

CONSULTATION PAPER

NSW updated factors for water recovery

Prepared by: the NSW Department of Industry and the Murray–Darling Basin Authority



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More information

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Executive Summary

The Basin Plan, as made in 2012, stated that recovery of an annual average of 2750 gigalitres of water was required for use by environmental water holders, and to restore the health and sustainability of the river system. At the time, this water was used for township, stock, domestic and irrigated agriculture.

Each catchment had its own rules around entitlements and allocations, and there remain over 150 different types of entitlements across the Basin. Entitlement units may result in different average annual volumes of use, and therefore water available for recovery, based on characteristics such as level of security, location, management rules and levels of activity. The Australian Government must be able to determine when enough water entitlements have been recovered to deliver the reduction volume over the long term. The recovery program requires that for each water entitlement recovered, the 'share' value of the entitlement has to be converted into a long-term average annual volume of use.

In 2011, a method using 'long term diversion limit equivalent factors' (LTDLE factors), sometimes referred to as cap factors, was used to determine entitlements required to meet recovery targets. These factors have known weaknesses. They are out of date, are generally not based on the modelling period used to develop the Basin Plan (1895 to 2009), and do not use a consistent set of assumptions about contemporary water use.

The NSW Government and the Murray–Darling Basin Authority (MDBA) are updating the planning assumptions and calculation methods for the LTDLE factors, incorporating new information and providing a comparative mechanism for different entitlements across NSW valleys. The new methods more accurately assess how much water has been recovered for the environment, and will be used to guide future recovery decisions. The LTDLE factors will not be used to determine water allocation, nor do they alter the characteristics of retail entitlements. The water market determines the financial value of an entitlement, which operates like any other free market, and LTDLE factors are not designed or suitable for setting markets' rates. Each Basin state has their method to allocate against entitlements—in New South Wales (NSW) this method is legislated and is included within each water sharing plan.

The factors are focused on historical patterns—they are not a prediction or a guide to future water use. Future allocations will continue to be determined based on water availability subject to the prevailing climatic conditions at the time.

To establish the updated factors, the NSW Government and the MDBA considered historical utilisation patterns, climatic data, and trade information. The determination of factors is based on an agreed methodology for NSW, using the best available information. Updated factors for each valley and entitlement class have been determined on a consistent basis, applied across different catchments.

The updated factors have been released for public consultation, and submissions can be made until 17 July 2018 via the NSW [DoI-Water website](#). Stakeholders are invited to make a submission that includes any new evidence/information that could be considered in the final assessment of factors. The NSW Government is particularly interested in feedback on the planning assumptions methodology, and the management of future changes that could be different to historical patterns of water use.

The factors will be finalised through the accreditation of each water resource plan— with all plans due to be accredited by June 2019.

Other jurisdictions will also be reviewing and updating their LTDLE factors and approach, as they develop their water resource plans. NSW and MDBA will continue to share information and experience with all jurisdictions as requested to assist their process.

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Introduction

Purpose of factors

Long-term diversion limit equivalent factors (LTDLE factors, also known as 'cap factors') have been established to accurately assess how much water has been recovered for the environment, and to guide future water recovery decisions.

There are over 150 different classes of water entitlements in the Murray–Darling Basin. LTDLE factors are a numerical value assigned to each of these entitlements, so they can be considered on equal terms to calculate progress towards the recovery target.

These factors provide a consistent accounting system to ensure the actual volume of water recovery has occurred as planned, and indicate where any future water recovery may be required.

The factors do not alter entitlements and are not considered during water resource assessment to determine allocations.

Updated factors for New South Wales

A set of factors across the Basin were adopted by the Murray–Darling Basin Ministerial Council in 2011, to account for the water recovery associated with the development of the Basin Plan. These factors were derived from a range of different sources and did not provide a consistent basis for water accounting across the Basin.

The updated factors for NSW have been developed on a consistent basis, and now include Basin Plan requirements, along with up-to-date information on trade and climate.

This new information ensures these factors are more accurate than the 2011 factors, and best reflect a basis for comparing different entitlement types for water recovery.

These updated factors are being finalised, ahead of the accreditation of each [water resource plan](#), to ensure plans are aligned with and consider the most recent information. The factors will be used to determine if the water recovery required in each catchment, and across all of NSW, has been completed by June 2019, as required under the Basin Plan.

