

Victorian Submission to Water Resources Report 2013-14

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. In addition this report provides as much information as possible 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 2013-14 reporting.

1.1 Regulated Systems

All the models used by Victoria to calculate Cap targets for regulated systems have been approved by the Murray Darling Basin Authority (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 valleys were developed by the MDBA. For the Wimmera Mallee Cap valley, the post irrigation entitlement sale model was used which includes the completion of all pipeline projects and the sale of irrigation entitlements in the Wimmera Mallee system.

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 2013-14 for the Goulburn/Broken/Loddon and Campaspe Cap model, there were a number of retrospective rating curve changes for gauging stations and re-derivation of Lake Nillahcootie rainfall and inflow inputs. This led to a net decrease of 3.5 GL and 1.5 GL in the Goulburn/Broken/Loddon and Campaspe cumulative Cap credits from 1997-98 to 2012-13 respectively, or approximately -0.2% and -1.2% 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 the updated model has been used for the 2013-14 assessment. These updates and input data extension to 2013-14 for the Victorian

Murray/Kiewa/Ovens models have led to a net decrease of 17.6 GL to the 1997-98 to 2012-13 cumulative Cap credit which is -1.0% of the long term average Cap. The reasons for this decrease are changes in NSW (Billabong Ck and Balranald flows) and Victorian (Goulburn, Loddon and Campaspe River flows) modelled inputs, fixing of errors on database for Snowy data and Campaspe River at Rochester, revised estimates of ungauged catchment inflows upstream Hume and Torrumbarry tributaries and other bug fixes.

The Wimmera Mallee Post Irrigation entitlement sale model has been used to calculate the 2013-14 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/yr 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 2013-14 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 recently conducted a detailed investigation to compare the annual environmental water adjustment determined by the Environmental Use method with three alternative MDBA proposed methods: 1) Bundled Scaling, 2) Unbundled Scaling by Entitlement Type and 3) Unbundled Scaling by Allocation. This investigation found that the long term (1895-2009) average annual environmental water adjustment determined by the Environmental Use method is close to that of the three alternative methods. In recent years the environmental water utilisation has been increased hence the discrepancy between these methods is continuing to reduce. Therefore, the current approach of adjusting diversion caps for the actual environmental use should be continued during the transitional period. For further details of this investigation please refer to Attachment 5.

Victoria remains committed to the ongoing development of hydrological models of all unregulated systems for calculating baseline and sustainable diversion limits.

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. Similar to 2012-13 for 2013-14 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 2013-14.

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 a 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

All northern Victorian systems received a seasonal determination of 100 per cent of high-reliability water shares (HRWS) during the 2013-14 season. In addition the Broken and Bullarook systems received 100 per cent of low-reliability water shares (LRWS). Entitlement holders in the Campaspe system received 46% LRWS.

Non-urban entitlement holders in the Wimmera-Mallee system received a seasonal determination of 81 per cent, while urban, domestic and stock customers supplied from the Wimmera-Mallee pipeline received a 100 per cent allocation.

Current carryover policy in the Murray, Goulburn and Campaspe systems allows unused allocation to be carried over into the following season, with any water above their entitlement volume being subject to spills or pre-releases that occur from Lakes Hume, Eildon or Eppalock respectively. The volume held above entitlement volumes by water shareholders is held in spillable water accounts until a low risk of spill declaration is made for the relevant system.

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 through August, September and early October 2013, 605 GL was debited from spillable accounts in the Murray system. There were no deductions from spillable accounts in Goulburn or Campaspe systems in 2013-14. There were also deductions from Living Murray extended use accounts in Murray system.

Across Goulburn-Murray Water's region, annual rainfall for the year ending 30 June 2014 was overall below average. The months of July, August and September were generally wetter than average, with the rest of the months rainfalls tending to be well below average. There was very low rainfall received across northern Victoria in the summer months of 2013-14.

2.2 Volumes Diverted

The northern Victorian systems diverted a total of 2,517 GL from the Murray-Darling Basin and 16 GL from the Wimmera-Mallee system during the 2013-14 season.

The volume diverted in the Murray/Kiewa/Ovens valley was 1,310 GL. In the Goulburn/Broken/Loddon designated river valley and the Campaspe River valley, diversions were 1,165 GL and 25.9 GL respectively. Wimmera-Mallee valley diversions were 15.5 GL.

The total Cap target adjusted for trade and environmental allocations, including the Wimmera-Mallee, was 3,432 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 2013-14 was 2,005 GL. This is 575 GL less than the volume delivered in 2012-13. The total Victorian usage was 66 per cent of the total volume allocated.

