

# Guide to Victoria's Water Resource Plans

Summary of Victoria's response to the Basin Plan and  
reference guide to Victoria's comprehensive reports

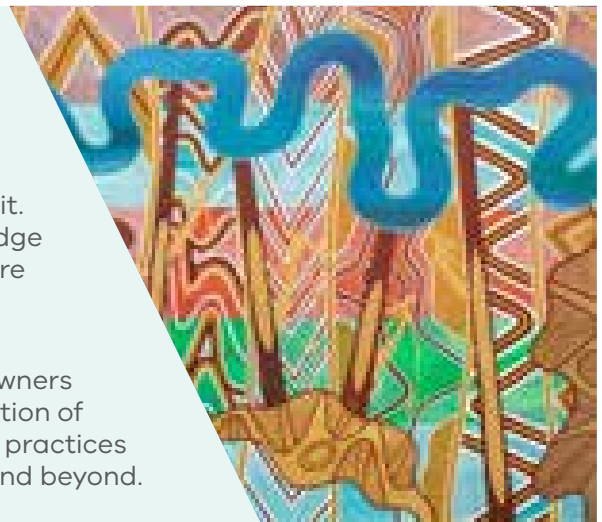


**Cover image:**  
**Rochester silo art**  
**Credit: DELWP**

### Acknowledgment

We acknowledge and respect Victorian Traditional Owners as the original custodians of Victoria's land and waters, their unique ability to care for Country and deep spiritual connection to it. We honour Elders past and present whose knowledge and wisdom has ensured the continuation of culture and traditional practices.

We are committed to genuinely partner, and meaningfully engage, with Victoria's Traditional Owners and Aboriginal communities to support the protection of Country, the maintenance of spiritual and cultural practices and their broader aspirations in the 21st century and beyond.



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*Tati Tati Wadi Wadi child*  
Photo crédit: DELWP

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# Preface

This document is a summary of Victoria’s water resource plans. It is intended to be an easy to read guide for all stakeholders interested in Victoria’s water resource plans, such as community members, Traditional Owners, people working in the water sector and environmental groups.

Victoria has prepared two water resource plans to show how we are managing surface water and groundwater in the Wimmera-Mallee and Victoria’s North and Murray water resource plan areas to meet the requirements of the Murray-Darling Basin Plan (the Basin Plan).

This document describes how Victoria is meeting those requirements and how the water resource plans will affect water management in Victoria’s share of the Basin. It summarises key information and references where more information can be found in the Comprehensive Reports for both plans and other relevant documents.

Many terms used in Victoria’s water resource plans are used in the Basin Plan or the *Commonwealth Water Act 2007*. Where these terms are defined in the Basin Plan or the Commonwealth Water Act, they have the same meaning in Victoria’s water resource plans, unless otherwise stated or the context indicates otherwise.



See [www.water.vic.gov.au/mdb/mdbp/water-resource-plans](http://www.water.vic.gov.au/mdb/mdbp/water-resource-plans) for copies of each water resource plan’s Comprehensive Report.

## How to navigate this document

This Summary Guide’s intent is to summarise the content of both Comprehensive reports given these are lengthy (1000+ pages each) and can initially feel overwhelming to understand and use. The Summary Guide also provides easy cross-reference points into the Comprehensive reports and Index Tables. See also [Section 2.3](#) for information on navigating Victoria’s water resource plans.





*Waranga Western Channel*  
Credit: DELWP

*Campaspe River*  
Credit: DELWP

# 1. Overview

## 1.1 The Murray-Darling Basin

### *Introduction to the Murray Darling Basin*

The Murray–Darling Basin is Australia’s largest river system. It covers half of Victoria and reaches into Queensland, New South Wales, the Australian Capital Territory and South Australia. The Basin holds important social, cultural, economic and environmental values, supporting strong rural communities and economies, and generating about 40 percent of the nation’s agricultural income.

It includes diverse ecosystems, internationally-recognised Ramsar wetlands, significant floodplains and river red gum forests. More than two million people live in the Basin, including about 500,000 Victorians. It is home to around 40 Aboriginal nations whose spiritual connection to their land, water and environment has extended over many thousands of years. More than three million people rely on the Murray-Darling Basin as a source of water.

### *Victoria’s share of the Basin*

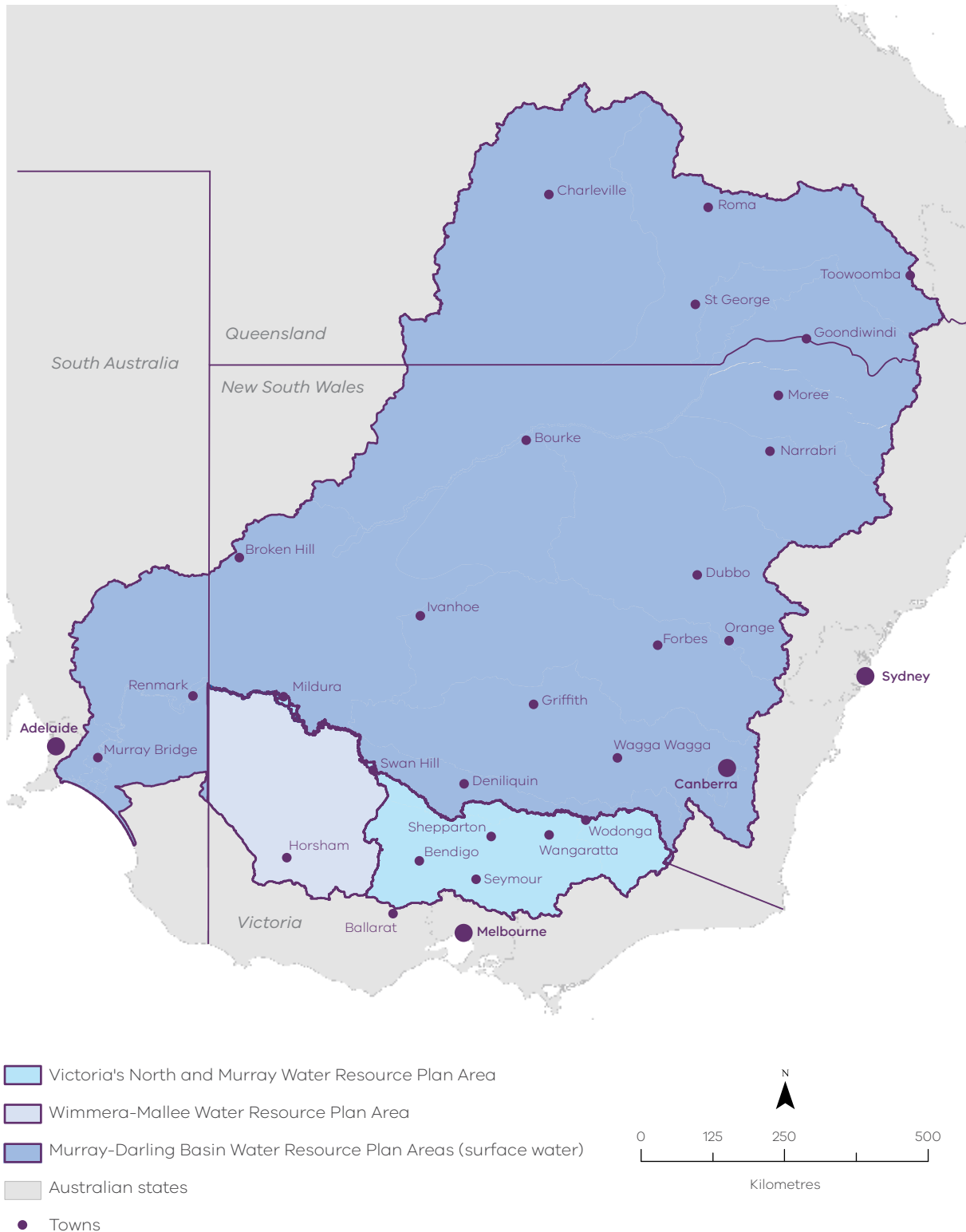
There are 77,000 kilometres of rivers in the Basin. Part of the River Murray and its tributaries flow through Victoria, including the Kiewa, Ovens, Broken, Goulburn, Campaspe and Loddon river systems.

**Figure 1** shows Victoria’s share of the Basin. This network of rivers, wetlands and floodplains is home to ancient river red gums and many plants and animals, and there are more than 400 high value wetlands in 30 wetland systems across Victoria’s north. These range from large areas of floodplain, such as the Barmah and Gunbower forests, to small wetlands on farms and public land.

Irrigated and dryland farming and associated industries in northern Victoria contribute significantly to the Australian economy:

- The Goulburn Murray Irrigation District (GMID) is the largest irrigation district in the Murray-Darling Basin. The GMID covers the municipalities of Greater Shepparton, Swan Hill, Campaspe, Moira, Gannawarra and Loddon. It hosts dairy, cropping and horticulture farms, and produces 21 percent of Australia’s milk, more than half of Victoria’s stone fruit and three quarters of Australia’s pears.
- The Sunraysia irrigation region in north western Victoria, on the south bank of the River Murray, is a significant producer of dried fruit, table grapes, wine grapes, almonds, pistachios, citrus and vegetables. The region exports about \$340 million of agricultural produce annually.





