Victorian Submission to Annual Transitional Period Water Take Report 2016/17

Draft

VICTORIA State Government | Environment, Land, Water and Planning

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1 Water resource management overview for Victoria

1.1 Introduction

This submission constitutes Victoria's 2016/17 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 2016/17.

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 2016/17, and provides context and analysis. The detailed data are provided in Appendix 1.

1.2 Achievements and Outcomes in Water Resource Management

Victoria submitted its draft Wimmera-Mallee Water Resource Plan to the MDBA in early May 2017 and commenced the development of a Water Resource Plan (WRP) for Northern Victoria (including the Victorian Murray) under the Basin Plan 2012 as part of the transition from Cap reporting to reporting under the Sustainable Diversion Limit (SDL). Significant achievements for 2016/17 towards this goal are:

- Progression of Victorian supply measure projects through Sustainable Diversion Limit Adjustment Assessment Committee, a number of which are Victorian works based supply measures and some are Victorian-led operating rule change proposals.
- Concept paper prepared during 2015/16 to set out Victoria's proposed method for assessing Basin Plan compliance in Victorian (Surface Water) Water Resource Plan Areas using hydrologic models has been updated to address various feedback received.
- Finalisation of documentation on entitlements in the Goulburn, Broken, Campaspe and Loddon systems at 30 June 2009 to inform the Goulburn Simulation Model (GSM) BDL model.
- Documenting operating and water management rules in the Goulburn, Broken, Campaspe and Loddon systems at 30 June 2009 to inform the Goulburn Simulation Model (GSM) BDL model.
- Completion of 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 (BSM) 2030 Status Report for 2015/16 to the MDBA, continuation of compliance with salinity and water quality trigger points, and preparation of a comprehensive report on compliance with BSM 2030 over 2015/16 and 2016/17 In line with new biennial reporting and auditing processes.
- Commenced the development of Victoria's Water Resources Plan (WRP) for Northern Victoria (including the Victorian Murray).

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 agree on the method to reduce the Cap for environmental flows, and to develop method for the calculation of volume of water available in the SDL resource units of the Murray-Darling Basin.

1.3 Available Water Resources

Following a dry autumn, 2016/17 started with well above average rainfall in July, which transitioned into Victoria's tenth wettest spring on record. Rainfall in September and October were the highest on record at many sites across Victoria, resulting in inflows in October being well above average. This rain also led to widespread flooding, particularly in the Murray and Loddon systems but meant that storages in the Ovens, Loddon and Campaspe, Lake Hume, Lake Lonsdale and Lake Wartook all filled. After a wet winter and spring, the summer and autumn rainfall was close to average and inflows were below the monthly average for the second half of the year at most storages.

In 2016/17, seasonal determinations in northern Victoria were the highest since water entitlements were unbundled, with the Murray system receiving a low-reliability water share seasonal determination for the first time. The final seasonal determinations are shown in Table 1.

Table 1. Final 2016/17 seasonal determinations

Regulated system	Final Seasonal Determination (HRWS)	Final Seasonal Determination (LRWS)
Victorian Murray	100%	5%
Goulburn	100%	0%
Campaspe	100%	100%
Loddon	100%	0%
Broken	100%	100%
Bullarook	100%	100%

In Wimmera-Mallee system, the Commonwealth Environmental Water Holdings received a 51 percent final allocation and other holders of different types of entitlements a 100 percent final allocation.

High availability of surface water in 2016/17 compared to 2015/16 was associated with a decrease in groundwater usage.

The carryover policy in the Murray, Goulburn and Campaspe systems allows unused allocation to be carried over by entitlement holders into the following year, 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 Loddon, Broken and Bullarook systems is not subject to any spill accounting. There were

deductions from spillable water accounts in the Campaspe and Murray 2016/17, with all water transferred to spillable water accounts deducted from those accounts.

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.

1.4 Water Resource Use and Trade

Victorian systems diverted a total of 1,905 GL for consumptive water use from the Murray-Darling Basin during the 2016/17, significantly less than in 2015/16. Demand in 2016/17 was reduced due to the wet conditions at the start of the year, and irrigation demand ended in April following widespread rainfall.

The volume diverted in the designated Murray/Kiewa/Ovens valley was 1,146 GL and 734 GL was diverted in the Goulburn/Broken/Loddon valley. The Campaspe River and Wimmera-Mallee valley diversions were 11.2 GL and 14.0 GL respectively.

The total volume delivered to northern Victorian regulated systems for consumptive water use during 2016/17 was 1,577 GL. This is 368 GL less than the volume delivered in 2015/16. The total Victorian usage was 64 per cent of the total volume allocated.

Deliveries in the Murray/Kiewa/Ovens designated valley were 992 GL in 2016/17, 143 GL less than the delivery of 1,135 GL in the previous year. Deliveries in the Goulburn/Broken/Loddon valley were also lower this year delivering 447 GL in 2016/17, 151 GL less than the 598 GL delivered in 2015/16. Campaspe valley deliveries were 126 GL in 2016/17, compared to 194 GL delivered in 2015/16.

Total Wimmera-Mallee deliveries, including water diverted from other valleys, were 12.1 GL in 2016/17, 5.6 GL less than the 17.7 GL delivered in 2015/16.

There was a net temporary allocation trade of consumptive water into Victoria of 208 GL in 2016/17. This was a significant turn around from the net 463 GL traded from Victoria in the previous year.