Once water resource plans are accredited, the agreed arrangements for water sharing and water allocation between entitlement classes will begin to operate. The factors will not be used any further, except for additional water recovery where required.

In 2015, all Basin government ministers agreed to update the original 2011 factors ahead of the accreditation of all water resource plans. This update is specifically for NSW, other jurisdictions will also, where necessary, update their figures before June 2019.

Planning assumptions that influence the updated factors

Planning assumptions have been established and then modelled for each water resource planning area to establish the updated factors. These assumptions are based on:

- historical usage of allocations, including carryover
- climatic patterns over the past one hundred years
- water trade patterns
- local rules associated with water access and allocation in each catchment area.

Entitlements, allocations and usage

Water markets in the Basin were established based on a 'cap and trade' system, where the cap represented the total pool of water available for consumptive use. This system is transitioning to [sustainable diversion limits](#), which set a new limit on water diversion under the Basin Plan.

Since the introduction of the cap in water use in 1995, available water in each water year has been distributed to users via water rights administered by Basin states.

The relationship between entitlement and allocation is outlined in Figure 1.

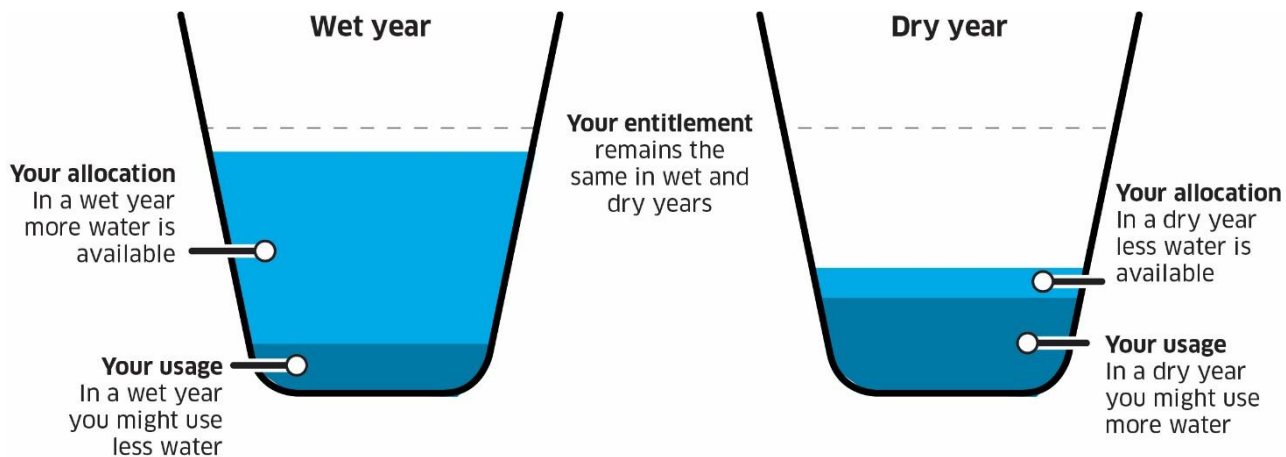


Figure 1. The relationship between entitlements, allocations and usage

Water entitlements are rights to an ongoing share of water in a system. The financial value of water entitlements is determined by the water market, which operates like any other free market. The value of an entitlement is subject to market change. Entitlements are prioritised in various ways across the Basin. The arrangements in NSW are shown in Figure 2.

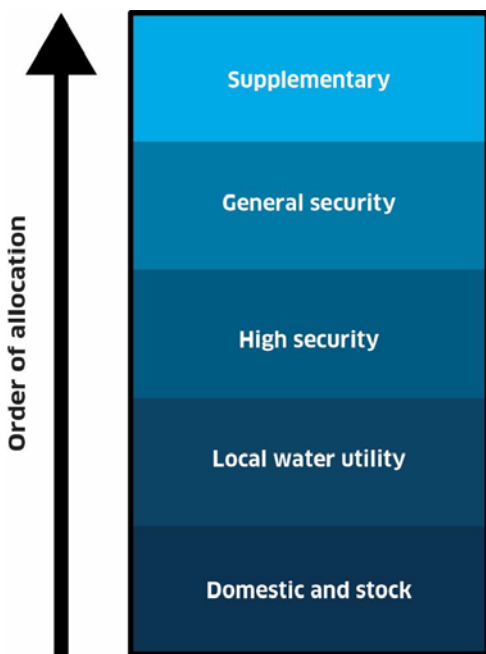


Figure 2. NSW prioritisation of entitlements

Water allocations are the amount of water distributed to users (water entitlement holders) in a water year. Allocations against those entitlements change according to rainfall, inflows into storages, and how much water is in storage. Each Basin state has a different process and different rules for allocating water.

