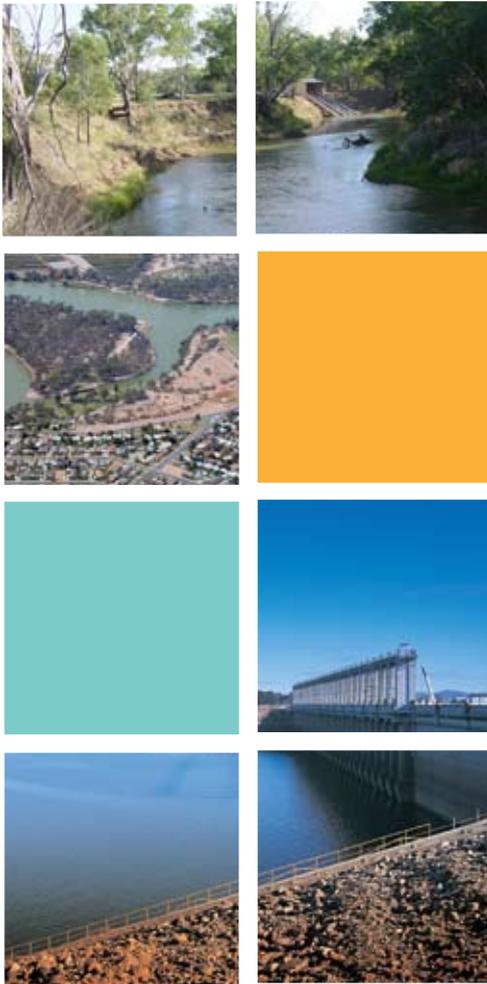


Water availability in New South Wales

Murray-Darling Basin regulated rivers



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1 Introduction

The following report provides the best available information on current water reliability for NSW river valleys in the Murray-Darling Basin. Information is provided to inform water users and water managers.

The *Water Management Act 2000* (WMA 2000) establishes the rules and/or guidelines under which the water is to be shared between water users and the environment where a water sharing plan is in place. The Department of Water and Energy (DWE) is responsible for sharing the available water between all water users including basic rights, domestic and stock, town water supply, environmental and irrigation water users. The water sharing plans detail the water access and trading rules to meet the requirements of the Act for each river valley. Water sharing plans for the major valleys of the Murray-Darling Basin commenced in 2004.

The water sharing plans give details of the environmental water provisions, basic landholder rights, share components for each licence category including access conditions and establish the process for determining long term availability of water for extraction. Water users with access licences (high security, general security and supplementary) have a water entitlement or share of the available water resources in a valley or water source. However, the amount of water available from year to year will vary depending on the climatic conditions, sharing rules and previous years' water management decisions.

DWE has developed valley-scale hydrologic models for the regulated rivers that can be configured with a fixed level of irrigation development and management, and can use the observed climate data for around the last 115 years (varies from valley to valley) to simulate the allocation and use of water. The information on long term water availability included in this report was obtained from the computer models used to support the development and auditing of water sharing plans (i.e. water availability as if the water sharing plans had been in place since the 1890s). Appendix A lists the model files used for this study.

It is important to be aware that updates to the computer models will happen from time to time due to improved understanding of processes or better data becoming available. Future updates to the models will see the information contained within this report change (see below disclaimer).

The information included in this report utilises more recent climate, hydrologic and infrastructure data available since the work for the water sharing plans was undertaken up to 2004 and these model results will therefore differ from those made available during the development of the water sharing plans.

The available water in each valley can be presented in a number of ways. The following section of the report discusses these matters.

1.1 Disclaimer

The NSW Government does not guarantee that information generated from these models is current nor does it guarantee that the model processes are free from corruption or error. Data has been

collated and models developed to best understand major water resource management practice and assist DWE in managing NSW water resources. Models are continually being updated.

Users are cautioned to consider carefully the information contained in this report before using it for decisions that concern personal or public safety or the conduct of business that involves substantial monetary or operational consequences. If users are uncertain about the information contained in the report it is recommended they discuss use of the information with DWE.

2 Water availability

2.1 Concepts and measures

There are a few concepts and measures worth describing before data is presented. These are as follows.

2.1.1 Types of water available

There are a range of categories for water access licences (under WMA 2000). In this report the three categories being discussed are regulated river (high security), regulated river (general security) and supplementary water. Town water needs, domestic and stock have the highest priority of the licence categories. The following broadly describes the next three categories:

- Regulated river (high security) – have priority over the below access licences. High security entitlements cannot carryover water from one year to the next, but must be allocated water to a level specified in the respective water sharing plan prior to general security water being made available in each year
- Regulated river (general security) – have next priority in access licences and form the bulk of water supplied to irrigators in NSW
- Supplementary water – have lowest priority of access of the three listed categories. In reporting the availability of supplementary water, consideration has been given to whether the total volume of the supplementary / high flow event should be used, or the simulated diversions of such water. The estimated volume of water diverted includes the ability of licensed infrastructure to actually capture such flows, whereas the volume of the total flow event may well represent flood waters that are too large or too quick to be accessed by existing infrastructure. The volume of water diverted also reflects the impact of share limits and other environmental restrictions to access during specific events. Accordingly, this report uses simulated diversion of supplementary flows as the primary measure of availability.

2.1.2 General security irrigator accounts and available water determinations

In the WMA 2000 framework, general security (GS) irrigators have water access “shares”. Available water determinations (AWD) are made by DWE at the start of each water year (see later discussion on annual and continuous accounting) and from time to time during the year announcing the amount of water available for use in terms of mega litres per share (ML/share). The total number of shares held by an irrigator multiplied by the ML/share announced gives the volume of water credited to that licensee’s account.

As additional water becomes available new AWD announcements are made thus adding to the irrigator’s account. The new announced AWD (annual accounting) or the sum of AWD in a season/water year (continuous accounting) provides the additional total amount of water made available to water users in that season/water year. This water is on top of any that they may have already had from previous years.

2.1.3 Water account management

The maximum possible balance in a water account is determined by the valley's water sharing plan (WSP) and the minimum balance in any account is zero. When water is diverted (or ordered in valleys running water order debit systems) the account is debited by the amount diverted/ordered.

Diversions/orders are limited by the balance in the account. Water users are allowed to trade water in their accounts (previously known as "temporary trade") and to trade their water shares (previously known as "permanent trade"). A trade of account water in adds to a user's account, and a trade of account water out reduces the account. However, if a trade only increases the number of shares the water in the user's account does not increase until the next AWD is made.

Some valleys have a seasonal maximum usage limit per unit share as prescribed in their respective water sharing plan. This limits the maximum amount of water that can be used by a particular water licence in a water year.

2.1.4 Annual and continuous accounting

Accounts in each valley are kept using either annual accounting or continuous accounting methods. In annual accounting systems an initial AWD is made at the start of the water year and may increase during the water year. Account balances may be reset to zero at the end of the water year, however, in some valleys there are carry over provisions that allow for some of the account water to be carried over from one water year to the next. Some valleys have a maximum amount that can be carried over from one water year to the next water year. In continuous accounting systems, in effect, there is no re-setting of account balances and the account balance continues from year to year with incremental AWD announcements made as and when new dam inflows happen.

In all valleys the water year is from 1 July to 30 June. The carryover limit, if relevant, determines the amount in an irrigator's account on 30 June that can be taken over to 1 July. If there is no provision for carryover from one year to the next then any unused water is forfeited and becomes a pooled resource which is reallocated at the start of the next water year.

Some valleys maintain carried over water in a different sub-account to water made available through the season's AWDs. This allows rules such as using carryover water first to be implemented.

2.1.5 Available water

Available water (AW) is the sum of the AWDs (continuous accounting) or new announced AWD (annual accounting) made during the water year. This measure has the following attributes:

- Indicative of extra resources made available within the water year
- Relatively unaffected by carryover decisions that are part of farmer behaviour.

The available water determinations may be expressed at a particular point in a water year or at the end of the water year to show the total water available in the water year or at a representative point in the years informative for planting decisions.

2.1.6 Effective available water

Effective available water (AEW) is the account balance at the start of the water year plus the sum of AWD during the year. This measure has the following attributes:

- Indicative of total resources available in the irrigator's account during the water year
- Includes any resources carried over from previous season.

