



8. Sustainable diversion limits (SDLs)



Part 8.

Sustainable Diversion Limits

The aim of the Basin Plan is to better protect the environment through reducing how much water can be taken for consumption, while also promoting the sustainable use of water for communities, agriculture and industries.

To support this, the Basin Plan prescribed sustainable diversion limits (SDLs) as a maximum volume of water that can be taken from Basin resources for consumption. Water taken for the environment is not part of the sustainable diversion limit volumes.

8.1 Basin Plan requirements

Clause 5.05 of the Basin Plan states:

Objective and outcomes in relation to long-term average sustainable diversion limits (SDLs)

1. *The objective in relation to long-term average sustainable diversion limits is to establish environmentally sustainable limits on the quantities of surface water and groundwater that can be taken for consumptive use from Basin water resources, having regard to social and economic impacts, and in doing so:*
 - a. *inform environmental water recovery measures, including water purchasing and infrastructure that improves water use efficiency; and*
 - b. *provide greater certainty for all water users, including in times of drought and low water availability; and*
 - c. *provide time for water access entitlement holders and communities to transition and adjust to long-term average sustainable diversion limits.*
2. *The outcomes in relation to the establishment of long-term average sustainable diversion limits are:*
 - a. *the restoration and protection of water-dependent ecosystems and ecosystem functions in the Murray-Darling Basin; and*
 - b. *well-informed water recovery measures, including water purchasing and infrastructure, enable a transition to long-term average sustainable diversion limits; and*
 - c. *greater certainty of access to Basin water resources; and*
 - d. *water access entitlement holders and communities of the Murray-Darling Basin are better adapted to reduced quantities of available water.*

8.2 What are baseline diversion limits and sustainable diversion limits?

8.2.1 Cap reporting framework

As noted by the Murray-Darling Basin Authority (MDBA), the Murray-Darling Basin Ministerial Council introduced the Murray-Darling Basin Cap on surface water diversions in 1995 to protect and enhance the riverine environment and protect the rights of water users. The Cap introduced long-term limits on how much water could be taken from rivers in 24 designated river valleys in the Murray-Darling Basin.

The Cap also introduced a requirement that Basin states had to work out ways to turn the long-term limits into annual cap targets that take account of changes such as the weather conditions and water availability in each year.

Under the Cap, Basin states had to provide data to the Murray -Darling Basin Authority (MDBA) to show how much water was actually taken each year compared to the annual cap targets.

8.2.2 Basin Plan reporting framework

The Basin Plan introduced a new water accounting and compliance framework to replace the Cap. When the Basin Plan was being developed, estimates were made of the volume of water diverted from the Basin under the conditions and level of development that were present in 2009 (or as at 31 October 2010 for some forms of take in the Wimmera-Mallee). These volumes, termed baseline diversion limits (BDLs) are the long-term average estimates of consumptive water use before the Basin Plan.

Sustainable diversion limits (SDLs) represent a maximum limit of water diverted from the Basin at an environmentally sustainable level.

The considerations for developing sustainable diversion limits were:

- the baseline diversion limit, as in how much water was being extracted from river or groundwater systems for use at the time of the Basin Plan's development
- the volume of water that could be extracted from river or groundwater systems without serious adverse impacts on the Basin's environmental health
- how much water needed to stay in the Basin's river or groundwater systems so that the environment across the Basin could thrive.

The Murray-Darling Basin Authority assessed these considerations and identified that the sustainable level of extraction from all Basin resources was an average of 10,873 gigalitres (GL) of surface water and 3,324 GL of groundwater per year.

This total volume for the Basin was then divided into water resource plan areas for surface water and groundwater. Each Basin state is required to demonstrate how it will limit the volume of water permitted to be taken in a water resource plan area to comply with sustainable diversion limits.

The water resource plan areas are further broken down into sustainable diversion limit resource units. In the Wimmera-Mallee water resource plan areas there is one surface water SDL resource unit and three groundwater SDL resource units. Further information on the water resource plan areas and SDL resource units relevant to the Wimmera-Mallee Water Resource Plan can be found in [Part 4](#).

8.2.3 Baseline diversion limits and sustainable diversion limits for the Wimmera-Mallee Water Resource Plan

Victoria's surface water BDL and SDL estimates in the Wimmera-Mallee (surface water) water resource plan area are summarised for each form of take in [Table 15](#). The surface water entitlement volumes and the characteristics of each class of right and any conditions on the exercise of the rights are provided in [Part 6](#).

Victoria has not undertaken independent modelling to determine SDL for the Wimmera-Mallee (groundwater) water resource plan area resources. Instead, Victoria has adopted the BDL and SDL figures prescribed in the Basin Plan for groundwater.

A summary of the Basin Plan groundwater management units in the Wimmera-Mallee water resource plan area and the relationship with the BDLs and SDLs, the Victorian management units and the licensed volumes is shown in [Table 16](#).

The groundwater SDL does not include groundwater take within the West Wimmera Groundwater Management Area (GMA), because the groundwater resources in the West Wimmera GMA have been excluded from the water resources of the Murray-Darling Basin under the *Water Regulations 2008 (Cth)*. This is due to the groundwater resources within the West Wimmera GMA being only remotely hydrologically connected to the River Murray and disconnected to surface ecosystems in the Murray-Darling Basin. A map of the West Wimmera area is provided in [Figure 1](#) of [Appendix C](#).

