

CSG Detailed Severe Thunderstorm Warnings

Instructions on how to prepare and issue a Detailed Severe Thunderstorm Warning, including warning escalations and concurrent warnings.

Document type	Work Instructions
Document Status	Approved
Process Group	4.2 Produce & Deliver Products
Process	4.2.1 Produce & Deliver Products
Activities (Process Level 4)	4.2.1.2 Produce and Issue Products
Approved by	s. 22 removed with consent
Date Approved	9/11/2023
Process Owner	EPS GM
Process Leader	< Program > < Role >
Review Date	1/09/2024

RELEASED UNDER FREEDOM OF INFORMATION

Contents

CSG Detailed Severe Thunderstorm Warnings.....	1
1. Systems & Tools	4
2. Work Instructions.....	4
2.1. Severe Thunderstorm Service	4
2.2. Detailed Severe Thunderstorms Warnings	4
2.3. Prepare and Issue Detailed Severe Thunderstorm Warnings	4
2.3.1. Region and Product Selection	4
2.3.2. Cell Identification	5
2.3.2.1. Thunderstorm Interactive Forecasting System	5
2.3.2.2. Manual Cell Creation and Tracking	6
2.3.3. Immediate Threat Areas	7
2.3.3.1. Autogenerated Immediate Threat Areas.....	7
2.3.3.2. Manual Immediate Threat Areas	8
2.3.4. Detailed Severe Thunderstorm Warning Content	8
2.3.5. Issuing Detailed Severe Thunderstorm Warnings	9
2.3.6. Cancelling Detailed Severe Thunderstorm Warnings	9
2.3.7. Suspension of Detailed Severe Thunderstorm Warnings	10
2.3.8. Very Dangerous Storm	10
2.3.8.1. Issue Criteria	10
2.3.8.2. Including Label	11
2.3.8.3. Excluding Label	11
2.3.9. Emergency Warning Escalations.....	12
2.3.9.1. Standard Emergency Warning Signal.....	12
2.3.9.1.1. Requesting the use of the Standard Emergency Warning Signal	13
2.3.9.1.2. Cancelling the Standard Emergency Warning Signal Request.....	13
2.3.9.2. Emergency Weather Alerts.....	14
2.3.10. Concurrent Warnings.....	14
2.3.10.1. Severe Thunderstorm Warnings and Severe Weather Warnings	14
2.3.10.1.1. Separate Severe Thunderstorm Warnings	14
2.3.10.1.2. Issue Criteria	14
2.3.10.1.3. Cancellations	15
2.4. Communication	15
2.4.1. Heads Up	15
2.4.2. Brief and Advise	16
2.4.3. Formal Sign Off	16
2.5. Appendix	17
2.5.1. Warning Content.....	17
2.5.1.1. Title.....	17
2.5.1.2. Issuance Time	17
2.5.1.3. Headline Statement	17
2.5.1.4. Graphical Warning Content	17
2.5.1.5. Weather Situation	17
2.5.1.6. Warning Details	17
2.5.1.7. Observations	17
2.5.1.8. Action Statements	18
2.5.1.9. Warning Updates.....	18
2.5.1.10. Warning Accessibility.....	18
2.5.2. Product Examples	19
3. Related Documents	21
4. Document Control	21

4.1. Approvals	Error! Bookmark not defined.
4.2. Version Control.....	Error! Bookmark not defined.

RELEASED UNDER FREEDOM OF INFORMATION

1. Systems & Tools

1. Interactive Forecasting System (TIFS).
2. Visual Weather (VW).
3. Microsoft Teams (MS Teams).

2. Work Instructions

2.1. Severe Thunderstorm Service

The Severe Thunderstorm Warning (STW) service is used whenever there is sufficient meteorological evidence to suggest one or more of the following:

- Severe thunderstorm development is likely
- Severe thunderstorm is likely to move into the STW domain
- Severe thunderstorm has been directly reported or observed
- Severe thunderstorm is inferred through various observational datasets

Occasionally, deep moist convective cells that are not producing lightning will be capable of producing severe or even high-end severe phenomena. Although such cells are not technically thunderstorms, the use of the STW service is still appropriate. For the purposes of this document, “severe thunderstorm” can be taken to mean “severe deep, moist convective cell” whether or not lightning is present.

Phenomena definitions associated with severe thunderstorms (STS) are listed in the [Thunderstorm and Severe Weather Service Level Specifications](#).

2.2. Detailed Severe Thunderstorms Warnings

The Bureau provides Detailed STW for all capital cities and surrounding areas. They provide time and location-specific information about the STS threat. The yellow shaded area represents a current Regional STW area that may consist of all, or part of one, or several weather forecast districts, or local government areas (LGA). The red shaded ellipses correspond to existing STS with red arrows overlain by red arcs indicating forecast direction and position at 10-minute intervals. Areas under immediate threat from the existing STS are represented by orange-hashed shaded polygons. Multiple examples of Detailed STW are listed in Appendix 2.5.2.

Detailed STW are issued when one or more STS are detected within the warning domain, or an existing thunderstorm is forecast to become severe within the next 30 or 60 minutes. They are also issued when an STS outside the warning domain is expected to move into the area.

A Detailed STW can only be issued if there is a Regional STW current over the respective Detailed STW domain. If there is only one cell or the immediate threat area is small, a Regional STW is still required. The exception to this rule applies when high-end severe phenomena are occurring or expected to occur within a Severe Weather Warning (SWW) area that resides over the detailed STW region. For more information on concurrent warnings, see Section 2.3.10.1.

Detailed STW are valid for 60 minutes from the issuance time and should be updated at least every 30 minutes.

If a current Detailed STW does not adequately describe the situation, it should be updated immediately. Examples for when this is necessary are an escalation or de-escalation of the hazard threat or a change in the communities expected to be impacted.

Detailed STW should be cancelled when STS move offshore or out of the detailed STW warning domain, or dissipate, and no further STS development is expected.

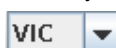
2.3. Prepare and Issue Detailed Severe Thunderstorm Warnings

Detailed STW are to be prepared and issued by Thunderstorm and Heavy Rainfall (TSHR) and National Production (NP) using TIFS.

In TIFS, a Detailed STW consists of a variety of sections that highlight threat areas and potential phenomena in a graphical and textual format. Manual intervention is required for the headline statement, graphical warning content, selection of phenomena, observations, and if required, relevant Standard Emergency Warning Signal (SEWS) text, or warning details when Very Dangerous Storms (VDS) are occurring or expected to occur. The remaining sections are autogenerated by TIFS or not required.

2.3.1. Region and Product Selection

1. Click Region to Load and select your respective state or territory.



2. Click Product and select Detailed STW.

Melbourne Detailed STW

2.3.2. Cell Identification

For any cells identified on the [Graphical Editor](#) that warrants a warning, their shape and orientation should represent the thunderstorm on radar as closely as possible. The cell's forecast track should also accurately represent what is currently occurring and what may take place over the next 60 minutes. On days where left or right-moving supercells are anticipated, it is recommended to incorporate the estimated Bunkers storm motion vectors (SMV) into warning strategies to establish a more likely cell motion.

Thunderstorm Identification, Tracking, Analysis and Nowcasting (TITAN) output is to be used when it appropriately identifies and represents the cell on the [Graphical Editor](#). Otherwise, manual cell creation via the [Cell Property Editor](#) is recommended.

2.3.2.1. Thunderstorm Interactive Forecasting System

1. Click Age of Cells and select Latest Only to view the latest location of all cells that are detected within the radar network.

Latest only

2. Select the GPATS [Feature](#) to view the most recent lightning data.

Features	
Name	Arrival Time
GPATS	04:46 UTC

3. Filter out Cells you do not wish to warn for by adjusting the following tools:

- Click Height of Cells of Display and select minimum thunderstorm height.

Any height

- Click Any VIL and select minimum vertical integrated liquid (VIL) associated with the thunderstorm or thunderstorms. VIL of 50 kg/m² is typically used for thunderstorms during the warm season, particularly across the tropics and subtropics.

Any VIL

4. Delete all remaining unwanted cell by using one of the following options:

- Select the unwanted cells on the [Graphical Editor](#) or listed [Storm Guidance](#) then click the **Delete** button.



- Select the unwanted cell on the [Graphical Editor](#) or [Storm Guidance](#) then click **Delete Cell** within the [Cell Property Editor](#).

TIFS Cell Property Editor

Identification	Latitude:	-37.806	⏪ ⏩ ⏴ ⏵
Tracking	Longitude:	145.051	⏪ ⏩ ⏴ ⏵
Intensity	Major Radius:	7.964	⏪ ⏩ ⏴ ⏵
Shape	Minor Radius:	6.636	⏪ ⏩ ⏴ ⏵
Information	Orientation:	0	⏪ ⏩ ⏴ ⏵

Delete Cell Close

5. Click and select the intended Forecast Length. Detailed STW will use the default cell forecast track length of 60 minutes. If high uncertainty on the evolution of the cell exists, or the cell is confidently expected to weaken before the 60-minute period, then the forecast track length can be shortened to 30 minutes.

60 minute forecast

6. If the cell's shape, orientation, and forecast track are not adequately represented on the [Graphical Editor](#), utilise [Track Sources](#) to generated more accurate representations of each cell.

- Under [Track Sources](#), select Radar 35 for broader cells and tracks.
- Under [Track Sources](#), select Radar 40 for more compact cells and tracks.
- Under [Track Sources](#), select Radar 45 for more compact and detailed cells and tracks.

▼ Track Sources	
Name	Arrival Time
Serptine 35	00:59 UTC
Serptine 40	00:59 UTC
Serptine 45	00:59 UTC
Halls Creek 35	00:59 UTC
Halls Creek 40	00:59 UTC
Halls Creek 45	00:59 UTC

2.3.2.2. Manual Cell Creation and Tracking

- When TITAN does not represent a cell adequately, click Add Cell to add a new cell on the [Graphical Editor](#).



- Manually adjust the cell's position and forecast track by using the cursor.
 - Drag the cell to the appropriate location on the [Graphical Editor](#).
 - On the [Graphical Editor](#), select the forecast track and drag it until it represents a more suitable forecast track, this includes adjustments to direction and speed.



- If the cursor adjustment process outline above in step 2 is not preferred, adjust the cell's intensity, position and forecast track in the [Cell Property Editor](#).

- Select [Tracking](#) and enter (or manually adjust using the arrow buttons) the Speed (km/h) to adjust the cell's forecast speed. Similarly, enter (or manually adjust using the arrow buttons) the Direction to adjust the cell's forecast direction.

TIFS Cell Property Editor

Identification	Speed (km/hr):	13.273	◀◀ ◀ ▶ ▶▶
Tracking	Direction:	90	◀◀ ◀ ▶ ▶▶
Intensity	lifetime	60 Min Fcst ▼	
Shape			
Information			

Delete Cell Close

- Select [Intensity](#) and manually adjust the cell's VIL, Height of Top and/or Max Reflectivity.

TIFS Cell Property Editor

Identification	VIL	60
Tracking	top	10
Intensity	max_dbz	50
Shape		
Information		

Delete Cell Close

- Select [Shape](#) and manually adjust the cell's Latitude and Longitude (Location), Major Radius and Minor Radius (Shape), and Orientation.

4. Delete all remaining unwanted cell by using one of the following options:

- Select the unwanted cells on the [Graphical Editor](#) or listed [Storm Guidance](#) then click the Delete button.



- Select the unwanted cell on the [Graphical Editor](#) or [Storm Guidance](#) then click Delete Cell within the [Cell Property Editor](#) (above).

2.3.3. Immediate Threat Areas

The immediate threat area should always cover the red shaded ellipse that symbolises the cell. In addition, it should only cover the red arcs that corresponds to the cell's forecast track.

Autogenerated immediate threat area is now the preferred method in producing immediate threat areas in TIFS. In the rare event where the meteorologist is required to manually draw the immediate threat area, as outlined below in Section 2.3.3.2., the following scenarios should be avoided to prevent erroneous and confusing warning graphics:

- An immediate threat area that is behind the cell and not bounded by the cell's red shaded ellipse.
- A large immediate threat area for a comparatively small cell.
- An unrealistic cell size that covers a large portion of the Detailed STW domain. There may be cases where a lengthy squall line or quasi-linear convective system is crossing or expected to move into the Detailed STW domain and require a large cell. In such instances, there are usually fragments within the mesoscale convective system (MCS) that can be highlighted and warned for instead of the whole MCS itself.

2.3.3.1. Autogenerated Immediate Threat Areas

1. Click the Add Area button then click again on the cell in question on the [Graphical Editor](#) to draw an immediate threat area around the cell and prescribed forecast track.



2. Click the Filter Storms Outside of Threat Areas button to remove all cells that do not reside within an immediate threat area.



3. To undo the removal of cells and re-show all deleted cells (in the event of mistakes or if one wishes to include subsequent cells in the warning), click the Show all Cells button. *Undo can also be used to revert a single step such as the manual deletion of a cell or any mistakes made in defining threat areas.*

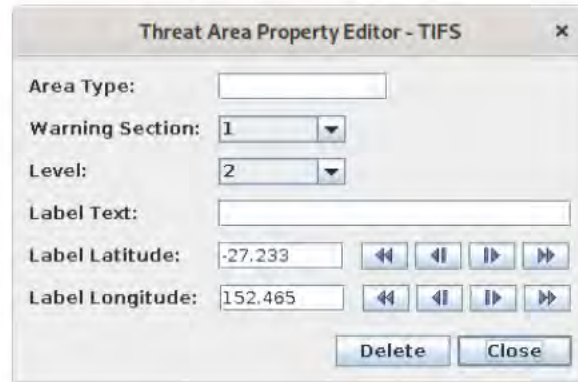


4. Delete all remaining unwanted immediate threat areas by using one of the following options:

- Select the unwanted immediate threat area on the [Graphical Editor](#) or [Threat Area Guidance](#) then click the Delete button.



- Select the unwanted immediate threat area on the [Graphical Editor](#) or [Threat Area Guidance](#) then click Delete within the [Threat Area Property Editor](#).



Threat Area Property Editor - TIFS

Area Type:

Warning Section:

Level:

Label Text:

Label Latitude:

Label Longitude:

2.3.3.2. Manual Immediate Threat Areas

1. Click the Add Area button then click again and hold on the [Graphical Editor](#) to draw an immediate threat area.



2. Click the Edit Area button then click again in an existing immediate threat area to edit.

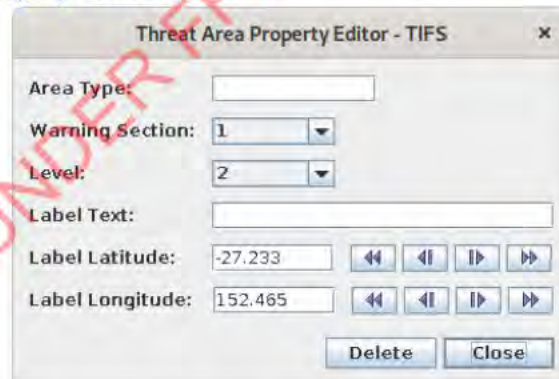


3. Click the Selection/Manipulation button to move the existing immediate threat area. This button can also be used to select other areas.



4. Delete all unwanted immediate threat areas by using one of the following options:

- Select the unwanted immediate threat area on the [Graphical Editor](#) or listed [Threat Area Guidance](#) then click the Delete button.
- Select the unwanted immediate threat area on the [Graphical Editor](#) or listed [Threat Area Guidance](#) then click Delete within the [Threat Area Property Editor](#).

Threat Area Property Editor - TIFS

Area Type:

Warning Section:

Level:

Label Text:

Label Latitude:

Label Longitude:

2.3.4. Detailed Severe Thunderstorm Warning Content

The following information highlights what sections within a Detailed STW may require attention and manual intervention. Guidance on the written content is in Appendix 2.5.1.

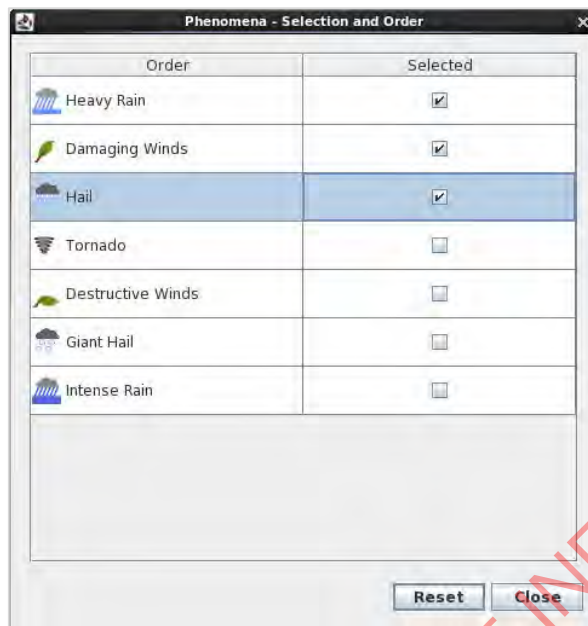
1. Click on a Phenomenon to add a severe and/or high-end severe threat.



Phenomenon	Text
H	large hailstones
H+	giant hailstones
H/H+	large, possibly giant hailstones
W	damaging winds
W+	destructive winds
W/W+	damaging, locally destructive winds
R	heavy rainfall
R+	intense rainfall
R/R+	heavy, locally intense rainfall
T	Tornadoes and destructive winds

Table 1: Autogenerated text for phenomena selection

2. If multiple phenomena are to be included in the Detailed STW, order the phenomena by the forecast level of threat from highest to lowest. Under the Options menu, click Phenomena and drag individual phenomena up or down the pop-up table.



3. Write an appropriate [Headline Statement](#) in the Headline section.

Headline	
-----------------	--

4. Check the list of locations and if required, manually modify and/or change the level of detail.

- Click the Detailed More button (up arrow) to increase the number of places mentioned in the warning text and graphic.
- Click the Detailed Less button (down arrow) to decrease the number of places mentioned in the warning text and graphic.



5. List all significant weather [Observations](#) in the Observations/Other section.

Obs/Other	
------------------	--

2.3.5. Issuing Detailed Severe Thunderstorm Warnings

1. If text has been added or autogenerated text has been modified, click the Check Spelling button.



2. Click the Save button to save all graphical and text data.



3. Click the Preview button to preview how the warning will look online as a live product.



4. Click the Issue button to send the STW. Be sure to double check pre-selected address zones before pressing Issue in the pop-up box.



5. Click Auto Refresh to monitor product. Turn off when updates or cancellations are required.



2.3.6. Cancelling Detailed Severe Thunderstorm Warnings

1. Click the Cancel Warning button to cancel the Detailed STW.



2. If applicable, contextualise or delete the [Headline Statement](#) in the Headline section.

Headline	
-----------------	--

3. If text has been added or autogenerated text has been modified, click the Check Spelling button.



4. Click the Save button to save all graphical and text data.



5. Click the Preview button to preview how the warning will look online as a live product.



6. Click the Issue button to send the Detailed STW. Be sure to double check pre-selected address zones before pressing Issue in the pop-up box.



7. Click Auto Refresh to monitor product. Turn off when new warnings are required.



2.3.7. Suspension of Detailed Severe Thunderstorm Warnings

When the threat of STS has eased within a metropolitan area but further development is possible within the next 60 minutes, and the Regional STW which includes the Detailed STW area remain current, the Detailed STW will be suspended. This will exclude cells and immediate threat areas while the text of the suspended warning will advise that STS have eased but the situation will be closely monitored.

Only once no further STS are anticipated, the Detailed STW will be cancelled, following an update of the Regional STW to remove the Detailed STW area.

1. Click the Suspend Warning button to momentarily delay the cancellation of the Detailed STW. *Autogenerated text will arise in the Situation ([Weather Details](#)) section where some modifications will be required – see step 3 below for the relevant text.*



2. If applicable, contextualise or delete the [Headline Statement](#) in the Headline section.

Headline	
-----------------	--

3. If text has been added or autogenerated text has been modified, click the Check Spelling button.



4. Click the Save button to save all graphical and text data.



5. Click the Preview button to preview how the warning will look online as a live product.



6. Click the Issue button to send the Detailed STW. Be sure to double check pre-selected address zones before pressing Issue in the pop-up box.



7. Click Auto Refresh to monitor product. Turn off when new warnings are required.



2.3.8. Very Dangerous Storm

2.3.8.1. Issue Criteria

If there is an expectation or a report of one or more high-end severe phenomena, a label that states **'This thunderstorm is very dangerous'** will be added to the Detailed STW graphic. The warning details section will also declare that a VDS has been detected on the weather radar with an updated list of high-end severe phenomena. An example is listed in Appendix 2.5.2.

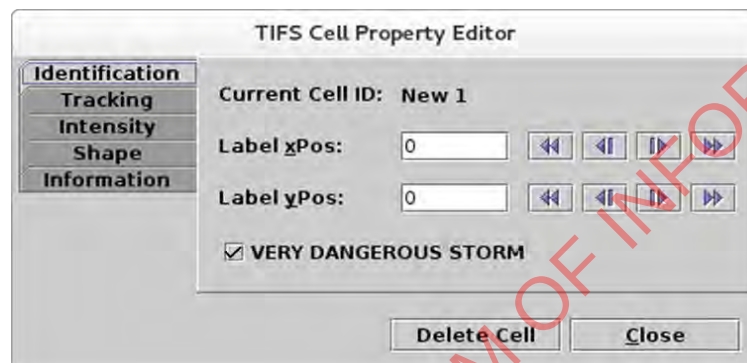
The following radar evidence may be used to justify the inclusion of the VDS label:

- supercell signatures
- destructive (>34 m/s) or near-destructive winds below 1000m on Doppler
- a moderate or strong mesocyclone
- a persistent area of significant Rainfields accumulation values coinciding with high to very high Specific Differential Phase (KDP)
- sufficiently high Maximum Estimated Size of Hail (MESH) values, considering the structure of the thunderstorm, radar characteristics and the environment

Once the threat of high-end severe phenomena has passed, the label and corresponding text will be excluded from the graphic.