Note: this will result in apparent double counting as carried over water would have been counted as an AWD increment in the previous water year. Therefore, reliability measures based on this would tend to appear higher than expected. However, this provides a clearer indication of the effect of the rules prescribed in the respective water sharing plan, on long-term water availability.

Effective available water can also be expressed at any point during a water year.

2.1.7 Reliability measures

There are a number of ways the reliability of the water users can be expressed using the above types of water availability measures

2.1.7.1 Percent of time full entitlement is available

This measure is the percentage of years the maximum AWD is achieved by a specific date in the water year. For example, the percentage of years that the cumulative AWD of 100 per cent (i.e. full entitlement) is achieved by January.

2.1.7.2 Average available water

This measure is the long term average AW/AEW at a date in the water year.

2.1.7.3 Average annual use

The long term average annual extractions divided by the sum of the issued shares.

2.1.8 Period of simulation

The information detailed in this report was derived from hydrologic models that simulated the operation of the system over the longest historical climatic sequence available. The climatic sequences used for the modelling results presented in this report were:

- Murrumbidgee Valley – 1892 to 2008
- Lachlan Valley – 1898 to 2008
- Macquarie Valley – 1892 to 2008
- Peel Valley – 1892 to 2008
- Namoi Valley – 1892 to 2008
- Border Rivers – 1892 to 2006
- Gwydir Valley – 1892 to 2008
- Murray Valley – 1891 to 2008
- Lower Darling – 1891 to 2008.

2.1.9 Development levels

2.1.9.1 Plan limit scenario

The results presented in this report represent the water sharing plan management rules with the latest cropping and farm infrastructure information available. Therefore, these results may vary from those presented at the time of gazetting water sharing plans. The following yearly development conditions apply for the results presented in this report:

- Border Rivers: 2001-02
- Gwydir Valley: 2002-03
- Namoi Valley: 2003-04
- Peel Valley: 2002/03
- Macquarie Valley: 1999-2000 (no change since original WSP modelling)
- Lachlan Valley: 1999-2000 (no change since original WSP modelling)
- Murrumbidgee Valley: 1999-2000 (no change since original WSP modelling)
- Murray Valley: 1999-2000 (no change since original WSP modelling)
- Lower Darling: 1999-2000 (no change since original WSP modelling).

2.1.9.2 Ultimate development scenario

Under programs such as The Living Murray (TLM) long term extraction factors were derived to convert actual entitlement to an equivalent long term annual extraction limit equivalent volume. In some other areas these factors have been used to value access licences.

Under the TLM definition the long term extraction factor is a measure of the long term average annual usage of a particular type of entitlement at the “ultimate development” scenario. It is calculated based on average usage for that category divided by the entitlement for that category under the scenario. This ultimate development scenario assumes full activation of the high security products. The important issues in the definition are:

- Full activation of high security entitlements
- Factors are assigned progressively from the highest priority entitlement down to the lowest priority entitlement until the total extraction is equal to that defined by the water sharing plan scenario modelled
- These factors do not reflect the current effective available water the available water resources under the plan limit scenario.

These long term extraction factors are closely analogous to the average annual percentage use of entitlement under plan limit scenario but represent what could happen to the water availability under ultimate development.

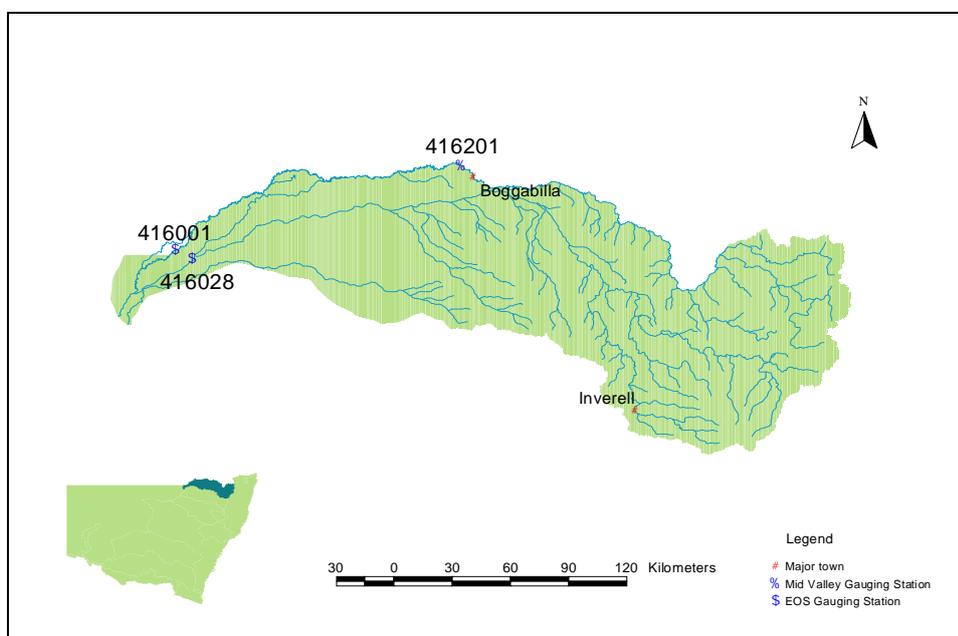
3 Water availability valley by valley

The previous section discussed the concepts and measures. The following section provides more specific information on water availability for each reported valleys.

3.1 NSW Border Rivers

The NSW Border Rivers Regulated River Valley is supplied by Glenlyon Dam (shared with Queensland) and Pindari Dam (NSW only) and includes the Dumaresq River downstream from the Pike Creek junction, and the Macintyre River downstream of Pindari Dam. NSW general security access licences have entitlement to a maximum of 264,411 ML and supplementary water access has an annual cap of 120,000 ML.

Figure 3.1 Location map of the NSW Border Rivers Regulated River Valley



At the time this report was prepared the water sharing plan for the NSW Border Rivers had not yet commenced. The Intergovernment Agreement between NSW and Queensland (2009) outlines sharing arrangements between the states and which are reflected in the draft Border Rivers water sharing plan that will be gazetted soon.

As such supplementary licences have not been issued. However off-allocation access (i.e. the same as supplementary access) is granted to general security users. Upon making of the water sharing plan, supplementary access will be separated from general security entitlements, and separate entitlements issued. Access to water from all entitlements will vary from year to year depending on climatic conditions and water availability.

A continuous accounting system operates for the NSW Border Rivers allowing general security users to accrue water in their accounts up to 100 per cent of entitlement (264,411 ML). The maximum usage (including trade out) in any year is 1.0 ML per unit share (264,411 ML).

Each general security user has in effect two classes of entitlement. An A class licence of 60 ML and a B class licence of varying size from individual to individual. Available water for general security users is allocated to A class first. Remain available water is then allocated to B class. This arrangement is unique to the NSW Border Rivers and provides a means of equally distributing water to all general security users in very dry times.

There are no special carryover accounts or limits. The only transition that occurs on 1 July is that the annual usage is reset to zero. Table 3.1 summarises water availability.

Table 3.1 Reliability / water availability – NSW Border Rivers Regulated River

Reliability Measure	High Security	General Security	Supplementary
Plan Limit Scenario			
Percentage of time full entitlement is available at start of water year (1 July)	100%	0%	-
Percentage of time full entitlement is available end of water year (30 June)	100%	10%	-
Average effective available water on 1 July	100%	34%	-
Average effective available water on 30 June	100%	77%	-
Average annual percentage of the entitlement used (rounded to 5%)		40%	70% (1)
Ultimate Development Scenario			
Long term extraction factor	0.95	0.43	0.63 (1)

(1) No supplementary entitlements issues, percentage of annual cap used

Figure 3.2 shows the frequency of the water estimated to be available each year of the 115 years from the Border Rivers model. Because of the continuous accounting system in the NSW Border Rivers Regulated River the figure shows effective available water (carry over plus annual AWD incremental water). Actual access to the effective available water will be governed by annual water use limits, current development and current on-farm water management practices. Figure 3.3 shows the frequency of supplementary water extractions.

