -- Commercial Extended Coverage

Tier 2 (Territories 1 and 11)

AY Ending	Earned Premium	Earned Premium at 1992 MR	TWIA Factor to Current Rate Level	Earned Premium at Current Rates	Incurred Loss	Incurred Loss Ratio
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1983	7,250,559	7,334,192	3.829	20,766,671	33,451,768	161.1%
1984	6,146,403	7,090,092	3.511	20,075,505	3,096,573	15.4%
1985	7,715,669	8,264,972	2.879	23,402,162	2,019,280	8.6%
1986	11,101,057	8,943,773	2.050	25,324,179	3,439,343	13.6%
1987	19,731,857	16,746,125	1.994	47,416,438	1,552,595	3.3%
1988	14,491,218	13,901,265	2.147	39,361,254	2,041,063	5.2%
1989	14,584,082	16,324,747	2.385	46,223,312	2,746,147	5.9%
1990	12,102,427	14,172,295	2.506	40,128,672	2,967,816	7.4%
1991	13,947,169	17,133,114	2.491	48,512,193	2,440,246	5.0%
1992	15,779,782	19,121,264	2.831	54,141,614	2,232,412	4.1%
1993	13,455,788		3.253	43,773,645	2,357,383	5.4%
1994	6,449,086		3.253	20,979,819	1,579,205	7.5%
1995	17,734,471		3.253	57,692,826	11,314,057	19.6%
1996	28,876,403		3.253	93,939,159	5,938,855	6.3%
1997	27,434,262		3.253	89,247,664	7,691,121	8.6%
1998	26,616,230		3.303	87,905,062	7,574,576	8.6%
1999	23,901,401		3.354	80,159,537	6,821,707	8.5%
2000	19,819,200		3.209	63,606,525	35,670,537	56.1%
2001	21,641,352		3.017	65,281,415	17,852,673	27.3%
2002	31,941,586		2.886	92,194,415	8,461,924	9.2%
2003	35,755,041		2.561	91,585,622	28,411,179	31.0%
2004	54,522,810		2.448	133,481,347	3,982,223	3.0%
2005	55,697,704		2.220	123,629,170	59,821,556	48.4%
2006	61,057,252		2.037	124,366,831	6,946,289	5.6%
2007	61,608,161		1.857	114,409,257	10,794,322	9.4%
2008	58,154,456		1.764	102,593,082	477,796,637	465.7%
2009	62,172,956		1.600	99,462,103	9,127,735	9.2%
2010	70,966,450		1.478	104,888,457	3,378,802	3.2%
2011	71,822,950		1.443	103,642,787	19,035,462	18.4%
2012	79,268,241		1.372	108,783,240	10,920,914	10.0%
2013	91,373,754		1.308	119,478,467	8,173,104	6.8%
2014	106,258,731		1.247	132,476,027	5,670,001	4.3%
2015	107,785,459		1.186	127,868,626	17,052,994	13.3%
2016	101,004,860		1.130	114,103,809	34,369,228	30.1%
2017	92,908,674		1.102	102,431,813	126,541,029	123.5%
2018	95,714,465		1.076	102,945,810	14,189,621	13.8%
2019	95,801,058		1.050	100,591,111	16,989,194	16.9%
2020	99,420,664		1.050	104,391,697	25,922,490	24.8%
2021	104,869,758		1.050	110,113,246	23,270,721	21.1%
Total	1,846,883,446			3,181,374,570	1,063,642,782	33.4%

Notes:

(2) Provided by TDI. 1983 - 1995 are year ending 9/30/xx as of 12/31/99; 1996 - 2021 are year ending 12/31/xx as of 12/31/21

(3) Provided by TDI (1992 MR = 1992 manual rates)

(4) Represents 8/1/80 through 6/30/22 rate changes for TWIA; factors assume uniform earning of written premium and that TWIA premium represents 0.8% of industry data in Tier 2

