



# **Narran Lakes Event Based Mechanism Pilot Project Review**

**Final report**

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## Summary

### *Pilot Project background*

The Narran Lakes wetland complex covers some 8,500 ha and is an internationally significant, Ramsar-listed wetland which is an important waterbird breeding site. It also holds significant cultural importance for the Traditional Owners.

The Condamine-Balonne river system in south west Queensland divides into a number distributary channels downstream of St George. These channels flow across the NSW border, and one of these channels, the Narran River, flows into NSW and terminates in the Narran Lakes, east of Brewarrina.

By December 2019, the Condamine Balonne catchment had experienced five years of very much below average rainfall, with extended periods of no flow in the Lower Balonne system. As a result of the extended dry conditions, large areas of vegetation important for providing bird breeding habitat were highly stressed. There had been a four to seven year gap in critical inflows to various parts of the site, where ideally watering of these bird breeding habitats should occur every one to two years.

The Murray-Darling Basin Authority's Basin environmental watering priorities for 2019/20 flagged provision of at least 25 GL of flow into the Narran Lakes as a high priority action. The CEWO's 2019/20 Portfolio Management Plan for the Northern Intersecting Streams clearly identified critical water needs of 25 – 50 GL of flow into the Narran Lakes to support waterbird breeding habitat in northern lakes. The plan identified further critical water needs for volumes of up to 154 GL that would also deliver important benefits.

The Commonwealth Environmental Water Office (CEWO) had been progressively working on concepts for developing and implementing Event Based Mechanisms (EBMs) in the Lower Balonne system in south western Queensland for some years. As part of the implementation of recommendations of the Northern Basin Review, the Murray Darling Basin Plan was amended in 2018 and it was agreed that a "toolkit" of measures aimed at improving environmental outcomes in the northern Murray-Darling Basin would be implemented.

One of the toolkit measures calls for the development of a broad range of practical, event based mechanisms that can be used by environmental water holders to meet important flow targets. The Commonwealth, Queensland and NSW governments committed to finalisation of a work plan for developing a suitable framework for event-based mechanisms by 31 December 2019. The broad aims of this measure are to develop trading and other contractual measures to complement management of water for the environment, in order to benefit environmental outcomes in the northern Murray-Darling Basin.

The development of EBM processes has also included consultation and discussion with a range of stakeholders. The key objective of the EBMs was purchase rights to water on a temporary basis with a view to augmenting the volumes of water that would reach the Narran Lakes in periods when the achievable flow increases were likely to create significant environmental benefits, particularly in relation to sustaining important vegetation communities in the Narran Lakes wetlands. The CEWO anticipates that any such augmentation of water available and provided under the Queensland water plan and Commonwealth holdings in the Lower Balonne will be on a strategic and occasional basis.

The CEWO commissioned several detailed studies into EBMs by expert consultants. By December 2019, CEWO staff had developed proposals and received approval for detailed development of a two stage process to implement EBMs in the lower Balonne.

- Stage 1: An interim approach of offering grants to landholders who agreed to forgo pumping of their water entitlements if predetermined target flow triggers in the system are met. This interim approach is planned to apply for the period from February to June 2020.
- Stage 2: Development of temporary transfer (seasonal assignment) arrangements for instantaneous volumetric limit and multi-year account entitlements. This activity is proposed to be led by DNRME with input from CEWO to provide an ongoing administrative option for EBMs that sits within the DNRME monitoring and compliance and accounting arrangements.

In early 2020 the positive Indian Ocean Dipole which had driven drought conditions across the northern MDB was breaking down and there was a more positive outlook for rainfall across northern Australia in the autumn. CEWO staff worked to develop final proposals, and by early February 2020, detailed arrangements for implementation of the preferred EBM (forgoing pumping), had been developed and approved.

As these arrangements were being put into place, rainfall started to occur in the upper reaches of the Condamine-Balonne catchment. CEWO immediately activated its flow monitoring and estimation procedures on 13 February, and on 18 February the CEWO event volume estimation procedure indicated that the necessary flow triggers would be met. This was confirmed via independent advice from DNRME. Accordingly, on 18 February the Commonwealth Environmental Water Holder approved the activation of the grant process.

Further rain continued to fall across the catchment, and on 22 and 23 February intense rainfall occurred upstream of St George. Cumulative rain in the period following grant activation was significantly higher than had been forecast at the time of grant activation. Based on CEWO's own event volume calculations and following independent confirmation from DNRME received late on 24 February that the event volume would exceed the deactivation trigger volume, on 25 February the CEWH approved deactivation of the grant. The grant recipient was also notified of this decision on 25 February, which initiated a seven day notice period until 3 March 2020, when the grant was formally deactivated, and the recipient ceased forgoing pumping opportunities.

The EBM pilot project provided an additional 9 GL of water to the flows into the Narran Lakes, which represented an increase of around 11% in the total volume that reached the lakes. Figure S1 provides a timeline of some of the key steps in the lead up to and implementation of the pilot project.

*Figure S1: Timeline of key actions for the Narran Lakes EBM pilot project*

## **Review findings**

Whilst is targeted important environmental outcomes, the first EBM implementation was also seen as a pilot project. As part of capturing the learnings from the project, the CEWO commissioned an independent review of the project to identify recommendations for improving the implementation of EBMs. A series of evaluation questions were developed around three key themes of project need, implementation and effectiveness.

### *Project need*

It was found that the CEWO clearly established the need for the project. A strong justification was developed for the environmental needs and potential benefits of implementing the pilot project. This justification was built on consideration of a range of scientific studies on the water requirements for the site, the extended time since meaningful flows had entered the lakes and monitoring of vegetation conditions at the site. There was also support from the local community, who were concerned over the condition of the lakes.

The selection of the form of EBM to be used for the pilot project was based on a clear rationale that had regard for the environmental water requirements of the site and how these could be best met, together with assessments of the feasibility of various EBM options that could be implemented in the 2019/20 water year. The selection of the EBM for the pilot project was also informed by a range of expert advice.

### *Project implementation*

The CEWO developed suitable procedures to guide implementation of the pilot project, particularly in relation to determining when the grant should be activated and deactivated, and then applied these procedures and documented the results.