Figure 3.2 NSW Border Rivers Regulated River – frequency of general security water available

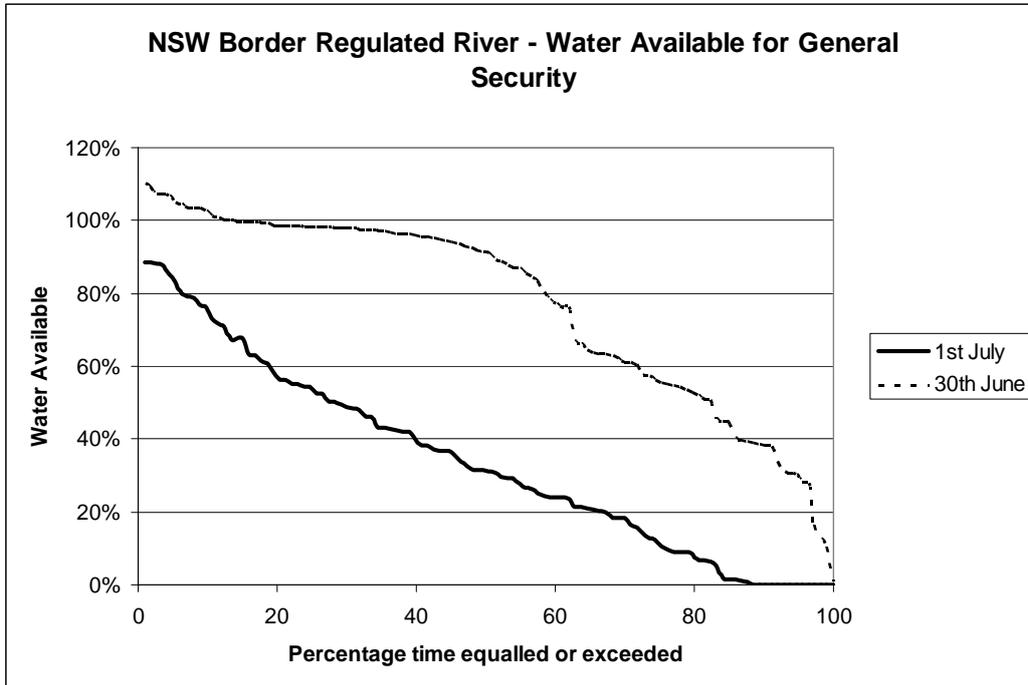
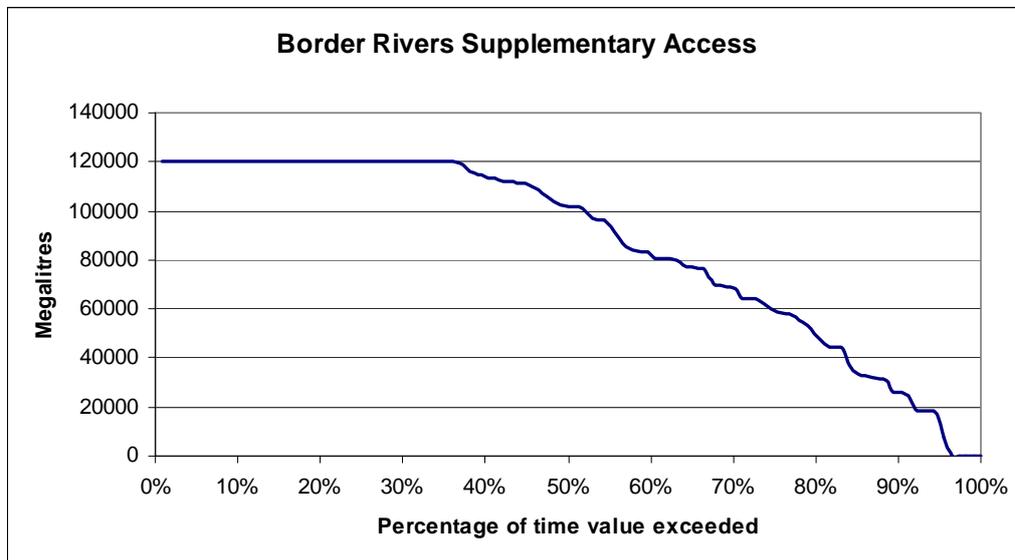


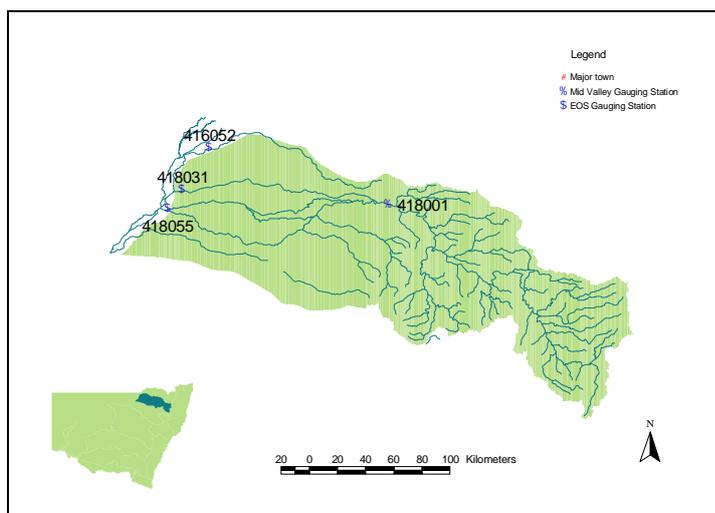
Figure 3.3 NSW Border Rivers Regulated River – frequency of supplementary water available



3.2 Gwydir Valley

The Gwydir Regulated River Valley is the Gwydir River downstream of Copeton Dam to the junction of the Gwydir River and its effluents with the Barwon River (see Appendix 1 of water sharing plan for exact location). The water sharing plan outlines that general security access licences have entitlement to about 509,500 ML and supplementary licences entitlement to 178,000 ML. Access to entitlement will vary from year to year depending on climatic conditions and water availability.

Figure 3.4 Location map of the Gwydir Regulated River Valley



.A continuous accounting system is in place for general security irrigators. The maximum volume of water that can be held in an account is 1.5 ML per unit share (764,250 ML). In a continuous accounting system carryover is unlimited (effectively limited by maximum account limit) and is determined from the combination of maximum account balance and yearly water use. The maximum usage (including trade) in any year is 1.25 ML per unit share (636,875 ML) and, for three consecutive years 3.0 ML per unit share. Table 3.2 summarises water availability.

Table 3.2 Reliability / water availability – Gwydir Regulated River

Reliability Measure	High Security	General Security	Supplementary
Plan Limit Scenario			
Percentage of time full entitlement is available at start of water year (1 July)	100%	21%	-
Percentage of time full entitlement is available at end of water year (30 June)	100%	41%	-
Average effective available water on 1 July	100%	45%	-
Average cumulative AWD for water year	100%	38%	-
Average annual percentage of the entitlement used (rounded to 5%)	-	40%	55%
Ultimate Development Scenario			
Long term extraction factor	0.95	0.41	0.43

Figure 3.5 shows the frequency of general security water availability from the Gwydir Valley model. Because of the continuous accounting system in the Gwydir Regulated River the figure shows effective available water (carry over plus annual AWD water). Access to the effective available water will be governed by annual water use limits, current development and assumptions on current on-farm water management practices. Figure 3.6 shows the frequency of supplementary water extractions.

