

# Victorian Submission to Annual Diversion Reporting and Cap to SDL Transition 2012-13

## 1 Assessment Tools

Victoria has used computer simulation models calibrated to a 1993/94 level of development to calculate Cap targets for all major regulated systems. Regression models have been used for smaller systems. This approach meets the requirements of Schedule E of the Murray Darling Basin Agreement (MDBA). A new aspect of the 2012/13 Water Audit Monitoring (WAM) report is reporting as much as information on all forms of take under Section 71 of the Water Act 2007. For unregulated systems, interception activities and groundwater Victoria has summarised readily available information on water management of these components for the 2012/13 reporting.

### 1.1 Regulated Systems

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 valleys were developed by Victoria while the models used for the Victorian Murray/Kiewa/Ovens valleys were developed by the MDBA. In the case of the Wimmera Mallee system, two new models have been approved by the MDBA to calculate Cap targets, a post pipeline model to be used 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 2012/13 for the Goulburn/Broken/Loddon and Campaspe Cap model, there were a large number of retrospective rating curve changes for gauging stations and a number of minor changes to climate and streamflow input due to data quality changes. This led to a net increase of 6 GL and 4 GL in the Goulburn/Broken/Loddon and Campaspe cumulative Cap credits from 1997/98 to 2011/12 respectively, or approximately +0.3% and +3.3% of the long term average Caps respectively.

Regression models are used for the Kiewa and Ovens valleys and 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 2012/13 assessment. These updates and input data

extension to 2012/13 for the Victorian Murray/Kiewa/Ovens models have led to a net decrease of 12 GL to the 1997/98 to 2011/12 cumulative Cap credit which is -0.7% of the long term average Cap. The reasons for this decrease are correction to the incorrectly set Darling Riparian flows, increase in incorrectly set Hume minimum inflows to 19.5 GL/month, turning on the option for NSW to make releases for Menindee and updated NSW and Victorian tributary inflows.

The pre-pipeline Wimmera-Mallee model was approved by the MDBA on 5 November 2011 and this model was used to calculate Cap targets from July 1997 to June 2011. Since then two updated computer simulation models has been developed to represent fully pipelined conditions following completion of the Northern Mallee and Wimmera-Mallee pipelines, and the sale of irrigation entitlements in the Wimmera Mallee system respectively. Both these models were approved by the 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 66.9 GL/yr while the Wimmera Mallee Post Irrigation model operated over the same period yields an average annual diversion of 44.2 GL/yr, both not including unregulated diversion outside the model area. The Wimmera Mallee Post Pipeline model has been used to calculate the 2012/13 Cap target for Wimmera Mallee valley.

On 30 October 2010 the MDBA approved Victoria's proposed method for Cap adjustment for environment water that is required under the Murray Darling Basin Agreement Schedule E protocol "Adjusting Caps on Diversions for Environmental Entitlements and Uses". Similar to the last two years, this method has been applied to 2012/13 Cap targets to account for water recovered for the environment through initiatives such as Snowy environmental flows, The Living Murray including decommissioning of Lake Mokoan, and Commonwealth purchases.

Victoria remains committed to the ongoing development and improvement of Cap models for calculating annual Cap targets and the baseline and the sustainable diversion models for calculating baseline and sustainable diversion limits respectively.

## **1.2 Unregulated Systems, Interception Activities and Groundwater**

In Victoria unregulated water course diversions are estimated to contribute to less than 2% of total diversions. Calculation and estimation of other (regulated) diversions therefore have a higher priority than unregulated use. In previous years basic approaches that are considered sufficient 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. Significant resources and effort would be required to improve estimation of unregulated use, and a key component of this would be collection of unregulated use data. For 2012/13 an improvement to the estimation of unregulated use has been made by using some available metered unregulated use data to extrapolate for total unregulated use in 2012/13

There are a number of methods available that can be used to estimate take from interception activities. Selection of the most appropriate method for Victoria would

include consideration of risks associated with the activity (proportion of diversions), policy context, cost and technical suitability of the method. In Victoria, farm dams to be used for irrigation or commercial purposes are required to have a licence. Risk of growth in this form of interception activity would therefore only be represented by stock & domestic components. Similarly majority (about 80%) of commercial plantations in Victoria replaced native forest and the resultant change in evapotranspiration may not be significant. Victoria has developed some models to represent interception activities and continues to investigate better approaches to manage this water use component.

The permitted take and use of groundwater is based on the sum of the licenced 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 through annual metering. All groundwater bores licensed for volume in excess of 20 ML/yr are metered. Many bores greater than 10 ML/yr are also metered. Meters are read at least once annually. Where bores are not metered, use is estimated based on the metered readings and in consideration of climate conditions over the water year. Domestic and Stock use is estimated based on the number of bores less than 30 years (given the likely life of a domestic and stock bore) with an average use of 2ML/year per bore.

## **2 Water Resource Management in Victorian Murray, Northern Victoria and Wimmera-Mallee Water Resource Plan Areas**

### **2.1 Overview**

At the start of the 2012-13 season, water availability was supported by the volume held in Victorian storages at the end of the 2011-12 season and above average inflows during winter at most storages. From October 2012 to the end of the 2012-13 season, monthly storage inflows were generally well below average. In the Loddon, Campaspe and Broken systems, there was very little inflow from November 2012 to May 2013 inclusive. For this same period, the inflows to the Goulburn system were approximately 500 GL less than they were in 2011-12.

As occurred in 2011-12, entitlement holders in all systems received a seasonal determination of 100% of high reliability water shares (HRWS). Seasonal determinations in the Campaspe, Broken and Bullarook systems again reached 100% of low reliability water shares (LRWS). As was the case in the preceding water year, seasonal determinations were issued for all systems at the beginning of the water year and updated throughout the season. Entitlement holders in the Wimmera Mallee system received a seasonal determination of 82%, as did urban, domestic and stock customers supplied from the Wimmera-Mallee pipeline.

