MEMORANDUM

DATE: March 7, 2022
TO: John Polak, General Manager
FROM: James Murphy, Chief Actuary | Vice President, Enterprise Analytics
RE: 2022 Funding - Reinsurance

The Association is required by statute to maintain total available loss funding in an amount not less than the Association's probable maximum loss for a catastrophe year with a one-in-100-year probability. In 2019, the Texas Legislature enacted statutory changes that require the Association to assess its member insurers to pay for any reinsurance it purchases in excess of the Association's 1:100 statutory minimum funding level. Member assessments to pay for this excess reinsurance are distinct from member assessments to pay losses and would not affect the Association's ability to assess member companies for excess losses incurred.

For reference, the resolutions regarding reinsurance passed by the TWIA board at its March 23, 2021 meeting are set forth below:

1. The Board agrees to average the results from the two catastrophe models presented as a reference point for making its reinsurance purchase decision using the following weighting: AIR 50%; and RMS 50%.

2. The Board agrees that the model results based on near term assumptions are preferable.

3. The Board agrees that the words, “total available loss funding” in statute contemplate inclusion of loss adjustment expenses in determining the probable maximum loss for the Association for a catastrophe year with a probability of one in one hundred.

4. The Board agrees based on the foregoing and the information presented that for catastrophe year 2021 the one in one hundred probable maximum loss amount is $4.03 billion.

5. The Board directs the Association’s reinsurance broker to pursue placement of the reinsurance program for the 2021-2022 reinsurance contract year using a combination of catastrophe bonds and traditional reinsurance in an aggregate amount of $4.03 billion ($1.9 billion excess of $2.1 billion) on the most favorable terms that can be achieved in the market.

6. Staff is authorized and directed to submit these resolutions and supporting information to the Texas Department of Insurance for any review or approval that may be required by the Commissioner of Insurance under law.
Texas Administrative Code Rule §5.4160 requires the Association to discuss determining its one-in-100-year probable maximum loss for the year at the Association’s first regular board meeting each year. Following the discussion at this meeting, the Association must determine its one in-100-year probable maximum loss for the year and disclose it to the Commissioner not later than April 1. The Association must disclose its method for determining its one-in-100-year probable maximum loss at the same time. The determination and information must be disclosed each year, regardless of whether the Association requests a reinsurance assessment. (See Rule §5.4160 attached.)

Neither the statute nor TDI’s rule guidance specify how the Association must determine its one-in-100-year probable maximum loss. However, the rule describes the information that must be included in regard to the methodology used to determine the one-in-100-year probable maximum loss.

Staff has included a template form below based on the Board’s resolutions from last March to assist the Board in formulating resolutions for adoption at the March 22, 2022 meeting.

1. The Board agrees to average the results from the catastrophe models presented as a reference point for making its reinsurance purchase decision using the following weighting: AIR __% RMS __% (IF __% RQE __%).
2. The Board agrees that the model results based on [near] [long] term assumptions are preferable.
3. The Board agrees that the words, “total available loss funding” in statute contemplate inclusion of loss adjustment expenses in determining the probable maximum loss for the Association for a catastrophe year with a probability of one in one hundred.
4. The Board agrees based on the foregoing and the information presented that for catastrophe year 2022 the one in one hundred probable maximum loss amount is $___ billion.
5. The Board directs the Association’s reinsurance broker to pursue placement of the reinsurance program for the 2022-2023 reinsurance contract year using a combination of catastrophe bonds and traditional reinsurance in an aggregate amount of $___ billion ($___ billion excess of $2.2 billion) on the most favorable terms that can be achieved in the market.
6. Staff is authorized and directed to submit these resolutions and supporting information to the Texas Department of Insurance for any review or approval that may be required by the Commissioner of Insurance under law.

Statute provides that the cost of reinsurance purchased or alternative financing mechanisms used in excess of the minimum funding level required shall be paid by assessments on member companies. If the board wishes to direct staff to make such a purchase, it needs to take action at the March 22, 2022 meeting in order for the purchase to be made timely and for applicable notice requirements to be met.
Sec. 2210.453(f) of the Texas Insurance Code prohibits the Association from purchasing reinsurance from an insurer or broker involved in the execution of a catastrophe model on which the Association relies in determining the probable maximum loss applicable for the period covered by the reinsurance. TWIA’s reinsurance broker, Gallagher Re, has not been involved in the execution of any of the catastrophe models to be relied on by the Board in determining the 100-year probable maximum loss.