Figure 3.5 Gwydir Regulated River – frequency of general security water available

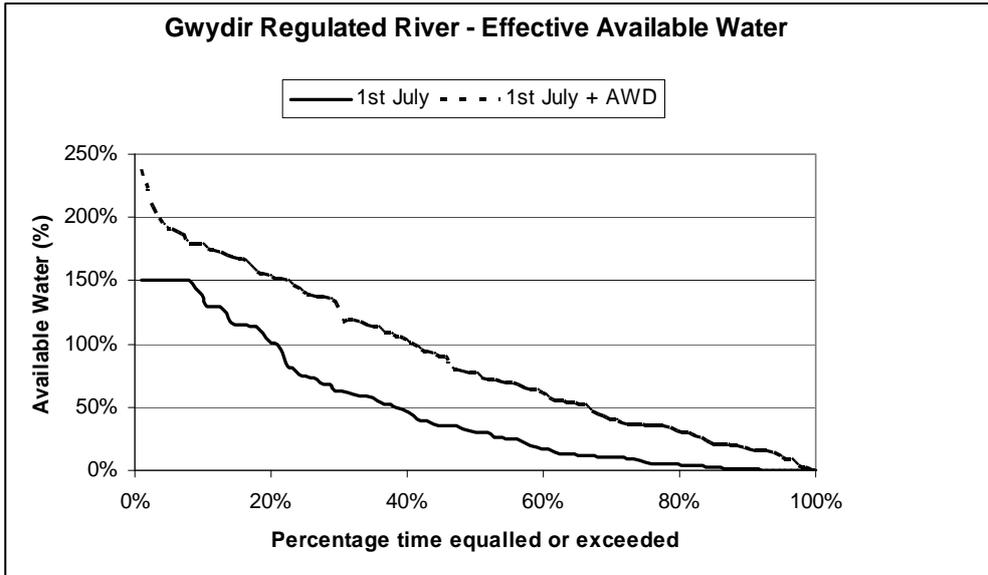
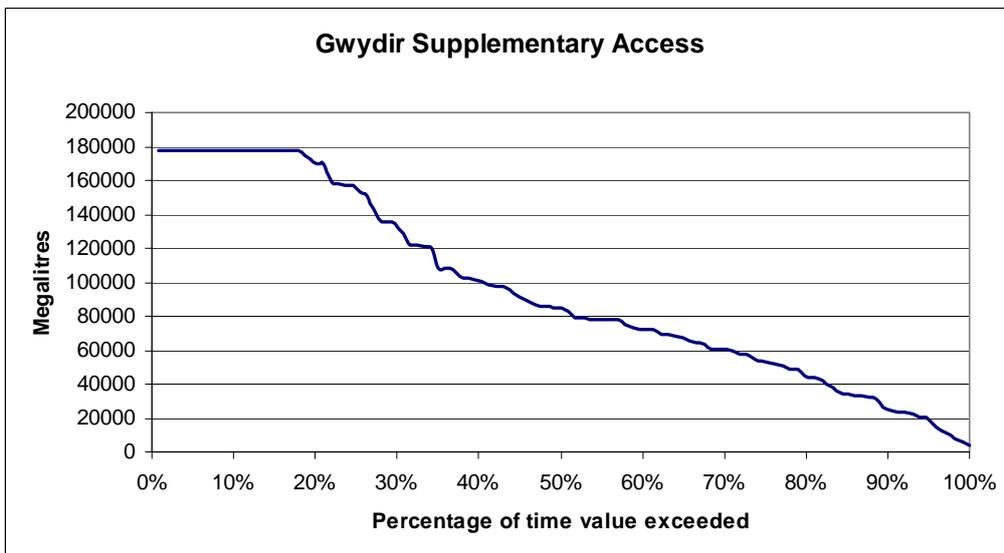


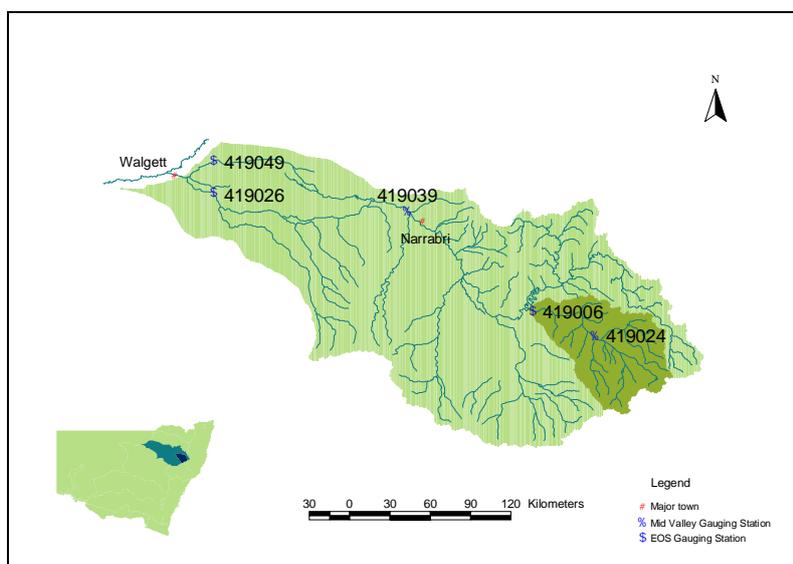
Figure 3.6 Gwydir Regulated River – frequency of supplementary water available



3.3 Namoi / Peel Valley

The Namoi Regulated River Valley is the Manilla River between Split Rock Dam and Keepit Dam and the Namoi River downstream of Keepit Dam to the junction of the Namoi River and the Barwon River (see Appendix 1 of water sharing plan for exact location). The Namoi Regulated River water sharing plan estimates that general security access licences have entitlement to about 256,400 ML and supplementary water access licences have entitlement to 115,000 ML. Access to entitlement will vary from year to year depending on climatic conditions and water availability.

Figure 3.7 Location map of the Namoi Regulated River Valley



The Peel Regulated River Valley is the Peel River between Chaffey Dam and the junction of the Namoi River. The system also includes the Tamworth water supply dam at Dungowan. General security access licences have entitlement to about 30,900 ML and Tamworth City Council has a high security access licence with an entitlement of 16,400 ML.

The Namoi and Peel Valleys operate differently; a water sharing plan has been implemented for the Namoi Valley but not yet the Peel Valley. The Peel Valley has an annual accounting system with no carryover and the maximum allocation is 100 per cent.

A continuous accounting system is used in the Namoi Valley for general security irrigators. The maximum that may be held in an account is 2.0 ML per unit share (512,800 ML). The amount carried over from year to the next is unlimited (maximum account balance effectively limits carryover volumes). The maximum usage (including trade) in any season is 1.25 ML per unit share (320,500 ML). The maximum water use over any 3 consecutive years is 3.0 ML per unit share. Tables 3.3 and 3.4 summarise water availability.

Under the Namoi Regulated River water sharing plan any growth in Tamworth City Council extractions above the Cap baseline is to be 95 per cent assigned to the Namoi Regulated River. Assessment of

long term extraction factors for the Namoi and Peel Valleys under ultimate development conditions have activated this sharing of growth and are reflected in the following tables.

Table 3.3 Reliability / water availability – Namoi Regulated River

Reliability Measure	High Security	General Security	Supplementary
Plan Limit Scenario			
Percentage of time full entitlement is available at start of water year (1 July)	100%	50%	-
Percentage of time full entitlement is available at end of water year (30 June)	100%	84%	-
Average effective available water on 1 July	100%	95%	-
Average cumulative AWD for water year	100%	76%	-
Average annual percentage of the entitlement used (rounded to 5%)	-	80%	30%
Ultimate Development Scenario			
Long term extraction factor	0.95	0.76	0.18

Table 3.4 Reliability / water availability – Peel Regulated River

	High Security	General Security	Supplementary
Plan Limit Scenario			
Percentage of time full entitlement is available at start of water year (1 July)	100%	0%	-
Percentage of time full entitlement is available at end of water year (30 June)	100%	10%	-
Average available water on 1 July	100%	64%	-
Average available water on 30 June	100%	91%	-
Average annual percentage of the entitlement used (rounded to 5%)		20%	
Ultimate Development Scenario			
Long term extraction factor	0.95	0.2	

Figure 3.8 shows the frequency of Namoi Valley general security water availability from the Namoi Valley model. Because of the continuous accounting system in the Namoi Regulated River the figure shows effective available water (carry over plus annual AWD water). Access to the effective available water will be governed by annual water use limits, current development and current on-farm water management practices. Figure 3.9 summarises Namoi supplementary water extractions. Figure 3.10 shows the frequency of Peel Valley general security water availability from the Peel Valley model.