Some of the key procedures that were developed and put in place to support effective implementation included:

- A clear procedure for activation and deactivation of the grant process. This involved documentation of a detailed procedure for estimating the volume of water in a flow event, together with guidance on additional lines of evidence that should also be considered in order to determine when to recommend approval for activation or deactivation of the grant.
- Probity procedures for management of the grant process.
- Detailed guidelines and standard letters of application and acceptance for the grants process were developed and published on the CEWO website.
- The Commonwealth government's Community Grants Hub, which has extensive experience in grant program delivery, was contracted to administer the grant process.
- An extensive communication and media plan was developed and implemented.
- Independent expert advice on the appropriate price to offer grant applicants for water harvesting opportunities forgone in the Lower Balonne system was prepared. This provided a clear fixed price which was incorporated in the offer guidelines provided to applicants.

### *Project effectiveness*

The CEWO put in place suitable measures to support the achievement of the pilot project objectives, and assessed and mitigated significant risks in a structured way. Whilst the measures that were implemented were suitable for the circumstances at the time and for the purposes of the pilot project, the application of EBMs in other circumstances may require other matters to be considered. The CEWO recognised this at the time of the pilot project's implementation, and purposefully chose the type of EBM and timing for the project to reduce risks associated with this initial pilot implementation.

Environmental water management in the Lower Balonne is an issue of strong interest to locals concerned about the health of their environment, water users and the wider community. The CEWO recognised this interest and proactively sought to provide relevant information on the EBM pilot

project to wide range of stakeholders. The approved arrangements for implementation of the pilot project included a detailed communications plan, which was also complemented by extensive direct engagement with affected water users in the Lower Balonne. The communications plan targeted local communities in the northern Basin, engaged stakeholder with an interest in the Narran Lakes and the wider water user and general community audiences. A range of communications channels were identified to provide these messages to the target groups. The communication products include a dedicated page on the CEWO website and a series of five event update facts sheets which were widely shared through electronic direct mailouts. The CEWO also advised that a sixth and final fact sheet is proposed for mid-June to provide a wrap up of the flow event.

Suitable monitoring programs were also implemented to assess the effects of the pilot project on the Narran Lakes environment.

### **Recommendations**

Overall, this review found that the Narran Lakes Event Based Mechanism Pilot Project was well managed and effectively implemented.

Whilst the pilot project was well managed overall, as noted earlier the circumstances around future EBM application will be different and will require further development of techniques and procedures. The following recommendation have been developed to assist the CEWO in continuous improvement of EBM implementation and to ensure they are able to be applied over a wider range of pre-existing conditions wherever feasible.

- R1:** It is recommended that the event volume estimation processes continue to be improved, with consideration being given to:
- Refinement of the spreadsheet process, which may include protection of key sections of the spreadsheet to improve robustness of the process.
  - Investigating cost effective options available for accessing further hydrologic advice, which may include utilising local hydrological consultants operating in the Lower Balonne area.
- R2:** It is recommended that the CEWO develop a range of suitable compliance procedures that can be applied to ensure compliance with grant conditions under a wider range of event conditions that may be experience in the future.  
It is noted that the possible implementation of seasonal water assignment arrangements for Instantaneous Volumetric Limit entitlements in the Lower Balonne may be one means of implementing this recommendation.
- R3:** It is recommended that agreed triggers/criteria should be further developed to determine when and if an EBM should be applied in the Lower Balonne, to ensure that there is a clear strategic framework guiding the application of this measure.
- R4:** It is recommended that the CEWO give further consideration to the need for development of an efficient, responsive processes to ensure that the offered price for access to water under future EBMs continues represents “fair” value for grant applicants and the CEWO under changing seasonal and economic conditions.
- R5:** It is recommended that the CEWO undertake formal internal post-implementation reviews of each EBM event to support continuous improvement.

## Contents

Summary .....	3
1. Introduction .....	9
2. Background to Narran Lakes EBM pilot project.....	9
2.1. The Narran Lakes .....	9
2.2. Development of the pilot project .....	10
3. Review methodology .....	14
3.1. Evaluation questions.....	14
3.2. Review process.....	15
3.3. Review limitations.....	15
4. Review findings .....	16
4.1. Project need.....	16
4.2. Project implementation .....	18
4.3. Project effectiveness.....	20
5. Conclusion.....	23

## Figures

Figure 1: Condamine-Balonne and Narran Lakes locality plan .....	10
Figure 2: Timeline of key actions for the Narran Lakes EBM pilot project .....	13
Figure 3: Narran Lakes watering imagery .....	22



## 1. Introduction

The Commonwealth Environmental Water Office (CEWO) had been working on concepts for developing and implementing Event Based Mechanisms (EBMs) in the Lower Balonne system in south western Queensland for some time.

The key objective of the EBMs was purchase rights to water on a temporary basis with a view to augmenting the volumes of water that would reach the Narran Lakes in periods when the achievable flow increases were likely to create significant environmental benefits, particularly in relation to sustaining important vegetation communities in the Narran Lakes wetlands. The CEWO intends that any such augmentation of water available and provided under the Queensland water plan and Commonwealth holdings in the Lower Balonne will be on a strategic and occasional basis.

Severe drought across NSW and Queensland had resulted in no significant flows reaching the Narran Lakes for an extended period. When favourable conditions emerged in February 2020, the CEWO implemented its first EBM.

Whilst targeting important environmental outcomes, this first EBM implementation was also seen as a pilot project. As part of capturing the learnings from the project, the CEWO commissioned DG Consulting to undertake an independent review of the project to identify recommendations for improving the implementation of EBMs. This report sets out the findings from the review.

