Department of Climate Change, Energy, the Environment and Water

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Snowy River Increased Flow (SRIF) Safety Management Plan 2022-2027

ENVIRONMENTAL FLOW RELEASES INTO THE SNOWY RIVER BELOW JINDABYNE DAM

March 2025 (Version 6)

Acknowledgement of Country

The Department of Climate Change, Energy, the Environment and Water acknowledges that it stands on Aboriginal land. We acknowledge the Traditional Custodians of the land and we show our respect for Elders past, present and emerging through thoughtful and collaborative approaches to our work, seeking to demonstrate our ongoing commitment to providing places in which Aboriginal people are included socially, culturally and economically.

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Version Control

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5	Nov 2024	Update the algae safety protocol with input from STAG	DOC24/203196 (v5)
6	Mar 2025	Update agency names	DOC25/104309 (v6)

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1. Introduction

As part of the Snowy River Increased Flow (SRIF) program, environmental water is released from Jindabyne dam into the Snowy River.

1.1. Purpose of environmental releases

The lack of high-flow events in the Snowy River since 1967 has made the river channel contract and caused sediment build up in the riverbed. Sediment is delivered to the Snowy River during local storm events via many of the smaller tributaries. Sediment settles out of the water in locations where velocity decreases. The reduced flow regime prevents sediment being transported downstream where it would previously be distributed in a natural way.

Localised build-up of sediment in the Snowy riverbed has been recognised as one of the key limitations for the recovery of the health of the river, as it reduces the quality of the river habitat and/or smothers plants and animals directly. To address the effects of river regulation, environmental water releases are used to encourage channel scour and lateral deposition of the sediment. These releases occur every day of the year, and events of greater magnitude are planned for the winter and spring periods to better reflect the natural hydrology of the mixed rainfall/snowmelt rivers of the Snowy Mountains.

1.2. Purpose of this plan

The SRIF Safety Management Plan (the SMP) has been prepared by the Department of Climate Change, Energy, the Environment and Water (NSW DCCEEW), including the Water (NSW DCCEEW-Water) and Conservation Program, Heritage and Regulation (DCCEEW-CPHR) divisions.

This SMP details the anticipated risks associated with environmental releases, and outlines the actions and processes required to be undertaken by NSW DCCEEW-Water, NSW DCCEEW-CPHR, Snowy Hydro and other key stakeholders to mitigate or manage these risks.

The SMP is a requirement of the Snowy Water Licence and the Snowy Water Inquiry Outcomes Implementation Deed 2002 (SWIOID), which states that a SMP be developed to address risks to public safety, third-party property and workplace health and safety in connection with the release of 'flushing flows', which are defined as a daily release greater than 5,000 megalitres (ML) per day. [1]

The NSW DCCEEW-Water takes a risk-based approach to safety and this SMP addresses not only the flushing flow, but all environmental releases over 2,500 ML/day[2], termed 'high-flow events'. Based on a review of evidence in March, this threshold has been increased from the previous flow rate of 2,000 ML/day.

The objectives of the SMP are to ensure that these risks are appropriately minimised by:

- Maintaining stakeholder relationships where there is an interest in public safety along the Snowy River.
- Promoting public awareness of the risks associated with environmental releases into the Snowy River catchment below Jindabyne Dam.
- Issuing of community information and warnings during flushing flow and high-flow events.
- Working with organisations that also have an interest in safe management of environmental releases (e.g. Snowy Hydro Limited, State Emergency Service, Councils, and Bureau of Meteorology) before and during high-flow events to mitigate, as far as possible, any detrimental impacts.

[1] This is the flow rate above which spillway releases are required. Releases less than 5,000 ML/d can be made from the Jindabyne Dam cone valves.

[2] When this SMP is reviewed annually for currency, the department will consider whether this threshold remains appropriate, subject to any improved understanding of the impacts of various flow rates.

1.3. Scope of this plan

Flows from Lake Jindabyne into the Snowy River may be a result of the following:

1. Planned SRIF releases – These are the environmental releases as designed by DCCEEW-CPHR and outlined in the annual SRIF Operations Plan
2. Modified planned SRIF releases – These are modifications to the dates or volumes of the planned SRIF releases as a result of climatic, environmental or other unforeseen circumstances that may arise closer to the time of the planned SRIF release.
3. Snowy Hydro Jindabyne unplanned storage releases – These are releases such as those made by Snowy Hydro in order to manage the volume of water held in storage, including to avoid uncontrolled spills. These are not accounted as SRIF, but where possible may be released in consideration of environmental outcomes.
4. Uncontrolled spills – These are spills over the dam spillway when the volume of Jindabyne Dam exceeds the storage capacity of the dam.

This SMP covers the safe management of (1) planned and (2) modified planned SRIF releases, including public communications.

Snowy Hydro is responsible for the safe management of (3) unplanned storage releases and (4) uncontrolled spills including public communications, and as such these are not covered by this SMP.

The SMP covers a 5-year period from May 2022 to April 2027.

1.4. Structure of this plan

This SMP outlines the risks and mitigation measures associated with all planned high-flow environmental releases. It details the processes to be undertaken in managing safety. The planned release strategy for each water year is outlined in the SRIF Operations Plan (see Error! Reference source not found.) and is available o n the NSW DCCEEW-Water website. Daily environmental flow releases are published on Snowy Hydro's website.

1.5. Policy and legislative context and responsibilities

The release of the SRIF is governed by the following key acts and agreements:

- Snowy Water Inquiry Outcomes Implementation Deed 2002 (SWIOID)
- The Snowy Water Licence
- *Snowy Hydro Corporatisation Act 1997*
- *Workplace Health and Safety Act 2011*

1.6. Overview of responsibilities

Multiple organisations are involved in the planning, design, implementation and safety management of environmental releases. In summary this includes:

- NSW DCCEEW-Water determine annual water allocations to the entitlement associated with SRIF.

- NSW DCCEEW-CPHR, in consultation with the Snowy Advisory Committee (SAC), designs the pattern of environmental flow releases to achieve environmental objectives listed in the SWIOID, taking into account Snowy Hydro's operational constraints.
- NSW DCCEEW-Water coordinate and implement the safety management process, with involvement of the Snowy Safety Technical Advisory Group (STAG), including community engagement, noting that all organisations involved are responsible for ensuring safe management of releases.
- NSW DCCEEW-Water instruct Snowy Hydro to make the releases.
- Snowy Hydro makes the physical release if safe to do so, and measure released volumes which subsequently are reported to NSW DCCEEW-Water.
- All organisations involved are responsible for ensuring safe management of releases.

Other stakeholders also have responsibilities and roles in identifying risks associated with environmental flows and implementing actions that will reduce the risks down to an acceptable level. Specific responsibilities for safety management are detailed further in **Section 3.**

1.7. Review of Safety Management Plan

This SMP is current for the 5-year period from May 2022 to April 2027. NSW DCCEEW-Water will review the SMP for currency prior to the commencement of planned environmental water releases annually. Any required amendments would be made as a revision to this document.

In the event of any adverse impacts resulting from a release, the SMP will be reviewed.

An annual SIRF Operations Plan is also prepared each year by NSW DCCEEW-CPHR. This is an internal document that details the release strategy.

2. Risk assessment

NSW DCCEEW-Water, in collaboration with stakeholders, has analysed the anticipated risks to public safety, property and work healthy and safety, associated with planned environmental flow releases. NSW DCCEEW-Water has also assessed the significance of the potential consequences for each associated risk, as well as the probability of that risk being realised. A detailed table of risks is provided in **Appendix A**.

The table also includes proposed control measures required to mitigate or reduce the risks. These measures have been developed into the safety management processes outlined in **Sections 3 and 1**.

2.1. Stakeholders

In assessing risks, NSW DCCEEW-Water has taken reasonable steps to identify stakeholders likely to be affected by the releases from Jindabyne Dam, or who may be able to assist in ensuring the safety of staff, the public and property during the releases. These include:

- landholders along the Snowy River
- local businesses within the Snowy region
- members of the general public
- recreational fishing and water user groups
- community interest groups
- Snowy River Alliance
- recreational campers and tourists
- Bureau of Meteorology (the Bureau)
- Snowy Monaro Regional Council (SMRC)
- East Gippsland Shire Council (EGSC)
- NSW State Emergency Service (NSW SES)
- Victorian State Emergency Service (Vic SES)
- Local Land Services
- NSW National Parks and Wildlife Service (NSW NPWS)
- NSW Roads and Maritime Services (NSW RMS)
- Snowy Hydro
- Victorian Department of Energy, Environment and Climate Action (Vic DEECA)
- Victorian Environmental Water Holder
- East Gippsland Catchment Management Authority (EGCMA)
- Snowy Advisory Committee (SAC)

NSW DCCEEW-Water recognises that effective management of the risks that could arise from the releases requires the support and coordination of many stakeholders. Effective working relationships with stakeholders must be maintained to ensure the environmental flow events occur safely.

2.2. Catchment description

To understand the risks, it is important to understand the river system downstream of where releases are made at Jindabyne Dam. A catchment map is shown in Figure 2-1

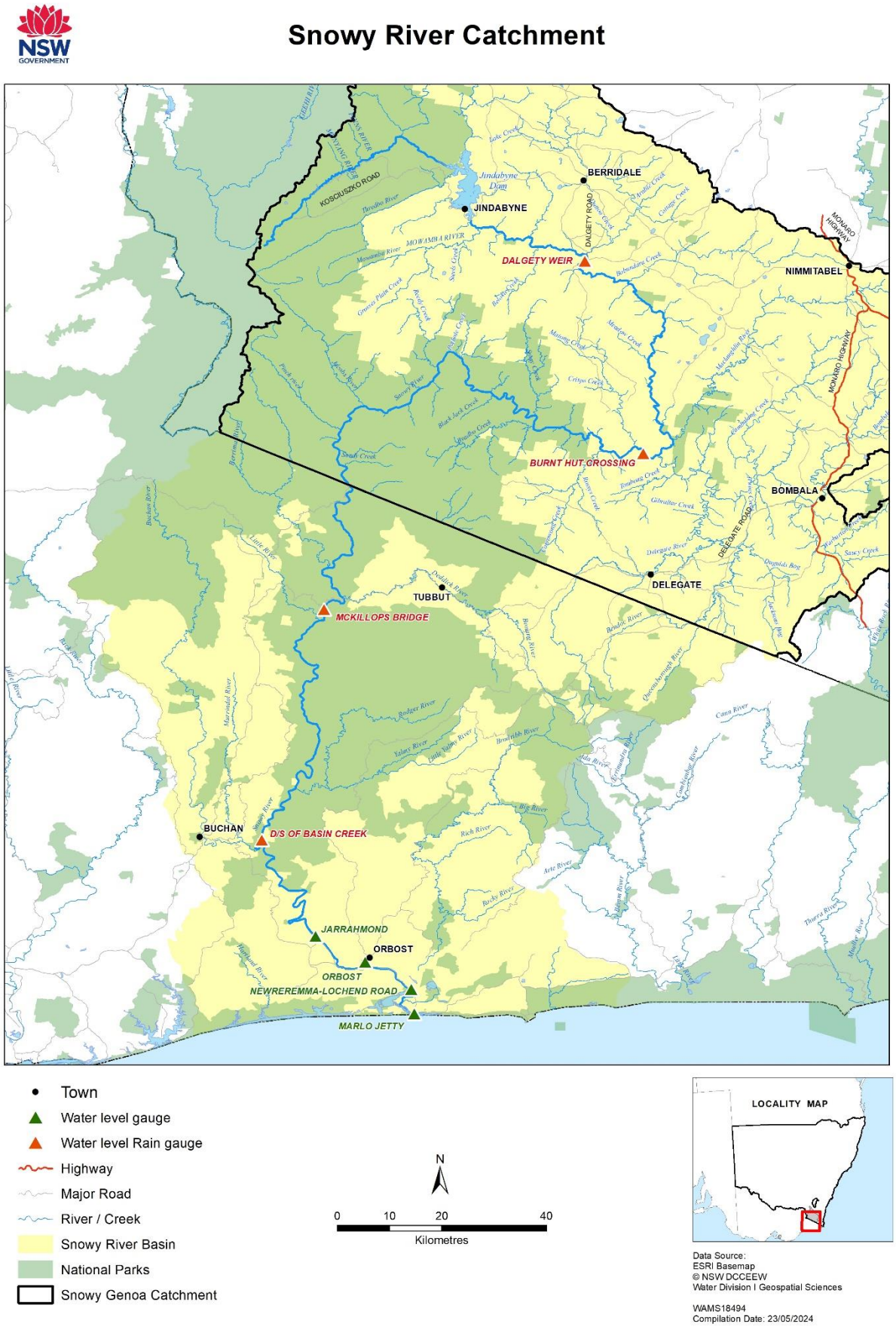

Figure 2-1 Contextual map of the Snowy River catchment

2.3. Catchment flow and rainfall gauges

There are eight existing relevant flow gauges, four of which also include rain gauges as partially shown in Figure 2-1 and detailed in Table 2-1.

Table 2-1 Flow gauges on the Snowy River

Flow gauges/Rain gauges	Operated by	Site Number	Location
Dalgety Weir (also a rain gauge)	WaterNSW	222026	Snowy River Way, near Dalgety Bridge, Buckley's Crossing
Burnt Hut Crossing (also a rain gauge)	WaterNSW	222013	Upstream of Merriangaah, Delegate River
McKillops Bridge (also a rain gauge)	Vic DELWP	222209	McKillops Bridge, McKillops Road E/N: 625612.000/5894902.000
Basin Creek (also a rain gauge)	Vic DELWP	222219	Buchan E/N: 612580.000/5848984.000
Jarrahmond	Vic DELWP	222200	William Track, upstream of Garnets Track, Jarrahmond E/N: 620071.000 / 5830901.000
Orbost	Vic DELWP	222201	Orbost Visitor Centre, Marlo Road, Orbost E/N: 627898.000 / 5825644.400
Newmerella at Lochen Road	Vic DELWP	222205	Along Lochen road E/N: 633887.775 / 5820634.951
Marlo jetty	Vic DELWP	222203	Marlo coastal reserve E/N: 634504.785 / 5815384.527

There are a number of tributaries to the Snowy River which contribute flows into the river downstream of Jindabyne Dam. Additionally, there are many minor and unnamed tributaries throughout the catchment. Detailed waterway information can be accessed in DCCEEW-Water's web mapping portal[3]. Table 2-2 provides a list of the main tributaries into the Snowy River, from Jindabyne Dam downstream to the NSW border.

Table 2-2 List of main tributaries into the Snowy River, from Jindabyne Dam downstream to the Victorian border.