JM
<table>
<thead>
<tr>
<th>Timing</th>
<th>Action</th>
</tr>
</thead>
</table>
| At the Association’s first regular board meeting (February) | The association must discuss with the Board its methodology for determining its one-in-100-year probable maximum loss for the calendar year.  
The association must determine its one-in-100-year probable maximum loss for the calendar year.  
In discussing its methodology, the Association must provide the information described in §5.4160(d) and make that information available to its members and the public. |
| After the first regular board meeting but not later than April 1 | The Association must disclose to the Commissioner its one-in-100-year probable maximum loss for the calendar year and the Association’s method for determining that probable maximum loss. |
| No later than the second regular board meeting (May) | If the Association elects to purchase coverage for reinsurance or alternative risk transfer mechanisms in excess of the one-in-100-year probable maximum loss, then the Association must also obtain a quote for coverage that provides funding equal to the one in 100-year probable maximum loss.  
The Association must provide each of the following to its board and make this information available to its members and the public:  
(1) the reinsurance or alternative risk transfer mechanism premium quote for coverage that provides funding equal to the one in 100-year probable maximum loss.  
(2) the total deposit premiums for all reinsurance or alternative risk transfer mechanism coverage for the year.  
If, at the time of the second regular board meeting of the calendar year, deposit premiums described above are not known, then the Association must provide its best estimate of those premiums to the board and make the estimate available to its members. |
<p>| Following disclosure to the Commissioner of the one-in-100-year probable maximum loss | The department (TDI) will post one-in-100-year probable maximum loss for the calendar year and the Association’s method for determining that probable maximum loss on its website. |</p>
<table>
<thead>
<tr>
<th>Event</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>As soon as the Association knows the deposit premiums</td>
<td>As soon as the Association knows the deposit premiums described in subsection (g) of this section, the Association must provide them to the board and make them available to its members.</td>
</tr>
<tr>
<td>(June)</td>
<td></td>
</tr>
<tr>
<td>Within a reasonable time after it knows its total reinsurance costs for that calendar year</td>
<td>If the Association must assess its members under Insurance Code §2210.453(d)(1) then the Association must request the Commissioner’s approval within a reasonable time after it knows its total reinsurance costs for that calendar year.</td>
</tr>
<tr>
<td>By the later of either:</td>
<td>The Association must issue the assessment.</td>
</tr>
<tr>
<td>(A) 120 days after the date the Association receives the member premium data that TDI provides under §5.4162(f) for that year; or (B) December 1 of that year.</td>
<td></td>
</tr>
<tr>
<td>Within 30 days of receipt of notice of assessment.</td>
<td>Each member must remit to the Association payment in full of its assessed amount of any assessment levied by the Association within 30 days of receipt of notice of assessment.</td>
</tr>
</tbody>
</table>
Sec. 2210.453. FUNDING LEVELS; REINSURANCE AND ALTERNATIVE RISK FINANCING MECHANISMS; REINSURANCE FROM CERTAIN INSURER OR BROKER PROHIBITED.

(a) The Association may purchase reinsurance or use alternative risk financing mechanisms or both as necessary.

(b) The Association shall maintain total available loss funding in an amount not less than the probable maximum loss for the Association for a catastrophe year with a probability of one in 100. If necessary, the required funding level shall be achieved through the purchase of reinsurance or the use of alternative financing mechanisms, or both, to operate in addition to or in concert with the trust fund, public securities, financial instruments, and assessments authorized by this chapter.

(c) The attachment point for reinsurance purchased under this section may not be less than the aggregate amount of all funding available to the Association under Subchapter B-1.

(d) The cost of the reinsurance purchased or alternative financing mechanisms used under this section in excess of the minimum funding level required by Subsection (b) shall be paid by assessments as provided by this subsection. The Association, with the approval of the commissioner, shall notify each member of the Association of the amount of the member’s assessment under this subsection. The proportion of the cost to each insurer under this subsection shall be determined in the manner used to determine each insurer’s participation in the Association for the year under Section 2210.052.