**Figure 1: Victoria's share of the Murray-Darling Basin**

## 1.2 The Basin Plan: a joint approach to managing the Basin’s water resources

### History of the management of the Murray-Darling Basin

Before the introduction of the Murray-Darling Basin Plan, the Commonwealth, Victorian, New South Wales and South Australian governments managed the Basin under the *1915 River Murray Waters Agreement*, and the *1987 Murray-Darling Basin Agreement*, which included the Australian Capital Territory and Queensland.

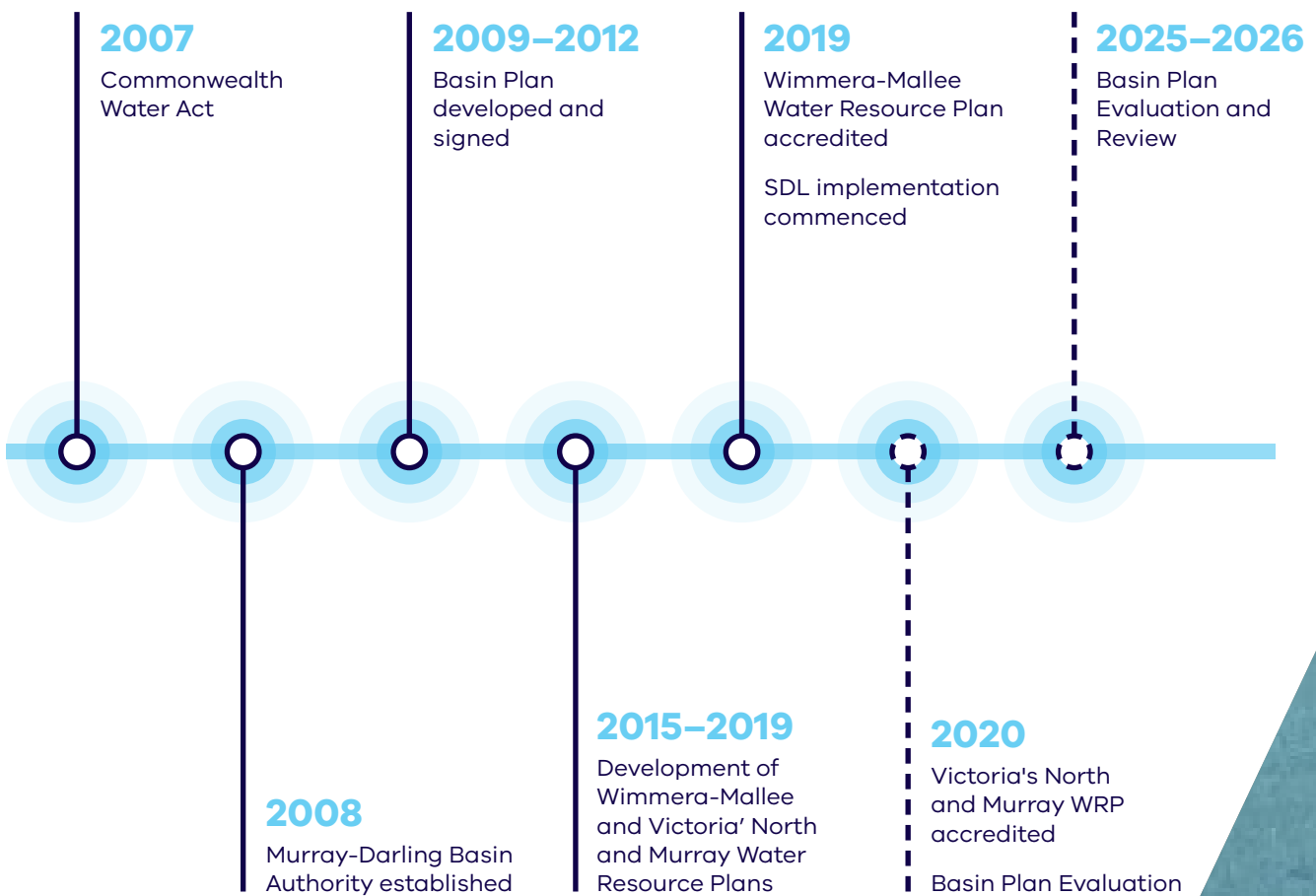
In 2007 the Commonwealth Government took on a greater role in Basin water management by passing the *Water Act 2007*. The Act integrated the management of Basin water resources, including new limits on how much water can be taken from the Basin’s surface and groundwater systems. The Act established the Murray-Darling Basin Authority (MDBA) to prepare a Murray-Darling Basin Plan.

### Why a Basin Plan?

In 2012, governments agreed that a plan was needed to manage our water carefully and protect the Basin for future generations. The Basin Plan was developed to manage the Basin as a whole connected system.

The aim of the Basin Plan is to bring the Basin back to a healthier and sustainable level, while continuing to support farming and other industries for the benefit of the Australian community. At its heart, the Basin Plan sets the amount of water that can be taken from the Basin each year, while leaving enough for our rivers, lakes and wetlands and the plants and animals that depend on them.

The Basin Plan was signed into law November 2012 under the Commonwealth Water Act 2007. Refer to **Figure 2** below for a timeline showing the development and review schedule of the Basin Plan and water resource plans.



**Figure 2: Timeline showing the development and review schedule of the Basin Plan and water resource plans**

### 1.3 New sustainable limits for consumptive take

The Basin states and the Commonwealth Government agreed under the Basin Plan to improve the health of the river and its floodplains by putting aside water for the environment.

The volume of water diverted from the Murray-Darling Basin under 2009 conditions was estimated to do this. These volumes called baseline diversion limits (BDLs) are the long-term average estimates of consumptive water use before the Basin Plan. In this Summary Guide, water extracted for irrigation, towns, drinking water and industry is referred to as consumptive use.

The Basin Plan then set new limits on how much water can be taken for consumptive use. These limits are called sustainable diversion limits, or SDLs. The SDLs limit how much water, on average, can be used in the Basin by towns and communities, Traditional Owners, farmers, and industries, while keeping the rivers and environment healthy.

The difference between the baseline diversion limits and sustainable diversion limits is a long-term average annual volume of water to be recovered for the environment. This is 2,075 gigalitres per year across the Basin. The SDLs came into effect in 2019. **Figure 4** shows the targets and limits under the Basin Plan for the whole of the Basin and Victoria's share.

Victoria's share of the Basin Plan environmental water recovery targets is a long-term average annual volume of 1,075 gigalitres, which is about 40 percent of the total Basin water recovery. A portion of this volume can be offset through Sustainable Limit Adjustment Mechanism projects. See <http://www.mdba.gov.au/basin-plan-roll-out/sustainable-diversion-limits/sdlam> for more information.

The Basin Plan also allows for additional water recovery of 450 GL, sometimes referred to as 'upwater' on the condition that there would be neutral or positive socio-economic impacts from recovering this water. See <http://www.water.vic.gov.au/mdb/mdbp/additional-water-recovery-450-gl-of-efficiency-measures> for more information.