Figure 3.8 Namoi Regulated River – frequency of general security water available

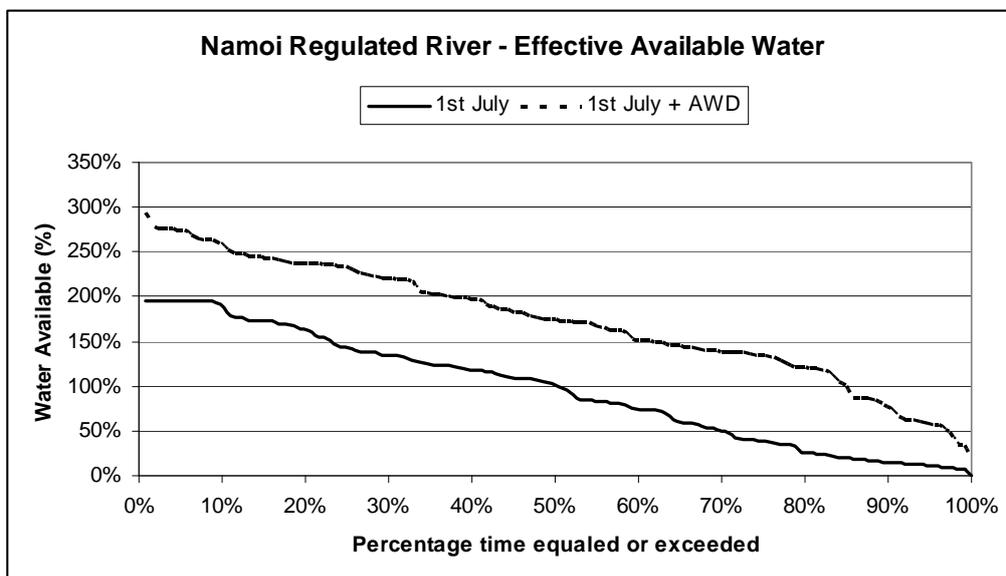


Figure 3.9 Namoi Regulated River – frequency of supplementary water available

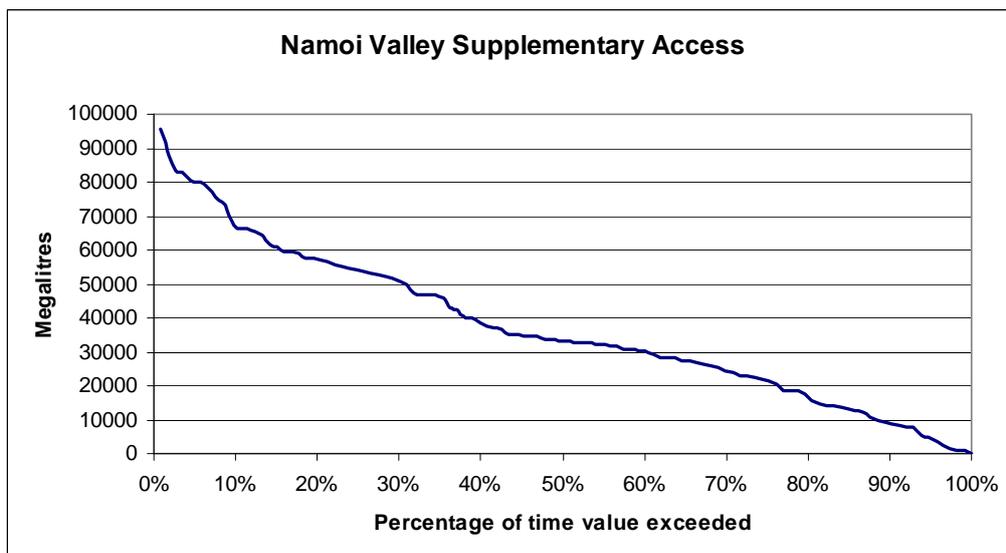
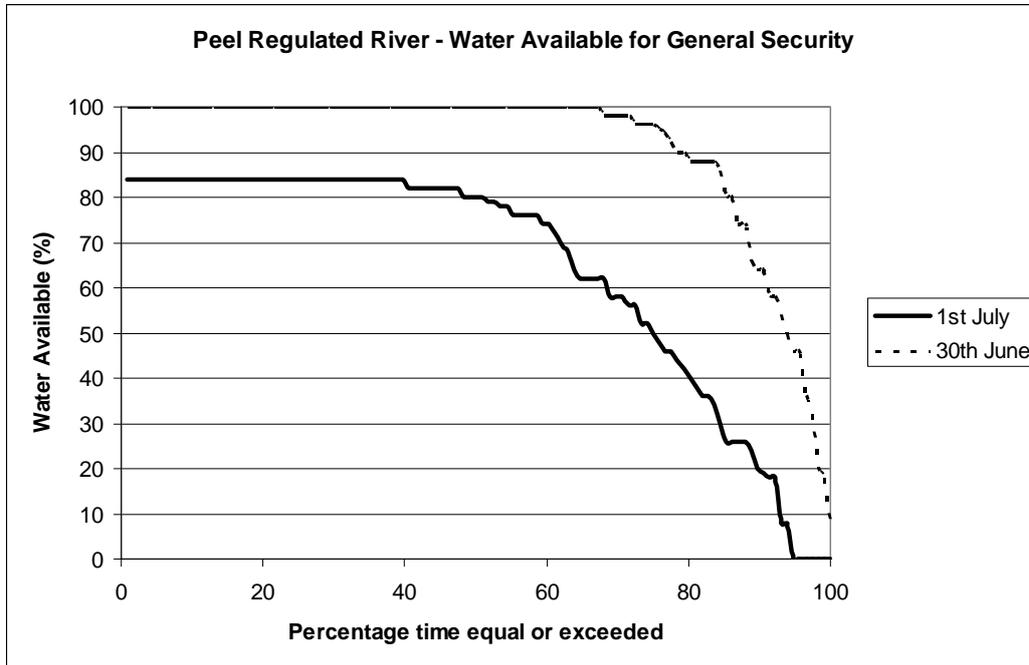


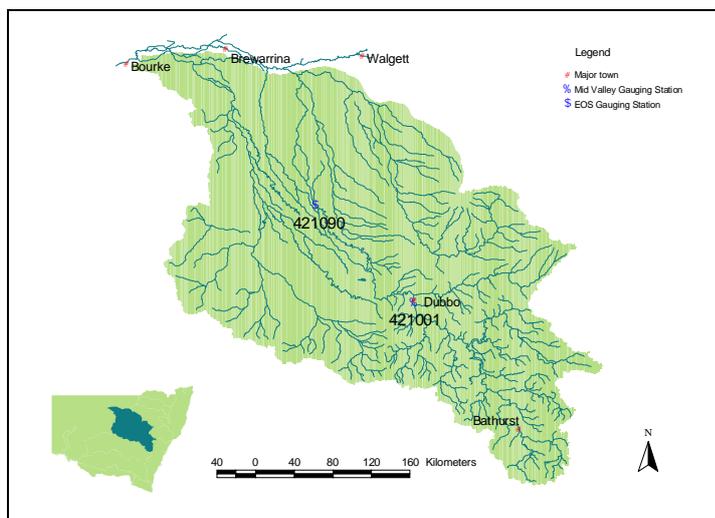
Figure 3.10 Peel Regulated River – frequency of general security water available



3.4 Macquarie Valley

The Macquarie Regulated River Valley is the Cudgegong River between Windamere Dam and Burrendong Dam and the Macquarie River downstream of Burrendong Dam to the Macquarie Marshes (see Appendix 1 of water sharing plan for exact location). The water sharing plan estimates that general security access licences have entitlement to about 632,400 ML, supplementary water access licences 50,000 ML and High Security 19,400 ML. Access to entitlement will vary from year to year depending on climatic conditions and water availability.

Figure 3.11 Location map of the Macquarie Regulated River Valley



An annual accounting system is in place for general security irrigators. The maximum that can be carried over is 1.0 ML per unit share (with some variation in the Cudgegong regulated system). Whenever Windamere Dam is spilling and Burrendong Dam is in the flood mitigation zone carryover accounts are in affect set to zero and the general security access account is re-set, therefore annual use limits can exceed 1.0 ML/share (632,400 ML). Table 3.5 summarises water availability.

Table 3.5 Reliability / water availability – Macquarie Regulated River

Reliability Measure	High Security	General Security	Supplementary
Plan Limit Scenario			
Percentage of time full entitlement is available at start of water year (1 July)	100%	22%	-
Percentage of time full entitlement is available at end of water year (30 June)	100%	42%	-
Average effective available water on 1 July	100%	49%	-
Average effective available water on 30 June	100%	77%	-
Average annual percentage of the entitlement used (rounded to 5%)	25%	50%	60%
Ultimate Development Scenario			
Long term extraction factor	0.95	0.53	0.0

Figure 3.12 shows the frequency of general security water availability from the Macquarie Valley model. Because of the annual accounting with carryover in the Macquarie Regulated River the figure shows effective available water (carry over plus annual AWD water). Access to the effective available water will be governed by annual water use limits, current development and current on-farm water management practices. Figure 3.13 summarises the frequency of supplementary water extractions.