(5) = (3) * (4) for 1983 - 1992; (2) * (4) for 1993 - 2021

(6) Provided by TDI. 1983 - 1995 are year ending 9/30/xx as of 12/31/99; 1996 - 2011 are year ending 12/31/xx as of 12/31/19
2012 - 2021 are year ending 12/31/xx as of 12/31/2021

(7) = (6) / (5)

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

Hurricane Loss Ratio -- AIR Model

County	TWIA Insured Values (000s) as of 11/30/21	Modeled Loss Cost	Expected Annual Hurricane Loss
(1)	(2)	(3)	(4)
Aransas	252,534	3.361	848,767
Brazoria	355,776	3.066	1,090,809
Calhoun	115,305	3.308	381,429
Cameron	1,012,077	3.747	3,792,253
Chambers	55,039	2.739	150,752
Galveston	2,517,442	8.728	21,972,234
Harris	34,468	5.406	186,334
Jefferson	312,903	2.792	873,625
Kenedy	694	1.192	827
Kleberg	17,079	1.077	18,394
Matagorda	75,962	2.901	220,366
Nueces	1,652,395	4.013	6,631,061
Refugio	20,480	1.449	29,676
San Patricio	101,012	2.217	223,944
Willacy	17,524	2.872	50,329
Total	6,540,690	5.576	36,470,800
(5) Inforce-Premium as of 11/30/21 at Present Rates			61,192,910
(6) Indicated Hurricane Loss Ratio			59.6%

Notes:

- (2) Provided by TWIA
- (3) Exhibit 8, Sheet 1
- (4) = (2) * (3)
- (5) Provided by TWIA
- (6) = (4) Total / (5)

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

Hurricane Loss Ratio -- RMS Model

County	TWIA Insured Values (000s) as of 11/30/21	Modeled Loss Cost	Expected Annual Hurricane Loss
(1)	(2)	(3)	(4)
Aransas	252,534	3.568	901,041
Brazoria	355,776	3.562	1,267,274
Calhoun	115,305	4.655	536,745
Cameron	1,012,077	5.205	5,267,861
Chambers	55,039	3.014	165,888
Galveston	2,517,442	6.486	16,328,129
Harris	34,468	5.140	177,166
Jefferson	312,903	2.697	843,899
Kenedy	694	2.440	1,693
Kleberg	17,079	2.131	36,395
Matagorda	75,962	3.922	297,923
Nueces	1,652,395	4.389	7,252,362
Refugio	20,480	2.552	52,265
San Patricio	101,012	3.322	335,562
Willacy	17,524	3.865	67,730
Total	6,540,690	5.127	33,531,933
(5) Inforce-Premium as of 11/30/21 at Present Rates			61,192,910
(6) Indicated Hurricane Loss Ratio			54.8%

Notes:

- (2) Provided by TWIA
- (3) Exhibit 8, Sheet 2
- (4) = (2) * (3)
- (5) Provided by TWIA
- (6) = (4) Total / (5)

Texas Windstorm Insurance Association
Commercial Property - Wind & Hail
Rate Level Review
Hurricane Loss Ratio -- Impact Forecasting Model

County	TWIA Insured Values (000s) as of 11/30/21	Modeled Loss Cost	Expected Annual Hurricane Loss
(1)	(2)	(3)	(4)
Aransas	252,534	2.724	687,903
Brazoria	355,776	2.849	1,013,606
Calhoun	115,305	3.095	356,869
Cameron	1,012,077	3.557	3,599,958
Chambers	55,039	2.598	142,991
Galveston	2,517,442	3.466	8,725,454
Harris	34,468	2.883	99,371
Jefferson	312,903	1.969	616,106
Kenedy	694	2.366	1,642
Kleberg	17,079	1.748	29,854
Matagorda	75,962	3.450	262,069
Nueces	1,652,395	2.873	4,747,331
Refugio	20,480	2.423	49,623
San Patricio	101,012	2.484	250,914
Willacy	17,524	3.003	52,625
Total	6,540,690	3.155	20,636,316
(5) Inforce-Premium as of 11/30/21 at Present Rates			61,192,910
(6) Indicated Hurricane Loss Ratio			33.7%

