



**Australian Government**  

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**National Water Commission**



**Chief Executive Officer**

The Committee Secretary  
House of Representatives Standing Committee on Regional Australia  
Parliament House  
CANBERRA ACT 2600

Dear Ms Leyne

**Inquiry into the Impact of the Murray-Darling Basin Plan in Regional Australia**

The Commission is pleased to provide answers to the questions on notice received following our appearance before the Committee on 2 March 2011 (attached).

The Commission is able to provide further clarification or detail should the Committee wish.

Yours sincerely

James Cameron  
Acting Chief Executive Officer  
23 March 2011

# **Inquiry into the Impact of the Murray-Darling Basin Plan in Regional Australia**

## **Responses to questions on notice**

### **1. National Water Commission definition of 'over-allocation'**

The National Water Commission uses the definitions set out in the Intergovernmental Agreement on a National Water Initiative. The NWI requires all currently over-allocated and overused surface and groundwater systems to be returned to environmentally sustainable levels of extraction. In this regard, the following definitions are taken from the NWI agreement (Glossary of Terms Schedule B (i) p29ff).

**Overallocation** – refers to situations where with full development of water access entitlements in a particular system, the total volume of water able to be extracted by entitlement holders at a given time exceeds the environmentally sustainable level of extraction for that system.

**Environmentally sustainable level of extraction** – the level of water extraction from a particular system which, if exceeded would compromise key environmental assets, or ecosystem functions and the productive base of the resource

**Overused** – refers to situations where the total volume of water actually extracted for consumptive use in a particular system at a given time exceeds the environmentally sustainable level of extraction for that system. Overuse may arise in systems that are overallocated, or it may arise in systems where the planned allocation is exceeded due to inadequate monitoring and accounting.

### **2.1 Information on the timing and extent of reductions that have been made in each of the surface water and groundwater systems in the Murray-Darling Basin and through what process were the reductions made**

The NWC has interpreted this question as applying to reductions in entitlements rather than reductions in allocations.

Information is provided below on entitlement reduction processes in New South Wales, Victoria and South Australia.

The NWC is not aware of any other substantial reductions to entitlements within water systems in the Murray-Darling Basin, although some recent reviews of water plans have recognized problems with overall entitlement levels.

The NWC also notes that water recovery initiatives such as the purchase of water access entitlements and the upgrading of infrastructure are being used within the Murray–Darling Basin as mechanisms to improve environmental outcomes, without necessarily reducing the total number of entitlements held.

#### New South Wales

The most significant reductions that have been made to date in entitlements in systems in the Murray-Darling Basin have occurred in six groundwater systems in New South Wales. These are:

- the Lower Gwydir Groundwater Source
- the Upper and Lower Namoi Groundwater Sources
- the Lower Macquarie Groundwater Sources
- the Lower Lachlan Groundwater Source
- the Lower Murrumbidgee Groundwater Sources
- the Lower Murray Groundwater Source

Each of these systems was identified as being over-allocated and most had also experienced over-extraction. Without action, it is likely that these systems would have experienced significant deterioration to the resource and the rural communities dependent on them would also have suffered.

In NSW, long-term extraction limits are set for each groundwater management zone within a water plan area. The extraction limit is the average annual recharge less the volume set aside for the environment. This aims to protect the entire long-term storage component from extraction. For the Macquarie, Gwydir and Murrumbidgee groundwater systems historically, 85% of recharge was made available for extraction.

For the Murray, Upper and Lower Namoi and Lachlan groundwater systems historically, 100% of recharge was made available for extraction. This was unlikely to be sustainable, given the dependence of associated ecosystems on groundwater.

In response to this, the NSW and Australian governments established the Achieving Sustainable Groundwater Entitlements program (ASGE). The program involves the provision of \$135 million in support for licence holders and regional communities.

Licence holders have had their existing five-year renewable licence under the Water Act 1912 replaced with a new licence under the Water Management Act 2000, adjusted to reflect the sustainable yield of the aquifer. The new licence is fully tradeable and is a perpetual right to access groundwater. The reductions in entitlements were based on the History of Extraction of each licence holder. The reduction was made by weighting the active and inactive portions of each licence. The local Catchment Management Authority consulted with licence holders on different relative weightings.