*Farm land near Burrumboot*  
Credit: DELWP



Figure 3: Targets for water recovery under the Basin Plan

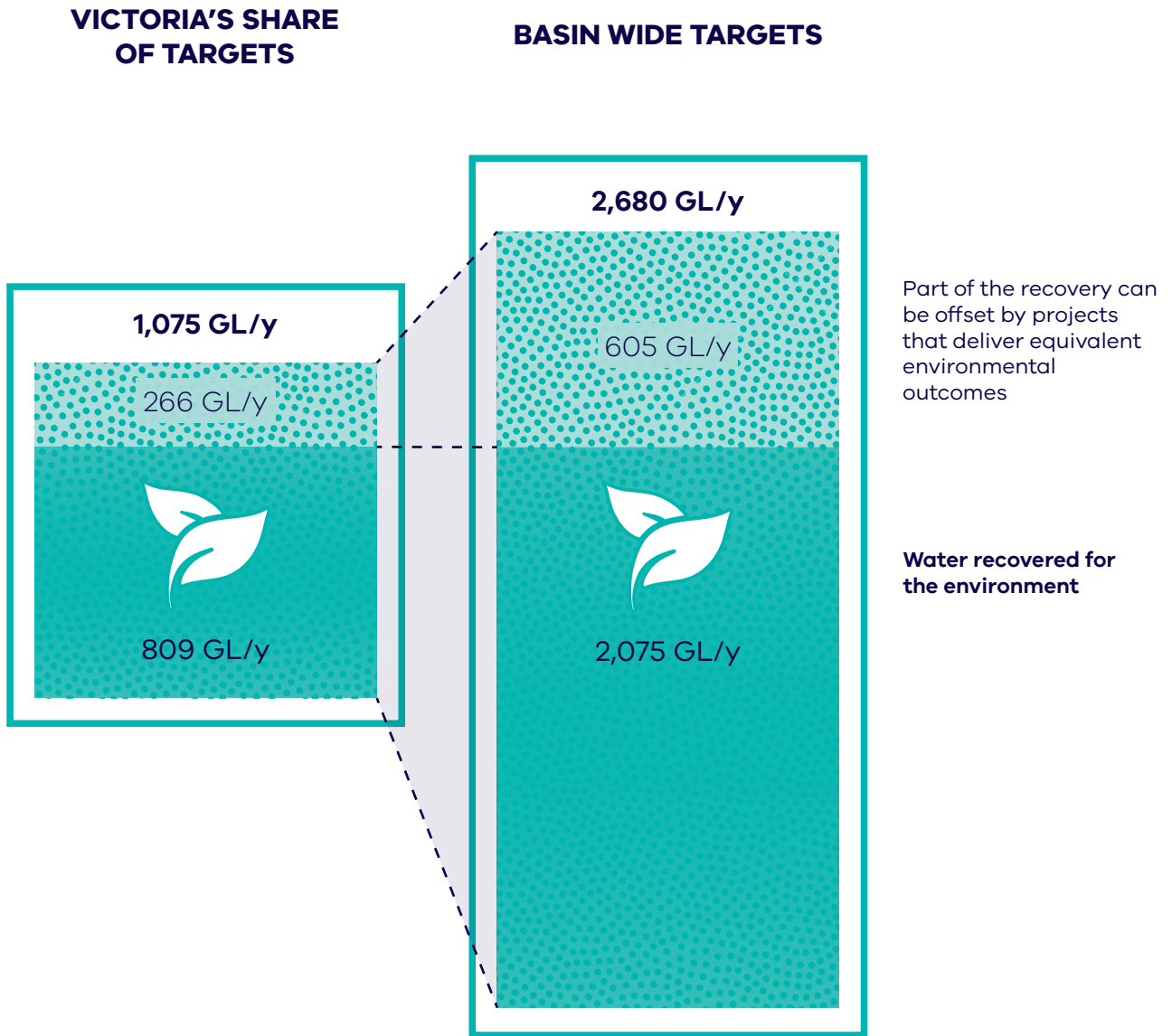


Figure 4: Water recovery targets

## 1.4 Delivering the Basin Plan through Water Resource Plans

All Basin states must prepare water resource plans to show how they will comply with the Murray-Darling Basin Plan to support a sustainable Basin. Water resource plans set out how Basin states will manage their water resources and respond to Basin Plan requirements for the key matters outlined in **Figure 5**.

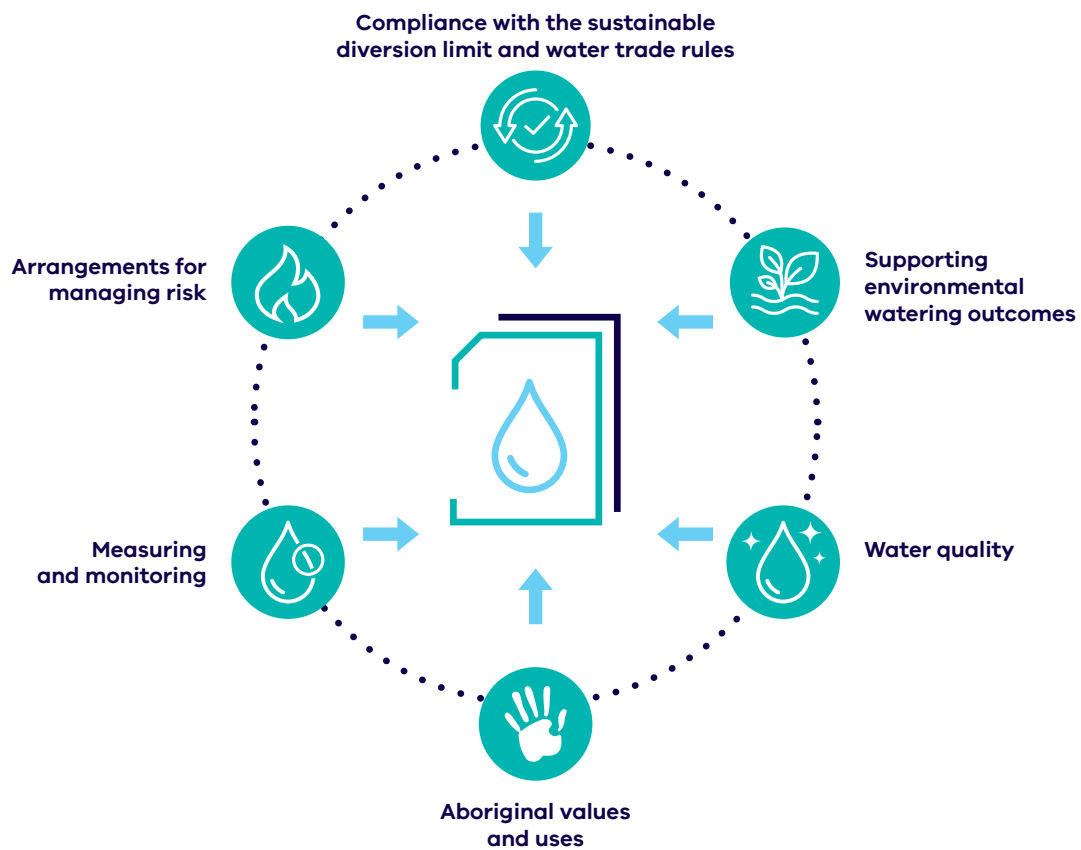


Figure 5: Water resource plans – Basin Plan requirements



*Lake Murphy*  
Credit: North Central CMA



## 2. Victoria’s water resource plans

The Murray-Darling Basin contains 20 surface water and 22 groundwater water resource plan areas, as well as six combined surface water and groundwater water resource plan areas.

Victoria has five water resource plan areas—three surface water and two groundwater. These have been combined into two water resource plans, which are detailed in **Table 1** and **Figure 6**:

**Table 1: Victoria’s water resource plan areas**



Wimmera-Mallee Water Resource Plan	Victoria’s North and Murray Water Resource Plan
Wimmera–Mallee (surface water) water resource plan area	Victorian Murray water resource plan area (surface water)
Wimmera–Mallee (groundwater) water resource plan area	Northern Victoria water resource plan area (surface water)
	Goulburn–Murray water resource plan area (groundwater)








Farming at Nangiloc on the River Murray  
Credit: Mallee CMA




### Wimmera-Mallee Water Resource Plan

-  Wimmera-Mallee (surface water) water resource plan area
-  Wimmera-Mallee (groundwater) water resource plan area

### Victoria's North and Murray Water Resource Plan

-  Victorian Murray (surface water) water resource plan area
-  Northern Victoria (surface water) water resource plan area
-  Goulburn-Murray (groundwater) water resource plan area

### Watercourses

-  Rivers
-  Channels
-  Towns

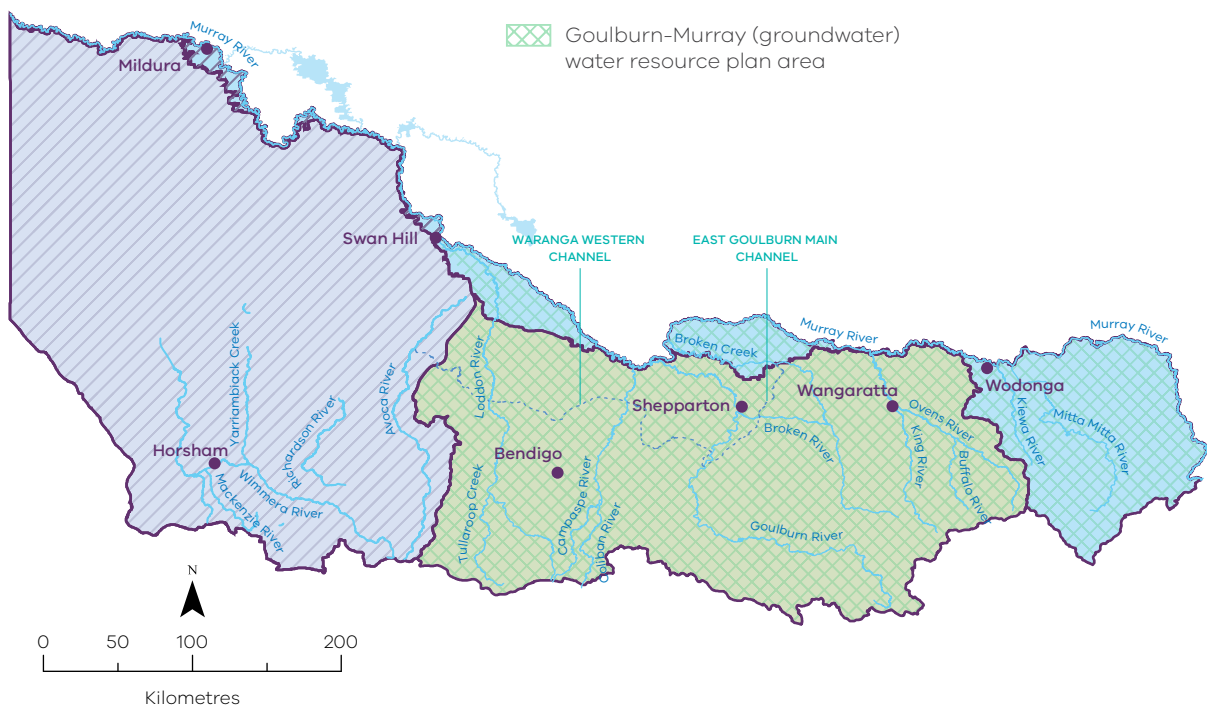


Figure 6: A map of Victoria's water resource plan areas

As well as combining water resource plan areas, Victoria also took a 'source-based' approach to preparing water resource plans. Even though some towns, irrigation areas and environmental assets such as wetlands may be located within the boundaries of the surface and/or groundwater water resource plan areas, they are not included in this plan if they source their water from outside the water resource plan area.

