2013-14 Annual Environmental Watering Priorities for the South Australian River Murray

1. Introduction
This document has been prepared to fulfil obligations related to the preparation of Annual Environmental Watering Priorities (the Priorities) as specified in the Basin Plan Chapter 8 Division 4. The principles and method described in Chapter 8 Part 6 of the Basin Plan have been applied in developing these priorities.

2. Assumptions

Forecast Flow Conditions
At the time of preparing the Priorities, the water resource outlook predictions for 2013-14 ranged widely from dry to wet. The Priorities have therefore been prepared for all scenarios. During dry scenarios not all planned activities will be possible, while during wet scenarios not all planned activities will be required.

The MDBA water resource outlook for flows to South Australia that was considered during the preparation of the Priorities is shown in Figure 1.

Figure 1: MDBA water resource outlook
Held Environmental Water Availability

Commonwealth Environmental Water
Total Commonwealth environmental water holdings within the Southern Connected Basin are approximately 1,108 GL, with varying levels of security and a long term average annual yield of 913 GL. The breakdown of the Commonwealth Environmental Water Holder (CEWH) water holdings in the Southern Connected Basin is set out in Table 1. It is uncertain what allocations will be available for 2013-14, but it is anticipated that most of the CEWH entitlements should receive high allocations due to preceding wet conditions and good storage levels.

Table 1: CEWH water holdings in the Southern Connected Basin from Commonwealth Environmental Water Office (April 2013)

<table>
<thead>
<tr>
<th>Security</th>
<th>Entitlement (ML)</th>
<th>Long Term Average Annual Yield (ML)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>57,996</td>
<td>538,173</td>
</tr>
<tr>
<td>General / Low</td>
<td>507,238</td>
<td>364,776</td>
</tr>
<tr>
<td>Conveyance</td>
<td>7,656</td>
<td>7,273</td>
</tr>
<tr>
<td>Supplementary</td>
<td>20,876</td>
<td>2,956</td>
</tr>
<tr>
<td>Total</td>
<td>1,107,766</td>
<td>913,178</td>
</tr>
</tbody>
</table>

The Living Murray Environmental Water
The Living Murray (TLM) water holdings are equivalent to approximately 479 GL of water, as set out in Table 2. Due to the preceding wet conditions and high storage volumes it is assumed that a large volume of TLM water will be available in 2013-14, together with water carried over from the previous water year. Increased flows from the Snowy Agreement may also be available if there is agreement to call on some of this water.

Table 2: TLM’s water holdings in the Southern Connected Basin from the MDBA (2013)

<table>
<thead>
<tr>
<th>Security</th>
<th>Entitlement (ML)</th>
<th>Long-Term Cap Equivalent (ML)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>114,225</td>
<td>106,829</td>
</tr>
<tr>
<td>General / Low</td>
<td>476,554</td>
<td>295,146</td>
</tr>
<tr>
<td>Conveyance</td>
<td>350,000</td>
<td>40,900</td>
</tr>
<tr>
<td>Supplementary</td>
<td>47,265</td>
<td>37,100</td>
</tr>
<tr>
<td>Total</td>
<td>988,044</td>
<td>479,975</td>
</tr>
</tbody>
</table>

South Australian Environmental Water
The volume of water held by South Australia varies from year to year, based on the water that is available and the water that is purchased. This water is administered by the Department of
Environment, Water and Natural Resources (DEWNR) and the held water contributes to addressing the identified Priorities. Six GL of water entitlement is currently held on the Minister for Water and the River Murray’s licence for environmental purposes and additional amounts (up to 120 GL over a 10 year rolling period of eligible years) are also required to be provided to the environment.

The following activities have been identified as possible applications of this water in 2013-14:

- outflows through the barrage fishways;
- delivering additional water to pool-connected wetlands (along the River Channel);
- supporting weir pool raisings at Locks 6, 5 and 1 (along the River Channel);
- depending on the availability of funding for pumping, delivering water to temporary wetlands; and
- Berri Evaporation Basin and Disher Creek.

Non-Government Organisations
Nature Foundation SA holds 37 ML of water for environmental use. The Foundation also has access to up to 10 GL of water each year from the CEWH for its work along the River Murray in South Australia.

The Murray Darling Association, through its Murray Darling Foundation, has established ‘Water Bank’ that receives donations for purchasing and holding water for environmental activities. It holds 14 ML of water but has no plans for environmental watering in 2013-14.

Planned Environmental Water Availability

Unregulated Flows
The Water Allocation Plan (WAP) for the River Murray Prescribed Watercourse establishes that any flows to South Australia in excess of its entitlement (unregulated flows) will be used for environmental purposes. Unregulated flows generally occur in response to high rainfall events upstream from South Australia. The MDBA Environmental Watering Group has delegated authority from the Basin Officials Committee to allocate unregulated flow for environmental purposes in the River Murray.