(e) A member of the Association may not recoup an assessment paid under Subsection (d) through a premium surcharge or tax credit.

(f) The Association may not purchase reinsurance under this section from an insurer or broker involved in the execution of a catastrophe model on which the association relies in:
   (1) determining the probable maximum loss applicable for the period covered by the reinsurance; or
   (2) adopting rates under Section 2210.355.
Exhibit 3
Information Required to be Disclosed to the Commissioner pursuant to §5.4160(d)

In disclosing its method for determining its one-in-100-year probable maximum loss, the association must include:

(1) the hurricane model or models it relied on, including the model vendors, the model names, and the versions of each model;

(2) the in-force date and the total amount of direct exposures in force for the policy data used as the input for each hurricane model the association relied on;

(3) all user-selected hurricane model input assumptions used with each hurricane model the association relied on;

(4) the one-in-100-year probable maximum loss model output produced by each hurricane model the association relied on;

(5) if the association relied on more than one hurricane model, the methodology the association used to blend or average the hurricane model outputs, including all weighting factors used; and

(6) any adjustments the association or another party made to the one-in-100-year probable maximum loss model outputs or the blended or averaged output, including any adjustments to include loss adjustment expenses.
Exhibit 4

Texas Administrative Code

TITLE 28  INSURANCE
PART 1  TEXAS DEPARTMENT OF INSURANCE
CHAPTER 5  PROPERTY AND CASUALTY INSURANCE
SUBCHAPTER E  TEXAS WINDSTORM INSURANCE ASSOCIATION
DIVISION 3  LOSS FUNDING, INCLUDING CATASTROPHE RESERVE TRUST FUND, FINANCING ARRANGEMENTS, AND PUBLIC SECURITIES

RULE §5.4160  Member Assessments to Pay for Reinsurance in Excess of the Association’s Statutory Minimum Funding Level

(a) The association, with the Commissioner’s approval, must assess members as provided by Insurance Code §2210.453(d) to pay for the cost of any reinsurance coverage or alternative risk transfer mechanisms it purchases in excess of the statutory minimum funding level. If, in a calendar year, the association must assess its members under Insurance Code §2210.453(d),

1. then the association must request the Commissioner’s approval within a reasonable time after it knows its total reinsurance costs for that calendar year; and

2. must issue the assessment by the later of either:

   (A) 120 days after the date the association receives the data that TDI provides under §5.4162(f) of this title for that year; or

   (B) December 1 of that year.

(b) At the first regular board meeting in each calendar year, but before April 1, the association must discuss with the board its methodology for determining its one-in-100-year probable maximum loss for the calendar year. In discussing its methodology, the association must provide the information described in subsection (d) of this section and make that information available to its members and the public.

(c) After the board meeting described in subsection (b) of this section, but not later than April 1 of each year, the association must disclose to the Commissioner its one-in-100-year probable maximum loss for the calendar year and the association’s method for determining that probable maximum loss.

(d) In disclosing its method for determining its one-in-100-year probable maximum loss, the association must include:

1. the hurricane model or models it relied on, including the model vendors, the model names, and the versions of each model;
(2) the in-force date and the total amount of direct exposures in force for the policy data used as the input for each hurricane model the association relied on;

(3) all user-selected hurricane model input assumptions used with each hurricane model the association relied on;

(4) the one-in-100-year probable maximum loss model output produced by each hurricane model the association relied on;

(5) if the association relied on more than one hurricane model, the methodology the association used to blend or average the hurricane model outputs, including all weighting factors used; and

(6) any adjustments the association or another party made to the one-in-100-year probable maximum loss model outputs or the blended or averaged output, including any adjustments to include loss adjustment expenses.

(e) The department will post the information disclosed under subsections (c) and (d) of this section on its website.

(f) If, in a year, the association elects to purchase coverage for reinsurance or alternative risk transfer mechanisms in excess of the one-in-100-year probable maximum loss, then the association must also obtain a quote for coverage that provides funding equal to the one in 100-year probable maximum loss. The premium quote must assume the minimum required attachment point described in Insurance Code §2210.453(c).

(g) No later than the second regular board meeting of the calendar year, the association must provide each of the following to its board and make this information available to its members and the public:

(1) the reinsurance or alternative risk transfer mechanism premium quote required under subsection (f) of this section; and

(2) the total deposit premiums for all reinsurance or alternative risk transfer mechanism coverage for the year.