Current carryover policy in the Victorian Murray, Goulburn and Campaspe systems allows unused allocation to be carried over into the next season, with any water above their entitlement volume being subject to spills or pre-releases that occur from Dartmouth Reservoir, Lake Eildon and Lake Eppalock. The volume held above entitlement volumes by water share holders is held in spillable water accounts until a low risk of spill declaration is made. Carryover has allowed irrigators to have water available to use early in a season regardless of the seasonal determination to high

reliability water shares. Due to pre-releases and physical spills, 351.6 GL was debited from spillable accounts in the Goulburn system (including Rochester and Pyramid-Boort irrigation areas), 38.6 GL in the Victorian Murray system and 21.7 GL in the Campaspe system in 2012-13. There were also deductions from Living Murray extended use accounts in the Goulburn and Victorian Murray systems.

Across Goulburn-Murray Water's region, annual rainfall for the year ending 30 June 2013 was overall below average. The months of July and August, February and June were generally wetter than average, with the rest of the months rainfalls tending to be well below average. There was very low rainfall received in January across the Goulburn-Murray Water region and spring in 2012 was much drier than average.

## **2.2 Volumes Diverted**

The volume diverted during 2012-13 in the Victorian Murray/Kiewa/Ovens valley was 1,683.2 GL. In the Goulburn/Broken/Loddon designated river valley and the Campaspe river valley, diversions were 1,237.5 GL and 42.6 GL respectively. Wimmera-Mallee valley diversions were 16.7 GL.

Victorian systems diverted 2,980.0 GL from the Murray-Darling Basin during 2012/13. The total Cap target adjusted for trade and environmental allocations, including the Wimmera-Mallee, was 3,255.9 GL.

## **2.3 Off-Quota**

Off-quota allocations have not been available in Victorian river valleys since 2003.

## **2.4 Deliveries**

The total volume delivered to northern Victorian regulated systems during 2012-13 was 2,579.8 GL, 726.5 GL higher than the volume delivered in 2011-12 and the highest volume delivered since 2001-02. The total Victorian usage was 64.0% of the total volume allocated.

Deliveries in the Victorian Murray/Kiewa/Ovens designated valley were 1,431.1 GL in 2012-13, 350.2 GL greater than the delivery of 1,080.9 GL in the previous year. Goulburn/Broken/Loddon valley deliveries were 896.9 GL in 2012-13, 304.3 GL higher than the 592.6 GL delivered in 2011-12. Deliveries in the Campaspe valley were also higher in 2012-13, with 237.0 GL compared to 166.7 GL delivered in 2011-12.

Total Wimmera-Mallee deliveries including water diverted from other valleys were 14.7 GL in 2012-13, 1.6 GL more than the 13.1 GL delivered in 2011-12.

## **2.5 Trading**

The allocation trade market in Victoria was again very active during 2012-13 with a net volume of 645.2 GL traded from Victoria which was significantly greater than the 231.7 GL traded in the previous season.

Interstate allocation trading with New South Wales resulted in an overall net outward transfer from Victoria of 108.2 GL during 2012-13. This volume includes net outward allocation trade of 62.8 GL to NSW Murray and 33.7 GL to the Murrumbidgee River basin. A volume of 11.6 GL was traded into the Darling River.

Trade with South Australia was a net allocation trade of 537.0 GL to South Australia from Victoria, compared to 180.4 GL to South Australia from Victoria in the 2011-12 season. This was mainly due to trade of environmental water.

There was 411.0 GL of allocation trade into the Victorian Murray/Kiewa/Ovens valley from other valleys and the reverse trade was 1,077.0 GL resulting in a net allocation trade out of the Victorian Murray/Kiewa/Ovens valley of 666.0 GL. There was a net allocation trade of 537.0 GL from the Victorian Murray/Kiewa/Ovens valley into South Australia.

There was a net volume of allocation trade into the Goulburn/Broken/Loddon valley of 14.7 GL. A total of 273.0 GL was traded in while 258.3 GL was traded out. There was a net allocation trade of 1.7 GL out the Goulburn/Broken/Loddon valley to South Australia.

The net trade into the Campaspe valley was 6.1 GL, including a net 31.8 GL traded into the Rochester Irrigation Area.

## **2.6 Environmental Flows**

As occurred in 2011-12, there were again long periods of unregulated flow conditions in the River Murray in 2013-13. This resulted in unregulated sources of water being available for environmental use.

The total use of water for environmental allocations in 2012-13 was 383.6 GL. This volume includes in-stream use in the Wimmera-Mallee system and excludes unregulated water use. The total consumptive volume of water used for environmental purposes was 92.6 GL. There was a total of 291.0 GL re-credited to environmental accounts and 290.0 GL traded to South Australia.

An additional 17.1 GL was used in the River Murray during periods of unregulated flows, all of which was delivered to sites upstream of Nyah: Gunbower Forest, Round Lake and lower Broken Creek.

In the Goulburn system a total of 254.5 GL from The Living Murray (TLM) entitlements and the Commonwealth Environmental Water Holder entitlements was delivered in-stream to provide additional passing flows downstream of Goulburn Weir. Of this volume 245.6 GL was delivered to the River Murray before being traded to South Australia. The Goulburn wetlands were not supplied with environmental water during 2012-13.

There was a total of 38.2 GL delivered to the Murray system this year with 25.0 GL re-credited to environmental accounts and traded to South Australia. There was 3.0 GL supplied to the Barmah-Millewa Forest during 2012-13 from the Living Murray entitlements. Upstream of Nyah, there was 5.4 GL delivered to sites within the Torrumbarry irrigation area and Richardson's Lagoon from the Flora and Fauna and Commonwealth entitlements. Downstream of Nyah there was 2.1 GL supplied to a number of environmental sites from the Flora and Fauna entitlement. There was no use of the Barmah-Millewa Forest Entitlement and 105.8 GL was carried over at the end of 2012-13.

Lower Broken Creek was supplied with 5.3 GL from unregulated River Murray flows, 13.0 GL of Goulburn Commonwealth entitlements and 27.8 GL of Murray Commonwealth entitlements. There was 36.7 GL of return flows from the Murray and Goulburn entitlements delivered to the River Murray, which was traded to South Australia. Environmental entitlements were used to cover the 0.4 GL of loss incurred when delivering water from the Goulburn Inter-Valley Trade account via Broken creek.