Main tributaries into the Upper Snowy River, from Jindabyne Dam downstream to the NSW border		
1. Cobbin Creek	2. Paddys Creek	3. Daley Creek

[3] https://water.dpie.nsw.gov.au/licensing-and-trade/hydro-line-spatial-data

Main tributaries into the Upper Snowy River, from Jindabyne Dam downstream to the NSW border		
4. Bulgundara Creek	5. Chapel Creek	6. Foxs Creek
7. Blackburn Creek	8. Stockyard Creek	9. Shaws Creek
10. Tollbar Creek	11. Black Flat Creek	12. Lambing Creek
13. Coal Creek	14. Scotchman Creek	15. Boundary Creek
16. Kemps Creek	17. Chasm Gap Creek	18. Deep Gully
19. Sandy Creek	20. Bluff Creek	21. Gap Creek
22. **Basin Creek**	23. Limestone Creek	24. Mother Moores Creek
25. Middle Creek	26. Sawpit Creek	27. Brownlies Creek
28. Dougherty Creek	29. Camerons Creek	30. Woolshed Creek
31. Station Gully	32. Church Creek	33. Youbong Creek
34. McDonalds Creek	35. Hobbs Flat Creek	36. River View Creek
37. Shed Creek	38. Boundary Creek	

2.4. River levels at various flow release rates

In determining the risks, NSW DCCEEW-Water considers the impact of different flow on river heights at key points along the length of the river. Tables F-1 and F-2 (Appendix F) provide water levels during the past environmental flow releases recorded at gauges downstream of Jindabyne Dam. Water levels are strongly influenced by catchment and climate conditions at the time of the event, and as such should be used as a guide only.

2.4.1. Flood levels at major gauging stations

Three gauges are utilised by the Bureau for the issuing of flood warnings – McKillops Bridge, Basin Creek and Jarrahmond.[4] At these gauges, the Bureau has determined river level heights that would cause impacts upstream and downstream in line with minor, moderate and major flood classifications in Table 2-2. The levels for these gauges are shown in Table 2-3. There are no other gauges with associated flood classifications on the Snowy River.

Table 2-2 Flood classification description

Classification	Bureau flood classification description
Minor	Causes inconvenience. Low-lying areas next to water courses are inundated. Minor roads may be closed and low-level bridges submerged. In urban areas inundation may affect some backyards and buildings below the floor level as well as bicycle and pedestrian paths. In rural areas removal of stock and equipment may be required
Moderate	In addition to the above, the area of inundation is more substantial. Main traffic routes may be affected. Some buildings may be affected above the floor level. Evacuation of flood affected areas may be required. In rural areas removal of stock is required.
Major	In addition to the above, extensive rural areas and/or urban areas are inundated. Many buildings may be affected above the floor level. Properties and towns are likely to be isolated and major rail and traffic routes closed. Evacuation of flood affected areas may be required. Utility services may be impacted

Table 2-3 Flood levels at major gauging stations in the Snowy River

Gauge	Classification	Flow rate (ML/d)	Flood level height (m)
McKillops Bridge Bureau gauge	**Moderate**	**>102,000**	**6.0**
	Major	**>200,000**	**8.0**
Basin Creek Bureau gauge	**Minor**	**>16,900**	**3.5**
	Moderate	**>64,300**	**5.5**
	Major	**>104,000**	**6.6**
Jarrahmond Bureau gauge	**Minor**	**>28,000**	**5.8**
	Moderate	**>95,500**	**6.2**
	Major	**>160,000**	**7.4**

Note: The minor flood class level at Jarrahmond was increased to 5.8 m on 12 December 2023 but is under review currently by the Bureau, with the community seeking reinstatement of the previous 4.1m level.

[4] The Bureau amended flood class levels for gauging stations in December 2023. Orbost gauging station was changed from a flood forecasting station to a data monitoring station which no longer produces flood warnings. Flood class levels were also amended for Jarrahmond station, however, the minor flood class level at Jarrahmond is under review in consideration of feedback from the local community. Finally, the minor flood level was removed for McKillops Bridge.

2.5. Travel times

In determining risks, NSW DCCEEW-Water has also considered the time taken for a flow release to travel down the river. Travel times can vary significantly, influenced by rainfall, existing antecedent catchment conditions, depth of flow and channel storage effects. If the ground is already wet, travel times are often reduced. Travel times also reduce as flow increases in the natural channel due to the declining influence of within-channel vegetation and obstructions.

In the event of floods, large volumes of water extending outside the main channel have a dampening effect on peak flows and slow the travel time.

To determine risk, NSW DCCEEW-Water estimates travel times based on observed data from similar historical events. As an example, travel times for 5,000 ML/d flow releases in 2021 and 2023 between key locations along the Snowy River are provided in **Table 2-4**.

Table 2-4 Approximate travel times for high-flow events for the Snowy River

Reach	Distance (km)	Travel time (hours) for initial rise in flow rate	Travel time (hours) for peak of event
Lake Jindabyne to Dalgety	25	6-11	8-18
Lake Jindabyne to Burnt Hut	80	24-37	26-45
Lake Jindabyne to Willis (NSW–Vic. border)	171	57	64
Lake Jindabyne to McKillops Bridge	203	48-60	55-70
Lake Jindabyne to Basin Creek	271	67-76	70-82
Jarrahmond	306	76-92	92-99
Lake Jindabyne to Orbost	321	80-96	88-111

Note: Flow times recorded for Willis are estimated from the release in October 2018. Distances are approximation only based on GIS measurements from aerial photography.

2.6. Impact of climatic and catchment conditions on risk

Climatic and catchment conditions can increase the risks associated with environmental flow releases by creating uncertainty around predicted flow rates and water levels.

In the Snowy River catchment, tributary inflows have a significant influence on flows and water levels in the main river. Inflows may result in the river rising before or during an environmental release, such that the release may contribute to increased flooding risk. Mitigation for this risk has been included in the safety procedures outlined in the next section.

High rainfall events that extend over the catchment area can lead to increases in the dam storage levels which could result in an uncontrolled spill although this is unlikely to occur from Jindabyne dam. Safety management of spills or unplanned releases to manage dam storage levels are the responsibility of Snowy Hydro and are not covered by this SMP. However, in some instances a planned environmental release may be brought forward to reduce the risk of uncontrolled spill.

2.7. Known locations of potential impact

The following locations have been raised by stakeholders as potentially being impacted by environmental releases:

- Jarrahmond farming area will be impacted by water levels above 4.1 m at Jarrahmond gauging station. At this height low lying areas next to water courses will be inundated.
- Access causeway to Snowy Cabins is impacted with environmental releases of more than 2,500 ML/d for AWD vehicles and more than 4,500 ML/d for 4WD vehicles.

3. Roles and responsibilities in managing risks

The following procedures have been developed to mitigate the risks tabled in Appendix A. This section defines the responsibilities of the participating organisations.

3.1. NSW DCCEEW-Water responsibilities for safety management

NSW DCCEEW-Water is responsible for coordinating the safe management of planned environmental releases.

3.1.1. Decision making roles

As the formal delegate for the Water Administration Ministerial Council, NSW DCCEEW-Water 's Executive Director Operation & Resilience (ED) is responsible for approving the SMP at the start of each water years and for instructing Snowy Hydro to make any modifications to, or cancellation of, planned flows for safety reasons.

The Director Asset Management and Performance is responsible for chairing STAG meetings, receiving advice from the STAG, and determining appropriate actions based on that advice. The Director can instruct Snowy Hydro to proceed where it is determined that planned flows can be safely implemented without modification. Responsibilities within NSW DCCEEW-Water are depicted in Figure 3-1. Note that Snowy Hydro can cease a release at any time if Snowy Hydro deems it to be unsafe.

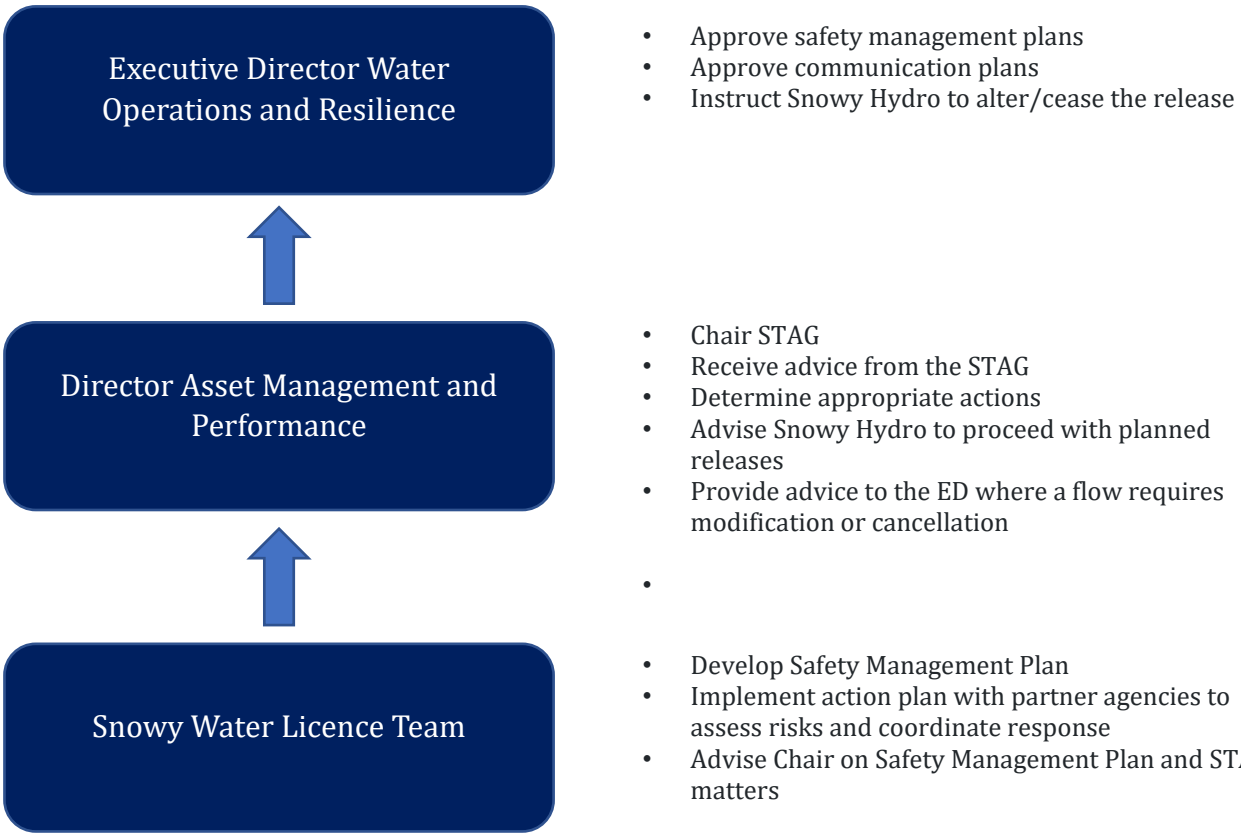

Figure 3-3 SRIF Safety management framework within Department of Climate Change, Energy, Environment and Water

3.1.2. Planning responsibilities

NSW DCCEEW-Water is responsible for planning including for each water year:

- NSW DCCEEW-Water is responsible for developing, updating and reviewing the Safety Management Plans.
- NSW DCCEEW-CPHR is responsible for developing, updating and reviewing the Operations Plan.
- NSW DCCEEW Comms is responsible for developing updating and reviewing the Stakeholder and Community Engagement Plan.

3.1.3. Coordination responsibilities

NSW DCCEEW-Water is responsible for coordination, including:

- Liaising between NSW DCCEEW-CPHR and Snowy Hydro in relation to SRIF volumes and release patterns.
- Providing timely advice to Snowy Hydro to commence, amend or cease dam releases.
- Chairing, coordinating and secretariat support to the Snowy Safety Technical Advisory Group (Snowy STAG) (details of the Snowy STAG are provided later). NSW DCCEEW-Water‘s internal technical staff may also provide advice to the Snowy STAG as required.
- Through the Snowy STAG process, coordinating, informing and delegating to stakeholders and the responsible agencies, such as NSW DCCEEW-CPHR, Snowy Hydro, the SES, the Bureau, National Parks and local councils, for the management of risks.

- Coordinating stakeholder and public communication (in coordination with NSW DCCEEW Corporate Communications).
- Alerting relevant emergency services during a flow release to activate emergency arrangements, if required.

3.1.4. Stakeholder communication responsibilities

NSW DCCEEW-Water recognises that effective management of the risks requires the support and coordination of many stakeholders. Effective working relationships with stakeholders must be maintained to ensure the high-flow events occur safely.

NSW DCCEEW-Water, in collaboration with the DCCEEW Corporate Communications team and NSW DCCEEW-CPHR, is responsible for coordinating communication to stakeholders and the public in relation to environmental releases. NSW DCCEEW Corporate Communications is responsible for developing an annual Stakeholder and Community Engagement Plan (Appendix B) to ensure proactive messaging to all stakeholders regarding environmental flow releases. NSW DCCEEW Corporate Communications ensures that community engagement and key messaging on the safety impacts of the releases and its related events is undertaken and continually improved.

NSW DCCEEW-Water currently provides information to stakeholders, downstream residents, and the community in a range of ways or channels in relation to environmental flow releases, including STAG:

- Publishing the SMP, SRIF Operations Plan, Rising River Alert, media releases, frequently asked questions and the dates/times/volumes of releases on the NSW DCCEEW-Water website.
- Publishing a tweet to the NSW DCCEEW-Water X account (formerly Twitter) approximately seven and three days prior to each release.
- Issuing an SMS three days prior to each release to a distribution list of downstream landholders and other interested stakeholders held by NSW DCCEEW-Water's Snowy Water Licence Team.
- Direct communication via email, phone and meetings with agency members of Snowy STAG.
- Direct communication with downstream landholders and stakeholders prior to a release (for example, via targeted mailing lists), and following a release as required. The NSW DCCEEW-CPHR website enables members of the public to opt-in to this distribution list.
- Advice and provision of information to the STAG (which includes emergency services, local councils, National Parks, and other partner agencies) who are then expected to enact their own communication arrangements.

In the event of an escalating flooding situation NSW DCCEEW-Water will assist relevant emergency service agencies i.e. contact SES STAG member or SES State Communication Centre as required.

In the event of major floods or an impending disaster, legislated NSW emergency management arrangements will be activated by emergency service authorities. At this time, emergency response agencies would take responsibility for provision of community safety and emergency messaging through established systems.

SSTAG detailed list of communication actions and responsibilities is provided in **Appendix B** - Stakeholder and Community .

3.2. Responsibilities of the Snowy STAG

The Snowy STAG consists of technical experts that provide NSW DCCEEW-Water with timely advice and information for NSW DCCEEW-Water to make informed decisions regarding proceeding with, or the need to alter the timing or volume of environmental flow releases.