Interstate temporary allocation trading with New South Wales resulted in an overall net transfer to Victoria of 46.7 GL during 2016/17. This volume includes net allocation trade of 68.6 GL to Victoria from NSW Murray and 13.5 GL from Victoria to the Murrumbidgee River basin. There was 8.5 GL trade from the Darling River to Victoria. Trade with South Australia resulted in a total net temporary allocation trade of 181 GL from Victoria, compared to 637 GL traded to South Australia from Victoria in 2015/16.

The net consumptive use of environmental water in 2016/17 was significantly greater than in 2015/16, with 295 GL used in comparison to 56.8 GL the year before. However, the volume of environmental allocation used in 2016/17 was less than in the previous year, 524 GL compared to 648 GL. Of this volume, the greatest usage was in the Goulburn and Murray systems, 240 GL and 252 GL. In 2016/17, 229 GL was recredited to environmental accounts and was part of the 306 GL traded to South Australia.

There was 20 GL traded from environmental entitlement holders to consumptive users in the Murray and Goulburn system, and 5.0 GL was traded from consumptive users to the environment in the Wimmera Mallee.

1.5 Assessment Tools and Data

1.5.1 Interception Diversion

Victoria is in the final stages of developing appropriate methods to estimate take from interception activities for Basin Plan reporting purposes. This includes take from runoff dams and commercial plantations.

The approach being taken for commercial plantations is based on the SoilFlux Model which is considered to provide the best available information. The annual permitted net take of water by commercial plantations will

be estimated based on the long-term average rate of evapotranspiration from plantations compared to the vegetation type that was present before the plantation was established.

All runoff dams used for irrigation or commercial purposes in Victoria are fully included in the capped entitlement system. Estimated take for these dams will be based on entitlement volume.

A hydrological model for estimating take by stock & domestic (basic rights) runoff dams has been developed by Victoria based on the best available data. While the model itself is robust, many of the data inputs to the model are subject to significant uncertainty. Given the high degree of uncertainty, using estimates of annual take by runoff dams for SDL compliance purposes cannot be done on a sound technical basis. Instead, annual take by stock and domestic runoff dams will be based on the best estimate of the long-term average annual take of water by runoff dams (for basic rights) using the model developed by Victoria. While this estimate will still have significant uncertainty, it remains the best available approach to develop a number which satisfies the Basin Plan requirements.

Victoria intends to continue to undertake further work to reduce the uncertainty associated with the estimates of runoff dam impact.

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 2016/17.

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 2016/17 for the Goulburn/Broken/Loddon and Campaspe Cap model, there were differences in May and June stream flow data from those used in the 2015/16 update. Edits were also made to inputs due to the availability of new climate data, review of spillway flows and changes to streamflow ratings, which led to changes in cumulative cap credits from 1997/98 to 2015/16. These changes are net increase of 14.2 GL for Goulburn/Broken/Loddon (approximately 0.7 per cent of the long-term average valley Cap) and net decrease of 7.5 GL for Campaspe valley (approximately 6 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. The updates in input data extension to 2016/17 for the Victorian Murray/Kiewa/Ovens models have led to a net increase of 1.2 GL to the 1997/98 to 2014/15 cumulative Cap credit – approximately 0.1 per cent of the long term average valley Cap.

The Wimmera-Mallee Post Irrigation entitlement sale model has been used to calculate the 2016/17 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 2016/17 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 take for the majority of licensed groundwater bores is measured through annual metering. All groundwater bores licensed for volume in excess of 20 ML/yr are metered, except in the Shepparton Irrigation Area. Many bores greater than 10 ML/yr 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 2ML/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.

Annual take in the Shepparton Irrigation Region is estimated based on a subset of metered 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 2016/17, 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 2016/17, there was no breach in cumulative Cap credit for any Cap valley in the Victoria.

Actual diversions are expected to exceed the modelled Cap targets in some years because significant policy changes since the introduction of Cap have altered water-use behaviour. To balance out the high variability between years, the cumulative Cap credit/debit is used for assessing Cap compliance — not each individual year's credit/debit.

The large cumulative Cap credits accrued since 1997 mean that Victoria is expected to be Cap compliant until 2019/20 (when the Cap will be superseded by Basin Plan Sustainable Diversion Limits).

2.2.1 Victorian Murray, Kiewa and Ovens

Diversion from the Murray/Kiewa/Ovens valley was 1,145 GL, which is 293 GL less than the Cap target of 1,438 GL (with preliminary adjustment for trade and environmental releases). The diversion was 33 per cent below the long-term Cap average of 1,702 GL/year. The cumulative Cap credit since July 1997 to June 2017 is 3,153 GL.

2.2.2 Goulburn, Broken and Loddon

Diversion from the Goulburn/Broken/Loddon River Valley was 734 GL, which is 532 GL less than the Cap target of 1265 GL (with adjustment for trade, environmental releases, decommissioning of Lake Mokoan and inter-valley transfers). Diversions were 64 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 2017 is 3,245 GL.

2.2.3 Campaspe

Diversion from the Campaspe valley was 11 GL, which is 58 GL below the Cap target of 69 GL (with adjustment for environmental releases). Diversions were 91 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 2017 is 526 GL.

2.2.4 Wimmera-Mallee

Diversion from the Wimmera-Mallee valley was 14 GL, which is 26 GL less than the Cap target of 40 GL. Diversions were 69 per cent below the long-term average Cap of 45 GL/year. The cumulative Cap credit for the Wimmera-Mallee valley since July 1997 to June 2017 is 158 GL.