2.3.8.2. Including Label

1. To include the VDS label in the Detailed STW, navigate to the [Cell Property Editor](#) and select [Identification](#) then tick **VERY DANGEROUS STORM**.



2. Enter (or manually adjust using the arrow buttons) the **Label xPos** and **Label yPos** to shift the position of the VDS label. **IMPORTANT:** Ensure the that the label does not impede the view of any warned cells and their forecast tracks and immediate threat areas.
3. If included (optional), contextualise, and uppercase the [Headline Statement](#) in the Headline section.

Headline	
----------	--

4. If text has been added or autogenerated text has been modified, click the Check Spelling button.



5. Click the Save button to save all graphical and text data.



6. Click the Preview button to preview how the warning will look online as a live product.



7. Click the Issue button to send the Detailed STW. Be sure to double check pre-selected address zones before pressing Issue in the pop-up box.



8. Click Auto Refresh to monitor product. Turn off when new warnings are required.



2.3.8.3. Excluding Label

1. To exclude the VDS label from the Detailed STW, navigate to the [Cell Property Editor](#) and click on [Identification](#) then untick **VERY DANGEROUS STORM**.
2. If included (optional), contextualise, and lowercase the [Headline Statement](#) in the Headline section.

Headline	
----------	--

3. If text has been added or autogenerated text has been modified, click the Check Spelling button.



4. Click the Save button to save all graphical and text data.



5. Click the Preview button to preview how the warning will look online as a live product.



6. Click the Issue button to send the Detailed STW. Be sure to double check pre-selected address zones before pressing Issue in the pop-up box.



7. Click Auto Refresh to monitor product. Turn off when new warnings are required.



2.3.9. Emergency Warning Escalations

The Bureau has two major emergency warning escalations; The SEWS and Emergency Weather Alerts (EWA). These warning escalations vary depending on state or mainland territory agreements. Each warning has its specific purpose, designed to obtain an appropriate response from our customers and the community, as well as promote the dispersion of the urgent safety messages through media and Hazard Management Agency (HMA) channels.

2.3.9.1. Standard Emergency Warning Signal

The SEWS is a wailing siren sound used as an alerting signal in Queensland, Victoria, and Tasmania. The SEWS is designed to alert the community to the broadcast of an urgent safety message relating to a VDS with **one or more confirmed high-end severe phenomena** on the Australian Broadcasting Corporation (ABC) radio stations. The signal is sounded immediately prior to an emergency warning message being played on ABC broadcasts, in the potential or likely impacted areas. As part of a coordinated national emergency plan, the SEWS is used to attract attention to emergency warnings.

The Bureau of Meteorology can request the use of the SEWS by including a standardise SEWS statement in a STW. In the event where a request is warranted, SEWS text will be added above the title section on either or both Regional and Detailed Severe Thunderstorm Warnings. It will explicitly state the major towns, suburbs, cities or LGA where the SEWS will be directed, transmitted, and broadcast on the ABC.

The official activation of the SEWS is at the discretion of the ABC.

Issue Criteria

The following criteria is to be satisfied before requesting the use of the SEWS:

- A confirmed report of one or more high-end severe phenomena by a reliable source such as a Bureau observer, automatic weather station, storm spotter and/or trustworthy social media outlet
- It is of sufficient scale where a significant number of people will be warned. This includes all towns and cities that have a designated Bureau forecast ([Queensland](#), [Victoria](#) and [Tasmania](#)), and all areas within the respective Detailed STW domain
- Is expected to continue for 30 minutes or more

Once the SEWS has been requested, the SEWS will continue until all VDS convective regions that can be identified and tracked using radar and/or satellite has ceased, even when all VDS convective regions have moved away from all towns and cities that have a designated Bureau forecast, or areas within the respective Detailed STW domain.

Responsible Officers and Request Authority

In the event where a SEWS request is warranted, the TSHR Operational Lead (Op-Lead) must obtain approval from the National Production Operational Lead (NPOL).

In the rare event that a SEWS request is warranted and no TSHR Op-Leads are onsite and/or online, the NPOL will have the authority to unilaterally request the use of the SEWS. The NPOL will monitor the situation until a TSHR Op-Lead is onsite and/or online.

Pre-approval

When the National TS Outlook indicates possible high-end severe phenomena over Queensland, Victoria, or Tasmania, the TSHR Op-Lead is to seek pre-approval from the NPOL. Pre-approval can be requested in the morning's [National Collaboration Meeting](#) or via MS Teams in the [EPS_TSHR](#) channel.

In Office Hours

The TSHR Op-Lead must inform Decision Support Services (DSS) when requesting the use of the SEWS, preferably before issuing the STW. In Queensland, DSS is to call the State Disaster Coordination Centre (SDCC), Queensland Police Service (QPS) and the ABC to undertake emergency procedures and broadcasts.

Once all conditions warranting the use of the SEWS request have eased, the TSHR Op-Lead must provide a notification of cancellation to DSS. In Queensland, a subsequent call to the SDCC, QPS and the ABC should then be made by DSS.

For contact details for all emergency services, navigate to the [TSHR Contacts](#) SharePoint page.

Out of Office Hours

In the absence of DSS, the TSHR Op-Lead will call the NPOL after requesting the use of the SEWS and provide a summary on the unfolding situation. This will enable NPOL to liaise with respective state-based customers and emergency services.

TSHR Op-Lead or NPOL should contact HPR managers by either a phone call or text to advise them on the unfolding situation.

In the rare event that a SEWS request is warranted and TSHR and DSS are not onsite and/or online, the NPOL will assume all duties.

2.3.9.1.1. Requesting the use of the Standard Emergency Warning Signal

If the confirmed VDS threat is confined to the Detailed STW domain, then the SEWS statement should only be included on the Detailed STW. If the confirmed VDS threat extends outside the Detailed STW domain (e.g., a VDS moving into or out of the Detailed STW domain), then the SEWS notification should appear on both the Detailed and Regional STW.

1. Click the SEWS button in the [Warning Text Editor](#) to request the use of the SEWS and the inclusion of the corresponding statement in the Detailed STW.



2. Overwrite the 11 consecutive dots by listing all major towns, suburbs, cities, or local government areas in the SEWS section.

SEWS	Transmitters serving the area are REQUESTED TO USE THE STANDARD EMERGENCY WARNING SIGNAL BEFORE BROADCASTING THIS MESSAGE.
-------------	--

3. Contextualise and uppercase the [Headline Statement](#) in the headline section.

Headline	
-----------------	--

4. List all significant weather [Observations](#) in the **Observations/Other** section, including the high-end severe observation or report that warranted the activation of the SEWS.

Obs/Other	
------------------	--

5. If text has been added or autogenerated text has been modified, click the Check Spelling button.



6. Click the Save button to save all graphical and text data.



7. Click the Preview button to preview how the Detailed STW will look online as a live product.



8. Click the Issue button to send the Detailed STW. Be sure to double check pre-selected address zones before pressing Issue in the pop-up box.



9. Click Auto Refresh to monitor product. Turn off when new warnings are required.



2.3.9.1.2. Cancelling the Standard Emergency Warning Signal Request

1. Click the SEWS button to cancel the SEWS request and exclude the **SEWS** statement from the Detailed STW. All SEWS text in the [Warning Text Editor](#) will be automatically deleted.



2. Contextualise and lowercase (if all high-end severe threats have ceased) the [Headline Statement](#) in the headline section.

Headline	
-----------------	--

3. If text has been added or autogenerated text has been modified, click the Check Spelling button.



4. Click the Save button to save all graphical and text data.



5. Click the Preview button to preview how the warning will look online as a live product.



6. Click the Issue button to send the Detailed STW. Be sure to double check pre-selected address zones before pressing Issue in the pop-up box.



7. Click Auto Refresh to monitor product. Turn off when new warnings are required.



2.3.9.2. Emergency Weather Alerts

An EWA is a verbal notification provided to the QPS and the SDCC in Queensland. It is done at the forecaster's discretion when they believe there are special circumstances requiring notification of emergency services but there is insufficient evidence such as a confirmed high-end severe report to trigger a request of the SEWS. An EWA should never be used with SEWS concurrently.

An EWA can be invoked for any area across Queensland, irrespective of known population or designated Bureau forecasts.

Issue Criteria

- Radar evidence suggests one or more high-end severe phenomena is likely to be occurring.

Responsible Officers and Invocation

When an EWA is warranted, the TSHR Op-Lead authorises its use.

In office hours

TSHR is to inform DSS that an EWA is to be invoked. DSS is to call the SDCC and QPS to alert them using the specific phrase "Emergency Weather Alert". The potential high-end severe phenomena and their impacts should also be mentioned during this brief call.

Once all conditions warranting the use of an EWA have eased, the TSHR must provide a notification of cancellation to DSS. A subsequent call to the SDCC and QPS should then be made by DSS.

Out of office hours

In the absence of DSS, TSHR or NP will assume all duties outlined above.

In the rare event that an EWA is warranted and TSHR and DSS are not onsite and/or online, the NPOL will assume all duties.

2.3.10. Concurrent Warnings

2.3.10.1. Severe Thunderstorm Warnings and Severe Weather Warnings

2.3.10.1.1. Separate Severe Thunderstorm Warnings

A separate STW is a Detailed or Regional STW that is issued over an accompanying SWW. This overlapping product is used to warn for a hazard that is not included in an accompanying SWW or provide increased geographical detail for areas under effect of a high-end severe hazard.

If a severe or high-end severe hazard is expected to remain exclusively within the Detailed STW domain, a Detailed STW will be issued without an accompanying Regional STW. If outside the Detailed STW domain, a Regional STW will be issued. If the severe or high-end severe hazard extends outside the Detailed STW domain (e.g., Very Dangerous Thunderstorm) moving into or out of the Detailed STW domain, then both Detailed and Regional STW will be issued until one of the products can be cancelled.

2.3.10.1.2. Issue Criteria

If either of the following conditions are satisfied, a separate STW will be issued over the accompanying SWW.

1. A hazard, other than those already included in the SWW, is occurring, or expected to occur and is linked to convective regions that can be identified and tracked using radar and/or satellite. For example:
 - Large or giant hail
 - Tornadoes (supercell, shear zone and QLCS mesovortices)

2. A high-end severe hazard is occurring, or expected to occur and is linked to convective regions that can be identified and tracked using radar and/or satellite. For example:
 - Destructive wind gusts
 - Intense rainfall
 - Tornadoes (supercell, shear zone and QLCS mesovortices)

In the rare situation where only a high-end severe hazard is included in a SWW (e.g., significant cold front over southwestern Western Australia that produces widespread destructive wind gusts), a separate STW is not required.

2.3.10.1.3. Cancellations

1. When cancelling a standard STW when a SWW is still in effect, the following text is to be used in the STW cancellation to convey the continued risk of severe weather within the warning area.

Severe thunderstorms are no longer occurring over [state / districts / area].

The immediate threat of severe thunderstorms has passed. The situation will continue to be monitored closely and further severe thunderstorm warnings will be issued, if necessary. A separate Severe Weather Warning for [heavy rainfall / damaging winds / heavy rainfall and damaging winds] remains current over [state / districts / area]. Please refer to <http://www.bom.gov.au/warnings/>

2. When cancelling a high-end STW when a SWW is still in effect, the following text is to be used in the STW cancellation to convey the continued risk of severe weather within the warning area.

Very dangerous thunderstorms are no longer occurring over [state / districts / area].

The immediate threat of very dangerous thunderstorms has passed. The situation will continue to be monitored closely and further very dangerous thunderstorm warnings will be issued, if necessary. A separate Severe Weather Warning for [heavy rainfall / damaging winds / heavy rainfall and damaging winds] remains current over [state / districts / area]. Please refer to <http://www.bom.gov.au/warnings/>

3. In the event where a SWW is cancelled and there is a risk of STS, the following text is to be used.

Severe weather is no longer occurring over [state / districts / area]. The immediate threat of widespread severe weather has passed, and the situation will continue to be closely monitored.

There remains a risk of severe thunderstorms over [state / districts / area] [describe timing]. A separate Severe Thunderstorm Warning will be issued, if required.

2.4. Communication

2.4.1. Heads Up

The TSHR meteorologist overseeing the Detailed STW is to message the respective DSS team on MS Teams via the [EPS_TSHR](#) channel to provide a 'heads up' about the upcoming Detailed STW. The message should briefly state and outline the technical rationale informing the warning decision and meteorological insight into the short-term prognosis. They should also inform when an emergency warning escalation such as a VDS, EWA or SEWS has been activated or deactivated.

Heads up messages are required for the following Detailed STW:

- **New** New STW
- **Escalation** STW upgraded to high-end severe phenomena
- **De-escalation** STW downgraded from high-end severe phenomena
- **Cancellation** Cancelled STW
- **Suspension** Suspended STW
- **Continuation** STW with no change in status

The following are heads up examples for Detailed STW:

New Detailed STW

Hi @DSS_VIC, a Detailed STW for R and W will be issued shortly for the slow-moving multicell northwest of Melbourne Airport. Sunbury's observations and Rainfields indicate that 30-minute rainfall are approaching 10% AEP with KDP on the rise. As outlined in the TS Outlook, high LCL with moderate DMAPE will pose a risk for W.

Continuation Detailed STW

Hi @DSS_NSW_ACT, a Detailed STW for R will be updated shortly for the training convection around Newcastle and Williamtown. Most recent reflectivity and observations indicate that rainfall rates are starting to ease from the south with a clearance and likely STW cancellation looking probable in approximately 40 minutes.

Escalation Detailed STW

Hi @DSS_QLD, a VDS Detailed STW for H+ and W+ will be issued shortly for the long-track supercell moving NNE towards Ipswich. The moderate to strong mesocyclone with rotational velocity around 45kts in combination with MESH > 11 cm and ZDR < -1 is indicative of potential H+ and W+. Due to minimal activity ahead of the supercell and very favourable conditions, expect this VDS STW to be in effect for the next hour or two.

TSHR would like to invoke an EWA for Ipswich, Highvale, and Narangba. SEWS will be activated if criteria are met.

2.4.2. Brief and Advise

The DSS Operational Lead (Op-Lead) or Outposted Meteorologist will be responsible for briefing emergency services. Outside of DSS operational hours, the responsibility transfers to NP who may delegate to TSHR (workload dependent). If TSHR is not operational, NP takes over responsibility for briefing emergency services.

2.4.3. Formal Sign Off

At the end of the PM shift or agreed restriction duty, the TSHR Op-Lead or delegate is to formally transfer responsibility of the severe thunderstorm and severe weather services to NP and sign off within the [EPS_TSHR](#) channel using the template below. The message is to include all current warnings and/or watch points.

The following are formal sign off examples:

No Activation

Hi @NP_Ops - TSHR signing off.

Status:

- No current warnings.

Watch Points:

- WA: Non-severe elevated thunderstorms expected to continue over the South Interior overnight tonight.

Restriction Activated

Hi @NP_Ops - TSHR signing off.

Status:

- Regional STW current for N NSW and S Qld.
- SWW current for NSW Alpine areas - 12:00 UTC SWW TN (OpsTools)

Watch Points:

- NSW/QLD: W can be excluded from the next Regional STW update due to the risk easing around midnight.
- WA: Non-severe elevated thunderstorms expected to continue over the South Interior overnight tonight.

2.5. Appendix

2.5.1. Warning Content

2.5.1.1. Title

The autogenerated title will state the warning type and all, or part of one, or several weather forecast districts. It will also list the potential phenomena.

2.5.1.2. Issuance Time

Autogenerated issuance time and date of the STW.

2.5.1.3. Headline Statement

The aim of a headline statement is to focus the attention on the key message in the warning. The warnings can be long and sometimes the information can be lost.

This statement should be a punchy and succinct one-line statement that describes the '**what when and where**' of key severe thunderstorm threats. Warning cancellations do not require a headline statement.

This statement does not always need to cover all elements of the warning but must cover those parts we want to emphasise. For example, if there is a period of particularly intense rain inside the broader event, use the headline statement to put a spotlight on it – using the where, when and what principle.

A repetition of the header of the STW most often will not serve this purpose.

For Regional STW that include high-end severe phenomena, the headline statement must be uppercase. Otherwise, the headline statement is to be lowercase.

Example headline statements:

- Severe thunderstorms with heavy rainfall are currently developing across the central interior.
- VERY DANGEROUS STORMS WITH DESTRUCTIVE WIND GUSTS LIKELY OVER THE DALY COAST.

2.5.1.4. Graphical Warning Content

Detailed STW graphic

2.5.1.5. Weather Situation

This section is not required for Detailed STW.

2.5.1.6. Warning Details

Autogenerated text including a list of selected phenomena and affected LGA and locations. If there are two or more warning sections, Warning Section 1 will always be at the top of the warning details section. As such, VDS threats should always be prioritised as Warning Section 1.

TIFS autogenerated text states that hazards have an implied 'likely' probability e.g., " Damaging winds and large hailstones are likely. ..." Hazard management agencies however assign Australian Warning System (Advice, Watch and Act, Emergency) based on several inputs including probability. The probability of hazards should be manually modified to best represent the confidence of the hazards occurring, consisting of the following terminology:

- Possible lower confidence in the occurrence of the hazard
- Likely higher confidence in the occurrence of the hazard

All warnings need to have at least one hazard as 'likely'.

Example: " Damaging winds are likely with large hail stones possible..."

2.5.1.7. Observations

Confirmed severe and high-end severe reports and observations are to be manually inserted in the observation section, listing the location, official or estimated time of occurrence (local time), and the significant weather observations. High-end severe reports and observations are to be uppercase.

Unit of measurement: rainfall, wind and hail reports and observations are to be listed in mm, km/h, and cm respectively.

Example observations listing:

- 56 mm was recorded at Melbourne Airport in 30 minutes to 4:24 pm.
- 3 cm hailstones were observed in Brisbane City at 4:45 pm.
- 118 km/h wind gust was recorded at Darwin Airport at 7:14 pm.
- CONFIRMED REPORTS OF GIANT HAIL UP TO 13.8 CM AT BORANA HEIGHTS AT 4:10 PM.
- CONFIRMED REPORT OF A TORANDO IN BEAUDESERT AROUND 4:30 PM.

2.5.1.8. Action Statements

Autogenerated action statements that have been agreed upon by state and territory-based emergency services.

2.5.1.9. Warning Updates

Autogenerated update time of the next Regional STW

2.5.1.10. Warning Accessibility

Autogenerated accessibility text that provides brief statement on the additional channels where the Regional STW is broadcasted.

RELEASED UNDER FREEDOM OF INFORMATION

2.5.2. Product Examples

Standard

IDD21035

Australian Government Bureau of Meteorology

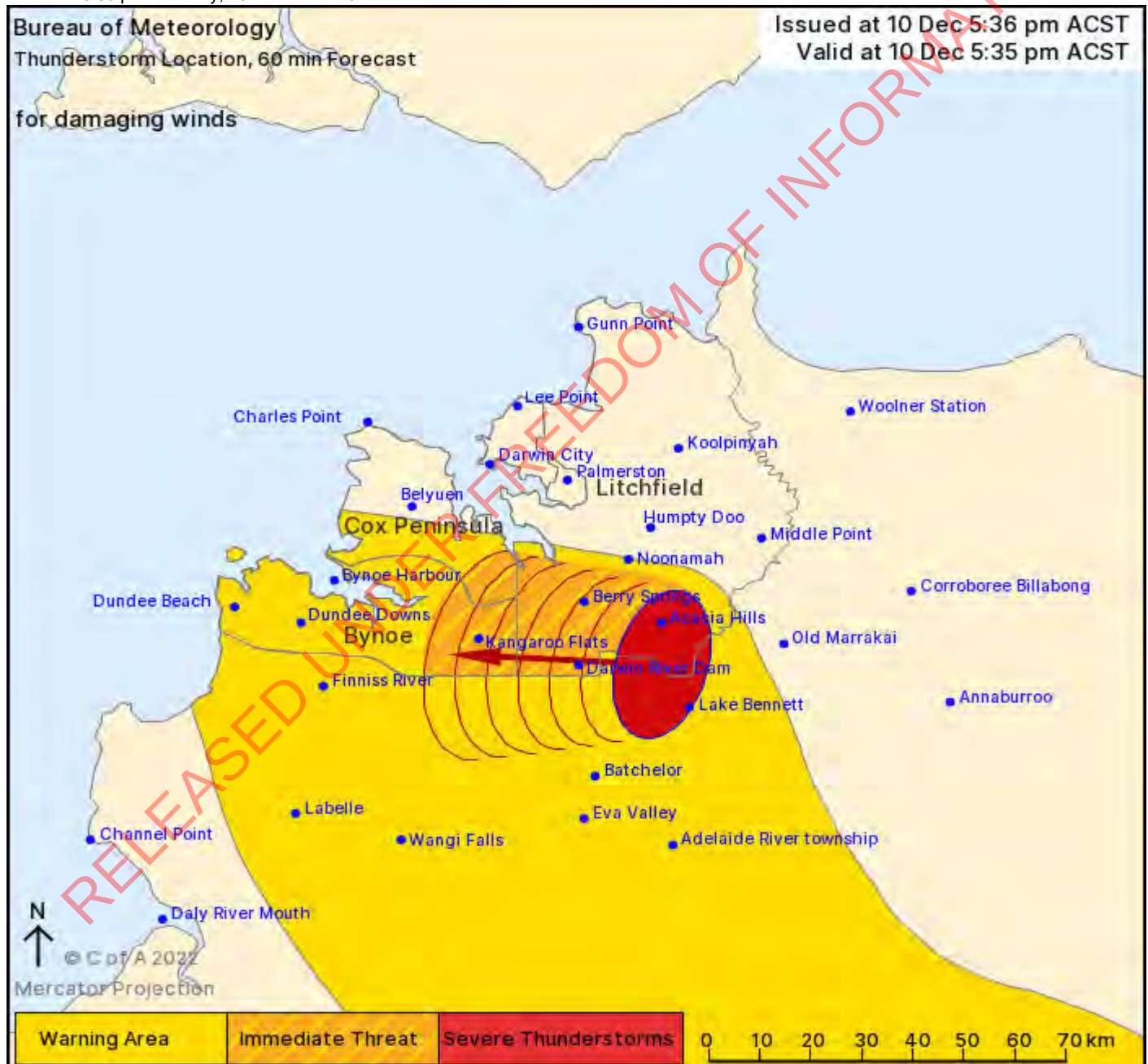
TOP PRIORITY FOR IMMEDIATE BROADCAST

Severe Thunderstorm Warning - Darwin City and Outer Darwin

for DAMAGING WINDS

For people in parts of Bynoe, Cox Peninsula and Litchfield areas.