The SSTAG is not required to reach a consensus; each agency may provide independent advice for consideration by NSW DCCEEW-Water. Final decision making, policy direction or delegating additional work is to be carried out by NSW DCCEEW-Water.

The Snowy STAG Terms of Reference is included in

Appendix C - Terms of Reference for the Snowy and Tantangara Safety Technical Advisory Group

3.2.1. Composition of the Snowy STAG

The Snowy STAG includes organisations with knowledge and expertise relevant to management the safety of environmental flow releases. The composition is flexible and may change subject to the expertise required. Current membership includes representatives from:

- NSW DCCEEW-Water
- NSW DCCEEW-CPHR
- NSW DCCEEW Corporate Communications
- The Bureau of Meteorology (the Bureau)
- Snowy Hydro
- NSW National Parks and Wildlife Service (NSW NPWS)
- NSW State Emergency Service (NSW SES)
- Victoria SES (Vic SES)
- East Gippsland Catchment Authority (EGCMA)
- Snowy Monaro Regional Council (SMRC)
- East Gippsland Shire Council (EGSC)

3.2.2. Roles of key Snowy STAG members

STAG members are expected to undertake the following tasks:

- Provide technical advice to the STAG Chair based on the agency's expertise and local knowledge, on the potential risk sand impacts of the releases and appropriate mitigation measures.
- Provide advice to the STAG chair on whether the SMP and flows should proceed.
- Ensure agency attendance at all STAG meetings and provide timely responses to STAG meetings actions.
- Distribute media releases and Rising River Alerts through their own agencies communication channels as required.
- Assist with community engagement as required.

Additional tasks specific to individual agencies are listed in Table 3-1.

Table 3-1. Snowy STAG roles and responsibilities

Agency	Role
NSW DCCEEW-Water	• Develop the Safety Management Plan • Lead implementation of processes detailed in the Safety Management Plan • Chair Snowy STAG • Provide secretariat support to Snowy STAG • Coordinate all public and stakeholder communications prior to high-flow releases • Reply to contentious issues and enquires • Make decision in consideration of advice of the Snowy STAG

Agency	Role
NSW DCCEEW Corporate Communications	• Develop and implement the Stakeholder and Community Engagement Plan • Undertake all public and stakeholder communications prior to high-flow releases
NSW DCCEEW-CPHR	• Development of Snowy Rivers Increased Flow (SRIF) release patterns • Develop the SRIF Operations Plan • Work with Snowy Advisory Committee to ensure they consider risks in planning future SRIF release patterns • Liaise with impacted stakeholders
The Bureau	• Provide advice to the Snowy STAG on rainfall forecasts • Undertake modelling of rainfall events and impacts on river flows / planned releases • Issues flood watch and warnings
NSW SES	• NSW SES is the legislated Combat Agency for floods and is responsible for the control of flood operations. NSW SES work with the Bureau and Councils to develop warning systems. • Responsible for flood consequence management
VIC SES	• VIC SES is the legislated Combat Agency for floods and is responsible for the control of flood operations. VIC SES work with the Bureau and Councils to develop warning systems. • Responsible for flood consequence management
Snowy Hydro	• Ensure releases are able to be undertaken safely • Operate infrastructure to make releases to the Snowy River in accordance with planned targets or agreed changes • Cease / alter releases (from this plan) when advised by NSW DCCEEW-Water
Snowy Monaro Regional Council	• Assist in providing up to date contact details for downstream landholders Install additional signage where necessary
East Gippsland Shire Council	• Assist in providing up to date contact details for downstream landholders
NSW National Parks and Wildlife Service	• Install additional signage to alert park users including campers in camping areas • Erect road closed signs as required

4. Process of managing risks

The following sections out the process to be followed prior to and during environmental releases. The estimated timeframes are indicative only and may be subject to change because of factors such as unexpected climatic conditions, ongoing stakeholder consultation, ongoing licence review considerations, etc.

4.1. Start of the water year

4.1.1. SRIF planning

Prior to the start of the water year (1 May), the design of the SRIF release pattern is undertaken by NSW DCCEEW-CPHR in consultation with the SAC and Snowy Hydro. The design considers environmental, safety, available water allocation and operational requirements. The strategy is detailed in the SRIF Operations Plan with further reasoning provided in NSW DCCEEW-CPHR 's 'Annual Plan for the Snowy Rivers Increased Flows'.

It is important to note that the annual release plan may change throughout the year due to climatic and other environmental conditions.

4.1.2. Safety planning

Once the SRIF release has been determined the Snowy STAG may convene[5] to:

- Discuss the coming year planned releases and the Annual SRIF Operations plan
- Review the Safety Management Plan.
- Review the STAG ToR
- Determine any risks associated with the planned timing, duration, and size of planned SRIF releases.
- Determine any risk mitigation measures that may be required for the upcoming water year.
- Determine which flow events would require the Safety Management Process to be enacted, as set out in the next sections. Based on current available evidence, the releases threshold for triggering the safety management process has been revised from 2,000ML to 2,500ML/d. However, this threshold would be reviewed annually and upon receipt of any evidence that may suggest a more appropriate value. Flow events that exceed the determined threshold are labelled as 'high-flow events'.
- Determine any risk and mitigation measures associated with water release impacted by algae growth in the dam.

The process of Snowy STAG involvement is detailed in the STAG terms of reference in

[5] Meetings may be undertaken in person, virtually or as group emails.

Appendix C. The algae safety protocol to mitigate risk of water release impacted by algae is detailed in **Appendix F** – Algae Safety Protocol

4.1.3. Public Communications

A key strategy for mitigating many of the risks identified in **Appendix A** - Risk analysis and mitigation measures which is ensuring effective and timely stakeholder communication. At the start of the water year, the following communications activities are undertaken:

- The Annual SRIF Operations Plan is published on the NSW DCCEEW-Water website.
- The Stakeholder and Community Engagement Plan (**Appendix B**) is developed by the NSW DCCEEW Corporate Communications team.
- The SMP, as published on the NSW DCCEEW-Water website, is reviewed for currency.
- The contact list for downstream landholders and key stakeholders is reviewed for currency by NSW DCCEEW Corporate Communications team as per the process set out in the Stakeholder and Community Engagement Plan.
- An overview list of the dates of planned environmental flows is published on NSW DCCEEW-Water website.
- A media release providing an overview of the environmental flow releases is issued to all relevant media outlets and published on the NSW DCCEEW-Water website by NSW DCCEEW Corporate Communications.
- NSW DCCEEW Corporate Communications publishes FAQs on the SRIF release plan on the NSW DCCEEW-Water website; emailed them directly to downstream landholders and interested parties on the NSW DCCEEW contact list and shared them directly with relevant stakeholder agencies as required.

Details of communications task and responsibilities are summarised in the Stakeholder and Community Engagement Plan in Appendix B - Stakeholder and Community

4.2. Approximately 4 to 6 weeks before first planned high-flow release commences

Approximately 4 to 6 weeks prior to the commencement of the first planned high-flow environmental release event, NSW DCCEEW Corporate Communications team contact (via email or similar) downstream landholders and key stakeholders (as identified on the NSW DCCEEW-Water contact list), coinciding with the issuing of the 'overview' media release and updates to the NSW DCCEEW-Water website with information on the planned environmental water releases for the upcoming water year**.** In some cases, this timeframe may be reduced, however, NSW DCCEEW-Water intends to provide the maximum notice period possible for the circumstances.

4.3. Approximately 1 week before planned high-flow release

4.3.1. Notify the Bureau and review weather

During the week leading up to a release, the Bureau provides NSW DCCEEW-Water with details of any climate risks during the release period such as:

- Flood watch issued for any part of the catchment
- Severe Weather Warning
- Flood warning

This information will be shared with the STAG for consideration.

4.3.2. The Bureau flood forecasting

The Bureau also uses various rainfall runoff models for flood forecasting in the Snowy River catchment. The Bureau undertakes this modelling, using the inputs of the planned release flow rates and observed or forecast rainfall to calculate likely flood levels at key downstream locations.

4.3.3. Review by Snowy STAG

The Snowy STAG convenes to review: the planned releases; the Bureau's rainfall predictions; and notification of any climatic risks. Where NSW DCCEEW-Water considers there to be risks associated with the release, the STAG convenes as a meeting; where the risks are considered to be low NSW DCCEEW-Water seeks advice from the STAG via email. Whether via a meeting or email, the Snowy STAG considers risks by:

- Reviewing estimated travel times listed in Table 2-3.
- Reviewing forecasted flood levels in Table 2-1 to estimate the potential water levels at key locations.
- Reviewing the risk and mitigation measures table in **Appendix A as part of the annual review of this SMP**.
- Using local knowledge or agency intelligence records to relate the estimated water levels to local impacts, such as inundation to property, access routes, roads, etc.
- Using local knowledge of upcoming events that may be impacted.
- Or any other appropriate means.

As a principle, flows will generally be managed to maintain water levels below the moderate flood level at McKillops Bridge gauge and below minor flood levels at Jarrahmond which are Bureau gauges (see **Table 2-3**).

Where risks are identified, the Snowy STAG will use their specialist technical and local knowledge to provide advice on both the risk and relevant mitigation measures.

Based on knowledge of site and weather conditions, the STAG members will provide advice to NSW DCCEEW Water as to whether they are comfortable that risks are known and mitigated against or reduced to an acceptable level, and consequently on whether the release should proceed, be modified or cancelled.

The NSW DCCEEW-Water Director Asset Management and Performance will decide on whether to proceed, based on the advice of the STAG. The decision-making process to be undertaken is outlined in the flow chart in Figure 4-1.

This meeting may occur via an in-person meeting, virtual meeting or through emails. A representative from each STAG agency is required to attend, or to otherwise provide their advice following the meeting in writing. Where the meeting is replaced by an email, each STAG agency must provide advice via email within the requested timeframe.

The Term of Reference of Snowy STAG involvement is summarised in

Appendix C - Terms of Reference for the Snowy and Tantangara Safety Technical Advisory Group .

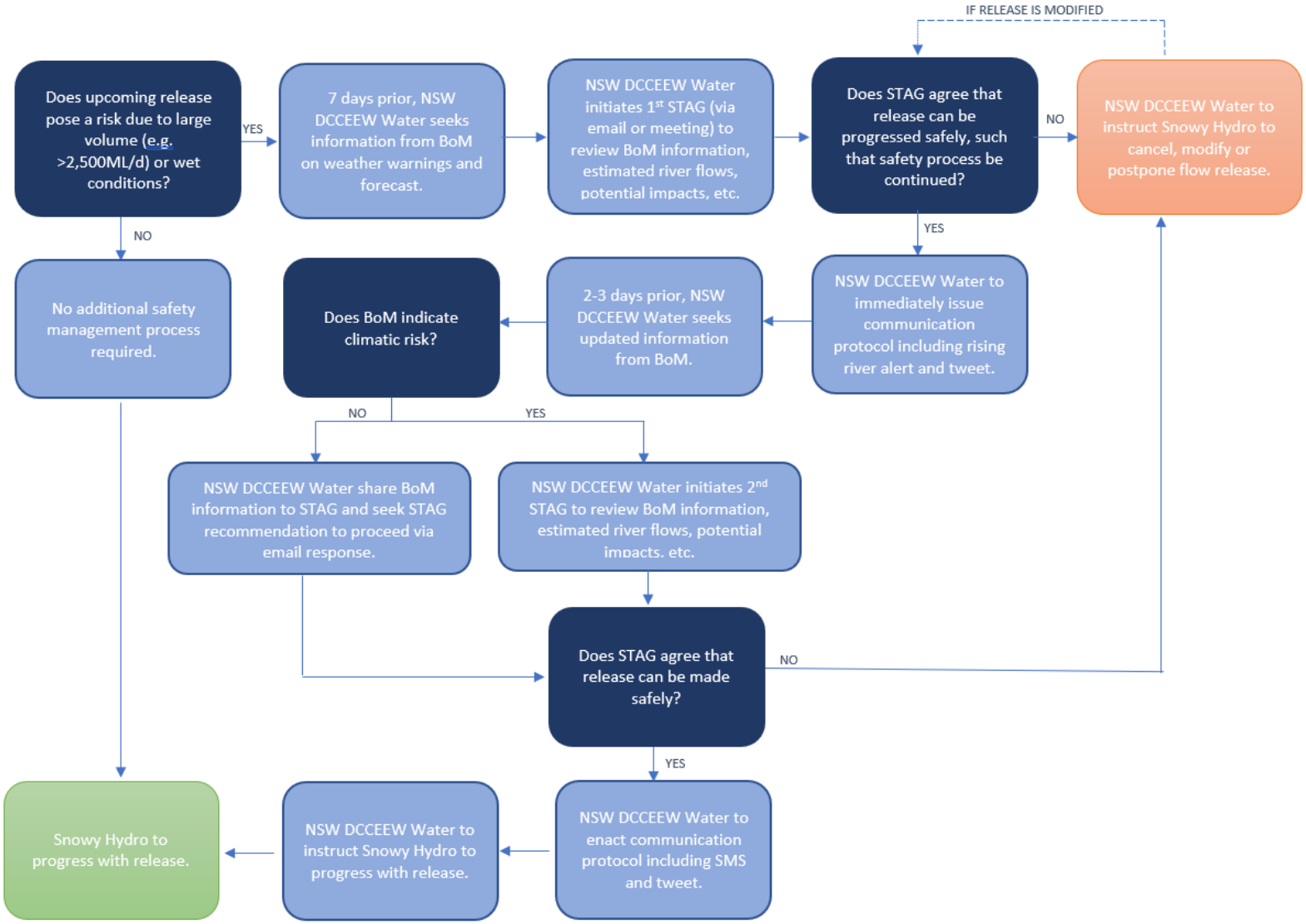

Figure 4-1 Snowy STAG process flow chart

4.3.4. Public Communications

4.4. A 'Rising river alert' media release is issued by DCCEEW Corporate Communications approximately seven days before each planned high-flow environmental release to inform affected communities/general public of the upcoming event. The "Rising river alert" is shared with STAG for distribution through their respective agency communication channels. The alert is published on NSW DCCEEW-Water website and a tweet is also issued on the same day of the NSW DCCEEW-Water X account (formerly named Twitter) (See **Appendix B -** Stakeholder and Community Approximately 3 days before releases

4.4.1. Review weather

In the days leading up to the high-flow environmental release, NSW DCCEEW-Water and Snowy Hydro closely monitor weather forecasts and flows in the Snowy River and the tributaries downstream of Jindabyne Dam.

4.4.2. Final Bureau advice

NSW DCCEEW-Water continues to liaise with the Bureau and the Bureau undertakes a final weather forecast based on the most recent weather data.