Equally, a water user located outside Victoria's North and Murray water resource plan area that sources water from a waterbody within the water resource plan area is included in this plan. For example, environmental wetlands like Hattah Lakes and some irrigators physically located in the Wimmera-Mallee (surface water) water resource plan area, that receive their water from the River Murray, are considered to be in the Victorian Murray water resource plan area.

Victoria maintains that our existing water management framework either meets or exceeds Basin Plan requirements. Our water resource plans make no changes to Victoria's water management framework.

## 2.1 Victoria's obligations under water resource plans



See Part 1 of the Wimmera-Mallee Comprehensive Report

See Section 1 of Victoria's North and Murray Comprehensive Report



See Index Tables of both the Wimmera-Mallee and Victoria's North and Murray water resource plans

Under the Commonwealth Water Act, Basin states are required to act *consistently* with the Basin Plan and water resource plans. Victoria understands this to mean that:

- key obligations are outlined in the Index Table of each water resource plan
- Column 4 of the Index Tables identify who is required to comply with the relevant obligation
- Victoria must make sure that if a policy or practice referred to in a water resource plan is changed, the water resource plan is reviewed to decide whether it still accurately reflects the arrangements described in response to Basin Plan requirements.

Obligations under a water resource plan are separate from any similar obligations under the Victorian Water Act. This means that where a person or entity does not comply with something it is required to either do or not do under a water resource plan, the Murray-Darling Basin Authority (MDBA) may choose to enforce compliance.

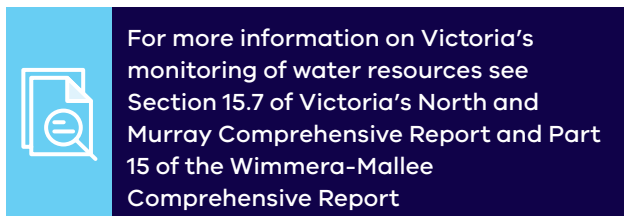
Enforcement action taken in Victoria does not prevent the MDBA from taking enforcement action under the Commonwealth Water Act where there is a breach of compliance with a water resource plan.

## 2.2 Impact of water resource plans on water users

Victoria's water resource plans will have little or no immediate effect on water users in the relevant regions. Victoria will not rely on the plans for enforcement purposes but will continue to use the compliance and enforcement provisions under Victorian legislation.

While water resource plans will not immediately affect water users, Victoria is required to make sure that decisions about managing our water resources align with the plans' content. Any policy changes to respond to emerging risks must either be consistent with existing water resource plans, or Victoria must amend those plans to align with the new resource management arrangements.

Basin states and the Commonwealth must report each year and five-yearly to support implementation of water resource plans and evaluate how effectively they are at meeting Basin Plan objectives.



Chapter 13 of the Basin Plan sets out the program for monitoring and evaluating the effectiveness of the Basin Plan. Reporting on 21 matters listed in Schedule 12 of the Basin Plan is required to support the monitoring program. See [Section 6.4](#) and [Section 6.3.2](#).

Victoria's water resource plans outline how the state proposes to support its annual reporting requirements and continually improve the monitoring and measurement of water resources in each water resource plan area.

As well as Victoria's commitment to improved monitoring, the water resource plans also outline how we will meet our reporting requirements under Schedule 12 of the Basin Plan.

## 2.3 Navigating the water resource plans

Victoria has prepared each water resource plan to improve readability and clarity of the state's specific obligations. The main parts of Victoria's water resource plans are an Index Table and the accompanying Comprehensive Report.

### 2.3.1 Index Tables

The Index Tables outlines how Victoria has responded to each specific Basin Plan requirement in each water resource plan (see [Figure 3](#)).

Each Index Table has five columns containing this material:

- Column 1 contains the relevant section number reference for the Basin Plan
- Column 2 contains the Basin Plan requirement
- Column 3 contains the formal response to the Basin Plan requirement, as either the formal text or the cross reference to the formal response incorporated in the Comprehensive Report
- Column 4 contains the name of the entity that is responsible for complying with an obligation under the relevant water resource plan
- Column 5 contains supplementary or explanatory material to support the formal response provided in Column 3.

Only Columns 1 to 4 have formal material accredited by the Commonwealth Minister (the formal plan).

The Index Table content follows the format of Chapter 10 of the Basin Plan which contains the requirements for water resource plans. The relevant sections of Basin Plan are separated into parts related to different subject matters.

FOR ACCREDITATION				NOT FOR ACCREDITATION
Column 1 Basin Plan Section	Column 2 Basin Plan Requirement (Section 10.04(4)(a))	Column 3 Accredited response Sect 10.04(2) & (3)	Column 4 Person responsible Sect 10.06(2)	Column 5 Explanatory material
10.06(1)	For each matter that this Chapter requires to be dealt with in a water resource plan, the plan must specify the person responsible for the matter.	<b>Victoria's North and Murray water resource plan area</b> The person responsible for each matter to be dealt with in a water resource plan is the Deputy Secretary Water and Catchments, of the Department.	n/a	The Deputy Secretary Water and Catchments is identified as the person responsible for developing the content of Victoria's North and Murray Water Resource Plan as the document was prepared by the Department. Reference to the Department is reference to the Department responsible through administrative arrangement orders for the administration of the Victorian Water Act. Reference to Water and Catchments means any group in the Department that assists in the administration of the Victorian Water Act and the name may change by administrative arrangements from time to time.
10.06(2)	Without limiting subsection (1), if a water resource plan requires a measure or action to be undertaken, the plan must specify the person responsible for undertaking that measure or action.	<b>Victoria's North and Murray water resource plan area</b> 1. The person responsible for any action or measure to be undertaken under Victoria's North and Murray Water Resource Plan is listed in Column 4 of Victoria's North and Murray Index Table. 2. If there is no person identified in Column 4, there is no requirement for an action or a measure to be undertaken. 3. If: (a) Victoria's North and Murray Water Resource Plan purports to impose an obligation on a Basin State to do a particular thing, and (b) the imposition of that obligation would contravene a constitutional doctrine restricting the obligations that the Commonwealth may impose on a State; 4. Victoria's North and Murray Water Resource Plan is taken, instead of imposing the obligation, to confer a discretion on the Basin State to do the thing.	n/a	This requirement is met by the text in Column 4 of Victoria's North and Murray Index Table, for each water resource plan requirement, which identifies the person responsible for each measure or action to be undertaken. The text in Column 3 of this row outlines how Column 4 should be applied to Victoria's North and Murray Water Resource Plan. The constitutional limitation provision is adapted from section 109 of the Basin Plan.
10.07(1)	A water resource plan prepared by a Basin State must contain a description of the consultation in relation to the plan (including in relation to any Part of the plan, if any, that was undertaken before the State gave the plan to the Authority under subsection 63(1) of the Act.	<b>Victoria's North and Murray water resource plan area</b> The Consultation Report contained at Appendix D of Victoria's North and Murray Comprehensive Report describes the consultation in relation to Victoria's North and Murray Water Resource Plan that was undertaken before Victoria gave the Plan to the MDBA under section 63(1) of the Water Act 2007 (Cth).	n/a	This requirement is met by the Consultation Report, contained at Appendix D of Victoria's North and Murray Comprehensive Report, as identified in Column 3 of this row. The Consultation Report describes the consultation that occurred to develop the material contained in Victoria's North and Murray Water Resource Plan prior to giving the plan to the MDBA under section 63 of the Commonwealth Water Act.
10.07(2)	If a water resource plan is amended in accordance with section 65 of the Act, the plan must contain a description of the consultation in relation to the amendment, if any, that was undertaken before the relevant Basin State gave the proposed amendment to the authority under subsection 65(2) of the Act.	<b>Victoria's North and Murray water resource plan area</b> This matter is not relevant to Victoria's North and Murray Water Resource Plan as it does not contain any amendments.	n/a	

Figure 7: A section of the Wimmera-Mallee Water Resource Plan Index Table

### 2.3.2 Comprehensive Reports

The Comprehensive Reports to Victoria's water resource plans provide background information on Victoria's water resource management and entitlement framework and address each Part of Chapter 10 of the Basin Plan.

As a result, for each part of Chapter 10 and the Index Table, there is a corresponding part in the Wimmera-Mallee Comprehensive Report or chapter in the Victoria's North and Murray Comprehensive Report.