## 2. Background to Narran Lakes EBM pilot project

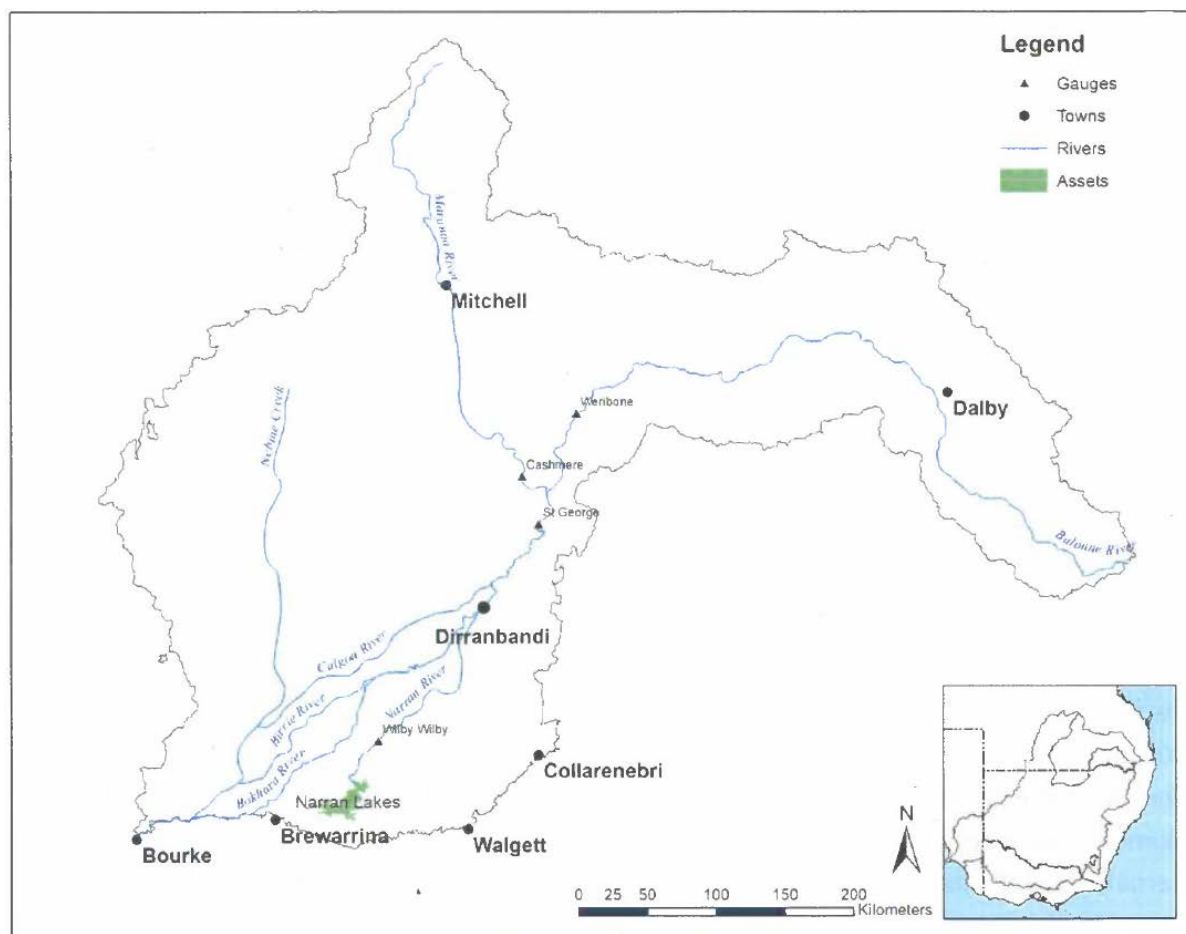
### 2.1. The Narran Lakes

The Condamine-Balonne river system in south west Queensland divides into a number distributary channels downstream of St George. These channels flow across the NSW border, and a number of them subsequently join the Barwon River. One of these channels, the Narran River, flows into NSW and terminates in the Narran Lakes, east of Brewarrina.

The Narran Lakes wetland complex covers some 8,500 ha and is an internationally significant, Ramsar-listed wetland which is an important waterbird breeding site. It also holds significant cultural importance for the Traditional Owners. The general location of the Narran Lakes and other key features is shown in Figure 1.

By December 2019, the Condamine Balonne catchment had experienced five years of very much below average rainfall, with extended periods of no flow in the Lower Balonne system. As a result of the extended dry conditions, large areas of vegetation important for providing bird breeding habitat were highly stressed.

Figure 1: Condamine-Balonne and Narran Lakes locality plan



Source: CEWO

## 2.2. Development of the pilot project

As part of the implementation of recommendations of the Northern Basin Review<sup>1</sup>, the Murray Darling Basin Plan was amended in 2018 and the Intergovernmental Agreement on Water Reform in the Murray-Darling Basin was amended in 2019 to include the development of a range of measures aimed at improving environmental outcomes in the northern Murray-Darling Basin<sup>2</sup>. These measures are collectively referred to as the “toolkit” measures.

One of the toolkit measures calls for the development of a broad range of practical event based mechanisms that can be used by environmental water holders to meet important flow targets. The Commonwealth, Queensland and NSW governments committed to finalisation of a work plan for developing a suitable framework for event-based mechanisms by 31 December 2019. The broad aims of this measure are to develop trading and other contractual measures to complement

<sup>1</sup> Murray Darling Basin Authority, 2016, The Northern Basin Review, Canberra: MDBA.  
<https://www.mdba.gov.au/sites/default/files/pubs/Northern-basin-review-report-FINAL.pdf>

<sup>2</sup> Refer to the Intergovernmental Agreement on Implementing Water Reform in the Murray Darling Basin, revised 2019: COAG, <https://www.coag.gov.au/sites/default/files/agreements/iga-on-implementing-water-reform-mbd-9-august-2019.pdf>

management of water for the environment, in order to benefit environmental outcomes in the northern Murray-Darling Basin.

The development of the concepts around EBMs has occurred over a period of time, and has been the subject of consultation and discussion with a range of stakeholders over that time. In 2008, the Murray–Darling Basin Commission purchased water from a private storage in Queensland to provide flows across the border to the Narran Lakes in northern NSW to support successful completion of a major bird breeding event that was in progress<sup>3</sup>. As far back as 2015, the CEWO had developed an overview of temporary water purchase options for Narran Lakes. This overview was developed for discussion with the Lower Balonne Water Network and summarised how contractual arrangements for the purchase and release of water from private storages or for the reduction of extractions might operate<sup>4</sup>.

The CEWO continued to refine the concepts and commissioned a comparative assessment of event based mechanisms by the BDA Group and CSIRO in 2017<sup>5</sup>. This was followed by an overview of how event based mechanisms could be implemented in the Lower Balonne, which was prepared by consultants Marsden Jacobs Associates in December 2019<sup>6</sup> and published on the CEWO website.