(h) If, at the time of the second regular board meeting of the calendar year, deposit premiums described in subsection (g) of this section are not known, then the association must provide its best estimate of those premiums to the board and make the estimate available to its members. As soon as the association knows the deposit premiums described in subsection (g) of this section, the association must provide them to the board and make them available to its members.

(i) In its request to the Commissioner to approve an assessment under Insurance Code §2210.453(d), the association must submit the following information:

(1) the portion of the association's reinsurance premium that provides coverage for losses or loss adjustment expenses above the association's one-in-100-year probable maximum loss; and

(2) the methodology the association used to calculate the amount described in paragraph (1) of this subsection.

(j) This section and §§5.4161 - 5.4167 of this title (relating to Member Assessments Other than for Reinsurance in Excess of the Association's Statutory Minimum Funding Level; Amount of Assessment; Notice of Assessment; Payment of Assessment; Failure to Pay Assessment; Contest After Payment of Assessment; and Inability to Pay Assessment by Reason of Insolvency, respectively) are a part of the association's plan of operation and will control over any conflicting provision in §5.4001 of this title (relating to Plan of Operation).
(k) Sections 5.4162 - 5.4167 of this title apply both to member assessments under this section and under §5.4161 of this title.

Source Note: The provisions of this §5.4160 adopted to be effective January 6, 2021, 46 TexReg 162
## Multi-Model Comparison – All Perils

Combined Hurricane (Near-Term) & Severe Conv. Storm AEP Gross Losses

### AEP - All Perils (Near-Term/ Warm Sea Surface Temperature)

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<thead>
<tr>
<th>Return Period</th>
<th>AIR v9</th>
<th>RMS v21</th>
<th>IF v15</th>
<th>RQE v21</th>
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<tr>
<td>1000 yr</td>
<td>11,392.5</td>
<td>9,953.5</td>
<td>8,009.2</td>
<td>8,980.7</td>
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<tr>
<td>500 yr</td>
<td>9,900.7</td>
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<td>6,927.3</td>
<td>7,201.1</td>
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<tr>
<td>250 yr</td>
<td>7,106.8</td>
<td>5,095.2</td>
<td>5,512.0</td>
<td>5,557.9</td>
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<tr>
<td>200 yr</td>
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<td>4,523.3</td>
<td>4,963.2</td>
<td>5,042.1</td>
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<td>100 yr</td>
<td>4,540.4</td>
<td>3,091.5</td>
<td>3,601.0</td>
<td>3,502.0</td>
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<tr>
<td>50 yr</td>
<td>2,612.5</td>
<td>1,932.2</td>
<td>2,353.0</td>
<td>2,124.7</td>
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<tr>
<td>25 yr</td>
<td>1,342.3</td>
<td>1,093.6</td>
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<td>20 yr</td>
<td>1,077.0</td>
<td>891.3</td>
<td>1,121.5</td>
<td>853.7</td>
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<tr>
<td>Annual avg</td>
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<td>191.2</td>
<td>220.2</td>
<td>182.4</td>
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<tr>
<td>Std dev</td>
<td>908.6</td>
<td>748.5</td>
<td>725.5</td>
<td>709.5</td>
</tr>
</tbody>
</table>

US $ in Millions

Including Demand Surge, Excluding Storm Surge
Limitations Regarding Use of Catastrophe Models

This report includes information that is output from catastrophe models of AIR Worldwide Corporation (AIR) and Risk Management Solutions, Inc. (RMS). The information from the models is provided by Aon Benfield Inc. (Aon) under the terms of its license agreements with AIR and RMS.

The results in this report from AIR and RMS are the products of the exposures modeled, the financial assumptions made concerning insurance terms such as deductibles and limits, and the risk models that project the dollars of damage that may be caused by defined catastrophe perils. Aon recommends that the results from these models in this report not be relied upon in isolation when making decisions that may affect the underwriting appetite, rate adequacy or solvency of the company.

