

Victorian Submission to Annual Transitional Period Water Take Report 2015/16

Draft

Acknowledgements

We gratefully acknowledge Goulburn Murray Water's substantial contribution to Victoria's submission. Goulburn Murray Water has played an important role in data preparation, analysis and preparation of narrative for Victorian water resource reporting 2015/16. Grampians Wimmera-Mallee Water and the Victorian Environmental Water Holder also provided valuable support to Victoria's 2015/16 submission.

Compiled by

Surface Water Assessment and Modelling, WRD, DELWP

© The State of Victoria Department of Environment, Land, Water and Planning 2016



This work is licensed under a Creative Commons Attribution 4.0 International licence. You are free to re-use the work under that licence, on the condition that you credit the State of Victoria as author. The licence does not apply to any images, photographs or branding, including the Victorian Coat of Arms, the Victorian Government logo and the Department of Environment, Land, Water and Planning (DELWP) logo. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>

Disclaimer

This publication may be of assistance to you but the State of Victoria and its employees do not guarantee that the publication is without flaw of any kind or is wholly appropriate for your particular purposes and therefore disclaims all liability for any error, loss or other consequence which may arise from you relying on any information in this publication.

Contents

1	Water resource management overview for Victoria	3
1.1	Introduction	3
1.2	Achievements and Outcomes in Water Resource Management	3
1.3	Available Water Resources	4
1.4	Water Resource Use and Trade	4
1.5	Assessment Tools and Data	5
1.5.1	Interception Diversion	5
1.5.2	Unregulated Diversion	5
1.5.3	Regulated Diversion	5
1.5.4	Groundwater Diversion	6
2	Cap Compliance	7
2.1	Cap Models: Status of Cap models	7
2.2	Annual Cap Compliance	7
2.2.1	Victorian Murray, Kiewa and Ovens	7
2.2.2	Goulburn, Broken and Loddon	7
2.2.3	Campaspe	7
2.2.4	Wimmera-Mallee	7
2.3	Victorian Murray	7
2.3.1	Resource Availability	7
2.3.2	Annual Diversion	8
2.3.3	Trade	8
2.4	Kiewa	8
2.4.1	Resource Availability	8
2.4.2	Annual Diversion	8
2.4.3	Trade	8
2.5	Ovens	8
2.5.1	Resource Availability	8
2.5.2	Annual Diversion	9
2.5.3	Trade	9
2.6	Broken	9
2.6.1	Resource Availability	9
2.6.2	Annual Diversion	9
2.6.3	Trade	9
2.7	Goulburn	9
2.7.1	Resource Availability	9
2.7.2	Annual Diversion	10
2.7.3	Trade	10
2.8	Campaspe	10
2.8.1	Resource Availability	10
2.8.2	Annual Diversion	10
2.8.3	Trade	11

2.9	Loddon.....	11
2.9.1	Resource Availability.....	11
2.9.2	Annual Diversion.....	11
2.9.3	Trade	12
2.10	Wimmera-Mallee.....	12
2.10.1	Resource Availability.....	12
2.10.2	Annual Diversion.....	12
2.10.3	Trade	12
3	Transition period Section 71 reporting	13
4	Environmental water – held and planned.....	14
4.1	Victorian Murray.....	14
4.2	Kiewa and Ovens	14
4.3	Broken	14
4.4	Goulburn.....	14
4.5	Campaspe.....	15
4.6	Loddon.....	15
4.7	Wimmera-Mallee.....	15
4.8	Planned Environmental Water Reporting.....	15
5	Progress of water reform.....	16
5.1	Existing Administration of the Basin Plan	16
5.2	Water Resource Plan Development.....	17
	Appendix 1: Key Information from 2015/16 Water Resource Reporting Spreadsheet	18

1 Water resource management overview for Victoria

1.1 Introduction

This submission constitutes Victoria's 2015/16 reporting on water resources in the Murray-Darling Basin. Specifically, this submission addresses the following:

- Reporting on matters stipulated in Schedule E of the Murray-Darling Basin Agreement for each designated river valley, including on compliance against Cap targets
- Reporting on matters stipulated in section 71 of the *Water Act 2007* (Commonwealth) for each water resource plan area (both surface water and groundwater), insofar as those matters are applicable in 2015/16.

This submission provides a “dry run” of reporting on matters 9.1 and 9.2 in Schedule 12 of the Basin Plan, which relate to the identification of environmental water and the monitoring of its use.

Information is also provided about Victoria's approach and progress towards reporting under the Basin Plan from 2019.

This narrative highlights the key information for 2015/16, and provides context and analysis. The detailed data are provided in Appendix 1.

This narrative is intended for publication by the Murray-Darling Basin Authority as an appendix to the Transitional Period Water Take Report.

1.2 Achievements and Outcomes in Water Resource Management

Victoria is working towards the development of Water Resource Plans (WRPs) under the Basin Plan 2012 as part of the transition from Cap reporting to reporting under the Sustainable Diversion Limit (SDL). Significant achievements for 2015/16 towards this goal are:

- Progression of all nineteen Victorian SDL adjustment proposals including 13 environmental works, four operating rule changes and two Constraint Management Strategy (CMS) to Phase 2.
- Development of a concept paper to set out Victoria's proposed method for assessing Basin Plan compliance in Victorian (Surface Water) Water Resource Plan Areas using hydrologic models.
- Preparation of Baseline Diversion Limit (BDL) and Sustainable Diversion Limit (SDL) models for the Wimmera-Mallee Water Resource Plan Area.
- Documentation of all baseline entitlements in the Goulburn, Broken, Campaspe and Loddon systems at 30 June 2009 to inform the Goulburn Simulation Model (GSM) BDL model.
- Development of over 100 years of daily data to be used in the Stage 1 SOURCE model of the Goulburn system.
- Development and submission of the Annual Environmental Watering Priorities to the MDBA.
- Submission of our Basin Salinity Management Strategy Annual Report for 2014/15 to the MDBA Independent Audit Group and continuing compliance with salinity and water quality trigger points.
- Progression in the development of Victoria's Water Resources Plans (WRPs).

Current administration and assessment tools under the Cap will underpin the development of the WRPs. Existing arrangements will be improved by selection and implementation of appropriate monitoring methods for unregulated use, interception activities and groundwater use.

Victoria also continues to work with the MDBA to improve the method to reduce the Cap for environmental flows.

1.3 Available Water Resources

Annual rainfall for 2015/16 was below average across northern Victoria. Winter 2015 was the driest since 2006 in Victoria, and spring was the 6th driest on record. Rainfall in summer and autumn was around average, with above average rainfall in May and June. This resulted in well below average inflows across northern Victorian storages, with combined inflow around 25 per cent of average and several storages received record low inflows.

In 2015/16, only the Murray system reached a seasonal determination of 100 per cent of high-reliability water shares (HRWS). The final HRWS seasonal determinations are shown in Table 1.

Table 1. HRWS seasonal determinations

Regulated system	Final Seasonal Determination (HRWS)
Murray	100%
Goulburn	90%
Campaspe	66%
Loddon	84%
Broken	26%
Bullarook	8%

There were no allocations made against low-reliability water shares (LRWS) in 2015/16. Entitlement holders on the Wimmera-Mallee pipeline received a seasonal determination of 16 per cent allocation.

Lower availability of surface water in 2015/16 compared to 2014/15 was associated with increased groundwater usage to a minor extent.