Approximate river flows can be forecasted by the Bureau up to several days in advance. If natural flows, combined with Jindabyne Dam releases, are likely to cause downstream flooding the department will consult with the Snowy STAG, prior to discussions with Snowy Hydro to modify or cease releases from the dam.

4.4.3. Final review by Snowy STAG

NSW DCCEEW-Water consults with the Snowy STAG to undertake a final review, virtually or by email, dependant on the level of risk observed in the Bureau rainfall forecast. The review includes:

- the planned release flow rate,
- updated Bureau rainfall predictions,
- updated estimates of water levels,
- and any final safety issues or actions required.

This information is used to seek advice from the Snowy STAG that they are comfortable that the risks of the impending flow event are known and have been mitigated to an acceptable level and therefore that the release can safely proceed.

The Snowy STAG again undertakes recommendations in line with the previous flow chart in Figure 4-1. NSW DCCEEW-Water considers the STAG's advice, makes decision on whether the flow should proceed and instructs Snowy Hydro based on the outcome.

Where there is a level of uncertainty with the forecasts the Snowy STAG may determine to reconvene 1 day prior to the environmental release and reconsider available data.

Snowy STAG involvement is summarised in

4.4.4. **Appendix C** - Terms of Reference for the Snowy and Tantangara Safety Technical Advisory Group Public communications

If the release is determined safe to proceed, approximately 1 to 3 days prior to release an SMS is sent by NSW DCCEEW-Water to the list of SRIF stakeholders in the NSW DCCEEW distribution list. NSW DCCEEW-Water and NSW DCCEEW Corporate Communications will work together to regularly review and update the list of stakeholders.

NSW DCCEEW Corporate Communications will also issue a Tweet the day before each respective environmental release event (See Appendix B - Stakeholder and Community

4.5. During the release

During the release, NSW DCCEEW-Water monitors information as required through liaison with the NSW DCCEEW-CPHR, the Bureau, Snowy Hydro and the Snowy STAG, particularly if forecasts indicate that rain is likely or a Flood Watch is issued for any part of the Snowy River or surrounding catchments.

Where any significant rainfall risks are forecasted during the duration of the event, NSW DCCEEW-Water will request Bureau to review rainfall predictions. Where risks are determined, NSW DCCEEW-Water may seek advice from the Snowy STAG on continuing, ceasing or modifying the release.

In addition to a flood mitigation directive from NSW DCCEEW-Water, Snowy Hydro will cease releases if:

- Directed to by NSW Police or the SES.
- Deemed necessary to manage public safety or environmental health risks.

4.6. Modified SRIF releases

Modifications to the planned SRIFs may occur throughout the year as a result of climatic, environmental or other unforeseen circumstances that may arise closer to the time of the planned SRIF release.

For example, prolonged climatic conditions in wet years may result in Jindabyne Dam approaching or realising spill level, such as occurred with Lake Jindabyne in December 2021 to March 2022. At these times, modifications to the volume, timing or flow rate of SRIF releases may be required to prevent uncontrolled spills and ensure that water levels can be reduced in a safe manner. Changes to the planned SRIF regime may be made rapidly.

As another example, where SRIF accounting is not finalised at the commencement of the water year, NSW DCCEEW-CPHR will design an interim SRIF regime which may be modified once accounting arrangements are resolved.

In these rare occurrences, a condensed approach to that described in Section 3 would be undertaken within the available timeframe. Warnings would be provided to stakeholders with as much time as practically available. The timeframes may be less than outlined Section 3, and in some extreme instances may be limited to less than 24-hour notice.

During unplanned storages releases or uncontrolled spills (See Section 3), Snowy Hydro is responsible for safety management, stakeholder coordination and public communication. NSW DCCEEW-Water would assist Snowy Hydro as requested.

4.7. Workplace health & safety

All agencies, corporations and stakeholders are responsible for their actions with regards to Workplace Health and Safety (WHS) legislation and must follow their organisation's WHS policies and procedures.

Departmental employees must follow the NSW DCCEEW Work Health and Safety Policy (DOC21/38032) and related procedures, accessed through the internal NSW DCCEEW intranet. Prior to any field work, departmental employees must consider relevant risks and follow all relevant departmental procedures. This may include, but is not limited to, NSW DCCEEW WHS procedures and critical risk controls in place for:

- Driving (WHS CRC 007)
- Remote or isolated work (WHS CRC 014)
- Working on or near water (WHS CRC 017)
- Dealing with aggressive stakeholders (WHS CRC 020)

These documents should be accessed by NSW DCCEEW employees through the internal NSW DCCEEW intranet. These documents have not been included herein as they are updated frequently, and it is important to access the most recent version. Further information is below.

5. Further information

Further information on the Snowy Water Initiative and Snowy Montane Rivers Increased Flows is available on the NSW DCCEEW-Water website.

Snowy Water Initiative:

https://www.industry.nsw.gov.au/water/basins-catchments/snowy-river/initiative

Snowy Rivers Increased Flows:

www.industry.nsw.gov.au/water/basins-catchments/snowy-river/initiative/increased-flows

Further information on the environmental management of Snowy and Montane Rivers is available on the NSW DCCEEW-CPHR website:

https://www.environment.nsw.gov.au/topics/water/water-for-the-environment/snowy-and-montane

Register for Rising River Alert notifications or to receive information about the Upper Murrumbidgee or Snowy Water for the Environment programs here:

https://www.environment.nsw.gov.au/topics/water/water-for-the-environment/snowy-and-montane/snowy-and-upper-murrumbidgee-landholder-survey-and-contact-information

Appendix A - Risk analysis and mitigation measures

Table A- 1 Risks and mitigation measures associated with environmental releases of SRIF

Ref	Hazard description (A hazard is a situation or thing that has the potential to cause harm.)	Risk description (A risk is the possibility a hazard can cause harm.)	Likelihood	Consequence	Initial risk rating	Proposed risk controls	Type of risk control	Likelihood	Consequence	Residual risk rating
E.g.	*(i.e. wet floor)*	*(i.e. slip on floor)*				*(i.e. mop the floor and place wet floor hazard signage)*	-	-	-	
1	Lack of public awareness of flow release, given large environmental releases.	The community being unprepared, leaving people and property exposed to harm and damage from the release.	Possible	Extreme	High	· SMP process to be followed by all members of STAG. · Stakeholder and Community Engagement Plan to be developed and implemented by NSW DCCEEW Corporate Communications, in collaboration with NSW DCCEEW-Water, to ensure community is aware of upcoming flows. · All communications to include accurate data of the date, volume and time that the release is **physically** made (rather than the date notified to Snowy Hydro) · Communications to include targeted communication to community by NSW DCCEEW Corporate Communications (via email, media release and tweet) and by NSW DCCEEW-Water (via SMS) at the start of the water year, 7 days and 3 days prior to higher-risk flow events. · Information materials, such as FAQs and 'Rising River Alerts' will be made publicly available by NSW DCCEEW Corporate Communications via the NSW DCCEEW-Water website and emailed directly to downstream landholders. · NSW DCCEEW to maintain up-to-date contact list of stakeholders and downstream landholders. · STAG members to communicate relevant information within their organisation's networks.	Reduce exposure to the hazard using administrative actions	Unlikely	Moderate	Medium
2	Flooded roads, causeways and property access.	· Nuisance caused by restricted vehicle access. · Harm to human safety, such as injury or fatality from entering flooded roads and causeways. · Damage to vehicles · Damage to roads and driveways Potential known issues occur at: • Jarrahmond farming area will be impacted by increase in water level above 6m at Jarrahmond gauging station. At this height water breaches rock wall and flows over local spillway. Low lying areas next to water courses will be inundated. • Access causeway to Snowy Cabin is not impacted with environmental release	Possible	Extreme	High	· SMP process to be followed by all members of STAG. · Proposed communication measures detailed in item 1 to be enacted to ensure community is aware of upcoming flows. · STAG members to use local knowledge to identify potential roads / causeways / property access that may be impacted at STAG meetings prior to release. · SES to be informed through STAG process when access is likely to be inundated in order for SES to enact their own processes. · STAG to recommend modifying or cancelling release if risk is deemed unacceptable due to nuisance or safety. · NSW DCCEEW-Water to communicate with relevant road authority (Council or National Parks) through the STAG meetings to close any roads identified by the STAG and will request Council or National Parks to communicate closures to the public. · Where public roadways are cut by flood water, Councils or other relevant authority will erect road closure signage.	Reduce exposure to the hazard using administrative actions Isolate hazard from people	Unlikely	Moderate	Medium

Ref	Hazard description (A hazard is a situation or thing that has the potential to cause harm.)	Risk description (A risk is the possibility a hazard can cause harm.)	Likelihood	Consequence	Initial risk rating	Proposed risk controls	Type of risk control	Likelihood	Consequence	Residual risk rating
		<2,500 ML/d for AWD vehicles and <4,500ML/d for 4WD vehicles.								
4	Flow release combining with rainfall event and/or downstream tributary inflows to cause flooding.	· Harm to human safety such as injury or drowning from rising floodwaters. · Harm to human safety such as injury or drowning from entering waterways. · Damage to private property, e.g. pumps, vehicles, access roads and buildings. · Damage to public property, e.g. pathways, roads, buildings, parks. · Nuisance caused by restricted vehicle and pedestrian access.	Possible	Extreme	High	· SMP process to be followed by all members of STAG. · Proposed communication measures detailed in item 1 to be enacted to ensure community is aware of upcoming flows. · NSW DCCEEW-Water to seek weather warning and rainfall forecast from Bureau, who must provide this as requested approx. 7 and 3 days prior to release as operations permit. This information to be shared with STAG for consideration. · NSW DCCEEW-Water to use Source model to estimate potential water levels from proposed release under current climate condition and share information with STAG. · NSW DCCEEW-Water to review past release and climate conditions to gain and understanding of potential flow impacts. · STAG to use local knowledge to provide insight into potential risks and impacts from the release in the existing climate and catchment conditions. · STAG to advise NSW DCCEEW-Water on any mitigation measures necessary to maintain river heights below minor flood levels and at an acceptable level of risk. Releases can be reduced if required to minimise the risk of targeted flows being exceeded. · STAG to recommend modifying or cancelling release if risk is deemed unacceptable due to nuisance or safety. Based on this, NSW DCCEEW-Water to decide if release should be modified or ceased. · NSW DCCEEW-Water to monitor flows prior to and during a release, and to liaise with the Bureau, Snowy Hydro, and seek updated rainfall forecasts from the Bureau as required to determine risks. · Snowy Hydro to cease releases if requested to do so by NSW DCCEEW, the State Emergency Service (SES) or NSW Police. Note: ceased flow may take considerable timeframe till it has a noticeable effect on a locality.	Reduce exposure to the hazard using administrative actions Isolate hazard from people	Unlikely	Moderate	Medium
5	Rising water levels at campsites and picnic areas, including The Barry Way, Scotchies Yard, Willis, Halfway Flat, Pinch River, Running Waters	· Harm to human safety from people entering waterways, such as injury or drowning, especially to holiday makers/ travellers/ hikers, campers and the general public using these areas. · Damage to private property, e.g. camping gear, vehicles, etc	Possible	Extreme	High	SMP process to be followed by all members of STAG. · Proposed communication measures detailed in item 1 to be enacted to ensure community is aware of upcoming flows. · NSW DCCEEW-Water to work collaboratively to address any identified flooding issues with the National Parks and Wildlife Service (NPWS) through the STAG process. · NPWS to post a warning regarding environmental release alerts on the NPWS website and to install temporary and/or permanent signage at any locations they have identified as vulnerable by NPWS and the STAG.	Reduce exposure to the hazard using administrative actions. Isolate hazard from people	Unlikely	Minor	Low

Ref	Hazard description (A hazard is a situation or thing that has the potential to cause harm.)	Risk description (A risk is the possibility a hazard can cause harm.)	Likelihood	Consequence	Initial risk rating	Proposed risk controls	Type of risk control	Likelihood	Consequence	Residual risk rating
		· Damage to public property, e.g. campground facilities.								
6	Flow release impacting bridges	· Bridges subject to gathering of debris, such as tree branches/logs, causing failure of the bridge	Rare	Major	Medium	· Stakeholder Engagement and Communication Plan to be developed by NSW DCCEEW Corporate Communications, in collaboration with NSW DCCEEW-Water, and implemented by both. · RMS and Council are notified of releases as part of the plan.	Reduce exposure to the hazard using administrative actions	Rare	Minor	Low
7	Flow release impacting property (buildings, pumps, livestock equipment, etc.)	· Damage to property located within close proximity to the river · Although the infrastructure is close to the river, most items are located on the high bank and are unlikely to be inundated. · Potential damage to property, stock and equipment if located within 50 metres of the expected inundation zone.	Unlikely	Minor	Low	· SMP process to be followed by all members of STAG. · Proposed all communication measures detailed in item 1 to be enacted to ensure community is aware of and prepared for upcoming flows. · Pump owners were previously identified and contacted individually to seek their interest in being notified about upcoming releases. · STAG members to use local knowledge to identify potential property that may be impacted at STAG meetings prior to release. · STAG to recommend modifying or cancelling release if risk is deemed unacceptable due to nuisance or safety. · Stakeholder and Community Engagement Plan developed. Provision of timely email and/or SMS notification of intended flow release and updates of any significant flow revision to previously identified landholders. · Additionally, the public will be informed via 'Rising River Alerts' issued to all relevant local media and Tweets will be issued for each alert.	Reduce exposure to the hazard using administrative actions	Unlikely	Insignificant	Low
8	Change to planned volume or timing of release with limited notice to the public	· The community being unprepared, leaving people and property exposed to harm (injury or fatality) and damage from the release.	Possible	Extreme	High	· SMP process to be followed by all members of STAG. · Stakeholder Engagement and Communication Plan to be developed and implemented by NSW DCCEEW Corporate Communications, in collaboration with NSW DCCEEW-Water, to ensure community is aware of upcoming flows. · Communications to include targeted communication to community by NSW DCCEEW Corporate Communications (via email, media release and tweet) and by NSW DCCEEW-Water (via SMS) at the start of the water year, 7 days and 3 days prior to higher-risk flow events. · Information materials, such as FAQs and 'Rising River Alerts' will be made publicly available by NSW DCCEEW Corporate Communications via the NSW DCCEEW-Water website and emailed directly to downstream landholders. · NSW DCCEEW-Water to ensure communications includes messaging that releases can be modified at short notice, · NSW DCCEEW to maintain up-to-date contact list of stakeholders and downstream landholders. · STAG members to communicate relevant information within their organisation's networks.	Reduce exposure to the hazard using administrative actions	Unlikely	Insignificant	Low