There was no use of environmental entitlements to supply the wetlands on the Loddon system in 2012-13. The Loddon River received 2.7 GL of environmental water from Commonwealth entitlements and 7.4 GL was delivered from Wimmera-Mallee Pipeline Savings entitlements downstream of Loddon Weir. This water was used to maintain increased passing flows below Loddon Weir from August 2012 to October 2012 inclusive, and again from May 2013 to June 2013, as well as to provide a fresh to the Loddon River in November 2012. There was no use of environmental entitlements in Birch Creek from Newlyn Reservoir.

The Campaspe River environmental entitlements were used to maintain increased passing flows in the Campaspe River and pass a pulse down the River as per environmental flow recommendations. A total of 6.8 GL was used from Commonwealth entitlements, 6.7 GL from Victorian Environmental Water Holder entitlements, 3.4 GL from The Living Murray entitlements and 8.0 GL from non-environmental allocation. There were 8.7 GL of return flows from the use of Living Murray and Commonwealth entitlements which was delivered to the River Murray before being traded to South Australia.

In the Wimmera-Mallee, 50.3 GL was delivered to the environment.

**Table 1: Comparison of Diversions with Cap Targets**

System	Long-term Diversion Cap <sup>1</sup> (GL)	This year's Cap Target <sup>1</sup> (GL)	Cap adjust't for trade <sup>2</sup> (GL)	Cap adjust't For envi use (GL)	This year's net <sup>3</sup> Diversion <sup>1</sup> (GL)	Cap Credits (Adjusted target less diversion)			Trigger Exceeded	Storage Difference (Simulated less Observed) (GL)
						This year (GL)	Cumulative since 1/7/97 (GL)	% <sup>5</sup> schedule trigger (GL)		
Goulburn/Broken <sup>4</sup> /Loddon	2,034	2,192	- 181	- 215	1,237	559	2,444	- 407	No	- 462
Victorian Murray/Kiewa/Ovens	1,702	1,905	- 291	- 328	1,683	- 397	1,776	- 340	No	- 620
Campaspe	122	153	0	- 25	43	85	337	- 24	No	- 66
Wimmera-Mallee	67	46	0	0 <sup>6</sup>	16	30	99	- 20	No	- 90
<b>TOTAL</b>	<b>3,925</b>				<b>2,981</b>					

Notes:

<sup>1</sup> Includes small allowance for diversions from unregulated streams, which are not included in the models and the modelled cap targets. However these diversions are excluded in the plots.

<sup>2</sup> Also includes Goldfields Superpipe transfers

<sup>3</sup> Diversion net of transfers to other Cap valleys

- <sup>4</sup> Cap adjusted for decommissioning of Lake Mokoan
- <sup>5</sup> 20% for all systems other than the Wimmera-Mallee, for which Victoria proposes to reduce its trigger to 20 GL or 30% of the reduced (post pipeline) long term Cap
- <sup>6</sup> Adjustment for environmental flows not required as updated post pipeline model was used.

## **2.7 Comparison of Annual Regulated Diversion with Annual Cap Targets - Goulburn/Broken/Loddon Valley**

### **2.7.1 Resource Availability and Diversion**

Gravity irrigation customers and private diverters in the Goulburn System of the Goulburn/Broken/Loddon designated river valley received an initial seasonal determination of 61% of high reliability water shares. The seasonal determination reached a maximum of 100% of high reliability water shares on 15 August 2012. There has been no seasonal determination of low reliability water shares since 1997-98.

Lake Eildon was 89.9% full at the start of July 2012 and reached 99.7% in mid October 2012 before being drawn down to 68.3% in mid May 2013. Pre-releases were made from Eildon from July to October inclusive for target filling arrangements. A total of 416.9 GL was debited from spillable water, the Goulburn Inter-Valley Trade and the Living Murray extended use accounts. A low risk of spill declaration was made on 10 December 2012 allowing customers access to water in spillable water accounts.

Waranga Basin was filled from 85% of capacity to full capacity from catchment inflows during July 2012 and was drawn down to 30% of capacity by mid May 2013, before refilling to 38% by the end of the irrigation season.

The total volume allocated for use in the Goulburn valley was 889.2 GL. Usage in the Goulburn valley was 631.2 GL, or 71.0% of the total allocated volume.

Approximately 538.4 GL was transferred to the Murray, Campaspe and Loddon systems. The total diversion during 2012-13 to the Goulburn valley was 1,155.5 GL. A total of 1.1 GL was transferred from north to south of the Great Dividing Range to Melbourne which included diversions for maintenance from the Goulburn River and diversions from Silver and Wallaby creeks (tributaries of the Goulburn River).

The Broken River system received an initial seasonal determination at the start of July 2012 of 18% of high reliability water shares. Seasonal determinations improved to reach 100% of high reliability water shares by mid October. A seasonal determination of 100% of low reliability water shares was announced in mid December.

Lake Nillahcootie was full at the start of the season and continued to spill until mid October 2012. Due to low inflows and high demand, the storage was drawn down to 60% in May 2013.

The Broken usage was 7.9 GL, or 34.3% utilisation of the total allocated volume.

On 1 July 2012 an initial seasonal determination of 61% of high reliability water shares was announced for the Loddon System (excluding Bullarook Creek). The seasonal determination reached a maximum of 100% of high reliability water shares in mid August 2012. Customers in the Bullarook system received a seasonal determination of 100% high reliability water shares and 100% low-reliability water shares on 16 July 2012.

Tullaroop Reservoir filled to capacity in mid August 2012 and ceased spilling in late October. Cairn Curran peaked at 99.4% of capacity in October. Cairn Curran and Tullaroop Reservoirs were drawn down to meet irrigation requirements, with the storages ending the season at 65% and 60% respectively.

Laanecoorie Reservoir rose from 37% on 1 July 2012 and reached full capacity at the end of July, where it spilt until mid September. By 30 June 2013 Laanecoorie Reservoir had been drawn down to 30% of capacity.

A total of 32.4 GL from the Loddon storages was used to meet irrigation demand in the Boort irrigation area from the Loddon supplement.

Newlyn Reservoir began the year at 85% of capacity and filled to capacity in mid July. As there was little to no inflow when water was required to meet irrigation demand, the storage was drawn down to 46% by the end of the season.

Diversions from the Loddon River and tributaries for private irrigation use, domestic and stock, commercial, industrial and urban purposes were 32.2 GL. A total of 234.2 GL was delivered in the Pyramid-Boort irrigation area within the Loddon valley in 2012-13 compared to 152.5 GL in 2011-12.

