Macquarie-Cudgegong Valley Operations update

Presented by:
Adrian Langdon, Executive Manager, System Operation

Locations:
15 January 2019 – Warren and Narromine
16 January 2019 – Dubbo
17 January 2019 - Mudgee
Today

- Welcome
- Introductions
- Current situation
- Why are we in this situation?
- What is WaterNSW doing?
- Questions and Answers
- How to keep updated

Refreshments
Current situation
Macquarie-Cudgegong Valley

Key points:
- Regulated sections of the system (dark blue)
- Non regulated section (light blue)
When is water allocated?

Macquarie-Cudgegong Valley river system inflows and allocations

Key points:
- Water inflows to the river system have been at a record low
- Drought conditions since 2012 with one year of significant inflows in 2016/17
- In low inflow years priorities are given to critical water needs such as town water supply, stock and domestic, and then environment and irrigation.
- Water Sharing Plan determines allocations. On 1 July and each month following, allocations are reviewed
- Water allocation in early 2017/18 was from water held in storage after the floods of 2016/17 that had not been allocated
- Irrigation extraction is on average 17% on inflows

Macquarie-Cudgegong Water Sharing Plan limits long-term extractions to an estimated 391,900 megalitres per year or 27% of the long-term average annual flow 1,448,000 megalitres per year.
Resource distribution
August 2017 – May 2018

Macquarie-Cudgegong Valley – Resource assessment August 2017
(With drought inflows starting in August 2017 producing 18 gigalitres in 1\textsuperscript{st} year and 231 gigalitres in 2\textsuperscript{nd} year)

Key points:
• Graph shows planned distribution after inflows in 2016/17
• Operational losses includes water required to run the river and stock and domestic replenishments

Total = 1,134 GL

* indicative breakdown of held environmental water holdings (OEH, CEWH).

Supply distribution

- Bulk Water Transfer: 81 GL
- Minimum forecast dam inflows: 18 GL
- Burrendong Dam Storage at 1 August: 1,035 GL
- Not to scale
Resource distribution
August 2018 – May 2020

Macquarie-Cudgegong Valley – Start of water year
(with drought inflows starting in Sept 2018 producing 14 gigalitres in 1st year and 100 gigalitres in 2nd year)

Key points:
- Graph shows planned distribution at the start of the current water year (20 month period)
- Allocations can be planned over a period of time
- Low inflows have resulted in a shortfall
- Bulk water transfer from Windamere to Burrendong dam included in water supply
- Situation prompted restriction to access carryover allocation

Total = 866 GL

Supply source

Shortfall 265 GL
Bulk Water Transfer 54 GL
Minimum inflows 114 GL
Burrendong Dam 433 GL

Key points:
- Planned Environmental Water 123 GL
- High Security 25 GL
- Evap from storage 70 GL
- Operational Losses 283 GL
- Inaccessible storage 35 GL
- Total General Security (AWD + Carryover) 306 GL
- Irrigator (200* GL)
- e-water (106* GL)
Planned drought contingency measures (2018-2019)

• Temporary water restriction order for general security and environmental water, allowing access to 70% of allocation

• Bulk water transfer from Windamere Dam to Burrendong Dam

• Regulated river operation aiming to under release rather than over release in the main Macquarie River in order to minimise operational losses and surpluses, including:
  – Implementing water order debiting
  – Active rescheduling of water orders
  – Main river - under release rather than over release
  – Gunningbar Creek - Low flows
  – Duck and Crooked Creeks – Low flows
  – Intermittent flows to Oxley in main river and in Bulgeragar Creek below bifurcation

• Stock and domestic replenishment flows in 2019 will rely on rain and inflows from tributaries
Drought contingency measures

Temporary water restriction order (General security/Environmental water)

Key points:
- Graph shows 30% portion of allocation now restricted
- 30% portion are held in drought accounts and will be made available again when adequate inflows are received and critical water needs are met.
Key points:
- Irrigation orders are released when required
- Delivery of planned and licenced environmental allocations are planned over 3-year period for fish and the Macquarie Marshes
Windamere Dam operations 2018-2019

Key points:
- Gradual decline in the dam levels at Windamere
- Dam release shows the bulk water transfer from Windamere to Burrendong dams Phase 1 (January-February 2019)
Key points:
- Graph shows revised water distribution from now till 2020 (16 month period)
- Expected shortfall

68 GL is effectively available to irrigators for use and/or trade.

Drought Account volumes will be made available when sufficient resources allow for easing/lifting of restrictions.

Evaporation from Storage
51 GL

Essential Requirements and Losses
209 GL

Essential Requirements represents the volume required to deliver all resources shown by May 2020

Inaccessible Storage
35 GL

GS Irrigation Available
68 GL

GS Irrigation Drought Account
52 GL

GS E-water® Drought Account
32 GL

Planned Environmental Water
37 GL

High Security
20 GL

LWU+S&D
18 GL

Total Resource = 567 GL

Total 567 GL

Shortfall 317 gigalitres (GL)

Burrendong Dam Volume + Min Inflows + Bulk Water Transfer 250 gigalitres (GL)

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Why are we in this situation?
NSW rainfall
1 January 2017 – 31 December 2018

Key point:
• Rainfall has been below average
Maximum temperature
1 January 2017 – 31 December 2018

Key point:
- High temperatures have continued and affected evaporation rates and soil conditions impacting runoff, water absorption in river system, and the natural environment.
Burrendong Dam storage levels

Millennium Drought
December 2006 – December 2009

Drought
December 2012 - December 2015
Key points:

• Median inflows (red line) vs actual inflows (blue line)
• Due to minimal rainfall, inflows into dam have been below the median
• Inflows from 2016/17 captured in the dam have enabled allocations
Comparison of drought inflows – Burrendong Dam

Drought inflows for 37 months starting in December

Key points:
- Drought conditions are unprecedented
- Current drought conditions (black line) are shown in comparison to previous drought periods
What is WaterNSW doing?
## Drought management

### Stage of the Incident Response Guide (IRG) framework

<table>
<thead>
<tr>
<th>Stage based on level of risk</th>
<th>Agency/management approaches</th>
<th>Water sharing plan approaches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 1</td>
<td>Normal management operations - long term planning, including drought security planning.</td>
<td>Normal Rules: In force</td>
</tr>
<tr>
<td>Stage 2</td>
<td>Operational adjustments may be required. Emergency management readiness implemented. Inter-agency Critical Water Advisory Panel for surface water sources established and updated regularly (by WaterNSW), Minister advised. Initial communications with potentially affected communities and stakeholders.</td>
<td>Contingency / Operational Measures: Possibly activated</td>
</tr>
<tr>
<td>Stage 3</td>
<td>Adjustments to management operations. Emergency management on stand-by. Critical Water Advisory Panel operational and meeting for both groundwater and surface water sources, with regular Ministerial updates. Communications with affected communities and stakeholders increased.</td>
<td>Suspension of parts of a water sharing plan: Possibly activated</td>
</tr>
</tbody>
</table>

Source: Department of Industry

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## Drought management

**Water Management Act take priority under s60(3) s49A order**

<table>
<thead>
<tr>
<th>Take type/use</th>
<th>Priority</th>
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<tbody>
<tr>
<td>• The taking of water for domestic purposes:</td>
<td>First</td>
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<tr>
<td>• by persons exercising basic landowner rights, and</td>
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<tr>
<td>• or essential town services authorised by an access licence</td>
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<td>• Needs of the environment</td>
<td>Second</td>
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<tr>
<td>• The taking of water for:</td>
<td>Third</td>
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<tr>
<td>• stock purposes by persons exercising basic landholder rights, and</td>
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<tr>
<td>• In the case of regulated rivers, the taking of water for purposes (other than domestic purposes) authorised by a regulated river (high security) access licence, and</td>
<td></td>
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<tr>
<td>• the purposes of supply of commercial and industrial activities authorised by a major utility access licence or local water utility access licence, subject to the water made available being in accordance with any drought management strategy established by the Minister for that purpose, and</td>
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</table>
## Drought management

**Water Management Act take priority under s60(3) s49A order cont.**

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<td>Continue ..</td>
<td>Third</td>
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<tr>
<td>• The taking of water for:</td>
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<tr>
<td>• the purposes of electricity generation authorised by a major utility access licence (not applicable in this WRPA), and</td>
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<tr>
<td>• purposes authorised by a domestic and stock access licence or by persons exercising any other water rights in relation to stock, and</td>
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<tr>
<td>• purposes authorised by a conveyance access licence in connection with the supply of water for any other purpose or need referred to in this paragraph (not applicable in this WRPA).</td>
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</tbody>
</table>

| Taking of water for purposes authorised by any other category or subcategory of access licence | Fourth   |
Flows required to run the river system

Whole regulated system – normal year

145 gigalitres per year

Town water supply (TWS)/ Stock and domestic (S&D)/ High security

126 gigalitres per year

Restricted town water supply

90 gigalitres per year

Stock and domestic replenishment

Gunningbar system and regulated streams

Warren and Gunningbar creek
## Windamere Drought Plan – Zero Inflow

### Phase 1
Windamere transfers 35 gigalitres

At the end of the transfer there will be 96 gigalitres remaining in storage

### Phase 2
At the start of the water year there will be 90 gigalitres held in Windamere dam storage

The likely allocation will be 100% to local water utilities and high security

The carry over will be able to be delivered for general security

Phase 2 Windamere transfers
October
13 gigalitres

### Water Year Overview

<table>
<thead>
<tr>
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<tr>
<td>Jan March July</td>
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<tr>
<td>Irrigation/</td>
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<tr>
<td>Stock and</td>
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<tr>
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<td>Supply</td>
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<tr>
<td>Domestic/Town</td>
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<td>Water Supply</td>
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# Drought Plan – Zero Inflow

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<td>Carryover available to end June 2019</td>
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<tr>
<td>Minimum flows maintained through to Marshes</td>
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<td>Stock and domestic replenishment only from surplus tributary flows</td>
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<tr>
<td>Continuous flow only to Warren Gunningbar Creek Weir–Intermittent flows to other regulated sections</td>
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<tr>
<td>Phase 2 Windamere Transfers October 13 gigalitres</td>
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<tr>
<td>Pumping dead storage in Burrendong dam</td>
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<td>Key point:</td>
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**WaterNSW**

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# Drought Plan – Drought of Record

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**Key point:**
- WaterNSW is working with key stakeholders to manage these stages
Drought management

Critical Water Advisory Panel

Critical Water Advisory Panel established by DOI Water for the Macquarie with representatives from all government agencies to continue to monitor the situation and advise on potential drought management measures.

Local Water Utilities

WaterNSW is working with local water utilities in the Macquarie to advise of water availability and quality to assist them in their drought planning. Council in the area have drought management plans that will need to be implemented as the drought continue and additional sources investigated if rainfall is not received before March 2020.
To keep updated

Visit the website at: waternsw.com.au/drought

For information on the Macquarie Valley including water availability reports and drought reports go to: waternsw.com.au/supply/drought-information/regional-nsw/macquarie-valley

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