200 GL of class 9 water
The WAP for the River Murray Prescribed Watercourse establishes Class 9 water access entitlements of 200 GL or 200,000,000 unit shares. This volume is the estimated annual evaporative loss from all wetlands that are connected to the South Australian River Murray at normal operating pool level. Of this 200 GL, approximately 34 GL (or 34,245,190 unit shares) have been assigned to a Minister for Water and the River Murray’s licence for use in 31 managed pool-connected wetlands. The priority for 2013-14 is to implement ecologically sound hydrological regimes at all managed, pool-connected wetlands. DEWNR staff manage the water allocation for managed wetlands. The water allocation for Class 9 water access entitlements in 2013-14 will be 100 percent.

Delivery Considerations
Delivery factors must be considered as part of managing any environmental water delivery. These have been identified and taken into account during the planning process. These will be discovered, assessed and addressed on a real-time basis through relevant State and Commonwealth forums.

Operational Considerations
The Riverine Recovery Project is undertaking a series of works to improve management of river wetlands and floodplains from the South Australian border to Wellington. In 2013-14 there will be a
number of wetlands subject to survey, design and construction work. Flow thresholds have been identified to enable the works to be completed and these will be considered on a real-time basis in light of water delivery considerations.

Similarly, there are MDBA assets that will be subject to structural work. Another significant consideration in 2013-14 relates to the construction of the Chowilla Environmental Regulator, which may require flows to be maintained below 25,000 ML/day at the South Australian border until early 2014. If necessary, the installation of coffer dam and sheet-pile extensions can increase that limit. This work and associated flow thresholds will be considered as 2013-14 progresses.

Policy Considerations
There are various policy considerations upstream of South Australia that can affect the delivery of water to the State. These are being addressed through the Constraints Management Strategy that is being delivered in accordance with the Basin Plan. The most significant consideration within South Australia relates to flows being augmented above 60,000 ML/day. Work is underway to facilitate management of flows in the 60,000 - 80,000 ML/day range.

3. Annual Environmental Watering Priorities

Environmental Assets
The environmental watering priorities for the South Australian River Murray for 2013-14 have been developed in accordance with the Basin Plan, using a variety of resource availability scenarios. The priorities are summarised in Table 3.

While water would be required for all sites during dry conditions, under wetter conditions more sites higher on the floodplain are inundated naturally and therefore additional water is not required. Although large volumes are required for the Lower Lakes, Coorong and Murray Mouth, and River Channel, these watering activities work in tandem with upstream actions. Therefore, a significant proportion of the volume for one site is actually delivered out of the water allocated to the other site.
<table>
<thead>
<tr>
<th>Sites</th>
<th>Estimated Volume</th>
<th>Purpose of Activity</th>
</tr>
</thead>
</table>
| 1 Lower Lakes, Coorong and Murray Mouth (TLM icon site)             | A large range 517 to 953 GL depending on flow conditions, with up to 5 GL used for each weir pool raising. (A significant proportion of this volume would be used concurrently for River Channel actions and to deliver water to LLCMM,) | ▪ ensure lake levels can be operated between 0.40 – 0.80 m AHD                        
▪ provide continuous barrage releases (with the majority of outflows in October to February) 
▪ enable lake level cycling and salinity reductions/export                      |
| 2 River Channel (TLM icon site)                                     |                                                                                   | ▪ create a flow pulse in spring/summer                                              
▪ extend duration of high flows                                                  
▪ increase height of natural flow peak                                          
▪ manage rate of flow recession                                                  
▪ raise weir pools                                                               |
| 3 Evaporation Basins - Berri Saline Water Disposal Basin / Dishers Creek / Bookmark Creek | Approximately 1.75 GL                                                            | ▪ maintain habitat (including water level and quality) for populations of the endangered Murray Hardyhead fish |
| 4 Chowilla (TLM icon site) – identified sites (Coppermine Waterhole, Gum Flat, Punkah Island Horseshoe, Werta Wert, Lake Littra, Brandy Bottle, Chowilla Horseshoe and Island Loop, and Woolshed Creek) | Ranging from approximately 4.47 GL under a medium scenario to 4.87 GL under a dry scenario | ▪ consolidate existing improvements in the condition of the priority wetland sites on the Chowilla Floodplain |
| 5 Milang Snipe Sanctuary                                              | Approximately 43 ML                                                               | ▪ prolong the length of wetland inundation in order to maintain summer foraging habitat for migratory and threatened birds. |
| 6 Identified temporary wetlands in the gorge region (Hogwash Bend, Morgan Conservation Park Lagoons, Overland Corner, Maize Island and Nikalapko) | Ranging from approximately 725 ML under a wet or medium scenario to 2,964 ML under a dry scenario | ▪ support a mosaic of habitats within the gorge region, including for waterbirds, threatened species and frog breeding opportunities. |
| 7 Identified temporary wetlands in the valley region (Weila Shedding, Carpark Lagoons, Piggy Creek and Templeton) | Ranging from approximately 808 ML to 2,037 ML, depending on flow conditions         | ▪ build upon the observed ecological benefits of the recent high flows and provide for threatened species and frog breeding opportunities. |
In addition to the South Australian priorities listed above, the Nature Foundation of South Australia is also exploring environmental watering actions for 2013-14. Although these actions have not been finalised, Table 4 summarises the location and purpose of some of the potential actions.