Deliveries in the Murray/Kiewa/Ovens designated valley were 1,134 GL in 2013-14, 297 GL less than the delivery of 1,431 GL in the previous year. Goulburn/Broken/Loddon valley deliveries were 645 GL in 2013-14, 252 GL less than the 897 GL delivered in 2012-13. Deliveries in the Campaspe valley were also lower in 2013-14, with 211 GL compared to 237 GL delivered in 2012-13.

Total Wimmera-Mallee deliveries including water diverted from other valleys were 14.0 GL in 2013-14, 0.7 GL less than the 14.7 GL delivered in 2012-13.

2.5 Trading

The allocation trade market in Victoria was again active during 2013-14 with a net volume of 134.7 GL traded from Victoria. However this was significantly less than the net 645.2 GL traded from Victoria in the previous season.

Interstate allocation trading with New South Wales resulted in an overall net transfer to Victoria of 150.3 GL during 2013-14. This volume includes net allocation trade of 102.8 GL to Victoria from NSW Murray and 50.3 GL from the Murrumbidgee River basin. A volume of 2.8 GL was traded into the Darling River from Victoria.

Trade with South Australia resulted in a net allocation trade of 285 GL from Victoria, compared to 537 GL traded to South Australia from Victoria in the 2012-13 season.

There was 510.4 GL of allocation trade into the Kiewa/Ovens/Murray valley from other valleys. With reverse trade totalling 698.6 GL, net allocation trade out of the Kiewa/Ovens/Murray valley in 2013-14 was 188.1 GL. There was a net allocation trade of 305.1 GL from the Kiewa/Ovens/Murray valley into South Australia.

There was a net volume of allocation trade into the Goulburn/Broken/Loddon valley of 26.7 GL. A total of 255.2 GL was traded in while 228.5 GL was traded out. There was a net allocation trade of 16.9 GL into the Goulburn/Broken/Loddon valley from South Australia.

There was a net allocation trade of 3.2 GL from the Campaspe valley into South Australia.

2.6 Environmental Flows

The total volume of water used for environmental purposes in 2013-14 was 229.2 GL. This volume includes in-stream use in the Wimmera-Mallee system and excludes unregulated water use and water delivered to downstream systems. There were a total of 25.9 GL re-credited to environmental accounts which were traded to South Australia.

Around 4.1 GL was used in the River Murray during periods of unregulated flows, all of which was delivered to sites upstream of Nyah including Gunbower Forest, Round Lake and lower Broken Creek.

In the Goulburn system a total of 320 GL from The Living Murray (TLM) entitlements and the Commonwealth and Victorian Environmental Water Holders entitlements was delivered in-stream to provide additional passing flows downstream of Goulburn Weir. Of this volume, 311 GL was available for use downstream, including Hattah Lakes and trade to South Australia. There was a total of 97 GL delivered to Hattah Lakes during 2013/14. Goulburn wetland Black Swamp was supplied with 50 ML during 2013/14.

There was a total of 182.9 GL delivered to the Murray system this year. There was 131 GL supplied to the Barmah-Millewa Forest during 2013-14 from the Living Murray, Commonwealth and Victorian Environmental Water Holder entitlements. A further 64.2 GL was delivered to the Barmah-Millewa Forest from the Barmah-Millewa Environmental Water Account. Upstream of Nyah, there was 4.7 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 5.0 GL supplied to a number of environmental sites from the Flora and Fauna entitlement.

Lower Broken Creek was supplied with 3.5 GL from unregulated River Murray flows, 8.1 GL of Goulburn Commonwealth entitlements and 28.9 GL of Murray Commonwealth entitlements. Environmental entitlements were used to cover the 1.3 GL of loss incurred when delivering water from the Goulburn Inter-Valley Trade account via Lower Broken Creek.

A total of 2.0 GL was delivered to Lake Meran and Lake Yando wetlands on the Loddon system in 2013-14. The Loddon River received 3.7 GL of environmental water from Victorian and Commonwealth entitlements and 4.8 GL was delivered from Wimmera-Mallee Pipeline Savings entitlements downstream of Loddon Weir. There was no use of environmental entitlements in Birch Creek from Newlyn Reservoir.

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.

The Broken system received 121 ML of environmental water which was used to provide water to Moodies Swamp. This water was provided from Commonwealth entitlements.

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 6.5 GL was from Commonwealth entitlements, 5.2 GL from Victorian Environmental Water Holder entitlements and 1.8 GL used from The Living Murray entitlements.

In the Wimmera-Mallee system, 19.5 GL was delivered to the environment, including 265 ML from the Victorian Environmental Water Holder wetland entitlement.