2.3 Victorian Murray

2.3.1 Resource Availability

There was a 1 per cent high-reliability water shares seasonal determination at the start of July 2016 for Murray system entitlement holders. The seasonal determination gradually increased to 100 per cent high-reliability water shares and 5 per cent low-reliability water shares by mid-February 2017 (Table 1). This was the first seasonal determination of low reliability water shares since entitlements were unbundled and the highest seasonal determination in the Victorian Murray since 2005/06. There was 186.1 GL debited from consumptive users' spillable water accounts in the Murray system. On 10 February 2017, a declaration was made that the risk of spill at Lake Hume was low which enabled the remaining water held in spillable water accounts to be accessed.

The Menindee Lakes passed from the control of the Office of Water NSW to the control of the MDBA during the 2016/17 as the storage volume increased above 640 GL in October 2016.

At 1 July 2016, Lake Dartmouth was 47 per cent of capacity and Lake Hume was 40 per cent capacity. Lake Hume filled and spilled during the 2016/17 before being drawn down to 71 per cent by the end of June 2017. By 30 June 2017 Lake Dartmouth was at 78 per cent. Inflows for Dartmouth and Hume in 2016/17 were 150 per cent and 160 per cent of the annual average respectively.

During 2016/17 there were suspensions to access for Murray System unregulated entitlement holders on 2 unregulated waterways in the Upper Murray and 2 in the Mitta Mitta. The duration of these restrictions ranged between 59 and 138 days, with one suspensions continuing into 2017/18.

2.3.2 Annual Diversion

The total diversion, excluding all environmental diversions, was 1,127 GL for the Victorian component of the River Murray valley. The allocated volume available for consumptive use was 1,006 GL, of which 982 GL or 97.6 per cent was used by private diverters and irrigators. There was also 3.5 GL estimated to be the diverted 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 1.5 GL.

2.3.3 Trade

There was a net allocation trade by consumptive users into the Victorian Murray in 2016/17 of 149 GL. Within this volume there was a net temporary allocation trade of 98.4 GL from the Victorian Murray from South Australia, and 43 GL from New South Wales.

There was 86 GL of permanent high-reliability water share trade within the Victorian Murray. The net permanent trade out of the Victorian Murray was 32 GL, including trade out to non-water users.

2.4 Kiewa

2.4.1 Resource Availability

During 2016/17 there were 7 suspensions to access for Kiewa valley unregulated entitlement holders of the 23 unregulated waterways. These suspensions were in place during 2016/17 for between 146 and 191 days, with all of the suspensions carrying through into July 2017.

2.4.2 Annual Diversion

Kiewa valley use of urban entitlements was 0.9 GL or 42 per cent of the entitlement volume. A further 4.1 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 well above average in 2016/17 with 159 per cent and 145 per cent of average annual inflows received at Lake Buffalo and Lake William Hovell respectively. Lake Buffalo was filled from sill level between the start of November to the start of December. The storage was drawn down to 45 per cent of capacity by the mid-May. Lake William Hovell began 2016/17 at 102 per cent capacity. Lake William Hovell was drawn down to 72 per cent of capacity by end of April, and reached 91 per cent at the end of June 2017.

Access to spill water entitlements on the Buffalo, Ovens and King Rivers ceased in mid-January 2017 when spill flows were forecast to fall below the minimum requirements in the regulated reaches. There were no restrictions to regulated high reliability supplies in the Ovens valley in 2016/17.

During 2016/17 there were suspensions to access for Ovens System unregulated entitlement holders on four unregulated waterways, and various stages of restriction on one other unregulated waterway. These suspensions to access went for between 135 and 146 days, with both restrictions continuing into 2017/18.

2.5.2 Annual Diversion

Diversion in the Ovens valley and regulated tributaries for private irrigation, domestic and stock, commercial, industrial and urban purposes was 9.7 GL or 23 per cent of the volume available for use in 2016/17. A further 3.7 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 2.8 GL of permanent high-reliability water share traded within the Ovens valley.

2.6 Broken

2.6.1 Resource Availability

The Broken River system seasonal determinations started at zero per cent on 1 July 2016. On 1 August 2016, the seasonal determination increased to 20 per cent of high-reliability water shares. Seasonal determinations improved to reach 100 per cent of high-reliability water shares and low-reliability water shares by mid-November 2016 (Table 1).

Lake Nillahcootie was 30 per cent full on 1 July and increased to 112 per cent when the storage surcharged when inflows increased during October. Lake Nillahcootie ended 2016/17 at 89 per cent of capacity. Inflows to Lake Nillahcootie for 2016/17 were 145 per cent of the annual average, compared to only 13 per cent of average in 2015/16.

During 2016/17 there were suspensions to access for Broken valley unregulated entitlement holders on two of the four unregulated waterways. These restrictions to access went for between 135 and 198 days, with one waterway carrying the restriction into 2017/18.

2.6.2 Annual Diversion

Diversion by consumptive users from the Broken system was 9.7 GL, and usage of the total allocated volume was 4.2 GL or 28.1 per cent utilisation. A further 0.6 GL was estimated to be taken in the unregulated system.

2.6.3 Trade

There was a net volume of consumptive allocation trade out of the Broken of 4.4 GL. A total of 0.1 GL was traded in while 4.5 GL was traded out.

There was 1.0 GL of permanent high-reliability water share traded within the Broken system.