Notes:

- (2) Provided by TWIA
- (3) Exhibit 8, Sheet 3
- (4) = (2) * (3)
- (5) Provided by TWIA
- (6) = (4) Total / (5)

Texas Windstorm Insurance Association
Commercial Property - Wind & Hail
Rate Level Review
Hurricane Loss Ratio -- CoreLogic RQE Model

County	TWIA Insured Values (000s) as of 11/30/21	Modeled Loss Cost	Expected Annual Hurricane Loss
(1)	(2)	(3)	(4)
Aransas	252,534	2.996	756,592
Brazoria	355,776	2.423	862,045
Calhoun	115,305	2.993	345,108
Cameron	1,012,077	2.728	2,760,946
Chambers	55,039	2.381	131,048
Galveston	2,517,442	4.510	11,353,663
Harris	34,468	4.867	167,756
Jefferson	312,903	3.316	1,037,586
Kenedy	694	1.294	898
Kleberg	17,079	1.097	18,736
Matagorda	75,962	2.621	199,096
Nueces	1,652,395	2.634	4,352,408
Refugio	20,480	1.768	36,209
San Patricio	101,012	1.801	181,923
Willacy	17,524	2.297	40,253
Total	6,540,690	3.401	22,244,267
(5) Inforce-Premium as of 11/30/21 at Present Rates			61,192,910
(6) Indicated Hurricane Loss Ratio			36.4%

Notes:

- (2) Provided by TWIA
- (3) Exhibit 8, Sheet 4
- (4) = (2) * (3)
- (5) Provided by TWIA
- (6) = (4) Total / (5)

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

AIR Simulated Hurricane Results

County	TWIA Insured Values (000s) as of 11/30/21	Average Annual Modeled Loss	Modeled Loss Cost
(1)	(2)	(3)	(4)
Aransas	252,534	848,782	3.361
Brazoria	355,776	1,090,909	3.066
Calhoun	115,305	381,387	3.308
Cameron	1,012,077	3,792,422	3.747
Chambers	55,039	150,756	2.739
Galveston	2,517,442	21,971,371	8.728
Harris	34,468	186,327	5.406
Jefferson	312,903	873,760	2.792
Kenedy	694	827	1.192
Kleberg	17,079	18,395	1.077
Matagorda	75,962	220,374	2.901
Nueces	1,652,395	6,630,507	4.013
Refugio	20,480	29,677	1.449
San Patricio	101,012	223,965	2.217
Willacy	17,524	50,327	2.872
Total	6,540,690	36,469,786	5.576

Notes:

(2) Provided by TWIA and Geo-coded by AIR

(3) Provided by AIR

(4) = (3) / (2)

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

RMS Simulated Hurricane Results

County	TWIA Insured Values (000s) as of 11/30/21	Average Annual Modeled Loss	Modeled Loss Cost
(1)	(2)	(3)	(4)
Aransas	252,534	901,029	3.568
Brazoria	355,776	1,267,254	3.562
Calhoun	115,305	536,744	4.655
Cameron	1,012,077	5,267,714	5.205
Chambers	55,039	165,862	3.014
Galveston	2,517,442	16,327,292	6.486
Harris	34,468	177,159	5.140
Jefferson	312,903	843,792	2.697
Kenedy	694	1,693	2.440
Kleberg	17,079	36,402	2.131
Matagorda	75,962	297,908	3.922
Nueces	1,652,395	7,251,673	4.389
Refugio	20,480	52,267	2.552
San Patricio	101,012	335,567	3.322
Willacy	17,524	67,725	3.865
Total	6,540,690	33,530,082	5.126

Notes:

(2) Provided by TWIA and Geo-coded by RMS

(3) Provided by RMS Excluding Storm Surge

(4) = (3) / (2)

Texas Windstorm Insurance Association
Commercial Property - Wind & Hail
Rate Level Review
Impact Forecasting Simulated Hurricane Results