Licence holders who in the past have used more water than on their new entitlement were also issued with a Supplementary Water Access Licence, which generally reflected the difference between the new licence and their history of extraction. The entitlements under the supplementary licence have a 10 year duration and are reduced annually, starting in 2006-07 and reaching zero on 1 July 2015.

The overall effects of the reductions as detailed in the relevant plans are summarised in the following table.

System	Original entitlements [GL]	July 2015 entitlements [GL]
Lower Gwydir Groundwater	70.7	32.3
Upper and Lower Namoi Groundwater*	474.1	208.1
Lower Macquarie Groundwater	136.8	66.9
Lower Lachlan Groundwater	212.2	108
Lower Murrumbidgee Groundwater**	514.6	270.0
Lower Murray Groundwater	267.5	83.7

\* Lower Namoi 172 GL to 86 GL, Upper Namoi 302 GL to 122 GL

\*\* For deep source aquifer, shallow source not affected.

Although no further systems in New South Wales have had adjustments to their entitlements, the recently published Water resources and management overview: Murrumbidgee Catchment (NSW Office of Water, January 2011) noted that '.... water sharing plans set rules for water trading, that is, the buying and selling of water licences and also annual water allocations. For most new commercial purposes, water trading remains the only way that water can be obtained as in most areas of NSW all available water is fully allocated.'

## Victoria

In Victoria, the Campaspe Deep Lead Water Supply Protection Area Groundwater Management Plan was reviewed in 2009. The review acknowledged that the original Campaspe plan did not achieve its objectives in returning groundwater levels to or above those of 1999-2000. The review also

recognised that the level of allocations and the rate of extraction were above the estimated sustainable yield level.

In June 2010 the Victorian Minister for Water decided to abolish the Campaspe Deep Lead Groundwater Supply Protection Area (GSPA), revoke the current Campaspe Deep Lead GSPA Groundwater Management Plan and declare the Lower Campaspe Valley Water Supply Protection Area (WSPA) to replace the existing GSPA. The Minister also decided to abolish the Spring Hill GSPA and Upper Loddon WSPA; revoke the Spring Hill GSPA Groundwater Management Plan; and declare the Loddon Highlands WSPA.

Both decisions took effect from 1 August 2010.

A process is now underway to seek the appointment of consultative committee to develop a draft groundwater management plan for each of the new WSPA's. Development of the new plans was expected to commence late 2010 and be completed by June 2012.

Also in Victoria, the Groundwater Management Plan for the Katunga Water Supply Protection Area (2006) includes a provision to reduce the total groundwater licence entitlement in the Protection Area over time. The provision requires that a permanent off-property transfer of a licence will be subject to adjustment of volumes on transfer whereby the individual licence entitlement will be reduced by 20%. However, the reduction will not apply to transfers resulting from the transfer or conveyance of a property as any reduction in the availability of water may adversely affect the sale.

### South Australia

In South Australia, the 2010 draft water allocation plan for the Mallee Prescribed Wells Area (PWA) plan discusses the conversion of entitlements under irrigation licences.

Historically, irrigation licences in the Mallee PWA were issued in hectare Irrigation Equivalent (halE), which allowed irrigators to irrigate up to a maximum area of crops. The halE was an estimate of the irrigation requirement (volume of water) of a reference crop. The draft plan seeks to convert this licensing mechanism to a volumetric arrangement.

Early in the development of volumetric conversion policies for the plan it became apparent that if all halE allocations (developed or undeveloped) were converted, then allocations would exceed the Permissible Annual Volume for the Mallee PWA and reductions to allocations would be required. A variety of options to convert allocations to volumes were considered and an equation was formulated to convert developed halE from area to volume.

The draft Plan proposed volumetric conversion policies based on a level of licence development within a given period, known as the Assessment Period. All development post this period will be converted at a lesser priority. The licensed volume for development post the Assessment Period will then be issued depending on the management area's existing allocation principles and available annual allowable volume.