2.7 Goulburn

The Goulburn River system supplies private diverters, environmental entitlements and an extensive irrigation network. The irrigation network supplied from the Goulburn River system via the Waranga Western Channel is physically located across three Cap valleys. Although physically located within the Campaspe and Loddon catchments, the Rochester Irrigation Area and Loddon Valley Irrigation Area are supplied primarily by Goulburn sourced entitlements which are subject to the Goulburn system seasonal determinations

2.7.1 Resource Availability

High-reliability water shares entitlement holders in the Goulburn system received an initial seasonal determination on 1 July 2016 of 8 per cent. The seasonal determination reached a maximum of 100 per cent of high-reliability water shares by mid-October 2016 (Table 1). There has been no seasonal determination of low-reliability water shares since 1997/98.

Lake Eildon was 36 per cent full at the start of July 2016 and reached 80 per cent at the start of December. At the end of June, Lake Eildon was 63 per cent of capacity. Inflows into Lake Eildon were 113 per cent of average, and unregulated inflows into Goulburn Weir were 80 per cent of average. A low risk of spill declaration was made on 1 July 2016 allowing customers access to water in spillable water accounts. There were no deductions from spillable water accounts in Goulburn system in 2016/17.

During 2016/17 there were suspensions to access for Goulburn valley unregulated entitlement holders on 2 unregulated waterways, and restriction on one other unregulated waterway. These restrictions to access went for between 61 and 192 days, with one suspension continuing into 2017/18

2.7.2 Annual Diversion

The total volume allocated for use by consumptive users in the Goulburn system was 853 GL. Usage in the Goulburn system was 322 GL, or 38 per cent of the total allocated volume. A further 12.8 GL was estimated to be taken in the unregulated system.

The total diversion by consumptive users during 2016/17 to the Goulburn valley was 691 GL. Of this diversion, the net volume of 287 GL was transferred from the Goulburn system via the Goulburn River or the Waranga Western Channel to the Murray, Campaspe, Loddon and Wimmera-Mallee systems. A total of 3.1 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

The net volume of temporary consumptive allocation trade out of the Goulburn system, excluding the Rochester and Loddon Valley irrigation areas which sit geographically in the Campaspe and Loddon valleys, was 77 GL. A total of 246 GL was traded in while 322 GL was traded out. There was a net allocation trade of 17.9 GL into the Goulburn system from South Australia.

There was 40.2 GL of permanent high-reliability water share traded within the Goulburn valley, excluding Loddon Valley Irrigation Area and Rochester Irrigation Area. The net permanent trade out this same area was 11.4 GL, including trade out to non-water users.

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 were zero per cent until 1 August when they increased to 21 per cent of high-reliability water shares. By mid- October the seasonal determination had increased to 100 per cent high-reliability water shares and low-reliability water shares (Table 1). All water held spillable water accounts in the Campaspe system was deducted by mid-October, and a low risk of spill declaration was not made in 2016/17.

Lake Eppalock was at 22 per cent on 1 July 2016, and filled at the start of October. Over the course of the water year it was drawn down to 89 per cent capacity. In 2016/17 the annual average inflows into Lake Eppalock were 217 per cent of average compared to only 5 per cent of average during 2015/16.

The Coliban storages started 2016/17 on 1 July at 41 per cent capacity, and significantly improved due to inflows, which resulted Upper Coliban Reservoir filling and spilling, and Lauriston Reservoir effectively filling. Over the course of 2016/17 the storages were drawn down to 46 per cent capacity at the end of the year.

There were 19 suspensions to access for Campaspe valley unregulated entitlement holders carried over from 2015/16, and were lifted between mid July and September. Suspensions to access were back in place for 19 unregulated waterways over the summer, three of which were lifted in May 2017 and 16 were carried into 2017/18.

2.8.2 Annual Diversion

In 2016/17 there was no use of the Goldfields Superpipe and no pumping from Lake Eppalock to Bendigo. There was no water transferred from the Goulburn system to Lake Eppalock in 2016/17.

The 2016/17 Campaspe valley allocated volume was 198.7 GL of which 63 per cent was utilised, including the Rochester Irrigation area. A further 0.7 GL was estimated to be taken in the unregulated system.

2.8.3 Trade

The net temporary allocation trade out of the Campaspe trading zones plus the Rochester Irrigation Area was 13.5 GL.

There was 62 GL of permanent high-reliability water share traded within the Campaspe valley, including the Rochester Irrigation Area, and 0.2 GL of permanent trade out of the same area.

2.9 Loddon

Although physically located within the Loddon catchment, the Loddon Valley Irrigation Area, also known as Pyramid Hill-Boort, 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

The Loddon system received its first non-zero seasonal determination on 1 August 2016 of 10 per cent of high-reliability water shares (excluding the Bullarook Regulated system). The seasonal determination reached a maximum of 100 per cent of high-reliability water shares by mid-October 2016 (Table 1). While there was not allocation of low-reliability water shares, there was supplementary resource available to the Goulburn system. Entitlement holders in the Bullarook system received a seasonal determination of 100 per cent high-reliability water shares and low-reliability water shares by mid-August 2016 (Table 1).

The 2016/17 inflows into the Loddon storages were high with Tullaroop and Cairn Curran Reservoirs receiving 195 and 197 per cent of average inflows respectively, compared to only 1.1 and 3.4 per cent in 2015/16. Tullaroop Reservoir started 2016/17 at 21 per cent of capacity and Cairn Curran Reservoir started at 12 per cent of capacity. Both storages and Laanecoorie reservoir filled and spilled. Over the 2016/17 Cairn Curran and Tullaroop Reservoirs were drawn down to meet entitlement holder requirements, ending the year at 75 per cent and 73 per cent of capacity respectively.