The Comprehensive Reports include explanatory and technical details that aim to:

- outline Victoria's current arrangements and how they practically support the effective management of our water resources

- explain how Victoria's existing arrangements align with Basin Plan requirements for water resource plans
- provide adequate explanation to the MDBA to support Victoria's approach to meeting Basin Plan requirements.

This guide aims to simplify the content of the Comprehensive Reports and help interested stakeholders navigate Victoria's water resource plans and supporting material.

**Table 2: Quick guide to Victoria's Comprehensive Reports**

Issue	Comprehensive Report reference		Summary Doc section
	Victoria's North	Wimmera-Mallee	
Introduction: Victoria implementing the Basin Plan	Chapter 1	Part 1	<b>Section 1</b>
Water resource plan area descriptions	Chapter 2	Part 2	<b>Section 2</b>
Landscape, people and economy	Chapter 3	Part 3	Not discussed in Summary Guide
Water resources	Chapter 4	Part 4	<b>Section 2</b>
Risk assessment	Chapter 5 Appendix B	Part 7 Appendix B	<b>Section 6</b>
Victorian water management framework, including institutions, water access and trade	Chapter 6-7	Part 5-6	<b>Section 3</b>
Traditional Owner contribution	Chapter 8 Appendix F	Part 11	Integrated across document
Compliance with sustainable diversion limits	Chapter 9 Appendix C	Part 8 Appendix C	<b>Section 4</b>
Extreme events and critical human water needs	Chapter 10	Part 9	<b>Section 6.2</b>
Interception by farm dams and commercial plantations	Chapter 11	Part 10	<b>Section 3.3</b> <b>Section 4.2.1</b>
Environmental watering	Chapter 12 Appendix E	Part 12	<b>Section 5</b>
Recreational watering	Chapter 13	Part 13	Not discussed in Summary Guide
Managing water quality and salinity	Chapter 14 Appendix A	Part 14 Appendix A	<b>Section 6.3</b>
Measuring and monitoring	Chapter 15	Part 15	Integrated across document
Stakeholder consultation	Appendix D	Appendix D	<b>Section 2.4</b>

### 2.3.3 Version of the Basin Plan applied to Victoria's water resource plans

Following an amendment to Basin Plan, Basin states have 3 years to review water resource plans to identify any required amendments. Given there was a Basin Plan amendment in July 2018, the Wimmera-Mallee Water Resource Plan was submitted without revising content to align with relevant amendments. This is why the two water resource plans look a little different in respect of water quality and groundwater management.

## 2.4 Engagement with key stakeholders and community



See Appendix D of the Wimmera-Mallee Comprehensive Report and Victoria's North and Murray Comprehensive Report

The Department of Environment, Land, Water and Planning (DELWP) consulted widely to support the development of Victoria's water resource plans, including:

- establishing a technical advisory panel to support preparation of the risk assessment
- establishing a technical advisory group for each water resource plan to review the proposed responses to the Basin Plan as they were being developed
- public consultation on each water resource plan to get community views on the approach to Basin Plan requirements, including publishing all information on the Victorian Government's online consultation platform Engage Victoria
- engagement with Traditional Owners, supported by the Murray Lower Darling Rivers Indigenous Nations (MLDRIN).



*A Goulburn-Murray Water staff member engaging with water users  
Credit: GMW*

## 2.5 Recognising Traditional Owner objectives and outcomes for water

Traditional Owner groups made important contributions to Victoria’s water resource plans and identified areas of significant cultural interest for managing water resources.

Water holds a significant place in Aboriginal culture and identity and is intimately linked to the health of Country and life. Many Aboriginal cultural sites in the water resource plan area are on or near waterways, and rivers, streams and waterbodies are still important sources of food and medicine.

The Traditional Owner groups identified in Victoria’s water resource plan areas are:

- Bangerang
- Barapa Barapa
- Dhudhuroa
- Dja Dja Wurrung
- Djab Wurrung
- First Peoples of the Millewa Mallee (including Ngintait, Nyeri Nyeri and Latji Latji)
- Tati Tati
- Taungurung
- Wadi Wadi
- Wamba Wemba
- Waywurru
- Weki Weki
- Wotjobaluk peoples
- Yaitmathang
- Yorta Yorta

See Part 11 of the Wimmera-Mallee Comprehensive Report

See Section 8 and Appendix F to Victoria’s North and Murray Comprehensive Report

Most Traditional Owner groups identified relevant areas of significant cultural interest and contributed to both water resource plans for Victoria’s North and Murray and the Wimmera-Mallee.

Traditional Owner groups engaged only through the Wimmera-Mallee Water Resource Plan include the Wotjobaluk peoples represented by the Barengi Gadgin Land Council, and the Djab Wurrung peoples who at the time of engagement were represented by Martang Pty Ltd, who did not provide a contribution to the plan.

Traditional Owner groups who contributed only to Victoria’s North and Murray Comprehensive Report included Dhudhuroa, Waywurru and Yaitmathang (combined contribution), Yorta Yorta and Taungurung. A formal contribution from Bangerang was not included in Victoria’s North and Murray Water Resource Plan.

### 2.5.1 Key learnings from engagement with Traditional Owners

See Part 11 of the Wimmera-Mallee Comprehensive Report

See Chapter 8 and Appendix F of Victoria’s North and Murray Comprehensive Report

As part of the engagement process with Traditional Owners, DELWP was required to identify their respective aims and outcomes for water resource management in Victoria’s share of the Basin.

Certain major learnings from our engagement with Traditional Owners included:

- An interest in restoring flows so that important species return or thrive at culturally significant sites through:
  - Traditional Owners’ involvement in determining a natural flow regime
  - adequate resourcing and providing opportunities for control of how and when cultural watering objectives are met, including access to water
  - continued funding for research on cultural flows.
- Identifying cultural outcomes when managing water for the environment to achieve shared benefits based on traditional ecological knowledge and cultural values, and supported by:
  - identification of priority watering sites for the environment being influenced by areas of cultural importance

- inclusion in decisions on site selection and watering requirements so that the right water is in the right place at the right time to meet the needs of the cultural environment.
- Consolidating and protecting traditional ecological knowledge and using it to guide the management of waterways and cultural landscapes.
- More recognition of Traditional Owners as custodians on Country, including integration of traditional rights, respect for Traditional Owner knowledge and cultural obligations and understanding of historical context through:
  - having a recognised and legitimate role in water governance, with genuine consultation in policy development and a part in decision-making about our waterways in a culturally safe process and environment
  - fully exercising water rights and water management according to the *Traditional Owner Settlement Act 2010* (Dja Dja Wurrung and Taungurung)
  - being invited to elect representatives onto advisory and working groups of stakeholders and partners.

See **Section 3.1.7** for information on Traditional Owners involvement in water.



A compilation of the contributions provided by Traditional Owners to Victoria’s water resource plans has been developed and is available at: <https://www.water.vic.gov.au/mdb/mdbp/waterresource-plans>

## 2.6 Wimmera-Mallee water resource plan area


The Wimmera-Mallee Water Resource Plan is made up of the Wimmera-Mallee (surface water) and Wimmera-Mallee (groundwater) water resource plan areas (**Figure 8**).

The Wimmera-Mallee (surface water) water resource plan area includes parts of three surface water basins:

- Wimmera-Avon
- Avoca
- Mallee

The Wimmera-Avon Rivers’ basin is not connected to the River Murray. The Avoca basin is infrequently connected to the River Murray by the Avoca floodway that connects with the Kerang Lakes during floods. The Mallee basin is a semi-arid zone that has no perennial streams, localised runoff during exceptionally wet conditions and no surface water diversions.

Main system resources to the Wimmera-Mallee (surface water) water resource plan area are from the Murray system, the Goulburn system and Glenelg basin.



For more information on the Wimmera-Mallee water resource plan area refer to **Part 2 of the Wimmera-Mallee Comprehensive Report**

For more information on system resources refer to **Part 4.4 of the Wimmera-Mallee Comprehensive Report**

The Wimmera-Mallee (groundwater) water resource plan area consists of the Wimmera-Mallee groundwater catchment and Avoca groundwater catchments. These groundwater catchments, located from the northern Grampians (*Gariwerd*) to the River Murray, represent regions of connected groundwater resources.



Groundwater resources in the Wimmera-Mallee water resource plan area are divided into three Sustainable Diversion Limit (SDL) resource units:

- Wimmera-Mallee: Highlands SDL resource unit
- Wimmera-Mallee: Sedimentary Plain SDL resource unit

- Wimmera-Mallee: deep SDL resource unit

For information on sustainable diversion limits see [Section 4](#).



Figure 8: Wimmera-Mallee water resource plan area

## 2.7 Victoria’s North and Murray water resource plan area

Victoria’s North and Murray Water Resource Plan is made up of the Northern Victoria (surface water), Victorian Murray (surface water) and Goulburn-Murray (groundwater) water resource plan areas (**Figure 9**).