The carryover policy in the Murray, Goulburn and Campaspe systems allows unused allocation to be carried over by entitlement holders into the following season, with any water above their entitlement volume being subject to spills or pre-releases that occur from Lake Hume, Lake Eildon or Lake Eppalock respectively. The volume held above entitlement volumes is held in spillable water accounts until a low risk of spill declaration is made for the relevant system. Spillable water accounting also applies in the Wimmera-Mallee system. The carryover in the other northern Victorian regulated systems is not subject to any spill accounting. There were no deductions from spillable water accounts in 2015/16.

In Victoria, diversions from unregulated waterways are estimated to be less than 2 per cent of total diversions. Restrictions to access of unregulated waterways were implemented across northern Victoria and, in many cases, were in place for the entire season.

1.4 Water Resource Use and Trade

Victorian systems diverted a total of 2,479 GL from the Murray-Darling Basin during the 2015/16 season.

The volume diverted in the Murray/Kiewa/Ovens valley was 1,342 GL. In the Goulburn/Broken/Loddon designated river valley and the Campaspe River valley diversions were 1,078 GL and 39.4 GL respectively. Wimmera-Mallee valley diversions were 19.8 GL.

The total volume delivered to northern Victorian regulated systems during 2015/16 was 1,944 GL. This is 253 GL less than the volume delivered in 2014/15. The total Victorian usage was 67 per cent of the total volume allocated.

Deliveries in the Murray/Kiewa/Ovens designated valley were 1,135 GL in 2015/16, 70 GL less than the delivery of 1,205 GL in the previous year. Deliveries in the Goulburn/Broken/Loddon valley were also lower in 2015/16 with 598 GL in 2015/16, 182 GL less than the 780 GL delivered in 2014/15. Campaspe valley deliveries were 194 GL in 2015/16, with 168 GL compared to 195 GL delivered in 2014/15.

Total Wimmera-Mallee deliveries, including water diverted from other valleys, were 17.7 GL in 2015/16, 0.8 GL more than the 16.9 GL delivered in 2014/15.

There was a net temporary allocation trade from Victoria of 463 GL in 2015/16. This was significantly more than the net 338 GL traded from Victoria in the previous season.

Interstate temporary allocation trading with New South Wales resulted in an overall net transfer to Victoria of 175 GL during 2015/16. This volume includes net allocation trade of 144 GL to Victoria from NSW Murray and 30.7 GL from the Murrumbidgee River basin. There was no trade into the Darling River from Victoria.

Trade with South Australia resulted in a net temporary allocation trade of 637 GL from Victoria, compared to 405 GL traded to South Australia from Victoria in the 2014/15 season. This includes the trade of environmental allocation.

1.5 Assessment Tools and Data

1.5.1 Interception Diversion

Victoria is developing appropriate methods to estimate take from interception activities for Basin Plan reporting purposes. In 2015/16 the focus has been on preparing for the Wimmera-Mallee Water Resource Plan (WRP). Runoff dams within the Wimmera-Mallee WRP area have been identified and a robust and defensible method for estimating take by farm dams is being developed. Victoria has also developed a method to identify commercial plantations and estimate their net take of water. Victoria is preparing to test the suitability of these proposed methods with stakeholders as part of the consultation for the Wimmera-Mallee WRP.

1.5.2 Unregulated Diversion

In Victoria unregulated watercourse diversions are estimated to represent less than 2 per cent of total diversions. In previous years, fit-for-purpose approaches have been used to estimate both long-term average unregulated usage and annual unregulated usage. In both cases the approach adopted estimates unregulated use based on regulated usage. Similar to previous years, an improvement to the estimation of unregulated use has been made by using some available metered unregulated use data to extrapolate total unregulated use in 2015/16.

1.5.3 Regulated Diversion

All the models used by Victoria to calculate Cap targets for regulated systems have been approved by the MDBA. The models used for the Goulburn/Broken/Loddon, Campaspe and Wimmera-Mallee Cap valleys were developed by Victoria while the models used for the Victorian Murray/Kiewa/Ovens Cap valleys were developed by the MDBA. In the case of the Wimmera-Mallee system, two new Cap models have been approved by the MDBA to calculate Cap targets, a post pipeline model to be used from July 2011 to June 2013 and a post irrigation model to be used from July 2013. These models represent the completion of all

pipeline projects in the Wimmera-Mallee system and the sale of irrigation entitlements in the Wimmera-Mallee system respectively.

Data inputs for all the models used are extended annually in order to undertake the Cap audit. As part of the data extension process improvements to data estimation techniques are included where possible. Any changes that impact on Cap assessment are explained in the following paragraphs.

The model used for the Goulburn/Broken/Loddon and Campaspe valleys was approved by the then Murray Darling Basin Commission at Meeting 93 on 4 September 2007. This model was re-calibrated for improved Campaspe Irrigation District diversion data and re-approved by the MDBA on 10 May 2012. In extending data inputs to 2015/16 for the Goulburn/Broken/Loddon and Campaspe Cap model, there were differences in May and June stream flow data from those used in the 2014/15 update. Edits were also made to inputs due to the availability of new climate data and changes to streamflow ratings. These led to a net decrease of 5 GL in the Goulburn/Broken/Loddon cumulative Cap credits from 1997/98 to 2014/15 — approximately 0.2 per cent of the long-term average valley Cap.

Regression models are used for the Kiewa and Ovens valleys. These were developed by the MDBA as part of their development of a computer simulation model for the Murray which includes the Victorian Murray. Both the regression models and the computer simulation model, excluding the Lower Darling component, were approved by the then Murray Darling Basin Commission at Meeting 96 on 26 August 2008. The Murray model has since undergone a number of updates and an updated model has been used for the 2015/16 assessment. These updates and input data extension to 2015/16 for the Victorian Murray/Kiewa/Ovens models have led to a net decrease of 11 GL to the 1997/98 to 2014/15 cumulative Cap credit — approximately 0.6 per cent of the long term average valley Cap.

The Wimmera-Mallee Post Irrigation entitlement sale model has been used to calculate the 2015/16 Cap target for Wimmera-Mallee valley. This model was approved by MDBA on 6 November 2013. The Wimmera-Mallee Post Pipeline model operated over the 114 year period from July 1895 to June 2009 yields a long term annual diversion of 44.2 GL/year, not including unregulated diversion outside the model area.

On 30 October 2010 the MDBA approved Victoria's proposed method for Cap adjustment for environmental water recovery that is required under the Murray Darling Basin Agreement Schedule E protocol "Adjusting Caps on Diversions for Environmental Entitlements and Uses". Similar to previous years, the Environmental Use method has been applied to 2015/16 Cap targets to account for water recovered for the environment through initiatives such as Snowy environmental flows, The Living Murray and Commonwealth purchases. A sliding scale method was used for the decommissioning of Lake Mokoan. MDBA agreed to continue using this method until the Basin Plan comes into effect. Victoria remains committed to the ongoing development of hydrological models of regulated systems for calculating baseline and sustainable diversion limits.

1.5.4 Groundwater Take

The permitted take and use of groundwater is based on the sum of the licensed entitlements for all groundwater bores, adjusted for any annual restrictions in place through a management plan. Actual diversion for the majority of licensed groundwater bores is measured through annual metering. All groundwater bores licensed for volume in excess of 20 ML/year are metered. Many bores greater than 10 ML/year are also metered. Meters are read at least once annually.