Table 15: Long-term average surface water diversion limits in the Wimmera-Mallee (surface water) water resource plan area according to form of take specified in the Basin Plan

Form of take – surface water	BDL (ML)	SDL (ML)
Take from a regulated river (excluding basic rights)	66,874	43,842
Take from a watercourse (excluding take under basic rights) ²	1,299	1,299
Take under basic rights including: take from a regulated river under basic rights take from a watercourse under basic rights	1,065	1,065
Total take by runoff dams	24,100	24,100
<i>Take by runoff dams (excluding take under basic rights)</i>	<i>13,100</i>	<i>13,100</i>
<i>Take by runoff dams under basic rights</i>	<i>11,000</i>	<i>11,000</i>
Net take by commercial plantations	5,700	5,700
Total (ML) ¹	99,038	76,006³

Notes to table:

- Schedule 2 of the Basin Plan specifies the water recovery target for the Wimmera-Mallee by stating that the surface water SDL for the Wimmera-Mallee is the BDL minus 23 GL⁸. The MDBA, in Schedule 3 of the Basin Plan, estimates the BDL to be 129 GL per year and so the SDL is estimated to be 106 GL per year. This 23 GL difference in the Basin Plan corresponds to the Basin Plan estimate of long-term average annual take by the former Wimmera Irrigation District under its entitlement of 28 GL (which included a 9 GL loss entitlement). This 28 GL entitlement was purchased by the Commonwealth Government for environmental watering in 2013.

⁸ Victoria considers that the full water recovery target for Wimmera-Mallee has been achieved. The MDBA currently reports this entitlement as equivalent to 22.6 GL long-term average on its website. This estimate will be updated by MDBA following the finalisation of Long-Term Diversion Limit Equivalent (LTDLE) factors.

- Under the Basin Cap the BDL for take from a watercourse (excluding basic rights) was calculated as a proportion of take from regulated rivers (excluding basic rights). The BDL is currently estimated as 1.9% of the BDL for take from a regulated river (excluding basic rights), assuming similar utilisation rates (which equates to a volume of 1.3 GL for the Wimmera-Mallee (surface water) SDL resource unit). Recognising there are flaws in this method, Victoria is proposing to revise the estimate within the next two years to determine a more accurate means of representing levels of take as at 2010 for this form of take. See **Part 2.2** and **Part 3.1.1.2** of the Methods Report at **Appendix C** for more information.
- The BDL minus the SDL volume for the revised estimate above is 23,032 ML, slightly higher than the 23 GL required in Schedule 2 of the Basin Plan.

Table 16: Groundwater diversion limits in the Wimmera-Mallee water resource plan area by SDL resource unit

SDL resource unit	Form of take	BDL ¹ (ML)	SDL ² (ML)	Permitted take (ML)
Highlands	Take from groundwater (excl. basic rights)	1,110	2,575	2,575
	Take from groundwater under basic rights	150	175	175
Sedimentary Plain	Take from groundwater (excl. basic rights)	67,770 less West Wimmera take ³	189,284 less West Wimmera take ³	189,284 less West Wimmera take ³
	Take from groundwater under basic rights	1,130	816	816
deep	Take from groundwater (excl. basic rights)	0	20,000	20,000
	Take from groundwater under basic rights	0	0	0

Notes to table:

- BDL is the baseline limit of take from an SDL resource unit (i.e. the volume of take before the SDL was determined). The diversion estimates from column 3, Schedule 4 of the Basin Plan have been adopted.
- SDL means the long-term average diversion limit to be achieved. The estimates from column 4, Schedule 4 of the Basin Plan have been adopted.
- The West Wimmera GMA PCV is 53,357 ML (at 30 June 2018) and includes groundwater resources outside the Murray-Darling Basin. There is approximately 3,200 ML of entitlement in the Murray-Darling Basin area of the West Wimmera GMA.

8.2.4 Modelling for regulated surface water BDL and SDL

The Wimmera-Mallee BDL and SDL models have been developed in the following manner:

- Wimmera-Mallee BDL model – this model represents infrastructure, operational rules and entitlements to water as at 31 October 2010. This represents the point in the time when entitlements were created to distribute the final water savings from the Wimmera-Mallee Pipeline.
- Wimmera-Mallee SDL model – this model represents infrastructure, operational rules and entitlements to water as in the BDL model, with the exception of the transfer of the 19 GL of former irrigation entitlement and the associated distribution losses of 9 GL to the Commonwealth Environmental Water Holder.

The Wimmera-Mallee BDL and SDL models will be used to determine the long-term average diversion limit and the annual permitted take from the Wimmera-Mallee (surface water) water resource plan area for regulated rivers.

The BDL and SDL models were run over the Basin Plan historic climate period of July 1985 to June 2009 and estimated the long-term BDL and SDL (for take from regulated rivers only) to be 66,874 ML per year and 43,842 ML per year. These values are broadly consistent with the corresponding Murray-Darling Basin caps (MDB caps) of 66,899 ML per year and 44,185 ML per year respectively. These MDB caps were estimated using the previously accredited Wimmera-Mallee post-pipeline and post-irrigation cap models.

For more information on the difference between the Basin Plan BDL and SDL estimates and the estimates based on Victoria's BDL and SDL models, see [Appendix C](#).

8.2.5 Accounting for inter-basin transfers

Three inter-basin transfers are associated with the take in the Wimmera-Mallee water resource plan area. First, under its Wimmera and Glenelg rivers bulk entitlement, GWMWater takes water from several sources in the Glenelg basin, outside the Murray-Darling Basin, for transfer into the Wimmera basin. These diversions are from the Upper Wannon River to Stawell township and Lake Bellfield; from Upper Glenelg River to Moora Moora Reservoir and then to the Wimmera basin; and Glenelg River to Rocklands Reservoir.