Victoria’s North and Murray water resource plan area is the combination of these three water resource plan areas, and includes:

- Victorian river systems connected to the Murray, such as the Mitta Mitta, Kiewa, Ovens and Goulburn
- Broken, Campaspe and Loddon rivers
- floodplain wetlands such as Hattah Lakes, Walpolla, Mulcra and Lindsay Islands and Barmah National Park, and wetlands in the Ovens, Broken, Goulburn, Campaspe and Loddon catchments
- groundwater in the northern Victoria area
- the irrigation districts and areas that source water from the River Murray or its tributaries.

See Sections 4.1.4 and 12.7.4 of the Victoria’s North and Murray Comprehensive Report for more information on Victoria’s North and Murray water resource plan area

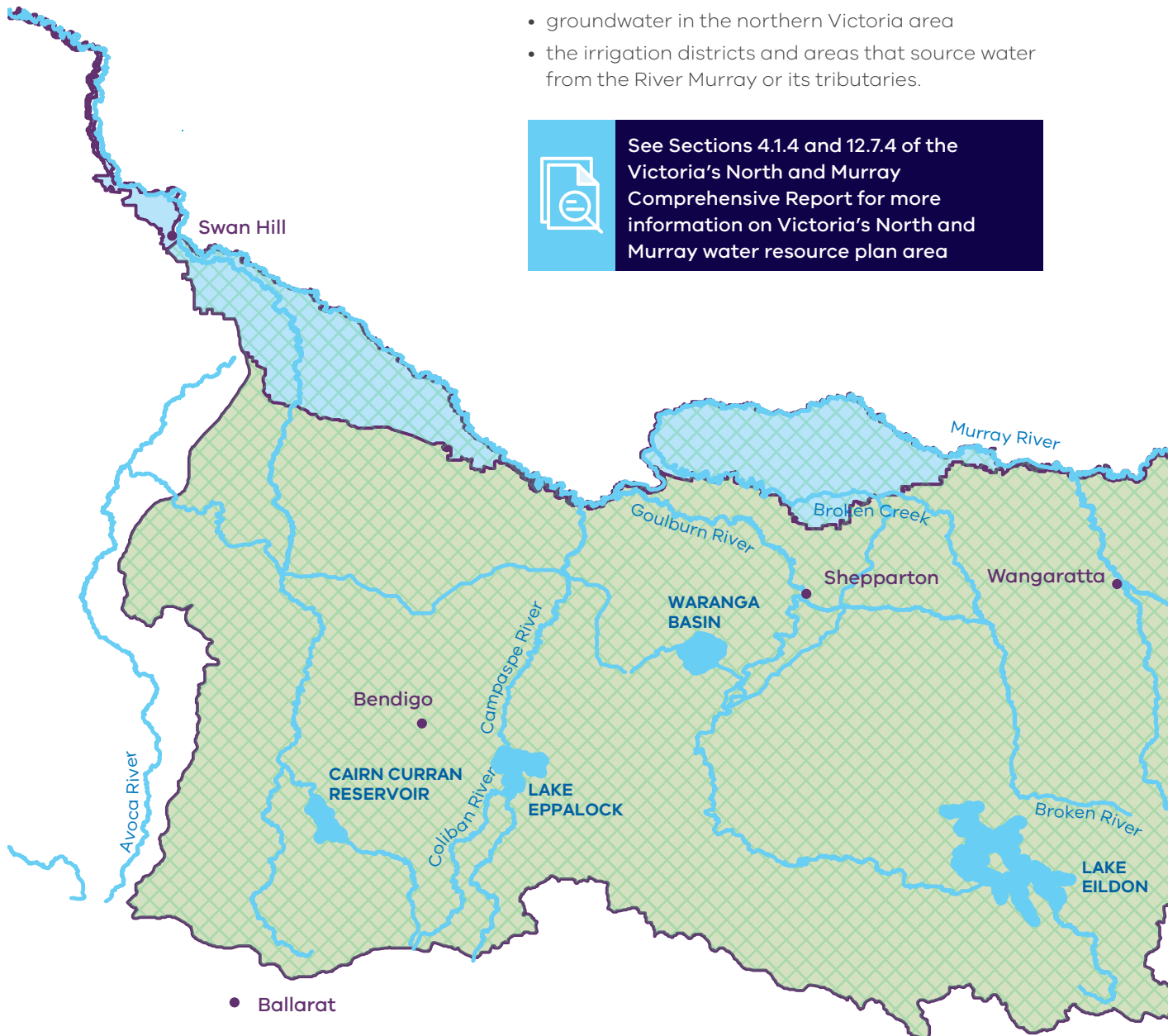



Figure 9: Victoria’s North and Murray water resource plan areas

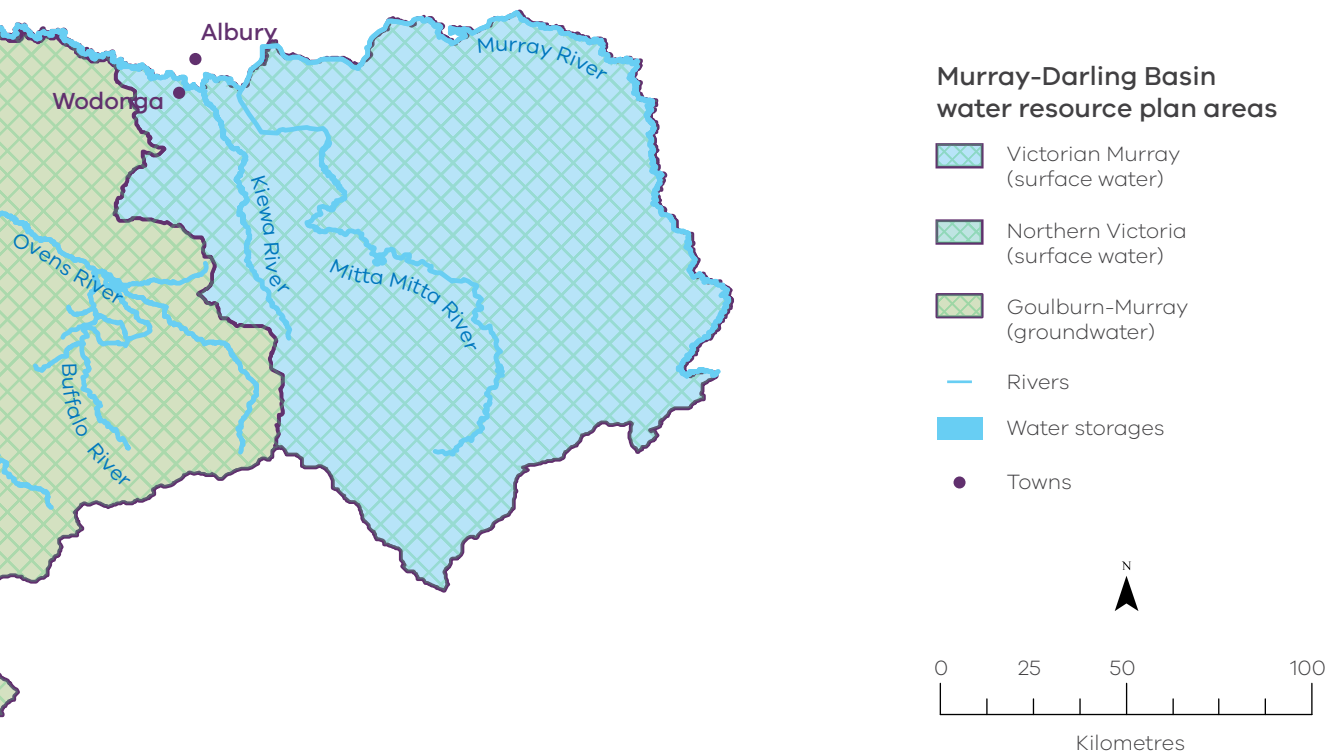
Victoria's North and Murray water resource plan area is included in the southern-connected Basin. This part of the Basin is a combination of the River Murray system and the major interconnecting rivers of the River Murray.

The southern-connected Basin includes the infrastructure on the interconnecting tributaries in Victoria of Eildon Dam and Goulburn Weir on the Goulburn River and Lake Eppalock on the Campaspe River. It also includes river flow interactions with the Snowy Mountains Scheme. The southern-connected Basin does not include disconnected rivers such as the Lachlan River and the Wimmera River. How environmental water is managed in the southern-connected Basin is outlined in [Section 6.1.3](#).

Rivers in Victoria's North and Murray water resource plan area vary from unregulated like the Yea River, a tributary of the Goulburn, to the semi-regulated Ovens River and the highly regulated Goulburn River.

Groundwater systems are described at many levels because groundwater moves lengthwise and sideways, and it depends on the scale at which the groundwater is being considered. Each groundwater SDL resource unit defined in the Basin Plan encompasses a number of Victorian groundwater management units, which are used to manage Victoria's groundwater.

 See Table 4.1 of the Victoria's North and Murray Comprehensive Report for a list of regulated and unregulated rivers





*Channel, Irymple*  
Credit: Bob Merlin

## 2.8 Considerations of connected water resources



See Parts 4 and 12, Appendix A (Part 5.5) and Appendix B of the Wimmera-Mallee Comprehensive Report

See Chapters 2, 4, 12, Appendix A (Part 5) and Appendix B of the Victoria's North and Murray Comprehensive Report

Section 10.05 (a) of the Basin Plan requires water resource plans to be prepared having regard to the management and use of any water resources which have a significant hydrological connectivity to the water resources of the water resource plan area.