Domestic and stock use is estimated based on the number of bores less than 30 years old (given the likely life of a domestic and stock bore) with an average use of 2 ML/year per bore. [Estimated use by domestic and stock bore are reported in a separate section of the table tabbed "VIC GW s71 Report" by groundwater catchment.

Licensed bores in the Shepparton Irrigation Region are not metered. Annual diversion is estimated based on a subset of bores.

2 Cap Compliance

2.1 Cap Models: Status of Cap models

Status of Cap models and associated historical changes are covered in Section 1.5.3 of this document. In summary, for 2015/16, there was no new model accredited for any regulated system in the Victoria.

2.2 Annual Cap Compliance

Annual Cap compliance for each Cap valley is presented in this section. In summary, for 2015/16, there was no breach in cumulative Cap credit for any Cap valley in the Victoria.

While 2015/16 diversions for consumptive purposes exceeded the annual diversion target in some river valleys, this was a flow-on effect from the large Cap credits accrued in those valleys over recent years.

2.2.1 Victorian Murray, Kiewa and Ovens

Diversion from the Murray/Kiewa/Ovens valley was 1,342 GL, which is 117 GL more than the Cap target of 1,225 GL (with preliminary adjustment for trade and environmental releases). The diversion was 21 per cent below the long-term Cap average of 1,702 GL/year. The cumulative Cap credit since July 1997 is 2,722 GL.

2.2.2 Goulburn, Broken and Loddon

Diversion from the Goulburn/Broken/Loddon River Valley was 1,078 GL, which is 346 GL more than the Cap target of 732 GL (with adjustment for trade, environmental releases, decommissioning of Lake Mokoan and inter-valley transfers). Diversions were 47 per cent below the long-term average Cap of 2,034 GL/year. The cumulative Cap credit for the period from July 1997 to June 2016 is 2,743 GL.

2.2.3 Campaspe

Diversion from the Campaspe valley was 39.4 GL, which is 20.0 GL below the Cap target of 59.3 GL (with adjustment for trade to supply the Goldfields Superpipe and environmental release). Diversions were 68 per cent below the long-term average Cap of 122 GL/year. The cumulative Cap credit for the Campaspe valley from July 1997 to June 2016 is 461 GL.

2.2.4 Wimmera-Mallee

Diversion from the Wimmera-Mallee valley in 2014/15 was 19.8 GL, which is 6.8 GL more than the Cap target of 13.1 GL. Diversions were 56 per cent below the long-term average Cap of 45 GL/year. The cumulative Cap credit for the Wimmera-Mallee valley since July 1997 is 133 GL.

2.3 Victorian Murray

2.3.1 Resource Availability

There was a 35 per cent high-reliability water share seasonal determination at the start of July 2015 for Murray system entitlement holders. The seasonal determination gradually increased to 100 per cent by mid-February 2016 (Table 1). There were no spills debited from spillable water accounts in the Murray system. On 10 September 2015, a declaration was made that the risk of spill at Lake Hume was low which enabled the water held in spillable water accounts to be accessed.

As the Menindee Lakes volume remained below 640 GL during the 2015/16 season, control of the storage remained with the NSW Office of Water.

At 1 July 2015, Lake Dartmouth was 73 per cent of capacity and Lake Hume was 32 per cent capacity. Lake Hume reached 55.5 per cent of capacity in mid-September 2015 before being drawn down to 38 per cent by the end of the season. By 30 June 2016 Lake Dartmouth was at 46 per cent. Inflows for Dartmouth and Hume in 2015/16 were 61 per cent and 47 per cent of average respectively.

During the 2015/16 season there were suspensions to access for Murray System unregulated entitlement holders on 2 unregulated waterways, and restrictions on one other waterway. The duration of these restrictions ranged between 74 and 252 days, with one suspensions continuing into early July 2016.

2.3.2 Annual Diversion

The total diversion, excluding all environmental diversions, was 1,319 GL for the Victorian component of the River Murray valley. The allocated volume available for use was 1,610 GL, of which 1,122 GL or 69.7 per cent was used by private diverters and irrigators. This includes the 4.0 GL estimated to be the diversion in the unregulated system.

Water was returned by North East Water to the River Murray from the West Wodonga Water Treatment Plant for take by towns downstream. The total volume returned was 1.8 GL.

2.3.3 Trade

There was 516 GL of temporary allocation trade into the regulated Victorian Murray from other valleys. With reverse trade totalling 1,023 GL, net allocation trade out of the Victorian Murray in 2015/16 was 508 GL. There was a net temporary allocation trade of 653 GL from the Victorian Murray into South Australia, and 118 GL into New South Wales.

There was a net 23.0 GL of permanent high-reliability water share trade from Victorian Murray, with 24.3 GL going to non-water user entitlement holders. There was 110 GL of permanent high-reliability water share trade within the Victorian Murray.

2.4 Kiewa

2.4.1 Resource Availability

During the 2015/16 season there were suspensions to access for Kiewa valley unregulated entitlement holders on 16 unregulated waterways. These restrictions went for between 84 and 212 days, with the several suspensions continuing into early July 2016.

2.4.2 Annual Diversion

Kiewa valley use of urban entitlements was 1.2 GL or 53 per cent of the entitlement volume. A further 5.0 GL was used by private diverters.

2.4.3 Trade

There is currently no reporting on unregulated temporary and permanent trade.

2.5 Ovens

2.5.1 Resource Availability

Storage inflows in the Ovens system were below average in the 2015/16 season with 40 per cent and 51 per cent of average inflows received at Lake Buffalo and Lake William Hovell respectively. Lake Buffalo was filled from sill level between the end of August to mid-October. The storage was drawn down to 33 per cent of capacity by the end of April. Lake William Hovell began the season at 98 per cent capacity. Lake William Hovell was drawn down to 33 per cent of capacity by mid-May, before returning to unregulated conditions at the start of June 2016.

Access to spill water entitlements on the Buffalo and Ovens Rivers ceased in mid-December 2015 when spill flows fell below the minimum requirements in the regulated reaches. Access to spill water entitlements on the King River ceased at the start of December 2015. There were no restrictions to regulated high reliability supplies in the Ovens valley in 2015/16.

During the 2015/16 season there were suspensions to access for Ovens System unregulated entitlement holders on 16 unregulated waterways, and various stages of restriction on seven of the unregulated waterways. These restrictions to access went for between 63 and 245 days, with one restriction continuing into the 2016/17 season.

2.5.2 Annual Diversion

Diversion in the Ovens valley was 12.0 GL or 28 per cent of the volume available for use in 2015/16. A further 4.7 GL was estimated to be taken in the unregulated system.

2.5.3 Trade

There was 1.6 GL of temporary allocation trade within the Ovens valley. Current rules on trading restrict allocation trade to remain within the Ovens valley.

There was 1.5 GL of permanent high-reliability water share traded within the Ovens valley, with a net trade of 0.1 GL to non-water user entitlement holders.

2.6 Broken

2.6.1 Resource Availability

The Broken River system received an initial seasonal determination at the start of October 2015 of 4 per cent of high-reliability water shares. Seasonal determinations improved to reach 26 per cent of high-reliability water shares by mid-February 2016 (Table 1).