Table 1: Comparison of Diversions with Cap Targets

System	Long-term Diversion Cap ¹ (GL)	This year's Cap Target ¹ (GL)	Cap adjust't for trade ² (GL)	Cap adjust't For envi use (GL)	This year's net ³ Diversion ¹ (GL)	Cap Credits (Adjusted target less diversion)			Trigger Exceeded	Storage Difference (Simulated less Observed) (GL)
						This year (GL)	Cumulative since 1/7/97 (GL)	% ⁵ schedule trigger (GL)		
Goulburn/Broken ⁴ /Loddon	2,034	2,054	- 112	- 329	1,165	449	2,889	- 407	No	- 873
Victorian Murray/Kiewa/ Ovens	1,702	1,698	276	- 305	1,311	358	2,116	- 340	No	- 542
Campaspe	122	126	0	- 21	26	79	414	- 24	No	- 101
Wimmera-Mallee	45	44	0	0 ⁶	16	29	128	- 20	No	- 34
TOTAL	3,903				2,518					

Notes:

- ¹ 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.
- ² Also includes Goldfields Superpipe transfers
- ³ Diversion net of transfers to other Cap valleys
- ⁴ Cap adjusted for decommissioning of Lake Mokoan
- ⁵ 20% for all systems other than the Wimmera-Mallee, for which Victoria proposes to reduce its trigger to 20 GL or 35% of the reduced (post pipeline) long term Cap
- ⁶ Adjustment for environmental flows not required as updated post irrigation entitlement sale 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 received an initial seasonal determination of 51 per cent of high-reliability water shares. The seasonal determination reached a maximum of 100 per cent of high-reliability water shares on 2 September 2013. There has been no seasonal determination of low-reliability water shares since 1997-98.

Lake Eildon was 70 per cent full at the start of July 2013 and reached 95 per cent in mid-October 2013 before being drawn down to 68 per cent in mid May 2014. A low risk of spill declaration was made on 10 December 2013 allowing customers access to water in spillable water accounts.

Waranga Basin was filled from 38 per cent of capacity from catchment inflows during July 2013 and was drawn down to 41 per cent of capacity by late March 2014 before refilling to 59 per cent by the end of the irrigation season.

The total volume allocated for use in the Goulburn valley was 798.2 GL. Usage in the Goulburn system was 453.2 GL, or 56.8 per cent of the total allocated volume.

Approximately 431.3 GL was transferred to the Murray, Campaspe, Loddon and Wimmera-Mallee systems. The total diversion during the 2013-14 season in the Goulburn system was 1,118.3 GL. A total of 1.9 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.

The Broken River system received an initial seasonal determination at the start of July 2013 of 0 per cent of high-reliability water shares. Seasonal determinations improved to reach 100 per cent of high-reliability water shares by mid-October. A seasonal determination of 100 per cent of low-reliability water shares was announced in mid-November.

Lake Nillahcootie was 62 per cent full at the start of the season; however had filled and was spilling by mid-August 2013. The storage continued to spill until late October 2013 and was drawn down to 62 per cent of capacity in early May 2014.

Usage on the Broken system was 6.9 GL, or 29.9 per cent utilisation of the total allocated volume.

On 1 July 2013 an initial seasonal determination of 51 per cent of high-reliability water shares was announced for the Loddon System (excluding Bullarook Creek). The seasonal determination reached a maximum of 100 per cent of high-reliability water shares in mid-September 2013. Customers in the Bullarook system received a seasonal determination of 100 per cent high-reliability water shares and 100 per cent low-reliability water shares on 1 October 2013.

Tullaroop Reservoir started the 2013-14 season at 60 per cent of capacity and reached seasonal maximum of 67 per cent of capacity in early November. Cairn Curran peaked at 87 per cent of capacity in October. Cairn Curran and Tullaroop Reservoirs were drawn down to meet irrigation requirements, with the storages ending the season at 57 per cent and 54 per cent of capacity respectively.

Laanecoorie Reservoir only gained 5 per cent storage capacity from 1 July 2013 to reach 65 per cent capacity before being drawn down to 31 per cent in June 2014.

Newlyn Reservoir began the year at 46 per cent of capacity and filled to capacity in early October. To meet irrigation demand, the storage was drawn down to 54 per cent capacity 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 21 GL. A total of 163.8 GL was delivered in the Pyramid Hill-Boort irrigation area from the Loddon valley in 2013-14 compared to 234.2 GL in 2012-13.

Loddon valley usage was 184.9 GL, or 68.9 per cent of the allocated volume.

The total unused allocation in the Goulbourn, Broken and Loddon that was carried over from 2013-14 to 2014-15 was 453.4 GL while the unused allocation that had been carried over from 2012-13 to 2013-14 was 460 GL.

2.7.2 Cap Compliance

Diversion from the Goulburn/Broken/Loddon River Valleys was 1,165.3 GL, which is 448.5 GL less than the Cap target of 1,613.8 GL (with preliminary adjustment for trade, environmental releases, decommissioning of Lake Mokoan and inter-valley transfers). Diversions were 43% below the long-term Cap of 2,034 GL/year. The cumulative Cap credit for the period from July 1997 to June 2014 is 2,889.3 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.