Figure 3.12 Macquarie Regulated River – frequency of general security water available

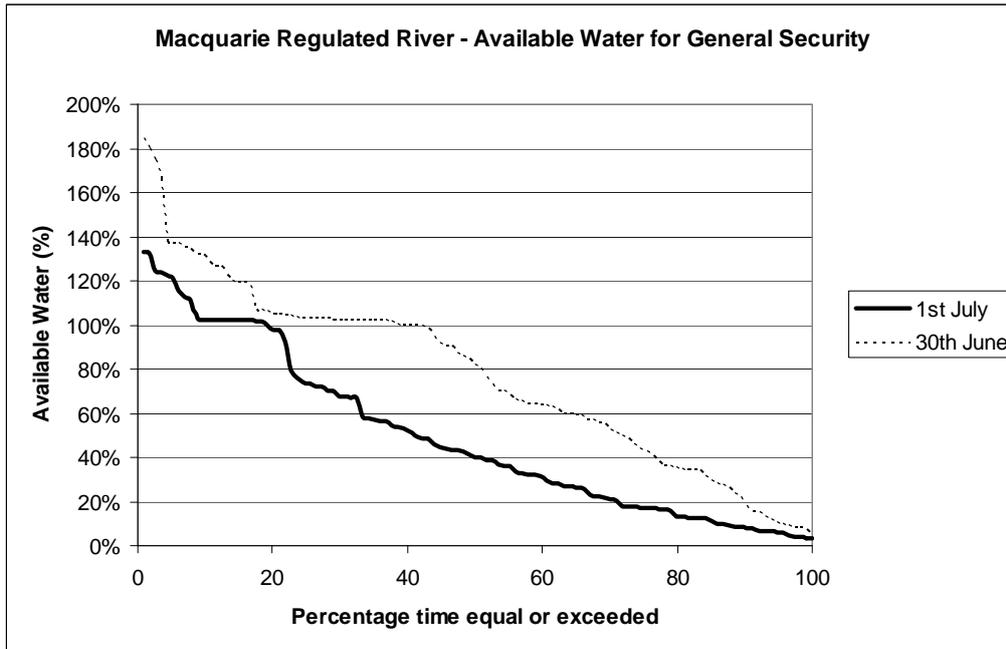
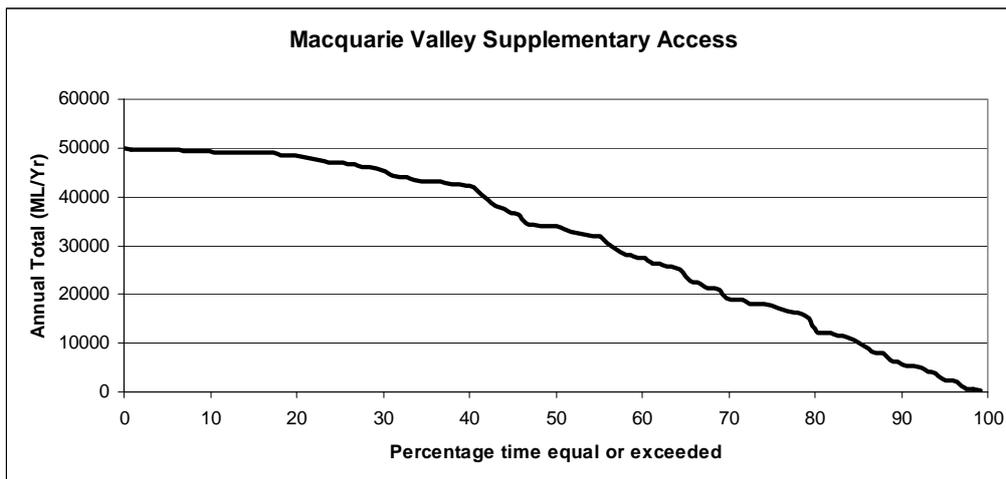


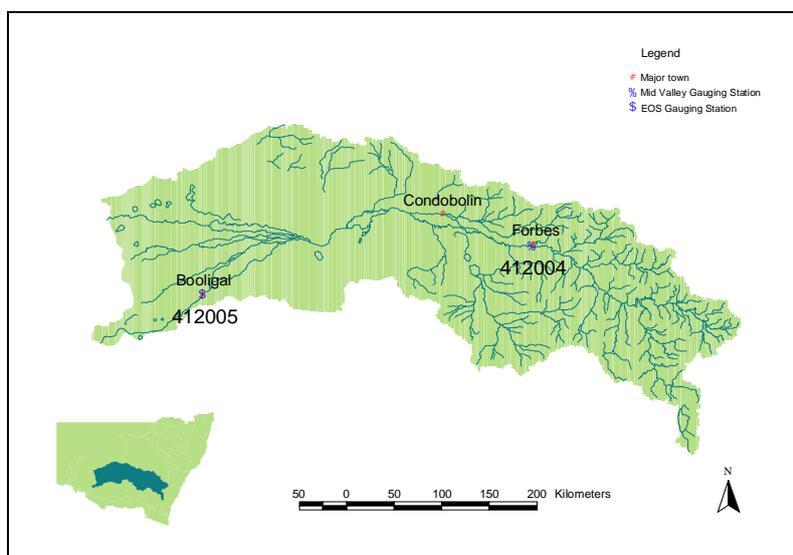
Figure 3.13 Macquarie Regulated River – frequency of supplementary water available



3.5 Lachlan Valley

The Lachlan Regulated River Valley is the Lachlan River downstream of Wyangala Dam to the junction of the Lachlan River with the Murrumbidgee River (see Appendix 1 of water sharing plan for exact location). The water sharing plan estimates that general security access licences have entitlement to about 592,800 ML and high security 26,500 ML. No supplementary access licences exist for the Lachlan regulated river. Access to entitlement will vary from year to year depending on climatic conditions and water availability.

Figure 3.14 Location map of the Lachlan Regulated River Valley



The Lachlan Valley water sharing plan outlines a continuous accounting system for general security irrigators that have not been implemented yet (management under the water sharing plan rules has not been implemented because of new record drought conditions). The Lachlan is therefore currently modelled as an annual accounting system with zero carryover and a maximum AWD of 75 per cent (444,600 ML). The model results adequately represent the gross valley numbers such as available water.

The total general security accounts cannot exceed 2.0 ML per unit share (1,185,600 ML). When Wyangala Dam, Lake Brewster and Lake Cargelligo are full all accounts are set to zero and a new AWD determination takes place.

At the time of preparing this document the Lachlan was still experiencing new record drought conditions. As such the hydrologic model for the river system had not been updated for the new record low inflow sequence. The results in the tables and diagrams below therefore do not reflect the impact of the new drought of record. Table 3.6 summarises water availability.

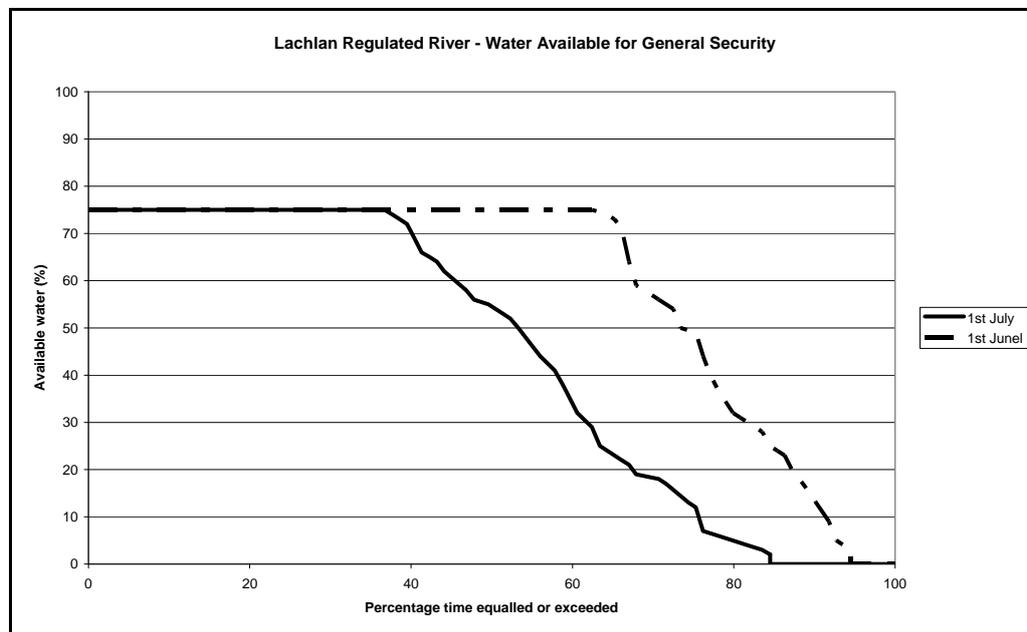
Table 3.6 Reliability / water availability – Lachlan Regulated River