Lake Nillahcootie was 54 per cent full at the start of the season and increased to 56 per cent before being drawn down to 21 per cent at the end of May. Lake Nillahcootie ended the 2015/16 season at 29 per cent of capacity. Inflows to Lake Nillahcootie for 2015/16 were only 13 per cent of average.

During the 2015/16 season there were suspensions to access for Broken valley unregulated entitlement holders on all 4 unregulated waterways. These restrictions to access went for between 134 and 180 days, with one waterway now being on restriction for 563 days.

2.6.2 Annual Diversion

Diversion from the Broken system was 10.8 GL, or 53 per cent utilisation of the total allocated volume. A further 0.8 GL was estimated to be taken in the unregulated system.

2.6.3 Trade

There was a net volume of allocation trade out of the Broken of 0.7 GL. A total of 0.6 GL was traded in while 1.3 GL was traded out.

There was 1.7 GL of permanent high-reliability water share traded within the Broken, and a net trade of 0.3 GL to non-water user entitlement holders.

2.7 Goulburn

2.7.1 Resource Availability

High-reliability water shares entitlement holders in the Goulburn system received an initial seasonal determination of 42 per cent. The seasonal determination reached a maximum of 90 per cent of high-reliability water shares by mid-February 2016 (Table 1). There has been no seasonal determination of low-reliability water shares since 1997/98.

Lake Eildon was 55 per cent full at the start of July 2015 and reached 62 per cent in mid-September before being drawn down to 30 per cent in mid-May 2016. Inflows into Lake Eildon were 36 per cent of average, and unregulated inflows into Goulburn Weir were 27 per cent of average. A low risk of spill declaration was

made on 1 July 2015 allowing customers access to water in spillable water accounts. There were no deductions from spillable water accounts in Goulburn system in 2015/16.

During the 2015/16 season there were suspensions to access for Goulburn valley unregulated entitlement holders on 7 unregulated waterways, and restriction on one other unregulated waterway. These restrictions to access went for between 36 and 310 days, with one suspension continuing into early July 2016.

2.7.2 Annual Diversion

The total volume allocated for use in the Goulburn system was 668 GL. Usage in the Goulburn system was 420 GL, or 63 per cent of the total allocated volume. A further 12.8 GL was estimated to be taken in the unregulated system.

Approximately 430 GL was transferred to the Murray, Campaspe, Loddon and Wimmera-Mallee systems. The total take during the 2015/16 season to the Goulburn valley was 1,043 GL. A total of 1.0 GL was transferred from north to south of the Great Dividing Range to Melbourne Water from the Goulburn River and Silver and Wallaby creeks which are tributaries of the Goulburn River.

2.7.3 Trade

There was a net volume of temporary allocation trade out of the Goulburn system of 61.9 GL. A total of 194 GL was traded in while 256 GL was traded out. There was a net allocation trade of 12.43 GL into the Goulburn system from South Australia.

There was 57 GL of permanent high-reliability water share traded within the Goulburn valley, and a net trade of 16.9 GL out of the Goulburn valley, including a net trade of 15.3 GL to non-water user entitlement holders.

2.8 Campaspe

The Campaspe River system supplies private diverters, environmental entitlements and the Coliban water supply system. Although physically located within the Campaspe catchment, the Rochester Irrigation Area receives its water from the Goulburn system via the Waranga Western Channel and is part of the Goulburn/Broken/Loddon designated river valley for Cap compliance. Seasonal determinations to irrigators in the Rochester Irrigation Area are the same as those in the Goulburn system.

2.8.1 Resource Availability

Seasonal determinations in the Campaspe system opened at 50 per cent of high-reliability water shares and increased to 66 per cent by 1 April 2016 (Table 1). A low risk of spill declaration was made on 1 July 2015 allowing customers access to water in spillable water accounts. There were no deductions from spillable accounts in the Campaspe system in 2015/16.

Lake Eppalock was at its highest point in the 2015/16 season on 1 July 2015 at 45 per cent capacity, and over the season was drawn down to 21 per cent capacity. Inflows into Lake Eppalock were only 5 per cent of average during 2015/16, with new minimum monthly inflows recorded in February and April.

The Coliban storages started the season at 56 per cent capacity, with only a slight increase in storage volume over winter/spring before being drawn down to 41 per cent capacity at the end of the season.

In 2015/16 there were suspensions to access for Campaspe valley unregulated entitlement holders on all 20 unregulated waterways, all of which were carried over on suspensions from 2014/15. There were six suspensions lifted during winter, which were all back in place by December 2015. One restriction was lifted in June 2016, and all other restrictions continued into the 2016/17 season.

2.8.2 Annual Diversion

There was no use of the Goldfields Superpipe in 2015/16. There was 19.0 GL pumped from Lake Eppalock to Bendigo. There was no water transferred from the Goulburn system to Lake Eppalock in 2015/16.

The 2015/16 Campaspe valley allocated volume was 194 GL of which 100 per cent was utilised. A further 0.7 GL was estimated to be taken in the unregulated system.

2.8.3 Trade

The net temporary allocation trade out the Campaspe valley was 51.3 GL, including a net 34.4 GL traded into the Rochester Irrigation Area.

There was 18.3 GL of permanent high-reliability water share traded within the Campaspe valley, and a net trade of 2.9 GL out of the Campaspe valley, including a net trade of 2.8 GL to non-water user entitlement holders.

2.9 Loddon

Although physically located within the Loddon catchment, the Loddon Valley Irrigation Area receives the majority of its water from the Goulburn system via the Waranga Western Channel. Seasonal determinations to irrigators in the Loddon Valley Irrigation Area are the same as those in the Goulburn system.

2.9.1 Resource Availability

On 1 July 2015 an initial seasonal determination of 37 per cent of high-reliability water shares was announced for the Loddon System (excluding the Bullarook Regulated system). The seasonal determination reached a maximum of 84 per cent of high-reliability water shares on 1 April 2016 (Table 1). Entitlement holders in the Bullarook system received a seasonal determination of 8 per cent high-reliability water shares 15 February 2016 (Table 1).

The inflows into the Loddon storages were very low in 2015/16 receiving only 1.1 and 3.4 per cent of average inflows at Tullaroop and Cairn Curran Reservoirs respectively. There were 21 new monthly inflow minimums set or equalled across the season across the three main storages. Tullaroop Reservoir started the 2015/16 season at 38 per cent of capacity and Cairn Curran Reservoir started at 35 per cent of capacity. There were limited harvesting opportunities at Cairn Curran and Tullaroop Reservoirs this season and the storages were drawn down to meet irrigation requirements, ending the season at 12 per cent and 21 per cent of capacity respectively.

As a dry inflow contingency planning measure to reduce evaporation losses, Laanecoorie Reservoir was operated at a lower level over the summer and autumn.

Newlyn Reservoir began the year at 45 per cent of capacity and increased to 49 per cent in late September. The storage was drawn down to 15 per cent capacity by the start of May 2016. Hepburns Lagoon was drawn down to its minimum operating level in March 2016; however this did not impact customer deliveries.

During the 2015/16 season there were suspensions to access for Loddon Valley unregulated entitlement holders on 26 unregulated waterways, 22 of which were carried over from the 2014/15 season. These restrictions to access went for between 127 and 365 days, with 24 waterways restrictions continuing into the 2016/17 season.