The closure of the Campaspe Irrigation District generated water savings that led to the creation of 23.7 GL of entitlements for the Victorian Environmental Water Holder. These entitlements are made up of 19.0 GL of HRWSs, 3.0 GL of LRWSs and 1.7 GL of environmental entitlement provisions.

Seasonal determinations in the Campaspe system opened at 100 per cent of high-reliability water shares and gradually increased to a maximum of 46 per cent of low-reliability water shares by mid December 2013. A low risk of spill declaration was made on 10 January 2014 allowing customers access to water in spillable water accounts.

Lake Eppalock was at 76 per cent capacity on 1 July 2013 and by October the storage had reached a seasonal maximum of 94 per cent of capacity. The storage gradually fell to 73 per cent by the end of June 2014.

The Coliban storages started the season at 84 per cent capacity, reached full capacity in August 2012, and were drawn down to 66 per cent capacity during the season. There was 0.2 GL transferred via the Goldfields Superpipe for Central Highlands Water in 2013/14. There was no water transferred from the Goulburn system to Lake Eppalock this season.

The 2013-14 Campaspe valley allocated volume was 257.5 GL of which 82.1 per cent was utilised.

The total unused allocation in the Campaspe system (excluding Rochester irrigation area) that was carried over from 2013-14 to 2014-15 was 26 GL while the total unused allocation that had been carried over from 2012-13 to 2013-14 was 25 GL.

2.8.2 Cap Compliance

Diversion from the Campaspe valley was 25.9 GL, which is 78.6 GL below the Cap target of 104.4 GL (with adjustment for trade to supply the Goldfields Superpipe and environmental release). Diversions were 79% below the long-term Cap of 122 GL/year. The cumulative Cap credit for the Campaspe valley from July 1997 to June 2014 is 413.8 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 42 per cent high-reliability water share seasonal determination at the start of July 2013 for Murray system entitlement holders. The seasonal determination gradually increased to 100 per cent by mid-September 2013. There was 608 GL debited from spillable accounts in the Murray system due to pre-releases made in August, September and October. On 10 December 2013, a declaration was made that the risk of spill at Lake Hume was low which enabled water held in spillable water accounts to be accessed.

At 1 July 2013, Lake Dartmouth was 94 per cent of capacity and Lake Hume was 63 per cent capacity. Lake Hume reached 99 per cent of capacity in late September before being drawn down to 36 per cent by early April 2014. By 30 June 2014 Lake Dartmouth was at 91 per cent and Hume had refilled to 52 per cent of capacity.

The Menindee Lakes started the 2013-14 season at 61 per cent of capacity and declined to 19 per cent at 30 June 2014. As the lakes declined below 640 GL during the 2013-14 season, control of the storage changed from the MDBA to the NSW Office of Water.

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 1.5 GL.

The total diversion, excluding all environmental diversions, was 1,291 GL for the Victorian component of the River Murray valley. The allocated volume was 1,430.6 GL, of which 1,123.3 GL or 78.9 per cent was used.

Total Kiewa valley usage was 0.6 GL or 53 per cent of the urban entitlement volume. A further 2.0 GL was used in the unregulated system.

Inflows in the Ovens system were above average during winter and spring, however were below average during the summer months. Lake Buffalo was filled from sill level between mid-October and early November. During the season the storage was drawn down to 58 per cent of capacity by early May. 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 per cent capacity. In January, Lake William Hovell was drawn down to 61 per cent of capacity by early May. Access to spill water on the King River ceased in January. There were no restrictions to supply in the Ovens valley.

Usage in the Ovens valley was 10.4 GL or 23.2 per cent of the allocated volume in 2013-14. A further 7.2 GL was used in the unregulated system.

The total unused allocation carried over in Murray/Kiewa/Ovens valley from 2013-14 to 2014-15 was 445 GL while the total unused allocation that had been carried over from 2012-13 to 2013-14 was 847 GL.

2.9.2 Cap Compliance

Diversion from the Murray/Kiewa/Ovens valley was 1,310.7 GL, which is 358.2 GL less than the Cap target of 1,668.9 GL (with preliminary adjustment for trade and environmental releases). The diversion was 23% below the long-term Cap of 1,702 GL/year. The cumulative Cap credit since July 1997 is 2,116.5 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 115 GL received, which is slightly above the 20th percentile historic inflow. The total system storage volume reached a maximum of 296 GL (57%) in October 2013. Total storage volume declined to a minimum of 201 GL (39%) in June 2014, as a result of supplying demands throughout the season.

Water allocations at the opening of the season were 22 per cent for Wimmera-Mallee Pipeline Product, with the final allocation for the 2013-14 water year being 81 per cent.

Glenelg River Compensation Flow, Recreation entitlement and Wetland entitlement all received a 25 per cent allocation.