Loddon valley usage was 257.5 GL, or 79.5% of the allocated volume. The majority of the usage was supplied from Goulburn resources.

The total unused allocation in the Goulbourn, Broken and Loddon that was carried over from 2012/13 to 2013/14 was 463 GL while the unused allocation that had been carried over from 2011/12 to 2012/13 was 911 GL.

## **2.7.2 Cap Compliance**

Diversion from the Goulburn/Broken/Loddon River Valleys was 1,237.5 GL, which is 558.9 GL less than the Cap target of 1,796.4 GL (with preliminary adjustment for trade, environmental releases, decommissioning of Lake Mokoan and inter-valley transfers). Diversions were 39% below the long-term Cap of 2,034 GL/year. The cumulative Cap credit for the period from July 1997 to June 2013 is 2,444.3 GL. These results are summarised in Tables 1 and 4, and are also shown graphically in Attachment 1.

## **2.8 Comparison of Annual Regulated Diversion with Annual Cap Targets - Campaspe Valley**

### **2.8.1 Resource Availability and Diversion**

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.

Seasonal determinations in the Campaspe system opened at 100% of high reliability water shares and gradually increased to 100% of low reliability water shares by mid January 2013. A low risk of spill declaration was made on 10 December 2012 allowing customers access to water in spillable water accounts.

Lake Eppalock was at 89% capacity on 1 July 2012 and by mid August the storage had filled. The storage gradually fell to 76% by the end of June 2013.

To assist with demand in the Goulburn system, water from the Campaspe supplement was utilised via the Campaspe pumps for the first time since the 2002-03 season. There was 2.8 GL of regulated water harvested from the Campaspe River to the Waranga Western Channel.

The Coliban storages started the season at 84% capacity, reached full capacity in August 2012, and were drawn down to 66% capacity during the season. There was only a minimal transfer via the Goldfields Superpipe of 0.3 GL to Coliban Water, and 0.04 GL to Ballarat for Central Highlands Water. There was no water transferred from the Goulburn system to Lake Eppalock this season.

The 2012-13 Campaspe valley allocated volume was 315.4 GL of which 75.2% was utilised.

The total unused allocation in Campaspe (excluding Rochester irrigation area) that was carried over from 2012/13 to 2013/14 was 25 GL while the total unused allocation that had been carried over from 2011/12 to 2012/13 was 40 GL.

### **2.8.2 Cap Compliance**

Diversion from the Campaspe valley was 42.6 GL, which is 85.0 GL below the Cap target of 127.6 GL (with adjustment for trade to supply the Goldfields Superpipe and environmental release). Diversions were 65% below the long-term Cap of 122 GL/year. The cumulative Cap credit for the Campaspe valley from July 1997 to June 2012 is 336.8 GL. These results are summarised in Tables 1 and 4, and also shown graphically in Attachment 2.

## **2.9 Comparison of Annual Regulated Diversion with Annual Cap Targets - Victorian Murray/Kiewa/Ovens Valley**

### **2.9.1 Resource Availability and Diversion**

There was a 26% high reliability water share seasonal determination at the start of July 2012 for Victorian Murray system entitlement holders. The seasonal determination gradually increased to 100% by 1 November 2012. On 10 January 2013, a declaration was made that the risk of spill at Lake Dartmouth was low which enabled water held in spillable water accounts to be accessed.

At 1 July 2012, Lake Dartmouth was 86% of capacity Lake Hume was 96%. Lake Hume reached 99% capacity in mid October before being drawn down to 44% by mid May 2013. By 30 June 2013 Lake Dartmouth was at 93% and Hume had refilled to 63% of capacity.

The Menindee Lakes started the 2012-13 season at 93% of capacity and fell to 41% in March, before refilling to 61%. As the Lakes were above 640 GL for the entire season, control of the Lakes remained with the MDBA.

As occurred last season, water was returned by North East Water to the River Murray from the West Wodonga Water Treatment Plant for diversion by towns downstream. The total volume returned was 1.4 GL.

The total diversion, excluding all environmental diversions, was 1,656.3 GL for the Victorian component of the River Murray valley. This diversion includes 3.9 GL for the Northern Mallee pipeline. The allocated volume was 2,293.6 GL, of which 1,418.0 GL or 61.8% was used.

Total Kiewa usage was 0.6 GL or 54% of the urban entitlement volume. A further 6.1 GL was used in the unregulated system.

Inflows in the Ovens system were below average, unlike previous years where inflows were above average. Lake Buffalo was filled from sill level at the start of October to mid November. During the season the storage was drawn down to 72% by mid March. Rainfall increased the storage volume to 80% before it was lowered to sill level in late April. Access to spill water on the Ovens River ceased in mid January when spill flows fell below the minimum requirements in the regulated reaches.

Lake William Hovell began the season at 100% full capacity. In January, Lake William Hovell was drawn below 100% of capacity for the first time since June 2010, to 65% of capacity by the end of the irrigation season. Access to spill water on the King River ceased in mid December and rostering arrangements were implemented in February for regulated King River customers which were lifted in April.

Total Ovens valley usage was 12.5 GL or 36.4% of the allocated volume. A further 7.6 GL was used in the unregulated system.

The total unused allocation carried over in Victorian Murray/Kiewa/Ovens valley from 2012/13 to 2013/14 was 847 GL while the total unused allocation that had been carried over from 2011/12 to 2012/13 was 1,417 GL.

## **2.9.2 Cap Compliance**

Diversion from the Victorian Murray/Kiewa/Ovens valley was 1,683.2 GL, which is 397.5 GL more than the Cap target of 1,285.7 GL (with preliminary adjustment for trade and environmental releases). The diversion was 1% below the long-term Cap of 1,702 GL/year. The cumulative Cap credit since July 1997 is 1775.9 GL. These results are summarised in Tables 1 and 4, and also shown graphically in Attachment 3.

## **2.10 Comparison of Annual Regulated Diversion with Annual Cap Targets - Wimmera-Mallee Valley**

### **2.10.1 Resource Availability and Diversion**

Inflows for the year were reasonably dry with only 82.5 GL received which is less than the 20<sup>th</sup> percentile historic inflows. These inflows resulted in the storages reaching a maximum of 323.9 GL (62%) in September 2012. Storage volumes decreased to a low of 204.1 GL (39%) in July 2013 through releases to meet demand requirements.