Newlyn Reservoir and Hepburn Lagoon began the year at 17 and 18 per cent of capacity and increased to 100 per cent in mid-August and late August respectively. Newlyn was drawn down to 67 per cent capacity by the end of May 2017, and Hepburns Lagoon was drawn down to 55 per cent to the start of April 2017.

There were suspensions to access on 23 unregulated waterways carried over from 2015/16. All of these suspensions were lifted by the mid- August. In summer suspensions were put in place on 28 unregulated waterways, six of which were lifted towards the end of the year. Suspensions to access for 22 waterways continued into 2016/17.

2.9.2 Annual Diversion

Diversion from the Loddon valley by consumptive users was 33.2 GL. An additional 5.8 GL was estimated to be taken in the unregulated system. An additional 126 GL was physically transferred into the Loddon Valley Irrigation Area, which sits within the Loddon Valley, from the Goulburn valley in 2016/17.

Total use by regulated consumptive entitlement holders in the Loddon valley was 120.1 GL, or 71 per cent of the allocated volume, including deliveries to Loddon Valley irrigation area.

2.9.3 Trade

The net temporary allocation trade into the combined Loddon trading zones and Loddon Valley Irrigation Area was 40 GL.

There was 5.1 GL of permanent high-reliability water share traded within the Loddon catchment, and a net trade of 0.3 GL out of the same area.

2.10 Wimmera-Mallee

2.10.1 Resource Availability

Water allocations for Wimmera-Mallee Pipeline Product for the 2016/17 water year reached 100 per cent. There was also a full allocation against the 1 GL wetland product component of the Wimmera and Glenelg Rivers Environmental Entitlement, and a 51 per cent allocation against the 28 GL former irrigation entitlement held by the Commonwealth Environmental Water Holder.

The Wimmera-Mallee storages started 2016/17 on 1 July at a combined 25 per cent capacity, with Lake Lonsdale being effectively dry. Lakes Lonsdale and Wartook filled and spilled during the year resulting in a combined 48 per cent capacity on 30 June 2017.

2.10.2 Annual Diversion

For 2016/17, the total diversion of water sourced within the Wimmera-Mallee valley was 14.0 GL or 6.8 per cent of the allocated volume.

Total use by regulated entitlement holders was 12.1 GL and additional 1.3 GL from unregulated waterways.

2.10.3 Trade

There was 2.8 GL of temporary allocation trade within the Wimmera-Mallee in 2016/17.

3 Transition period Section 71 reporting

While the Draft Water Resource Plan (WRP) for the Wimmera-Mallee WRP area has been submitted, the Water Resource Plan for Northern Victoria (including the Victorian Murray) has commenced to set out water management arrangements for implementing the SDLs from 1 July 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 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 2016/17 to achieve this timeline include:

- Concept paper prepared during 2015/16 to set out Victoria's proposed method for assessing Basin Plan compliance in Victorian (Surface Water) Water Resource Plan Areas using hydrologic models has been updated to address various feedback received.
- Finalisation of documentation on 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 in 2015/16 so that it could be replicated for the Victorian Murray.
- Documenting operating and water management rules in the Goulburn, Broken, Campaspe and Loddon systems at 30 June 2009 to inform the GSM BDL model.
- Submission of BDL and SDL models for the Wimmera-Mallee Water Resource Plan Area as part of Wimmera-Mallee Water Resource Plan.

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 significant unregulated flows on the River Murray in 2016/17, resulting in the use of 38.7 GL of unregulated environmental entitlements. In addition to unregulated water the Barmah Environmental Water Account (EWA) rules were triggered and 84 GL was delivered to the River Murray. According to the current agreement of definitions the Barmah EWA is planned environmental water.

Use of regulated environmental entitlement in the Victorian Murray was 252 GL, which included use of recredited water from the Goulburn, Campaspe and Victorian Murray systems. The net usage in the Victorian Murray was 196.5 GL. There was 96 GL spilled from Murray spillable water accounts held by environmental water holders.

There was a net trade of 252 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 306 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 also trade of 241 GL within the Victorian Murray system moving water between environmental water holders.

There was 173 GL of environmental water credited to the Murray system for reuse or trade downstream, originating from the Goulburn, Campaspe systems and an additional 55.6 GL from the Victorian Murray.

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

There was no environmental water delivered in the Broken system in 2016/17.

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 240 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. In 2016/17, 169.5 GL was recredited to be available for use downstream and trade to South Australia.

There was a net 71 GL of environmental allocation traded out the Goulburn system to environmental water holders in other systems, and trade of 205 GL within the Goulburn system moving water between environmental water holders.

A 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 2016/17 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 5.6 GL was from Commonwealth, Victorian Environmental Water Holder and The Living Murray entitlements was used in 2016/17. Of this volume, 4.2 GL was re-credited to the Murray system, resulting in a net use of 2.4 GL.

There was a net 17.1 GL of environmental allocation traded out of the Campaspe from environmental water holders in other systems, and no trade within the Campaspe between environmental water holders.

There is no planned environmental water reporting requirement for the Campaspe System, as there are no flows that meet the Commonwealth definition of planned environmental water.

4.6 Loddon

While there were no environmental water deliveries to the Boort wetlands in 2016/17, all of the wetlands filled naturally as a result of the flooding in September and October.