No allocation was made to the low reliability entitlement held by the Commonwealth Environmental Water Holder.

For the year ending June 2014, diversions from water sourced within the Wimmera-Mallee valley totaled 15.5 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 2013-14 period, the total releases to the environment from regulated environmental entitlements and these passing flow rules were 29.7 GL and 14.8 GL respectively.

The total unused allocation carried over from 2013-14 to 2014-15 was 112 GL while the total unused allocation that had been carried over from 2012-13 to 2013-14 was 111 GL.

2.10.2 Cap Compliance

Diversion from the Wimmera-Mallee River Valley in 2012-13 was 15.5 GL, which is 28.9 GL less than the Cap target of 44.4 GL. Diversions were 66% below the long-term Cap of 45 GL/year. The cumulative Cap credit for the Wimmera-Mallee valley since July 1997 is 128.2 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.

Local Management Plans have been prepared by Goulburn-Murray Water for a majority of 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. Since 2012-13 unregulated use has been estimated using some available metered unregulated use data to extrapolate for total unregulated use. In previous years unregulated use was estimated based on regulated usage.

In 2013-14 it is estimated that unregulated use was 11.8 GL in the Goulburn Valley, 2.9 GL in the Broken Valley, 8.3 GL in the Loddon Valley, 1.2 GL in the Campaspe Valley, 4.0 GL in the Victorian Murray Valley, 2.0 GL in the Kiewa, 7.2 GL in the Ovens and 0 GL in the Wimmera-Mallee Valley. Total unregulated use in Victoria is estimated as 37.5 GL which is 1.5% of total diversions (2517.5 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 2013-14 is sufficient.

3.2 Interception Activities

As was the case in 2012-13 there is limited information readily available to quantify 2013-14 water use under interception activities in Victoria. Victoria uses policy instruments such as licencing to manage water usage by irrigation & commercial farm dams. No annual estimate can be provided at this point in time. 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)

To be confirmed.

Table 2: GOULBURN-MURRAY WATER

WATER ENTITLEMENTS IN GROUNDWATER SYSTEMS	Entitlement Volume	2013-14 Extraction
GMU	Volume (ML)	Volume (ML)
Alexandra (GMU)		
Barnawartha (GMU)		
Katunga (GMU)		
Kinglake (GMU)		
Loddon Highlands (GMU)		
Lower Campaspe Valley (GMU)		
Lower Ovens (GMU)		
Mid Goulburn (GMU)		
Mid Loddon (GMU)		
Mullindoolingong (GMU)		
Shepparton Irrigation (GMU)		
Upper Ovens (GMU)		
Unincorporated (GMU)		
Groundwater Total 30 June 2014		

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

Table 3: GRAMPIANS WIMMERA MALLEE WATER

WATER ENTITLEMENTS IN GROUNDWATER SYSTEMS	Entitlement Volume	2013-14 Extraction

4 Cap to Sustainable Diversion Limit (SDL) Transition

4.1 Existing Administration of the Cap

Monitoring of the effectiveness of the water management policies is undertaken on an ongoing basis. No new capping policies were introduced in 2013-14 and none are currently proposed for 2014-15 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 purchases and the completion of works to permanently reduce distribution losses within the irrigation systems including the closure of the Campaspe Irrigation District. These are as follows:

- 73.2 GL of high reliability water share environmental entitlements (24.8 GL, 1.6 GL, 19.0 GL and 27.8 GL in Goulburn, Loddon, Campaspe and Victorian Murray valleys respectively);
- 17.8 GL of low reliability water share environmental entitlements (7.6 GL, 3.0 GL and 7.2 GL in Goulburn, Campaspe and Victorian Murray valleys respectively); and
- 7.2 GL of environmental entitlement provisions (1.7 GL, 1.5 GL and 4.1 GL in Campaspe, Goulburn and Victorian Murray valleys respectively)*.

*These provisions are comparable to high reliability entitlements and include 1.7 GL of fixed entitlement and 5.6 GL of variable entitlement.

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 to meet the reporting obligations under section 71 of the Water Act.

5 Table 4: Updated Cap Register

Year	Location	Cap Targets				Diversions			Cap Credits			
		Model component	Outside model component	Adjustment for trade and environmental use	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
2013-14	Goulburn / Broken ^{\$} / Loddon	2,031	23	-441	1,614	1,142	23	1,165	449	2,444	-4 [#]	2,889
	Campaspe	125	1	-21	104	25	1	26	79	337	-2 [#]	414
	Wimmera / Mallee [@]	44	0	0	44	16	0	16	29	99	0	128
	Murray / Kiewa / Ovens	1,694	4 [@]	-29	1,669	1,307	4 ^{^^}	1,311	358	1,776	-18 [^]	2,116

Notes:

(1) All volumes in gegalitres.