Ref	Hazard description (A hazard is a situation or thing that has the potential to cause harm.)	Risk description (A risk is the possibility a hazard can cause harm.)	Likelihood	Consequence	Initial risk rating	Proposed risk controls	Type of risk control	Likelihood	Consequence	Residual risk rating
9	Cancellation of release with limited notice to public.	· Nuisance to community that have already made alternative arrangements to address the impact of the release. · Commercial losses to businesses that have already made alternative plans to address the release, such as cancellation of accommodation bookings due to restricted property access. · Reputational damage to department where community has been unnecessarily impacted · loss of environmental benefit from the release · Reputational damage to department and Minister due to environmental water not being delivered as designed.	Possible	Minor	Medium	· NSW DCCEEW-Water to ensure communications includes messaging that releases can be modified or cancelled at short notice, including Rising River Alerts and NSW DCCEEW-Water Website. · Snowy Hydro to update website to include a note that releases can be cancelled at short notice. · Where NSW DCCEEW-Water has notified parties of an environmental release, NSW DCCEEW-Water to also notify them, by the same medium, if a release is changed or cancelled. This is to be completed as closely to the decision being made as possible.	Reduce exposure to the hazard using administrative actions	Unlikely	Insignificant	Low
10	Public access to dam infrastructure during release (dam wall, spillway, plunge pool)	· Harm to human safety, such as injury or drowning from entering spillway, dam, plunge pool or river.	Unlikely	Extreme	High	· The area around the dam wall is behind locked gates and includes fencing and warning signs to minimise risk of public access. A buoy line is in place around spillway in the storage. Snowy Hydro will cease releases if notified of a person or watercraft in the plunge pool or if a person or watercraft enters the area of the Dam between the buoy line and the spillway.	Reduce exposure to the hazard using administrative actions Isolate hazard from people Provide protective equipment	Rare	Extreme	High
11	Snowy Hydro personnel access to dam infrastructure during release (dam wall, spillway, plunge pool)	· Harm to Snowy Hydro employees undertaking releases or working in the vicinity, such as injury or fatality.	Unlikely	Extreme	High	· Snowy Hydro have work health and safety procedures in place for its employees and worksites and is required to comply with them. Snowy Hydro applies its own safety management procedure including access rules and risk managements. These are completed under various internal access rule and risk management policies and procedures that meet WH&S requirements. Operating the dam to release the environmental flows is part of Snowy Hydro's core business.	Reduce exposure to the hazard using administrative actions Provide protective equipment	Rare	Extreme	High

Ref	Hazard description (A hazard is a situation or thing that has the potential to cause harm.)	Risk description (A risk is the possibility a hazard can cause harm.)	Likelihood	Consequence	Initial risk rating	Proposed risk controls	Type of risk control	Likelihood	Consequence	Residual risk rating
12	Public access to sites downstream of Jindabyne Dam wall during releases	· Harm to human safety, such as injury or drowning from entering waterway during release	Unlikely	Extreme	High	· Snowy Hydro have locked gates, fence areas and warning signs immediately downstream of the dam to minimise risk of public access.	Reduce exposure to the hazard using administrative actions	Rare	Extreme	High
13	Monitoring the release near riverbank or spillway	Injury or fatality from falling into water.	Rare	Extreme	High	· All personal working near water will work in compliance with approved relevant work, health and safety procedures. · For NSW DCCEEW-Water this includes 'Working on or near water procedures', WHS CRC 017. · For NSW DCCEEW-CPHR this includes the South West Region General Fieldwork Job Safety Assessment (signed 09/03/2020) which includes measures for working in and around water · NSW DCCEEW-CPHR to ensure that any consultants or subcontractors work to relevant NSW DCCEEW-CPHR WHS procedures. · NSW DCCEEW-CPHR to alert Snowy Hydro that they will be working downstream of the dam prior to any monitoring.	Reduce exposure to the hazard using administrative actions	Rare	Moderate	Low
14	Remote work to inspect release	Lack of mobile phone signal causing inability to seek help during emergency.	Possible	Extreme	High	· All personnel working in remote or isolated areas will work in compliance with approved relevant work, health and safety procedures. · For NSW DCCEEW-Water this includes 'Remote or isolated work procedures' · NSW DCCEEW-Water personnel to carry a Breon device. · For NSW DCCEEW-CPHR this includes the South West Region General Fieldwork Job Safety Assessment (signed 09/03/2020) which includes measures for working in bushland and "Remote and isolated work procedure". · NSW DCCEEW-CPHR personnel to carry a Spot device or satellite phone. · NSW DCCEEW-CPHR to ensure that any consultants or subcontractors work to relevant NSW DCCEEW-CPHR WHS procedures.	Reduce exposure to the hazard using administrative actions	Rare	Moderate	Low
15	Animals	Snake bite and insect stings	Possible	Moderate	Medium	· Personnel to wear sturdy shoes, long pants and long sleeves where appropriate. · Personnel to wear insect repellent. · Personnel to have access to a first aid kit. · At least one member of the group to be trained in first aid.	Reduce exposure to the hazard using administrative actions Provide protective equipment	Unlikely	Minor	Low
16	Driving to inspect release	Injury to personnel from vehicle crash	Unlikely	Extreme	High	· All staff undertaking extended periods of driving will work in compliance with approved relevant work, health and safety procedures. · For NSW DCCEEW-Water this includes 'Driving procedures', WHS CRC 007. · For NSW DCCEEW-CPHR this includes the South West Region General Fieldwork Job Safety Assessment (signed 09/03/2020) which includes measures for driving and "Driving & Vehicle Safety Policy and Procedures"	Reduce exposure to the hazard using administrative actions	Rare	Moderate	Low

Ref	Hazard description (A hazard is a situation or thing that has the potential to cause harm.)	Risk description (A risk is the possibility a hazard can cause harm.)	Likelihood	Consequence	Initial risk rating	Proposed risk controls	Type of risk control	Likelihood	Consequence	Residual risk rating
						· NSW DCCEEW-CPHR to ensure that any consultants or subcontractors work to relevant NSW DCCEEW-CPHR WHS procedures.				
17	Meetings with community and landholders	Aggressive stakeholders causing harm to personnel	Unlikely	Extreme	High	· All staff working in remote or isolated areas will work in compliance with approved relevant work, health and safety procedures. · For NSW DCCEEW-Water this includes 'Dealing with Aggressive Stakeholders', WHS CRC 020. · For NSW DCCEEW-CPHR this includes the South West Region General Fieldwork Job Safety Assessment (signed 09/03/2020) which includes the "Guide to dealing with aggressive, abusive, threatening " · NSW DCCEEW-CPHR to ensure that any consultants or subcontractors work to relevant NSW DCCEEW-CPHR WHS procedures.	Reduce exposure to the hazard using administrative actions	Rare	Moderate	Low
18	Public swimming downstream of Jindabyne Dam during increased flow release	Harm to human safety, such as injury or drowning from entering waterway during release	Unlikely	Extreme	High	· SMP process to be followed by all members of STAG. · Proposed communication measures detailed in item 1 to be enacted to ensure community is aware of upcoming flows. .	Reduce exposure to the hazard using administrative actions Isolate hazard from people	Rare	Extreme	High
20	Interstate communication	Risk to safety of Victorian public if notice for upcoming releases is inadequate	Possible	Moderate	Medium	· SMP process to be followed by all members of STAG. · Victorian representatives on Snowy STAG and in stakeholder are included in communication process. · Victorian contacts have been added to email distribution list for Rising River Alert.	Reduce exposure to the hazard using administrative actions	Unlikely	Moderate	Medium
21	Release of water impacted by algae	Harm to human safety through contact or intake. Harm to ecological system i.e. aquatic animals like fishes	Unlikely	Moderate	Medium	· Algae safety protocol to be followed by NSW DCCEEW, including regular satellite monitoring during warmer months and mitigating risk when algae is present by either ceasing releases or releases water form the lower water column. .	Reduce exposure to the hazard using administrative and operation actions to isolate hazard from entering downstream	Rare	Insignificant	Low

Appendix B - Stakeholder and Community Engagement Plan 2024-25

a. Introduction

The Snowy Water Initiative (SWI) was formally established in 2002 to significantly improve river health by releasing environmental water into the Snowy, upper Murrumbidgee and upper Murray river systems.

Embodied in the Snowy Water Inquiry Outcomes Implementation Deed 2002 (SWIOID), the SWI is an agreement for water recovery and environmental flows between the NSW, Victorian and Australian governments (the partner governments) and Snowy Hydro. The NSW Government is responsible for the implementation of the SWIOID.

The environmental water is released from Jindabyne Dam into the Snowy River. The NSW Government is responsible for determining the annual release strategy of these environmental flows, which collectively are called the Snowy River Increased Flows (SRIF).

The annual SRIF strategy focuses on three key aspects, these being:

- increased daily flow variability
- a series of high-flow releases to rework the river bed and improve in instream habitat
- frequent smaller releases.

b. Key issues/considerations

- The Snowy River is an Australian icon. There is strong community interest in rehabilitating the Snowy River, as well as widespread agreement across all stakeholders that the delivery of additional flows is greatly needed.
- The department has previously consulted widely with the local community to identify stakeholders likely to be affected by the planned 2024 high-flow water releases, or who may be able to assist in ensuring the safety of staff, the public and property during the releases.
- The department recognises that effective management of the risks that could arise from the releases requires the support and coordination of many stakeholders.
- This year's annual targeted volume of 204,963 megalitres (ML) reflects the generally wet conditions seen over the past year. The yearly flow sequences are designed to differ from previous years to introduce variability between years, especially around the timing and magnitude of high-flow events.
- As in past years a component of the strategy is to include, where dam levels are high enough to allow delivery via the spillway gates, a 'flushing flow' event large enough to scour the bed of the Snowy River to improve the habitat and resulting in secondary ecological responses to the improved habitat condition.

c. Key water release dates

The table below shows the schedule for high-flow releases. "High-flow" releases are those equal or greater than 2,500 ML/day, which is the threshold above which flows may have the potential to create safety risks,

based on local risk knowledge and experience from past releases. The timing and volumes of flows may change subject to environmental, climatic or operation conditions.

Date	Volume
Thursday 27 June 2024	Daily flow of 2,977 megalitres per day (ML/d) over 24 hours, with equivalent peak flow 4,006 ML/d for eight hours from 8 am to 4 pm
Wednesday 21 August 2024	Daily flow of 3,549 ML/d over 24 hours, with equivalent peak flow 4,916 ML/d for eight hours from 8 am to 4 pm
Wednesday 28 August 2024	Daily peak flow of 4,935 ML/d over 24 hours
Thursday 19 September 2024	Daily flow of 3,135 ML/d over 24 hours
Thursday 3 October 2024	Daily flow of 3,917 ML/d over 24 hours, with equivalent peak flow 4,787 ML/d for eight hours from 8 am to 4 pm
Monday 14 October 2024	Daily peak flow of 2,932 ML/d over 24 hours
Wednesday 23 October 2024	Daily flow of 5,596 ML/d over 24 hours with equivalent peak flow 9,563 ML/d for eight hours from 8 am to 4 pm if Jindabyne Dam levels are high enough to enable delivery If dam levels are not high enough, daily flow of 4,200 ML/d over 24 hours with equivalent peak flow 5,000 ML/d for eight hours from 8 am to 4 pm.
Thursday 24 October 2024	Daily peak flow of 2,575 ML/d over 24 hours If dam levels are not high enough to allow the peak delivery on 23 October, a daily peak flow of 3,525 ML/d will be delivered on 24 October over 24 hours.
Thursday 21 November 2024	Daily flow of 2,410 ML/d over 24 hours, with equivalent peak flow 3,837 ML/d for eight hours from 8 am to 4 pm

Note: Flows will commence at 00:00am (midnight) local time on the date listed for a period of 24 hours. Peak flow releases will occur between 8am to 4pm local time.

The flow regime includes eight separate 'high-flow' events between 27 June and 21 November 2024. The daily flow for each of these high-flow events will be near or above 2,500 megalitres per day (ML/d). High-flow events are generally released at midnight, with a constant flow rate for 24 hours. Five of the high-flow release events will include a higher peak flow rate over 8 hours from 8am to 4pm.

A flushing flow is planned in October, which will be delivered if Jindabyne Dam water levels are high enough to enable delivery of flows via the spillway gates. If water levels are insufficient to achieve this, a lesser volume will be released via the cone valves.

Frequent smaller flow releases, below 2,500 ML/d, will also be made throughout the year.

d. About this stakeholder and community engagement plan

The stakeholder and community engagement activities outlined in this plan have been developed in line with the department's Stakeholder and Community Engagement Policy (IND-I-245) to ensure effective and genuine engagement with stakeholders and the broader community to achieve better public policy outcomes, improved service delivery and enhanced customer service.

The methodologies and actions listed in this plan demonstrate a transparent and consistent approach in relation to stakeholder and community engagement and have been developed using the principles of the International Association for Public Participation (IAP2) model.

These principles include:

- **Purposeful** – deliver on NSW Government priorities, corporate goals with a clear understanding of what we want to achieve.
- **Inclusive** – the identification of all stakeholders and enabling participation.
- **Timely** – clear identification of timeframes and allow sufficient time for meaningful consultation.
- **Transparent** – clearly explain the engagement, consultation and implementation processes and provide the information necessary to enable meaningful and purposeful participation.
- **Respectful** – ensure engagement activities acknowledge and cater for the differing needs, perspective and levels of understanding of participants.

e. Objectives

The aim of this Stakeholder and Community Engagement Plan is to outline the key activities to be undertaken during the 2024-25 water year, but predominantly focusing on the 2024 high-flow releases.

The department has prepared the *Snowy Rivers Increased Flows: Safety Management Plan 2022-2027* to identify and manage public and staff risks associated with the planned environmental water releases. This plan reflects the communication requirements of the SMP.