The Loddon River and Serpentine creek received 12.4 GL of environmental water entitlements held in the Loddon system. There was 0.1 GL environmental entitlement allocated from Newlyn Reservoir in 2016/17, which was carried over into 2017/18.

There was a net 1.7 GL of environmental allocation traded out of the Loddon system to environmental water holders from other systems, and trade of 1.7 GL within the Loddon system moving water between environmental water holders.

There is no planned environmental water reporting requirements for the Loddon System, as there are no flows that meet the Commonwealth definition of planned environmental water.

4.7 Wimmera-Mallee

In the Wimmera-Mallee system, 13.6 GL was delivered to the environment, including 119 ML from the Victorian Environmental Water Holder wetland entitlement.

There is no planned environmental water reporting requirements for the Wimmera-Mallee, as there are no flows that meet the Commonwealth 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 2016/17 recognises previous discussions with the MDBA in which it was agreed that the majority of Victoria's 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 the definition in 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 undertook work in 2015/16 to more accurately determine what forms of PEW meet the Commonwealth's definition. Two forms were identified for reporting at this time. However, more recent work has clarified that these forms did not meet the definition. Therefore, the reporting on PEW differs to that reported in previous years. In bi-lateral discussions with the MDBA Victoria's advice was that no instruments identify and protect PEW in accordance with the definition under the Commonwealth Water Act. As a result, there is no PEW to report on for the purposes of the Wimmera-Mallee Water Resource Plan Area (surface water).

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 2016/17 and none are currently proposed for 2017/18 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 2016/17 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 progressed and finalised the evaluation of the Hume to Yarrawonga constraints measure business case and will now develop a new Goulburn constraints project that must be accepted by the community, be feasible and based on improved data and on ground knowledge.
- Working on the progression of supply measure projects through the Sustainable Diversion Limit Adjustment Assessment Committee, which were endorsed by the Ministerial Council in June 2017. A number of these are Victorian works based supply measures, developed in partnership with the Mallee and North Central Catchment Management Authorities, and some are Victorian-led operating 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 2 model to be ready by June 2018.
- 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 (BSM) 2030 Status Report for 2015/16 to the MDBA and continuing compliance with salinity and water quality trigger points. In line with new biennial reporting and auditing processes, Victoria is preparing a comprehensive report on compliance with BSM 2030 over 2015/16 and 2016/17 which will be submitted to the MDBA Independent Audit Group.

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 with Water Resource Plans in 2016/17 focused on finalising and releasing the preliminary Water Resource Plan Risk Assessment, several months' discussion and engagement with key stakeholders leading to the release of the Draft Wimmera-Mallee Water Resource Plan for public consultation.

5.2.1 Draft Wimmera-Mallee Water Resource Plan

The May release of the Draft Wimmera-Mallee Water Resource Plan for public comment was predicated by the establishment of the Wimmera-Mallee Water Resource Plan Technical Advisory Group, which included representatives from local water corporations, catchment management authorities, MLDRIN, the Victorian Farmers Federation, the Victorian Environmental Water Holder and the Wimmera Development Association.

The Technical Advisory Group met throughout the drafting of the Wimmera-Mallee Water Resource Plan to:

- Undertake a technical review of working documents, including the draft water resource plan.
- Share their skills and expertise and represent local perspectives within the water resource plan area.
- Participate and at times, lead, community and stakeholder consultation and help inform the wider public.

The Group will reconvene to guide the incorporation of feedback from the public consultation period into the final Wimmera-Mallee Water Resource Plan before submission to the MDBA.

The draft Wimmera-Mallee Water Resource Plan was released for a three-month period of public consultation, which included:

- Public meetings
- Targeted stakeholder briefings
- Presentations at existing stakeholder forums
- A submissions process
- Meetings on Country with Traditional Owner Groups.

Primary interests within the region included:

- Recreation water
    - while not a factor in the Basin Plan recreation water was acknowledged in the draft Wimmera-Mallee Water Resource Plan in deference to stakeholder priorities.
- Water for tourism
    - Including recognising the economic value of water for tourism.
- Aboriginal water.

5.2.2 Aboriginal Water

In addition to the broad public consultation process from May-August 2017, the Wimmera-Mallee Water Resource Plan held (and is continuing) discussions with Traditional Owner Groups as it works to identify Aboriginal Water objectives, and desired outcomes. This engagement has been both through direct on Country meetings, and providing funding to better support Traditional Owner aspirations for the lower Wimmera River system in relation to culture and traditional practices, Country, economic development opportunities, and to build relationships and community capacity.

Support has included co-funding an Aboriginal Water Officer with the Wimmera CMA and Barengi Gadjin Land Council, and through the Victorian Government Aboriginal Water Unit, employing an Aboriginal Water Policy officer at the Dja Dja Wurrung Clans Aboriginal Corporation.

Engagement with Traditional Owners has been framed by the Aboriginal Water Policy announced in the Victorian Government's 'Water for Victoria' October 2016 water plan. The policy is the foundation of Victoria's response to the Aboriginal Water requirements under the Murray-Darling Basin Plan, committing Victoria to:

- Recognise Aboriginal values and objectives of water
- Include Aboriginal values and traditional ecological knowledge in water planning
- Support Aboriginal access to water for economic development, and
- Build capacity to increase Aboriginal participation in water management.

The $9.7 million funding commitment from the Victorian Government includes $5 million to support Aboriginal access to water for economic development, and $4.7 million over four years to incorporate Aboriginal values and expertise into water management.