Victoria's approach to cap compliance has been to include the Glenelg basin transfers in the Wimmera basin inflows because:

- the Glenelg basin is a major source of water for the Wimmera-Mallee system and contributes to the resources that determine available water and allocations for entitlement holders
- the Wimmera-Mallee is operated as an integrated system and it is not practical to track Glenelg water once it enters the system.

Any consumptive use or environmental release in the Glenelg basin from the Wimmera-Mallee system is not accounted for in the Wimmera-Mallee water resource plan area.

Second, GWMWater holds two bulk entitlements authorising it to take water from sources other than the Wimmera basin to supply its customers in the Wimmera-Mallee water resource plan area:

- Bulk entitlement River Murray-Grampians Wimmera Mallee Water Conversion Order 1999 authorises GWMWater to take up to 3,492 ML per year from the River Murray to supply its customers in the area who are serviced by the Northern Mallee Pipeline and Supply System 5 of the Wimmera-Mallee Pipeline. This water is sourced from the Northern Victoria water resource plan area.
- Bulk entitlement Quambatook-Grampians Wimmera Mallee Water Conversion Order 2006 authorises GWMWater to take up to 100 ML per year from the Goulburn system within the Northern Victoria water resource plan area to supply the township of Quambatook.

These transfers into the basin are accounted as diversions in the Victorian Murray and Northern Victoria water resource plan areas respectively, and so are not included in the BDL or SDL for the Wimmera-Mallee water resource plan area.

Third, GWMWater's Willaura water supply system takes water from three small creeks on the eastern slopes of the Grampians (*Gariwerd*) to supply a group of towns (Willaura, Wickliffe, Moyston, Lake Bolac and Glenthompson) and rural properties. For more information regarding this supply, see the [Appendix C](#).

8.3 Annual determinations of permitted take

Under section 10.10 of the Basin Plan, the Wimmera-Mallee Water Resource Plan is required to set out the method for determining permitted take for each form of take in the water resource plan area.

Section 6.10 of the Basin Plan specifies that permitted take is the maximum quantity of water allowed to be taken by each form of take for consumptive use from the SDL resource unit in each water accounting period.

For surface water permitted take equates to authorised take and for groundwater permitted take equates to SDL under the Victorian framework. Actual take is the water diverted or taken by water users from the resource or system to be stored or used (see [Part 8.4](#)).

In Victoria, permitted take is determined to be equal to the SDL for that water resource plan area or resource. The methods used to determine permitted take are outlined below.

8.3.1 Surface water

The determination of permitted take in the Wimmera-Mallee (surface water) water resource plan area varies depending on the form of take. [Table 17](#) outlines the methods used for determining permitted take for each form of take in the Wimmera-Mallee (surface water) water resource plan area.

These methods are based on the best available information for the relevant form of take. The Victorian Water Register provides the most accurate and up-to-date information regarding water taken by entitlement holders in Victoria. It records the volume of water the entitlement holder is permitted to take during an accounting period and also the volume of water actually taken against the entitlement.

Where the volume of take is estimated, the estimates are based on the best available data and latest models available. For example, the best available data includes the most recent aerial photographs for farm dams and the latest models for determining commercial plantation interception. For more information on the best available information for each method, see [Table 5](#) of [Appendix C](#).

Table 17: Methods for determining permitted take – surface water

Form of take	Permitted take (accredited text for 10.10(1))
<p>Take from a regulated river (excluding basic rights)</p>	<p>The method used for determining permitted take for take from a regulated river (excluding basic rights) in the Wimmera–Mallee (surface water) water resource plan area is the scaled water resource plan model which was developed by:</p> <ul style="list-style-type: none"> • updating the SDL model to represent infrastructure, policy, operational rules and full use of entitlements as required and defined by the currently published Bulk and Environmental Entitlements relevant to Wimmera–Mallee (surface water) water resource plan area (i.e. 2014 BEs and EEs) as at 31 December 2017 • scaling the modelled diversions to ensure that average annual diversion over the historical climate conditions from 1895 to 2009 matches the SDL. <p>The scaled water resource plan model will be used at the end of each year as follows:</p> <ul style="list-style-type: none"> • extend the inputs (inflows, rainfall, evaporation and demands) to 30 June, being the end of the last water accounting year • run the model from 1 July 2019 to end of the last water accounting year by initialising the simulation with recorded storage volumes at the end of June 2019 • determine the annual permitted take using the consumptive diversions calculated by the model • less any incomplete recovery <p>The model version is from 16 May 2018 and the key model files are:</p> <ul style="list-style-type: none"> • WPO1.sys • WPO1.scn • WPO1.log <p>The disposal and acquisition of held environmental water is accounted for separately and in a manner that does not affect the permitted take method.</p>
<p>Take from a watercourse (excluding take under basic rights)</p>	<p>The permitted take for the Wimmera–Mallee (surface water) water resource plan area equals actual take, where actual take equals the sum of all diversions taken under an entitlement from a watercourse that is not a regulated river minus environmental water held (or HEW) by VEWH and CEWH as recorded in the VWR as at 30 June in the relevant year.</p>