In addition to these pieces of foundational work developed by specialist external consultants, the CEWO also undertook further detailed planning in-house and in collaboration with the Queensland water management agency, the Department of Natural Resources, Mines and Energy (DNRME) and other relevant government agencies.

By December 2019, CEWO staff had developed proposals and received approval for detailed development of a two stage process to implement EBMs in the lower Balonne. The aim for the use of EBMs was to augment mid-sized flow events that were highly likely to reach the Narran Lakes, so as to increase the extent and duration of inundation in the lakes following the event.

- Stage 1: An interim approach of offering grants to landholders who agreed to forgo pumping of their water entitlements if predetermined target flow triggers in the system are met. This interim approach is planned to apply for the period from February to June 2020.
- Stage 2: Development of temporary transfer (seasonal assignment) arrangements for instantaneous volumetric limit and multi-year account entitlements. This activity is proposed to be led by DNRME with input from CEWO to provide an ongoing administrative option for EBMs that sits within the DNRME monitoring and compliance and accounting arrangements.

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<sup>3</sup> Cummins T, Duggan K. 2009 *Options for environmental water: An evaluation of the 2008 Narran Lakes environmental water purchase*, Canberra: Murray Darling Basin Authority, <https://www.mdba.gov.au/sites/default/files/pubs/Options-for-environmental-water.pdf>

<sup>4</sup> Commonwealth Environmental Water Office, 2015, *Purchase of water for Narran Lakes – Overview*, Canberra: CEWO, <http://www.environment.gov.au/system/files/consultations/d222b893-be24-4337-90a5-7c6e45ca32fa/files/purchase-water-narran-lakes-overview.pdf>

<sup>5</sup> BDA Group & CSIRO, 2017, *A comparative assessment of event-based mechanisms for providing water to the Narran Lakes*, Canberra: CEWO. <https://www.environment.gov.au/system/files/resources/816a8709-c4e0-4138-8c37-5868c40fd681/files/comparative-assessment-event-based-mechanisms-narran-lakes.pdf>

<sup>6</sup> Marsden Jacobs Associates, 2019, *Event-based mechanisms in the Lower Balonne: Implementation Overview*, Canberra: CEWO, <https://www.environment.gov.au/system/files/resources/31a8a312-0835-40c9-82cf-6b4c5f4700c6/files/event-based-mechanisms-lower-balonne-implementation-overview.pdf>

Early 2020 saw the breakdown of the positive Indian Ocean Dipole and some prospects of more positive outlooks for rainfall across northern Australia in autumn. CEWO staff worked to develop final proposals, and by early February 2020, detailed arrangements for implementation of the preferred EBM (forgoing pumping), had been developed and approved, which included:

- Grant guidelines and standard Letters of Invitation, Letters of Acceptance (grant application) and Letters of Agreement (the contract setting out the terms and conditions for the grant including the requirements for grant recipients to provide suitable evidence to support the claimed volumes of water forgone).
- Confirmation of the volumetric triggers for activation and deactivation of the grants.
- A communications and media plan.
- Development of a short term intervention monitoring program.
- Probity management arrangements.
- An independent assessment of pricing for water in the Lower Balonne system.
- Detailed procedures for estimating the volumes of flow in an event and using these to activate and deactivate the grant.

As these arrangements were being put into place, rainfall started to occur in the upper reaches of the Condamine-Balonne catchment. CEWO immediately activated its flow monitoring and estimation procedures on 13 February, and on 18 February the CEWO event volume estimation procedure indicated that the necessary flow triggers would be met. This was confirmed via independent advice from DNRME. Accordingly, on 18 February the Commonwealth Environmental Water Holder approved the activation of the grant process.

Further rain continued to fall across the catchment, and on 22 and 23 February intense rainfall occurred upstream of St George. Cumulative rain in the period following grant activation was significantly higher than had been forecast at the time of grant activation. Based on CEWO's own event volume calculations, and following independent confirmation from DNRME received late on 24 February that the event volume would exceed the deactivation trigger volume, on 25 February the CEWH approved deactivation of the grant. The grant recipient was also notified of this decision on 25 February, which initiated a seven day notice period until 3 March 2020, when the grant was formally deactivated, and the recipient ceased forgoing pumping opportunities.

Figure 2 provides a timeline of some of the key steps in the lead up to and implementation of the pilot project.

Figure 2: Timeline of key actions for the Narran Lakes EBM pilot project



### 3. Review methodology

The brief for this review set out a series of issues to be reviewed in relation to the planning and implementation of the pilot project. The review was required to consider:

- environmental justification for implementing the pilot;
- the rationale for the type of EBM that was selected;
- process for activation and de-activation of the grant, including how it was followed during implementation;
- communications and engagement approach;
- adequacy of risk analysis, including measures to minimise the risk of the grant recipient making up for water foregone; and
- adequacy of monitoring underway.

The review was not required to consider or assess the following issues, which are out of scope:

- The work of the Community Grants Hub in the Department of Social Services, which ran the administrative process associated with the grant.
- Financials regarding the choice to use a grant, and how consistent the grant was with Commonwealth Grant Guidelines.

The CEWO indicated that these items were out of scope because they are standard Commonwealth government processes, and the Community Grants Hub has extensive experience in implementing numerous grants at a range of scales.

Based on the issues for review identified in the brief, a series of evaluation questions have been developed.

#### 3.1. Evaluation questions

The evaluation questions have been grouped into three key themes.

i. *Project Need:*

Was the need for the project clearly established with supporting logic in relation to the:

- a. environmental justification for implementing the project?
- b. rationale for the type of EBM selected?

ii. *Project implementation:*

Was the project efficiently implemented, and in particular:

- a. Were suitable/reasonable procedures developed prior to guide project implementation?
- b. Were these procedures followed during implementation?

iii. *Project effectiveness:*

Were suitable measures put in place to support the achievement of the agreed objectives/targeted outcomes?

- a. Were risks and mitigations identified, and were they effective?
  - i. Risks not identified?
  - ii. Gaps in mitigations?

- b. Was suitable monitoring undertaken that was likely to identify whether the project achieved its objectives in relation to Narran Lakes.