Reliability is a measure of the likelihood of an amount of water being allocated to a particular class of entitlements over a period.

Water usage is how much water is used from the water that is allocated. When water is allocated to an entitlement holder, they use it as needed—sometimes they use only a proportion of their allocated water. For example, an entitlement holder may use 30% in some instances and 95% in others. Depending on the rules, water that is not used may be carried over for use in the following water year. Water use is an individual business decision, where entitlement holders consider climate and rainfall, their cropping cycle, and their business plans.

Water usage is the primary consideration in establishing the updated factors. These factors are used to determine the water recovery required to meet the outcomes of the Basin Plan.

Planning assumptions

Establishment of the 2011 factors

With over 150 different classes of water entitlements across all Basin states, the Australian Government needed an agreed method for accounting for water recovery, and to enable a consistent and methodical approach to future recovery under the Basin Plan.

The first set of factors that were adopted in 2011 were derived from a range of different sources and did not provide a consistent basis for water accounting across the Basin. At the time, it was agreed that this method could be used initially to compare different entitlement classes across different catchment areas to account for water recovery.

In 2015, Basin governments committed to updating the factors and developing an updated set based on agreed and consistent assumptions. The updated factors for NSW, which are now available for comment, are a result of this process. Other jurisdictions will also review the need to update their factors before June 2019.

Assumptions for updated factors

Planning assumptions using up-to-date information have been established for each water resource planning area in NSW to determine the updated factors.

Water usage patterns consistently demonstrate over the long-term that many entitlement holders do not use all the water allocated to them. Usage is an individual business decision, where entitlement holders consider climate and rainfall, the cropping cycle, and their business plans.

By considering recent data in the planning assumptions for each catchment, including trading patterns in some areas for up to the 2016–17 water year, the NSW Department of Industry and the MDBA are confident the updated set of factors are realistic and reflect the best available information for this purpose.

Generally, the assumptions for the updated factors have considered:

- recent information on water usage, along with historical information on usage and carryover
- climatic patterns over the past one hundred years
- water trade patterns, including inter-jurisdictional change and trade between entitlement types
- local rules regarding water access in each area through individual water sharing plans.

The assumptions considered for each catchment were applied consistently across NSW. Some variation based on the specific arrangements within catchments was applied. For more information on the method used to determine the factors, please refer to the [Technical paper - Derivation of LTDLE factors in NSW](#).

Water recovery

The Basin Plan sets sustainable diversion limits, which specify how much water can be used in the Murray–Darling Basin. This limit ensures there is enough water remaining in the environment to keep the rivers in a healthy state.

The first step in establishing the sustainable diversion limits was a process to determine how much water was currently being used by industries and communities annually. It was estimated, on average, that 13,623 gigalitres per year of surface water was being taken from the system for consumptive use. This is now known as the baseline diversion limit.

It was determined that recovering and retaining in the system 2,750 gigalitres per year of the baseline level will be enough to improve the health of the river system. This figure is known as the water recovery target and is also a long-term average.

Water recovery under the Basin Plan

The primary role of the LTDLE factors is to account for the actual volume of water recovery required under the Basin Plan.

In 2012, a water recovery target of 2,750 gigalitres was set by the Basin Plan. Through recent amendments to the Basin Plan, the water recovery target has been changed. Environmental outcomes are being sought, but with less water, through projects known collectively as the sustainable diversion limit adjustment mechanism. Therefore, 605 gigalitres of water can now remain in the system for other users, provided that these projects deliver the benefits currently estimated. There is also bipartisan support to change the water recovery target in the northern Basin following the Northern Basin Review. The water recovery target is expected to change by 70 gigalitres in the coming months, alongside the delivery of a number of environmental works and measures collectively known as the Northern Basin Toolkit.



Figure 3: Water recovery changes through the Northern Basin Review and the sustainable diversion limit adjustment mechanism

It is in the interest of all stakeholders that the amount of water recovered accurately reflects the targets established under the Basin Plan.