Allocations at the opening of the season were 26.3 GL (59%) and the final allocation for the 2012-13 water year was 86.6 GL (82%). A system reserve volume of 76.8 GL was also created during this period.

No allocation was again made available for open channel irrigation, which now belongs to the Commonwealth Environmental Water Holder after purchase in December 2012. Both Coliban and Wannon Water received an 82% seasonal determination.

For the year ending June 2013, diversions from water sourced within the Wimmera-Mallee valley totaled 16.7 GL.

Although not considered part of the total system diversion reportable under the MDBA Cap, the environment is entitled to releases from regulated environmental entitlements and passing flows from Lake Lonsdale to the Mt William Creek, Huddleston's Weir to the Wimmera River and Rocklands Reservoir to the Glenelg River. These volumes form a large part of the volumes returned to the environment as required by contract under the Wimmera Mallee Pipeline Product. For the 2012 – 2013 period, the total releases to the environment from regulated environmental entitlements and these passing flow rules were 50.3 GL and 19.0 GL respectively.

The total unused allocation carried over from 2012/13 to 2013/14 was 111 GL while the total unused allocation that had been carried over from 2011/12 to 2012/13 was 106 GL.

## 2.10.2 Cap Compliance

Diversions from the Wimmera-Mallee River Valley in 2012/13 was 15.9 GL, which is 30.0 GL less than the Cap target of 45.9 GL. Diversions were 76% below the long-term Cap of 67 GL/year. The cumulative Cap credit for the Wimmera-Mallee valley since July 1997 is 99.3 GL. These results are summarised in Tables 1 and 4, and are also shown graphically in Attachment 4.

## 3 Un-modelled Components of Water Use

The Victorian *Water Act 1989* prescribes the statutory mechanism for establishing management arrangements for priority unregulated surface water and groundwater systems, known as management plans. Statutory management plans are developed for highly stressed or utilised systems if:

- there is a need to amend licence volumes or conditions
- permanent or ongoing restrictions on licensed extractions are required to protect consumptive licences, domestic and stock use or the environment
- the overall licence volume needs to be reduced

Statutory management plans are developed on behalf of the Minister for Water by a consultative committee consisting of water users, community, environmental and government agency representatives, in accordance with *Water Act 1989* provisions.

In consultation with stakeholders and the broader community, Victoria previously identified priority areas requiring the development of a management plan. At this time, the Upper Ovens River is the only system where a statutory management plan is required, and this is an integrated surface water and groundwater management plan. The Upper Ovens River Water Supply Protection Area Water Management Plan was approved in January 2012.

Local Management Plans have been prepared by Goulburn-Murray Water for all other river systems and are available on their website. The plans are prepared by water authorities in consultation with stakeholders and publicise and formalise the existing water management arrangements, including the management of environmental flows, trading rules, rosters and restriction arrangements.

Victoria not only manages water in waterways, but also licenses the use of water for irrigation and commercial purposes in catchment dams under the *Water Act 1989*, as amended by the *Water (Irrigation Farm Dams) Act 2002*. All existing dams used for irrigation or commercial purposes were required to be either licensed or registered during the period 1 July 2002 to 30 June 2003. All new irrigation and commercial use of water must be licensed, whether the proposed dam is located on a waterway or not. Changes to the legislation have also led to the establishment of Permissible Consumptive Volumes for catchments across the state and the establishment of exchange rates to ensure that the MDB Cap is preserved when licences are traded.

Over 6000 catchment dams in the MDB basin south of the Murray River have been licensed. New licence applications for catchment dams are subject to the MDB Cap and new developers are required to purchase an existing entitlement before approval is provided.

All new or altered domestic and stock dams on properties of less than 8 hectares (20 acres) in peri urban areas must also be registered. Any growth in the use of surface water for domestic and stock purposes permitted by s8 of the Act will inform decisions on whether any further regulatory action is needed.

### **3.1 Unregulated Use**

For Cap reporting purposes, unregulated use has previously been estimated either as a proportion of regulated use or a proportion of unregulated entitlements based on the pattern of regulated use. In 2012/13, an improved method of estimating unregulated use has been trialled in Victoria. While the unregulated use in previous years was estimated based on regulated usage, it is estimated in 2012/13 using some available metered unregulated use data to extrapolate for total unregulated use.

In 2012/13 it is therefore estimated that unregulated use was 16.9 GL in the Goulburn Valley, 2.8 GL in the Broken Valley, 17.8 GL in the Loddon Valley, 3.3 GL in the Campaspe Valley, 8.6 GL in the Victorian Murray Valley and 0 GL in the Kiewa, Ovens and Wimmera-Mallee Valleys. Total unregulated use in Victoria is estimated as 49.2 GL which is 1.7% of total diversions (2979.1 GL).

Ideally, metering would be used to improve estimation of unregulated use in Victoria. An appropriate method is however also dependant on the cost effectiveness and risk associated with unregulated usage volumes. Victoria considers that the method applied for 2012/13 is sufficient.

### **3.2 Interception Activities**

Limited information is readily available to quantify 2012/13 water use under interception activities in Victoria. Victoria uses policy instruments such as licencing to manage water usage by irrigation & commercial farm dams. Victoria is proposing to amend the Water Act 1989 to manage the impact of new forestry developments in intensive management areas. At this time there is no annual estimate of interception from commercial plantations as the impact of any changes in commercial plantation on water availability in northern Victoria are considered to be insignificant.

### **3.3 Groundwater Use**

There is no historical reporting of groundwater against a Murray Darling Basin cap, as until the Basin Plan came into effect, there was no basin-wide cap. Groundwater use is reported from the Victorian Water Register based on the existing management framework comprising Groundwater Management Units and unincorporated areas.

#### **Goulburn Murray Water Resource Plan Area (Goulburn Murray Water)**

The following (Table 2) is the entitlement and use recorded in the Victorian Water Register. It is noted that there are some existing discrepancies between the Water Register and official water use numbers reported by Goulburn Murray Water for the purpose of annual water accounts. The current estimated difference is approximately 2%. The current Water Register work program has a task to resolve these discrepancies in the future. The use volume in the table does not include an estimate for Domestic and Stock use.

