Independent Panel into the Management of the 2020 Northern Basin First Flush Event
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Submission to the Northern Rivers First Flush Review

Dear panel members,

eWater is a not-for-profit enterprise jointly owned by Australian Federal and State governments including New South Wales. The 2008 COAG National Hydrological Modelling Strategy foreshadowed the efficiency and consistency gains by having a single point of truth in assessing, planning and operating our scarce water resources, which resulted in the eWater CRC and subsequently eWater's role in supporting water resources management across Australia. The challenge remains to complete the journey across all jurisdictions and to realise the benefits of millions of dollars of public funds which have been invested in the eWater Source common platform.

Hydrology modelling played an important role in planning and implementing the 2020 First Flush event. As articulated in the draft report, the event would have been very challenging to model. In our view, WaterNSW modelled the event appropriately, taking into consideration the data, knowledge and tools available to them.

The draft report identifies several issues related to modelling that are important to address. eWater fully endorses the Panel's recommendation (8) to:

> *improve flow forecasting modelling and real-time monitoring capability, including measurement of extractions and the hydrometric system for inflows and monitoring end of system flows*

WaterNSW has been progressively implementing Source for infrastructure planning and operations. The panel notes that WaterNSW is working to complete and integrate its eWater Source model for the Barwon-Darling with the CARM (Computer Aided River Management) framework. Legacy IQQM (Integrated Quantity and Quality Models) models are still in use for water resource planning in NSW rivers within the Murray-Darling Basin (MDB) and there remains a body of work to bring these two approaches together for a consistent hydrological assessment of flows in the MDB, particularly for low flows.

Together with the Murray-Darling Basin Authority (MDBA), eWater has made significant enhancements to the operations mode of Source. The MDBA is in the final stages of testing

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these enhancements, before adopting Source for operating the River Murray model. The model will complement the MDBA's existing Source planning model for the River Murray. We recommend WaterNSW adopt a similar approach and build an integrated planning and operations Source model for the Barwon-Darling River.

eWater Source can also be easily integrated with other tools to add functionality. For example, automatic connections to satellite inundation mapping (e.g. through Digital Earth Australia) or adding sub-hydrodynamic floodplain models would support a greater understanding of the complex hydraulic interactions between the river channel and the floodplains without confounding the overall hydrological balance of the river systems reflected in the Source platform.

The first flush event demonstrates the powerful tool that streamflow forecasting is for water managers. eWater and the Bureau of Meteorology are exploring opportunities to integrate the two tools. This would be particularly beneficial for Source operations models, as the forecasts could be directly imported and used to explore different scenarios.

Although in a different context, eWater and the Bureau have piloted the integration of the two tools in a project for the Australian Water Partnership and United Nations Economic and Social Commission for the Asia Pacific. This work also involved Geoscience Australia and demonstrates the value of remotely sensed data in water management. This integrated approach would also suit activities like the First Flush event. For example, remotely sensed information about the volume of water entering and leaving floodplains could be fed into the Source model to improve inflow estimates and forecast flows. More on this work is available at https://waterpartnership.org.au/wp-content/uploads/2019/08/UN-ESCAP-Brochure.pdf.

Long-term, eWater believes there are opportunities to further extend Source and capitalise on the efficiency gains of a single, national hydrology modelling platform consistent with the Bureau of Meteorology's recently released Research and Development Plan 2020–2030.

The draft report highlights many of the challenges of water modelling, especially low-flow events in environments such as the northern basin. The importance of improving our ability to model these conditions has been highlighted in several recent reviews, such as the Vertessy Report and is a core component of the Australian Government's recently released Water and Environment Research Prospectus.

eWater stands ready to work with governments and water managers to address these challenges, protecting the value of their collective investment in Source over the last 20 years and ensuring the platform serves Austalia's water modelling needs long into the future.

Yours Sincerely

Dr Robert Carr
Chief Executive