Issued at 5:36 pm Saturday, 10 December 2022.



The Bureau of Meteorology warns that, at 5:35 pm, potential severe thunderstorms were detected on the weather radar near Acacia Hills and Manton Dam. They are forecast to affect Berry Springs, Darwin River Dam and Darwin River by 6:05 pm and Kangaroo Flats, Middle Arm and the base of Cox Peninsula by 6:35 pm.

Damaging winds are likely.

Standard Emergency Warning Signal

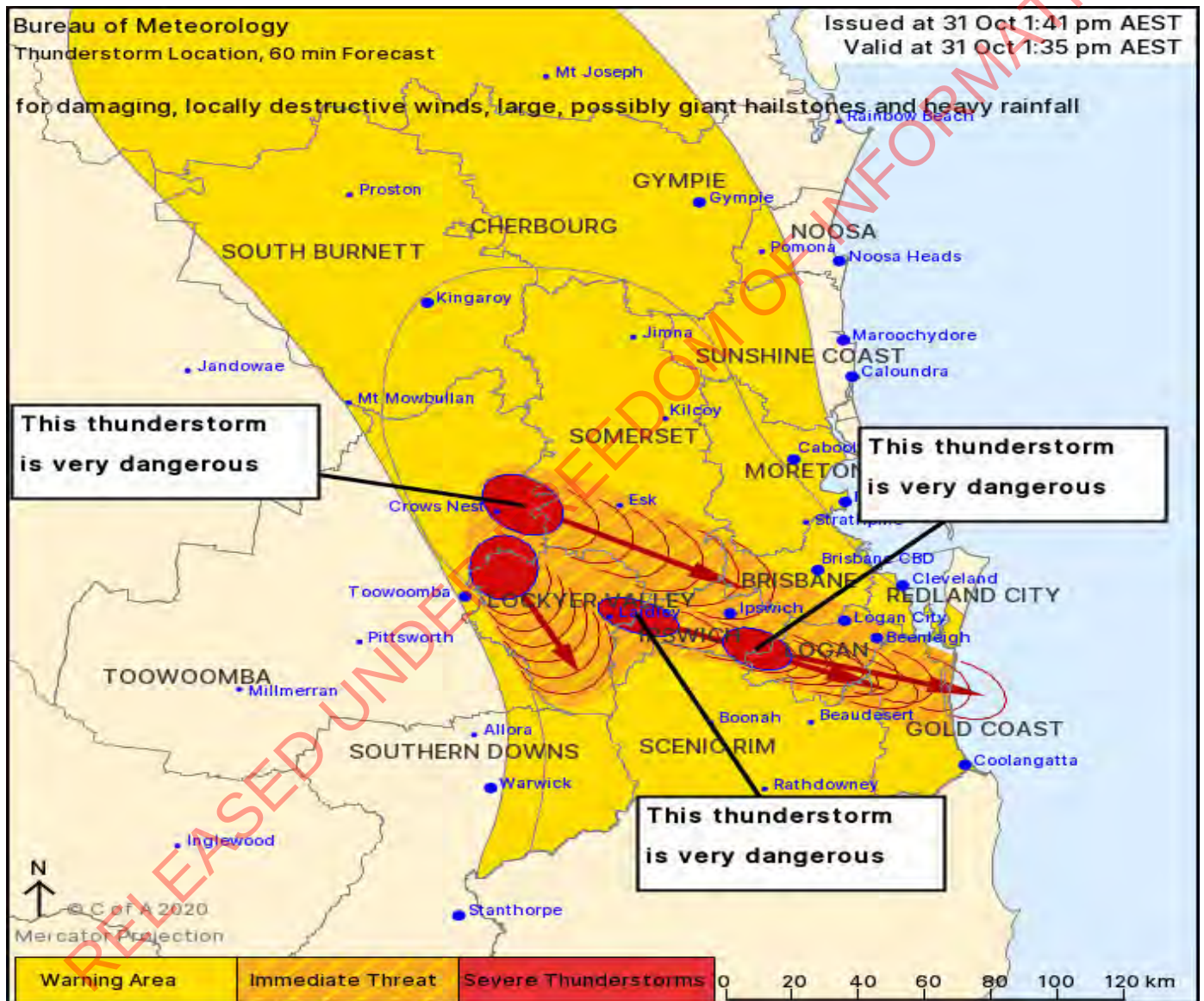
IDQ21035

Australian Government Bureau of Meteorology

Transmitters serving the area for Gatton, Ipswich, Greenbank, Jimboomba, Beenleigh and Logan area are REQUESTED TO USE THE STANDARD EMERGENCY WARNING SIGNAL BEFORE BROADCASTING THIS MESSAGE.

TOP PRIORITY FOR IMMEDIATE BROADCAST**Severe Thunderstorm Warning - Southeast Queensland****for DAMAGING, LOCALLY DESTRUCTIVE WINDS, LARGE, POSSIBLY GIANT HAILSTONES and HEAVY RAINFALL****For people in Ipswich, Logan, Lockyer Valley and parts of Somerset, Scenic Rim, Toowoomba, Gold Coast and Brisbane City Council Areas.**

Issued at 1:41 pm Saturday, 31 October 2020



The Bureau of Meteorology warns that, at 1:35 pm, very dangerous thunderstorms were detected on the weather radar near Laidley, Crows Nest and Bundamba Lagoon. These thunderstorms are moving towards the east to southeast. Very dangerous thunderstorms are forecast to affect the area south of Esk, the area southwest of Esk and the area west of Esk by 2:05 pm and Ipswich, Mount Nebo and southern Lake Wivenhoe by 2:35 pm.

Other severe thunderstorms were detected on the weather radar near Helidon, Hampton and Murphy's Creek. They are forecast to affect Gatton, Grantham and the area south of Helidon by 2:05 pm and Mulgowie and the area northwest of Cunninghams Gap by 2:35 pm.

Damaging, locally destructive winds, large, possibly giant hailstones and heavy rainfall that may lead to flash flooding are likely.

4-7cm has been observed around Gatton and Adare around 12:30pm

5cm hail has been recorded around Seventeen Mile around 1pm

4cm hail has been reported just northeast of Toowoomba around 1pm

3. Related Documents

CSG RACI	CSG RACI
CSG Process Maps	< Include as hyperlinks > Remove and add rows as required
CSG Work Instructions	< Include as hyperlinks > Remove and add rows as required
CSG Master Glossary	CSG Master Glossary

4. Document Control

4.1. Approvals

Date Approved	Version No.	Name	Position	Signature (electronic)
Nov 2023	V4.0		Manager Severe Weather	

4.2. Version Control

Version No.	Version date	Author	Comments
V1.0	26/07/2022		Initial draft
V2.0	05/08/2022		Updated instructions and format
V2.0	02/09/2022		Updated shading to grey as the blue for accessibility reasons
V3.0	Nov 2022	EPS team members	General updates
V4.0	Nov 2023	EPS team members	Updates for 23/24

CSG Regional Severe Thunderstorm Warnings

Instructions on how to prepare and issue a Regional Severe Thunderstorm Warning, including warning escalations and concurrent warnings.

Document type	Work Instructions
Document Status	Ready for approval
Process Group	4.2 Produce & Deliver Products
Process	4.2.1 Produce & Deliver Products
Activities (Process Level 4)	4.2.1.2 Produce and Issue Products
Approved by	Manager Severe Weather
Date Approved	9/11/2023
Process Owner	EPS GM
Process Leader	< Program > < Role >
Review Date	1/09/2024

RELEASED UNDER FREEDOM OF INFORMATION

Contents

CSG Regional Severe Thunderstorm Warnings	1
1. Systems & Tools	4
2. Work Instructions.....	4
2.1. Severe Thunderstorm Service	4
2.2. Severe Thunderstorm Warning Type.....	4
2.2.1. Standard Severe Thunderstorm Warning	4
2.2.2. Reactive Severe Thunderstorm Warning.....	4
2.2.3. Proactive Severe Thunderstorm Warning.....	4
2.3. Regional Severe Thunderstorms Warnings.....	4
2.4. Prepare and Issue Regional Severe Thunderstorm Warnings	5
2.4.1. Region and Product Selection in TIFS.....	5
2.4.2. Creating Regional Severe Thunderstorm Warning Areas.....	5
2.4.2.1. Visual Weather	5
2.4.2.1.1. Loading EPS_TSHR Role	5
2.4.2.1.2. Opening Regional Severe Thunderstorm Warning Task	5
2.4.2.1.3. Drawing Regional Severe Thunderstorm Warning Areas	5
2.4.2.1.4. Sending Regional Severe Thunderstorm Warning Areas to TIFS	6
2.4.2.1.5. Loading Regional Severe Thunderstorm Warning Areas in TIFS	6
2.4.2.2. Thunderstorm Interactive Forecasting System (TIFS).....	7
2.4.3. Regional Severe Thunderstorm Warning Content.....	8
2.4.4. Issuing Regional Severe Thunderstorm Warnings	9
2.4.5. Cancelling Regional Severe Thunderstorm Warnings.....	10
2.4.6. Emergency Warning Escalations.....	10
2.4.6.1. Standard Emergency Warning Signal.....	10
2.4.6.1.1. Requesting the Use of the Standard Emergency Warning Signal	11
2.4.6.1.2. Cancelling the Standard Emergency Warning Signal Request.....	12
2.4.6.2. Emergency Weather Alerts.....	12
2.4.7. Concurrent Warnings.....	13
2.4.7.1. Severe Thunderstorm Warnings and Severe Weather Warnings	13
2.4.7.1.1. Separate Severe Thunderstorm Warnings	13
2.4.7.1.2. Issue Criteria	13
2.4.7.1.3. Cancellations.....	13
2.5. Communication	14
2.5.1. Heads Up	14
2.5.2. Brief and Advise	14
2.5.3. Formal Sign Off	14
2.6. Appendix	15
2.6.1. Warning Content.....	15
2.6.1.1. Title.....	15
2.6.1.2. Issuance Time	15
2.6.1.3. Headline Statement	15
2.6.1.4. Graphical Warning Content	15
2.6.1.5. Weather Situation	15
2.6.1.6. Warning Details	15
2.6.1.7. Observations	16
2.6.1.8. Action Statements	16
2.6.1.9. Warning Updates.....	16
2.6.1.10. Warning Accessibility.....	16
2.6.2. First Issue of a Regional Severe Thunderstorm Warning	16
2.6.3. Collaboration Tool	17

2.6.4. Product Examples	18
3. Related Documents	21
4. Document Control	21
4.1. Approvals	Error! Bookmark not defined.
4.2. Version Control.....	Error! Bookmark not defined.

RELEASED UNDER FREEDOM OF INFORMATION

1. Systems & Tools

1. Interactive Forecasting System ([TIFS](#)).
2. Visual Weather (VW).
3. Microsoft Teams (MS Teams).

2. Work Instructions

2.1. Severe Thunderstorm Service

The Severe Thunderstorm Warning (STW) service is used whenever there is sufficient meteorological evidence to suggest one or more of the following:

- Severe thunderstorm development is likely
- Severe thunderstorm is likely to move into the STW domain
- Severe thunderstorm has been directly reported or observed
- Severe thunderstorm is inferred through various observational datasets

Occasionally, deep moist convective cells that are not producing lightning will be capable of producing severe or even high-end severe phenomena. Although such cells are not technically thunderstorms, the use of the STW service is still appropriate. For the purposes of this document, “severe thunderstorm” can be taken to mean “severe deep, moist convective cell” whether or not lightning is present.

Phenomena definitions associated with severe thunderstorms (STS) are listed in the [Thunderstorm and Severe Weather Service Level Specifications](#).

2.2. Severe Thunderstorm Warning Type

2.2.1. Standard Severe Thunderstorm Warning

A STW is issued once STS signatures have been identified on radar (reflectivity, velocity, dual-polarisation fields) and/or satellite imagery.

Standard STW typically occur when the National Thunderstorm Outlook (National TS Outlook) indicates **STS Possible** and **STS Likely**.

2.2.2. Reactive Severe Thunderstorm Warning

A STW that is issued immediately after an official or reliable ground observation or report.

Reactive STW typically occur when unexpected STS have been reported or observed. This scenario generally takes place when the pre-event forecast probability is low, either (a) just above 10% with the National TS Outlook indicating STS Possible with the risk rated as 'marginal'; or (b) below 10% and there is no STS Possible area depicted.

2.2.3. Proactive Severe Thunderstorm Warning

A STW that is issued when convective initiation is taking place in an environment favourable for STS (up to one hour of lead time for the first STS), or at the latest just prior to the development of likely STS (up to 10 minutes of lead time).

- Tier 1 STW issued as soon as deep, moist convection (DMC) is realised and there is high confidence for STS over the validity period.
- Tier 2 STW issued as soon as strong and/or organised DMC is detected, and STS are imminent.

Proactive STW typically occur when the National TS Outlook indicates **STS Likely**.

2.3. Regional Severe Thunderstorms Warnings

The Bureau provides Regional STW for all states and mainland territories. The area covered by a warning is shaded yellow and represents the area where there is a potential threat for STS. The area may consist of all, or part of one, or several weather forecast districts. Multiple examples of Regional STW are listed in Appendix 2.6.4.

Regional STW are valid for a three-hour period from the issuance time and will be updated routinely every one to two hours but may be updated more frequently during rapidly evolving situations.

If a current Regional STW does not adequately describe the situation, it should be updated immediately. Examples for when this is necessary are an escalation or de-escalation of the hazard threat or a change in the communities expected to be impacted.

Regional STW should be cancelled when STS move offshore or dissipate, and no further STS development is expected over the next three hours.

Operational guidance on when to issue the first Regional Severe Thunderstorm Warning is in Appendix 2.6.2

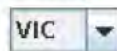
2.4. Prepare and Issue Regional Severe Thunderstorm Warnings

Regional STW are to be prepared and issued by Thunderstorm and Heavy Rainfall (TSHR), and National Production (NP) using TIFS in conjunction with VW.

In TIFS, a Regional STW product consists of a variety of sections that highlight warning areas and expected phenomena in a graphical and textual format. Manual intervention is required for the headline statement, weather situation, graphical warning content, selection of phenomena, observations, and if required, relevant Standard Emergency Warning Signal (SEWS) text, or warning details when Very Dangerous Storms (VDS) are occurring or expected to occur. The remaining sections are autogenerated in TIFS.

2.4.1. Region and Product Selection in TIFS

1. Click Region to Load and select your respective state or territory.



2. Click Product and select Regional STW. If the STS threat is confined to a particular area of the state or territory, the appropriate preset zoomed area should be select.



2.4.2. Creating Regional Severe Thunderstorm Warning Areas

There are two methods for producing Regional STW areas. The preferred method is to create warning areas in VW and subsequently send the shapefile to TIFS. If this is not possible due to time constraints or technical issues, the method of manually drawing the warning areas in TIFS can be used.

2.4.2.1. Visual Weather

2.4.2.1.1. Loading EPS_TSHR Role

1. In VW Main Panel, click on Role Selector button



2. In the window that lists all available roles select the EPS_TSHR role and press OK.



2.4.2.1.2. Opening Regional Severe Thunderstorm Warning Task

1. The EPS_TSHR role will appear in the My Roles selection. Once the role is selected, the 'Regular Tasks' pane populates with the STW task (orange). Left mouse button (LMB) on the hyperlink text buttons or icons to open the Regional STW.



The hyperlink text buttons or icons appearing on the right-hand side of the tasks listed consists of the default 'create' and 'import from latest'. These options change as follows:

Left Link Button	Right Link Button	Description
Create	Import from latest	No product has been created.
Amend/Revise		A product has been created and sent.
Edit		A product has been created, but not yet sent.

Table 1: A list of possible actions for each task.

2.4.2.1.3. Drawing Regional Severe Thunderstorm Warning Areas

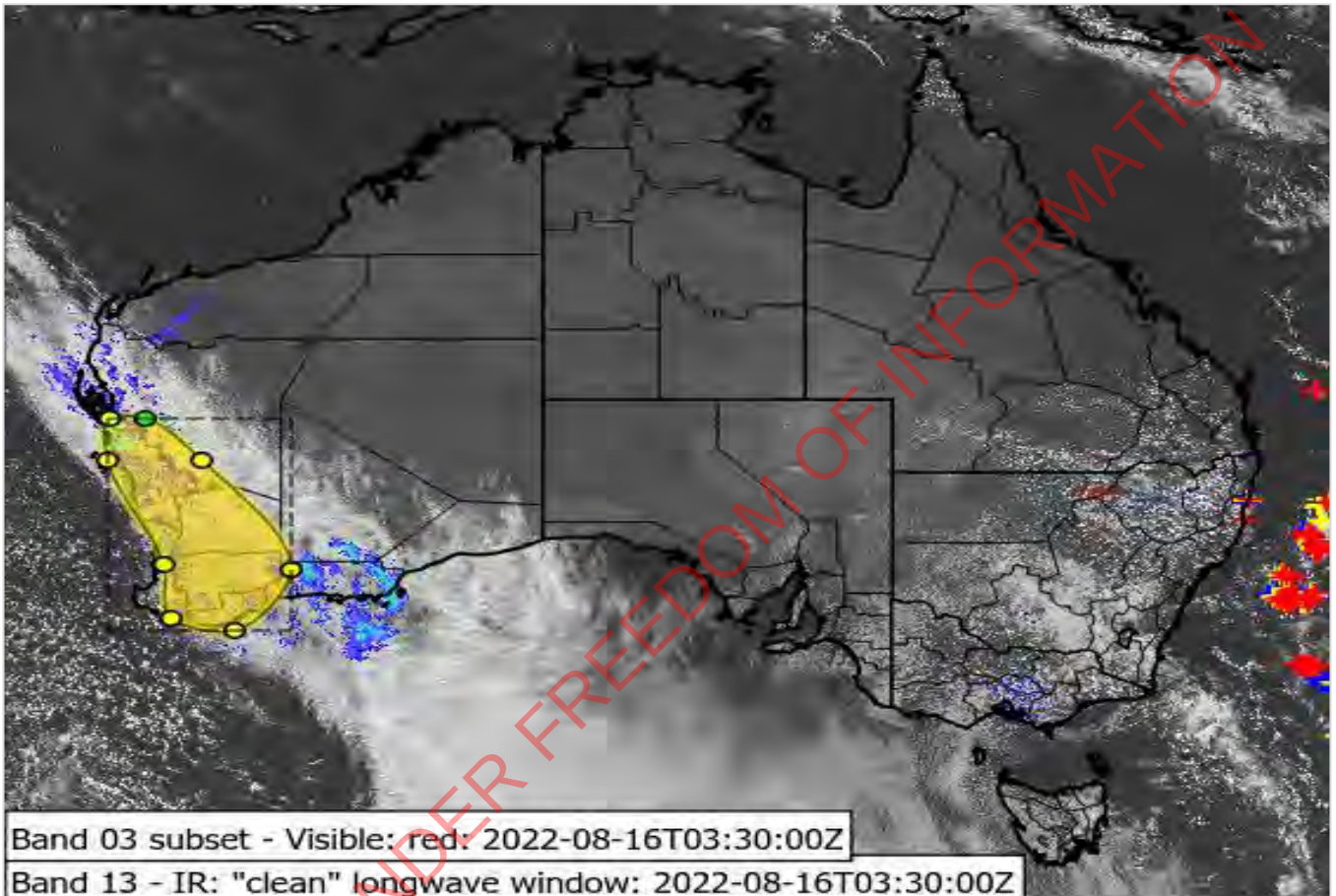
1. On the right-hand side of the Forecaster application within the Feature Editor pane, click the Favourites button.



2. Double click on the State STS Warning to activate the feature editor in collaboration mode. If you do not have session ownership, see Appendix 2.6.3.



3. Draw the Regional STW area by strategically clicking the LMB at various points, defining 'anchor' points before finally clicking on the first anchor point to close the contour (hovering over the final anchor point will display a multi-coloured donut near the cursor). IMPORTANT: Be careful not to cross over contour lines. This could happen when creating a single contour, i.e., creating a 'figure 8' shape, or when drawing a contour within or around a second contour.