**Table 2: GOULBURN-MURRAY WATER**

<b>WATER ENTITLEMENTS IN GROUNDWATER SYSTEMS</b>		
	<b>Entitlement Volume</b>	<b>2012/13 Extraction</b>
<b>GMU</b>	<b>Volume (ML)</b>	<b>Volume (ML)</b>
Alexandra (GMU)	1721	253
Barnawartha (GMU)	381	22
Katunga (GMU)	60932	23253
Kinglake (GMU)	1905	231
Loddon Highlands (GMU)	20694	7027
Lower Campaspe Valley (GMU)	55874	27246
Lower Ovens (GMU)	19913	5343
Mid Goulburn (GMU)	12509	2960
Mid Loddon (GMU)	34163	17031
Mullindolingong (GMU)	1646	35
Shepparton Irrigation (GMU)	201876	38627
Upper Ovens (GMU)	3770	523
Unincorporated (GMU)	34048	3078
<b>Groundwater Total 30 June 2013</b>	<b>449431</b>	<b>125627</b>

### **Grampians Wimmera Mallee Water Supply Protection Area (Grampians Wimmera Mallee Water)**

The Grampians Wimmera Mallee Water Supply Protection Area entitlement and use figures (Table 3) are as reported from the Victoria Water Register. The table excludes the West Wimmera GMU, as it is excised by regulation from the Murray Darling Basin Plan. The use volume in the table does not include an estimate for Domestic and Stock use.

**Table 3: GRAMPIANS WIMMERA MALLEE WATER**

<b>WATER ENTITLEMENTS IN GROUNDWATER SYSTEMS</b>		
	<b>Entitlement Volume</b>	<b>2012/13 Extraction</b>
<b>GMU</b>	<b>Volume (ML)</b>	<b>Volume (ML)</b>
Avoca GMU	2,194	956
East Grampains GMU	805	128
Murrayville GMU	9,634	5,568
West Grampians GMU	4,700	61
Unincorporated area	7,576	2,725
<b>Groundwater total 30 June 2013</b>	<b>78,236</b>	<b>9,438</b>

## **4 Cap to Sustainable Diversion Limit (SDL) Transition**

### **4.1 Existing Administration of the Cap**

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 2012/13 and none are currently proposed for 2013/14 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.

Victoria implements the Cap on regulated systems by establishing Bulk Entitlements in accordance with the *Water Act* 1989. Victoria has created additional environmental entitlements since the last submission as the result of environmental water recovery through the completion of works to permanently reduce distribution losses within the irrigation systems and purchases. These are as follows:

- 212.2 GL of high reliability water share environmental entitlements (119.4 GL, 1.2 GL, 0.7 GL and 90.9 GL in Goulburn, Loddon, Campaspe and Victorian Murray valleys respectively);
- 0.7 of low reliability water share environmental entitlements (0.5 GL, and 0.2 GL in Goulburn and Victorian Murray valleys respectively); and
- 40.0 GL of supplementary access environmental entitlements in Victorian Murray valley.

### **4.2 Transition to the SDL**

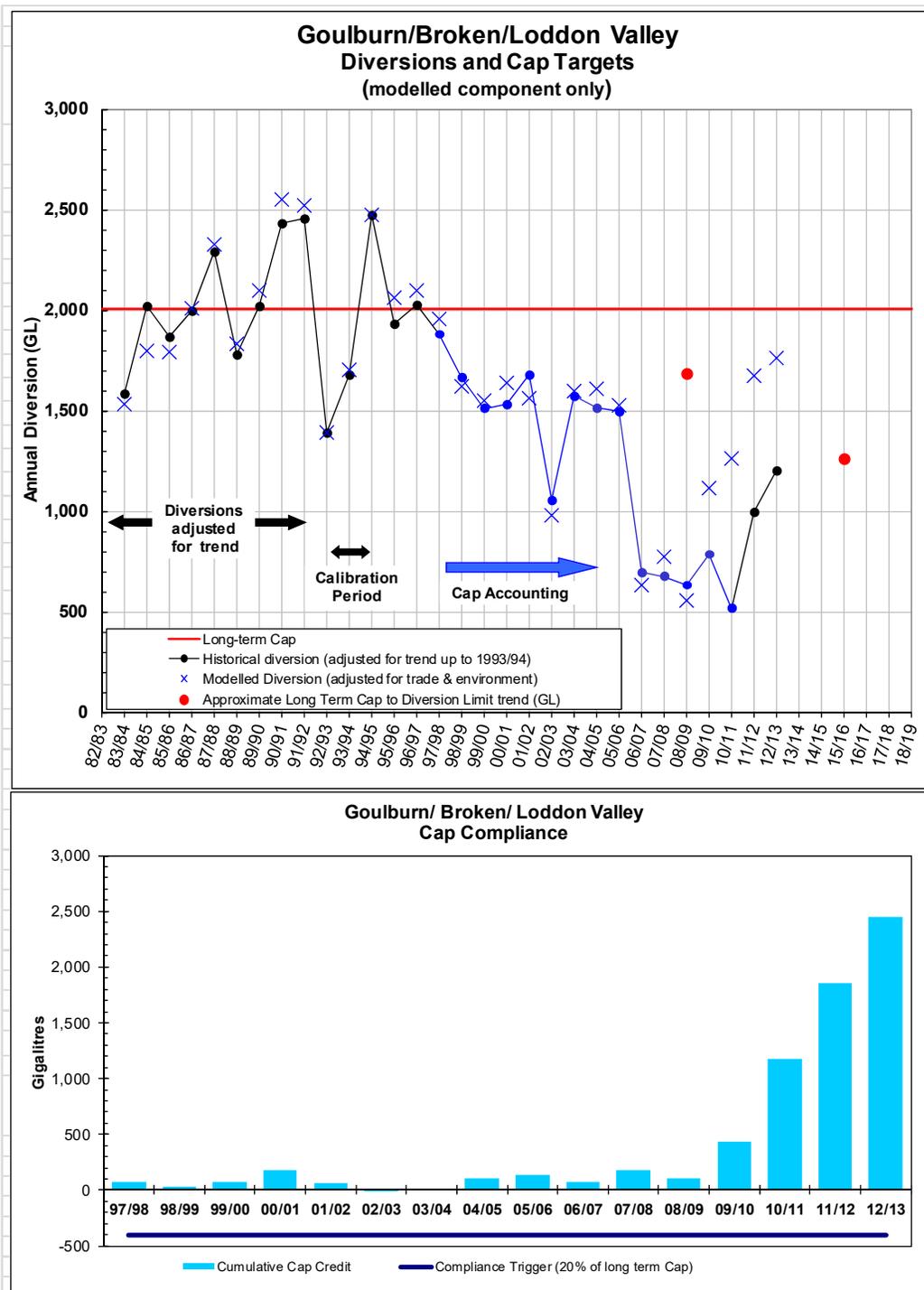
Victoria is working towards the development of Water Resource Plans under the Basin Plan 2012 as part of the transition from Cap reporting to reporting under the SDL. Current administration and assessment tools under the Cap will underpin the development of the Water Resource Plans. Existing arrangements will be improved by selection and implementation of appropriate monitoring methods for all forms of take including unregulated use, interception activities and groundwater use.