Hydrologic connectivity is the physical ability of water to move between locations. It includes the effect on flow of the losses and constraints along the way. Hydrologic connectivity of water can happen in different ways. It can happen longitudinally along rivers; laterally between rivers and their floodplains, wetlands, and anabranches; laterally and longitudinally with connected rivers; between surface water and groundwater or between groundwater systems and through infrastructure that connects water resources.

Significant hydrological connectivity means clear connection between different resources and a high likelihood of impacts from the use of one resource on the others. For instance, clear connection and impacts between surface waters and groundwater within and between water resource plan areas or between water resource plan areas across state borders.

Significant hydrological connectivity in Victoria's water resource plans are Ovens River, Broken River (via Broken Creek), Goulburn River, Campaspe River

and Loddon River with the River Murray. **Figure 10** show significant hydrological connectivity in Victoria's water resource plans. No significant hydrological connections were identified between groundwater and surface water in the Wimmera-Mallee water resource plan area. The only significant hydrological connection for groundwater identified in the Wimmera-Mallee water resource plan area occurs in the Tertiary Limestone aquifer within the Wimmera-Mallee: Sedimentary Plain SDL resource unit.

Other types of connectivity in the water resource plans are sufficient hydraulic connectivity and priority environmental assets.

- sufficient hydraulic connectivity can be a single aquifer, a group of connected aquifers or groundwater and surface water elements together connected by a groundwater flow path. Sufficient hydraulic connectivity has discrete boundaries and has areas of groundwater recharge and discharge.
- priority environmental assets depending on groundwater that support ecological values and hydrological connectivity.

Sufficient hydraulic connection between groundwater and surface water and groundwater-dependent ecosystems is highly variable across the Goulburn-Murray water resource plan area. There is significant hydraulic connectivity between groundwater resource units that contain a shallow water table, are directly connected to the water table or are along flow pathways between SDL resource units. Groundwater to groundwater connections are Renmark aquifer, Tertiary Limestone and the Parilla Sands aquifer within the Wimmera-Mallee. This extends into South Australia and is managed through the South Australia-Victoria Border Groundwaters Agreement for equitable sharing.

Victorian Water grid

- - - Aqueduct
- River/drainage line/ephemeral stream
- Channel
- Existing piped connection
- ▽ Catchment storage
- ◻ Operational storage
- Other lakes
- ◻ Groundwater extraction location
- ◻ Desalination plant
- ◻ Living Murray Icon site
- = Major weir
- Town
- ⋯ Irrigation district
- Northern Victoria water resource plan area
- Victorian Murray water resource plan area

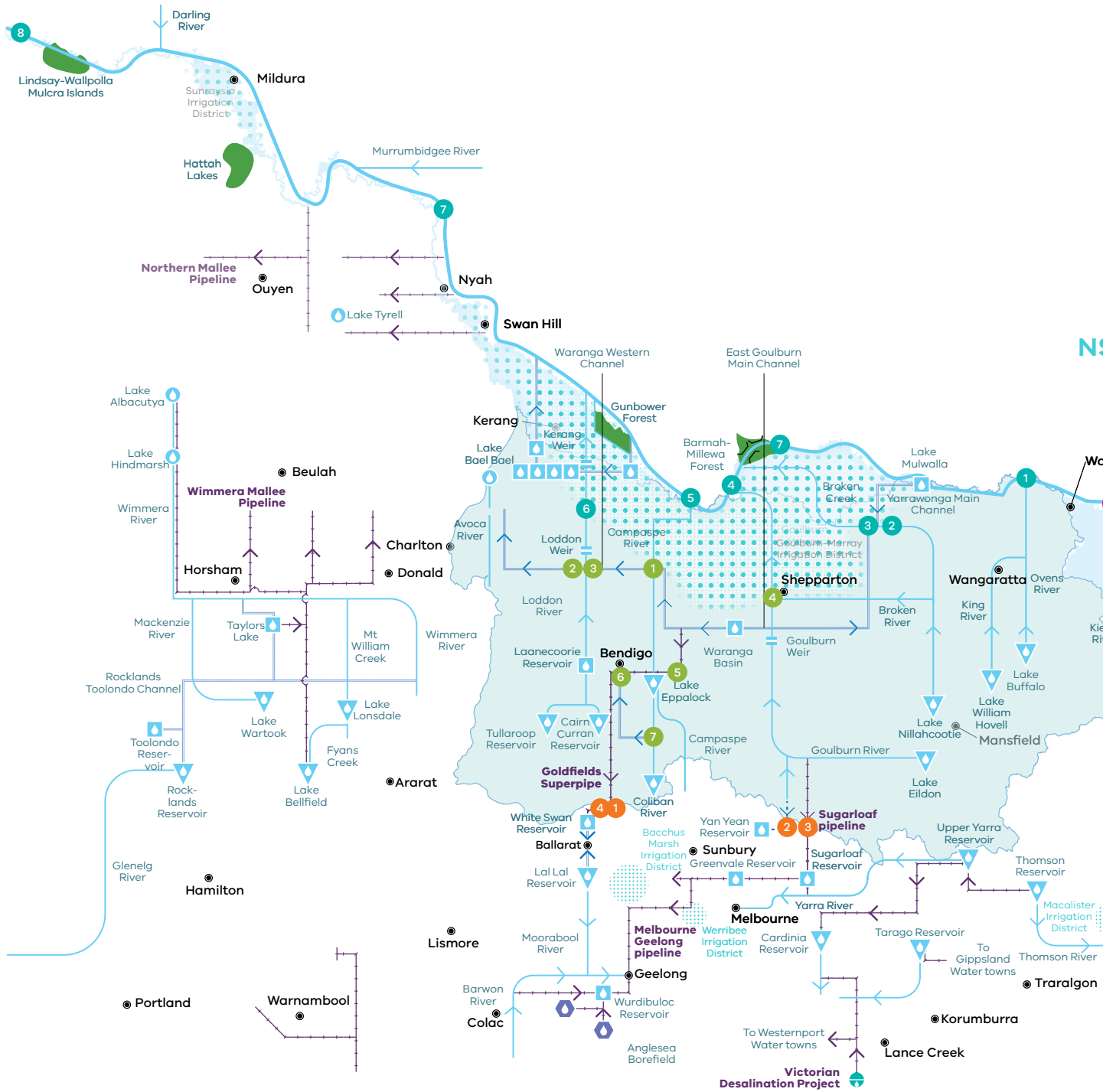
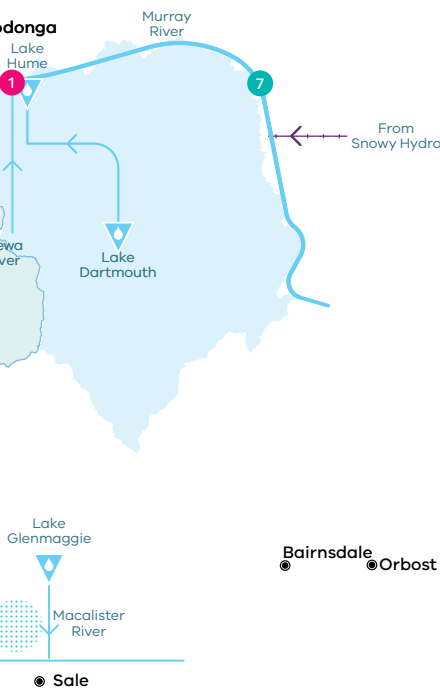


Figure 10: Hydrological connectivity in Victoria's water resource plans

**Table 3: Significant connections between water resource plan areas, and within water resource plan areas**


	Connections between water resource plan areas		Connections within the Northern Victoria water resource plan area		Connections within the Victorian Murray water resource plan area		Connections with waterways beyond the Murray-Darling Basin water resource plan areas	
	From	To	From	To	From	To	From	To
1	SS4	Ovens River to Murray via Ovens River	SS6 to/from SS7	Goulburn River and Campaspe River through Waranga Western Channel	SS3 to SS2	Kiewa River to Murray River	SS6 to	Goulburn River to White Swan Reservoir (Ballarat) through the Goldfields Superpipe
2	SS5 to SS2	Upper Broken Creek to Lower Broken Creek	SS6 to/from SS8	Goulburn River and Loddon River through Waranga Western Channel			SS6 to	Goulburn River to Yan Yean Reservoir (Melbourne)
3	SS6 to SS2	Goulburn River via East Goulburn Main Channel to Lower Broken Creek	SS7 to SS8	Campaspe River and Loddon River through Waranga Western Channel			SS6 to	Goulburn River to Sugarloaf Reservoir (Melbourne)
4	SS6 to SS2	Goulburn River to River Murray	SS5 to SS6	Broken River to Goulburn River				
5	SS7 to SS2	Campaspe River to Murray River	SS6 to SS7	Goulburn River to Lake Eppalock through the Goldfields Superpipe				
6	SS8 to SS2	Loddon River to Lower Loddon	SS7 to SS8	Lake Eppalock to Bendigo (Loddon) through the Eppalock-Bendigo pipeline				
7	SW2 to SW8	Victoria Murray to New South Wales	SS7 to SS8	Upper Coliban Storages (Campaspe) to Bendigo (Loddon)				
8	SW2 to SW6	Victoria Murray to South Australia						

