Hunter Regulated
ROSCCo
(River Operations Stakeholder Consultation Committee Meeting)

Club Singleton
22 January 2020
36 month rainfall deficiency

Australian Rainfall Deciles
1 October 2016 to 30 September 2019

Distribution Based on Gridded Data
Australian Bureau of Meteorology

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ID code: AWAP
Issued: 03/10/2019
Soil moisture deficiencies
August 2019

Soil moisture: August 2019
Decile range

- Highest on record
- Very much above average
- Above average
- Average
- Below average
- Very much below average
- Lowest on record
Water Availability

**Red Number** – water available in accounts

**Blue Number** – water available in storage

**Legend**
- Blue Number
- Red Number
- Dam
- River
- Town/city
- Regulated valley boundary

**Data Points**
- Macquarie River: 24.5
- Namoi: 11.8
- Peel: 18.5
- Greater Sydney: 400
- Hunter/Patterson: 149
- Lachlan/Belubula: 121
- Murrumbidgee: 894
- Murray: 662
- Murray: 2,490
- Griffith: 654
- Fish River: 19
- Border Rivers: 5
- Gwydir: 51
- Tamworth: 4
- North Coast: 19
- Peel: 2.4
- Coonamble: 1
- Moree: 7
- Rock: 4
- South Coast: 18.5
## Drought of Record – 24 Months

<table>
<thead>
<tr>
<th>Valley</th>
<th>Previous Drought of Record Inflows (GL)</th>
<th>Period</th>
<th>Last 24 months Inflows (GL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glen Lyon</td>
<td>7</td>
<td>1992-94</td>
<td>33</td>
</tr>
<tr>
<td>Pindari</td>
<td>45</td>
<td>1918-20</td>
<td>25</td>
</tr>
<tr>
<td>Copeton</td>
<td>53</td>
<td>1918-20</td>
<td>107</td>
</tr>
<tr>
<td>Keepit</td>
<td>57</td>
<td>2001-03</td>
<td>25</td>
</tr>
<tr>
<td>Split Rock</td>
<td>8</td>
<td>1956-58</td>
<td>7</td>
</tr>
<tr>
<td>Chaffey</td>
<td>13</td>
<td>1964-66</td>
<td>6</td>
</tr>
<tr>
<td><strong>Burrendong</strong></td>
<td><strong>257</strong></td>
<td><strong>1936-38</strong></td>
<td><strong>68</strong></td>
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<tr>
<td>Wyangala</td>
<td>138</td>
<td>2001-03</td>
<td>228</td>
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<tr>
<td>Burrinjuck</td>
<td>463</td>
<td>2008-10</td>
<td>571</td>
</tr>
<tr>
<td>Blowering</td>
<td>124</td>
<td>2006-08</td>
<td>421</td>
</tr>
</tbody>
</table>
## Drought of Record – 36 Months