Victoria will continue to work with the MDBA to improve the method to reduce Cap for environmental flows.

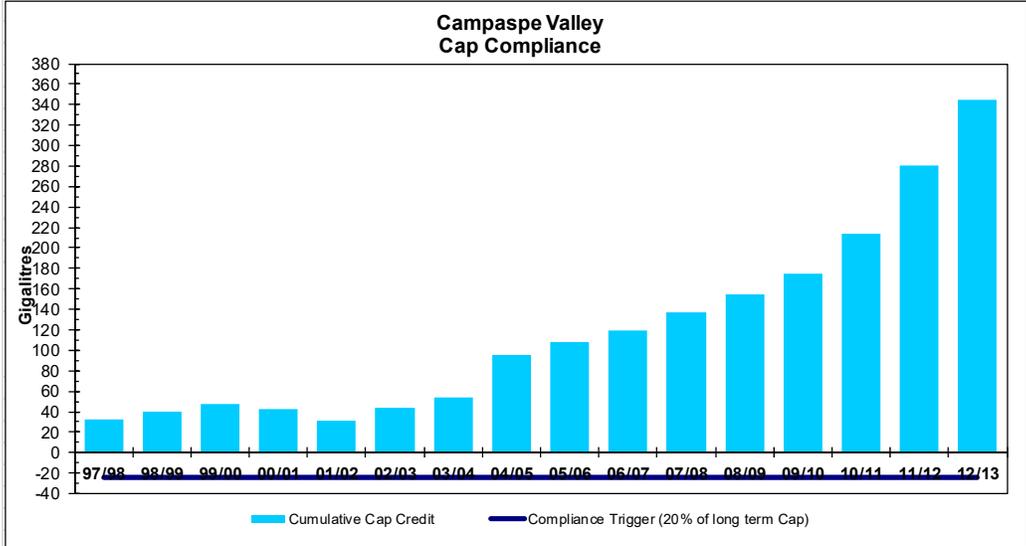
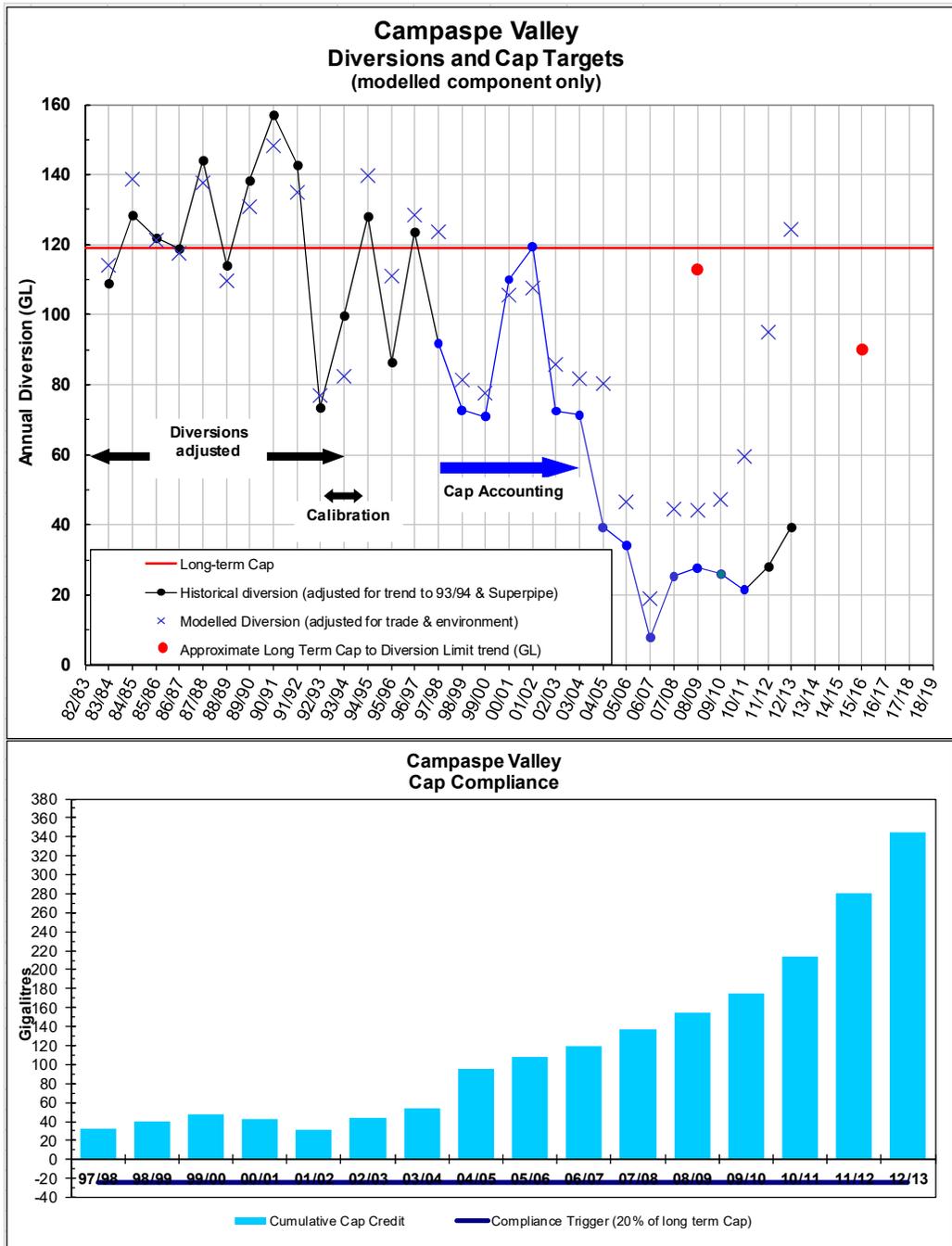
## 5 Table 4: Updated Cap Register