continued

Form of take	Permitted take (accredited text for 10.10(1))
Take from a regulated river under basic rights	Estimated as the sum of: <ul style="list-style-type: none"> a modelled estimate of the volume of water taken from freehold land and Crown frontage based on estimated domestic demand of 0.3 ML/house/year and stock drinking water of 0.03ML/year/per ha of land grazed. an estimate of the volume of expected water demand under section 8A of the Victorian Water Act where the Traditional Owners have a natural resource agreement under the <i>Traditional Owner Settlement Act 2010</i>
Take from a watercourse under basic rights	
Take by runoff dams (ex basic rights)	To be determined from the total volume of licences and registrations based on a fixed annual volume in the Victorian Water Register as at 30 June in the relevant year (being the water accounting period). <p>Note: Total volume of licences and registrations refers to the maximum volume authorised to be taken under take and use licences and registrations.</p>
Take by runoff dams (basic rights)	Estimate is based on modelling using the number and volume of dams shown in aerial imagery as at 2005, adjusted to account for entitlements to take from runoff dams as given in the Victorian Water Register as at July 2016.
Net take by commercial plantations	Net take is estimated as the difference between the long-term average rate of evapotranspiration from commercial plantations that were present as at 30 June 2009 and from the vegetation type that was thought to be present before the commercial plantations were established. The long-term average rate of evapotranspiration is estimated using the SoilFlux model. <p>The long-term average rate of evapotranspiration from commercial plantations present in 2009 was estimated by using the SoilFlux model with the following inputs:</p> <ul style="list-style-type: none"> areas of plantations present as at 2009 using data from the Victorian Land Use Information System (VLUIS) dataset 2009 and improved using aerial imagery and plantation industry data. This is considered the best available data of current commercial plantation conditions and best available evidence suggests that this has not changed between June 2009 and June 2016. climate data between 1961 and 2016 from the Bureau of Meteorology <p>The long-term average rate of evapotranspiration from plantations present before the plantations were established was estimated by using the SoilFlux model with the following inputs:</p> <ul style="list-style-type: none"> Estimated land use types present prior to establishment of plantations present in 2009 using nearby land use data from the Victorian Land Use Information System (VLUIS) dataset and expert judgement. climate data between 1961 and 2016 from the Bureau of Meteorology.

8.3.2 Groundwater

The determination of permitted take in the Wimmera-Mallee (groundwater) water resource plan area varies depending on the form of take. **Table 18** outlines the methods used for determining permitted take for each form of take in the Wimmera-Mallee (groundwater) water resource plan area.

These methods are based on the best available information for the relevant form of take. The Victorian Water Register provides the most accurate and up-to-date information regarding water taken by entitlement holders in Victoria. It records the volume of water the entitlement holder is permitted to take during an accounting period and the volume of water actually taken against the entitlement.

For more information on the best available information for each method, see the Methods Report (**Table 8** of **Appendix C**).

Table 18: Methods for determining permitted take – groundwater

Form of take	Method
Take from groundwater (excluding basic rights)	<p>Highlands</p> <p>The method for determining permitted take is the method used to determine the SDL for the Wimmera-Mallee: Highlands SDL resource unit as prescribed in Schedule 4 of the Basin Plan minus the SDL volume for take from groundwater under basic rights.</p> <p>Sedimentary Plain</p> <p>The method for determining permitted take is the method used to determine the SDL for the Wimmera-Mallee: Sedimentary Plain SDL resource unit as prescribed in Schedule 4 of the Basin Plan minus the SDL volume for take from groundwater under basic rights.</p> <p>The reduction in the SDL to account for the West Wimmera is determined using entitlement data on the Victorian Water Register, based on the location of licensed bores.</p> <p>deep</p> <p>The method for determining permitted take is the method used to determine the SDL for the Wimmera-Mallee: deep SDL resource unit as prescribed in Schedule 4 of the Basin Plan minus the SDL volume for take from groundwater under basic rights.</p>
Take from groundwater (basic rights)	<p>All SDL resource units</p> <p>Estimate based on the number of bores less than 30 years old with a rate of 2 ML per year (as at 30 June 2010)</p>

8.3.3 Accounting for water availability

Section 10.10(2) of the Basin Plan requires the method be applied after the end of the relevant water accounting period, having regard to the water resources available during that period.

In respect of take from a regulated river (excluding basic rights) the impact of water availability is managed in practice throughout the accounting period on a monthly basis. Water available during the period is accounted for in the SDL model at the end of the period based on seasonal conditions in the preceding year and the same allocation rules as detailed in Part 3.1.1.1 and [Schedule 1](#) of the Methods Report at [Appendix C](#).

For take from watercourses that are not regulated rivers (excluding take under basic rights) the interim method is based on actual diversions until a review of the method is completed (see [Appendix C, Part 3.1.1.2](#)) Annual actual take determination in this circumstance reflects any measures that respond to water availability as outlined in [Part 6.7](#) or water shortages during extreme dry periods as outlined in [Part 9.3](#).

For all other forms of take, there is no mechanism to allocate or restrict water take on an annual basis and the estimates are based on long-term averages hence the method for permitted take does not take into account water availability on an annual basis.

10.10(2) Surface water

The methods for the purposes of section 10.10(1) of the Basin Plan are applied at the end of each accounting period having regard to the water resources available during that period, where relevant. For take from a regulated river (excluding basic rights) a method for determining allocations based on water availability is included in the method for determining permitted take.

Groundwater

The method is applied at the end of each accounting period having regard to the water resources available during that period.

8.4 Annual determinations of actual take

Section 10.15 of the Basin Plan requires that the Wimmera-Mallee Water Resource Plan set out how the volume of water actually taken for consumptive use by each form of take from each SDL resource unit will be determined after the end of a water accounting period using the best available information at the time. Actual take is the quantity of water actually taken from the system within an accounting period. Long-term average actual take should be less than or equal to permitted take in order to comply with the SDL.