If too much water is recovered for the environment there will be impacts on other water uses including urban, domestic, stock and irrigated agriculture. If too little water is recovered, environmental outcomes in the Basin Plan will not be achieved. For these reasons, it is vital that water recovery is accurately accounted.

Water recovery in NSW

The updated factors, once adopted, will affect the amount of water recovered against the targeted recovery in some catchments. There are a number of issues that will determine if further recovery is required, including updated factors and the delivery of currently contracted water.

A review of water recovery progress will be undertaken for each water resource area closer to June 2019. Delivery against projects, as well as the finalisation of the water resource plans will be considered.

In the meantime, the Australian Government Department of Agriculture and Water Resources will continue to provide regular public updates via its website on water recovered.

The updated factors from all Basin states will also be used to account for water recovery through efficiency measures, to deliver 450 gigalitres of water for the environment by 2024.

The following recovery information is based on the existing reporting conducted by the Department of Agriculture and Water Resources and published on the department's website. These figures include a range of recovery programs that are underway, but not expected to be completed until June 2019 (i.e. some water is contracted but not yet delivered).

Table 1: Water recovery targets at a valley scale under accepted and proposed Basin Plan amendments (2018) showing recovery volumes (LTDLE) under the 2011 factors and BDL factors (recovery target as per SDLAM amendment and proposed NBR amendments to the Basin Plan)

	Local reduction amount (ML/y)	Shared reduction amount (incl supply contribution) (ML/y) ^a	2075 GL recovery target by valley (ML/y) ^b	Recovery under current 2011 factors (ML/y) ^c	Recovery under 2018 updated factors (ML/y) ^c	Net change due to factors (ML/y)	Local recovery status (ML/y)	Shared recovery status (ML/y) ^a
Intersecting Streams ^d	0			8,106	8,106	0	0	
Barwon-Darling	32,000			32,582	32,582	0	0	
NSW Border Rivers	7,000			3,302	4,247	944	-2,753	
Gwydir	42,000			46,859	54,656	7,796	0	
Namoi	20,000			11,539	11,205	-334	-8,795	
Macquarie-Castlereagh	55,000			82,525	102,472	19,947	0	
Northern Basin	156,000	24,000	180,000	184,913	213,267	28,354		44,816
Lachlan^e								
Lachlan ^e	48,000	0	48,000	49,555	46,699	-2,856	-1,301	
NSW Murrumbidgee^{gh}								
NSW Murrumbidgee ^{gh}	320,000			439,982	428,686	-11,296	0	
NSW Murray	262,000			353,355	311,822	-41,533	0	
Lower Darling	8,000			20,044	22,334	2,290	0	
Southern Basin	590,000	171,200	761,200	813,380	762,842	-50,538		1,642
Total NSW	794,000	195,200	989,200	1,047,848	1,022,809	-25,040	-12,850	46,458

^a s6.05 (3) of the Basin Plan (2012) sets shared reduction amounts across basin zones

^b Assumes that the full adjustment to the recovery volume resulting from SDL adjustment mechanism and the Northern Basin Review is in effect. The requirement that 62,000 ML in SDL adjustment mechanism efficiency measures is achieved to enable the full 605,000 ML supply measure adjustment is assumed to have been met. While some projects are underway across the Basin to this effect, projects in NSW have yet to commence.

^c Recovery values include water which is contracted but not yet delivered

^d Pending finalisation of factors for the Intersecting Streams, current reporting method is maintained - 9,720 ML special additional high flow entitlement is not reported

^e The Lachlan is presented separately in this table as it is a terminal system, and is not considered to be a part of either the northern or southern Basin for recovery purposes

^f BDL determined with a revised agreed accounting for Nimmie-Caira recoveries – entire volume of this entitlement is now recognised for 'gap-bridging' purposes, adding an additional 40,300 ML/y to previously published recovery volumes of 132,600 ML/y

^g BDL determined continuing the practice under Cap arrangements, where defined in the Diversion Formula Register v6, of deducting return flows

^h 4,900 ML/y LTDLE has been recovered in NSW for the ACT shared reduction amount and has not been reported in this table

Updated factors

Intersecting streams

Entitlement type	2011 factor	2018 updated factor—DRAFT*
Unregulated entitlement	1.000	1.000
Unregulated entitlement—special additional high flow		0

*Work is progressing on finalising the factors for the Intersecting Streams valley.