(2) Cap models used: Goulburn/Broken/Loddon and Campaspe - N900.log, GoulN900.sys; Wimmera Mallee - CP20.log, WMPPcp15.sys

^{\$} Includes adjustment for decommissioning of Lake Mokoan.

[#] Mainly due to retrospective rating curve changes and some due to re-derivation of Lake Nillahcootie rainfall and inflow inputs

[@] Post-irrigation entitlement sale Cap model used for the Cap assessment since 2013-14.

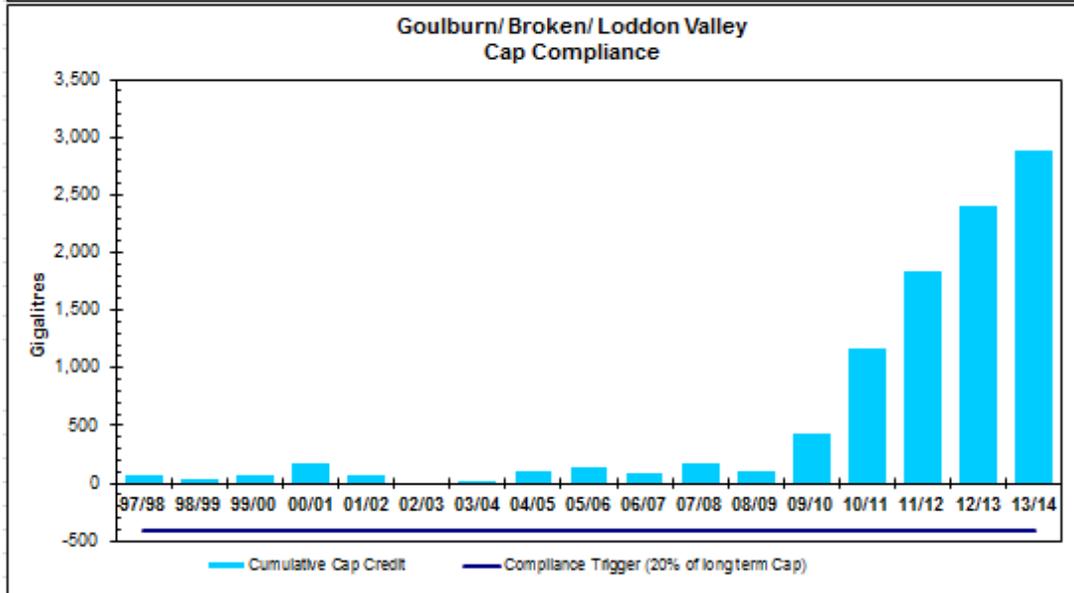
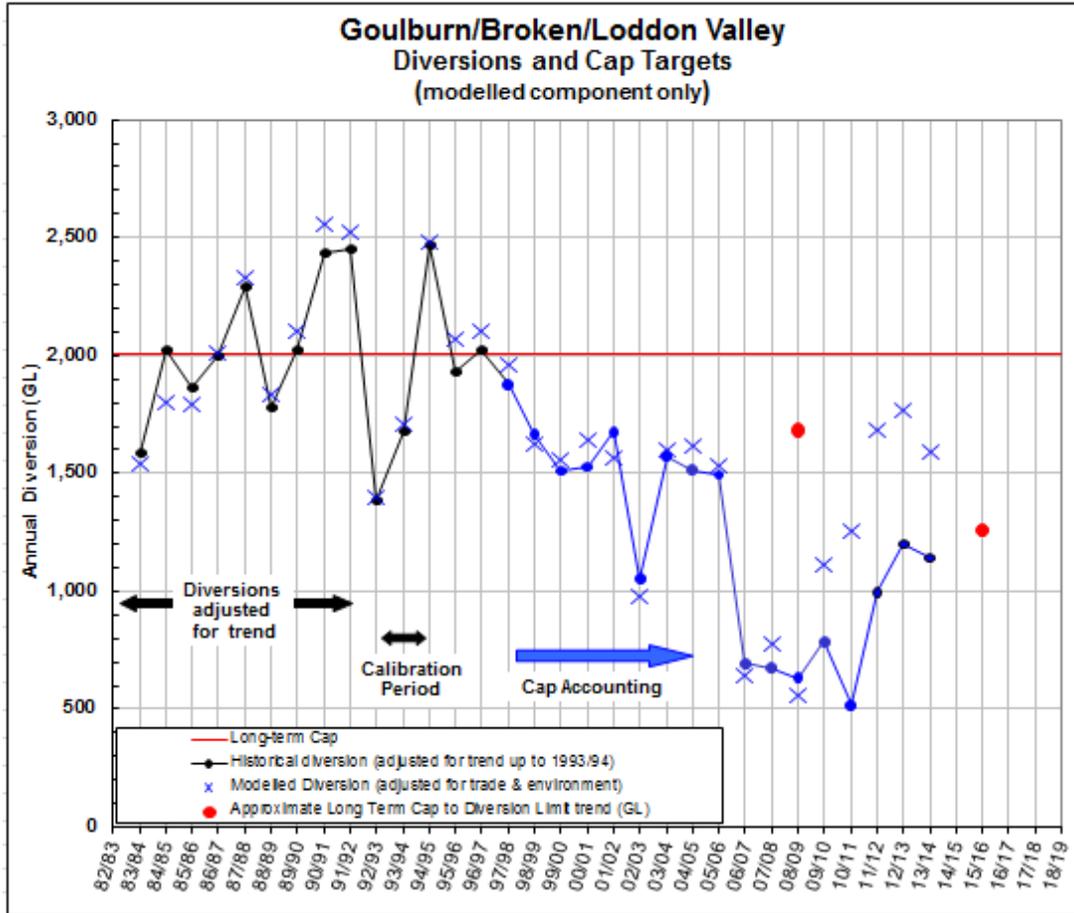
^{*} Victoria proposes to reduce its Wimmera Mallee trigger to a maximum of 20 GL or 35% of the reduced (post irrigation entitlement sale) long term Cap.