The draft plan underwent community consultation between mid-October 2010 and mid-January 2011. The SA Murray-Darling Basin Natural Resources Management Board currently is reviewing submissions on the draft plan, which is expected to be forwarded to the Water Minister for adoption in mid 2011.

More broadly, the NWC's 2009 Second Biennial Assessment of progress in implementing the National Water Initiative (2009 BA) outlined jurisdiction pathways for addressing overallocation and overuse and current water recovery initiatives. Table 17 from that report is reproduced below.

The full 2009 *Second biennial Assessment of progress in implementing the National Water Initiative* can be found at <http://www.nwc.gov.au/www/html/147-introduction---2009-biennial-assessments.asp?intSiteID=1>

Pathways for addressing overallocation and overuse and current water recovery initiatives

Jurisdiction	Avenue for environmental improvement	Description
ACT	Water plans	Strong mechanisms are available to the Minister to amend water access entitlements through imposing conditions on or amending an existing condition of a water access entitlement. However, unlike arrangements in many jurisdictions, the mechanisms only require that the Minister has given notice, and do not trigger financial compensation.
	Water recovery	The ACT has reported that as there are no overallocated systems in the ACT, no water recovery initiatives are required.
NSW	Water plans	NSW has taken a precautionary approach and embargoed all surface water systems across the state and all groundwater systems within the Murray–Darling Basin.  In areas with water sharing plans, the extraction limits plus the environmental water rules are designed to ensure that systems are not overused.  The NSW Government is a partner in the Great Artesian Basin Sustainability Initiative, which will reduce extractions of artesian water through bore capping, bore rehabilitation and piping.
	Water recovery	NSW has also recovered water for the environment through purchase and recovery activities under RiverBank, Water for Rivers, the River Environmental Restoration Program, the Wetland Recovery Program and The Living Murray initiative.
NT	Water plans	The Northern Territory has no overallocated systems and therefore has no pathways in place. One groundwater system has been assessed as being overused and water allocation planning for that system has commenced. The NT Government is a partner in the Great Artesian Basin Sustainability Initiative. This will reduce extractions of artesian water through bore capping, bore rehabilitation and piping.
	Water recovery	
Qld	Water plans	A number of mechanisms and legislative instruments occur to provide a pathway, such as rationalisation of water access entitlements, caps on further resource development, water trading and water sharing rules.
	Water recovery	The Queensland Government is a partner in the Great Artesian Basin Sustainability Initiative, which will reduce extractions of artesian water through bore capping, bore rehabilitation and piping.
SA	Water plans	Overallocation and/or overuse issues are addressed through amendments to the relevant water allocation plan.
	Water recovery	The South Australian government is a partner in The Living Murray Initiative and the Great Artesian Basin Sustainability Initiative, which will reduce extraction of artesian water through bore capping, bore rehabilitation and piping.
Tas.	Water plans	Tasmania is currently developing a number of water management plans that are setting environmentally sustainable levels of extraction. The Tasmanian Government envisages that substantial progress will have been made by the end of 2010.
	Water recovery	Not applicable
Vic.	Water plans	Victorian sustainable water strategies
	Water recovery	The Living Murray initiative, the Snowy Initiative; the Northern Victoria Irrigation Renewal Project; other infrastructure projects.

Jurisdiction	Avenue for environmental improvement	Description
WA	Water plans	Minister has a broad set of instruments to address overallocation and overuse, including the purchase of licences, the ability to vary, amend, add or remove any condition on a licence, cancel or suspend a licence or at their total discretion decide not to renew a water licence. Where a groundwater proclaimed area is classified as fully or overallocated, an allocation plan is written that sets out the procedure for the above instruments to be applied.
	Water recovery	As described above, the Minister has a broad set of instruments to address overallocation and overuse, including the purchase of licences, the ability to vary, amend, add or remove any condition on a licence, cancel or suspend a licence or at their total discretion decide not to renew a water licence. Where a groundwater proclaimed area is classified as fully or overallocated, an allocation plan is written that sets out the procedure for the above instruments to be applied. In smaller areas where there are limited users, the instruments may be applied in the absence of a plan or while a plan is being developed.
Commonwealth	Water plans	Murray–Darling Basin Plan and subsidiary plans. The Basin Plan will contain a long-term sustainable diversion limit for limiting consumptive uses to sustainable levels.
	Water recovery	Water for the Future acquisition of water entitlements and water savings through infrastructure investments. The Australian Government is a partner in the Great Artesian Basin Sustainability Initiative, which will reduce extractions of artesian water through bore capping, bore rehabilitation and piping.