	High Security	General Security	Supplementary
Plan Limit Scenario			
Percentage of time full entitlement is available at start of water year (at 1 July)	100%	37%	-
Percentage of time full entitlement is available end of water year (1 June)	100%	61%	-
Average available water on 1 July	100%*	45%	-
Average available water on 1 June	100%	60%	-
Average annual percentage of the entitlement used (rounded to 5%)	35%	50%	
Ultimate Development Scenario			
Long term extraction factor	0.97	0.42	

*Note – Current drought management practices have resulted in partial supplies to high security users being made to allow some limited access to water for general security water users.

Figure 3.15 shows the frequency of general security water availability from the Lachlan Valley model. Access to the effective available water will be governed by annual water use limits, current development and on-farm water management practices.

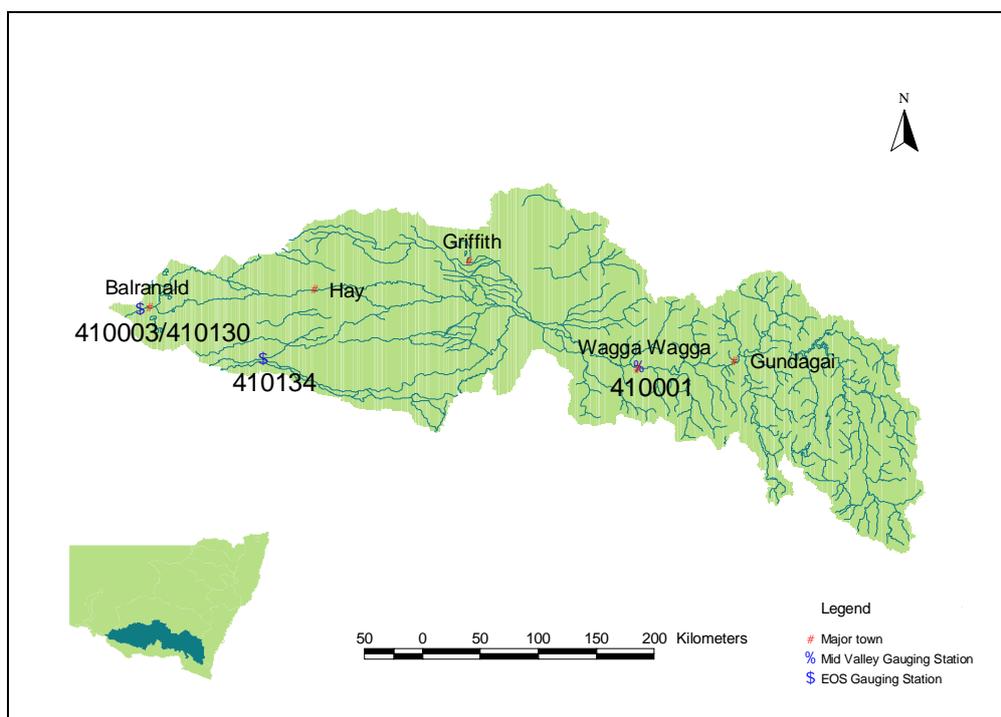
Figure 3.15 Lachlan Regulated River – frequency of general security water available



3.6 Murrumbidgee Valley

The Murrumbidgee Regulated River Valley is the Murrumbidgee River downstream of Burrinjuck and Blowering Dams to the junction of the Murrumbidgee River with the Murray River and the junction of the Billabong system with the Edward-Wakool system (see Appendix 1 of water sharing plan for exact location). The water sharing plan estimates that general security access licences have entitlement to about 2,043,400 ML, supplementary 220,000 ML and high security 365,000 ML. Access to entitlement will vary from year to year depending on climatic conditions and water availability.

Figure 3.16 Location map of the Murrumbidgee Regulated River Valley



The Murrumbidgee Valley has an annual accounting system for GS irrigators. The maximum carryover is 0.15 ML per unit share (306,510 ML). The maximum that a general security account can be credited in a year is 1.0 ML/share (2,043,400 ML) minus what is carried over from the previous year. The maximum AWD in a season is 1.0 ML per unit share (2,043,400 ML).

At the time of preparing this document the Murrumbidgee was still experiencing new record drought conditions. As such the hydrologic model for the river system had not been updated for the new record low inflow sequence. The results in the tables and diagrams below therefore do not reflect the impact of the new drought of record. Table 3.7 summarises water availability.

Table 3.7 Reliability / water availability – Murrumbidgee Regulated River

	High Security	General Security	Supplementary
Plan Limit Scenario			
Percentage of time full entitlement is available at start of water year (1 July)	2%	2%	-
Percentage of time full entitlement is available at end of water year (30 June)	95%	50%	-
Average effective available water on 1 July	95%	61%	-
Average effective available water on 1 June	98%	87%	-
Average annual percentage of the entitlement used (rounded to 5%)	90%	60%	50%
Ultimate Development Scenario			
Long term extraction factor	0.92	0.63	0.16

Figure 3.17 shows the frequency of general security water availability. Because of the annual accounting with carryover in the Murrumbidgee Regulated River the figure shows effective available water. Access to the effective available water will be governed by annual water use limits, current development and on-farm water management practices. Figure 3.18 summarises the supplementary water extractions.

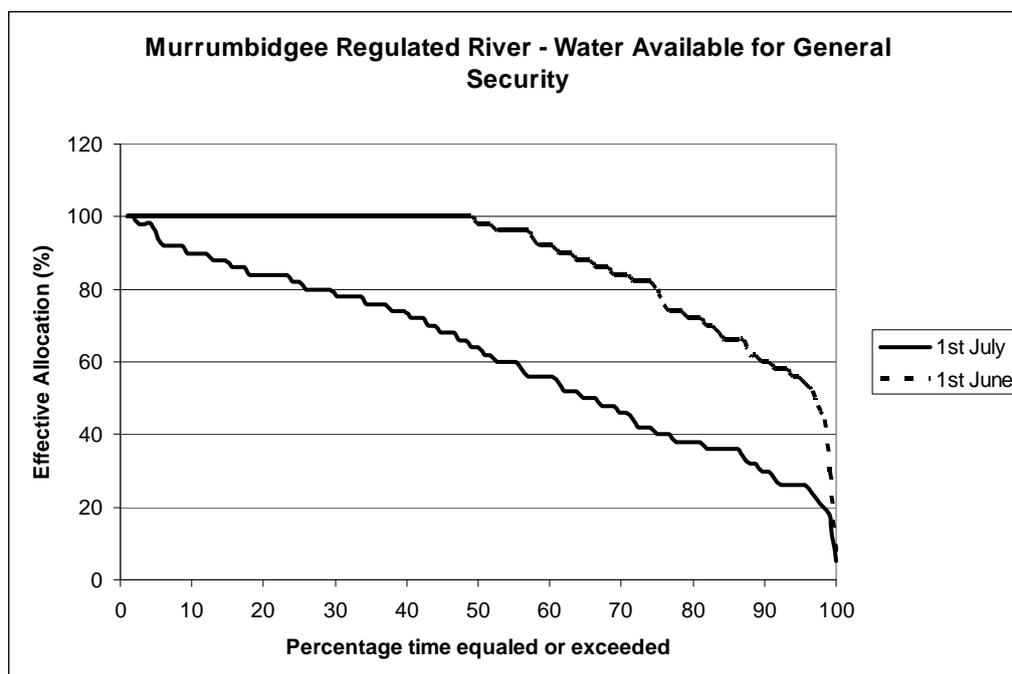
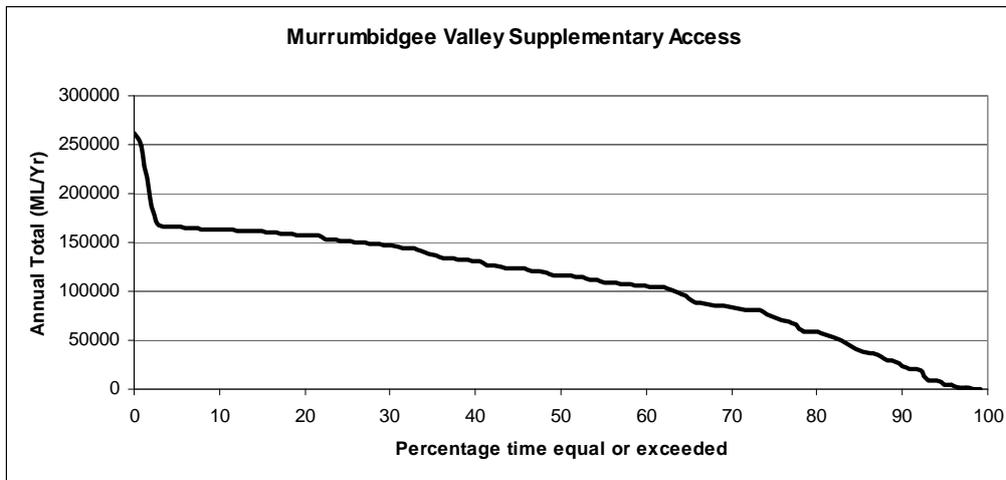
Figure 3.17 Murrumbidgee Regulated River – frequency of general security water available