The AIR and RMS models are based on scientific data, mathematical and empirical models, and the experience of engineering, geological, meteorological and terrorism experts. Calibration of the models using actual loss experience is based on very sparse data, and material inaccuracies in these models are possible. The loss probabilities generated by the models are not predictive of future hurricanes, other windstorms, or earthquakes or other natural or man-made catastrophes, but provide estimates of the magnitude of losses that may occur in the event of such catastrophes.

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Texas Windstorm Insurance Association
Meeting of the TWIA Board of Directors
March 22, 2022
2022 Property Cat Market Conditions

Favorable market conditions for cat reinsurance buyers:
- Capacity remains elevated, although a majority of reinsurers shifted up programs focusing capacity utilization on layers above the 1-in-20 return period
- Competing market with traditional vs. ILS (Cat Bonds)
- ROLs still well below 2008 - 2012 levels

An abundance of headwinds in 2022:
- All major reinsurers have reduced net PML in 2022
- Another large rate increase pushed through the market at 1/1
- Record cat losses in 2020 & 2021
- Inflation on loss trend
- Interest rates begin to compete for risk assets
- Currency exchange rates may impact certain European capital levels

<table>
<thead>
<tr>
<th>US Nationwide</th>
<th>Risk Adjusted Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cat loss free % change</td>
<td>+2.5% to +10%</td>
</tr>
<tr>
<td>Cat loss hit % change</td>
<td>+10% to +25%</td>
</tr>
</tbody>
</table>
Cat Bond Market Update
US Diversifiers continue to deliver improved terms for sponsors

Weighted Average Cat Bond Margin has tightened over the past year

US Diversifiers deliver improved terms for sponsors across 2021

Size available for US diversifiers has been notable

Of the 15 largest cat bonds issued since 2021 exposed to US Wind and Multi-Perils, over half have either been regional diversifiers, or had minimal or no Floridian risk — as highlighted in the table opposite

Total Issuance: US Diversifying/Non-FL vs FL Cat Bonds

Source: Industry publications, Transaction Database and internal estimates as of 12/31/2021

1) Issuer disregards fronting arrangements where applicable
2) Note that the bold and represent regional diversifying or minimal/no Floridian exposure risk contribution
2021 Program vs Preliminary 2022

2021 Funding Structure

<table>
<thead>
<tr>
<th>Amount</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$4.03 Billion</td>
<td>1:100-Year including 15% LAE - $4.03 Billion Aggregate Loss</td>
</tr>
<tr>
<td>$2.743 Billion</td>
<td>1:100-Year $3.51 Billion Aggregate Loss</td>
</tr>
<tr>
<td>$2.10 Billion</td>
<td>$250 Million Class 3 Member Assessments</td>
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<td>$1.85 Billion</td>
<td>$250 Million Class 3 Public Securities</td>
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<tr>
<td>$1.60 Billion</td>
<td>$250 Million Class 2 Member Assessments</td>
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<td>$1.35 Billion</td>
<td>$250 Million Class 2 Public Securities</td>
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<td>$500 Million Class 1 Member Assessments</td>
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<td>$600 Million</td>
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<tr>
<td>$400 Million</td>
<td>Alamo Re II Series 2020-1 Notes</td>
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<td>$500 Million</td>
<td>Series 2021-1 Notes</td>
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<tr>
<td>$830 Million</td>
<td>Traditional Reinsurance</td>
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<tr>
<td>$200 Million</td>
<td>Alamo Re Series 2019-1 Notes</td>
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2022 Funding Structure

<table>
<thead>
<tr>
<th>Amount</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>$4.03 Billion</td>
<td>1:100-Year including LAE Aggregate Loss</td>
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<td>$250 Million Class 3 Member Assessments</td>
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<td>$600 Million</td>
<td>$500 Million Class 1 Public Securities</td>
</tr>
<tr>
<td>$400 Million</td>
<td>Alamo Re II Series 2020-1 Notes</td>
</tr>
<tr>
<td>$500 Million</td>
<td>Series 2021-1 Notes</td>
</tr>
<tr>
<td>$830 Million</td>
<td>Traditional Reinsurance</td>
</tr>
<tr>
<td>$200 Million</td>
<td>Alamo Re Series 2019-1 Notes</td>
</tr>
<tr>
<td>$250 Million</td>
<td>Series 2021-1 Notes</td>
</tr>
</tbody>
</table>

CRTF Balance ($179 Million)
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