This plan will:

- Identify and define the approach, methods and collateral material to engage stakeholders to inform them of and assist them prepare for the Jindabyne releases.
- Ensure appropriate action is undertaken in a timely manner to inform stakeholders and the community, with particular emphasis on down-stream landholders, of the planned 'high-flow' water releases, the anticipated dates of each release, the associated volumes of each release and the potential water depths at existing gauges downstream of Jindabyne Dam.

f. Engagement purpose

To effectively engage with relevant stakeholders regarding the Snowy River environmental high-flows by:

- Informing all interested parties of the planned series of eight 'high-flow' events between 1 May 2024 and 30 April 2025.
- Providing interested stakeholders and the broader community with access to relevant materials regarding the high-flow events.
- Ensuring interested people, particularly landholders immediately down-stream of Jindabyne Dam are aware of the planned high-flow events, their timing and magnitude.

g. Stakeholders targeted under this plan

Agency	Contact (where applicable)
Commonwealth Government	https://www.dcceew.gov.au/about/contact
NSW Government	https://water.dpie.nsw.gov.au/about-us/contact-us

Agency	Contact (where applicable)
Victorian Government	https://www.deeca.vic.gov.au/our-department/contact-us
Snowy Hydro Limited	https://www.snowyhydro.com.au/contact/
Snowy Advisory Committee	sac@dpie.nsw.gov.au
Snowy River Alliance	wallacevr@snowy.net.au
Landholders along the Snowy River	
Snowy Monaro Regional Council	council@snowymonaro.nsw.gov.au
East Gippsland Shire Council	https://www.eastgippsland.vic.gov.au/contact-us
NSW National Parks and Wildlife Service	info@environment.nsw.gov.au
Transport for NSW	https://www.nsw.gov.au/transport-for-nsw/contact-roads-and-waterways
State Emergency Service **NSW SES** **Vic SES**	 https://www.ses.nsw.gov.au/about-us/contact-us/ https://www.ses.vic.gov.au/about-us/contact-us/
Other Emergency Service Agencies	
Bureau of Meteorology	https://shop.bom.gov.au/contactus
Local Land Services	
East Gippsland CMA	https://egcma.com.au/contact-us/
State/Regional/Local media organisations Snowy Monaro Regional Council – e-news Shire Wire Snowy Magazine Jindabyne Summit Sun Monaro Post XL FM Snow FM ABC Radio South East	communications@snowymonaro.nsw.gov.au https://www.snowymagazine.com.au/contact http://www.summitsun.com.au/ https://monaropost.com.au/contact https://www.2xl.com.au/connect/contact snow@capitalradio.net.au https://www.abc.net.au/southeastnsw/contact-us
Local businesses within the Snowy region	
Recreational fishing industry	
Recreational campers and tourists	
Community interest groups	
Members of the general public	

Agency	Contact (where applicable)
Department of Climate Change, Energy, the Environment and Water – staff	snowylicencemanagement@dpie.nsw.gov.au

h. Key messages

Volumes allocated to environmental flows

- For the 2024-2025 water year, the New South Wales, Victorian and Commonwealth governments have committed 204,963 ML to be released from Jindabyne Dam into the Snowy River.
- This includes 196,463 ML of SRIF and 8,500 ML base passing flow.

Specific details for 2024/25 high-flow releases

- There are eight scheduled 'high-flow' environmental water releases to the Snowy River in excess of 2,500 ML/d planned for the 2024 water year, occurring between June and November.
- There will be three winter and five spring water releases, reflecting the natural timing of expected high-flow events.
- Flows from Jindabyne Dam are generally released at midnight, with a constant flow rate for 24 hours.
- Five of the high-flow release events will include a higher peak flow rate over 8 hours from 8am to 4pm.
- A flushing flow of 9,563 ML/d is planned for Wednesday 23 October 2024. If dam levels are not sufficient to deliver this in full, the following options will be implemented:
  - If dam levels are high enough to deliver a flushing flow but not high enough to provide the full peak, 5,000 ML/day will be delivered via the cone valves and as much additional SRIF via the spillway gates as possible.
  - If dam levels are insufficient to achieve this a smaller flow will be delivered.

General details for all high-flow releases

- High-flow releases are those in excess of 2,500 ML/day. This is the threshold above which flows may have the potential for creating safety risks, based on local risk knowledge and evidence from past releases. Smaller releases are also made throughout the water year.
- High-flows events from Jindabyne Dam are generally released at midnight, with a constant flow rate for 24 hours.
- Peak flow events are sometimes included, which involve an increased flow rate over 8 hours from 8am to 4pm.
- The days leading up to and following high-flow releases will have intermediate flows to create a more natural flow release pattern (hydrograph) that maximises ecological benefits.

Changes to planned dates and volumes

- Planned flows may be modified or cancelled subject to climatic, environmental or operational conditions near to the time of release.
- The department will endeavour to inform the public of changes to large flow releases, where possible.
- Whilst the volumes of smaller releases are also planned at the start of the year, these may be changed at any time without notice. This allows greater flexibility in the delivery of environmental releases, which provides improved environmental outcomes.

Why releases are being made

- Environmental water releases to the Snowy montane rivers are mandated under the *Snowy Water Inquiry Outcomes Implementation Deed 2002*, a tri-government agreement between the Australian, New South Wales and Victorian Governments, to achieve significant improvements in river health.
- Significant improvement in the condition of the Snowy River has occurred since the introduction of a more variable daily flow regime, including the introduction of a high-flow release strategy.

Design strategy for the flow release patterns

- Flushing flows are important to help develop a more defined river channel within the former riverbed to assist in achieving the long-term goal of returning the Snowy River to a smaller, but healthy montane river.
- High-flow water releases are designed to better mimic the natural flow characteristics that are seen in Snowy montane rivers, including snowmelt and 'freshes' that occurred before the construction of the Snowy scheme, with the aim of improving the long-term health of these river systems.
- High-flow releases are generally planned over winter and spring. This reflects the pre-regulation flow regime of a mixed rainfall and snowmelt river system characteristic of the Snowy Mountains.
- There are generally periods of lower flow in summer and autumn, broken by pulses of higher flow which are aimed to help maintain the opening of the Snowy River estuary and support the seasonal movement of native fish.
- A series of smaller flow releases has been demonstrated to improve river health by establishing a new smaller channel, wetting the riparian zone and promoting the establishment of aquatic and riparian vegetation.
- There is a high degree of daily flow variability with complex multi-peak hydrographs that are typical of rivers in the Snowy Mountains.

Introduction of flexibility in the delivery of smaller releases

- As an outcome of the Snowy Water Licence Review, flexible delivery of smaller flows may be introduced on a trial basis in 2024/25, whereby releases will be made in response to natural cues such as rainfall events. This will help support river health and water dependant plants and animals including native fish.
- The trials may include:
    - Varying releases based on Thredbo trigger flows – responding to natural flow cues based on real-time Thredbo River flow triggers resulting from rainfall events. If triggered, the highest planned release for the month (<1,500 ML) will occur in the Snowy River around one day after the Thredbo flow trigger. This will be done on up to four occasions throughout the water year. The default date for the highest flow is the 25th day of the month if not triggered.
    - Varying releases to achieve flows to the estuary– trial and monitor a series of low flow variations to support estuary health and help keep the estuary entrance open during summer and autumn 2025. Planned daily flows will be increased in February if conditions are dry. The water would be moved from a higher flow period in autumn to achieve this if required.

- Delivering flows in response to natural cues aims to support healthy river functions including helping to maintain a Snowy River estuary connection to the sea supporting critical habitat for native fish migration and breeding including for the Australian grayling which is nationally listed as vulnerable.
- Flexible delivery will not apply to high-flow events (i.e. great than 2,500 ML/day) for the 2024/25 water year, although we may move towards greater flexibility of high-flow events in the future. Appropriate safety management planning would be developed to support this.

Safety messaging

- Downstream landholders are encouraged to make appropriate plans, ahead of the water releases, including securing watercraft and moving stock, pumps and infrastructure to higher ground.
- The release of environmental water into the Snowy River over a series of high-flow events has been successfully trialled since 2011.
- Measures to ensure safe management of high-flow releases are detailed in the Safety Management Plan, which is available on the NSW DCCEEW -Water website.

i. Supporting materials

- Fact sheet: Frequently Asked Questions – provides an overview of the high-flow water release events
- Snowy River Increased Flows: Safety Management Plan – identifies risks associated with the high-flow water release events and outlines the management of these risks for both the general public and staff.
- Rising River Alerts – provides specific details for each of the eight high-flow events in relation to timing, volume and anticipated river level heights down-stream of Jindabyne Dam for the duration of each of the water releases.

j. Agency safety responsibilities for high-flow events

STAG members are expected to undertake the following tasks:

- Provide technical advice to the STAG Chair based on the agency's expertise and local knowledge, on the potential risks and impacts of the releases and appropriate mitigation measures.
- Provide advice to the STAG chair on whether the SMP and flows should proceed.
- Ensure agency attendance at all STAG meetings and provision of timely responses to STAG meeting actions.
- Distribute media releases and Rising River Alerts through their own agencies communication channels as required.
- Assist with community engagement as required.

Additional tasks specific to individual agencies are listed in the below table

Agency	Role
NSW DCCEEW-Water	• Develop the Safety Management Plan • Lead implementation of processes detailed in the Safety Management Plan • Chair Snowy STAG • Provide secretariat support to Snowy STAG • Coordinate all public and stakeholder communications prior to high-flow releases • Reply to contentious issues and enquires • Make decision in consideration of advice of the Snowy STAG
NSW DCCEEW Corporate Communications	• Develop and implement the Stakeholder and Community Engagement Plan • Undertake all public and stakeholder communications prior to high flow releases
NSW DCCEEW-CPHR	• Development of Snowy Rivers Increased Flow (SRIF) release pattern • Develop the SRIF Operations Plan • Work with Snowy Advisory Committee to ensure they consider risks in planning future SRIF release patterns • Liaise with impacted stakeholders
BoM	• Provide advice to the Snowy STAG on rainfall forecasts • Undertake modelling of rainfall events and impacts on river flows / planned releases • Issues flood watch and warnings
NSW SES	• NSW SES is the legislated Combat Agency for floods and is responsible for the control of flood operations. NSW SES work with the Bureau and Councils to develop warning systems. • Responsible for flood consequence management
VIC SES	• VIC SES is the legislated Combat Agency for floods and is responsible for the control of flood operations. VIC SES work with the Bureau and Councils to develop warning systems. • Responsible for flood consequence management

Agency	Role
Snowy Hydro Limited	• Ensure releases are able to be undertaken safely • Operate infrastructure to make releases to the Snowy River • Cease / alter releases (from this plan) when directed by NSW DCCEEW-Water
Snowy Monaro Regional Council	• Assist in providing up to date contact details for downstream landholders • Install additional signage where necessary
East Gippsland Shire Council	• Assist in providing up to date contact details for downstream landholders
NSW National Parks and Wildlife Service	• Install additional signage to alert park users including campers in camping areas • Erect road closed signs as required

k. Direct actions for high-flow events

Action item	Responsibility	Comment
Provide FAQ's factsheet	NSW DCCEEW-Water and NSW DCCEEW Corp Comms	The factsheet will be made publicly available via the department's website, emailed directly to downstream landholders (those with listed contact details) and via the working group.
Provide updates on the down-stream landholder and key stakeholders contact list to DCCEEW	NSW DCCEEW-CPHR NSW DCCEEW-Water and NSW DCCEEW Corp Comms	Opt-in list data is collected by DCCEEW-CPHR, via website. This information is input directly into a contact list held by the Snowy Licence Team. SMS contacts added to Borealis by Snowy Licence Team and Email contacts forwarded to Comms Team for inclusion on their list. Media contacts maintained by Media Team, including interstate. Amendments made following requests from individuals, or following bump back on emails. Other agencies submit direct request to DCCEEW-CPHR or the departments, for removal or inclusion of representatives.
Advise Local Police and SES of the planned high-flows and seek comment on any issues they perceive	NSW DCCEEW Corp Comms	Act on any issues identified.
Email landholders below Jindabyne Dam along the Snowy River (those with listed contact details) and key stakeholders advising of the timing and magnitude of the flows	NSW DCCEEW Corp Comms	The department to make direct contact with downstream landholders (those with listed contact details) and key stakeholders approximately 4 to 6 weeks prior to first high-flow event – then ongoing as required.
Distribute 2024 Snowy River high-flows FAQs to Jindabyne Visitors Information Centre and relevant SES offices for display	NSW DCCEEW Corp Comms	The department to prepare FAQs in PDF format and distribute to working group members and appropriate stakeholders – further copies will be emailed to external contacts as required.

Action item	Responsibility	Comment
Issue a total of eight separate media releases/notices including seven rising river alerts approximately seven days prior to the respective flow release to inform the affected communities **Media outlets to be targeted:** **Snowy Shire Council – e-news** **Shire Wire** **Snowy Magazine** **Jindabyne Summit Sun** **Monaro Post** **XL FM** **Snow FM** **ABC Radio South East**	NSW DCCEEW Corp Comms	Media release providing 'overview' of the high-flow water releases issued May 2024 - and then 'Rising river alerts' to be issued 7 days before the planned releases.
Provide Departmental 'Customer Experience' staff with all up-to-date information to answer any requests received.	NSW DCCEEW- Water and NSW DCCCEEW Corp Comms	'Customer Experience' staff to be provided with all relevant information – May 2024.
Release the 'SRIF Safety Management Plan and the SRIF Operations Plan 2024-25' – to be placed on the department's website and sent to members of the inter-agency working group.	NSW DCCEEW Corp Comms	Updated 'SRIF Safety Management Plan and SRIF Operations Plan 2024-25' provided to interagency working group members – May 2024. Updated documents uploaded to DCCEEW website – May 2024.
Update the department's website to ensure it contains the latest information on the environmental releases – 'Snowy River Increased Flows' website page.	NSW DCCEEW Corp Comms	'Snowy River Increased Flows website page updated to coincide with the issuing of the 'overview' media release. Overview media release to be issued in May 2024.

l. Evaluation

The following qualitative data will be used to indicate if this plan has successfully achieved its objectives.

Objective	Key indicators of success
Identify and define the best approach to engage key target groups to better inform them of planned high-flow water releases.	▪ media coverage resulting from the 'overview' media release issued announcing the planned high-flow water releases. ▪ the number of media requests for interviews received. ▪ the amount of positive/negative/incorrect media coverage (through media monitors). ▪ stakeholder and landholder comments in both traditional and social media. ▪ direct feedback from down-stream landholders as a result of the outlined notification process for planned high-flow water releases during winter-spring. ▪ visits to the department's website for information on the Snowy River environmental water releases. ▪ feedback from inter-agency members.

Appendix C - Terms of Reference for the Snowy and Tantangara Safety Technical Advisory Group (STAG)

Endorsed May 2022 – Amended April 2024

The Snowy River and Tantangara Safety Technical Advisory Group (STAG) "Terms of Reference" are the guiding principles and functions for assisting the NSW Department of Climate Change, Energy, the Environment and Water (NSW DCCEEW–Water) in the implementation of the Snowy River and Tantangara Safety Management Plans.

a. Background

The Snowy and Tantangara STAG are an advisory committees established to assist DCCEEW-Water to:

- implement the safety management processes for the waterways below the Jindabyne and Tantangara Dam.
- creates the opportunity for the views of key stakeholders to be identified and captured through the implementation of the safety management plan, and
- act as a consultative forum for the development and implementation of the safety management plan.

b. Purpose

The STAG is established to review safety matters associated with high-flow releases. It provides advice as requested by NSW DCCEEW-Water to assist the safety management process. The STAG has an advisory role and will not have a formal role in decision making, policy direction or delegating additional work to be carried out by NSW DCCEEW-Water.