2.9.2 Annual Diversion

Diversion from the Loddon River and tributaries for private irrigation, domestic and stock, commercial, industrial and urban purposes was 17.2 GL. An additional 5.2 GL was estimated to be taken in the unregulated system. A total of 201 GL was transferred into the Loddon Valley Irrigation Area, also known as Pyramid-Boort, from the Goulburn valley in 2015/16.

Total use by regulated entitlement holders in the Loddon valley was 172.7 GL, or 70 per cent of the allocated volume.

2.9.3 Trade

The net temporary allocation trade into the Loddon valley was 56.12 GL.

There was 18.1 GL of permanent high-reliability water share traded within the Loddon valley, a net trade of 3.5 GL out of the Loddon valley, and a net trade of 3.4 GL to non-water user entitlement holders.

2.10 Wimmera-Mallee

2.10.1 Resource Availability

Water allocations for Wimmera-Mallee Pipeline Product for the 2015/16 water year reached 16 per cent. In 2015/16, there was no allocation against the 1 GL wetland product component of the Wimmera and Glenelg Rivers Environmental Entitlement 2010, and no allocation against the 28 GL former irrigation entitlement held by the Commonwealth Environmental Water Holder.

The Wimmera-Mallee storages started the season at a combined 26 per cent capacity, with Lake Lonsdale and Pine Lake being effectively dry. Several of the storages were drawn down significantly over the season resulting in a combined 22 per cent capacity at the end of the season.

2.10.2 Annual Diversion

For the 2015/16 season, utilisation of water sourced within the Wimmera-Mallee valley totalled 19.8 GL.

2.10.3 Trade

There was 3.6 GL of temporary allocation trade within the Wimmera-Mallee in 2015/16.

3 Transition period Section 71 reporting

The Water Resource Plans being developed under the Basin Plan set out water management arrangements from 2019 onwards. These plans must set out methods for determining the maximum quantity of water permitted to be taken for consumptive use during a water accounting period. Victoria's proposed method for determining Baseline Diversion Limits (BDLs), Sustainable Diversion Limits (SDLs), and for the assessment of compliance with the SDLs for take from regulated rivers, is the use of hydrologic models. DELWP is preparing BDL and SDL models for the Wimmera-Mallee and Goulburn-Broken-Campaspe-Loddon systems for this purpose. These models are to be submitted to the Murray-Darling Basin Authority (MDBA) for accreditation by 2017/18. Tasks undertaken in 2015/16 to achieve this timeline include:

- Developing a concept paper to set out Victoria's proposed method for assessing Basin Plan compliance in Victorian (Surface Water) Water Resource Plan Areas using hydrologic models. This concept paper was submitted in December 2015, and has since been updated based on verbal feedback received from the MDBA.
- Documenting all entitlements in the Goulburn, Broken, Campaspe and Loddon systems at 30 June 2009 to inform the GSM BDL model. A draft version of this document was sent to MDBA so that it could be replicated for the Victorian Murray. This was not required for the Wimmera-Mallee because all BDL entitlements are documented in the Bulk Entitlement (Wimmera and Glenelg Rivers – GWMWater) Order 2010.
- Preparing BDL and SDL models for the Wimmera-Mallee Water Resource Plan Area, which are ready for submission in early 2017.

Although the REALM modelling platform is to be used initially, Victoria is currently working on the development and testing of the new National Hydrological Modelling Platform, "Source", with the aim of replacing the REALM SDL models with daily Source SDL models, once these are deemed fit for purpose.

4 Environmental water – held and planned

4.1 Victorian Murray

There were no periods of unregulated flow on the River Murray in 2015/16, resulting in no use of the unregulated environmental entitlements this year.

There was a net trade of 688 GL of environmental allocation out the Victorian Murray system to environmental water holders in other systems. Of this volume there was a net trade of 689 GL traded out to South Australia to facilitate the delivery of water from the Goulburn system, as well as held water in the Murray system across the South Australian border. There was a net trade of 9.2 GL from the Victorian Murray to NSW Murray. There was also trade of 341 GL within the Victorian Murray system moving water between environmental water holders.

There was 591 GL of environmental water credited to the Murray system for reuse or trade downstream, originating from the Goulburn, Campaspe and Victorian Murray. There was 23.5 GL of returns, resulting from use in June 2015, which was recredited into environmental Murray system accounts in the 2015/16 season, and there is 8.3 GL which will be re-credited into Murray environmental accounts in 2016/17.

There is no planned environmental water reporting requirement for the Murray System.

4.2 Kiewa and Ovens

The Ovens system received 70 ML of environmental water which was used to contribute toward a pulse in the Buffalo and King Rivers. This water was provided from Commonwealth entitlements. There is no held environmental water in the Kiewa valley.

There is a planned environmental water reporting requirement for the Ovens System. However due to the complex nature of minimum flow requirements, with different flow requirements at multiple sites along the system, only qualitative remarks were made in the reporting.

4.3 Broken

The Broken system delivered 500 ML of environmental water to Moodies Swamp in 2015/16. This water was provided from Commonwealth entitlements traded into the Broken system. There was no trade within the Broken system between environmental water holders.

There is a planned environmental water reporting requirement for the Broken System. However due to the complex nature of minimum flow requirements, with different flow requirements at multiple sites along the system, only qualitative remarks were made in the reporting.

4.4 Goulburn

In the Goulburn system a total of 243 GL from The Living Murray (TLM), and Commonwealth and Victorian Environmental Water Holders entitlements was delivered in-stream to provide environmental freshes and maintain additional passing flows downstream of Goulburn Weir. Of this volume, 298 GL was recredited to be available for use downstream, for Gunbower Creek and trade to South Australia. The net use of environmental water within the Goulburn system was -55.0 GL due to the re-credit of 77.5 GL resulting from water delivered in June 2015, which was re-credited into Murray environmental accounts in the 2015/16 season. There will be 7.9 GL of use from June 2016 that will be re-credited in 2016/17.

There was a net 4.3 GL of environmental allocation traded out the Goulburn system to environmental water holders in other systems, and trade of 221 GL within the Goulburn system moving water between environmental water holders.

A recent review of Victorian water entitlements concluded that water previously reported as planned environmental water in the Goulburn does not meet the Commonwealth's definition of planned environmental water. Therefore, in 2015/16 no planned environmental water is reported for the Goulburn.

4.5 Campaspe

The Campaspe River environmental entitlements were used to maintain increased passing flows in the Campaspe River and provide environmental pulses down the River as per environmental flow recommendations. A total of 13.7 GL was from Commonwealth and Victorian Environmental Water Holder entitlements, and less than 0.1 GL from The Living Murray entitlements was used in 2015/16. Of this volume, 13.2 GL was re-credited to the Murray system, resulting in a net use of 0.4 GL. There was 0.7 GL, resulting from use in June 2015, which was re-credited into Murray environmental accounts in the 2015/16 season, and there is 0.3 GL of re-credit from June 2016, which will be re-credited in 2016/17.

There was a net 8.0 GL of environmental allocation traded into the Campaspe from environmental water holders in other systems, and trade of 3.3 GL within the Campaspe moving water between environmental water holders.

There is no planned environmental water reporting requirement for the Campaspe System, due to the current definition of planned environmental water.