Figure 3.18 Murrumbidgee Regulated River – frequency of supplementary water available



3.7 NSW Murray Valley and Lower Darling

The Murray Regulated River Valley is the Murray River downstream of Hume Dam to the South Australian border (including Wentworth Weir pool on the Lower Darling River; and Lower Darling River downstream of Lake Wetherell to the Wentworth Weir Pool.

The water sharing plan estimates that general security access licences have entitlement to about 1,670,500 ML (Murray) and 30,300 ML (Lower Darling) and supplementary water access licences have entitlement to 250,000 ML (Murray) and high security 198,000 ML (Murray). Access to entitlement will vary from year to year depending on climatic conditions and water availability. The Murray Regulated River operates under an annual accounting system access to water can increase as the water year progresses.

At the time of preparing this document the Murray and Lower Darling were still experiencing new record drought conditions. As such the hydrologic model for the river system had not been updated for the new record low inflow sequence. The results in the tables and diagrams below therefore do not reflect the impact of the new drought of record.

Figure 3.19 shows the frequency of water available and Table 3.8 provides a summary for the Murray Regulated River.

Table 3.8 Reliability / water availability - Murray Regulated River

	High Security	General Security	Supplementary
Plan Limit Scenario			
Percentage of time full entitlement is available at start of water year (1 July)	9%	9%	-
Percentage of time full entitlement is available at end of water year (1 June)	72%	72%	-
Average available water on 1 July	92%	35%	-
Average available water on 1 June	99%	86%	-
Average annual percentage of the entitlement used (rounded to 5%)	60%	70%	75%
Ultimate Development Scenario			
Long term extraction factor	0.93	0.80	0.0

Figure 3.19 Murray Regulated River – frequency of general security water availability

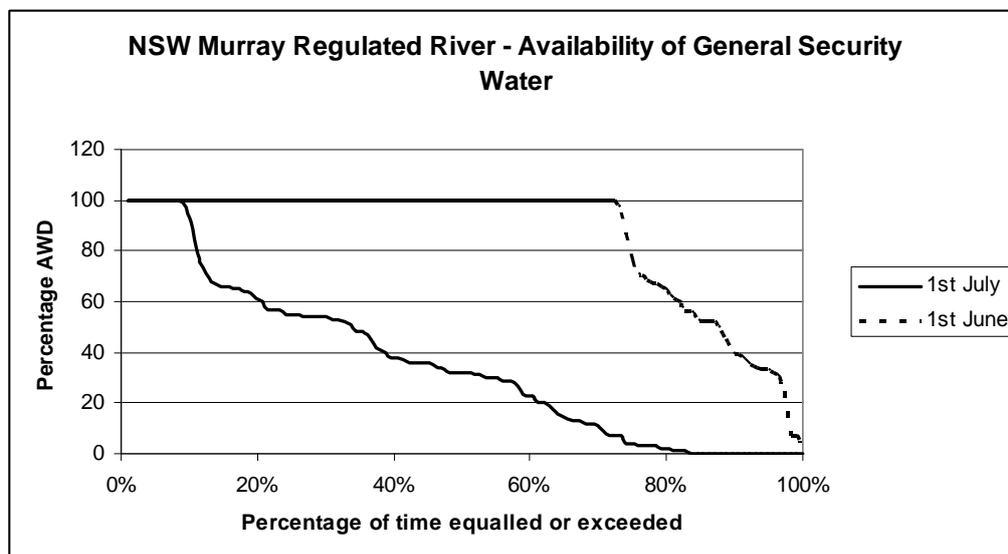
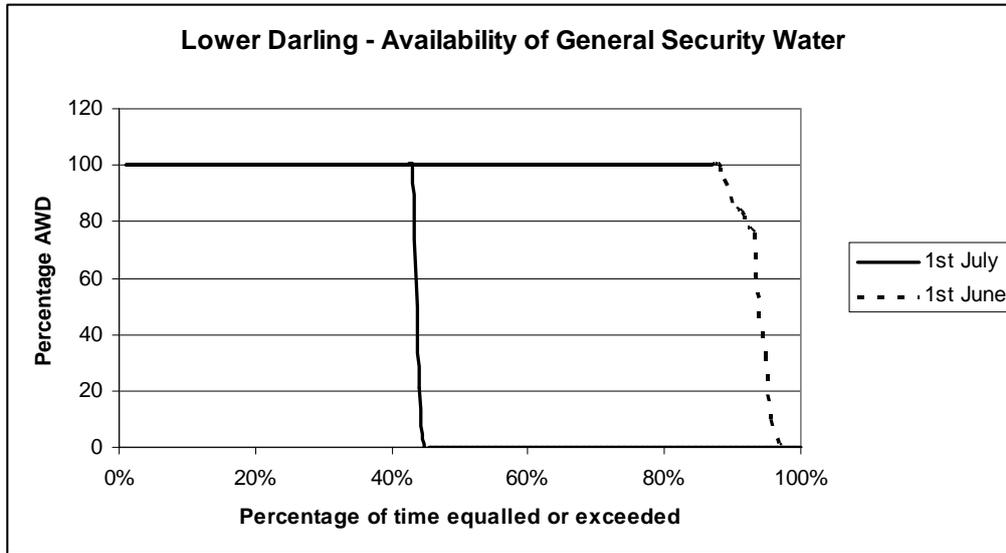


Figure 3.20 shows the frequency of water available and Table 3.9 provides a summary for the Lower Darling Regulated River.

Table 3.9 Reliability / water availability – Lower Darling

	High Security	General Security	Supplementary
Plan Limit Scenario			
Percentage of time full entitlement is available at start of water year (1 July)	43%	43%	
Percentage of time full entitlement is available (1 June)	97%	88%	
Average available water on 1 July	44%	43%	
Average available water on 1 June	98%	93%	
Average annual percentage of the entitlement used (rounded to 5%)	-	90%	
Ultimate Development Scenario			
Long term extraction factor	0.91	0.88	

Figure 3.20 Lower Darling River – frequency of general security available water



Appendix A – model system file names:

The following valley model system files were used to obtain the results presented in this report.

- Border Rivers – bor0609u.s7_
- Gwydir Valley – dev0203+wsp20.sqq
- Namoi Valley – namow2006.sqq
- Peel Valley – peelr03a.sqq
- Macquarie Valley – macqw014.sqq
- Lachlan Valley – lachw006.sqq
- Murrumbidgee Valley – wsp05cue.iqq
- Murray Valley / Lower Darling – msm-46-7361