(Second biennial Assessment of progress in implementing the National Water Initiative, Table 17 pp99-100)

## 2.2 Changes that have occurred to the reliability of entitlements since the Cap was introduced.

When the Murray-Darling Basin Cap was established in the mid-1990s, it defined the quantity of water that can be diverted by the pool of issued entitlements.

Since the Cap was established, there have been a number of developments that have affected the reliability of entitlements (such that they are below the levels experienced in the mid-1990s):

- prolonged drought – During the drought allocations were well below historic levels for all water products due to dramatic reduction in available water volumes. Since 2003-03, diversions have been under 10,000GL, and for the four years up to 2009-10 have been between 4,400GL and 5,500GL.
- activation of sleeper/dozer licences – At the time the Basin Cap was introduced, some water entitlements were not utilised (often referred to as sleeper/dozer rights). Rather than being left for environmental use, water unused by such entitlements each season would be redistributed to existing consumptive users through annual allocations. This led to reliabilities (allocated volumes to entitlements) higher than would have been the case if all water entitlements had been exercised. Activation of sleeper/dozer licences meant that less water was left unused to be reallocated to existing users.
- the introduction of carryover arrangements – Carryover meant that unused water (within carryover limits) was not reallocated to other users, rather it was held over for the entitlement-owner into the next period.

- unbundling such that many newly created water entitlements now have a limit of 100% allocation – Unbundling, such as in Victoria, created high and low reliability water entitlements that could not receive in excess of 100% allocation – whereas previous allocations of 220% had been observed.
- changes to water allocation methodologies – NSW (revised assumptions on future inflows' November 2006) and Victoria (changed reserve policy, July 2010 Goulburn and July 2011 Murray) have both made changes to water allocation methodologies. These changes mean water allocation approaches are in place result in (on average) lower volumes being allocated to entitlements, and this could be interpreted as reductions in the reliability of entitlements.

The NWC's 2010 report *The impacts of water trading in the southern Murray-Darling Basin* provides data on end-of-season allocations to key entitlement products for the period 1998-99 to 2008-09. Table 2 from that report is reproduced below.

End-of-season allocations to key entitlement products in the sMDB, 1998–99 to 2008–09

Water products	Entitlement volume on issue (GL)	End of season allocations (%) (year)										
		98–99	99–00	00–01	01–02	02–03	03–04	04–05	05–06	06–07	07–08	08–09
<b>Higher reliability entitlements</b>												
Vic. Goulburn HRWS	994	100	100	100	100	57	100	100	100	29	57	33
Vic. Murray HRWS	1182	100	100	100	100	100	100	100	100	95	43	35
NSW Murray High Security <sup>a</sup>	184	100	100	100	100	100	100	97	97	69	50	95
NSW Murrumbidgee High Security	357	100	100	100	100	100	95	95	95	90	90	95
SA Murray High <sup>b</sup>	672	100	100	100	100	100	95	95	100	60	32	18
<b>Lower reliability entitlements</b>												
Vic. Goulburn LRWS <sup>c</sup>	438	0	0	0	0	0	0	0	0	0	0	0
Vic. Murray LRWS <sup>c</sup>	301	100	90	100	100	29	0	0	0	0	0	0
NSW Murray General Security	1668	93	35	95	105	10	55	49	63	0	0	9
NSW Murrumbidgee General Security	1908	85	78	90	72	38	41	40	54	10	13	21

a NSW water access entitlements for indigenous, community and education, research and town water rights are excluded.

b Non-tradeable South Australian water access entitlements are excluded. South Australian irrigation rights (classes 3a and 3b) were restricted below 100% to the reported values. Stock and domestic, and industrial, for example, were not restricted below 100%.

c Low-reliability water shares in Victoria were created on 1 July 2007. Before that time, this water was referred to as 'sales water' and not separated from the higher reliability water entitlement.