4. Click the Save button on the Feature Editor Toolbar.



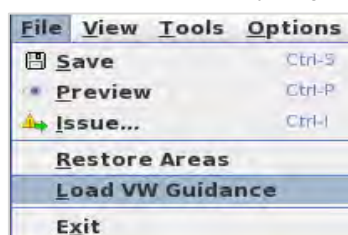
2.4.2.1.4. Sending Regional Severe Thunderstorm Warning Areas to TIFS

1. Click the Issue button on the Feature Editor Toolbar. Once issued, all the features will then go grey indicating the product has been issued and the shapefile generation commenced.



2.4.2.1.5. Loading Regional Severe Thunderstorm Warning Areas in TIFS

1. Navigate to File menu in the top left and select Load VW Guidance. Note that there may be a delay of up to 30-60 seconds depending on the current load on the Visual Weather server, possibly longer in certain regions.



2. Once areas have been ingested into TIFS, go to Section 2.4.3.

2.4.2.2. Thunderstorm Interactive Forecasting System (TIFS)

1. Select the GPATS [Feature](#) to view the most recent lightning data.

▼ Features	
Name	Arrival Time
GPATS	04:46 UTC

2. Click the Add Area button then click again and hold on the [Graphical Editor](#) to draw a warning area.



3. Click the Edit Area button then click again in an existing warning area to edit.



4. Click the Reshape button to modify the shape of the existing area.



5. Click the Resize button to modify the size of the existing area.



6. Click the Selection/Manipulation button to move the existing area. This button can also be used to select other areas.



7. Delete all unwanted warning areas by using one the following options:

- Select the unwanted warning area on the [Graphical Editor](#) or listed [Threat Area Guidance](#) then click the Delete button.



- Select the unwanted warning area on the [Graphical Editor](#) or listed [Threat Area Guidance](#) then click Delete within the [Threat Area Property Editor](#).

8. In the [Threat Area Property Editor](#), a second or third warning area with different phenomena sets can be added by changing the number in the Warning Section.

When VDS are detected or expected to develop, a new warning area should be created and overlaid on top of the original STW area to distinguish where exactly STS and VDS are located or may develop. These segregated areas will become more discernible to the end-user where a thin black contour will be added to the graphic and a new section outlining the VDS threats will be included in the warning details.

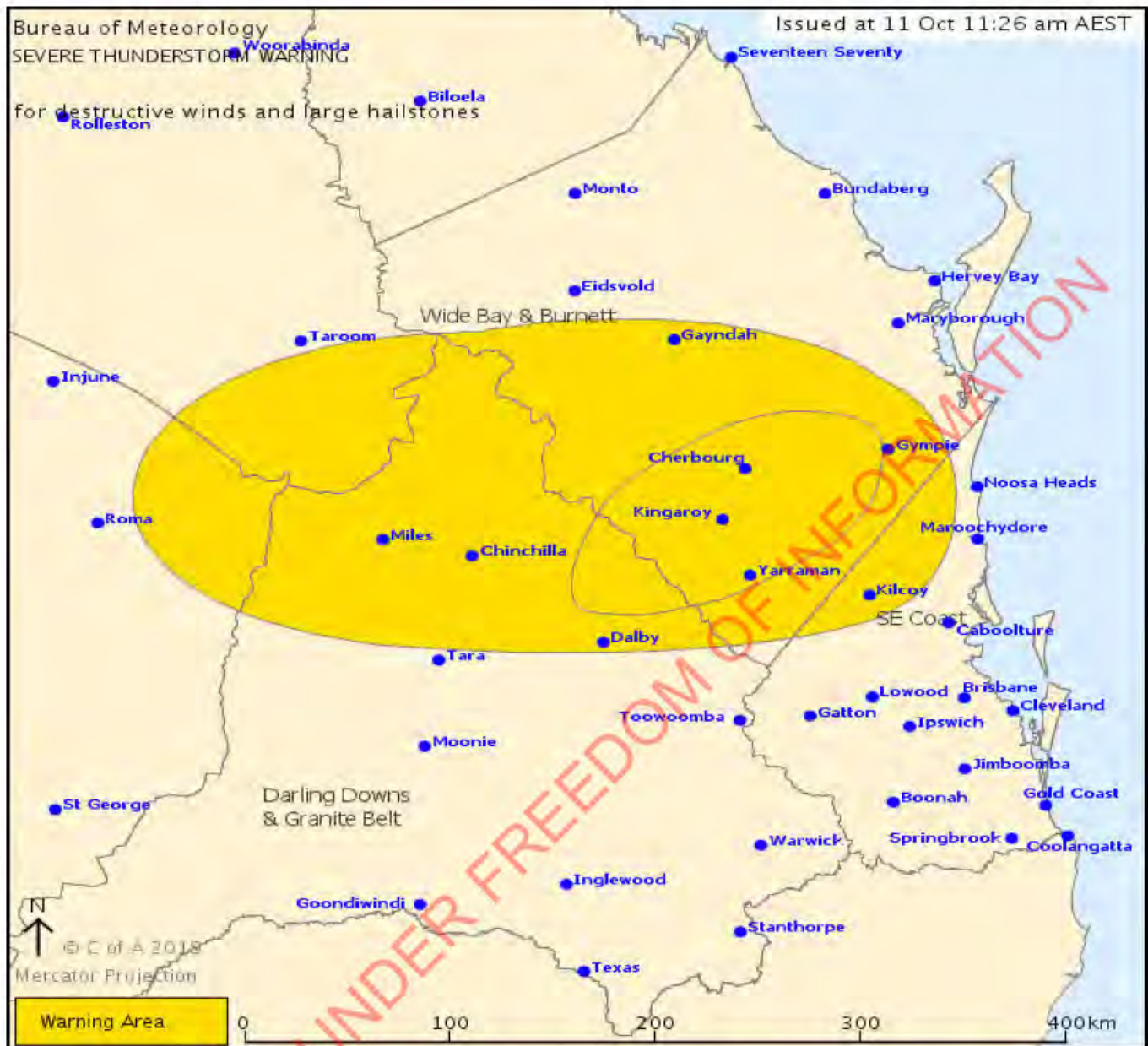


Table 2: Example of a Regional STW with STS and VDS.

2.4.3. Regional Severe Thunderstorm Warning Content

The following information highlights what sections within a Regional STW may require attention and manual intervention. Guidance on the written content in Regional STW can be found in Appendix 2.6.1.

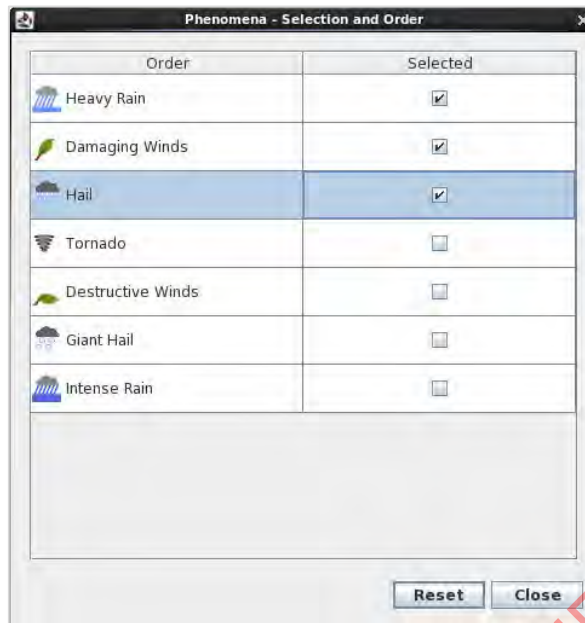
1. Click on a Phenomenon to add a severe and/or high-end severe threat.



Phenomenon	Text
H	large hailstones
H+	giant hailstones
H/H+	large, possibly giant hailstones
W	damaging winds
W+	destructive winds
W/W+	damaging, locally destructive winds
R	heavy rainfall
R+	intense rainfall
R/R+	heavy, locally intense rainfall
T	Tornadoes and destructive winds

Table 3: Autogenerated text for phenomena selection.

2. If multiple phenomena are to be included in the Regional STW, order the phenomena by the forecast level of threat from highest to lowest. Under the Options menu, click Phenomena and drag individual phenomena up or down the pop-up table.



3. Write an appropriate [Headline Statement](#) in the Headline section.

Headline	
-----------------	--

4. Write an appropriate [Weather Situation](#) in the Situation section.

Situation	Weather Situation:
------------------	--------------------

5. Check the list of locations and if required, manually modify and/or change the level of detail.

- Click the Detailed More button (up arrow) to increase the number of places mentioned in the warning text and graphic.
- Click the Detailed Less button (down arrow) to decrease the number of places mentioned in the warning text and graphic.



6. List all significant weather [Observations](#) in the Observations/Other section.

Obs/Other	
------------------	--

2.4.4. Issuing Regional Severe Thunderstorm Warnings

1. If text has been added or autogenerated text has been modified, click the Check Spelling button.



2. Click the Save button to save all graphical and text data.



3. Click the Preview button to preview how the warning will look online as a live product.



4. Click the Issue button to send the STW. Be sure to double check pre-selected address zones before pressing Issue in the pop-up box.



5. Click Auto Refresh to monitor product. Turn off when updates or cancellations are required.



2.4.5. Cancelling Regional Severe Thunderstorm Warnings

1. Click the Cancel Warning button to cancel the Regional STW.



2. If applicable, contextualise or delete the [Headline Statement](#) in the Headline section.

Headline	
-----------------	--

3. Contextualise or delete the [Weather Situation](#) in the Situation section.

Situation	Weather Situation:
------------------	--------------------

4. If text has been added or autogenerated text has been modified, click the Check Spelling button



5. Click the Save button to save all graphical and text data.



6. Click the Preview button to preview how the warning will look online as a live product.



7. Click the Issue button to send the Regional STW. Be sure to double check pre-selected address zones before pressing Issue in the pop-up box.



8. Click Auto Refresh to monitor product. Turn off when new warnings are required.



2.4.6. Emergency Warning Escalations

The Bureau has two major emergency warning escalations; the SEWS and Emergency Weather Alerts (EWA). These warning escalations vary depending on state or mainland territory agreements. Each warning has its specific purpose, designed to obtain an appropriate response from our customers and the community, as well as promote the dispersion of the urgent safety messages through media and Hazard Management Agency (HMA) channels.

2.4.6.1. Standard Emergency Warning Signal

The SEWS is a wailing siren sound used as an alerting signal in Queensland, Victoria, and Tasmania. The SEWS is designed to alert the community to the broadcast of an urgent safety message relating to a VDS with **one or more confirmed high-end severe phenomena** on the Australian Broadcasting Corporation (ABC) radio stations. The signal is sounded immediately prior to an emergency warning message being played on ABC broadcasts, in the potential or likely impacted areas. As part of a coordinated national emergency plan, the SEWS is used to attract attention to emergency warnings.

The Bureau of Meteorology can request the use of the SEWS by including a standardise SEWS statement in a STW. In the event where a request is warranted, SEWS text will be added above the title section on either or both Regional and Detailed Severe Thunderstorm Warnings. It will explicitly state the major towns, suburbs, cities or LGA where the SEWS will be directed, transmitted, and broadcast on the ABC.

The official activation of the SEWS is at the discretion of the ABC.

Issue Criteria

The following criteria is to be satisfied before requesting the use of the SEWS:

- A confirmed report of one or more high-end severe phenomena by a reliable source such as a Bureau observer, automatic weather station, storm spotter and/or trustworthy social media outlet
- It is of sufficient scale where a significant number of people will be warned. This includes all towns and cities that have a designated Bureau forecast ([Queensland](#), [Victoria](#) and [Tasmania](#)), and all areas within the respective Detailed STW domain
- Is expected to continue for 30 minutes or more

Once the SEWS has been requested, the SEWS will continue until all VDS convective regions that can be identified and tracked using radar and/or satellite has ceased, even when all VDS convective regions have moved away from all towns and cities that have

a designated Bureau forecast, or areas within the respective Detailed STW domain.

Responsible Officers and Request Authority

In the event where a SEWS request is warranted, the TSHR Operational Lead (Op-Lead) must obtain approval from the National Production Operational Lead (NPOL).

In the rare event that a SEWS request is warranted and no TSHR Op-Leads are onsite and/or online, the NPOL will have the authority to unilaterally request the use of the SEWS. The NPOL will monitor the situation until a TSHR Op-Lead is onsite and/or online.

Pre-approval

When the National TS Outlook indicates possible high-end severe phenomena over Queensland, Victoria, or Tasmania, the TSHR Op-Lead is to seek pre-approval from the NPOL. Pre-approval can be requested in the morning's [National Collaboration Meeting](#) or via MS Teams in the [EPS_TSHR](#) channel.

In Office Hours

The TSHR Op-Lead must inform Decision Support Services (DSS) when requesting the use of the SEWS, preferably before issuing the STW. In Queensland, DSS is to call the State Disaster Coordination Centre (SDCC), Queensland Police Service (QPS) and the ABC to undertake emergency procedures and broadcasts.

Once all conditions warranting the use of the SEWS request have eased, the TSHR Op-Lead must provide a notification of cancellation to DSS. In Queensland, a subsequent call to the SDCC, QPS and the ABC should then be made by DSS.

Out of Office Hours

In the absence of DSS, the TSHR Op-Lead will call the NPOL after requesting the use of the SEWS and provide a summary on the unfolding situation. This will enable NPOL to liaise with respective state-based customers and emergency services.

TSHR Op-Lead or NPOL should contact HPR managers by either a phone call or text to advise them on the unfolding situation.

In the rare event that a SEWS request is warranted and TSHR and DSS are not onsite and/or online, the NPOL will assume all duties.

For contact details for all emergency services, navigate to the [TSHR Contacts](#) SharePoint page.

2.4.6.1.1. Requesting the Use of the Standard Emergency Warning Signal

If the confirmed VDS threat is confined to the Detailed STW domain, then the SEWS statement should only be included on the Detailed STW. If the confirmed VDS threat extends outside the Detailed STW domain (e.g., a VDS moving into or out of the Detailed STW domain), then the SEWS notification should appear on both the Detailed and Regional STW.

1. Click the SEWS button in the [Warning Text Editor](#) to request the use of the SEWS and the inclusion of the corresponding statement in the Regional STW.



2. Overwrite the 11 consecutive dots by listing all major towns, suburbs, cities, or local government areas in the SEWS section.

SEWS	Transmitters serving the area are REQUESTED TO USE THE STANDARD EMERGENCY WARNING SIGNAL BEFORE BROADCASTING THIS MESSAGE.
-------------	--

3. Contextualise and uppercase the [Headline Statement](#) in the headline section.

Headline	
-----------------	--

4. List all significant weather [Observations](#) in the **Observations/Other** section, including the high-end severe observation or report that warranted the activation of the SEWS.

Obs/Other	
------------------	--

5. If text has been added or autogenerated text has been modified, click the Check Spelling button.



6. Click the Save button to save all graphical and text data.



7. Click the Preview button to preview how the Regional STW will look online as a live product.



- Click the Issue button to send the Regional STW. Be sure to double check pre-selected address zones before pressing Issue in the pop-up box.



- Click Auto Refresh to monitor product. Turn off when new warnings are required.



2.4.6.1.2. Cancelling the Standard Emergency Warning Signal Request

- Click the SEWS button to cancel the SEWS request and exclude the **SEWS** statement from the Regional STW. All SEWS text in the [Warning Text Editor](#) will be automatically deleted.



- Contextualise and lowercase (if all high-end severe threats have ceased) the [Headline Statement](#) in the headline section.

Headline	
-----------------	--

- If text has been added or autogenerated text has been modified, click the Check Spelling button.



- Click the Save button to save all graphical and text data.



- Click the Preview button to preview how the warning will look online as a live product.



- Click the Issue button to send the Regional STW. Be sure to double check pre-selected address zones before pressing Issue in the pop-up box.



- Click Auto Refresh to monitor product. Turn off when new warnings are required.



2.4.6.2. Emergency Weather Alerts

An EWA is a verbal notification provided to the QPS and the SDCC in Queensland. It is done at the forecaster's discretion when they believe there are special circumstances requiring notification of emergency services but there is insufficient evidence such as a confirmed high-end severe report to trigger a request of the SEWS. An EWA should never be used with SEWS concurrently.

An EWA can be invoked for any area across Queensland, irrespective of known population or designated Bureau forecasts.

Issue Criteria

- Radar evidence suggests one or more high-end severe phenomena is likely to be occurring.

Responsible Officers and Invocation

When an EWA is warranted, the TSHR Op-Lead authorises its use.

In office hours

TSHR is to inform DSS that an EWA is to be invoked. DSS is to call the SDCC and QPS to alert them using the specific phrase "Emergency Weather Alert". The potential high-end severe phenomena and their impacts should also be mentioned during this brief call.

Once all conditions warranting the use of an EWA have eased, the TSHR must provide a notification of cancellation to DSS. A subsequent call to the SDCC and QPS should then be made by DSS.

Out of office hours

In the absence of DSS, TSHR or NP will assume all duties outlined above.

In the rare event that an EWA is warranted and TSHR and DSS are not onsite and/or online, the NPOL will assume all duties.

2.4.7. Concurrent Warnings

2.4.7.1. Severe Thunderstorm Warnings and Severe Weather Warnings

2.4.7.1.1. Separate Severe Thunderstorm Warnings

A separate STW is a Detailed or Regional STW that is issued over an accompanying SWW. This overlapping product is used to warn for a hazard that is not included in an accompanying SWW or provide increased geographical detail for areas under effect of a high-end severe hazard.

If a severe or high-end severe hazard is expected to remain exclusively within the Detailed STW domain, a Detailed STW will be issued without an accompanying Regional STW. If outside the Detailed STW domain, a Regional STW will be issued. If the severe or high-end severe hazard extends outside the Detailed STW domain (e.g., Very Dangerous Thunderstorm moving into or out of the Detailed STW domain), then both Detailed and Regional STW will be issued until one of the products can be cancelled.

2.4.7.1.2. Issue Criteria

If either of the following conditions are satisfied, a separate STW will be issued over the accompanying SWW.

1. A hazard, other than those already included in the SWW, is occurring, or expected to occur and is linked to convective regions that can be identified and tracked using radar and/or satellite. For example:
 - Large or giant hail
 - Tornadoes (supercell, shear zone and QLCS mesovortices)
2. A high-end severe hazard is occurring, or expected to occur and is linked to convective regions that can be identified and tracked using radar and/or satellite. For example:
 - Destructive wind gusts
 - Intense rainfall
 - Tornadoes (supercell, shear zone and QLCS mesovortices)

In the rare situation where only a high-end severe hazard is included in a SWW (e.g., significant cold front over southwestern Western Australia that produces widespread destructive wind gusts), a separate STW is not required.

2.4.7.1.3. Cancellations

1. When cancelling a standard STW when a SWW is still in effect, the following text is to be used in the STW cancellation to convey the continued risk of severe weather within the warning area.

Severe thunderstorms are no longer occurring over [state / districts / area].

The immediate threat of severe thunderstorms has passed. The situation will continue to be monitored closely and further severe thunderstorm warnings will be issued, if necessary. A separate Severe Weather Warning for [heavy rainfall / damaging winds / heavy rainfall and damaging winds] remains current over [state / districts / area]. Please refer to <http://www.bom.gov.au/warnings/>

2. When cancelling a high-end STW when a SWW is still in effect, the following text is to be used in the STW cancellation to convey the continued risk of severe weather within the warning area.

Very dangerous thunderstorms are no longer occurring over [state / districts / area].

The immediate threat of very dangerous thunderstorms has passed. The situation will continue to be monitored closely and further very dangerous thunderstorm warnings will be issued, if necessary. A separate Severe Weather Warning for [heavy rainfall / damaging winds / heavy rainfall and damaging winds] remains current over [state / districts / area]. Please refer to <http://www.bom.gov.au/warnings/>

3. In the event where a SWW is cancelled and there is a risk of STS, the following text is to be used.

Severe weather is no longer occurring over [state / districts / area]. The immediate threat of widespread severe weather has passed, and the situation will continue to be closely monitored.

There remains a risk of severe thunderstorms over [state / districts / area] [describe timing]. A separate Severe Thunderstorm Warning will be issued, if required.

2.5. Communication

2.5.1. Heads Up

The TSHR meteorologist overseeing the Regional STW is to message the respective DSS team on MS Teams via the [EPS_TSHR](#) channel to provide a 'heads up' about the upcoming Regional STW. The very brief message should outline the warning area and hazards while leaving all technical rationale and meteorological insight for the official [STW Technical Notes](#).

Heads up messages are required for the following Regional STW:

- **New** New STW
- **Escalation** STW upgraded to high-end severe phenomena
- **De-escalation** STW downgraded from high-end severe phenomena
- **Cancellation** Cancelled STW
- **Continuation** Change in hazard and/or area only

The following are heads up examples for Regional STW:

New Regional STW

Hi @DSS_VIC, a Regional STW for R and W will be issued shortly for the slow-moving thunderstorms over eastern Gippsland. STW TN to be issued shortly.

Continuation Regional STW

Hi @DSS_WA, the current Regional STW for W will be updated shortly with the warning area now covering the western half of the Southern Interior district. STW TN to be issued shortly.

Escalation Regional STW

Hi @DSS_QLD, TSHR will be upgrading the Regional STW to include H+ and W+ for the long-track supercells over the Southeast Coast. STW TN to be issued shortly.