The purpose of the STAG is to provide specific advice in relation to how to:

- reduce the probable impact of flooding and flood liability on the community from high flow releases
- reduce and prevent private and public losses resulting from high flow releases

c. Establishment and membership

The Committee

The committee comprises representatives from various Federal, State and Local Government departments / authorities / corporations and Snowy Hydro Ltd.

Membership of the advisory committee shall comprise of one representative from:

Departments / Authorities / Corporations	Jindabyne Releases	Tantangara Releases
NSW Department of Climate Change, Energy, the Environment and Water - Water (NSW DCCEEW-Water)	x	x
NSW Department of Climate Change, Energy, the Environment and Water- Conservation Program, Heritage and Regulation (NSW DCCEEW-CPHR)	x	x

Departments / Authorities / Corporations	Jindabyne Releases	Tantangara Releases
NSW National Parks and Wildlife Service (NSW NPWS)	x	x
East Gippsland Catchment Authority (EGCA)	x	
NSW State Emergency Service (NSW SES)	x	x
Victoria SES (Vic SES)	x	
ACT SES		x
The Bureau - Hazard Preparedness and Response (HPR) South	x	
The Bureau - Hazard Preparedness and Response (HPR) East		x
Snowy Hydro	x	x
Snowy Monaro Regional Council (SMRC)	x	x
East Gippsland Shire Council (EGSC)	x	
Victoria Police (Vic Police)	x	

From time to time, other people who have clearly defined interest in topics being pursued by the committee, may be invited.

Chairperson

The committee shall be chaired by the NSW DCCEEW-Water, Director Asset Management and Performance. If the nominated staff is not available the replacement Chair shall be the alternate from NSW DCCEEW-Water, or if unavailable, a committee member agreed upon by the majority of members.

Acting members

Each of the agencies can nominate an alternative person to act as their committee member representative, including the Chair.

Secretariat support

To enable the committee to operate effectively NSW DCCEEW-Water shall provide:

- any relevant and available data, technical/management studies and mapping
- expert advice from NSW DCCEEW-Water staff as required
- as agenda items relevant draft documents, and the opportunity to discuss open and transparent communication; and
- secretariat services and venues for meetings.

Tenure

This Terms of Reference is effective from the establishment of the SSTAG and will be ongoing as required.

Other meeting participants

Relevant technical and policy staff may attend meetings and provide advice as appropriate. committee members should notify the Chair of additional attendees in advance of the meeting.

Committee members may invite representatives of Snowy Hydro and other agencies to attend and participate in meetings as required.

Invited staff and other representatives will not be authorised to vote on matters to be decided by the committee.

d. Amendment, modification or variation

This Terms of Reference may be amended, modified, or varied in writing after consultation and agreement by the committee.

e. Responsibilities and scope

The STAG shall:

- Provide technical support to NSW DCCEEW-Water in the decision-making concerning the safe planning and implementation of environmental releases (SRIF) from Jindabyne Dam and (SMRIF) from Tantangara Dam, particularly where it is possible that they could contribute to flooding impacts.
- Provide advice on planned and modified planned SRIF releases (as described in the Safety Management Plan)
- Provide technical advice to the STAG Chair based on the agency's expertise and local knowledge, on the potential risks and impacts of the releases and appropriate mitigation measures.
- Provide advice to the STAG chair on whether the SMP and flows should proceed.
- Ensure agency attendance at all STAG meetings and provide timely responses to STAG meetings.
- Distribute media releases and Rising River Alerts through their own agencies communication channels as required.
- Assist with community engagement as required.
- Provide input as set out in Table C-1.

Bureau of Meteorology

The Bureau of Meteorology (the Bureau) provides input to the Snowy River and Tantangara Safety Technical Advisory Group, relating to weather conditions. The level of input is determined by the availability of information. For Tantangara Dam releases this is limited to rainfall forecasts only. For Jindabyne Dam releases, hydrological modelling and rainfall forecasts can be provided.

The Bureau is not involved in the making of recommendations regarding dam management or releases, they only provide information to allow informed decisions.

Table C-1. Process for the STAG input prior to a high-risk release

Timing	Process
When SRIF/SMRIF flow plan for the	Snowy and Tantangara Safety Technical Advisory Group (STAG) may meet to:

Timing	Process
coming year is released	1. Discuss the coming years planned releases and the Annual SRIF/SMRIF Operations plan 2. Review the Safety Management Plan, 3. Review the STAG ToR 4. Determine any risks associated with the planned timing, duration, and size of planned SMRIF releases. 5. Determine any risk mitigation measures that may be required for the upcoming water year. 6. Determine which flow events would require the Safety Management Process to be enacted, as set out in in the next sections.
Approximately 5-7 days prior to commencement of SRIF/SMRIF release	1. NSW DCCEEW-Water notifies the Bureau of upcoming release. The Bureau and NSW DCCEEW-Water review any likely weather event or triggers during the planned release. 2. The Bureau undertakes rainfall and flood forecasting (Snowy River only) to determine water levels. 3. NSW DCCEEW-Water informs STAG of upcoming planned release and makes any required meeting arrangements or via email response. 4. STAG reviews planned releases along with the Bureau's weather predictions, climatic risks and/or flood forecasting. STAG reviews risks and mitigation measures and provides advice on whether the release will be recommended to proceed to the next stage. 5. NSW DCCEEW decision-making process in flow chart followed (Figure C-1)
Approximately 2-3 days prior to commencement of each SRIF/SMRIF release	1. The Bureau and NSW DCCEEW-Water undertake a final flood / weather forecast. 2. Decision made if STAG requires meeting via Teams or via email. 3. STAG considers updated rainfall and flood forecasting (Snowy River only) and any final safety issues/actions required. 4. STAG reviews planned releases, risk and proposed mitigation measures and communication. 5. STAG members confirm that they are comfortable that the risks of the impending flow event are known and have been mitigated to an acceptable level. 6. NSW DCCEEW-Water makes decision on whether the flow should proceed and instructs Snowy Hydro based on the outcome. Where there is determined to be a high risk the STAG may reconvene 1 day prior to release and review
During release	1. The Bureau monitors weather and advises NSW DCCEEW-Water of any likely event that coincides with the full duration of the current release.

Timing	Process
	2. If necessary, the Bureau / NSW DCCEEW-Water undertake flood forecasting (Snowy River only) to determine any potential impacts from any forecasted weather. 3. If a risk arises, NSW DCCEEW-Water advises the STAG, and may call a STAG meeting. 4. Flow chart decision making process followed (Figure C-1).

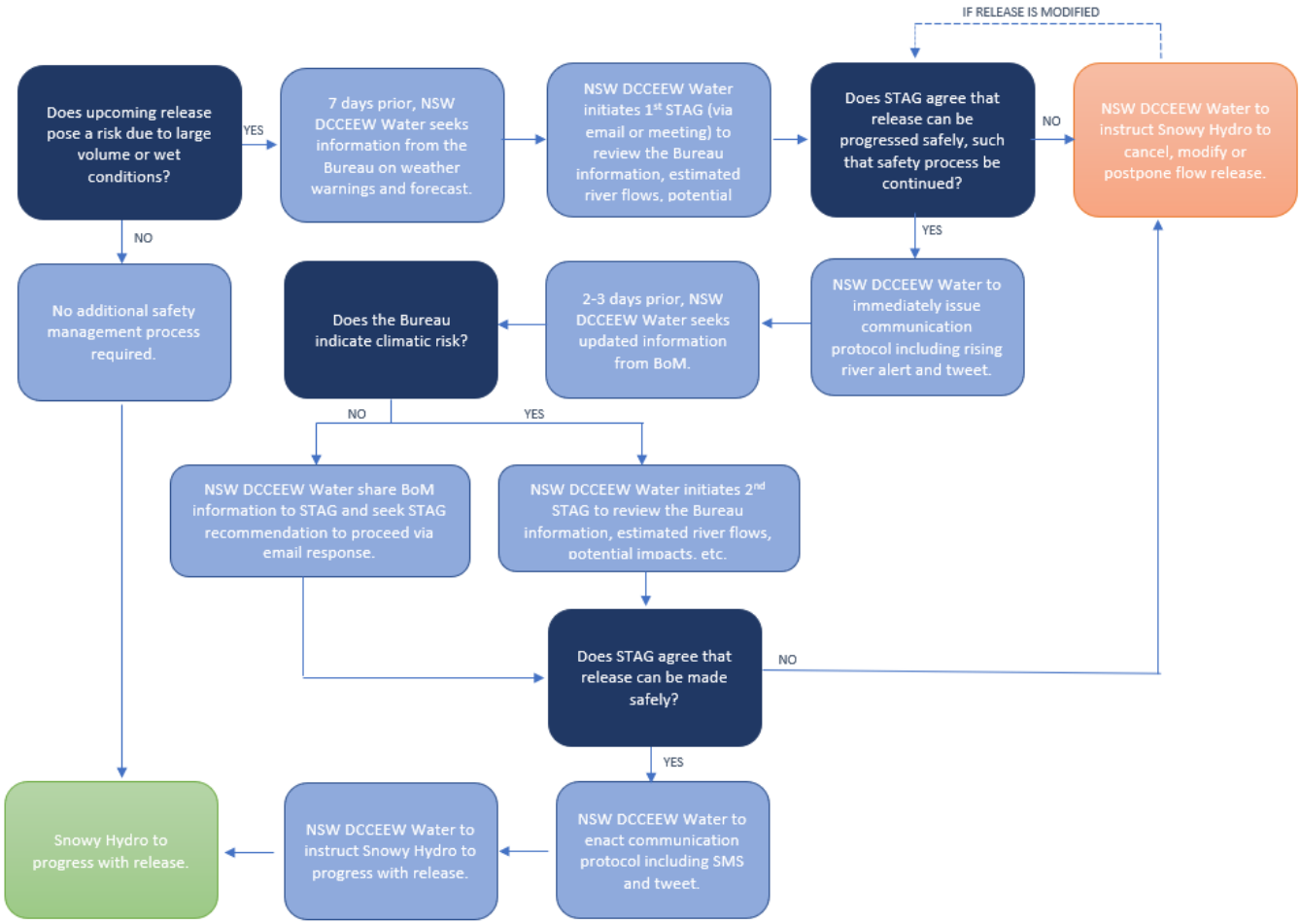

Figure C-1. STAG process flow chart

f. Operating protocols

Convening meetings

- The Committee will meet as required to satisfy its responsibilities and will have at least one meeting in each calendar year.
- Meetings may be called at short notice, due to deteriorating conditions.
- Meetings may be arranged at the request of one or more Committee members, through the Chairperson.

- Meeting locations will be agreed upon by Committee members and can be face-to-face or by video/teleconference.
- All attendees will meet the costs of their own travel and accommodation.
- The Chair is responsible for deciding to reschedule meetings should the need arise.

Quorum

The quorum for a meeting of the Committee will be attendance be representatives of NSW DCCEEW-Water, NSW DCCEEW-CPHR, Snowy Hydro, the Bureau and SES.

Delegation

- The Committee is advisory in nature providing recommendations to NSW DCCEEW-Water.
- The Committee has not been delegated authority by NSW DCCEEW-Water.
- Any recommendations of the Committee must be ratified by resolution of NSW DCCEEW-Water and implemented by department staff with an appropriate delegation.
- The Committee does not have any power to incur expenditure or to bind the NSW DCCEEW-Water to any decision upheld by the Committee.

Dissolution

The Committee may at any time be dissolved and disbanded by NSW DCCEEW-Water.

Conflicts of interest

Panel members must declare any conflicts of interest at the start of each meeting or before discussion of a relevant agenda item or topic. Details of any conflicts of interest should be appropriately minuted.

Committee member conduct

To enable the Committee to perform effectively, members will:

- disclose interests on all matters brought before the Committee that could conflict with the proper performance of their functions.
- Respect the views and interests of other Committee members and their respective governments when considering matters brought before the Committee.
- take all reasonable steps to gain a thorough understanding of the matters brought before the Committee.
- participate to the full extent of their knowledge and expertise in deliberations of the Committee to ensure those deliberations are fully informed.
- inform their respective Ministers of issues that may warrant ministerial level attention as these issues arise for discussion or decision by the Committee.
- consult with other agencies and portfolios of their respective governments as required to ensure that the positions brought to the Committee have whole of government support.

Contact officers

Each agency shall appoint a lead and backup officer and provide contact details for each officer to NSW DCCEEW-Water. NSW DCCEEW-Water should be copied into any correspondence sent between committee members.

Attendance

The lead officer is expected to attend each meeting. Where this is not possible, the backup officer must attend. Where no representative is available to attend at all, the agency must contact the Chair with sufficient notice for the Chair to consider rescheduling the meeting. The Chair may request agencies not in attendance to provide advice in writing.

Committee Members – Confidentiality

From time to time, members may be required to review and comment on draft documentation that has not been formally considered by the NSW DCCEEW-Water's decision-making body. In these circumstances, it is crucial members understand the status of any documentation and the importance of maintaining confidentiality if they wish to have input at such a preliminary time. Similarly, discussion may take place on matters subject to state government protocols that need to be adhered to. Each member is required to agree to the confidentiality requirements of membership.

Confidentiality of Snowy Hydro related information and data

- All material dealt with by the committee shall be treated as confidential unless otherwise identified by the Chair, after consulting with the NSW DCCEEW-Water member, or if tabled by a committee member of the other Agencies.
- Where confidential information is provided to a committee member or contact officer, care must be taken to ensure the information is kept secure, and that numbers of copies are kept to the minimum necessary. If such information is to be disposed of, it must be destroyed.
- The Department may, on behalf of and on terms acceptable to Snowy Hydro, require Committee members or contact officers to sign a confidentiality agreement or deed in regard to the use of Snowy Hydro data or information it deems to be commercially sensitive.

Appendix D - Enquiries and emergency contacts

Table D- 1 Contacts (current as of April 2024)

Contact	Telephone Number
NSW DCCEEW-Water	1300 081 047
Police/Ambulance	000
State Emergency Service	132 500
RMS Transport Management Centre Incident Reporting Line	131 700
Snowy Monaro Regional Council	1300 345 345
Snowy Hydro Limited	https://www.snowyhydro.com.au/contact/

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Appendix E - Historic releases and recorded river levels

Table F-1 Historic releases and recorded river heights (5,000ML/d and above). All flows values are in ML/d.