<table>
<thead>
<tr>
<th>Valley</th>
<th>Previous Drought of Record Inflows (GL)</th>
<th>Drought Period (Yrs)</th>
<th>Current Drought Inflows (GL)</th>
<th>Current Drought Period Months (GL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glen Lyon</td>
<td>44</td>
<td>1992-95</td>
<td>32</td>
<td>32</td>
</tr>
<tr>
<td>Pindari</td>
<td>142</td>
<td>1992-95</td>
<td>82</td>
<td>31</td>
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<tr>
<td>Copeton</td>
<td>218</td>
<td>1992-95</td>
<td>209</td>
<td>31</td>
</tr>
<tr>
<td>Keepit</td>
<td>157</td>
<td>1992-95</td>
<td>100</td>
<td>36</td>
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<tr>
<td>Split Rock</td>
<td>22</td>
<td>1925-28</td>
<td>21</td>
<td>36</td>
</tr>
<tr>
<td>Chaffey</td>
<td>26</td>
<td>1964-67</td>
<td>19</td>
<td>36</td>
</tr>
<tr>
<td><strong>Burrendong</strong></td>
<td><strong>533</strong></td>
<td><strong>1937-40</strong></td>
<td><strong>153</strong></td>
<td><strong>36</strong></td>
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<tr>
<td>Wyangala</td>
<td>283</td>
<td>2002-05</td>
<td>315</td>
<td>34</td>
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<tr>
<td>Burrinjuck</td>
<td>756</td>
<td>2007-09</td>
<td>926</td>
<td>34</td>
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<tr>
<td>Blowering</td>
<td>240</td>
<td>2006-09</td>
<td>599</td>
<td>34</td>
</tr>
<tr>
<td>Criticality</td>
<td>Evidence base for surface water</td>
<td>Evidence base for groundwater</td>
<td>Broad intent of measures</td>
<td></td>
</tr>
<tr>
<td>------------</td>
<td>---------------------------------</td>
<td>------------------------------</td>
<td>--------------------------</td>
<td></td>
</tr>
<tr>
<td><strong>Stage 1</strong> Normal management</td>
<td>Can deliver all account water under normal river operations practices.</td>
<td>Groundwater levels remain within acceptable ranges, with annual recovery as expected given rainfall/recharge events.</td>
<td>Provide certainty for water use planning. Long term water security and emergency/drought contingency planning.</td>
<td></td>
</tr>
<tr>
<td><strong>Stage 2</strong> Emerging drought/water shortage</td>
<td>Unable to deliver 100% of high priority account water and maximum expected use of general security under normal river operations practices.</td>
<td>Unacceptable groundwater level and/or pressure declines potentially or actually impacting on groundwater availability to high priority GDEs, BLRs and/or LWUs. Drawdown to levels that could lead to aquifer subsidence.</td>
<td>Operational measures in the current water year to reduce transmission losses and prevent potential future failure to supply water in accounts (surface water). Limit potential impacts in local areas via dealings restrictions and potential local area access restrictions (groundwater). Drought response readiness (LWUs).</td>
<td></td>
</tr>
<tr>
<td><strong>Stage 3</strong> Severe drought/water shortage</td>
<td>Only able to deliver restricted high priority demands and restricted remaining general security account water.</td>
<td>Continuing unacceptable groundwater level or pressure declines. Unacceptable drawdown impacts on ‘efficiently constructed’ BLR bores (i.e. levels below the pump or deeper than the bore). Evidence of aquifer compaction.</td>
<td>Restricting access to account water, restricting trade, and suspending some WSP rules in addition to increased operational measures to prevent potential future failure to supply water in accounts (surface water). Restrict access from bores in all affected areas. Drought management/restrictions (LWUs).</td>
<td></td>
</tr>
<tr>
<td><strong>Stage 4</strong> Critical drought/water shortage</td>
<td>Only able to deliver restricted town water supply, stock and domestic and other restricted high priority demands.</td>
<td>Water level declines pose a risk to long term availability of the groundwater resources - subsidence, and/or mobilisation and induced flow of poorer water quality. Access by ‘efficiently constructed’ BLR bores significantly impacted.</td>
<td>Suspension of some WSP rules. Severe restrictions required to prioritise remaining supplies for critical human water needs (surface water and groundwater). Avoidance of permanent damage to aquifers (compaction or salinization). Emergency drought management measures/restrictions (LWUs).</td>
<td></td>
</tr>
</tbody>
</table>
Average 12 Month rainfall

Based on a standard 30-year climatology (1961-1990)
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Historic Inflows Combined (Glenbawn and Glennies)

Combined Inflows (ML)

Median Inflows 161.4 GL
Hunter system inflows

Long Term Average Annual Inflows 1,040 GL

Inflows (GL)

Comb Dams
Goulburn River
Hunter River At Greta Total Annual Flows

WSP Flow Target 12000ML DRY condition

WSP Flow Target 19000ML Normal Conditions

Flow (ML)

- Hunter River at Greta Total Flow

<table>
<thead>
<tr>
<th>Year/Year</th>
<th>Flow (ML)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003/04</td>
<td></td>
</tr>
<tr>
<td>2004/05</td>
<td></td>
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<tr>
<td>2005/06</td>
<td></td>
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<td>2006/07</td>
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<td>2007/08</td>
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<td>2008/09</td>
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<td>2009/10</td>
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<td>2010/11</td>
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<td>2011/12</td>
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<td>2012/13</td>
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<td>2013/14</td>
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<td>2014/15</td>
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<td>2015/16</td>
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<td>2016/17</td>
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<td>2017/18</td>
<td></td>
</tr>
<tr>
<td>2018/19</td>
<td></td>
</tr>
<tr>
<td>2019/20</td>
<td></td>
</tr>
</tbody>
</table>
Paterson system inflows

Long Term Average Annual Inflows 223 GL
Paterson River At Gostwyk Total Annual Flows

Flow ML/d


WSP Flow Target 6000ML

Paterson River at Gostwyk total flows
Comparison of Drought Inflows - Glenbawn & Glennies Ck Dams (Drought Inflows for 36 Months Starting in July)

- July 1939 - Jun 1942
- July 1979 - Jun 1982
- July 2015 - Jun 2018
- July 2016 - June 2019
- Current Drought July 2017 - Dec 2019
Resource Assessment 1 July 2019

Distribution of Water 1 July 2019 - 30 June 2022

- Unallocated water, 31 GL
- Storage Evap, 15 GL
- GS allocations, 151 GL
- Transmission & Ops Loss, 150 GL
- LWU and S&D and BLR, 54 GL
- Operational Target Flows, 97 GL
- Major Utility, 140 GL
- EWA, 60 GL
- HS, 65 GL