Section 6.10 of the Basin Plan defines actual take as the sum of the quantity of water actually taken by each form of take for consumptive use from the SDL resource unit. Actual take is the water diverted or taken by water users from the resource or system to be stored or used.

8.4.1 Managing surface water actual take during the accounting period

Take under entitlements

The Wimmera-Mallee system includes all regulated rivers in the Wimmera-Mallee water resource plan area.

GWMWater's bulk entitlement (Bulk Entitlement (Wimmera and Glenelg Rivers – Grampians Wimmera-Mallee Water) Conversion Order 2010) grants the corporation the right to harvest and store water flows in the Wimmera-Mallee system with a complementary obligation to supply all entitlement holders.

This corresponds with take from a regulated river but also includes take from several small diversions on unregulated tributaries in the catchment that are part of the overall Wimmera-Mallee supply system and are covered under GWMWater's bulk entitlement. These include the Mt Cole, Langi Ghiran, Huddleston's Weir and Panrock Creek diversions in the upper reaches of the Wimmera basin.

It also includes water taken from the Glenelg River catchment and used to supply the Wimmera-Mallee system. These flow diversions are transfers into the Murray-Darling Basin.

The bulk entitlements contain all the provisions required to determine the maximum quantity of water that the Basin Plan permits to be taken for consumptive use during a water accounting period.

GWMWater, as the storage manager, is required to determine the available water that can be taken from the system during the accounting period and make the corresponding water allocations for all consumptive users and the environment. Schedule 3 of the storage manager instrument of appointment (Minister for Water, 2010) establishes the rules the storage manager must use when determining available water and allocations.

The distribution of available water is determined by a formula that allocates water to each user group, including the environment, according to the reliability of their entitlement. The storage manager determines the available water (and corresponding entitlement allocations) as specified by its instrument of appointment for the accounting period from 1 July of one year to 30 June of the next.

Take from watercourses that are not regulated rivers (excluding take under basic rights)

This category includes take by small urban water supply systems and take and use licence (see [Appendix C](#)).

The authorisation to take water under the bulk entitlements for small urban water supply systems is based on full utilisation of each entitlement, however, these instruments specify rules that limit take that can respond to water availability year to year, including:

- minimum passing flows to be met before diversions can occur, and in some cases the months of the year when no diversion is permitted
- capacity of on-stream storage
- maximum rates of diversion

Take and use licence holders are required to comply with rosters, bans or restrictions. These rosters, bans and restrictions are articulated in either local management plans or water supply protection area water management plans.

Until Victoria can determine a more appropriate and cost-effective method for determining permitted for take from a watercourse (excluding basic rights) that recognises adjustments under bans and restrictions it is proposed that the permitted take method is the same as the annual actual take determination in the water accounting period.

Victoria will revise the BDL estimate within the next two years to determine a more accurate means of representing levels of take as at October 2010 for this form of take. This is explained further in [Appendix C, Part 2.2](#) and [Part 3.1.1.2](#).

Take from a regulated river or watercourse that is not a regulated river under basic rights

Basic rights as defined by section 1.07 of the Basin Plan includes a right under state law to take water for domestic and stock purposes and a Native Title right.

These include rights to take water under section 8 and section 8A of the Victorian Water Act. Under section 8, water users have a right to take water, free of charge, from a waterway for domestic and stock purposes under prescribed circumstances (see [Part 6.2](#)).

Take under basic rights is not managed in the same manner as take under an entitlement. Water users exercising their rights under section 8 are not required to meter their extraction, report on the volume of extraction or otherwise monitor their use. There is a widely used figure of 2 ML per year that is considered a reasonable estimate of the average volume for domestic and stock use as defined in the Victorian Water Act (SKM, CSIRO and the Bureau of Rural Sciences, 2010).

Total take under this form is small given the right cannot be exercised for commercial purposes and therefore only small volumes of water are used. Additionally, the unregulated rivers in the Wimmera-Mallee water resource plan area dry up regularly and most of the unregulated parts of the Wimmera and Avoca rivers and their tributaries are bordered by Crown land. Under section 8, a person can access water where their land is next to the waterway and the bed and banks of the waterway have remained the property of the Crown. The rights do not apply where there is Crown frontage between the waterway and freehold land.

Under section 8A of the Victorian Water Act, a Traditional Owner group with a Settlement Agreement has a right to take water in accordance with the conditions of section 8A. To date, no water has been taken from the Wimmera-Mallee water resource plan area under the right prescribed in section 8A of the Victorian Water Act. Therefore, to ensure water is available under the BDL and SDL volumes for this type of take, an estimate has been made of the expected demand for the Wimmera-Mallee water resource plan area based on eligibility under section 8A. This estimate is based on the number of Traditional Owner groups and information regarding access to main waterways, given the basis for accessing water under section 8A depends on the circumstances under which water can be accessed under section 8 of the Victorian Water Act.

Take by runoff dams

Runoff dams (often referred to in Victoria as small catchment dams) are small dams not located on a defined watercourse. Small catchment dams are used mainly for:

- commercial and irrigation purposes, which are required to be licensed or registered in Victoria
- domestic and stock purposes, which take water under the basic right provided under section 8 of the Victorian Water Act.

See [Part 10.3.1](#) and [Part 10.4.1](#) for further details on runoff dams.

The volume of water authorised under a licence to be taken by these runoff dams by individuals is estimated to be 12,753 ML (in the Wimmera-Avon and Avoca basins).

The volume of water authorised to be taken by unlicensed runoff dams used for stock and domestic (basic rights) purposes within the Wimmera-Mallee water resource plan area is 29,826 ML.