Barwon–Darling

Entitlement type	2011 factor	2018 updated factor—DRAFT
A Class	1.000	1.000
B Class	1.000	1.000
C Class	1.000	1.000
Unregulated stream entitlements	1.000	1.000

Border Rivers

Entitlement type	2011 factor	2018 updated factor—DRAFT
Domestic and stock	0.850	0.617
Local water utility	0.994	0.812
High security	0.850	0.603
General security Class A	0.850	0.976
General security Class B	0.400	0.337
Supplementary water access	0.266	0.697

Gwydir

Entitlement type	2011 factor	2018 updated factor—DRAFT
Domestic and stock	0.850	0.432
Local water utility	0.850	0.578
High security	1.000	0.886
General security	0.360	0.380
Supplementary water access	0.190	0.485

Peel

Entitlement type	2011 factor	2018 updated factor—DRAFT
Domestic and stock	0.850	0.282
Local water utility	0.850	0.525
High security	0.850	0.393
General security	0.259	0.209

Namoi excluding Peel

Entitlement type	2011 factor	2018 updated factor—DRAFT
Domestic and stock	0.850	0.435
Local water Utility	0.850	0.349
High security	0.850	0.723
General security	0.770	0.753
Supplementary water access	0.170	0.279

Macquarie/Castlereagh/Bogan

Entitlement type	2011 factor	2018 updated factor—DRAFT
Domestic and stock	0.850	0.290
Local water utility	0.850	0.681
High security	0.850	0.668
General security	0.420	0.516
Supplementary water access	0.210	0.588

Lachlan (excluding Belubula)

Entitlement type	2011 factor	2018 updated factor—DRAFT
Domestic and stock	0.825	0.402
Local water utility	0.825	0.530
High security	1.000	0.927
Conveyance	0.686	0.834
General security	0.420	0.396

Murrumbidgee

Entitlement type	2011 factor	2018 updated factor—DRAFT
Domestic and stock	0.850	0.805
Local water utility	0.850	0.488
High security	0.950	0.977
High security (TWS)		0.977
Conveyance	0.950	0.870
General security	0.640	0.591
General security—meeting ACT shared reduction		
Supplementary water	0.140	0.377
Lowbidgee entitlement—Nimmie Caira net diversions	0.454	0.456
Lowbidgee entitlement—Redbank North diversions	0.336	0.172
Lowbidgee entitlement—Redbank South diversions (Yanga NP)	0.336	0.448
Unregulated		1.000

Murray (NSW)

Entitlement type	2011 factor	2018 updated factor—DRAFT
Domestic and stock	0.850	0.623
Local water utility	0.850	0.581
High security	0.950	0.873
Conveyance	0.784	0.918
General security	0.810	0.699
Supplementary water access	0.735	0.703
Unregulated		1.000

Lower Darling

Entitlement type	2011 factor	2018 updated factor—DRAFT
Domestic and stock	0.862	0.345
Local water utility	0.850	0.365
High security	0.838	0.734
General security	0.810	0.931
Use of inter-valley trade		

Issues requiring community feedback

The factors are currently in draft and are being finalised over the coming months. The NSW Government and the MDBA are seeking specific stakeholder feedback about two areas, and could consider any new information or evidence on these specific areas in finalising the factors. Information that could influence the factors needs to be technically robust to be included in the assumptions.

There are two elements of planning assumptions that the NSW government and the MDBA are seeking feedback on:

Estimates of supplementary and general security entitlements: The planning assumptions considered domestic and stock, local water security and high-security entitlements first, and then supplementary and general security entitlements. For supplementary access, long-run modelling estimates were used with the remaining water available for general security. Existing growth in use provisions apply first to supplementary access. Usage behaviour by supplementary and general security entitlements is linked, and this approach assumes that supplementary access will continue to occur opportunistically and will often substitute for general security usage. Feedback on this aspect of the method is invited.

Historical usage: The updated factors consider recent historical usage patterns (for some areas this includes information up to and including the 2016–17 water year). This recent data is considered to provide a good source for determining usage patterns for water resource plans. The NSW Government and the MDBA are seeking any stakeholder evidence that could be considered regarding historical usage.