Total: 656 GL

Source of Water

- Usable Trib inflows, 102 GL
- Dam inflows 1 July 19 to June 22, 532 GL

Total: 762 GL
Resource Assessment 31 Dec 2019

Distribution of Water 1 January 2020 - 30 June 2022

- Unallocated water, -73 GL
- GS allocations, 146 GL
- EWA, 0 GL
- HS, 58 GL
- Major Utility, 106 GL
- LWU and S&D and BLR, 48 GL
- Transmission & Ops Loss, 121 GL
- Storage Evap, 10 GL

538 GL

Source of Water

- Usable Trib inflows 1 Jan 20 to June 22, 21 GL
- Dam inflows 1 Jan 20 to June 22, 30 GL
- Combined dams on 1 Jan 20, 414 GL

465 GL

538 GL
Low inflows: Portion of drought of record inflows (drought starting in Jan 20, Orange line in next graph)

No EWA use in year 19-20, 20-21 and 21-22

Reduced Transmission Loss

Reduced end of System flow targets

Reduced Operational Surplus

General Security use: 80GL in 19-20 and 32 GL in 20-21

Major water Utility: 40GL use in 19-20
Hunter Inflow (combined) Comparison – Planned Vs observed

Cumulative Inflows (GL)

Planned Combined Inflows (dams and d/s)
Observed Inflows from 1 July 2019
DOR inflows
Low Inflows DOR Inflows

Planned inflows on 1 July 2019
Drought of record inflows, drought starting in Jan 20
Portion of drought of record inflows, drought starting in Jan 20
# Account Balance

## 31 Dec 2019

<table>
<thead>
<tr>
<th>Licence Category</th>
<th>Sum of Share Component</th>
<th>Sum of Account Balance</th>
<th>Sum of Available Water</th>
<th>Sum of AWD Vol</th>
<th>Sum of Carryover In</th>
<th>Sum of Allocation Assignments In</th>
<th>Sum of Allocation Assignments Out</th>
<th>Sum of Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOMESTIC AND STOCK</td>
<td>1569</td>
<td>1478.8</td>
<td>1478.8</td>
<td>1569</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>90.2</td>
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<tr>
<td>DOMESTIC AND STOCK [DOMESTIC]</td>
<td>144</td>
<td>142.5</td>
<td>142.5</td>
<td>144</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1.5</td>
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<tr>
<td>DOMESTIC AND STOCK [STOCK]</td>
<td>103</td>
<td>88.1</td>
<td>88.1</td>
<td>103</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>14.9</td>
</tr>
<tr>
<td>LOCAL WATER UTILITY</td>
<td>10832</td>
<td>7874.5</td>
<td>7632.5</td>
<td>10832</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2957.5</td>
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<tr>
<td>MAJOR UTILITY [POWER GENERATION]</td>
<td>36000</td>
<td>61045.9</td>
<td>61045.9</td>
<td>36000</td>
<td>31712.2</td>
<td>0</td>
<td>0</td>
<td>6666.3</td>
</tr>
<tr>
<td>REGULATED RIVER (GENERAL SECURITY)</td>
<td>128544</td>
<td>112346.2</td>
<td>109311.2</td>
<td>122097.8</td>
<td>28822.7</td>
<td>6263.8</td>
<td>8236.3</td>
<td>37369</td>
</tr>
<tr>
<td>REGULATED RIVER (HIGH SECURITY)</td>
<td>21740</td>
<td>14577.7</td>
<td>14022.4</td>
<td>18340</td>
<td>3537.7</td>
<td>1863.5</td>
<td>615</td>
<td>8293.2</td>
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<tr>
<td>SUPPLEMENTARY WATER</td>
<td>48519.1</td>
<td>48519.1</td>
<td>48519.1</td>
<td>48519.1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td><strong>247451.1</strong></td>
<td><strong>246072.8</strong></td>
<td><strong>242240.5</strong></td>
<td><strong>237604.9</strong></td>
<td><strong>64072.6</strong></td>
<td><strong>8127.3</strong></td>
<td><strong>8851.3</strong></td>
<td><strong>55392.6</strong></td>
</tr>
</tbody>
</table>
Storage Depletion Curve

Hunter Valley forecast storage volume

- January 2020
  - 95% GS allocation
  - 100% allocation of all other categories

- December 2021
  - Cease to Flow

- April 2021
  - Cease to Flow

Legend:
- Dead Storage
- Drought of Record + Base Demand
- Zero Inflow + Base Demand
- Low Inflow + Most Probable Demand
- Zero Inflow + Most Probable Demand
- Actual
Lostock Dam Storage Status

Storage Capacity %

1-Jul 1-Aug 1-Sep 1-Oct 1-Nov 1-Dec 1-Jan 1-Feb 1-Mar 1-Apr 1-May 1-Jun

Lostock Dam
Inflows since last spill
Actual v Statistical

Storage Capacity (GL)

Actual  Wet 20% COE  Median 50% COE  Dry 80%COE  Minimum 99% COE
Temperature Forecast
Discussion

- Current usage and water requirements.
- General discussion
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

Call us on: 1300 662 077

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End Of Presentation