Gauge	**Flow release**	**5,000**	**5,000**	**5,000** (4,189)*	**5,000**	**5,000**	**5,000**	**9,562** (3,910)*	**10,000**	**13,000**
	Date	6/7/21	17/10/18	14/11/22	18/5/23	18/10/23	31/10/22	31/10/22	14/10/14	4/10/17
Dalgety Weir	Rain (mm)+	0	0	<0.5	0	3	12.2	10	10	0
	Water level (m)	1.55	1.55	1.64	1.94	1.51	1.73	2.04	2.04	2.28
	Flow	5,293	5,266	6,183	9,117	4,917	6,982	10,068	10,068	12,176
	Travel time - Initial rise to peak (hrs)	11 - 18	11 - 17	n.a	10-15	6-8	n.a	7 - 13	7 - 13	8 - 13
Burnt Hut	Rain (mm)	0	0	3.0	0	0	20.4	0.5	0.5	0
	Water level (m)	1.81	1.68	2.72	2.3	1.78	4.47	2.69	2.69	2.71
	Flow	5,186	4,469	11,985	8,374	5,150	40,881	11,552	11,552	11,765
	Travel time - Initial rise to peak (hrs)	37- 42	35 - 38	n.a.	29-31	24-26	30 - 45	26 - 30	26 - 30	26 -29

Gauge	Flow release	5,000	5,000	5,000 (4,189)*	5,000	5,000	5,000	9,562 (3,910)*	10,000	13,000
	Date	6/7/21	17/10/18	14/11/22	18/5/23	18/10/23	31/10/22	31/10/22	14/10/14	4/10/17
McKillops Bridge	Rain (mm)	0	0	<0.5	0	0	<0.5	0	0	0
	Water level (m)	1.95	1.86	2.72	1.94	1.95	3.56	2.54	2.54	2.28
	Flow	5,329	4,734	13,375	4,932	4,968	27,819	10,083	10,083	8,232
	Travel time Initial rise - peak (hrs)	57 - 63	60 - 70	n.a.	53-55	48-57	n.a.	43 - 48	43 - 48	44 - 50
Basin Creek	Rain (mm)	0	17	>0.5	4	0	1.8	<0.5	<0.5	<0.5
	Water level (m)	2.68	2.62	3.51	2.7	2.7	4.36	3.21	3.21	2.92
	Flow	5,379	4,537	17,068	5,574	5,531	33,748	12,013	12,013	7,972
	Travel time Initial rise - peak (hrs)	72 - 77	76 - 82	n.a.	67-70	68-72	n.a.	56 – 71	56 - 71	58 – 73
Jarrahmond	Rain (mm)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
	Water level (m)	1.85	1.77	3.36	1.88	1.89	4.63	2.6	2.6	2.14
	Flow (ML/d)	5,322	4,294	19,943	5,476	5,393	34,850	12,244	12,244	7,400

Gauge	Flow release	5,000	5,000	5,000 (4,189)*	5,000	5,000	5,000	9,562 (3,910)*	10,000	13,000
	Date	6/7/21	17/10/18	14/11/22	18/5/23	18/10/23	31/10/22	31/10/22	14/10/14	4/10/17
	Travel time - Initial rise to peak (hrs)	92 - 99	85 - 92	n.a.	76-82	78-84	n.a.	72 - 79	72 - 79	77 - 84
Orbost	Rain (mm)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
	Water level (m)	1.48	1.3	3.25	1.6	1.3	5.01	2.42	2.42	1.75
	Flow	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
	Travel time - Initial rise to peak (hrs)	96 - 107	96 - 111	96 - 111	n.a.	80-88	82-92	n.a.	80 - 96	81 - 92

Table F-2 Historic releases and recorded river heights (2,500M to < 5,000 ML/d) All flows values are in ML/d.

Gauge	Flow release	2,743	2,832	2,847 (2,832)*	2,931	3,715	3,827	3,919	4,099	4,504	4,755 (5,000)*	4,763 (2,143)*	4,979
	Date	13/10/23	10/11/23	1/12/22	21/6/23	31/5/22	20/9/23	22/8/23	6/7/23	14/07/22	12/10/22	24/10/22	5/9/22
Dalgety Weir	Rain (mm)+	0.8	0.2	1.4	0	0	0	1.2	0	0	0	6.4	<0.5

Gauge	Flow release	2,743	2,832	2,847 (2,832)*	2,931	3,715	3,827	3,919	4,099	4,504	4,755 (5,000)*	4,763 (2,143)*	4,979
	Date	13/10/23	10/11/23	1/12/22	21/6/23	31/5/22	20/9/23	22/8/23	6/7/23	14/07/22	12/10/22	24/10/22	5/9/22
	Water level (m)	**1.31**	**1.45**	**1.31**	**1.47**	**1.18**	**1.5**	**1.51**	**1.46**	**1.47**	**1.61**	**1.68**	**1.5**
	Flow	2,900	4,228	2,867	4,400	1,762	4,783	4,850	4,342	4,423	5,754	6,223	4,816
	Travel time Initial rise - peak (hrs)	8-12	9-15	n.a.	12-13	6 - 8	8-9	7-8	7-8	10 -19	n.a.	n.a.	8 - 16
Burnt Hut	Rain (mm)	0.2	0	0	0	0.8	0	0	0.6	0	0	47.2	0
	Water level (m)	**1.36**	**1.59**	**1.54**	**1.58**	**1.67**	**1.68**	**1.72**	**1.67**	**1.76**	**2.21**	**7.87**	**1.8**
	Flow	3,122	4,180	3,816	3,993	1,413	4,495	4,717	4,428	4,929	7,669	133,767	5,141
	Travel time Initial rise - peak (hrs)	28-34	31-34	n.a.	37-38	30 - 38	29-36	29-33	31-33	32 - 37	n.a.	31 - 37	30 - 36
McKillops Bridge	Rain (mm)	5	0	0	0	<0.5	0	0	0	1.8	0	0	0
	Water level (m)	**1.95**	**1.7**	**1.94**	**1.7**	**1.90**	**1.85**	**1.78**	**1.87**	**1.93**	**2.41**	**4.2**	**2.04**
	Flow	4,968	3,464	4,960	3,458	4,617	4,289	3,937	4,368	4,797	9,419	42,924	5,624
	Travel time Initial rise - peak (hrs)	63-68	54-58	n.a.	56-70	52 -58	56-65	55-63	58-64	56 - 61	n.a.	n.a.	48 -53

Gauge	Flow release	2,743	2,832	2,847 (2,832)*	2,931	3,715	3,827	3,919	4,099	4,504	4,755 (5,000)*	4,763 (2,143)*	4,979
	Date	13/10/23	10/11/23	1/12/22	21/6/23	31/5/22	20/9/23	22/8/23	6/7/23	14/07/22	12/10/22	24/10/22	5/9/22
Basin Creek	Rain (mm)	0	0.6	0	0	0	0	0	0	0	0	34	0
	Water level (m)	**2.51**	**2.5**	**2.69**	**2.52**	**2.62**	**2.6**	**2.59**	**2.64**	**2.66**	**3.09**	**5.19**	**2.73**
	Flow	3,614	3,511	5,515	3,697	4,699	4,542	4,388	4,815	5,177	10,540	55,839	5,908
	Travel time Initial rise - peak (hrs)	80-85	79-83	n.a.	82-85	63 - 70	74-81	70-74	74-78	64 -70	n.a.	n.a.	60 - 65
Jarrahmond	Rain (mm)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
	Water level (m)	**1.66**	**1.61**	**1.99**	**1.64**	**1.79**	**1.6**	**1.73**	**1.78**	**1.85**	**2.44**	**8.68**	**1.95**
	Flow)	3,604	3,272	6,522	3,806	4,917	4,339	4,138	4,770	5,375	10,466	148,939	6,158
	Travel time Initial rise - peak (hrs)	88-96	88-96	n.a.	91-99	73 - 92	85-92	79-86	83-90	86 -92	n.a.	57 - 62	73 - 84
Orbost	Rain (mm)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
	Water level **(m)**	**1.3**	**1.23**	**1.87**	**1.23**	**1.54**	**1.3**	**1.36**	**1.44**	**1.66**	**2.49**	**7.1**	**1.73**
	Flow	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

Gauge	Flow release	2,743	2,832	2,847 (2,832)*	2,931	3,715	3,827	3,919	4,099	4,504	4,755 (5,000)*	4,763 (2,143)*	4,979
	Date	13/10/23	10/11/23	1/12/22	21/6/23	31/5/22	20/9/23	22/8/23	6/7/23	14/07/22	12/10/22	24/10/22	5/9/22
	Travel time Initial rise - peak (hrs))	96-117	95-117	n.a.	96-106	92 – 97	91-99	82-92	84-96	93 - 100	n.a.	n.a.	81 - 93

* Superseded by flood mitigation releases by Snowy Hydro – **actual release** (planned environmental release in bracket). Travel time is normally not determined for these releases which water level and flow are daily average, except 12 Oct 2022.

+ Rain is estimated at gauging station corresponding to travel time of the releases.

Appendix F – Algae Safety Protocol

Endorsed June 2024

Process to mitigate impacts from algae released from Jindabyne and Tantangara Dams during environmental releases

Context

1. Schedule 3 Part 4 Clause 15.7 of the Snowy Water Licence (the Licence) requires that the Water Administration Ministerial Corporation (WAMC) prepares a safety management plan that addresses the legal obligations with respect to public safety and other matters in connection with release of flushing flows.
2. Clause 16.2 of the Licence requires WAMC to use reasonable endeavours to mitigate a 'Prescribed Event' and its effects. Prescribed Events include public safety or environmental health risks with respect to increased flow releases from Tantangara and Jindabyne Dam.
3. Key agencies involved in environmental releases have a common law duty of care with respect to their impact on public safety and environmental health.

Objective

4. The objective of this protocol is to mitigate potential downstream impacts of algae released from Tantangara and Jindabyne Dams as part of the Snowy River Increased Flows (SRIF) and Snowy Montane River Increased Flows (SMRIF) program.
5. This protocol does not cover management of water quality or algae within Snowy Hydro reservoirs, which is not the responsibility of NSW DCCEEW.

Scope

6. The protocol applies to SRIF releases from Jindabyne Dam into the Snowy River and SMIRF releases from Tantangara Dam into the upper Murrumbidgee River.
7. This protocol is developed to tie into the existing processes within the Snowy and Tantangara safety management plans (SMPs), and will be incorporated into the SMPs during the next review phase.
8. The protocol uses a risk-based approach. Accordingly, the protocol will focus on releases between January and April when warmer water temperatures increase the risk of algal blooms in the dams.
9. The protocol may also be enacted outside of the summer period if high-risk conditions are overserved, such as unseasonal prolonged warm weather during period of low flows.

Algae mitigation process

Algae monitoring

10. Sentinel 2 satellite imagery of Tantangara and Jindabyne reservoirs is available at two to three-day intervals through the EO Browser developed by Sentinel-Hub. WaterNSW has developed a Custom Algal

script for use with the Sentinel EO Browser, to map the algal risk level based on an estimate of the algae biovolume of the waterbody using the satellite imagery. The script uses the widely accepted Normalised Difference Chlorophyll Index (NDCI) algorithm for estimating the algae biovolume. The script does not distinguish between blue-green or other algae. The colour coding produced by the script aligns with NSW algae alert levels.

11. DCCEEW-Water will review satellite imagery at approximate fortnightly intervals throughout the summer period. As an example, DCCEEW-Water will review imagery on Monday mornings from the second week of January through until the end of April (or longer if algae are persistent in the system). A pragmatic approach will be taken during public holiday periods based on available resourcing.
12. If the imagery is unclear due to cloud cover, DCCEEW-Water will review the most recent imagery available and the next earliest imagery available.
13. If imagery shows an amber or red alert, DCCEEW-Water will notify DCCEEW- Conservation Program, Heritage and Regulation (CPHR) on the same day.
14. DCCEEW-CPHR will review the data. Where a red alert is present, DCCEEW-CPHR will liaise with WaterNSW, as the Statewide Algae Coordinator, and Snowy Hydro to confirm the site condition. WaterNSW may provide further algae information for the reservoir and downstream waterway. Snowy Hydro may conduct on-site visual assessments and/or algae sampling monitoring.
15. If the site condition is confirmed by Snowy Hydro or WaterNSW, DCCEEW-CPHR will lead mitigation actions relating to the release of environmental flows.

Mitigation actions

16. DCCEEW-CPHR will consult with relevant agencies (e.g. DCCEEW-Water, WaterNSW and Snowy Hydro) to determine appropriate mitigation measures. This may include (but not be limited to):
    a. Amending the volume or timing of the release
    b. Releasing water from lower in the water column (consider cold water impact to downstream)
    c. Cancelling the release
17. DCCEEW-CPHR will consider the risks of implementing any mitigation measures, e.g.:
    a. the degree of stratification in the reservoir and consequential thermal pollution from releasing water from lower in the water column
    b. the reduced habitat, increased drying, reduced connectivity, decreased thermal buffering and other effects from reducing or cancelling releases.
18. DCCEEW-CPHR will inform DCCEEW-Water of the agreed action.
19. If necessary, DCCEEW-Water, acting as WAMC, will instruct Snowy Hydro in writing to implement the mitigation action.
20. Snowy Hydro will implement the mitigation action.

Follow up actions

21. DCCEEW Water will continue monitoring satellite imagery and provide updates to DCCEEW-CPHR as mentioned in item 2.
22. WaterNSW and Snowy Hydro will provide DCCEEW-CPHR with updated site observations they may take whilst mitigation is in place.
23. DCCEEW-CPHR will monitor any feedback received from WaterNSW or other downstream stakeholders of to determine any algae issues that may be derived from environmental releases.

24. Where algae monitoring or feedback demonstrates that additional mitigation is required, the process under 'Mitigation actions' will be repeated.
25. Where monitoring demonstrates that the algae risk has subsided, DCCEEW-CPHR will consult with relevant agencies such as DCCEEW-Water WaterNSW and Snowy Hydro and determine when mitigation actions can be ceased and normal operations resumed.
26. DCCEEW-CPHR will inform DCCEEW-Water of the agreed action.
27. If necessary, DCCEEW-Water, acting as WAMC, will instruct Snowy Hydro in writing to resume normal operation at its earliest convenience.
28. Snowy Hydro will use best endeavours to implement the action as soon as practicable.

Evaluation and Revision

29. Algae mitigation processes will be reviewed at the end of each water year as part of the annual review of the SMP, led by DCCEEW-CPHR. The SMP will be updated to reflect improvements.

Satellite imagery colour code

30. The table below shows satellite imagery colour codes representing observed risk levels based on the estimated photosynthetic activity.

Map Colour	**Risk Level -** *Potential Photosynthetic Activity*	Starting concentration guide range	RACC recreational alert values approx. equivalence
Blue	Very low	<0.05 mm3/L	No Alert
Green	Low	0.05 to 0.5 mm3/L	Green
Yellow	Medium	0.5 to 5.0 mm3/L	Amber
Red	High	5.0 to 20.0 mm3/L	Red
Dark red	Extreme	> 20 mm3/L	Red

**RACC: Regional Algae Coordinating Committee*