County	TWIA Insured Values (000s) as of 11/30/21	Average Annual Modeled Loss	Modeled Loss Cost
(1)	(2)	(3)	(4)
Aransas	252,534	688,023	2.724
Brazoria	355,776	1,013,475	2.849
Calhoun	115,305	356,903	3.095
Cameron	1,012,077	3,599,753	3.557
Chambers	55,039	143,010	2.598
Galveston	2,517,442	8,726,067	3.466
Harris	34,468	99,364	2.883
Jefferson	312,903	616,015	1.969
Kenedy	694	1,642	2.366
Kleberg	17,079	29,850	1.748
Matagorda	75,962	262,073	3.450
Nueces	1,652,395	4,747,488	2.873
Refugio	20,480	49,619	2.423
San Patricio	101,012	250,953	2.484
Willacy	17,524	52,631	3.003
Total	6,540,690	20,636,867	3.155

Notes:

(2) Provided by TWIA and Geo-coded by IF

(3) Provided by IF

(4) = (3) / (2)

Texas Windstorm Insurance Association
Commercial Property - Wind & Hail
Rate Level Review
CoreLogic RQE Simulated Hurricane Results

County	TWIA Insured Values (000s) as of 11/30/21	Average Annual Modeled Loss	Modeled Loss Cost
(1)	(2)	(3)	(4)
Aransas	252,534	756,686	2.996
Brazoria	355,776	862,054	2.423
Calhoun	115,305	345,074	2.993
Cameron	1,012,077	2,761,116	2.728
Chambers	55,039	131,023	2.381
Galveston	2,517,442	11,352,453	4.510
Harris	34,468	167,745	4.867
Jefferson	312,903	1,037,500	3.316
Kenedy	694	898	1.294
Kleberg	17,079	18,729	1.097
Matagorda	75,962	199,115	2.621
Nueces	1,652,395	4,352,952	2.634
Refugio	20,480	36,206	1.768
San Patricio	101,012	181,935	1.801
Willacy	17,524	40,257	2.297
Total	6,540,690	22,243,743	3.401

Notes:

- (2) Provided by TWIA and Geo-coded by RQE
- (3) Provided by CoreLogic RQE
- (4) = (3) / (2)

Texas Windstorm Insurance Association
Commercial Property - Wind & Hail
Rate Level Review
Texas Hurricanes 1850 - 2021

<u>Landfall</u>			<u>Landfall</u>		
Year	Month	Name	Year	Month	Name
(1)		(2)	(1)		(2)
1851	Jun		1933	Sep	
1854	Jun		1934	Jul	
1854	Sep	"Matagorda"	1936	Jun	
1865	Sep	"Sabine River-Lake Calcasieu"	1940	Aug	
1866	Jul		1941	Sep	
1867	Oct	"Galveston"	1942	Aug	
1869	Aug	"Lower Texas Coast"	1942	Aug	
1875	Sep		1943	Jul	
1879	Aug		1945	Aug	
1880	Aug		1947	Aug	
1882	Sep		1949	Oct	
1886	Jun		1957	Jun	Audrey
1886	Aug	"Indianola"	1959	Jul	Debra
1886	Sep		1961	Sep	Carla
1886	Oct		1963	Sep	Cindy
1887	Sep		1967	Sep	Beulah
1888	Jun		1970	Aug	Celia
1891	Jul		1971	Sep	Fern
1895	Aug		1980	Aug	Allen
1897	Sep		1983	Aug	Alicia
1900	Sep	"Galveston"	1986	Jun	Bonnie
1909	Jun		1989	Aug	Chantal
1909	Jul	"Velasco"	1989	Oct	Jerry
1909	Aug		1999	Aug	Bret
1910	Sep		2003	Jul	Claudette
1912	Oct		2005	Sep	Rita
1913	Jun		2007	Sep	Humberto
1915	Aug	"Galveston"	2008	Jul	Dolly
1916	Aug		2008	Sep	Ike
1919	Sep		2017	Aug	Harvey
1921	Jun		2020	Jul	Hanna
1929	Jun		2020	Aug	Laura
1932	Aug	"Freeport"	2020	Oct	Delta
1933	Aug		2021	Sep	Nicholas