To assist Aboriginal communities in Victoria's share of the Basin to measure and prioritise river and wetland health, Victoria agreed to fund six Aboriginal Waterway Assessments received as part of an EOI process conducted by MLDRIN. Four of these AWAs have been conducted to date – the Wimmera River with Barengi Gadjin, the Upper Coliban with Dja Dja Wurrung, a series of wetlands and waterways with Tati Tati Wadi Wadi Traditional Owners, and several sites with the Barapa Barapa Water for Country Steering Committee.

Victoria has met with Martang Pty Ltd regarding management of culturally significant sites at the headworks storage of Lake Lonsdale. Martang's Registered Aboriginal Party area includes a portion of the Wimmera-Mallee Water Resource Plan area.

In addition to surface water, Victoria has facilitated discussions and information sharing between the First People of the Millewa-Mallee Aboriginal Corporation and the Murrayville Groundwater Advisory Committee to understand aspirations for groundwater in the region. The First People of Millewa-Mallee have a strong connection with surface water that is being included in the Northern Victoria Water Resource Plan, and conversations have commenced in that regard, along with other Traditional Owner groups.

It is anticipated the final Wimmera-Mallee Water Resource Plan will be submitted to the MDBA during 2017-18 and the Northern Victoria Water Resource Plan will be developed during 2017-18 for public release and final submission during 2018-19.

Appendix 1: Key Information from 2016/17 Water Resource Reporting Spreadsheet

Table 2. Murray-Darling Basin Diversions

Valley	Irrigation Diversion (GL)	Other Diversion (GL)	Total Diversion (GL)
Victoria			
Goulburn	672	19	690.589
Broken	8	1	9.694
Loddon	30	3	33.246
Goulburn Broken Loddon Cap Valley	*710.402*	*23*	*733.5*
Campaspe	6.121	5	11.238
Wimmera-Mallee	1	13	14.0
Kiewa	4.071	0.9	5.0
Ovens	8.405	5	13.476
Murray	1,076	51	1,127.3
Kiewa Ovens Murray Cap Valley	*1,089*	*57*	*1,145.8*
Total Victoria	1,807	98	1,904.6

Table 3. Accuracy of Diversion Estimates

Valley	Diversion (GL)	Accuracy +/- GL	Accuracy +/- %
Victoria			
Goulburn	691	0	0%
Broken	10	0	0%
Loddon	33	0	0%
Campaspe	11	0	0%
Wimmera-Mallee	14	0	0%
Kiewa	5	0	0%
Ovens	13	0	0%
Murray	1,127	0	0%
Total Victoria	1,905	0	0%

Table 4. Comparison of Diversions with Cap Levels

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. Allcn	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]	1,629	-55	-309	1,265.0	734	532	3,245	-407	-2,309
Loddon]									
Campaspe	92	0	-23	69	11	58	526	-24	-326
Wimmera-Mallee[2]	45	0	-5	40	14	26	158	-20	-166
Kiewa]									
Ovens]	1,461	228	-250	1,438	1,145.8	293	3,153	-340	-38
Murray]									
Total Victoria	3,228	173	-587	2,813	1,905	908	7,083	-792	-2,838

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	857879	430562	n/a	0	39542	n/a	n/a	37649
Broken	17625	3299	n/a	0	10088	n/a	n/a	2324
Loddon	144346	86766	n/a	0	28631	n/a	n/a	7319
Goulburn Broken Loddon Cap Valley	1019850	520627	0	0	78260	0	0	47292
Campaspe	160732	102837	n/a	0	8314	n/a	n/a	50862
Wimmera-Mallee	114746	0	n/a	0	466	n/a	n/a	2420
Kiewa	0	0	n/a	0	18331	n/a	n/a	2207
Ovens	33021	0	n/a	0	24762	n/a	n/a	10284
Murray	1315015	423751	n/a	40,000	28468	n/a	n/a	59662
Kiewa Ovens Murray Cap Valley	1348036	423751	0	40000	71561	0	0	72153
Total Victoria	2643364	1047215	0	40000	158602	0	0	172727

Table 7. Net Water Entitlement Transfers

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)		
	(GL)	(GL)	(GL)	(GL)	(GL)	(GL)		
Victoria[4]								
Goulburn	40	849	-3	23				
Broken	1	7	0	-4				
Loddon	5	49	-1	40				
Goulburn Broken Loddon Cap Valley	46	904	-4	59	-109	-55		
Campaspe	17	86	-1	0		0		
Wimmera-Mallee	0	8	0	0		0		
Kiewa	0	0	0	0				
Ovens	3	2	0	0				
Murray	86	1,471	5	148				
Kiewa Ovens Murray Cap Valley	89	1,473	5	148	74	228		
Total Victoria	152	2,471	0	207	-35	173		

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.