### 3.2. Review process

The review involved three key stages:

- Development of the evaluation framework:  
The evaluation questions were developed and tested with CEWO to ensure they covered the required review elements.
- Assessment process:  
The CEWO provided a large volume of project related material to support this review. Much of the information was internal CEWO documentation which covered matters including:
  - Processes and procedures for estimating event flows/volumes.
  - Development of arrangements for implementation of the pilot project, including approval of key aspects of the project.
  - Information and data used to confirm compliance with the grant conditions.
  - Communications plans/programs.
  - Technical reports supporting the development of the EBM processes  
*(Publicly available reports and information have been referenced throughout this report in footnotes).*

This information was assessed in detail and a series of additional questions/clarifications were identified and responses provided by CEWO officers. Preliminary findings were also presented to CEWO and discussed via video conference.

- Reporting:  
A draft report was provided to the CEWO for review and comment on matters of fact. Comments and feedback provided by the CEWO were addressed and a final report developed.

### 3.3. Review limitations

This review has been undertaken within the limits defined in the scope of works for the review and has relied on the information contained in publicly available reports and documentation provided by the CEWO. The review has not involved any further enquiries or engaged directly with the other agencies or stakeholders to seek information, as this was outside the scope of the current review assignment.

The conduct of the review was significantly assisted by the verbal and written contributions provided by CEWO staff. The review has used the information provided to it by the CEWO in helping it to formulate observations, conclusions and recommendations; however, the conclusions and recommendations included in this report have been developed independently.

## 4. Review findings

The review findings and recommendations are presented for each of the three elements of the evaluation framework

### 4.1. Project need

*Was the need for the project clearly established with supporting logic in relation to the:*

- *environmental justification for implementing the project?*
- *rationale for the type of EBM selected?*

In 2016, the Northern Basin Review specifically contemplated and recommended the development of EBMs to better support the achievement of environmental water requirements of the Narran Lakes and the Condamine Balonne system.

The recommendations of detailed water requirements studies undertaken in 2012 and updated in 2016 informed the development of the CEWO's 2019/20 Portfolio Management Plan for the Northern Intersecting Streams<sup>7</sup>. That plan clearly identified critical water needs of 25 – 50 GL of flow into the Narran Lakes to support waterbird breeding habitat in the northern lakes and to provide in-channel freshes in the Narran River to maintain fish populations. The plan identified further critical water needs for volumes of up to 154 GL that would also deliver important benefits. As noted earlier, the Narran Lakes are a Ramsar-listed wetland complex, and the vegetation communities targeted under these high priority water demands are considered critical components of the Ramsar site.

The Murray-Darling Basin Authority's Basin environmental watering priorities for 2019/20<sup>8</sup> also identified providing at least 25 GL of flow into the Narran Lakes as a high priority action, and endorsed the use of EBMs where appropriate to help achieve this. It was also noted that there had been no appreciable volumes into the Narran Lakes since 2016, and the last major event that met the key watering requirements for this site was in 2013. By early 2020, this meant there had been a four to seven year gap in critical inflows to the site, where ideally watering of these bird breeding habitats should occur every one to two years.

The CEWO considered and documented all of this information and in combination with monitoring information confirming the stress on lignum and other vegetation, concluded that there was very strong environmental justification for seeking to augment small to medium flows that might reach the Narran Lakes.

Perhaps most importantly, the availability of detailed studies on the environmental water requirements of the lakes enabled very clear objectives to be developed defining the target flow range for a natural event that would benefit from augmentation, which was set as 15-50 GL passing the Wilby Wilby gauge on the Narran River. Using data from past events and advice from DNRME, the CEWO was also able to translate these Narran Lakes flow objectives into clear target flows for

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<sup>7</sup> CEWO, 2019, *Portfolio Management Plan Northern Intersecting Streams 2019-20*, Canberra: CEWO, <https://www.environment.gov.au/system/files/resources/a3126565-16b2-4d81-96fa-13438d93425d/files/portfolio-mgt-plan-northern-intersecting-streams-2019-20.pdf>

<sup>8</sup> MDBA, 2019, *Basin environmental watering priorities 2019–20*, Canberra: Murray–Darling Basin Authority, [https://www.mdba.gov.au/sites/default/files/pubs/e-water-priorities-2019-20\\_0.pdf](https://www.mdba.gov.au/sites/default/files/pubs/e-water-priorities-2019-20_0.pdf)



the Balonne River at St George that defined the suitable window for beneficial augmentation of flows.

The CEWO undertook considerable work on the development of the EBMs, and commissioned a number of consultancies to develop the concepts and approach to EBMs. Two consultancies were particularly relevant to selection of a suitable EBM. The first of these was undertaken in 2017 by the BDA Group and CSIRO<sup>9</sup>. It identified and scoped a range of potential EBMs, and provided an assessment of expected suitability of each mechanism for meeting various types of environmental water requirements. The key risks associated with each EBM were also identified.

The second consultancy was undertaken by Marsden Jacobs Associates in 2019<sup>10</sup>. This report focussed on identifying the EBM options with the lowest risk attached that were appropriate for the circumstances that existed in the Lower Balonne in late 2019. This report concluded that the most appropriate options were:

- Seasonal assignment of water during a flow event, which would allow augmentation of the volumes expected to reach Narran Lakes within the nominated volumes thresholds.
- Agreement for release of water from a private storage into the Narran River.

It was also noted that seasonal assignment of water harvesting entitlements managed under Instantaneous Volumetric Limits was not yet possible for the Lower Balonne system, so Marsden Jacobs also recommended that the CEWO consider “no-pump” contractual arrangements for entitlement holders to forgo pumping during announced harvesting periods. Such an arrangement could be used prior to the development of seasonal assignment arrangements by DNRME.

The CEWO also considered the fact that the “no-pump” option would directly augment flows into Narran Lakes during an event, whilst a store and release option had limited application for the initial pilot project as all private storages were effectively empty and there were also a number of practical issues around the logistics of releases from storages into the river. This led the CEWO to focus on the “no-pump” option for the pilot project.

### Finding

The CEWO clearly established the need for the project.

A strong justification was developed for the environmental needs and potential benefits of implementing the pilot project. This justification was built on consideration of a range of scientific studies on the water requirements for the site, the extended time since meaningful flows had entered the lakes and monitoring of vegetation conditions at the site. There was also support from the local community concerned over the condition of the lakes.