Victoria has estimated the number and volume of runoff dams used for domestic and stock purposes in the Wimmera-Mallee water resource plan area and also the total annual extraction, which varies with climatic conditions. These estimates were made from desktop studies using maps and aerial photographs. Dams used for commercial and irrigation purposes which are subject to licensing were separated, based on the imperfect data available, to avoid double counting of take.

Net take by commercial plantations

The effect of commercial forestry plantations on the water balance in the Wimmera-Mallee water resource plan area is not accurately monitored and good data is not readily available.

The annual permitted take of water by commercial plantations will be estimated as the difference between the long-term average rate of evapotranspiration from plantations that were present in 2009 and from the vegetation type that was thought to be present before the plantation was established. Commercial plantations cover 42 square kilometres within the Wimmera-Mallee water resource plan area and take an estimated 5,700 ML per year.

8.4.2 Managing groundwater actual take during the accounting period

For purposes of the Basin Plan requirements for groundwater management and trade, Victoria acknowledges that the state management unit (as defined by the Commonwealth groundwater trade guidelines) is the Wimmera-Mallee water resource plan area (comprising the Highlands SDL resource unit that is longitudinally connected to the Sedimentary Plain SDL resource unit and the deep SDL resource unit at depth). Within this water resource plan area, Victoria manages the resource and licensing.

The groundwater management parameters used for measurement and reporting by Victoria do not align exactly with the groundwater SDL resource units specified in the Basin Plan.

Further work is required to enable Victoria's water accounting and reporting arrangements to accurately differentiate the volume of groundwater taken from the groundwater resources included in the Wimmera-Mallee Water Resource Plan.

The Victorian Government plans to upgrade the Victorian Water Register to enable better reporting at the scale of the water resource plan SDL resource units. This will help with the relevant MDBA trading rules where applicable, and reporting on compliance with the Basin Plan SDL resource units for groundwater in future. Given that the total licensed volume of groundwater take in the area is significantly below the total SDL, there is no risk to groundwater SDL compliance in the Sedimentary Plain, and only a low risk in the Highlands due to the current boundary misalignment.

Take from an aquifer (excluding basic rights)

This form of take is prescribed as "take from groundwater (excluding basic rights)" under the Basin Plan. For this reason, the tables in this Water Resource Plan and the Methods Report ([Appendix C](#)) refer to take from groundwater when providing the methods and volumes for SDL and permitted take to meet Basin Plan requirements.

Take from an aquifer, excluding where it is under a basic right, is managed through Victoria's entitlement framework. A water user must hold a take and use licence and a works licence to take water from an aquifer. The works licence regulates the construction, use, maintenance and alteration of the bore used to extract groundwater. The take and use licence is the water access right that authorises the maximum volume the user is permitted to take in a year. The take and use licence also prescribes the place at which groundwater may be taken, and the time and rate. These conditions protect other users and the aquifer by regulating how water is extracted overall to prevent unacceptable third-party impacts from extraction and also protect the resource and environment.

In the Wimmera-Mallee: Sedimentary Plain SDL resource unit, the water taken from Basin resources in the West Wimmera GMA is excluded from the water resource plan and the SDL maximum volume. The limit on taking groundwater from the Wimmera-Mallee: Sedimentary Plain SDL resource unit excludes groundwater taken (licensed and domestic and stock) from the West Wimmera Groundwater Management Area (GMA) in the Murray-Darling Basin (see [Figure 1](#) in [Appendix C](#)). This volume is estimated to be 3.2 GL. The volume may vary due to trade within the West Wimmera GMA but is not expected to increase markedly, due to the poor quality of groundwater in the area.

Take from an aquifer under basic rights

This form of take is prescribed as 'take from groundwater (excluding basic rights)' under the Basin Plan. For this reason, the tables in this water resource plan and the Methods Report ([Appendix C](#)) refer to take from groundwater when providing the methods and volumes for SDL and permitted take to meet Basin Plan requirements.

Basic rights are defined under the Basin Plan to include rights to take water for domestic and stock purposes and a Native Title right. Basic rights are prescribed in sections 8 and 8A of the Victorian Water Act.

Under section 8, water users have a right to take water, free of charge, from a bore for domestic and stock purposes under prescribed circumstances (see [Part 6.2](#)). In general terms, people or businesses can exercise that right if they own the land on which the bore is located.

Take under section 8 is generally not metered and the quantity of take is unknown. Take under this right may be metered in circumstances where bores are used to take water for other purposes under an entitlement in addition to water taken under section 8. In these cases, a meter may be attached to the works; however, where the works provide only for take for domestic and stock rights, there is no requirement to install a meter to monitor volumes of take. Take under basic rights is relatively small because water taken under this right cannot be used for commercial purposes including irrigation.

Traditional Owner rights to take water under section 8A where the Traditional Owners have a natural resource agreement under the *Traditional Owner Settlement Act 2010* are outlined in more detail in [Part 6.2.2](#) of this Water Resource Plan. At the time of publication, there were no circumstances of Traditional Owner groups exercising this right in the Wimmera-Mallee water resource plan area. However, this may change as a result of the implementation of the Aboriginal Water Policy outlined in *Water for Victoria*.

8.4.3 Determining actual take

The Basin Plan (section 10.15) requires a water resource plan to set out how the quantity of water actually taken will be determined after the end of the water accounting period using the best information available.