4.6 Loddon

A total of 2.0 GL was delivered to Lake Meran in the Boort wetlands in the Loddon valley in 2015/16. The Loddon River received 1.5 GL of environmental water from Victorian and Commonwealth entitlements and 5.2 GL was delivered from Wimmera-Mallee Pipeline Savings and East Loddon Water Works District Savings entitlements downstream of Loddon Weir. There was no environmental entitlement allocated from Newlyn Reservoir in 2015/16.

There was a net 1.3 GL of environmental allocation traded out of the Loddon system to environmental water holders from other systems, and trade of 1.5 GL within the Loddon system moving water between environmental water holders.

There is no planned environmental water reporting requirements for the Loddon System, due to the current definition of planned environmental water.

4.7 Wimmera-Mallee

In the Wimmera-Mallee system, 8.1 GL was delivered to the environment, including 142 ML from the Victorian Environmental Water Holder wetland entitlement.

There is no planned environmental water reporting requirements for the Wimmera-Mallee, due to the current definition of planned environmental water.

4.8 Planned Environmental Water Reporting

The submission of Victoria's reporting on the use of planned environmental water (PEW) in 2015/16 recognises previous discussions with the MDBA in which Victoria was informed that the majority of its non-held environmental water did not meet the Commonwealth definition for PEW. While much of Victoria's non-held environmental water contributes to environmental outcomes, it does not specifically meet section 6 of the *Water Act 2007* (Commonwealth), or as explained in the MDBA position statement 'Determining Planned Environmental Water' "the water cannot, to the extent to which it is committed or preserved, be taken or used for any other purpose".

Victoria has undertaken further work in 2015/16 to more accurately determine what forms of PEW meet the Commonwealth's definition. Three forms have been identified in this more detailed work. These forms have been reported on for 2015/16, and differ slightly to those reported on in previous years.

5 Progress of water reform

5.1 Existing Administration of the Basin Plan

Between 1995 and 1997, Victoria introduced and refined the following changes to water management in response to the Murray-Darling Basin Ministerial Council decision to Cap water use:

- restrictions on temporary and permanent water trading,
- reductions on allocations for a given resource, and
- limits on the issuing of new entitlements.

Monitoring of the effectiveness of the water management policies is undertaken on an ongoing basis. No new capping policies were introduced in 2015/16 and none are currently proposed for 2016/17 as existing measures have continued to be effective. There is no evidence of growth in diversions in any of the Victorian valleys.

Victoria currently administers the Cap through establishment and implementation of bulk entitlements, Streamflow Management Plans and licensing of irrigation farm dams.

During 2015/16 the Victorian Government has continued to undertake a number of transitional arrangements to ensure the progress of water reform in the Murray-Darling Basin, including:

- Continuing to work collaboratively with the MDBA and other Basin states to progress implementation of the Constraints Management Strategy through our ongoing involvement in the River Murray Constraints Steering Committee. Victoria also developed the Goulburn Constraints Measure business case, and jointly developed with NSW, the Hume to Yarrawonga Constraints Measure business case. In April 2016 Victoria submitted the Goulburn and joint Victorian / NSW Hume to Yarrawonga constraints measure business cases to SDL Adjustment Advisory Committee for evaluation. The joint Minister's agreed to progress these business cases amongst the 37 package of measures in late April 2016.
- Working on the progression of nineteen Phase 2 supply measure business cases through the Sustainable Diversion Limit Adjustment Assessment Committee. Nine of these are works based supply measures, developed in partnership with the Mallee and North Central Catchment Management Authorities, with the remaining four supply measures relating to operation rule change proposals.
- Continuing to work towards Victoria's water recovery targets through water savings projects and SDL offsets.
- Continuing to develop a SOURCE model of the Goulburn system, with a Stage 1 model to be ready by June 2017. As part of this project, over 100 years of daily input data and associated derivation methods were developed.
- Development and submission of the Annual Environmental Watering Priorities to the MDBA consistent with the Basin Plan, while working collaboratively with the Commonwealth Environmental Water Holder and through other formal coordination forums to successfully deliver our Seasonal Water Plan.
- Submission of our Basin Salinity Management Strategy Annual Report for 2014/15 to the MDBA Independent Audit Group and continuing compliance with salinity and water quality trigger points.

Victoria has continued work on further refining procedures and policies to strengthen existing business practices to mitigate risks associated with the disclosure and management of water announcements.

5.2 Water Resource Plan Development

Victoria's progress in developing its five water Resources Plans (WRPs) in 2015/16 focused on the following activities:

- Continued engagement with Indigenous groups. The WRP project team and Victoria's Aboriginal Water Unit have been in regular discussions throughout the 12 month period with MLDRIN and the Barengi Gadjin Land Council about cultural values and uses, and possible approaches to meet the requirements for the Basin Plan. Ongoing WRP consultation including, cultural values case studies, will be coordinated through the DELWP Aboriginal Water Program and with existing Catchment Management Authority programs and any relevant state-wide policy developed as part of the Victorian Water Plan.
- Throughout 2015/16, the WRP project team has presented to a number of key stakeholders, and had one-on-one briefings with several external stakeholders, contributing to its approach of continual engagement with key stakeholders. Victoria's WRP engagement strategy was developed, and will be delivered as we develop WRP drafts.
- A preliminary risk assessment for all five WRP areas was completed in May 2016, including workshops with key regional stakeholders to test the method, the identified risks, scenarios for those risks and the analysis. The preliminary risk assessment will be used for ongoing consultation with stakeholders in each WRP area and in discussions with New South Wales and South Australia to refine the assessment and develop management strategies to address risks where required in order to be included in Victoria's WRPs.
- Continued coordination of the assessment of water quality requirements under the Basin Plan with the review of the state-wide water quality policy.
- Settling an acceptable form for Victoria's WRPs in discussions with the MDBA.

In addition, the work to progress the WRPs was coordinated with the development of Water for Victoria, which provides state-wide policy direction about key water management issues. It was released in October 2016.

Appendix 1: Key Information from 2015/16 Water Resource Reporting Spreadsheet

Table 2. Murray-Darling Basin Diversions in 2015/16			
Valley	Irrigation Diversion (GL)	Other Diversion (GL)	Total Diversion (GL)
Victoria			
Goulburn	1,023	19	1,042.804
Broken	9	2	10.773
Loddon	21	3	24.363
<i>Goulburn Broken Loddon Cap Valley</i>	<i>1,053.746</i>	<i>24</i>	<i>1,077.9</i>
Campaspe	9.160	30	39.359
Wimmera-Mallee	1	19	19.8
Kiewa	4.989	1.2	6.2
Ovens	11.585	5	16.691
Murray	1,265	54	1,319.1
<i>Kiewa Ovens Murray Cap Valley</i>	<i>1,282</i>	<i>60</i>	<i>1,341.9</i>
Total Victoria	2,346	133	2,479.1

Table 3. Accuracy of Diversion Estimates in 2015/16			
Valley	Diversion (GL)	Accuracy +/- GL	Accuracy +/- %
Victoria			
Goulburn	1,043	0	0%
Broken	11	0	0%
Loddon	24	0	0%
Campaspe	39	0	0%
Wimmera-Mallee	20	0	0%
Kiewa	6	0	0%
Ovens	17	0	0%
Murray	1,319	0	0%
Total Victoria	2,479	0	0%

Table 4. Comparison of Diversions with Cap Levels in 2015/16									
Valley	Cap Target from Cap Model	Adjustment to Cap Target for Trade ¹	Adjustment to Cap Target for Environmental Allocations	Cap Target Adjusted for Trade and Env. Allen	Total Diversion	Cap Credit	Cumulative Cap Credit	Cap Target Exceedance Trigger (20% of Long-Term Diversion Cap)	Cumulative Difference (Modelled minus Observed) in Storage
	(GL)	(GL)	(GL)	(GL)	(GL)	(GL)	(GL)	(GL)	(GL)
Victoria									
Goulburn]									
Broken]	1,038	-72	-233	732.2	1,078	-346	2,743	-407	-1,229
Loddon]									
Campaspe	65	0	-6	59	39	20	461	-24	-96
Wimmera-Mallee ²	13	0	0	13	20	-7	133	-20	-85
Kiewa]									
Ovens]	1,501	260	-536	1,225	1,341.9	-117.3	2,722	-340	-47
Murray]									
Total Victoria	2,617	188	-775	2,029	2,479	-450	6,059	-792	-1,457

1. Adjustment to Cap target for trade includes exchange rate adjustments to permanent interstate trade.
2. Wimmera/Mallee Cap model not completed.