The selection of the form of EBM to be used for the pilot project was based on a clear rationale that had regard for the environmental water requirements of the site and how these could be best met, together with assessments of the feasibility of various EBM options that could be implemented in the 2019/20 water year. The selection of the EBM for the pilot project was also informed by a range of expert advice.

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<sup>9</sup> BDA Group & CSIRO, 2017, *A comparative assessment of event-based mechanisms for providing water to the Narran Lakes*

<sup>10</sup> Marsden Jacobs Associates, 2019, *Event-based mechanisms in the Lower Balonne: Implementation Overview*

## Recommendations

None

### **4.2. Project implementation**

*Was the project efficiently implemented, and in particular:*

- *Were suitable/reasonable procedures developed prior to guide project implementation?*
- *Were these procedures followed during implementation?*

The development of procedures to guide project implementation was a phased process. Preliminary work involved considerable thinking and analysis to understanding EBMs and their application over an extended period. The broad concepts around negotiating and implementing agreements with water entitlement holders were all developed and tested internally and with key stakeholders (including potential grant participants) well before the pilot project was implemented.

The first formal phase in the development of specific procedures to guide implementation was the work undertaken by Marsden Jacobs Associates. This involved the preparation of an implementation overview, which identified the key stages involved in successful implementation of an EBM and scoped out the main tasks involved in each stage of implementation.

For phase 2 of the procedure development process, the CEWO used the general advice provided by Marsden Jacobs Associates in Phase 1 and undertook or oversaw the development of a range of detailed procedures and tools to enable implementation of the pilot project to occur. These procedures were specifically tailored to address the issues and circumstances that existed at the time of the pilot project. Some of the key elements developed through this phase were:

- A procedure for activation and deactivation of the grant process.  
This involved documentation of a detailed procedure for estimating the volume of water in a flow event, plus guidance on additional lines of evidence that should also be considered in order to determine when to recommend approval for activation or deactivation of the grant.
- A spreadsheet template set up for capturing relevant flow data during the event and calculating estimated volumes of water that will flow past St George, which formed a key input to the decision making process for activation or deactivation of the grant.
- Detailed guidelines and standard letters of application and acceptance for the grants process, which was administered by the Community Grants Hub.
- Probity procedures for management of the grant process.
- A communication and media plan
- Independent expert advice on the appropriate price to offer grant applicants for water harvesting opportunities forgone in the Lower Balonne system.

Based on the evidence available to the review, these procedures were followed during implementation. The approvals memoranda for activation and deactivation of the grant included documentation of the results of applying a range of these procedure.

The spreadsheets used to estimate the event volumes were reviewed and showed that the procedures developed had been applied. The estimation technique used gauged flows in the Balonne River at Weribone and in the Maranoa River at Cashmere to estimate the volume of flow that would pass St George and flow into the Lower Balonne system. A number of aspects of good practice were clearly evident in these spreadsheets:

- The volume estimation technique was relatively simple, using techniques advised by DNRME hydrologists based on their analysis of past hydrographs in this system.
- Rather than opting for a single estimate figure, the approach used the maximum, minimum and average daily flows at each gauge to develop a high, low, and best estimate of event volume to provide a measure of sensitivity testing.
- Each daily spreadsheet included capture of the key data available on that day that could be used in further informing the event volume assessments and their likely future trajectory, such as catchment rainfall, weather forecasts, flood warning status and river heights/trends.
- A notes section on each spreadsheet also summarised other information available, the assessment of key lines of evidence, any points of uncertainty to be further monitored, together with conclusions around the most probable event volume estimates relative to event trigger thresholds.

Overall, the procedure for estimating event volumes worked effectively and the pilot project yielded a number of learnings. Using two gauges lower down the catchment simplifies the estimation technique and improves the accuracy by integrating inflows above these points, however it also means that the travel time from these sites to St George is relatively short so there is limited lead time to respond to the estimate results when activation or deactivation are needed. Relying on two gauges to represent complex catchment responses to variable rainfall presents some challenges, and localised rainfall near the gauges resulted in short term rises in flow which may have led to overestimation of event volumes, however CEWO staff mitigated this risk by also accessing advice from river operators and local water users experienced in catchment behaviour.

During implementation, CEWO staff also consulted with DNRME river operators and Bureau of Meteorology flood forecasting staff in relation to flow peaks and event volumes. This experience suggested that DNRME tended to be reasonably conservative in their estimates of event volumes, whilst the BoM estimates tended towards the upper end of the possible range. This is not unexpected, given the different needs that each organisation seeks to meet through flow estimates. DNRME needs to ensure that sufficient water is available to satisfy water user demands during announced water harvesting events, whilst the BoM needs to ensure that communities are alert to the maximum possible impacts that flooding may generate. This spread of estimates leads to some uncertainty for CEWO, as it creates risks of not initiating grants during suitable events or deactivating the grant process later or earlier than necessary. Investigating options to reduce this source of uncertainty/risk may help to improve management of future events and will support more timely decisions on grant deactivation.

It is also noted that the key CEWO staff undertook these daily assessments over a two week period until it was determined that the grant should be deactivated as the event volume exceeded the upper threshold. Whilst this was manageable, if the event had extended over a longer period there may have been a need to involve additional staff and consideration may need to be given to simple improvements to the spreadsheet process and protection of key sections of the spreadsheet to avoid inadvertent modification to formulas etc. if less experienced staff are involved.

### Finding

The CEWO developed suitable procedures to guide implementation of the pilot project, particularly in relation to determining when the grant should be activated and deactivated, and then applied these procedures and documented the results.

### Recommendations

**R1:** It is recommended that the event volume estimation processes continue to be improved, with consideration being given to:

- Refinement of the spreadsheet process, which may include protection of key sections of the spreadsheet to improve robustness of the process.
- Investigating cost effective options available for accessing further hydrologic advice, which may include utilising local hydrological consultants operating in the Lower Balonne area.

### **4.3. Project effectiveness**

*Were suitable measures put in place to support the achievement of the agreed objectives/targeted outcomes?*

- *Were risks and mitigations identified, and were they effective?*
  - *Risks not identified?*
  - *Gaps in mitigations?*
- *Was suitable monitoring undertaken that was likely to identify whether the project achieved its objectives in relation to Narran Lakes.*

Risk can be defined as the effect of uncertainty on achievement of an objective. In the development of options for EBMs in the Lower Balonne, risk was explicitly considered, identified, and assessed from an early stage. Much of the work on development of procedures for implementation of the grant was initiated based on issues identified through formal risk assessment processes.