Frequency	Date Period	Hurricanes	Period	Annual Frequency
52.0-Year	1/1/1970 - 12/31/2021	18	52	0.346
171-Year	1/1/1851 - 12/31/2021	68	171	0.398

Notes:

(1), (2) from NOAA Technical Memorandum NWS-NHC-6, updated with actual experience through 2021

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

Calculation of Earned Premium at Present Rate Level

Year	TWIA Written Premium	Factor to Current Rate Level	Written Premium at Current Rate Level	Earned Premium at Current Rate Level
(1)	(2)	(3)	(4)	(5)
1994	10,672,677	3.253	34,718,218	34,718,218
1995	12,865,905	3.253	41,852,789	38,285,504
1996	15,640,660	3.253	50,879,067	46,365,928
1997	16,536,186	3.253	53,792,213	52,335,640
1998	16,558,977	3.353	55,522,250	54,657,232
1999	17,394,142	3.353	58,322,558	56,922,404
2000	17,332,561	3.077	53,332,290	55,827,424
2001	17,544,251	2.958	51,895,894	52,614,092
2002	24,013,525	2.818	67,670,113	59,783,004
2003	29,220,514	2.562	74,862,957	71,266,535
2004	31,009,323	2.329	72,220,713	73,541,835
2005	35,740,174	2.117	75,661,948	73,941,331
2006	76,847,840	1.964	150,929,158	113,295,553
2007	110,951,718	1.800	199,713,092	175,321,125
2008	98,036,118	1.715	168,131,943	183,922,518
2009	111,269,573	1.494	166,236,742	167,184,343
2010	102,174,680	1.477	150,912,002	158,574,372
2011	100,017,021	1.407	140,723,949	145,817,976
2012	110,524,397	1.340	148,102,691	144,413,320
2013	112,904,624	1.276	144,066,300	146,084,496
2014	104,642,688	1.215	127,140,866	135,603,583
2015	98,715,934	1.158	114,313,052	120,726,959
2016	88,278,690	1.103	97,371,395	105,842,224
2017	70,749,081	1.103	78,036,236	87,703,816
2018	65,696,833	1.050	68,981,675	73,508,956
2019	59,123,729	1.050	62,079,915	65,530,795
2020	60,327,052	1.050	63,343,405	62,711,660
2021	63,366,551	1.050	66,534,879	64,939,142
Total	1,678,155,423		2,637,348,310	2,621,439,985

Notes:

(2) Provided by TWIA

(3) Exhibit 10, Sheet 2

(4) = (2) * (3) (calculated on a monthly basis)

(5) Calculated from (4), using annual uniform earning assumption for 2002 and prior and monthly for 2003 and after

Texas Windstorm Insurance Association
Commercial Property - Wind & Hail
Rate Level Review
Calculation of On-Level Premium Factors