Sources: [www.waterregister.vic.gov.au/Public/Reports/WaterShareStatistics.aspx](http://www.waterregister.vic.gov.au/Public/Reports/WaterShareStatistics.aspx), [waterinfo.nsw.gov.au/ac/alloc.xls](http://waterinfo.nsw.gov.au/ac/alloc.xls), [www.wma.dnr.nsw.gov.au/wma/WALStatisticsSearch.jsp?selectedRegister=WALStatistics](http://www.wma.dnr.nsw.gov.au/wma/WALStatisticsSearch.jsp?selectedRegister=WALStatistics), [www.samdbnrm.sa.gov.au/LinkClick.aspx?fileticket=s1%2fxzoJI14A%3d&tabid=433](http://www.samdbnrm.sa.gov.au/LinkClick.aspx?fileticket=s1%2fxzoJI14A%3d&tabid=433).

The data shows that allocations generally declined through the period across the entire southern MDB. Reductions in higher reliability entitlements were most evident from 2006–07 onwards, whereas reductions in lower reliability entitlements were pronounced from 2002–03.

The full report can be found at <http://www.nwc.gov.au/www/html/2816-impacts-of-water-trading-in-the-southern-murraydarling-basin.asp?intSiteID=1>.

### **2.3 Which valleys in the Murray-Darling Basin are over-allocated and by how much?**

Management of over-allocation and ensuring sustainable levels of extraction are both functions of water sharing plans, which are developed and administered by state or local organisations. However, at present, there is no agreed national list of over-allocated or overused systems.

The Commission has previously expressed concern that five years after the signing of the NWI, it has not been possible to develop a nationally consistent picture of the level and distribution of overallocation and overuse across Australia. This not only makes it difficult to know whether adequate steps have been taken to deal with overallocation, but also jeopardises other aspects of the NWI such as the risk assignment and interception provisions, which rely on identification of over-allocated and overused systems.

In the 2009 Biennial Assessment (BA), the States and Territories were requested to provide their assessments against the Natural Resource Management Ministerial Council's performance indicators 4.1 & 4.2, which dealt with overallocation and overuse for water systems for which a water plan had been completed. Some States were reluctant to do so and the following responses were received from the MDB jurisdictions:

- NSW recommended that 'a national agreed definition and methodology is required before this indicator can be assessed for surface systems'. It went on to note that 'NSW has pathways in place to return major inland alluvial systems [ie groundwater] to sustainable levels of extraction.
- Victoria responded that it did 'not explicitly identify systems as over-allocated or over-used'.
- Queensland noted that systems are not explicitly identified as over-allocated or over-used in Queensland water plans.
- South Australia identified two systems with completed water plans as either as over-allocated or over-used with pathways in place to return the system to sustainable levels of extraction, and a further 13 systems with completed plans that had been assessed as either as over-allocated or over-used, but with no pathway in place. South Australia did not identify the systems, and so this will include some outside the MDB.

In the 2009 BA, the Commission undertook a review of 107 completed water plans nationally in an effort to assess whether the status and level of overallocation and overuse in each water system is stated clearly. This review complemented the self reporting by the jurisdictions against NRMCC performance indicators 4.1 and 4.2 (see Table 16 from the report, reproduced below).

From the Commission's review, it was found that, with a few exceptions, the allocation status of a plan area is normally implicit rather than explicit in water plans. For example, systems where no further entitlements are permitted or where there was no unallocated water available were assumed to be fully allocated. Similarly, overuse is usually implied through management arrangements in the plans. These range from the control of non-entitlement water users, such as water interception activities (farm dams, forestry), control of illegal use or improved monitoring of the water resources through more intensive and better metering and extraction rostering. A water plan was categorised by the Commission as overallocated or overused if either all or part of the water system was identified in the plan as being in one of these categories.