There is a hierarchy of risk controls, and elimination of sources of risk wherever feasible is generally considered to be one of the most effective actions available. CEWO pursued this philosophy in the EBM pilot project through the selection of the form of EBM with lowest levels of risk attached.

The circumstances around the implementation of the pilot project also helped reduce or eliminate a number of potential sources of risk. Compliance with the terms of the grant was recognised as a key area of risk. Given that the option adopted of grants for forgoing pumping opportunities was a contractual arrangement between the CEWO and the entitlement holder, there was no compliance role or involvement from DNRME.

On-farm storages were dry at the start of the event, significantly simplifying the process of confirming that the successful grant applicant had not pumped any water during the event (e.g. through the use of remote sensing), and will also contribute to simplifying the confirmation that the applicants don't "make-up" the forgone volumes with additional water harvesting during the balance of the water year. Holding final payment of the grant funds until the end of the water year after compliance has been fully verified will also help reduce the risks of non-compliance.

Further thought may need to be given to suitable compliance arrangements to deal with the possibility that on-farm storages may be partially full at the time of a future EBM activation. It is also noted that if DNRME is able to establish seasonal water assignment arrangements for instantaneous volumetric limit entitlements in the Lower Balonne, the pilot project approach of a contractual agreement to forgo pumping can be replaced by a water trade transactions, with DNRME responsible for ensuing compliance, which may also address these risk issues.

The fact that the Lower Balonne and Narran Lakes area had experienced one of the most severe, extended droughts on record effectively eliminated any questions around the need or justification for implementing an EBM if suitable circumstances arose. This may not be the case in future, and further development of agreed triggers/criteria to help determine when and if an EBM should be implemented may help ensure that there is a clear strategic framework guiding the application of this measure. The broad underpinning philosophy for use of EBMs is “strategically and occasionally”, but there is a need to provide clearer guidance on what this looks like in practice. Any such guidance should avoid attempting to be overly prescriptive and is likely to still require the application of some judgement as to when and if implementation of an EBM is appropriate.

The negotiation and establishment of a price for access to water in the Lower Balonne system was identified as a potential source of risk. There is a limited time window to implement a “no-pump” option once a flow event is in progress, so lengthy negotiations over price may impact on timely implementation. Also, the market for potential participants is quite limited so there may be few “sellers” and they may seek unreasonably high prices. In order to address these risks, CEWO also commissioned an independent expert assessment of the appropriate price for access to water, and offered a fixed price and invited all entitlement holders in the relevant water management zones the chance to participate. This fixed price was also published on the CEWO website.

This appeared to be an effective strategy, and the acceptance of the grant was negotiated in a timely fashion with the sole applicant that responded to the invitation to apply. The fact that the price assessment had been completed only a short period earlier meant that the pricing was relevant and represented a fair “market” price for both the applicant and the CEWO at the time of the event. If the event was later in the water year, and commodity prices or water availability had changed substantially in the meantime, this may have introduced risks in participation for either the entitlement holders or the CEWO. Options to address this could include being prepared to update the independent price assessment price before each event, and potentially incorporating the step of undertaking an independent price assessment into the standard guidelines for participation in a grant round.

Environmental water management in the Lower Balonne is an issue of strong interest to locals concerned about the health of their environment, water users and the wider community. This interest also brings with it a range of risks. The CEWO addressed these risks and proactively sought to provide relevant information on the EBM pilot project to a wide range of stakeholders. The approved arrangements for implementation of the pilot project included a detailed communications plan, which was also complemented by extensive direct engagement with affected water users in the Lower Balonne. The communications plan targeted local communities in the northern Basin, engaged stakeholders with an interest in the Narran Lakes and the wider water user and general community audiences. A range of communications channels were identified to provide these messages to the target groups.

A summary of communications outputs prepared by the CEWO after the event showed that all of the key elements of the communications plan had been delivered, with the exception of a scheduled field day at the site which had to be postponed due to COVID-19 restrictions. Some of the key communications outputs were two media releases, the development of a dedicated webpage on the CEWO site, a range of social media posts and the production of a series of 5 event update factsheets which were widely shared through electronic direct mailouts. The CEWO also advised that a sixth and final fact sheet is proposed for mid-June to provide a wrap up of the flow event.

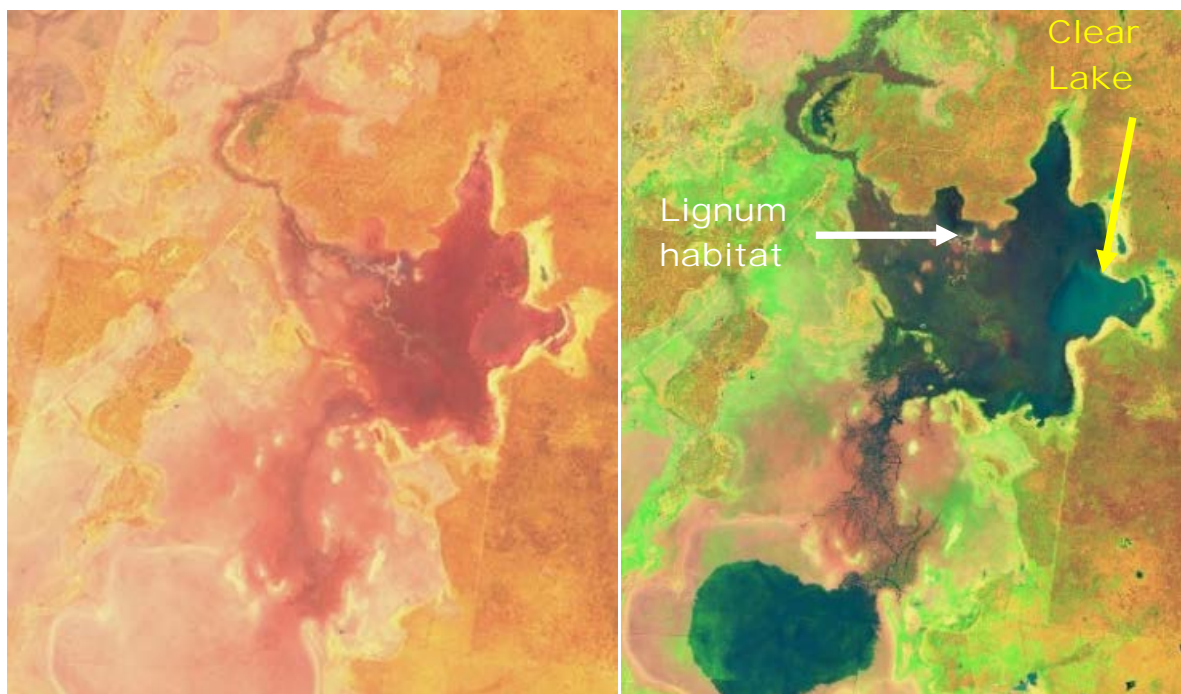
Many of the event update emails and social media posts were extensively shared through networks, and media reportage of the event occurred in rural and capital city print media. Statistics collated by