Other issues identified

There is a range of other issues that have previously been identified by stakeholders and considered by the NSW Government and the MDBA in development of the updated factors. These issues are summarised below along with an explanation of their consideration in the updated factors



Impact on water entitlements

Stakeholders have raised concerns about the impact of these factors on water entitlements. The factors do not have any direct impact on water entitlements. The financial value of water entitlements is determined by the water market, which operates like any other free market. The factors simply provide a comparative mechanism in the accounting system to ensure water recovery has occurred as planned, and to guide any future water recovery required.



Impact on water allocations

Stakeholders have asked about water allocations and how these factors will be used by water managers in allocating water. There will be no direct impact on established water allocation policy and rules. Allocations occur through a different system—in NSW there are many legal requirements for allocating water. Allocations change according to rainfall, inflows into storages and how much water is in storage. Each Basin state has different processes for allocating water. These new factors simply provide a consistent mechanism within the accounting system to ensure water recovery has occurred as planned, and to guide any future water recovery required.



Changes to factors since 2011

Since 2011, feedback has consistently stated that the 2011 factors do not provide a complete and accurate basis for water recovery. Stakeholders have been concerned about consistency and the underpinning basis of some of the individual factors. Basin governments committed to reviewing the methodology and the assumptions used to develop the 2011 set of factors—the updated factors are a result of this agreed review process. The NSW Government and the MDBA are confident the updated set of factors are realistic and are understood to reflect the best available information for this purpose.



Changes to water recovery

Stakeholders have been asking for information on future water recovery plans. The factors agreed as part of this process will also be used to account for water recovered through efficiency projects, which aim to deliver 450 gigalitres to the environment by 2024, subject to having neutral or positive social and economic impacts.

The updated factors, if adopted, will affect the amount of water recovered against the targeted recovery in some catchments. There are a number of issues that will impact on future recovery, including the factors, the delivery of currently contracted water, and the outcomes of the efforts to recover further water.

The final outcome will be known closer to the deadline of June 2019, as state water resource plans are finalised, and recovery programs and projects are completed.



Climate change and drought

Some stakeholders want to know the impact of climate change on usage, and whether the Millennium drought has overly influenced the development of the factors. By considering a significant period, the assumptions include extreme weather events and normal conditions. The planning assumptions have considered over one hundred years of climatic data, including both the driest and wettest periods on record. In the future, water allocations will provide the flexibility to manage changing climate and rainfall patterns.



Business decisions

There has been recent media coverage regarding the potential impact of these updated factors on the water market and decisions made by financial institutions. LTDLE factors are not designed for valuation purposes and banks, financial advisors and water brokers should consider many sources of information when assessing the financial value of individual entitlements.

The water market operates across the Murray–Darling Basin, and value is determined by market forces. Factors simply provide a consistent accounting system to ensure water recovery by the Commonwealth has occurred as planned and to guide any future water recovery required. More information is available in a [statement from the MDBA](#).



Water resource plans

Stakeholders want to know how the updated factors relate to the development of water resource plans. These plans are a key requirement of the Basin Plan and bring the new water accounting system into force at a local level. The plans need to be accredited by the Commonwealth minister responsible for water by June 2019. In NSW, water sharing plans will remain in place and form a component of a wider-reaching water resource plan to implement the Basin Plan requirements.

Currently, in NSW, water resource plans are in various stages of development and community consultation is occurring primarily through the stakeholder advisory panels. Panel members include representatives from NSW government agencies, water users, environmental interest groups, Aboriginal communities and local councils.

The assumptions associated with the updated factors will be included in the water resource plans, which will be finalised through accreditation occurring plan by plan through to June 2019.

Submissions and next steps

The NSW Government is seeking submissions on the updated factors. The assumptions associated with these factors will be included in the water resource plans for each NSW area, and the factors will be used to determine whether the water recovery target has been met for the area.

The NSW Government is particularly looking for feedback on certain aspects of the method used to determine these factors (see section 5). Written submissions can be made until **17 July 2018** via the [Department of Industry- Water website](#).

This consultation paper and the associated technical report will be available on the MDBA and NSW Department of Industry website for the duration of the consultation process. Submissions will be private, and following the consultation period, NSW will publish a response document covering major themes and emergent issues.

This paper provides information on some of the issues already identified by stakeholders (see section 6). Through the submissions process, the New South Wales Government is interested in hearing from stakeholders about any other issues that haven't already been identified

Make a submission to the New South Wales Government on updated factors at <https://www.nsw.gov.au/improving-nsw/have-your-say/release-of-amended-cap-factors>.