Table 6: Total Water Entitlements

Valley	High Reliability	Low Reliability	Conveyance	Supplementary Access / Water Harvesting	Unregulated Stream Licences	Unsupplemented Licenced Areas	Stock and Domestic	Urban
	ML	ML	ML	ML	ML	ha	ML	ML
Victoria ⁴								
Goulburn	812873	424927	n/a	0	39542	n/a	n/a	37649
Broken	17625	3330	n/a	0	10088	n/a	n/a	2324
Loddon	157140	87967	n/a	0	28631	n/a	n/a	7319
Goulburn Broken Loddon Cap Valley	987638	516224	0	0	78260	0	0	47292
Campaspe	169431	103937	n/a	0	8314	n/a	n/a	66768
Wimmera-Mallee	100520	0	n/a	0	0	n/a	n/a	47140
Kiewa	0	0	n/a	0	18331	n/a	n/a	2207
Ovens	33272	0	n/a	0	24762	n/a	n/a	10353
Murray	1413890	440564	n/a	0	28468	n/a	n/a	59662
Kiewa Ovens Murray Cap Valley	1447162	440564	0	0	71561	0	0	72222
<i>Total Victoria</i>	2704751	1060726	0	0	158136	0	0	233421.8

Table 7. Net Water Entitlement Transfers in 2015/16

Valley	Trade Data Not Affecting Cap		Trade Data Affecting Cap			
	Total Intravalley Permanent Entitlement Sold (GL)	Total Temporary Allocation Sold (GL)	Net Tagged trade Usage (GL)	Net Temporary Trade Inwards (GL)	Adjustment to this Year's Cap for Previous Permanent Trade (GL)	Total Trade Adjustment to this Years Cap Target (GL)
Victoria ⁴						
Goulburn	57	697	-3	-14		
Broken	2	2	0	-1		
Loddon	18	21	-1	57		
Goulburn Broken Loddon Cap Valley	77	721	-4	42	-109	-72
Campaspe	18	53	-1	0		0
Wimmera-Mallee	0	4	0	0		0
Kiewa	0	0	0	0		
Ovens	1	2	0	0		
Murray	110	1,621	5	181		
Kiewa Ovens Murray Cap Valley	111	1,623	5	181	74	260
<i>Total Victoria</i>	207	2,399	0	223	-35	188

1. No data is to be entered in shaded area.

2. The total Cap adjustment for permanent trade (including exchange rate adjustments to permanent interstate trade) is comprised of the sum of net inter-valley and net interstate trade for each designated river valley, as per the Diversion Cap Register.

3. The total Cap adjustment for temporary trade is comprised of the sum of net inter-valley and interstate trade for each designated river valley, as per the Diversion Cap Register.

4. The sign convention used is that a negative value indicates a trade out of the valley and a positive value indicates a trade into the valley.

5. Temporary entitlement transfers in Victoria, includes temporary trade in both water right and sales entitlement.

6. The Metro-Adelaide Cap component is non-tradeable, unless the Ministerial Council determines otherwise.

7. Adjustment for Campaspe equals water transferred via Goldfields Superpipe. All other trades are effected by changing the Rochester pumped diversions

8. Goulburn/Broken/Loddon Cap adjustment reduces by the total water transferred via the Goldfields Superpipe.

Valley	Base Valley Water Entitlement (GL)	Announced Allocation (GL)	Net Carryover from 2014/15 (GL)	Water available under continuous accounting	Allocation Transferred into Valley (GL)	Net Trade in from Environment (GL)	Total Allocated Water in Valley (GL)
Victoria							
Goulburn	792	462	223	-	-17	-354	668
Broken	33	7	5	-	-1	-1	10
Loddon	264	133	34	-	56	-14	224
Campaspe	313	140	54	-	-1	-27	194
Wimmera-Mallee	78	15	112	-	0	-16	127
Kiewa	21	2	0	-	0	0	2
Ovens	68	44	0	-	0	0	44
Murray	1,296	978	447	-	186	-165	1,610
Total Victoria	2,864	1,782	875		223	-577	2,879

1. No data is to be entered in shaded area.

Table 9. Carryovers and Overdraws for 2015/16

Valley	Carryover from Last Year (GL)	Less Carryover Cancelled this Year (GL)	Less Overdraw used Last Year (GL)	Plus Overdraw cancelled this year (GL)	Plus Overdraw from Next Year (GL)	Net Carryover (GL)
Victoria						
Goulburn	223	0				223
Broken	5	0				5
Loddon	34	0				34
Campaspe	54	0				54
Wimmera-Mallee	112	0				112
Kiewa	0	0				0
Ovens	0	0				0
Murray	447	0				447
Total Victoria	875	0				875

1. No data is to be entered in shaded area.

Table 10. Water Authorised for Use in 2015/16

Valley	Diversion from Valley (GL)	Diverted from other valleys (GL)	Less Supplementary Access & Water-harvesting Use (GL)	Less Unregulated Stream Use not in Allocation (GL)	Less System Diversion not in Allocation (GL)	Use of Allocated Water in Valley (GL)
Victoria						
Goulburn	1,043	-430		6.8	186	420
Broken	11	0		0.8	4	6
Loddon	24	201		5.2	48	173
Campaspe	39	173		0.7	18	194
Wimmera-Mallee	20	0		1.1	1	18
Kiewa	6	0		5.0	0.0	1
Ovens	17	0		4.7	0	12
Murray	1,319	55		4.0	248	1,122
Total Victoria	2,479	-1,265		28	505	1,944

Table 11. Use of Valley Allocations in 2015/16

Valley	Total Allocated Water in Valley (GL)	Use of Allocated Water in Valley (GL)	Use as a % of Total Effective Allocation (%)
Victoria			
Goulburn	668	419.5	63%
Broken	10	5.6	53%
Loddon	224	172.7	77%
Campaspe	194	193.5	100%
Wimmera-Mallee	127	17.7	14%
Kiewa	2.2	1.2	53%
Ovens	43.6	12.0	28%
Murray	1,610	1,122.1	70%
<i>Total Victoria</i>	2,879	1,944.2	68%