Using these interpretations, the Commission found that nationally, 19 of the 107 water systems assessed were identified as being overallocated, 15 were identified as being overused, and 48 were identified as being fully allocated or approaching full allocation. These results are generally consistent with the jurisdictions' self-assessments (Table 16) of the allocation status of their water systems (note that New South Wales and Victoria did not provide results). The results are also consistent with the self-assessments undertaken for the Australian Water Resources 2005 baseline assessment of water resources at the beginning of the NWI, whereby 22 systems were assessed as either overallocated or



overused. The vast majority of the water systems currently identified by jurisdictions as overallocated and/or overused are groundwater systems.

#### Jurisdictional responses to NRMCC performance indicators 4.1 and 4.2

Jurisdiction	Indicator	Number and proportion of water systems for which a water plan has been completed that:			
		has not been assessed	has been assessed, and determined not to be overallocated/overused	has been assessed as overallocated or overused, and has a pathway in place	has been assessed as overallocated or overused, but no pathway in place
ACT	4.1 (overallocation)	0	All	0	0
	4.2 (overuse)				
NSW	4.1 (overallocation) 4.2 (overuse)	Recommend that a national agreed definition and methodology to determine sustainable yield is required before this indicator can be assessed for surface water systems. NSW has pathways in place to return 6 major inland alluvial systems to sustainable levels of extraction.			
NT	4.1 (overallocation)	0	2	0	0
	4.2 (overuse)	0	2	0	0
Qld	4.1 (overallocation) 4.2 (overuse)	Indicators cannot be assessed as systems are not explicitly identified as overallocated or overused in Queensland water plans.			
SA	4.1 (overallocation)	0	10	1	8
	4.2 (overuse)	0	12	1	5
Tas.	4.1 (overallocation)	0	5	0	0
	4.2 (overuse)	0	2	3	0
Vic.	4.1 (overallocation) 4.2 (overuse)	Do not explicitly identify systems as overallocated or overused.			
WA	4.1 (overallocation)	8 out of 15 completed water plans contained an overallocated system. The Department of Water is producing two policies to address overallocation. The first, <i>Confirming overallocation operational policy 2.1</i> , has almost been finalised. The second is a strategic policy on the action to be taken after overallocation is identified. It will probably be released for public comment and is expected to commence in 2010.			
	4.2 (overuse)	Current data management does not allow for direct response to each of these categories.			

#### 2.4 Where and to what extent do sleeper and dozer licenses exist in the Murray-Darling Basin?

The NWC does not have quantitative information about the extent of sleeper and dozer licences in the Murray-Darling Basin. State licensing authorities would be the holders of this information.

Several studies have provided some evidence of activation and trade in sleeper and dozer licences. In the former MDBC's interstate trade pilot project, it was found that 99% of the 9.5 GL of water traded was previously not being used by sellers (Young et al. 2000, *Inter-state water trading: a two year review*, CSIRO Land and Water). In an assessment from 2004, sleeper and dozer licences were found to have represented 50% of sales in northern Victoria (Alankarage WH; *Implications of water transfers on environmental flows in northern Victoria*, 2004 PhD Thesis, University of Melbourne). Similar results were reported by Bjornlund and McKay (*Are water markets achieving a more sustainable water use?* Proceedings of the Xth World Water Congress, Melbourne, 12-17 March 2000, <http://196.36.166.88/iwra/proceedings/details.aspx?id=4>).

In the *Impacts of Trade* report, the Commission found that the development of water markets may have contributed to the activation of sleeper/dozer licences, which could affect the reliability of supply to users,

the environment, or both. However, the report also found that it is likely that sleeper and dozer activation would have emerged because of drought, even in the absence of trading. (Finding 13, pg 38, *The impacts of water trading in the southern Murray-Darling Basin, NWC 2010*)

There are two potential impacts of the activation of these rights:

- In a system in which overall diversions are capped, increased use of water allocations to these rights can lead to a reduction in the reliability of future allocations to other entitlements, thus affecting individual water entitlement holders.
- In a system in which overall diversions are not capped (or not capped in a completely effective manner), increased use water allocations to these rights are likely to lead to a reduction in water available to meet environmental water requirements.