Year	Rate Level in Effect			Cumulative Rate Level			# Months		E.O.Y.	Average Rate Level	Factor to Current Rate Level			
	Applicable Rates			B.O.Y.			B.O.Y.							
(1)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1980	Prior			8/1/1980	1.000			1.175	7.0			5.0	1.073	4.869
1981	8/1/1980			9/1/1981	1.175			1.132	8.0			4.0	1.161	4.500
1982	9/1/1981			9/1/1982	1.132			1.428	8.0			4.0	1.231	4.244
1983	9/1/1982			10/10/1983	1.428			1.514	9.3			2.7	1.447	3.610
1984	10/10/1983			10/10/1983	1.514			1.514	12.0			0.0	1.514	3.451
1985	10/10/1983	3/1/1985	3/15/1985	11/15/1985	1.514	1.892	2.428	2.651	2.0	0.5	8.0	1.5	2.281	2.290
1986	11/15/1985			11/15/1985	2.651			2.651	12.0			0.0	2.651	1.971
1987	11/15/1985			7/1/1987	2.651			2.407	6.0			6.0	2.529	2.066
1988	7/1/1987			11/1/1988	2.407			2.075	10.0			2.0	2.352	2.221
1989	11/1/1988			11/1/1988	2.075			2.075	12.0			0.0	2.075	2.518
1990	11/1/1988			3/1/1990	2.075			2.104	2.0			10.0	2.099	2.489
1991	3/1/1990			4/1/1991	2.104			2.083	3.0			9.0	2.088	2.502
1992	1/1/1992			1/1/1992	1.606			1.606	12.0			0.0	1.606	3.253
1993	1/1/1992			10/1/1993	1.606			1.606	9.0			3.0	1.606	3.253
1994	10/1/1993			10/1/1993	1.606			1.606	12.0			0.0	1.606	3.253
1995	10/1/1993			10/1/1993	1.606			1.606	12.0			0.0	1.606	3.253
1996	10/1/1993			10/1/1993	1.606			1.606	12.0			0.0	1.606	3.253
1997	10/1/1993			10/1/1993	1.606			1.606	12.0			0.0	1.606	3.253
1998	1/1/1998			1/1/1998	1.558			1.558	12.0			0.0	1.558	3.353
1999	1/1/1998			1/1/1998	1.558			1.558	12.0			0.0	1.558	3.353
2000	1/1/2000			1/1/2000	1.698			1.698	12.0			0.0	1.698	3.077
2001	1/1/2001			1/1/2001	1.766			1.766	12.0			0.0	1.766	2.958
2002	1/1/2002			1/1/2002	1.854			1.854	12.0			0.0	1.854	2.818
2003	1/1/2003			1/1/2003	2.039			2.039	12.0			0.0	2.039	2.562
2004	1/1/2004			1/1/2004	2.243			2.243	12.0			0.0	2.243	2.329
2005	1/1/2005			1/1/2005	2.468			2.468	12.0			0.0	2.468	2.117
2006	1/1/2006			9/1/2006	2.591			2.798	8.0			4.0	2.660	1.964
2007	1/1/2007			1/1/2007	2.902			2.902	12.0			0.0	2.902	1.800
2008	1/1/2007			2/1/2008	2.902			3.059	1.0			11.0	3.046	1.715
2009	2/1/2008			2/1/2009	3.059			3.536	1.0			11.0	3.496	1.494
2010	2/1/2009			2/1/2009	3.536			3.536	12.0			0.0	3.536	1.477
2011	1/1/2011			1/1/2011	3.713			3.713	12.0			0.0	3.713	1.407
2012	1/1/2012			1/1/2012	3.898			3.898	12.0			0.0	3.898	1.340
2013	1/1/2013			1/1/2013	4.093			4.093	12.0			0.0	4.093	1.276
2014	1/1/2014			1/1/2014	4.298			4.298	12.0			0.0	4.298	1.215
2015	1/1/2015			1/1/2016	4.513			4.513	12.0			0.0	4.513	1.158
2016	1/1/2016			1/1/2017	4.738			4.738	12.0			0.0	4.738	1.103
2017	1/1/2017			1/1/2018	4.738			4.738	12.0			0.0	4.738	1.103
2018	1/1/2018			1/1/2019	4.975			4.975	12.0			0.0	4.975	1.050
2019	1/1/2019			1/1/2019	4.975			4.975	12.0			0.0	4.975	1.050
2020	1/1/2020			1/1/2020	4.975			4.975	12.0			0.0	4.975	1.050
2021	1/1/2021			1/1/2021	4.975			4.975	12.0			0.0	4.975	1.050
Current								5.224				5.224		1.000

Notes:

- (1) - (4) Rates in effect and beginning and end of year (B.O.Y. and E.O.Y.)
For each year except 1985, 2006, and 2008 the B.O.Y. and E.O.Y. rates are the only rates applicable
For 1985, there were two additional rate changes
For 2006, there was one additional rate change
For 2008, the rate change took effect mid-year
- (5) - (8) Based on Exhibit 10, Sheet 3
- (9) - (12) Number of months that each of the rates were effective
- (13) = Weighted average of (5) - (8) using (9) - (12) as weights
- (14) = Current (13) / (13)