2.5.2. Brief and Advise

The DSS Operational Lead (Op-Lead) or Outposted Meteorologist will be responsible for briefing emergency services. Outside of DSS operational hours, the responsibility transfers to NP who may delegate to TSHR (workload dependent). If TSHR is not operational, NP takes over responsibility for briefing emergency services.

2.5.3. Formal Sign Off

At the end of the PM shift or agreed restriction duty, the TSHR Op-Lead or delegate is to formally transfer responsibility of the severe thunderstorm and severe weather services to NP and sign off within the [EPS_TSHR](#) channel using the template below. The message is to include all current warnings and/or watch points.

The following are formal sign off examples:

No Activation

Hi @NP_Ops - TSHR signing off.

Status:

- No current warnings.

Watch Points:

- WA: Non-severe elevated thunderstorms expected to continue over the South Interior overnight tonight.

Restriction Activated

Hi @NP_Ops - TSHR signing off.

Status:

- Regional STW current for N NSW and S Qld.
- SWW current for NSW Alpine areas - 12:00 UTC SWW TN (OpsTools)

Watch Points:

- NSW/QLD: W can be excluded from the next Regional STW update due to the risk easing around midnight.
- WA: Non-severe elevated thunderstorms expected to continue over the South Interior overnight tonight.

2.6. Appendix

2.6.1. Warning Content

2.6.1.1. Title

The autogenerated title will state the warning type and all, or part of one, or several weather forecast districts. It will also list the potential phenomena.

2.6.1.2. Issuance Time

Autogenerated issuance time and date of the STW.

2.6.1.3. Headline Statement

The aim of a headline statement is to focus the attention on the key message in the warning. The warnings can be long and sometimes the information can be lost.

This statement should be a punchy and succinct one-line statement that describes the **'what, when and where'** of key severe thunderstorm threats. Warning cancellations do not require a headline statement.

This statement does not always need to cover all elements of the warning but must cover those parts we want to emphasise. For example, if there is a period of particularly intense rain inside the broader event, use the headline statement to put a spotlight on it – using the where, when and what principle.

A repetition of the header of the STW most often will not serve this purpose.

For Regional STW that include high-end severe phenomena, the headline statement must be uppercase. Otherwise, the headline statement is to be lowercase.

Example headline statements:

- Severe thunderstorms with heavy rainfall are currently developing across the central interior.
- VERY DANGEROUS STORMS WITH DESTRUCTIVE WIND GUSTS LIKELY OVER THE DALY COAST.

2.6.1.4. Graphical Warning Content

Regional STW graphic

2.6.1.5. Weather Situation

The weather situation is to include a brief description on the current and/or developing STS situation. It should list the synoptic drivers producing the STS and may provide an overview on the spatial and temporal extent of the activity. This section should not cover standard, non-severe thunderstorm activity.

Example weather situations:

- A cold front and pre-frontal trough will combine with a strong upper trough to produce widespread severe thunderstorms over southern New South Wales this afternoon and early evening.
- A slow-moving coastal trough is linking up with a very moist and unstable airmass to produce slow-moving thunderstorms over the South Coast this morning.
- A southeasterly change and an inland trough will produce a few severe thunderstorms over the Southeast Coast this afternoon. The threat of severe thunderstorms will increase into the afternoon as a strong upper trough moves across Southeast Queensland.

2.6.1.6. Warning Details

Autogenerated text including a list of selected phenomena and affected weather forecast districts and locations. If there are two or more warning sections, Warning Section 1 will always be at the top of the warning details section. As such, VDS threats should always be prioritised as Warning Section 1.

TIFS autogenerated text states that hazards have an implied 'likely' probability e.g., "Severe thunderstorms are likely to produce damaging winds and large hailstones over the next several hours..." Hazard management agencies however assign Australian Warning System (Advice, Watch and Act, Emergency) based on several inputs including probability. The probability of hazards should be manually modified to best represent the confidence of the hazards occurring, consisting of the following terminology:

- Possible lower confidence in the occurrence of the hazard
- Likely higher confidence in the occurrence of the hazard

All warnings need to have at least one hazard as 'likely'.

Example: "Severe thunderstorms are likely to produce damaging winds with possible large hailstones over the next several hours...Observations

Confirmed severe and high-end severe reports and observations are to be manually inserted in the observation section, listing the location, official or estimated time of occurrence (local time), and the significant weather observations. High-end severe reports and observations are to be uppercase.

Unit of measurement: rainfall, wind and hail reports and observations are to be listed in mm, km/h, and cm respectively.

Example observations listing:

- 56 mm was recorded at Melbourne Airport in 30 minutes to 4:24 pm.
- 3 cm hailstones were observed in Brisbane City at 4:45 pm.
- 118 km/h wind gust was recorded at Darwin Airport at 7:14 pm.
- CONFIRMED REPORTS OF GIANT HAIL UP TO 13.8 CM AT BORANA HEIGHTS AT 4:10 PM.
- CONFIRMED REPORT OF A TORANDO IN BEAUDESERT AROUND 4:30 PM.

2.6.1.7. Action Statements

Autogenerated action statements that have been agreed upon by state and territory-based emergency services.

2.6.1.8. Warning Updates

Autogenerated update time of the next Regional STW

2.6.1.9. Warning Accessibility

Autogenerated accessibility text that provides brief statement on the additional channels where the Regional STW is broadcasted.

2.6.2. First Issue of a Regional Severe Thunderstorm Warning

The following is operational guidance on when to issue the first Regional STW when the **Day 0 National TS Outlook** indicates STS Possible, STS Likely, or nil STS.

STS Possible

- **Standard STW** or **Reactive STW** that captures likely development and cell motion for the next three hours (standard validity period).
- The size of the warning polygon is dictated by the confidence that STS will sustain themselves or whether fresh development will continue.
- The warning polygon should remain within the STS Possible area unless the following is expected or occurring:
 - STS to move outside the STS Possible area
 - STS to develop outside the STS Possible area

STS Likely

- **Proactive STW** that captures likely development and cell motion for the next three hours (standard validity period).
- The size of the warning polygon is typically larger than that in the 'STS Possible' and 'Nil STS' scenarios due to greater confidence in occurrence and/or sustainment.
- The warning polygon should remain within the STS Possible forecast area unless the following is expected or occurring:
 - STS to move outside the STS Possible area
 - STS to develop outside the STS Possible area

Nil STS

- **Reactive STW** that captures likely development and cell motion for the next three hours (standard validity period).
- The size of the warning polygon is typically much smaller than that in the 'STS Possible' and 'STS Likely' scenarios due to lower confidence in the development, sustainment, and motion of the STS.

Guidance and Considerations

- STW polygons can be determined by using and considering the following:
 - o NWP guidance – Identify appropriate areas where DMC (convective precipitation, lightning flash rate, significant updraft helicity and speeds) will occur during the validity period.
 - o Storm motion can be approximated by using storm motion vectors (SMV), Bunkers SMV, deep layer mean (DLM), or Mesoscale Convective System (MCS) Motion – Downshear (Corfidi).
 - o Radar and satellite – Identify existing STS signatures and areas where strong DMC is occurring or starting to unfold.
 - o Synoptic – Identify where the greatest risk of STS exists on a synoptic scale. STS are likely to develop and/or be sustained along synoptic features such as fronts, troughs, and surges.
 - o Observations – Identify where STS are likely to develop by using nowcasting tools (real-time instability and shear) and finding such features as the theta-e ridge or dryline bulge. hi

- A STW can be cancelled at any point when STS are not considered likely within the validity period. It is acceptable to reissue a STW after a cancellation, particularly when it is an environment marginally favourable for STS.

Example: If a STW is issued mid-afternoon, it does not mean the meteorologist has to continue with the STW through till evening when all TS have weakened.

- Check the National TS Outlook in conjunction with Nowcasting tools to determine whether TS outside the current STW are worthy of an inclusion.

Example: If TS are occurring outside the current STW polygon, this does not necessarily mean they should be included in the subsequent STW. In the absence of viable STS signatures, cross-check the National TS Outlook to confirm whether the environment was considered favourable for STS along with confirming that available nowcasting guidance agrees with this risk.

2.6.3. Collaboration Tool

When the Regional STW is launched correctly from the Main Panel 'Regular Tasks' in VW, it will automatically enable the Collaboration Tool where multiple people can edit the product at the same time.

Towards the bottom left-hand side of the map area within the Forecaster application, the meteorologists currently editing the product are listed. The username corresponding to the meteorologist currently viewing the forecast product locally on their workstation will be indicated by an asterisk, *. The username highlighted in bold font indicates the meteorologist who has 'session ownership' and typically coincides with the meteorologist who first loaded the product and still has the product active on their workstation (has not closed the instance of Forecaster).

When meteorologist (1) is editing the Regional STW Weather Warning area, the warning area will appear as normal with the forecast area appearing with the correct fill and displaying the 'anchor' points for editing. If another meteorologist (2) is in this product, they will see the edits undertaken by meteorologist (1) in real-time, but the area will be "greyed out" and not able to be edited. When the meteorologist (1) finishes editing the forecast area and LMB clicks off of the forecast area, such that the 'anchor' points are no longer visible on their workstation, the Regional STW area will appear with the correct fill and will be able to be selected on the meteorologist's (2) workstation.

Session Ownership

When preparing the Regional STW areas in collaboration mode, if the 'Save' button appears "greyed out", this is likely the result of not being the "session owner". As outlined above, the session owner is indicated by the username highlighted in bold font towards the bottom left-hand side of the map area within the Forecaster application. If this is the case, navigate to the 'Feature Editor' menu towards the top of the Forecaster application, and click on 'Take session ownership'. Upon doing so, your username should now appear bold and with the asterisk.

2.6.4. Product Examples

Standard

DD21033

Australian Government Bureau of Meteorology

TOP PRIORITY FOR IMMEDIATE BROADCAST

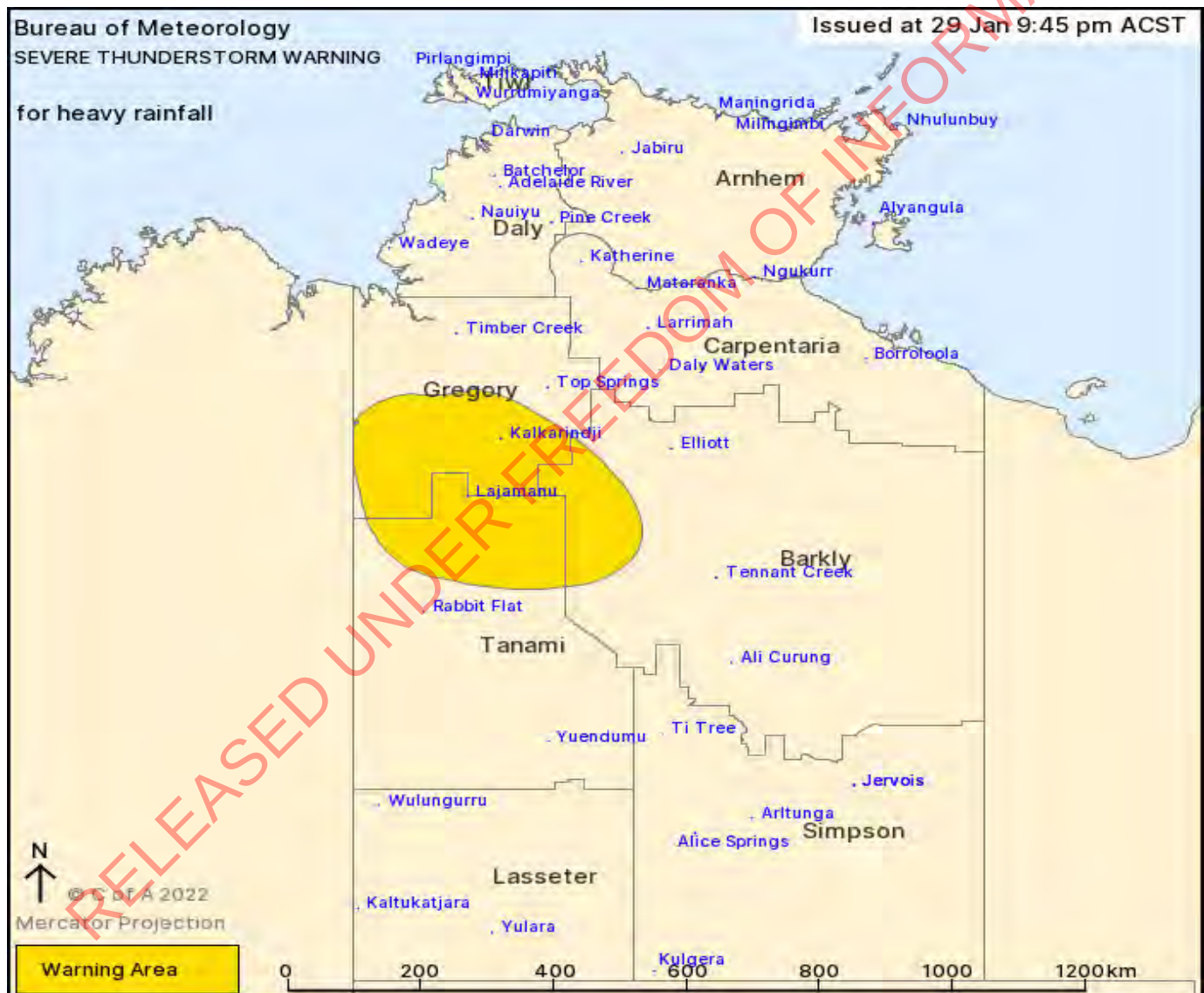
Severe Thunderstorm Warning

for HEAVY RAINFALL

For people in parts of Gregory, Barkly and Tanami districts.

Issued at 9:45 pm Saturday, 29 January 2022.

Heavy falls expected over areas between Top Springs and Rabbit Flat.



Weather situation: A monsoon trough over the Barkly, southern Gregory and northern Tanami Districts is leading to slow-moving thunderstorms across central districts.

Severe thunderstorms are likely to produce heavy rainfall that may lead to flash flooding in the warning area over the next several hours. Locations which may be affected include Lajamanu and Kalkarindji.

Severe thunderstorms are no longer occurring in the Simpson district and the warning for this district is CANCELLED.

The Northern Territory Emergency Service advises that people should:

Multiple Warning Areas

Q21033

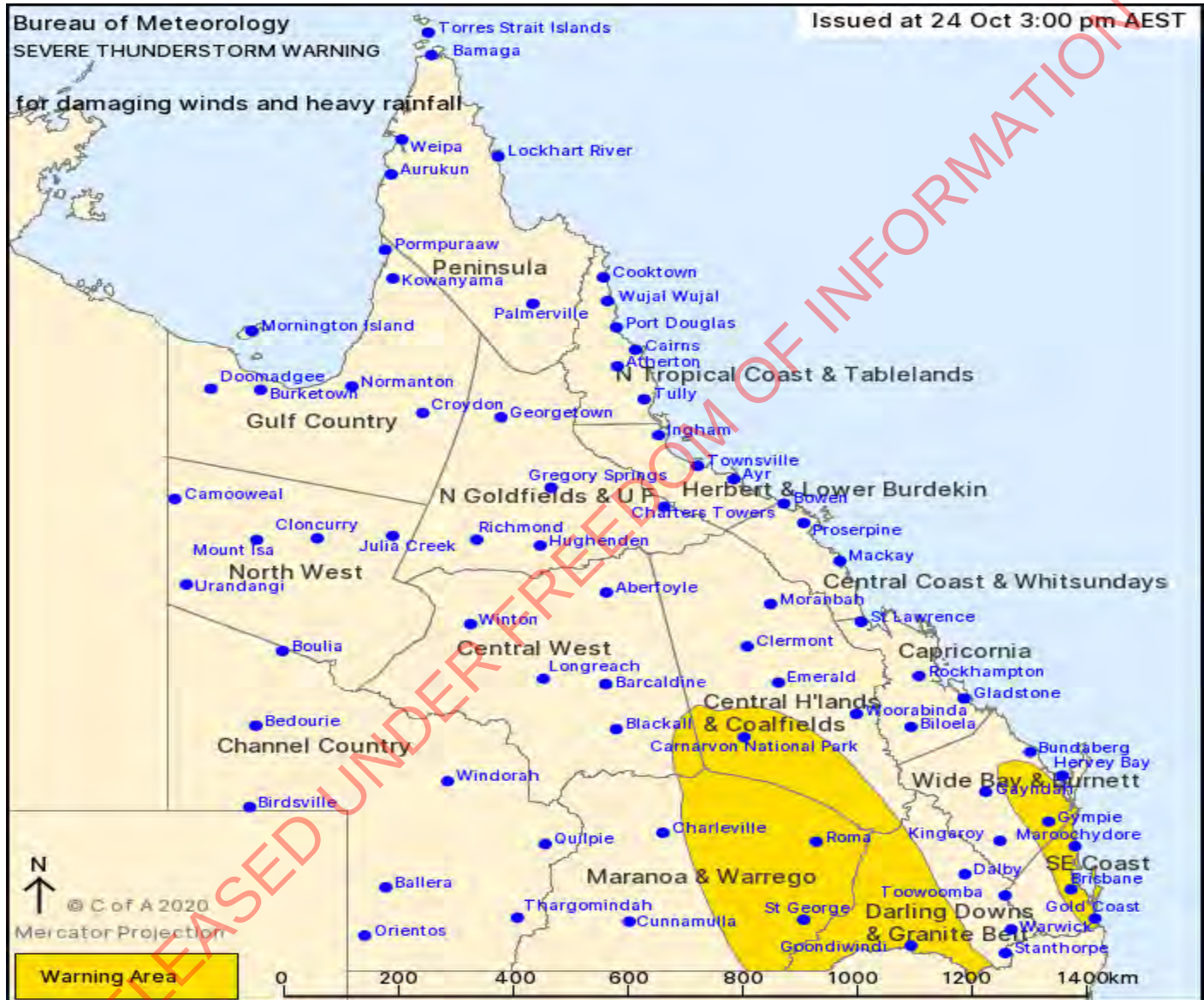
Australian Government Bureau of Meteorology

TOP PRIORITY FOR IMMEDIATE BROADCAST**Severe Thunderstorm Warning****for DAMAGING WINDS and HEAVY RAINFALL**

For people in parts of Central Highlands and Coalfields, Central West, Wide Bay and Burnett, Maranoa and Warrego, Darling Downs and Granite Belt and Southeast Coast Forecast Districts.

Issued at 3:00 pm Saturday, 24 October 2020.

Gusty and potentially severe thunderstorms over the southeastern interior, slow-moving and heavy activity over the southeast coast.



Weather Situation: A cold front and pre-frontal trough will combine with a very moist and unstable airmass to trigger severe thunderstorms across parts of Southeast Queensland this afternoon and evening.

Severe thunderstorms are likely to produce damaging winds over the next several hours in parts of the Central Highlands and Coalfields, Central West, Maranoa and Warrego and Darling Downs and Granite Belt districts. Locations which may be affected include Roma, Goondiwindi, St George, Carnarvon National Park, Mungindi and Tara.

Severe thunderstorms are likely to produce heavy rainfall that may lead to flash flooding over the next several hours in parts of the Wide Bay and Burnett and Southeast Coast districts. Locations which may be affected include Gold Coast, Brisbane, Maroochydore, Gympie, Coolangatta and Jimboomba.

Overlain Warning Areas

DQ21033

Australian Government Bureau of Meteorology

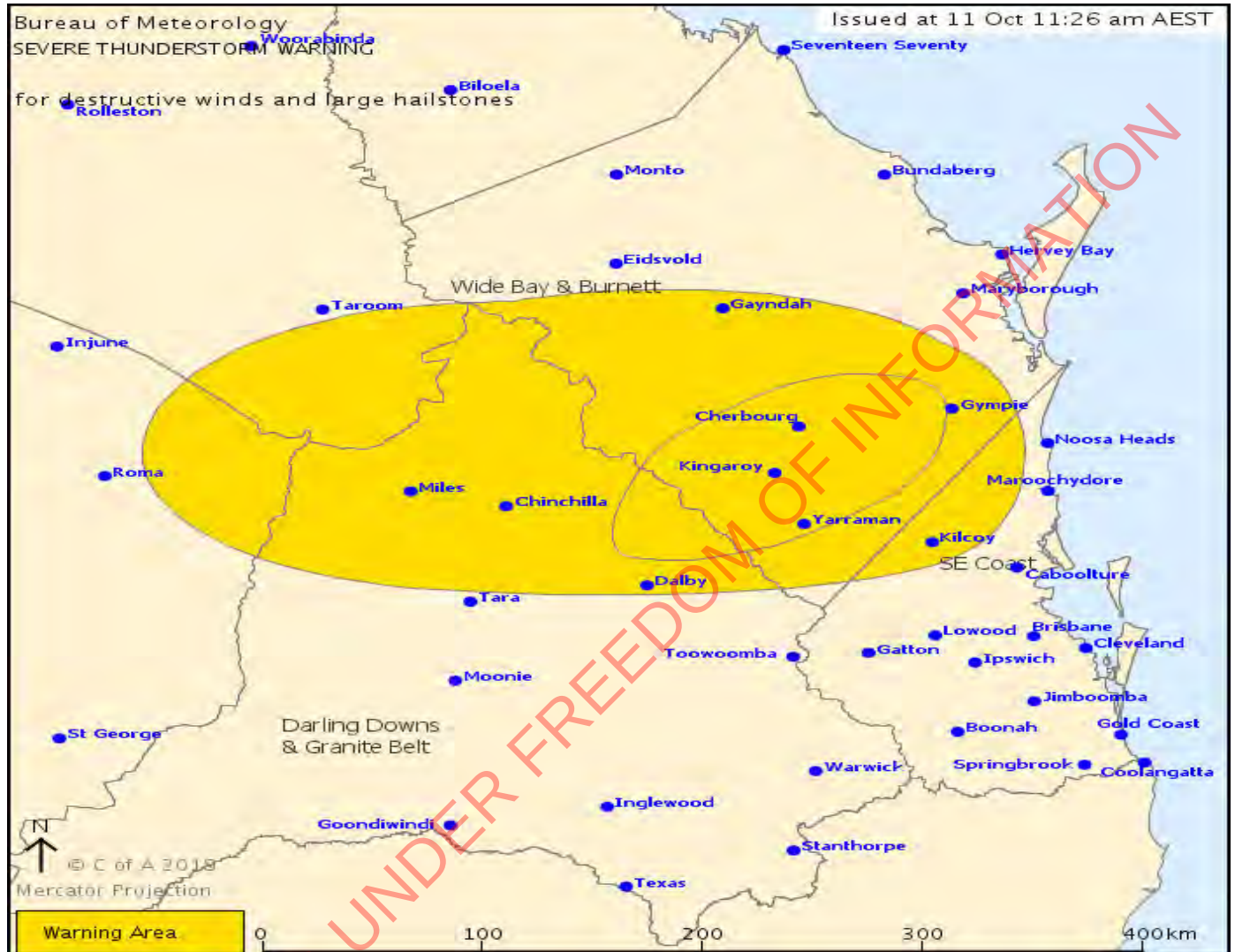
Queensland

TOP PRIORITY FOR IMMEDIATE BROADCAST

Severe Thunderstorm Warning**for DESTRUCTIVE WINDS and GIANT HAILSTONES**

Issued at 11:26 am Thursday, 11 October 2018.