[^] Due to change in NSW (Billabong Ck and Balranald flows) and VIC (Goulburn, Loddon and Campaspe River flows) modelled inputs, fixing of errors on database for Snowy data and Campaspe River at Rochester, revised estimates of ungauged catchment inflows u/s Hume and Torrumbarry tributaries and other bug fixes

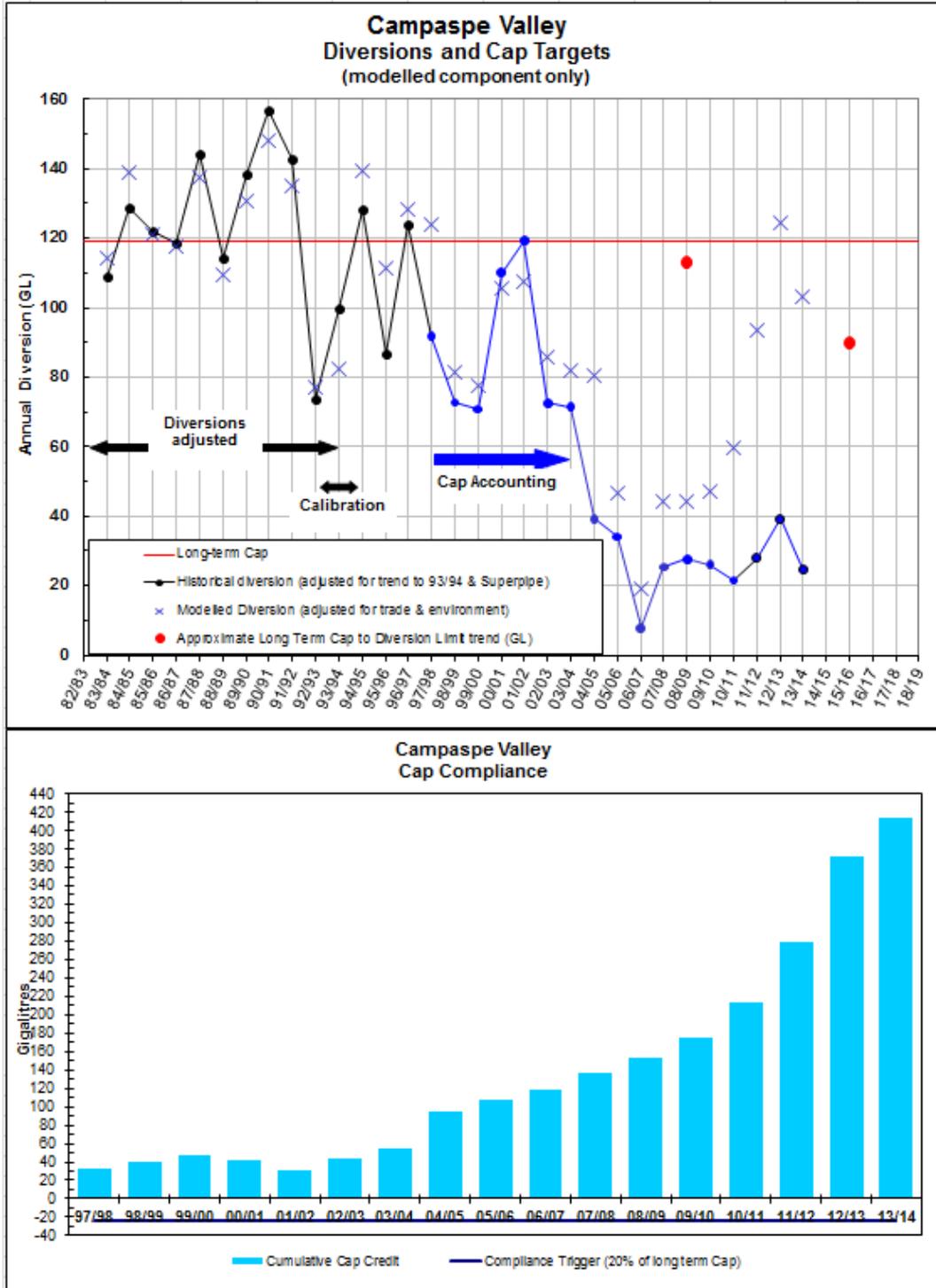
⁺ Including outside model component

^{^^} This does not include unregulated use in the Kiewa and Ovens systems

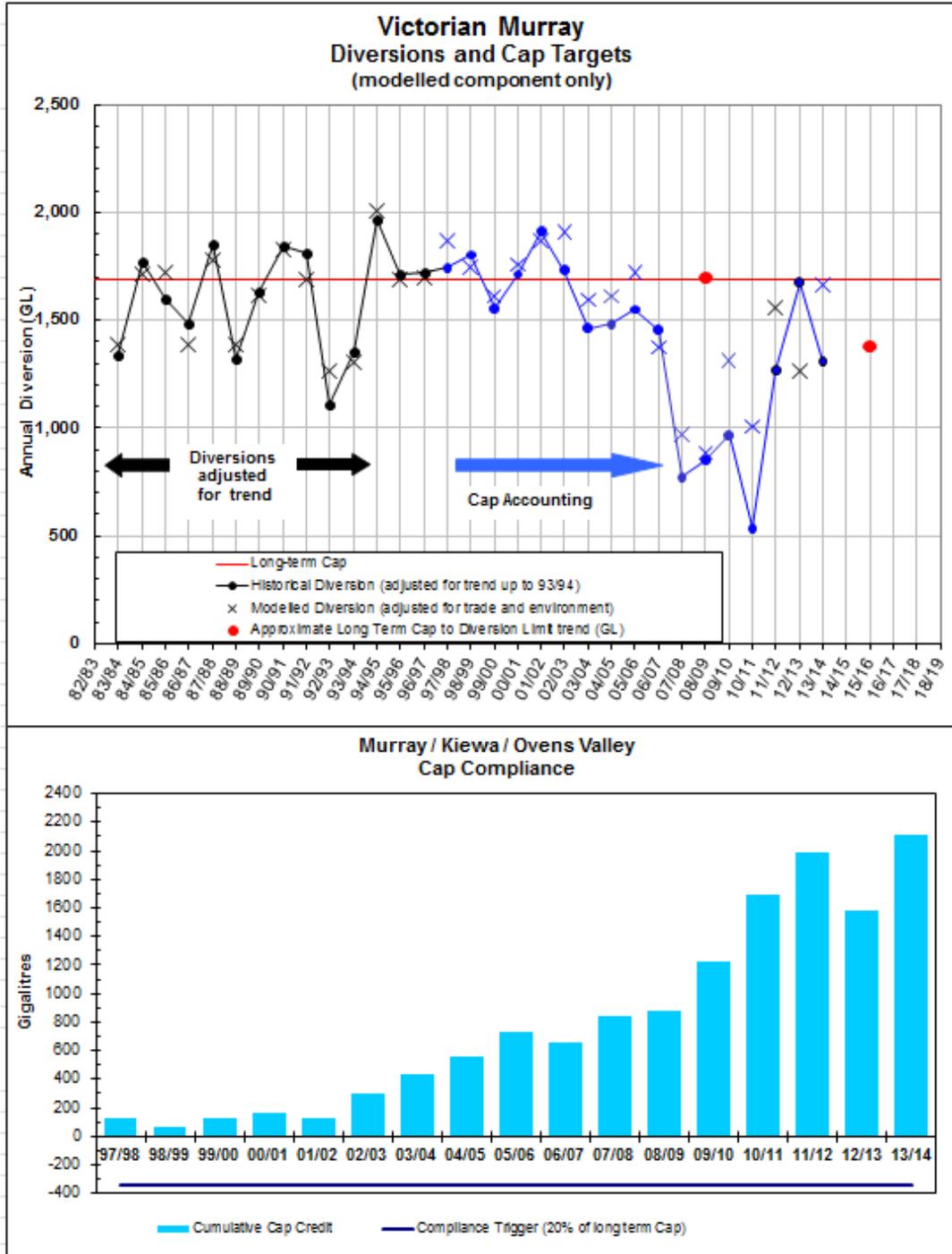
Attachment 1



Attachment 2



Attachment 3



Attachment 4