the CEWO indicated that their twitter posts on the event had been viewed some 15,000 times and the CEWO webpage of the Narran Lakes event had been viewed over 1,500 times by mid-May.

In order to gauge the outcomes of the intervention to direct additional water to Narran Lakes, CEWO developed a monitoring program in conjunction with Queensland and NSW state agencies, the MDBA and the CSIRO. This covered flows into the lakes, vegetation health changes and waterbird surveys. Early indication are that these responses have been positive. The 9 GL of additional water provided by the pilot project increased the volume of water reaching the lakes by around 11%.

Each flow event and EBM implementation in the Lower Balonne will be different, and there are significant opportunities to learn and continuously improve processes by undertaking structured post-implementation reviews of each event. This CEWO is encouraged to develop processes to make these internal reviews a part of their ongoing approach to EBMs

*Figure 3: Narran Lakes watering imagery*



*A dry Narran Lakes before the flow (left) – 2 Feb 2020 and inundation following the current flow (right) – 23 Mar 2020 (Sentinel satellite images). - Source: CEWO Lower Balonne flow 2020 Update #4 fact sheet*

### Findings

The CEWO put in place suitable measures to support the achievement of the pilot project objectives, and assessed and mitigated significant risks in a structured way. It is noted that whilst the measures implemented were suitable for the circumstances at the time and for the purposes of the pilot project, the application of EBMs in other circumstances may require other matters to be considered. Stakeholder engagement and information programs were implemented to ensure that there was accurate information readily available in relation to the project, its objectives and its progress. Suitable monitoring programs were also implemented to assess the effects of the pilot project on the Narran Lakes environment.

### Recommendations

- R2:** It is recommended that the CEWO develop a range of suitable compliance procedures that can be applied to ensure compliance with grant conditions under a wider range of event conditions that may be experience in the future.  
It is noted that the possible implementation of seasonal water assignment arrangements for Instantaneous Volumetric Limit entitlements in the Lower Balonne may be one means of implementing this recommendation.
- R3:** It is recommended that agreed triggers/criteria should be further developed to determine when and if an EBM should be applied in the Lower Balonne, to ensure that there is a clear strategic framework guiding the application of this measure.
- R4:** It is recommended that the CEWO give further consideration to the need for development of an efficient, responsive processes to ensure that the offered price for access to water under future EBMs continues represents “fair” value for grant applicants and the CEWO under changing seasonal and economic conditions.
- R5:** It is recommended that the CEWO undertake formal internal post-implementation reviews of each EBM event to support continuous improvement.

## **5. Conclusion**

The Narran Lakes are an important Ramsar-listed wetland complex in northern NSW, which are fed by flows largely originating in the Condamine Balonne river system in Queensland.

The Murray-Darling Basin Authority published its Northern Basin Review, which proposed a toolkit of measures to maintain positive environmental outcomes whilst requiring the recovery of less consumptive water than was originally proposed under the Basin Plan. One of the toolkit measures calls for the development of a broad range of practical event based mechanisms that can be used by environmental water holders to meet important flow targets.

The Commonwealth, Queensland and NSW governments have committed to implementation of the toolkit measures. The CEWO has undertaken the development of the concepts around EBMs has occurred over a period of time, and they have been the subject of consultation and discussion with a range of stakeholders over that time. The CEWO developed proposals for a two stage process to implement EBMs in the lower Balonne. The aim for the use of EBMs was to augment mid-sized flow events that were highly likely to reach the Narran Lakes, so as to increase the extent and duration of inundation in the lakes following the event.

- **Stage 1:** An interim approach of offering grants to landholders who agreed to forgo pumping of their water entitlements if predetermined target flow triggers in the system are met. This interim approach is planned to apply for the period from February to June 2020.
- **Stage 2:** Development of temporary transfer (seasonal assignment) arrangements for instantaneous volumetric limit and multi-year account entitlements. This activity is proposed to be led by DNRME with input from CEWO to provide an ongoing administrative option for EBMs that sits within the DNRME monitoring and compliance and accounting arrangements.

The first EBM pilot project under Stage 1 was implemented in February 2020 following the commencement of a natural flow event in the Lower Balonne system. Documentation detailing the planning and implementation of the EBM pilot project was reviewed, together with interviews and collection of additional information from CEWO staff.

Overall, this review has found that the CEWO clearly established the environmental need for the project. The project justification was soundly based on scientific studies and monitoring or vegetation conditions at the site, supplemented by local knowledge of the site condition following extended drought.

The selection of the form of EBM to be used for the pilot project was based on a clear rationale that had regard for the environmental water requirements of the site and how these could be best met, together with assessments of the feasibility of various EBM options that could be implemented in the 2019/20 water year.

The project was effectively implemented and the CEWO developed, documented and applied a range of appropriate procedures to guide and govern implementation. This was supported by a structured, active focus on identification, assessment and mitigation of key project risks, which included an effective communications strategy and a monitoring program to assess the benefits of delivering water to the Narran Lakes.

Whilst the pilot project was well managed overall, the circumstances around its implementation of helped reduce or eliminate a number of potential sources of risk, and the CEWO was aware of this. A range of recommendation have been developed to assist the CEWO in continuous improvement in the implementation of EBMs and to ensure they are able to be applied over a wider range of pre-existing conditions wherever feasible.