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

History of Rate Level Changes

Effective Date	Rate Change	Cumulative Rate Level
(1)	(2)	(3)
Prior		1.000
8/1/80	17.5%	1.175
9/1/81	-3.7%	1.132
9/1/82	26.2%	1.428
10/10/83	6.0%	1.514
3/1/85	25.0%	1.892
3/15/85	28.3%	2.428
11/15/85	9.2%	2.651
7/1/87	-9.2%	2.407
11/1/88	-13.8%	2.075
3/1/90	1.4%	2.104
4/1/91	-1.0%	2.083
1/1/92	-22.9%	1.606
10/1/93	0.0%	1.606
1/1/98	-3.0%	1.558
1/1/00	9.0%	1.698
1/1/01	4.0%	1.766
1/1/02	5.0%	1.854
1/1/03	10.0%	2.039
1/1/04	10.0%	2.243
1/1/05	10.0%	2.468
1/1/06	5.0%	2.591
9/1/06	8.0%	2.798
1/1/07	3.7%	2.902
2/1/08	5.4%	3.059
2/1/09	15.6%	3.536
1/1/11	5.0%	3.713
1/1/12	5.0%	3.898
1/1/13	5.0%	4.093
1/1/14	5.0%	4.298
1/1/15	5.0%	4.513
1/1/16	5.0%	4.738
1/1/17	0.0%	4.738
1/1/18	5.0%	4.975
1/1/19	0.0%	4.975
1/1/20	0.0%	4.975
1/1/21	0.0%	4.975
1/1/22	5.0%	5.224

Notes:

(2) Provided by TWIA, excludes 1/1/92 refund on in-force policies

(3) = Cumulation of (2)

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

Fixed Expenses and Permissible Loss & LAE Ratios

Expense Category	2019	2020	2021	Selected
(1) Direct Written Premium	\$372,016,601	\$369,600,488	\$395,112,773	
(2) Direct Earned Premium	\$381,571,182	\$369,179,093	\$378,504,197	
(3) Commission				
\$ Amount	59,474,929	59,103,153	63,161,029	
% 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	\$31,461,936	\$31,624,678	\$29,979,903	
Adjustments				
Contribution to Statutory Fund	0	0	0	
Adjusted \$ Amount	31,461,936	31,624,678	29,979,903	
% of DEP	8.2%	8.6%	7.9%	8.2%
(6) Taxes, Licenses & Fees				
\$ Amount	\$7,024,246	\$6,904,349	\$7,364,210	
% of DWP	1.9%	1.9%	1.9%	1.9%
(7) Reinsurance Expense				19.6%
(8) Outstanding Class 1 Public Security Repayment				0.0%
(9) Total Fixed Expenses				27.8%
(10) Total Variable Expenses				17.9%
(11) CRTF Contribution & UW Contingency & Uncertainty				5.0%
(12) Permissible Loss, LAE, and Fixed Expense 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; Outstanding principles have been paid off in 2022

(9) = (5) + (7) + (8)

(10) = (3) + (4) + (6)

(11) CRTF contribution selected judgmentally

(12) = 100% - (10) - (11)