Table 12. Environmental Water Entitlements (GL) in 2015/16

Valley	Total Environmental Entitlements			Entitlements created from Savings made outside the Cap		
	High Reliability Entitlement (GL)	Low Reliability Entitlement (GL)	Supplementary Access Entitlements (GL)	High Reliability Entitlements (GL)	Low Reliability Entitlements (GL)	Supplementary Access Entitlements (GL)
Victoria						
Goulburn	341	182	0	0	0	0
Broken	0	0	0	0	0	0
Loddon	14	3	0	0	0	0
Campaspe	27	8	0	0	0	0
Wimmera-Mallee	70	0	0	0	0	0
Kiewa	0	0	0	0	0	0
Ovens	0	0	0	0	0	0
Murray	496	151	0	22	0	34
<i>Total Victoria</i>	948	344	0	22	0	34

Table 13. Environmental Water Allocations (GL) in 2015/16

Valley	Environmental Allocation (GL)	Net Availability of Carryover (GL)	Environmental Allocation Borrowed by Non-Environmental Users	Use of Environmental Supplementary Access Entitlements	Net Trade in from Non-Environmental Allocations (GL)	Net transfer in from Environmental Allocations in other valleys (GL)	Water Available for Environmental Use (GL)	Water made available to the environment as a result of Savings outside the Cap (GL)
Victoria								
Goulburn	322	58	0	0	-22	-4	354	0
Broken	0	0	0	0	0	1	1	0
Loddon	13	2	0	0	0	-1	14	0
Campaspe	19	0	0	0	0	8	27	0
Wimmera-Mallee	6	10	0	0	0	0	16	0
Kiewa	0	0	0	0	0	0	0	0
Ovens	0	0	0	0	0	0	0	0
Murray	437	417	0	0	0	-688	165	22
<i>Total Victoria</i>	797	487	0	0	-22	-685	577	22

Table 14. Environmental Water Use in 2015/16

Valley	Total use of Environmental Allocations (GL)	Consumptive Use of Environmental Allocations (GL)	Consumptive Environmental Use not covered by Entitlement (GL)	Total Consumptive Environmental Use (GL)	Percentage Use of Environmental Allocations
Victoria					
Goulburn	243	-55	0	-55	69%
Broken	1	1	0	1	88%
Loddon	7	7	0	7	53%
Campaspe	14	0	0	0	51%
Wimmera-Mallee	8	8	0	8	50%
Kiewa	0	0	0	0	0%
Ovens	0	0	0	0	100%
Murray	375	95	0	95	227%
Total Victoria	647.784	56.797	0.000	56.797	112%

1. No data is to be entered in shaded area.

Table 15. Cap Adjustment for Environmental Water Use in 2015/16

Valley	Component of calculated Annual Diversion Target that was used for Environment under baseline conditions (GL)	Component of Calculated Annual Diversion Target relating to an Entitlement and water savings that has been transferred to Environmental Use (GL)	Credits from Upstream Tributaries Not Traded	Environmental Use of an Non-Environmental Allocation (trade to Environment) (GL)	Non-Environmental Use of an Environmental Allocation (trade from Environment) (GL)	Water Within Cap transferred to Snowy Annual Allocation (GL)	Cap Adjustment for Environmental Entitlements and Use (GL)
Victoria							
Goulburn Broken Loddon Cap Valley	0	-75	-298	0	22	33	233
Campaspe	0	-8	-13	0	0	0	6
Wimmera-Mallee	0	0	0	0	0	0	0
Kiewa Ovens Murray Cap Valley	60	766	311	28	0	21	564
Total Victoria	60	683	0	28	22	54	803

Table 16. Comparison of 2015/16 Actual and Natural Annual Flows (GL) for Key Sites

Valley	Actual Flow (GL)	Natural Flow (GL)	Actual/ Natural (%)
Inter Basin Transfers			
Snowy Mountain Scheme to Murrumbidgee River	N/A	N/A	N/A
Snowy Mountain Scheme to Murray River	N/A	N/A	N/A
Glenelg River Catchment to Wimmera-Mallee	N/A	N/A	N/A
Wannon River Catchment to Wimmera-Mallee	N/A	N/A	N/A
Victorian Tributaries			
Kiewa River at Bandiana	438	444	99%
Ovens River at Wangaratta	621	648	96%
Goulburn River at McCoys Bridge	441	879	50%
Campaspe River at Rochester	26	11	238%
Loddon River at Appin South	20	13	162%
Wimmera River at Horsham	3	22	14%

TABLE 17 IMPOUNDMENTS & LOSSES IN MAJOR ON-STREAM STORAGE (>10GL Capacity) in 2015/16

	Major On-Stream Storage	Completion Date	Storage Capacity (GL)	Volume of Storage at Beginning of Water Year (GL)	Volume of Storage at End of Water Year (GL)	% of Storage Full at End of Year (%)	Increase in Volume of Storage (GL)	Evaporation Losses (Net) (GL)	Net Reduction in Flow due to Storage (GL)	% Evap Loss to Storage Capacity (%)
Victoria										
	<i>Goulburn/Broken/Loddon</i>									
	Eildon Reservoir	0	3334	1853	1184	36%	-669	18.2	-651	0.5%
	Lake Nillahcootie	0	40	21	12	30%	-10	0.8	-9	2.0%
	Cairn Curran Reservoir	0	147	52	17	12%	-34	6.4	-28	4.4%
	Tullaroop Reservoir	0	73	27	15	21%	-12	3.1	-9	4.2%
	<i>Campaspe</i>									
	Lake Eppalock	0	305	137	66	22%	-72	12.8	-59	4.2%
	Lauriston Reservoir	0	20	17	13	65%	-4	2.1	-2	10.3%
	Malmsbury Reservoir	0	18	4	3	15%	-2	1.9	0	10.4%
	Upper Coliban Reservoir	0	37	20	15	40%	-6	3.0	-3	8.2%
	<i>Wimmera-Mallee</i>									
	Lake Bellfield	0	79	51	44	56%	-7	2.1	-5	2.6%
	Lake Fyans	0	18	12	10	53%	-3	3.4	1	18.2%
	Lake Lonsdale	0	65	0	0	0%	0	0.3	0	0.5%
	Lake Taylor	0	34	9	13	37%	3	3.6	7	10.6%
	Pine Lake	0	62	0	0	0%	0	0.0	0	0.0%
	Tooloondo Reservoir	0	92	9	3	4%	-6	6.1	0	6.6%
	Wartook Reservoir	0	29	18	16	54%	-2	4.4	2	15.1%
	<i>Murray/Kiewa/Ovens</i>									
	Rocky Valley Reservoir	0	28	15	18	64%	4	0.0	4	0.0%
	Lake Buffalo	0	24	15	15	61%	0	0.4	0	1.8%
	Lake William Hovell	0	14	13	14	101%	0	-0.3	0	-2.2%
Total Victoria			4420	2277	1457	33%	-820	68	-752	1.5%

1. Evaporation data for GWMW storages are estimates only and rely on pan evaporation data at Rocklands Reservoir.
2. Rocky Valley reservoir data sourced from AGL Hydro. No evaporation data available.
3. Lauriston, Malsbury & Upper Coliban reservoir data sourced from Coliban Water.
4. Lake Bellfield, Lake Fyans, Lake Lonsdale, Lake Taylor, Pine Lake Tooloondo Reservoir & Wartook Reservoir sourced from Grampians Wimmera Mallee Water
5. All other reservoir data sources from G-MW's data base or from BoM for rainfall/evaporation
6. Lake Mokoan has been decommissioned