Table 8. Water Allocated

Valley	Base Valley Water Entitlement (GL)	Announced Allocation (GL)	Net Carryover from 2015/16 (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	806	525	255	-	21	-371	801
Broken	33	19	0	-	-4	0	15
Loddon	258	141	36	-	39	-15	216
Campaspe	287	153	47	-	-1	-19	199
Wimmera-Mallee	48	94	84	-	0	-68	178
Kiewa	21	2	0	-	0	0	2
Ovens	68	43	0	-	0	0	43
Murray	1,301	994	-135	-	153	-217	1,012
Total Victoria	2,821	1,971	286		208	-689	2,465

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

Table 9. Carryovers and Overdraws

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	255	0				255
Broken	4	4				0
Loddon	40	4				36
Campaspe	56	9				47
Wimmera-Mallee	84	0				84
Kiewa	0	0				0
Ovens	0	0				0
Murray	51	186				-135
Total Victoria	489	203				286

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

Table 10. Water Authorised for Use

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	691	-287		12.8	68	322
Broken	10	0		0.6	5	4
Loddon	33	125		5.8	33	120
Campaspe	11	127		0.7	12	126
Wimmera-Mallee	14	0		1.3	1	12
Kiewa	5	0		4.1	0	1
Ovens	13	0		3.7	0	10
Murray	1,127	32		3.5	174	982
Total Victoria	1,905	-3		32	292	1,577

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

Table 11. Use of Valley Allocations

Valley	Total Allocated Water in Valley (GL)	Use of Allocated Water in Valley (GL)	Use as a % of Total Effective Allocation (%)
Victoria			
Goulburn	801	322.2	40%
Broken	15	4.2	28%
Loddon	216	120.1	56%
Campaspe	199	126.0	63%
Wimmera-Mallee	178	12.1	7%
Kiewa	2.2	0.9	42%
Ovens	43.2	9.7	23%
Murray	1,012	981.5	97%
Total Victoria	2,465	1,576.7	64%

Table 12. Environmental Water Entitlements (GL)

	Total Environmental Entitlements			Entitlements created from Savings made outside the Cap		
Valley	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	370	190	0	0	0	0
Broken	0	0	0	0	0	0
Loddon	7	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	394	131	40	50	0	34
Total Victoria	869	332	40	50	0	34

Table 13. Environmental Water Allocations (GL)

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	351	106	0	0	-16	-71	371	0
Broken	0	0	0	0	0	0	0	0
Loddon	15	2	0	0	0	-2	15	0
Campaspe	36	0	0	0	0	-17	19	0
Wimmera-Mallee	56	7	0	0	5	0	68	0
Kiewa	0	0	0	0	0	0	0	0
Ovens	0	0	0	0	0	0	0	0
Murray	432	41	0	39	-4	-252	256	75
Total Victoria	891	156	0	39	-15	-342	728	75

Table 14. Environmental Water Use

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	240	71	0	71	65%
Broken	0	0	0	0	0%
Loddon	12	12	0	12	81%
Campaspe	6	1	0	1	30%
Wimmera-Mallee	14	14	0	14	20%
Kiewa	0	0	0	0	0%
Ovens	0	0	0	0	100%
Murray	252	196	0	196	99%
Total Victoria	523.957	294.661	0.000	294.661	72%

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

Table 15. Cap Adjustment for Environmental Water Use

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 fromUpstream 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	115	-170	0	16	41	309
Campaspe	0	18	-4	0	0	0	23
Wimmera-Mallee	0	0	0	5	0	0	5
Kiewa Ovens Murray Cap Valley	7	448	174	0	4	-27	250
Total Victoria	7	581	0	5	20	14	587

Table 16. Comparison of 2016/17 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	1,030	N/A	N/A
Ovens River at Wangaratta	2,539	N/A	N/A
Goulburn River at McCoys Bridge	1,742	N/A	N/A
Campaspe River at Rochester	154	N/A	N/A
Loddon River at Appin South	214	N/A	N/A
Wimmera River at Horsham	135	N/A	N/A

TABLE 17 IMPOUNDMENTS & LOSSES IN MAJOR ON-STREAM STORAGES (>10GL Capacity)

	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										
Goulburn/Broken/Loddon	Eildon Reservoir	0	3334	1188	2114	63%	926	5.3	931	0.2%
	Lake Nillahcootie	0	40	12	31	78%	19	-0.4	19	-1.1%
	Cairn Curran Reservoir	0	147	17	110	75%	93	10.0	103	6.8%
	Tullaroop Reservoir	0	73	16	53	73%	38	3.4	41	4.6%
Campaspe	Lake Eppalock	0	305	66	271	89%	206	16.7	222	5.5%
	Lauriston Reservoir	0	20	13	17	86%	4	2.0	6	9.9%
	Malmsbury Reservoir	0	18	3	2	11%	-1	1.9	1	10.3%
	Upper Coliban Reservoir	0	37	15	35	95%	20	3.8	24	10.3%
Wimmera-Mallee	Lake Bellfield	0	79	44	64	81%	20	-0.8	19	-1.0%
	Lake Fyans	0	18	10	14	75%	4	2.0	6	10.9%
	Lake Lonsdale	0	65	0	33	50%	33	10.1	43	15.5%
	Lake Taylor	0	34	13	21	61%	8	3.0	11	9.0%
	Pine Lake	0	62	0	0	0%	0	0.0	0	0.0%
	Tooloondo Reservoir	0	92	3	13	15%	10	4.5	15	4.9%
	Wartook Reservoir	0	29	16	21	73%	6	-2.3	3	-8.1%
Murray/Kiewa/Ovens	Rocky Valley Reservoir	0	28	18	13	45%	-5	0.0	-5	0.0%
	Lake Buffalo	0	24	15	13	55%	-2	-0.5	-2	-2.1%
	Lake William Hovell	0	14	14	12	91%	-1	-0.8	-2	-5.9%
Total Victoria			4420	1461	2838	64%	1378	58	1436	1.3%

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 Londsdale, Lake Taylor, Pine Lake Toolondo 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