VERY DANGEROUS THUNDERSTORM NORTHEAST OF KINGAROY WITH TENNIS BALL SIZE HAIL OBSERVED AT KUMBIA.



Weather Situation: A very dangerous thunderstorm northeast of Kingaroy is expected to continue its northeast track towards Gympie. Another developing thunderstorm northeast of Chinchilla is also expected to intensify further as it moves towards Cherbourg and Gayndah. Giant hail is expected within the core of these cells.

Very dangerous thunderstorms are likely to produce destructive winds and giant hailstones over the next several hours in parts of the Wide Bay and Burnett and Darling Downs and Granite Belt districts. Locations which may be affected include Kingaroy, Cherbourg, Wondai, Murgon and Nanango.

Severe thunderstorms are likely to produce damaging winds and large hailstones over the next several hours in parts of the Central Highlands and Coalfields, Wide Bay and Burnett, Maranoa and Warrego, Darling Downs and Granite Belt and Southeast Coast districts. Locations which may be affected include Dalby, Gympie, Kingaroy, Cherbourg, Nambour and Nanango.

Severe thunderstorms are no longer occurring in the Maranoa and Warrego district and the warning for this district is CANCELLED.

Tennis ball size hail (up to 7cm) was reported at Kumbia around 11am.

3. Related Documents

CSG RACI	CSG RACI
CSG Process Maps	< Include as hyperlinks > Remove and add rows as required
CSG Work Instructions	< Include as hyperlinks > Remove and add rows as required
CSG Master Glossary	CSG Master Glossary

4. Document Control

4.1. Approvals

Date Approved	Version No.	Name	Position	Signature (electronic)
Nov 2023	V4.0		Manager Severe Weather	

4.2. Version Control

Version No.	Version date	Author	Comments
V1.0	26/07/2022		Initial draft
V2.0	05/08/2022		Updated instructions and format
V2.0	02/09/2022		Updated shading to grey as the blue for accessibility reasons
V3.0	Nov 2022	EPS team members	General updates
V4.0	Nov 2023	EPS team members	Updates for 23/24

Document 3

CSG Severe Weather Warnings

Instructions on how to prepare and issue a Severe Weather Warning, including warning escalations and concurrent warnings.

Document type	Work Instructions
Document Status	In review
Process Group	4.2 Produce & Deliver Products
Process	4.2.1 Produce & Deliver Products
Activities (Process Level 4)	4.2.1.2 Produce and Issue Products
Approved by	Manager Severe Weather
Date Approved	9 November 2023[Approved Date]
Process Owner	EPS GM
Process Leader	< Program > < Role >
Review Date	1/09/2024

RELEASED UNDER FREEDOM OF INFORMATION

Contents

CSG Severe Weather Warnings	1
1. Systems & Tools	4
2. Work Instructions	4
2.1. Severe Weather Warning Service	4
2.2. Severe Weather Warnings	4
2.3. Prepare and Issue Severe Weather Warnings	5
2.3.1. Region and Product Selection in TIFS	5
2.3.2. Creating Severe Weather Warning Areas	5
2.3.2.1. Visual Weather	5
2.3.2.1.1. Loading EPS_TSHR Role	5
2.3.2.1.2. Opening Severe Weather Warning Task	5
2.3.2.1.3. Drawing Severe Weather Warning Areas	5
2.3.2.1.4. Sending Severe Weather Warning Areas to TIFS	6
2.3.2.1.5. Loading Severe Weather Warning Areas in TIFS	6
2.3.2.2. Thunderstorm Interactive Forecasting System (TIFS)	7
2.3.3. Severe Weather Warning Content	8
2.3.4. Issuing Severe Weather Warnings	9
2.3.5. Cancelling Severe Weather Warnings	10
2.3.6. Concurrent Warnings	11
2.3.6.1. Land and Marine Based Severe Weather Warnings	11
2.3.6.1.1. Cancellations	11
2.3.6.2. Severe Thunderstorm Warnings and Severe Weather Warnings	11
2.3.6.2.1. Separate Severe Thunderstorm Warnings	11
2.3.6.2.2. Issue Criteria	11
2.3.6.2.3. Cancellations	11
2.3.6.3. Tropical Cyclone Advices and Severe Weather Warnings	12
2.3.6.4. Tropical Cyclone Watches and Severe Weather Warnings	12
2.3.6.5. Tropical Cyclone Warnings and Severe Weather Warnings	12
2.3.6.6. Transition from Tropical Cyclone Warnings to Severe Weather Warnings	12
2.4. Communication	12
2.4.1. Heads Up	12
2.4.2. Brief and Advise	13
2.4.3. Formal Sign Off	13
2.5. Appendix	13
2.5.1. Warning Content	13
2.5.1.1. Title	14
2.5.1.2. Issuance Time	14
2.5.1.3. Headline Statement	14
2.5.1.4. Warning Graphic	14
2.5.1.5. Weather Situation	14
2.5.1.6. Warning Details	14
2.5.1.7. Locations	14
2.5.1.8. Observations	15
2.5.1.9. Action Statements	15
2.5.1.10. Warning Updates	15
2.5.1.11. Warning Accessibility	15
2.5.2. Phenomena Selection in TIFS	16
2.5.3. Collaboration Tool	16
3. Related Documents	17
4. Document Control	17

4.1. Approvals 17

4.2. Version Control..... 17

RELEASED UNDER FREEDOM OF INFORMATION

1. Systems & Tools

- Interactive Forecasting System ([TIFS](#)).
- Visual Weather (VW).
- Microsoft Teams (MS Teams).
- Microsoft SharePoint (MS SharePoint).
- [Operational Tools](#) (OpsTools).

2. Work Instructions

2.1. Severe Weather Warning Service

The Severe Weather Warning (SWW) service is used whenever there is sufficient meteorological evidence to suggest either of the following:

- severe weather development is possible or likely
- severe weather has been directly reported or observed
- severe weather is inferred through various observational datasets

The SWW service alerts the community, emergency services and other organisations about the threat of severe weather.

Phenomena definitions associated with severe weather are listed in the [Thunderstorm and Severe Weather Service Level Specifications](#).

2.2. Severe Weather Warnings

The Bureau provides graphical SWW that cover all Australian states and mainland territories. The area covered by a warning is shaded yellow and represents the area where there is a potential threat for severe weather. The area may consist of all, or part of one, or several weather forecast districts. The Bureau also provides text based SWW for Lord Howe Island and Norfolk Island.

If a current SWW does not adequately describe the situation, it should be updated immediately. Examples for when this is necessary are an escalation or de-escalation of the hazard threat, or a change in the communities expected to be impacted.

A SWW should be cancelled when severe weather moves offshore or dissipates, and no further development is expected.

SWW do not have a prescribed validity period, this is described in general terms within the warning details section. Once a SWW is issued, routine updates will be issued, at least, every six hours. They are to be updated at the standard times of 4:30 - 5:00 am, 10:30 - 11:00 am, 4:30 - 5:00 pm and 10:30 - 11:00 pm in local time, but may be updated more frequently during rapidly changing situations or periods of high-impact severe weather.

The lead-time will depend on the nature of the event, the ability to forecast it with reasonable certainty and the time of day. In general, severe weather events will fall into two categories:

Synoptic scale	Local scale
Tropical lows	Orographic lift: Heavy and/or intense rainfall
Subtropical lows	Topography: Downslope winds
Extratropical lows	
East coast lows	
Monsoon/equatorial trough	
Cold fronts	

Table 1: Synoptic and local drivers to severe weather in Australia.

For synoptic-scale severe weather events, SWW will aim to be issued 24 to 36 hours ahead of the expected onset of severe weather conditions. Depending on forecast confidence and the level of threat, SWW may be issued with longer or shorter lead times.

Local-scale severe weather events are more difficult to forecast with significant lead-time, and in some instances, a SWW may only be issued after observations or reports of severe weather are received. A SWW should be issued as early as possible prior to the event, however, lead-times are likely to be less than for synoptic-scale phenomena.

As a guideline, a SWW should not be used to warn for severe thunderstorms (STS). Events such as warm-sector outbreak or prolonged thunderstorm activity in a moist and unstable airmass should utilise the Severe Thunderstorm Warning (STW) service, not the SWW service. This is particularly important for heavy rainfall associated with thunderstorms. The uncertainty in placement, duration and occurrence means that the utilisation of a SWW will regularly result in over-warning given the localised nature of heavy rainfall associated with convection.

Conversely, SWW is often more appropriate with vigorous cold fronts of the typical cool-season archetype over central and southern Australia, even if they produce thunderstorm activity.

2.3. Prepare and Issue Severe Weather Warnings

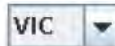
SWW are to be prepared and issued by Environmental Prediction Services (EPS) - Thunderstorm and Heavy Rainfall (TSHR), EPS-Marine and Antarctic, and National Production (NP) using TIFS in conjunction with VW.

In TIFS, a SWW product consists of a variety of sections that highlight warning areas and expected phenomena in a graphical and textual format. Manual intervention is required for the headline statement, weather situation, graphical warning content and warning details. It may also be necessary for the Locations and Obs/Other sections. The remaining sections are autogenerated in TIFS.

To formulate all manually inserted sections, including recommended styles and structures, refer to the [SWW Pro Forma](#) page.

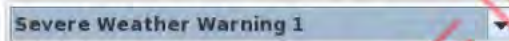
2.3.1. Region and Product Selection in TIFS

1. Click Region to Load and select your respective state or territory.



2. Click Product and select Severe Weather Warning. If severe weather is confined to a particular area of the state or territory, the appropriate preset zoomed area should be select.

- Severe Weather Warning 1 is for EPS-TSHR and NP
- Severe Weather Warning 2 is for EPS-TSHR and NP
- Severe Weather Warning 3 is for EPS-Marine and Antarctica, and NP



Use SWW 1 for the first SWW in a state or territory, and only use SWW 2 for a well-separated warning area within a state or territory that is driven by a different weather system with an overlapping time period. For example, in Western Australia, use SWW 1 for a cold front in the south and SWW 2 for a tropical low in the north.

2.3.2. Creating Severe Weather Warning Areas

There are two methods for producing SWW. The preferred method is to create warning areas in VW and subsequently send the shapefile to TIFS. If this is not possible due to time constraints or technical issues, the traditional method of manually drawing the warning areas in TIFS can be used.

2.3.2.1. Visual Weather

2.3.2.1.1. Loading EPS_TSHR Role

1. In VW Main Panel, click on Role Selector button.

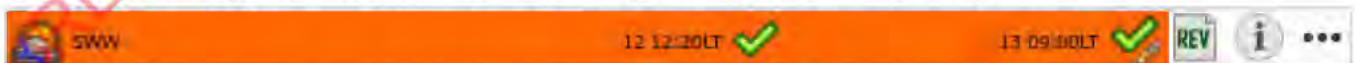


2. In the window that lists all available roles, select the EPS_TSHR role and press OK.



2.3.2.1.2. Opening Severe Weather Warning Task

1. The EPS_TSHR role will appear in the My Roles selection. Once the role is selected, the 'Regular Tasks' pane populates with the SWW task (orange). Left mouse button (LMB) on the hyperlink text buttons or icons to open the SWW.



The hyperlink text buttons or icons appearing on the right-hand side of the tasks listed consists of the default 'create' and 'import from latest'. These options change as follows:

Left Link Button	Right Link Button	Description
Create	Import from latest	No product has been created.
Amend/Revise		A product has been created and sent.
Edit		A product has been created, but not yet sent.

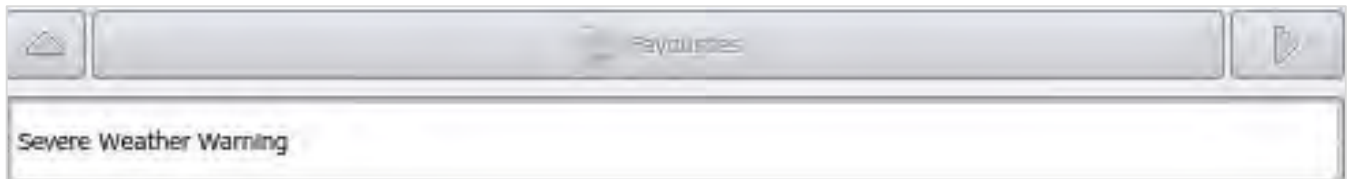
Table 2: A list of possible actions for each task.

2.3.2.1.3. Drawing Severe Weather Warning Areas

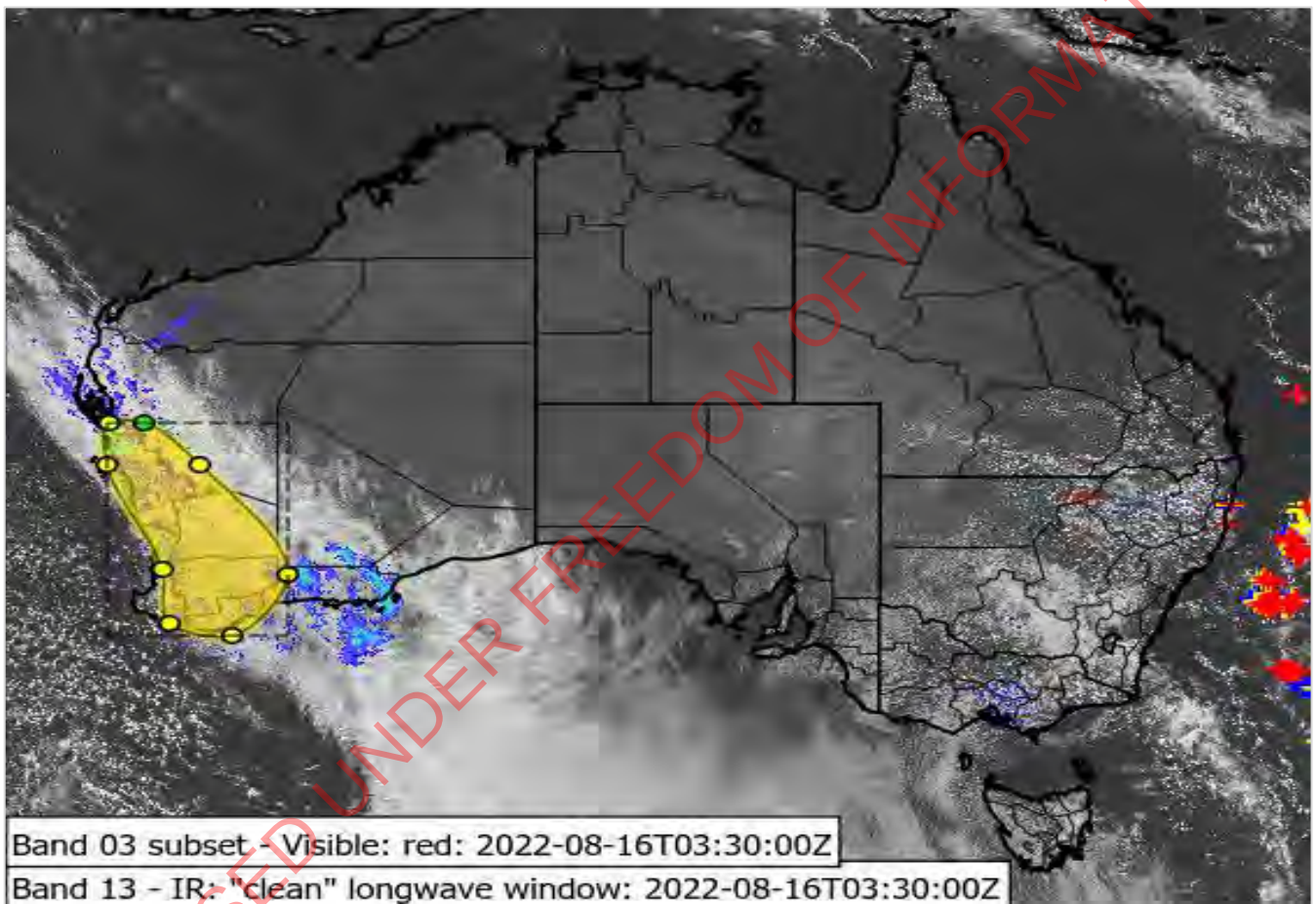
1. On the right-hand side of the Forecaster application within the Feature Editor pane, click the Favourites button.



- Double click on the Severe Weather Warning to activate the feature editor in collaboration mode. If you do not have session ownership, see Appendix 2.5.3.



- Draw the SWW area by strategically clicking the LMB at various points, defining 'anchor' points before finally clicking on the first anchor point to close the contour (hovering over the final anchor point will display a multi-coloured donut near the cursor). If multiple new areas are required, be sure to select Severe Weather Warning from the Favourites menu before starting to draw each separate closed contour area. IMPORTANT: Be careful not to cross over contour lines. This could happen when creating a single contour, i.e., creating a 'figure 8' shape, or when drawing a contour within or around a second contour.



- Click the Save button on the Feature Editor Toolbar.



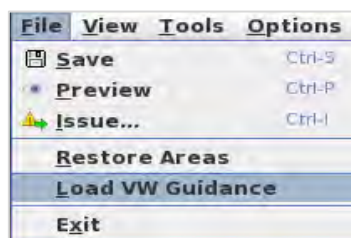
2.3.2.1.4. Sending Severe Weather Warning Areas to TIFS

- Click the Issue button on the Feature Editor Toolbar. Once issued, all the features will then go grey indicating the product has been issued and the shapefile generation commenced.



2.3.2.1.5. Loading Severe Weather Warning Areas in TIFS

- Navigate to File menu in the top left and select Load VW Guidance. Note that there may be a delay of up to 30-60 seconds depending on the current load on the Visual Weather server, possibly longer in certain regions - TIFS will produce a popup notification if the most recent shapefile received is more than an hour old.



2. Once areas have been ingested into TIFS, go to Section 2.3.3.

2.3.2.2. Thunderstorm Interactive Forecasting System (TIFS)

1. Click the Add Area button then click again and hold on the [Graphical Editor](#) to draw a warning area.



2. Click the Edit Area button then click again in an existing warning area to edit.



3. Click the Reshape button to modify the shape of the existing area.



4. Click the Resize button to modify the size of the existing area.



5. Click the Selection/Manipulation button to move the existing area. This button can also be used to select other areas.

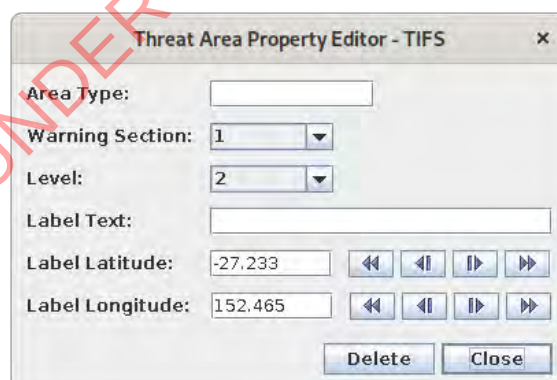


6. Delete all unwanted warning areas by using one the following options:

- Select the unwanted warning area on the [Graphical Editor](#) or listed [Threat Area Guidance](#) then click the Delete button.



- Select the unwanted warning area on the [Graphical Editor](#) or listed [Threat Area Guidance](#) then click Delete within the [Threat Area Property Editor](#).



7. In the [Threat Area Property Editor](#), a second (2) or third (3) warning area with different phenomena sets can be added by changing the number in the Warning Section.

2.3.3. Severe Weather Warning Content

The following information highlights what sections within a SWW may require attention and manual intervention. Guidance on the written content in SWW can be found in Appendix 2.5.1.

1. Click on a Phenomenon to add a severe and/or high-end severe threat. For guidance on when to select severe and high-end severe phenomena, see Appendix 2.5.2.