Table 19: Approaches to determine actual take for surface water and groundwater (10.15(1) Basin Plan)

Form of take	Determination of actual take
Surface water	
Regulated rivers (excluding basic rights)	The actual take for the Wimmera-Mallee Water Resource Plan surface water area is the sum of all diversions taken under an entitlement from a regulated river minus environmental water held (or HEW) by VEWH and CEWH as recorded in the Victorian Water Register.
Regulated rivers under basic rights and watercourses that are not regulated rivers under basic rights	<p>Estimated as the sum of:</p> <ul style="list-style-type: none"> a. a modelled estimate of the volume of water taken from freehold land and Crown frontage based on estimated domestic demand of 0.3 ML/house/year and stock drinking water of 0.03ML/year/per ha of land grazed. b. an estimate of the volume of expected water demand under section 8A of the Victorian Water Act where the Traditional Owners have a natural resource agreement under the <i>Traditional Owner Settlement Act 2010</i> <p>Note: This volume is estimated in conjunction with take from watercourses that are not regulated rivers under basic rights.</p>
Watercourses that are not regulated rivers (excluding take under basic rights)	The actual take for the Wimmera-Mallee Water Resource Plan surface water area is the sum of all diversions taken under an entitlement from a watercourse that is not a regulated river minus environmental water held (or HEW) by VEWH and CEWH as recorded in the Victorian Water Register as at 30 June in the relevant year (being the water accounting period).
Runoff dams (excluding take under basic rights)	To be determined from the total volume of licences and registrations based on a fixed annual volume in the Victorian Water Register as at 30 June in the relevant year (being the accounting period).
Runoff dams under basic rights	Estimate is based on modelling using the number and volume of dams shown in aerial imagery as at 2005, adjusted to account for entitlements to take from runoff dams as given in the Victorian Water Register as at July 2016.
Commercial plantations	Estimated as the difference between the long-term average rate of evapotranspiration from plantations that were present in 2009 and from the vegetation type that was thought to be present before the plantation was established. The long-term average rate of evapotranspiration will be estimated using the SoilFlux model.

continued

Form of take	Determination of actual take
Groundwater	
<p>Aquifer (excluding basic rights)</p>	<p>Highlands</p> <p>Determined using entitlement data from all forms of take except basic rights use on the Victorian Water Register, based on the location of licensed and registered bores in the water resource plan SDL reporting area.</p> <p>Sedimentary Plain</p> <p>Determined using entitlement data from all forms of take except basic rights use on the Victorian Water Register, based on the location of licensed and registered bores in the water resource plan SDL reporting area (excluding bores in the West Wimmera Groundwater Management Area that are also in the Basin).</p> <p>deep</p> <p>Determined using entitlement data from all forms of take except basic rights use on the Victorian Water Register, based on the location of licensed and registered bores in the SDL resource unit.</p>
<p>Aquifer under basic rights</p>	<p>Highlands</p> <p>Estimate based on the number of bores less than 30 years old with a rate of 2 ML per year (as at 30 June 2010).</p> <p>Sedimentary Plain</p> <p>Estimate based on the number of bores in the SDL resource unit less than 30 years old with a rate of 2 ML/year as at 30 June 2010, (excluding those bores in the West Wimmera GMA).</p> <p>deep</p> <p>Estimate based on the number of bores in the SDL resource unit less than 30 years old with a rate of 2 ML/year (as at 30 June 2010).</p>

8.5 Ensuring actual take does not exceed permitted take

Part 6 explains the rules that govern the volume of water that can be taken from the Wimmera-Mallee system. As discussed in **Part 6**, certainty of entitlements is central to Victoria's water management framework. This certainty is provided in two distinct ways:

- limiting the ability to take and use water to those with express authorisation
- requiring the allocation of water in a system to be subject to considerations of the impact on other users, including the environment.

The methods for determining permitted take outlined in **Appendix C** are based on the assumption of full use of all entitlements. For surface water, the current level of consumptive use aligns with the SDL. For groundwater the current level of entitlements is below the SDL. The management of allocation or actual take underneath the primary entitlement only occurs to respond to water availability in accordance with the methods identified in **Appendix C**.

Fundamentally, managing access to water to ensure that actual take does not exceed permitted take is done through limiting the authorisation to take water. As outlined above in **Part 5.1**, the Minister authorises the take and use of water through entitlements issued under the Victorian Water Act. These entitlements are subject to terms and conditions which include:

- the maximum volume that may be taken
- the time, place and rate at which water may be taken
- limitations on the take under the maximum volume by way of allocations or restrictions imposed to respond to water availability during the accounting period.

The rules relating to allocations or restrictions are included in the methods for determining permitted take. The issuing of entitlements, amendment of entitlements and exercise of powers to restrict authorisations during the accounting period are a core component of the power of the Minister (or their delegates) to authorise the take and use of water.

In order to ensure that authorisations to take water under the Victorian Water Act do not cause actual take to exceed permitted take, the Minister (and delegates) is subject to the following obligation in relation to the issue of new entitlements in the Wimmera-Mallee water resource plan area.

10.11(1)

1. From 1 July 2019, the Victorian Minister for Water must not:

- a. amend entitlements; or
- b. issue entitlements to take water; or
- c. make rules regarding allocations or restrictions to entitlement holders;

in respect to entitlements to take water from a water resource in the Wimmera-Mallee (surface water) water resource plan area or the Wimmera-Mallee (groundwater) water resource plan area if to do so would cause annual permitted take for that resource unit to be exceeded.

Note: The response to section 10.08(2) of the Basin Plan, requiring the holder of a water access right to comply with the conditions specified in the water access right instrument supports the above obligation to ensure, as far as practical that actual take does not exceed permitted take.