**Table 4: Possible NFSA Actions for 2013-14**

<table>
<thead>
<tr>
<th>Group</th>
<th>Site</th>
<th>Estimated Volume</th>
<th>Purpose</th>
</tr>
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<tbody>
<tr>
<td>Lock 3 - Lock 4 Reach</td>
<td>Clarks Floodplain</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rilli Reach</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rilli Lagoons</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Thiele Flat</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Loxton Riverfront Reserve</td>
<td>320 ML</td>
<td>To maintain juvenile vegetation and sustain regeneration from previous high river flow</td>
</tr>
<tr>
<td>Lock 2 - Lock 3 Reach</td>
<td>Ramco Lagoon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lock 1 - Lock 2 Reach</td>
<td>Reid Flat</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Molo Flat</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Ecosystem Functions**

The annual priorities have been developed based on environmental assets, rather than ecosystem functions. However, the assets outlined in this Plan, their environmental water requirements and the planned actions for 2013-14, have been developed by considering the ecosystem functions relevant to each site.

**4. Co-operative Watering Arrangements**

For the last three years the MDBA has worked with the Basin States and the CEWO to plan and coordinate annual multi site environmental watering trials. The trials attempt to maximise the use of environmental water by re-using return flows as the water moves through the southern connected Basin. In 2013 the MDBA Basin Officials Committee agreed that the long-term objective of the multi-site environmental watering trials is to work towards incorporating environmental delivery into normal River Murray operations. This is occurring by identifying and analysing issues and potential changes to current operational practices. An additional objective is to implement policy measures from the Basin Plan.

These include:

- credit environmental return flows for downstream environmental use; and
- allow the call of held environmental water from storage during un-regulated flow events.
Each year the multi site environmental watering trials have tested a range of actions including new accounting methods, addition of environmental water to unregulated flows, use of loss factors and coordination of environmental releases with flow peaks. Each trial builds on lessons learned from the previous year and enhances understanding of the key elements for a success.

The MDBA Environmental Watering Group and Water Liaison Working Group contribute to the development of the multi site strategy. Real-time operations groups hold regular teleconferences to ensure coordination and communication during the trial and rapid response to any issues that may arise, such as black water events. An environmental watering trial is proposed for 2013-14. Environmental water holders are working towards co-ordinated delivery between releases in the Murray, Murrumbidgee, Darling and the Goulburn to maximise environmental benefits at multiple sites. This could involve the concurrent delivery of water from multiple sources.

The ecological objectives and the environmental water used will vary depending on the seasonal conditions. For example, concurrent delivery of water from the Goulburn, Murrumbidgee and Darling Rivers will increase flow along the River Murray in South Australia and boost flows into the Coorong, Lower Lakes and Murray Mouth. There will be in-stream benefits along the entire River Murray System from Hume Dam to the Murray Mouth.

South Australia is participating in the planning for the multi site watering trial for 2013-14 through the MDBA Environmental Watering Group and Water Liaison Working Group and will contribute to the operations groups for the management and delivery of the environmental water available from all water holders.
5. Risk Management

Risks related to the planned environmental watering actions have been identified and assessed in accordance with DEWNR’s Risk Management Framework for Water Planning and Management, which is consistent with the Australian and New Zealand Standard for Risk Management (AS/NZS ISO 31000: 2009).

Key identified risks relating to the environmental watering program include:

- disruption to construction works from the planned environmental watering activities, or vice versa;
- potential for temporary increases in salinity; and
- potential for enhancing populations of invasive species.

However, these risks are generally manageable. For instance, the impact from or on infrastructure construction works will be managed on a real-time basis through regular communications with key parties. Site specific risks will be managed by water managers as required. More general risks relating to river operations and water quality are managed by the DEWNR River Operations Team in conjunction with the environmental water policy and program teams. DEWNR has the responsibility for communicating any significant risks to the broader community.

The risk criteria applied relate to likelihood and consequence and will be outlined in full detail in South Australia’s forthcoming annual environmental watering plan for the River Murray.