Phenomenon	Text
W	<i>damaging winds</i>
W+	<i>destructive winds</i>
W/W+	<i>damaging, locally destructive winds</i>
R	<i>heavy rainfall</i>
R+	<i>intense rainfall</i>
R/R+	<i>heavy, locally intense rainfall</i>
AHT	<i>Abnormally high tides</i>
DS	<i>Dangerous/damaging surf</i>

Table 3: Autogenerated text for phenomena selection.

2. If multiple phenomena are to be included in the SWW, order the phenomena by the forecast level of threat from highest to lowest. Under the Options menu, click Phenomena and drag individual phenomena up or down the pop-up table.

Order	Selected
Heavy Rain	☒
Damaging Winds	☒
Destructive Winds	☐
Intense Rain	☐
Abnormally High Tides	☐
Damaging Surf	☐

Reset Close

3. Write an appropriate [Headline Statement](#) in the Headline section.

Headline	
-----------------	--

4. Write an appropriate [Weather Situation](#) in the Situation section.

Situation	Weather Situation:
------------------	--------------------

5. Write all appropriate [Warning Details](#) in the Detail - Condition section.

6. Click the Lock button to ensure no changes are made in the [Warning Details](#) section. Click again to unlock this textbox.



7. Check the list of [Locations](#) and if required, manually modify and/or change the level of detail.

- Click the Detailed More button (up arrow) to increase the number of places mentioned in the warning text and graphic.
- Click the Detailed Less button (down arrow) to decrease the number of places mentioned in the warning text and graphic.



8. Click on the Lock button to ensure no changes are made to the list of locations. Click again to unlock this textbox.



9. List all significant weather [Observations](#) in the Observations/Other section.

2.3.4. Issuing Severe Weather Warnings

1. Change the Issuance Frequency to indicate when the next update will be issued. Change to 3hr if severe weather is rapidly clearing from a major area (capital city and/or Detailed Severe Thunderstorm Warning domain) or if conditions are high-end severe and require more frequent updates. For an initial issue or an update/correction at non-standard time (e.g., 8 am), if the auto-generated Next Issue Time is more than 6 hours in the future, the Issuance Frequency should be changed to 3hr for that issue, then back to 6hr for subsequent issues if moving back to 6-hour mode.

2. If text has been added or autogenerated text has been modified, click the Check Spelling button.



3. Click the Save button to save all graphical and text data.



4. Click the Preview button to preview how the warning will look online as a live product. Make every attempt to have a second pair of eyes review the warning prior to issue. Where possible, the Operational Lead (Op-Lead) should review the warning if Ops or Support are producing the warning. Use draft products ([TIFS Draft Products](#) via Australian Integrated Forecast System) to review.



5. Click the Issue button to send the SWW. Be sure to double check pre-selected address zones before pressing Issue in the pop-up box.



2.3.5. Cancelling Severe Weather Warnings

1. Click the Cancel Warning button to cancel the SWW.



2. If applicable, contextualise or delete the [Headline Statement](#) in the Headline section.

Headline	
-----------------	--

3. Contextualise or delete the [Weather Situation](#) in the Situation section.

Situation	Weather Situation:
------------------	--------------------

4. Either use standard autogenerated text or write appropriate [Warning Details](#) in the Detail Condition section.

Detail	Warning Section 1 Warning Section 2 Warning Section 3 Cancellation Locations
	Condition

5. If text has been added or autogenerated text has been modified, click the Check Spelling button.



6. Click the Save button to save all graphical and text data.



7. Click the Preview button to preview how the warning will look online as a live product.



8. Click the Issue button to send the SWW. Be sure to double check pre-selected address zones before pressing Issue in the pop-up box.



2.3.6. Concurrent Warnings

2.3.6.1. Land and Marine Based Severe Weather Warnings

2.3.6.1.1. Cancellations

1. When cancelling a land based SWW when an adjacent marine based SWW is still in effect, the following text is to be used.

[Cancelled phenomenon or phenomena] [is / are] no longer occurring across [state / districts / area]. However, a separate Severe Weather Warning for [damaging or dangerous surf / abnormally high tides] remains current over [coastal areas / districts]. Please refer to <http://www.bom.gov.au/warnings/>

2.3.6.2. Severe Thunderstorm Warnings and Severe Weather Warnings

2.3.6.2.1. Separate Severe Thunderstorm Warnings

A separate STW is a Detailed or Regional STW that is issued over an accompanying SWW. This overlapping product is used to warn for a hazard that is not included in an accompanying SWW or provide increased geographical detail for areas under effect of a high-end severe hazard.

If a severe or high-end severe hazard is expected to remain exclusively within the Detailed STW domain, a Detailed STW will be issued without an accompanying Regional STW. If outside the Detailed STW domain, a Regional STW will be issued. If the severe or high-end severe hazard extends outside the Detailed STW domain (e.g., Very Dangerous Thunderstorm) moving into or out of the Detailed STW domain, then both Detailed and Regional STW will be issued until one of the products can be cancelled.

2.3.6.2.2. Issue Criteria

If either of the following conditions are satisfied, a separate STW will be issued over the accompanying SWW.

1. A hazard, other than those already included in the SWW, is occurring, or expected to occur and is linked to convective regions that can be identified and tracked using radar, satellite and/or real-time observations. For example:
 - Large or giant hail
 - Tornadoes (supercell, shear zone and QLCS mesovortices)
2. A high-end severe hazard is occurring, or expected to occur and is linked to convective regions that can be identified and tracked using radar and/or satellite. For example:
 - Destructive wind gusts
 - Intense rainfall
 - Tornadoes (supercell, shear zone and QLCS mesovortices)

In the rare situation where only a high-end severe hazard is included in a SWW (e.g., significant cold front over southwestern Western Australia that produces widespread destructive wind gusts), a separate STW is not required.

2.3.6.2.3. Cancellations

1. When cancelling a standard STW when a SWW is still in effect, the following text is to be used in the STW cancellation to convey the continued risk of severe weather within the warning area.

Severe thunderstorms are no longer occurring over [state / districts / area].

The immediate threat of severe thunderstorms has passed. The situation will continue to be monitored closely and further severe thunderstorm warnings will be issued, if necessary. A separate Severe Weather Warning for [heavy rainfall / damaging winds / heavy rainfall and damaging winds] remains current over [state / districts / area]. Please refer to <http://www.bom.gov.au/warnings/>

2. When cancelling a high-end STW when a SWW is still in effect, the following text is to be used in the STW cancellation to convey the continued risk of severe weather within the warning area.

Very dangerous thunderstorms are no longer occurring over [state / districts / area].

The immediate threat of very dangerous thunderstorms has passed. The situation will continue to be monitored closely and further very dangerous thunderstorm warnings will be issued, if necessary. A separate Severe Weather Warning for [heavy rainfall / damaging winds / heavy rainfall and damaging winds] remains current over [state / districts / area]. Please refer to <http://www.bom.gov.au/warnings/>

3. In the event where a SWW is cancelled and there is a risk of STS, the following text is to be used.

Severe weather is no longer occurring over [state / districts / area]. The immediate threat of widespread severe weather has passed, and the situation will continue to be closely monitored.

There remains a risk of severe thunderstorms over [state / districts / area] [describe timing]. A separate Severe Thunderstorm Warning will be issued, if required.

2.3.6.3. Tropical Cyclone Advices and Severe Weather Warnings

Developing tropical lows near the coast or decaying tropical cyclones over land are common synoptic patterns leading to the onset or continuation of severe weather. Therefore, as the event evolves, EPS-severe weather (SW) may be required to transition from SWW to Tropical Cyclones (TC) Advices or vice versa.

The following sections describe how the severe weather and TC warning service can interact with each other in order to provide the clearest message to the public. It is imperative that all services within CSG are proactive and maintain effective communication during such events, particularly EPS-SW TSHR and EPS-SW TC.

2.3.6.4. Tropical Cyclone Watches and Severe Weather Warnings

A SWW and TC Watch can be current for overlapping areas as the validity period of each product is different. The SWW describes current or forecast hazardous phenomena for the next 24 hours, while the TC Watch forecasts gales and associated severe weather impacts with a TC developing within 24-48 hours.

For example, a SWW for strong monsoonal flow north of a developing tropical low affecting a large area of coast may be supplemented with a TC Watch for a tropical low, covering a smaller or overlapping area of coast.

In this situation, the TC Watch and SWW must cross reference each other. An example statement that could be added into the warning details section within the SWW is:

A Tropical Cyclone Advice is also current for this system.

2.3.6.5. Tropical Cyclone Warnings and Severe Weather Warnings

2.3.6.5.1. Overlapping Areas

If a SWW is current for an area overlapping with a TC Watch area and the TC Watch is upgraded to a TC Warning, the SWW is cancelled. This is to ensure that the same phenomena are not being mentioned in two separate warning products and that there is a consistent weather narrative.

When the SWW is to be cancelled, the TC Warning is referenced within the warning details section using the following statement:

This is the final Severe Weather Warning for this system – refer to Tropical Cyclone Advice number [XX] issued at hh:mm am/pm.

2.3.6.5.2. Adjacent Areas

If severe weather not directly related to the TC such as a shear zone or strong (background) monsoonal flow is occurring or expected to occur, a separate SWW will be issued. The SWW should avoid overlap with the TC Advice warning zone to ensure that people at any given location only need to refer to one warning product.

2.3.6.6. Transition from Tropical Cyclone Warnings to Severe Weather Warnings

A weakening or transitioning system over land may require a transition from a TC Warning to a SWW. Standard practice is for EPS-SW TC to use referral statements on the TC Advice product, one within the body of the text and another on the graphic. In such instances, EPS-SW TSHR is to work closely with EPS-SW TC to align warning strategies and obtain confirmation that no further TC warnings will be issued for the system.

2.4. Communication

2.4.1. Heads Up

The TSHR meteorologist overseeing the SWW is to message the respective DSS team on MS Teams via the [EPS_TSHR](#) channel to provide a 'heads up' about the upcoming SWW. The message is to link to the draft warning ([TIFS Draft Products](#)) with a formal notification that the corresponding Severe Weather Technical Notes (Log ID) are ready, or that they will be ready shortly. There is no requirement to link the SWW draft for a Cancellation SWW.

Heads up messages are required for the following SWW:

- **New** New SWW
- **Escalation** SWW upgraded to high-end severe phenomena
- **De-escalation** SWW downgraded from high-end severe phenomena
- **Cancellation** Cancelled SWW

- **Continuation** Change in hazard and/or area only

The following are heads up examples for SWW:

New SWW

Hi @DSS_VIC, here is the [SWW TIFS Draft](#) that will be issued around 5 pm AEDT. 07:00 UTC Warning SWW TN (Log ID 290) are now available in OpsTools.

Escalation SWW

Hi @DSS_QLD, here is the [SWW TIFS Draft](#) that will be issued within the next 30 minutes. SWW TN (Log ID 291) will be ready shortly in OpsTools and will highlight the new risk of R+ later this evening over the Wide Bay and Burnett.

Cancellation SWW

Hi @DSS_WA, the SWW will be cancelled around 8:30 am AWST. 01:30 UTC Warning SWW TN (Log ID 291) will be ready shortly.

2.4.2. Brief and Advise

The DSS Op-Lead or Outposted Meteorologist will be responsible for briefing emergency services. Outside of DSS operational hours, the responsibility transfers to NP who may delegate to TSHR (workload dependent). Navigate to the [TSHR Contacts](#) SharePoint page for contact details for all emergency services.

If TSHR is not operational, NP takes over responsibility for briefing emergency services.

2.4.3. Formal Sign Off

At the end of the PM shift or agreed restriction duty, the TSHR Op-Lead or delegate is to formally transfer responsibility of the severe thunderstorm and severe weather services to NP and sign off within the [EPS_TSHR](#) channel using the template below. The message is to include all current warnings and/or watch points.

The following are formal sign off examples:

No Activation

Hi @NP_Ops - TSHR signing off.

Status:

- No current warnings.

Watch Points:

- WA: Non-severe elevated thunderstorms expected to continue over the South Interior overnight tonight.

Restriction Activated

Hi @NP_Ops - TSHR signing off.

Status:

- Regional STW current for N NSW and S Qld.
- SWW current for NSW Alpine areas - 12:00 UTC SWW TN (OpsTools)

Watch Points:

- NSW/QLD: W can be excluded from the next Regional STW update due to the risk easing around midnight.

WA: Non-severe elevated thunderstorms expected to continue over the South Interior overnight tonight.

2.5. Appendix

2.5.1. Warning Content

The following sections cover all graphical and textual information required for a SWW. Please refer to the [SWW Pro Forma](#) for guidance and instructions on how to complete each section of the warning.

2.5.1.1. Title

The autogenerated title will state the warning type and all, or part of one, or several weather forecast districts. It will also list the potential phenomena.

2.5.1.2. Issuance Time

Autogenerated issuance time and date of the SWW.

2.5.1.3. Headline Statement

The headline statement is a punchy, succinct one-line statement that describes the 'what, where, and when' of key severe weather threats. The aim of a headline statement is to focus the attention on the key message in the warning. The warnings can be long and sometimes the information can be lost.

Warning cancellations do not require a headline statement.

This statement does not always need to cover all elements of the warning but must cover those parts we want to emphasise. For example, if there is a period of particularly intense rain inside the broader event, use the headline statement to put a spotlight on it – using the where, when and what principle.

A repetition of the header of the SWW most often will not serve this purpose.

For SWW that include high-end severe phenomena, the headline statement must be uppercase. Otherwise, the headline statement is to be lowercase.

Example headline statements:

- Heavy rainfall and damaging wind gusts to develop over the Pilbara this evening.
- INTENSE RAINFALL OCCURRING OVER COASTAL AREAS BETWEEN NEWCASTLE AND SYDNEY.

2.5.1.4. Warning Graphic

SWW graphic

2.5.1.5. Weather Situation

The weather situation is to include a brief description on the current and/or developing severe weather situation. It should list the synoptic drivers and may provide an overview on the spatial and temporal extent of the synoptic drivers and associated phenomena. For prolonged events, a general statement of the evolution of the system including uncertainty may be appended.

Example weather situations:

- A surface trough over southeast Queensland is forecast to deepen into a low over the Wide Bay and Burnett in response to a strong upper low later tonight. This low is expected to track southward over the Southeast Coast and into northeastern New South Wales during Sunday producing further heavy rainfall with embedded thunderstorms. The evolution of this system and its relatively slow movement will continue to cause significant and prolonged impacts across southeast Queensland over the weekend.
- A strong cold front is expected to move eastwards across the southwest of the state during Wednesday. Unstable conditions and very strong winds aloft associated with this feature are likely to produce widespread damaging winds.

2.5.1.6. Warning Details

The main body of the warning is to list all potential phenomena and describes their upper limits or ranges, probability, and temporal and spatial characteristics.

Major statements that may also be required in this section of the SWW:

- [Custom action statements](#) may be required for Queensland, New South Wales, Victorian or Tasmanian SWW during or after severe weather with heavy rainfall. The use of these action statements is a joint decision between TSHR and DSS.
- [Climatological statements](#) are to be added to this section for all Western Australian SWW, including both cool and warm season. Please refer to the [SWW Pro Forma](#) page for a comprehensive overview of conditions when to include these climatological statements.
- [Separate STW referral statements](#) are to be added to this section for all SWW at any time where high-end severe hazards that can be identified and tracked using radar and/or satellite are considered possible or likely. This statement is not required for SWW where identification and tracking are not possible (e.g., central Northern Territory where there is no radar network).

2.5.1.7. Locations

Autogenerated summary of locations which may be affected by the severe weather event.

Although this section is autogenerated in TIFS, manual intervention may be needed to explicitly list the potentially impacted towns, cities, or coastal communities that TIFS does not automatically populate. Take particular care when there is more than one warning area within the single SWW product.

2.5.1.8. Observations

Confirmed severe and high-end severe reports and observations are to be manually inserted in the observation section, listing the location, official or estimated time of occurrence (local time), and the significant weather observations. High-end severe reports and observations are to be uppercase.

Unit of measurement: rainfall, wind and hail reports and observations are to be listed in mm, km/h, and cm respectively.

Example observations listing:

- 56 mm was recorded at Melbourne Airport in 30 minutes to 4:24 pm.
- 118 km/h wind gust was recorded at Darwin Airport at 7:14 pm.
- CONFIRMED REPORT OF A TORANDO IN BEAUDESERT AROUND 4:30 PM.

2.5.1.9. Action Statements

Autogenerated action statements that have been agreed upon by state and territory-based emergency services.

2.5.1.10. Warning Updates

Autogenerated update time of the next SWW.

2.5.1.11. Warning Accessibility

Autogenerated accessibility text that provides brief statement on the additional channels where the SWW is broadcasted.

2.5.2. Phenomena Selection in TIFS

1. Phenomena should be ordered from most likely to least likely.
2. When a high-end severe phenomenon is considered **possible** (Weather Detail section states that the phenomenon is possible), the phenomenon is to be selected so it is listed in the SWW Title and Graphic.
3. Due to the localised and often unpredictable nature of intense rainfall within a broader system, it is recommended that both heavy and intense rainfall are selected so the SWW Title and Graphic will list heavy, locally intense rainfall. This should limit over-warning and the perception of scaremongering.
4. When destructive winds are considered **likely** (Weather Detail section states that the phenomenon is likely) and is not expected to be entirely linked to convective regions, destructive winds can be selected only.

Typical scenarios where destructive winds can be selected only:

- A significant cold front with low-level winds near or in excess of 65 knots over southwestern Western Australia that produces widespread destructive winds from the west.
- A deep low over the Tasman Sea that produces destructive winds over Victoria and Tasmania from the east to southeast.

2.5.3. Collaboration Tool

When the SWW is launched correctly from the Main Panel 'Regular Tasks' in VW, it will automatically enable the Collaboration Tool where multiple people can edit the product at the same time.

Towards the bottom left-hand side of the map area within the Forecaster application, the meteorologists currently editing the product are listed. The username corresponding to the meteorologist currently viewing the forecast product locally on their workstation will be indicated by an asterisk, *. The username highlighted in bold font indicates the meteorologist who has 'session ownership' and typically coincides with the meteorologist who first loaded the product and still has the product active on their workstation (has not closed the instance of Forecaster).

When meteorologist (1) is editing the Severe Weather Warning area, the warning area will appear as normal with the forecast area appearing with the correct fill and displaying the 'anchor' points for editing. If another meteorologist (2) is in this product, they will see the edits undertaken by meteorologist (1) in real-time, but the area will be "greyed out" and not able to be edited as illustrated in the image on the right. When the meteorologist (1) finishes editing the forecast area and LMB clicks off of the forecast area, such that the 'anchor' points are no longer visible on their workstation, the Severe Weather Warning area will appear with the correct fill and will be able to be selected on the meteorologist's (2) workstation.

Session Ownership

When preparing the Severe Weather Warning areas in collaboration mode, if the 'Save' button appears "greyed out", this is likely the result of not being the "session owner". As outlined above, the session owner is indicated by the username highlighted in bold font towards the bottom left-hand side of the map area within the Forecaster application. If this is the case, navigate to the 'Feature Editor' menu towards the top of the Forecaster application, and click on 'Take session ownership'. Upon doing so, your username should now appear bold and with the asterisk.

3. Related Documents

CSG RACI	CSG RACI
CSG Process Maps	< Include as hyperlinks > Remove and add rows as required
CSG Work Instructions	< Include as hyperlinks > Remove and add rows as required
CSG Master Glossary	CSG Master Glossary

4. Document Control

4.1. Approvals

Date Approved	Version No.	Name	Position	Signature (electronic)
Nov 2023	V4.0		Manager Severe Weather	

4.2. Version Control

Version No.	Version date	Author	Comments
V1.0	26/07/2022		Initial draft
V2.0	05/08/2022		Updated instructions and format
V2.0	02/09/2022		Updated shading to grey as the blue for accessibility reasons
V3.0	31/10/2022	EPS team members	General updates
V4.0	Nov 2023	EPS team members	Updates for 23/24

Detailed Work Instruction – Heatwave Warnings

Purpose

This detailed work instruction provides a step-by-step process to generate and issue the Heatwave Warnings. The [Best Practice](#) and [Examples](#) sections towards the bottom of this document can be used as a guide when formulating the warning text that accompanies this product.

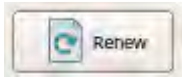
Note this does not cover the process of forecasting the temperature grids in GFE and publishing them for the heatwave algorithm, these processes are covered in the [Detailed Work Instruction – GFE Forecasting and Publishing for Heatwave Products](#).

Heatwave Warnings are issued by 15:00 local time each day, but slightly earlier at 14:00 local time in Western Australia. Warnings are issued daily during heatwave events and then cancelled at the end of the event. The warning covers 4 three-day periods, extending out to 3 days in the future.

1. Generate the warnings from VW

- 1.1 In Visual Weather Mainpanel change "My Roles" to "Heatwave" by clicking the pencil to select heatwave from the list of roles.
- 1.2 Once the GFE grids have been published the heatwave algorithm can take approximately 45 minutes to run and identify which districts reach warning criteria (at least 10% of the district is severe or extreme). Note this is longer than it takes to just produce the maps given it has to tally up the percentages of each district over all days.
- 1.3 Once the algorithm has run and identified which districts have reached warning criteria, VW will generate an alert to identify which States and Territories require a warning. This will appear in the My Notifications section of VW.
- 1.4 Send a message in the EPS_FHAQ Operational Channel to alert the relevant DSS teams that a heatwave warning will be issued for their state. (e.g. @DSS_NT a heatwave warning will be issued for the NT today). Also tag in DSS_HPR_Nat.
- 1.5 **Note that full cancellations are not identified through this process so one must be aware of what warnings are current and, if not continuing, will require a cancellation.** See [cancelling a warning section](#) below.
- 1.6 You can cross reference the details supporting the heatwave warning (find out % of districts affected and towns impacted) by looking at the Heatwave Decision Support Product on the [Heatwave Product Viewer \(bom.gov.au\)](http://bom.gov.au) and the EHF Map in Visual Weather (that includes town names across the country).
- 1.7 The Heatwave Warnings will appear in the "My tasks" window (click the "Regular Tasks" Tab).
- 1.8 A separate warning is issued for each state and territory.
- 1.9 Click on the "create" icon (sheet of paper)
- 1.10 Once a warning has been issued, all subsequent warnings in the event for that state/territory need to be issued by using the renew button. **To access the "Renew"**

button click on the Warning for each state under “My Active Warnings & Forecasts”.