2. From 1 July 2019, if the cumulative volume of annual actual take is identified to equal or exceed the cumulative volume of annual permitted take, in accordance with section 6.11 of the Basin Plan, by the threshold established in section 6.12(1)(a)

of the Basin Plan, Victoria will meet the requirements to ensure compliance with sustainable diversion limits established under section 71(1)(h) of the Water Act 2007 (Cth) and Part 4, Chapter 6 of Basin Plan.

This obligation is included in the Wimmera–Mallee Water Resource Plan to provide assurance that no new entitlements will be issued and no entitlement will be amended in the water resource plan area that would result in authorised take in Victoria exceeding the SDL or permitted take. The obligation also requires that the exercise of powers to adjust authorisations to respond to water availability must consider the impact on permitted take and the SDL. This obligation reflects the obligation currently contained in section 6 of the Victorian Act that requires the Minister and Authorities to exercise their discretion in accordance with the Murray–Darling Basin Agreement and *Murray–Darling Basin Act 1993*. Section 6 of the Victorian Water Act invalidates any decision that is made to the extent that it is inconsistent with the Murray–Darling Basin Agreement and *Murray–Darling Basin Act 1993*. The above obligation is enforceable under the Commonwealth Water Act by the MDBA.

8.6 Limits on certain forms of take

Section 10.13(1) of the Basin Plan states that a water resource plan must require that the long-term annual average quantity of water that can be taken from a surface water SDL resource unit for consumptive use by:

- take under basic rights
- take by runoff dams
- net take by commercial plantations

does not exceed the level specified in column 2 of Schedule 3 for the form of take.

10.13(1)

1. The long term annual average quantity of water in the Wimmera–Mallee surface water SDL resource unit that can be taken for consumptive use for the forms of take listed at section 10.13(1) of the Basin Plan is the level specified in item 24 of Column 2 of Schedule 3 to the Basin Plan. This is the level of take at a specified point in time and is represented by the estimated volume of the baseline diversion limit identified in Column 5 of **Table 3 of Appendix C** to the Wimmera–Mallee Comprehensive Report for that form of take from the Wimmera–Mallee surface water SDL resource unit.
2. Annual actual take under the Wimmera–Mallee Water Resource Plan is limited by the volume of annual permitted take determined by the method specified in response to section 10.10(1) of the Basin Plan for the following forms of take:
 - a. take under basic rights; or
 - b. take by runoff dams; or
 - c. net take by commercial plantations.
3. The requirement for section 10.13(1) of the Basin Plan is met by the response to sections 10.08(2), 10.10(1) and 10.11(1).
4. The Department will monitor actual take for the above specified forms of take and where the actual take increases above annual permitted take the application of section 10.13(2) of the Basin Plan to the Wimmera–Mallee Water Resource Plan will be assessed by the Department and an amendment to the Plan will be pursued if necessary.

Note 1: Volume for annual permitted take is identified in **Table 7** of **Appendix C** to the Wimmera-Mallee Comprehensive Report. The methods for determining the volume of annual permitted take is identified in **Table 5** of **Appendix C**. The Table further identifies the modelling related to determining permitted and actual take will be reviewed as follows:

- a. take under basic rights every 5 years;
- b. take by runoff dams every 10 years;
- c. take by commercial plantations every 10 years subject to any significant changes in the industry in which case a review would occur earlier.

Note 2: The relevant responses identified in (3) above relate to:

- a. section 10.08(2) of the Basin Plan which requires holders of a water access right to comply with the conditions of that right;
- b. section 10.10(1) of the Basin Plan which sets out the method for determining permitted take limits for the relevant forms of take in the Wimmera-Mallee water resource plan area;
- c. section 10.11(1) of the Basin Plan which ensures that actual take does not exceed permitted take.

Victorian legislation does not regulate take under domestic and stock rights, take by commercial plantations or take by runoff dams under domestic and stock rights. Access to water for domestic and stock purposes is limited by the scope of that right under Section 8 of the Victorian Water Act (see **Part 6.2**). Victoria does manage a portion of runoff dams via licences. Where a runoff dam collects water for purposes other than domestic and stock use under section 8 of the Victorian Water Act, a licence is required for the use of that dam to take water from the system.

8.6.1 Take under domestic and stock rights

Information on expected future growth in take under a domestic and stock right, is not available. Any estimate of future trends for this form of take must be based on future climate projections.

The climate in western Victoria is likely to become drier with decreased surface runoff. Streamflow in waterways is expected to become less reliable. In this climate, take under domestic and stock rights extracted directly from waterways is very unlikely to increase. Reliability concerns will make direct surface water extraction a less desirable option. Overall, no significant growth in this form of take is expected in future.

8.6.2 Take by runoff dams

The number of runoff dams is expected to increase in the higher rainfall areas on the flanks of the Grampians (*Gariwerd*) and Pyrenees. Net growth in the number and volume of runoff dams in the Wimmera-Mallee water resource plan area is expected to continue at a low rate. Additionally, licensed runoff dams will not increase as the Minister will not issue new licences in circumstances where it will cause the relevant SDL to be exceeded. How the Victorian Water Act and commitments under the Basin Plan limit the ability of the Minister to issue new entitlements is outlined in **Part 5.1**.

8.6.3 Net take by commercial plantations

The trend in the Wimmera-Mallee water resource plan area is for the area of plantations to decline. Almost all of the Wimmera-Mallee water resource plan area is unsuitable for commercial plantations because of inadequate rainfall. On this basis, it is considered a very low risk that net take by commercial plantations will exceed the relevant SDL (see [Part 10.3.2](#) and [Part 10.3.3](#)).