Commercial Property - Wind & Hail

Rate Level Review

Development of Reinsurer Expense

Using Average of AIR and RMS Hurricane Models

	Combined	Residential	Commercial
(1) 2022 - 2023 Reinsurance Premium	116,631,547	97,295,616	19,335,931
(2a) Average Annual Loss by Reinsurance Layer (AIR) 100% of \$2036M XS \$2200M	30,831,902	25,851,654	4,980,248
Total	30,831,902	25,851,654	4,980,248
(2b) Average Annual Loss by Reinsurance Layer (RMS) 100% of \$2036M XS \$2200M	19,211,333	15,895,091	3,316,242
Total	19,211,333	15,895,091	3,316,242
(2c) Selected Total Average Annual Loss	25,021,617	20,873,372	4,148,245
(3) Annual Exposure Growth	8.0%	8.0%	8.0%
(4) Prospective Average Annual Loss	27,023,347	22,543,242	4,480,105
(5) Net Cost of Reinsurance	85,554,698	71,370,888	14,183,810
(6) TWIA 2021 Earned Premium at Present Rates	400,352,299	335,413,157	64,939,142
(7) 2022 - 2023 TWIA Prospective Earned Premium at Present Rates	446,481,829	374,060,247	72,421,582
(8) Indicated Reinsurance Expense %	19.2%	19.1%	19.6%

Notes:

(1) From TWIA reinsurance contract effective 6/1/2022 through 5/31/2023

(2a) Provided by AON, based on AIR model using TWIA exposures as of 11/30/2021

(2b) Provided by AON, based on RMS model using TWIA exposures as of 11/30/2021

(2c) Selected equal to the average of the modeled average annual losses

(3) Selected based on projections communicated to reinsurers

(4) = (2c) * [(1+ (3)) ^ 1.000](projected exposure growth from 11/30/2021 to 12/1/2022)

(5) = (1) - (4)*1.15, 1.15 is the loading for loss adjustment factor

(6) = Commercial Exhibit 10, Sheet 1 + Residential Exhibit 10, Sheet 2, calendar year ending 12/31/2021

(7) = (6) adjusted for exposure growth trend * [(1+ (3)) ^ 1.417] (projected exposure growth from 7/1/2021 to 12/1/2022)

(8) = (5) / (7)

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

Reconciliation of Paid Loss Data to Schedule P

Accident Year	TWIA Provided Paid Loss			Schedule P	
	Commercial & Farm	Residential	Total	Direct & Assumed Paid Loss	Difference
(1)	(2)	(3)	(4)	(5)	(6)
2008	857,250,899	1,709,221,198	2,566,472,097	2,562,744,000	3,728,097
2009	2,553,456	8,479,585	11,033,041	10,403,000	630,041
2010	7,478,289	10,958,718	18,437,007	18,005,000	432,007
2011	19,217,587	76,997,393	96,214,980	96,073,000	141,980
2012	14,459,642	52,336,910	66,796,552	66,741,000	55,552
2013	7,351,329	63,532,058	70,883,387	70,832,000	51,387
2014	1,056,281	6,116,759	7,173,040	7,005,000	168,040
2015	18,672,896	120,009,849	138,682,745	138,697,000	(14,255)
2016	2,596,505	25,917,370	28,513,875	28,422,000	91,875
2017	465,109,077	930,334,554	1,395,443,631	1,395,497,000	(53,369)
2018	251,357	11,896,867	12,148,224	12,013,000	135,224
2019	886,664	16,141,151	17,027,815	17,248,000	(220,185)
2020	5,862,548	53,379,210	59,241,758	59,601,000	(359,242)
2021	5,200,301	39,108,478	44,308,779	43,378,000	930,779
Total	1,407,946,831	3,124,430,100	4,532,376,931	4,526,659,000	5,717,931

Notes:

- (2), (3) Provided by TWIA, as of 12/31/2021
- (4) = (2) + (3)
- (5) Based on TWIA 2021 Annual Statement
- (6) = (4) - (5)

Texas Windstorm Insurance Association
Commercial 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)
1994	10,672,677	15,758,330	26,431,007	26,510,501	(79,494)
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
2020	60,327,052	310,312,753	370,639,805	369,600,488	1,039,317
2021	63,366,551	331,736,850	395,103,401	395,112,773	(9,372)
Total	1,678,155,423	5,408,413,828	7,086,569,251	7,082,112,706	4,456,545

Notes:

- (2), (3) Provided by TWIA, as of 12/31/2021
- (4) = (2) + (3)
- (5) Based on TWIA Annual Statements
- (6) = (4) - (5)