- 1.11 Use the [FHAQ Technical Info OneNote](#) to save/copy drafted text.
- 1.12 Type a description in the text box. Consider the [Best Practice](#) and [Examples](#) sections below. Please avoid using the following characters which will cause errors in the xml version of the warning " , ' < , > , & .
- 1.13 Check the list of impacted locations and edit, if needed. See the [Best Practice](#) section below for further guidance.
- 1.14 Preview (magnifying glass) the PDF then Issue the Warning using the Send button (paper plane).
- 1.15 Check the [Bureau Heatwave website](#) to ensure the warning has been issued correctly. A PDF version will also be emailed to EPS_SW_FireHeatwaveAQ@bom.gov.au.
- 1.16 If you later spot an error in the warning text, you can issue a correction by selecting the warning from the “My Active Forecasts and Warnings” box then clicking the Correct (COR) button.

2. Cancelling a warning

2.1 Note that VW does not produce an alert when full cancellations are required, so always compare the warnings current with the VW notification about which states/territories require a warning to confirm if any cancellations are required.

2.2 Warnings need to be cancelled when there is no longer any severe or extreme heatwave areas in that weather district – this will be automatically completed in the system if there are continuing severe or extreme heatwaves in other weather districts.

2.3 Warnings are also cancelled when there is no longer any severe or extreme heatwave areas in that state/territory.

2.4 Press the Cancel button, then follow the steps 1.9-1.11 for renewing the warning.



2.5 Action statements for a cancellation situation will be automatically included in the Safety Advice section.

2.6 You can include the statement about affected locations if that makes sense in the context of the weather situation, for example if Severe heatwave will continue but below the 10% threshold.

2.7 If the cancellation gets sent late it may ingest the wrong data/day. This following process can be used if a cancellation needs to be corrected. Go to VisWx> Message

Editor > Select Heatwave Warning State > Adjust the time to the previous day and the original cancellation form will be provided and can be sent.

3. Renewing or cancelling an expired heatwave warning

If the Heatwave Warning product that you wish to renew or cancel has expired and disappeared from the "My Active Warnings & Forecasts" section on Main Panel (Figure 1), there are still steps that can be taken to send out the update, these are as follows.

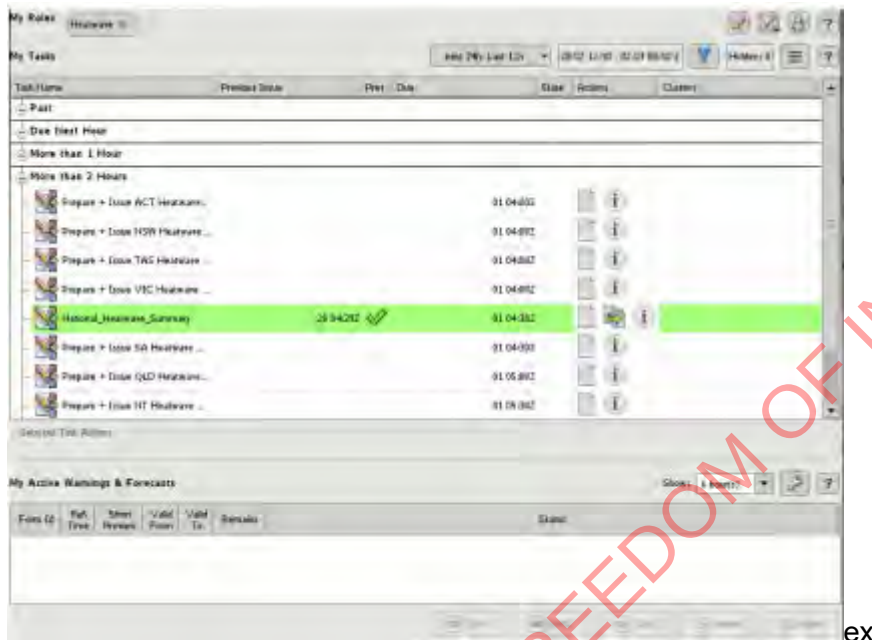


Figure 1 The warning has expired and disappeared from "My Active Warnings & Forecasts" on Main Panel.

From the Main Panel "Main Window" you can manually open the Message Editor application clicking on the Icon next to the Message Editor header in the top quick launch bar (Figure 2).

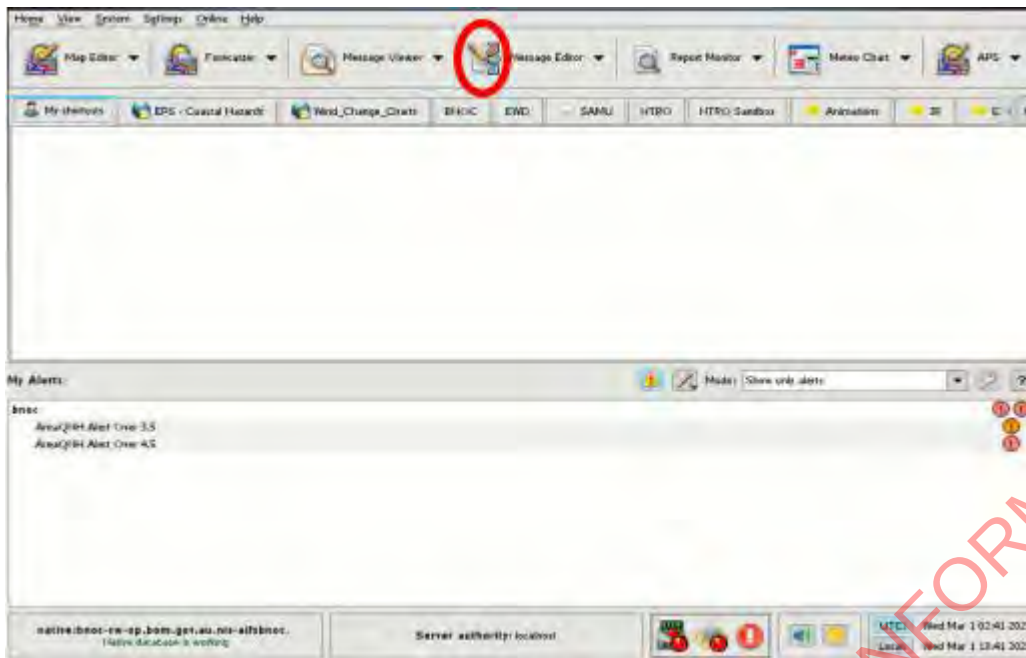


Figure 2: Message Editor application icon located next to the Message Editor header in the top quick launch bar.

Once the Message Editor application is open you can select the warning that you wish to renew or cancel by clicking on the open product folder icon (Figure 3).

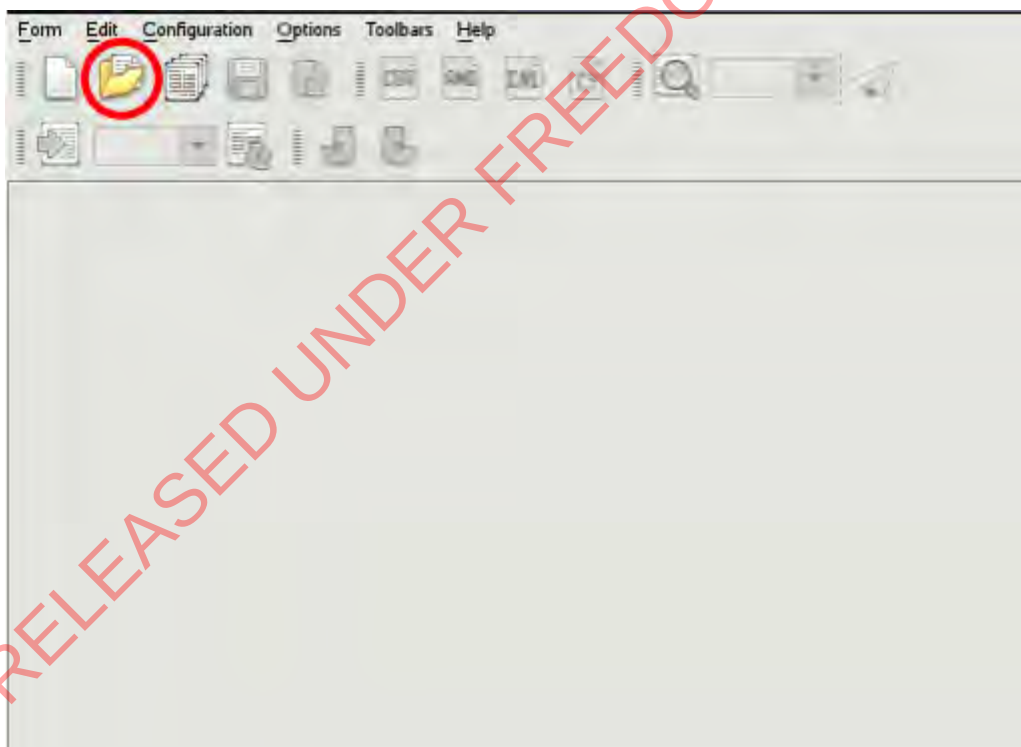


Figure 3 Open product folder icon location in Message Editor.

Then selecting the form / product you wish to renew or cancel from the left-hand side of the window and the appropriate product for a set date and time from the right-hand side of the window. You can then select the required option of "CNL" (Cancel) or "Renew". When you

click on these options the product will then open for you to edit and issue as required (Figure 4).

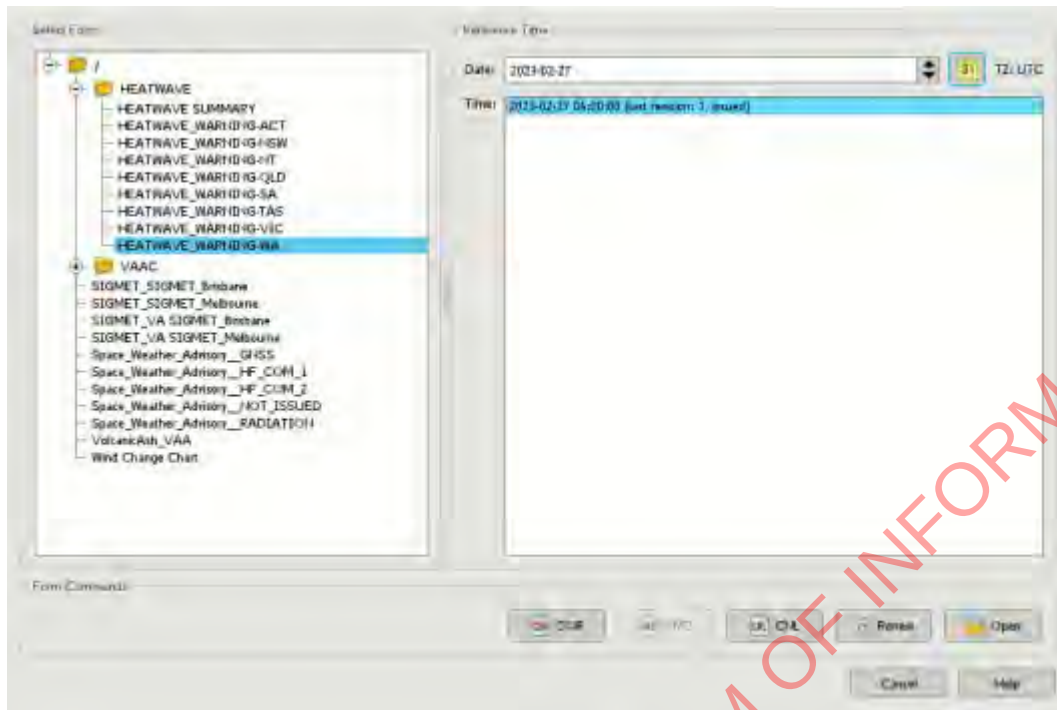


Figure 4 Dialog box to select the form / product and reference time to CNL or Renew the product.

4. Correcting a cancelled warning

If you have issued a heatwave warning cancellation and then need to issue a correction for this, you unfortunately cannot do this via the "My Active Forecasts and Warnings" section on Main Panel. This will only open the previous active warning and try to correct that, and not the cancellation message. Correcting the cancelled warning can be done by following the steps above, but at step 3 you select the "COR" option when opening the product (Not CNL or Renew). This will correct the most recent version of the product that was issued, which will be the cancellation.

5. Best Practice

5.1 Given the districts and their forecast severity has been detailed at the beginning of the warning, use the "Forecast Summary" section to focus on the temperatures driving the heat, and when heatwave conditions are expected to peak or ease.

5.2 Points to include:

- A description on the maximum and minimum temperatures over the warning area (it's important to spell out "mid forties" as opposed to "mid-40s" for better TTS results).
- When the heat will peak throughout the heatwave, if identifiable.

- When the heatwave is expected to ease. This may be well after the outlook period but is still useful to try to indicate when the current heat will ease.

5.3 The **Impacted Locations** section (i.e., list of town names) will automatically populate below the Forecast Summary text.

- This section is editable in the case of adding a town within the edit area that wasn't automatic populated, but has something significant going on there (e.g., a festival, etc) or if the surrounding area is at heatwave warning level, but not at that specific location.
- Discuss with DSS which locations are important to include.
- This could help with message continuity during a heatwave event.
- If there are no pre-defined locations impacted within the warning area, you can delete this statement from the warning message.

5.4 Use separate sentences rather than just one block of text. White space makes it easier to see this information on the web.

5.5 Use the phrase "expected to ease" rather than a heatwave will cease because impacts can linger for a few days afterwards or it may stay in low-intensity heatwave for a period.

5.6 If heatwave conditions continue beyond the warning period, reference when the heatwave will continue until. E.g., "Severe heatwave conditions will continue until early next week".

5.7 If heatwave conditions ease below warning criteria within the warning period, reference when the heatwave will ease. E.g., "Severe heatwave conditions will ease from the weekend".

5.8 In full cancellations the statement "*No further warnings will be issued for this event, but the situation will continue to be monitored and further warnings issued if necessary*" appears at the bottom of the warning, so just focusing on the temperature forecast should be sufficient in the "Forecast Summary" of a cancellation warning.

5.9 If a heatwave eases then restarts within the outlook period, reference the period of reprieve and when it will expect to recommence. E.g., "a period of reprieve from the current heatwave is expected due to milder temperatures over the weekend, however higher temperatures will redevelop leading to severe heatwave conditions from Monday".

6. Examples

For the below examples, assume current day is Wednesday.

6.1 Heatwave conditions not current but developing in the outlook period, and easing after the outlook period:

Maximum Temperatures in the high thirties and overnight minimum temperatures in the low twenties across Victoria from Saturday.

The heat will peak Monday and Tuesday with maximum temperatures in the low forties and overnight minimum temperatures in the high twenties.

A cooler change from the west will ease heatwave conditions during the middle of next week.

6.2 Heatwave conditions current and easing in the outlook period:

Maximum Temperatures in the low forties and overnight minimum temperatures in the mid twenties over eastern NSW will continue until Friday.

Severe heatwave conditions will ease from the south with a cooler change developing late Thursday and extending throughout the warning area during Friday.

6.3 Cancellation in part of the state/territory (note that this type of cancellation will not trigger the automatic text "*No further warnings will be issued for this event, but the situation will continue to be monitored and further warnings issued if necessary*" so try and mention within the text where heatwave conditions have eased):

Maximum temperatures in the mid forties and overnight minimum temperatures in the mid twenties over southern and central parts of the NT for the outlook period.

Severe heatwave conditions are likely to persist in the south until the middle of next week.

Severe heatwave conditions have eased in the northern part of the NT, including the Arnhem and Daly districts.

6.4 Full cancellation:

Maximum temperatures in the mid thirties with overnight minimum temperatures in the low twenties throughout southern parts of WA.

6.5 Heatwave eases then redevelops:

Maximum temperatures in the low forties and overnight minimum temperatures in the mid twenties in the east of SA ahead of a cooler change developing from the west during Friday.

Milder maximum temperatures in the high twenties and overnight minimum temperatures in the high teens behind the change will bring some reprieve from current heatwave conditions over the weekend.

Severe heatwave conditions will redevelop throughout SA next week with a return of elevated temperatures.

6.6 Extended heatwave period, detailing when the heatwave will peak within warning period:

A prolonged period of heat is forecast over southern Queensland for the next week or so. Maximum temperatures in the high thirties and overnight minimum temperatures in the low twenties will be experienced most days.

The severe heatwave will peak over the weekend with maximum temperatures reaching the low forties and overnight minimum temperatures in the mid twenties.

The severe heatwave is expected to continue through most of next week with milder temperatures possible from later in the week.

6.7 Two separate heatwave areas over a large state with different trends:

Maximum temperatures in the high thirties to low forties and overnight minimum temperatures in the mid to high twenties over the Kimberley.

Maximum temperatures in the mid thirties to low forties and overnight minimum temperatures in the high teens to mid twenties over the Central West and Lower West.

Severe heatwave conditions in the Kimberley are expected to ease over the coming days.

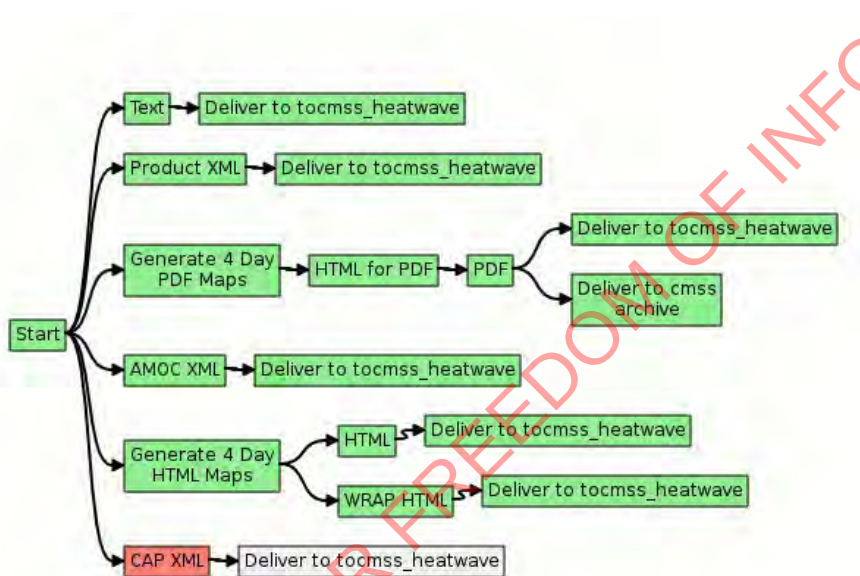
Heatwave conditions over the west coast are expected to increase in intensity and extend further south over the coming days.

7. Troubleshooting Tips

7.1 When you issue the warning, ensure that the pipeline shows as a green tick.



If some part of the process has not worked (no green tick), click on the pipeline icon to see what worked and what didn't. The parts that didn't work will show up in red.



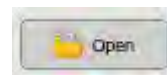
part

Figure 5. Pipeline details showing that the CAP XML component did not work, but all other components did work.

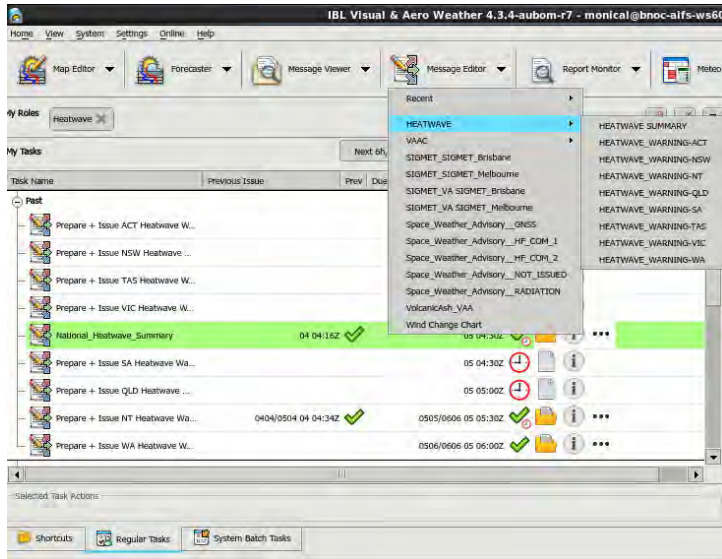
7.2 If a failure in the pipeline occurs, rerun the pipeline by clicking on the send icon. Do not start a new form.



7.3 To open an existing warning without changing anything, select the warning from the list of My Active Warnings and Forecasts and use the Open button.



7.4 If the pipeline keeps failing, the only option may be to reset the form by creating a new warning from scratch. Do this from the Message Editor menu. Select Heatwave then select the relevant jurisdiction's heatwave warning.



RELEASED UNDER FREEDOM OF INFORMATION