Year	Location	Cap Targets				Diversions			Cap Credits			20% Trigger	
		Model component	Outside model component	Adjustment for trade and environmental use <sup>3</sup>	Total	Model component	Upper trib. component	Total	Current year	Cum. Credit from last year's WAM report	Correction to cum. Credit to last year		Cum. credit
2012/13	Goulburn / Broken <sup>\$</sup> / Loddon	2,155	37	-396	1,796	1,200	37	1,237	559	1,879	6 #	2,444	-407
	Campaspe	149	3	-25	128	39	3	43	85	248	4	337	-24
	Wimmera / Mallee <sup>@</sup>	46	0	0	46	16	0	16	30	69	0	99	-20 *
	Murray / Kiewa / Ovens	1,897	9	-619	1,286	1,675	9	1,683	-397	1,991	182 <sup>^</sup>	1,776	-340
Notes:													
	(1)	All volumes in gicalitres.											
	(2)	Cap models used: Goulburn/Broken/Loddon and Campaspe - K900.log, GoulR888.sys; Wimmera Mallee - CP16.log, WMPPcp08.sys											
	<sup>\$</sup>	Includes adjustment for decommissioning of Lake Mokoan.											
	#	Mainly due to retrospective rating curve changes and minor changes to climate and streamflow data due to data quality changes											
	<sup>@</sup>	Post-pipeline Cap model used for the Cap assessment since 2011/12.											
	*	Victoria proposes to reduce its Wimmera Mallee trigger to 20 GL or 30% of the reduced (post pipeline) long term Cap.											
	<sup>^</sup>	Includes -10.4 GL for Victorian Murray and -1.5 GL for Ovens due to correction in Darling riparian flows, Hume minimum inflows, releases for Menindee and input data; and +194 GL due to correction for environmental return flows from Goulburn to Murray in 2011/12											

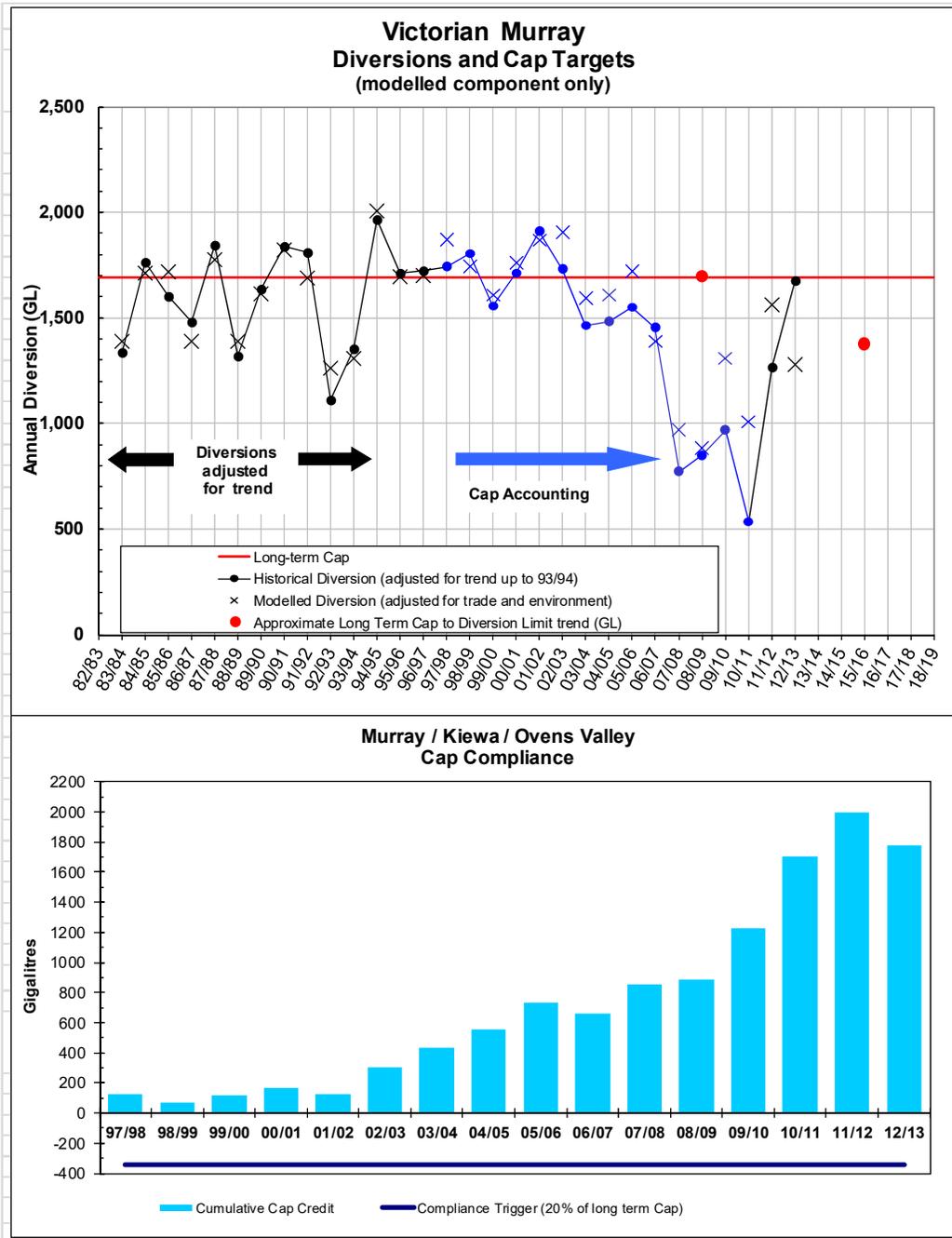
# Attachment 1



## Attachment 2



### Attachment 3



# Attachment 4