SW



Hydrological connectivity has considerations for informing permitted take, risk assessment, water quality, extreme events and environmental watering such as:

- assessment of possible current and future risks to the continued availability and condition of water resources
- the review and development of measures relating to responding to extreme events
- review of the circumstances in which trade can occur between groundwater resources and between groundwater and surface water resources
- consideration of whether rules are necessary to address water quality issues in groundwater
- complete return of all currently over allocated or overused systems to environmentally sustainable levels of extraction
- progressive removal of barriers to trade in water, and opportunities for trading within and between states and territories, where water systems are physically shared or hydrologic connections and water supply considerations will permit water trading
- addressing future adjustment issues that may impact on water users and communities
- recognition of the connectivity between surface and groundwater resources and connected systems managed as a single resource



**See Wimmera-Mallee Water Comprehensive Report Parts 2.2, 9.3, 12.5.6, 13.12.1 and Appendix B**

**See Victoria's North and Murray Comprehensive Report Sections 1.6, 5.7, 7.1, 7.4, 8.4.2, 10.3.1.2, 12.2, 12.6.2, 12.8.5, 13.8.1, 14.2 and Appendix B**

Victoria's water resource management framework addresses these considerations in connectivity at local, catchment, regional and state-wide scales. A strong regulatory framework has been developed for managing water resources and as a legal basis for sharing water. The Victorian water entitlement framework makes sure that individual entitlements to water are explicit, enforceable and tradable in the right circumstances. For groundwater, resource management decisions are strengthened by hydrogeological assessments to understand impacts

on users at a neighbouring, local and regional scale. See more information on Victoria's water management framework in Section 3.

The water resource plans are aligned with Victoria's water resource management framework and undertake connectivity considerations in three ways:

1. Where groundwater and surface water are not significantly hydrologically connected, where connection is regional and not of a similar timing volume or reliability, there is consideration for:
  - the need to cap the total available take from licensed groundwater use for the area
  - location for construction of both licensed and domestic and stock bores to prevent unacceptable drawdown in the water table at the connected feature
  - for issuing licences for take to prevent unacceptable drawdown in the water table at the connected feature.
2. Where groundwater and surface water are highly connected when the connection is local and has a similar timing, volume and reliability, there is consideration for:
  - managing licensed groundwater and surface water extraction
  - the need to cap the total available take from licensed use of both groundwater and surface water for the area.
3. Where surface water is significantly hydrologically connected within Victoria, bulk entitlements issued under the *Water Act 1989* contain arrangements for managing those resources. In setting the rules for managing the system, there is consideration for how water is taken by individual users from the system.





*Waranga Western Channel near Colbinabbin*  
Credit: DELWP

### 3. Victoria's water management framework and water resource plans

Victoria's current water resource management arrangements enable the state to meet the Basin Plan's requirements for managing water resources.

Victoria has a strong and adaptable framework to support delivering the requirements of the water resource plans and to respond to current and future risks to water availability and quality.

#### 3.1 Water resource management



See Part 5 of the Wimmera-Mallee Water Comprehensive Report

See Section 6 of Victoria's North and Murray Comprehensive Report

Victoria's water resource management is supported by a statutory framework in which the Minister for Water is responsible for managing the water sector under the Victorian Water Act.

Victorian Ministers for Environment and Health and the Treasurer have certain responsibilities for elements of the framework, but these are not significantly affected by the Basin Plan.

The Victorian Water Act sets out the law for water resources and water corporations. It provides for integrated management of the state's water resources and includes the Minister for Water's responsibilities, functions and powers.



*Cohuna irrigation diversion screens*  
Credit: DELWP

The Act sets out the water corporations' functions for water supply, sewerage, regional drainage, floodplain management, irrigation and managing waterways, which the corporations share with catchment management authorities (CMAs). The Minister has delegated some functions and powers to the relevant water corporations, including managing water shares and take and use licences.

The other statutory bodies involved in the water sector that are most relevant to the water resource plans are:

- The Essential Services Commission which oversees fees and charges
- The Energy and Water Ombudsman which can investigate complaints.



**See Column 4 of the relevant Index Table for the person/entity responsible for delivery of a requirement under each plan**

The Minister for Water also has obligations under Victoria's water resource plans. For example, the Minister must not amend or issue new entitlements to take water if doing this would result in the volume of entitlements exceeding the water take permitted each year.

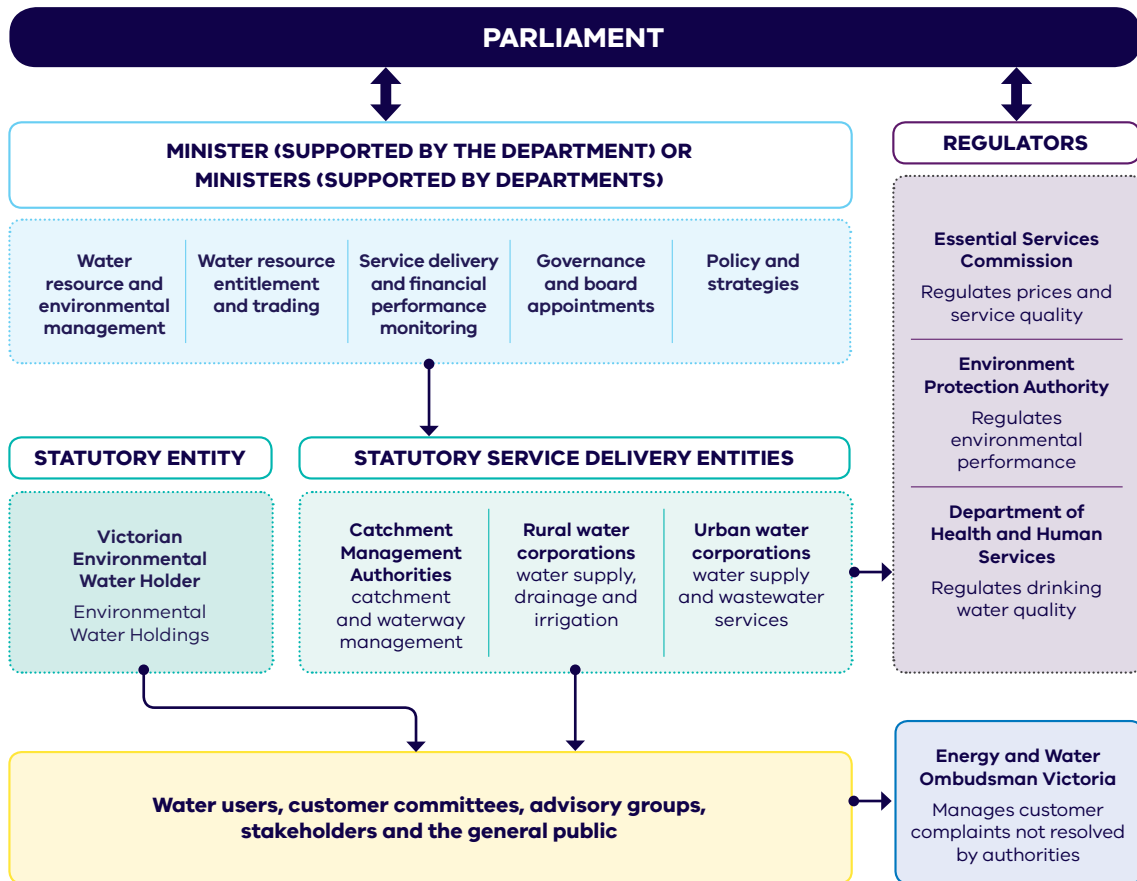


Figure 11: Structure of the Victorian water sector

3.1.1 Water corporations

	See the relevant Index Table (Column 4) for water corporation obligations under water resource plans
	See Part 5.2 of the Wimmera-Mallee Comprehensive Report
	See Section 6.3 of Victoria's North and Murray Comprehensive Report

Urban water corporations are responsible for managing urban water supply, wastewater services and trade waste treatment and disposal in cities and towns.

Rural water corporations are responsible for managing water in regulated and unregulated water systems and groundwater. In regulated water systems, rural water corporations have been

appointed as storage managers to manage the dams and water in those systems.

Rural water corporations play a major role administering the state's entitlement framework. They have a delegated responsibility from the Minister for managing entitlements for the take and use of water.

Water corporations operating in Victoria's water resource plan areas are shown in the map at [Figure 12](#).

The relevant rural water corporations for the Wimmera-Mallee Water Resource Plan entitlements are Grampians Wimmera-Mallee Water and Goulburn-Murray Water. The water corporations for Victoria's North and Murray Water Resource Plan are Goulburn-Murray Water, Lower Murray Water and Coliban Water.

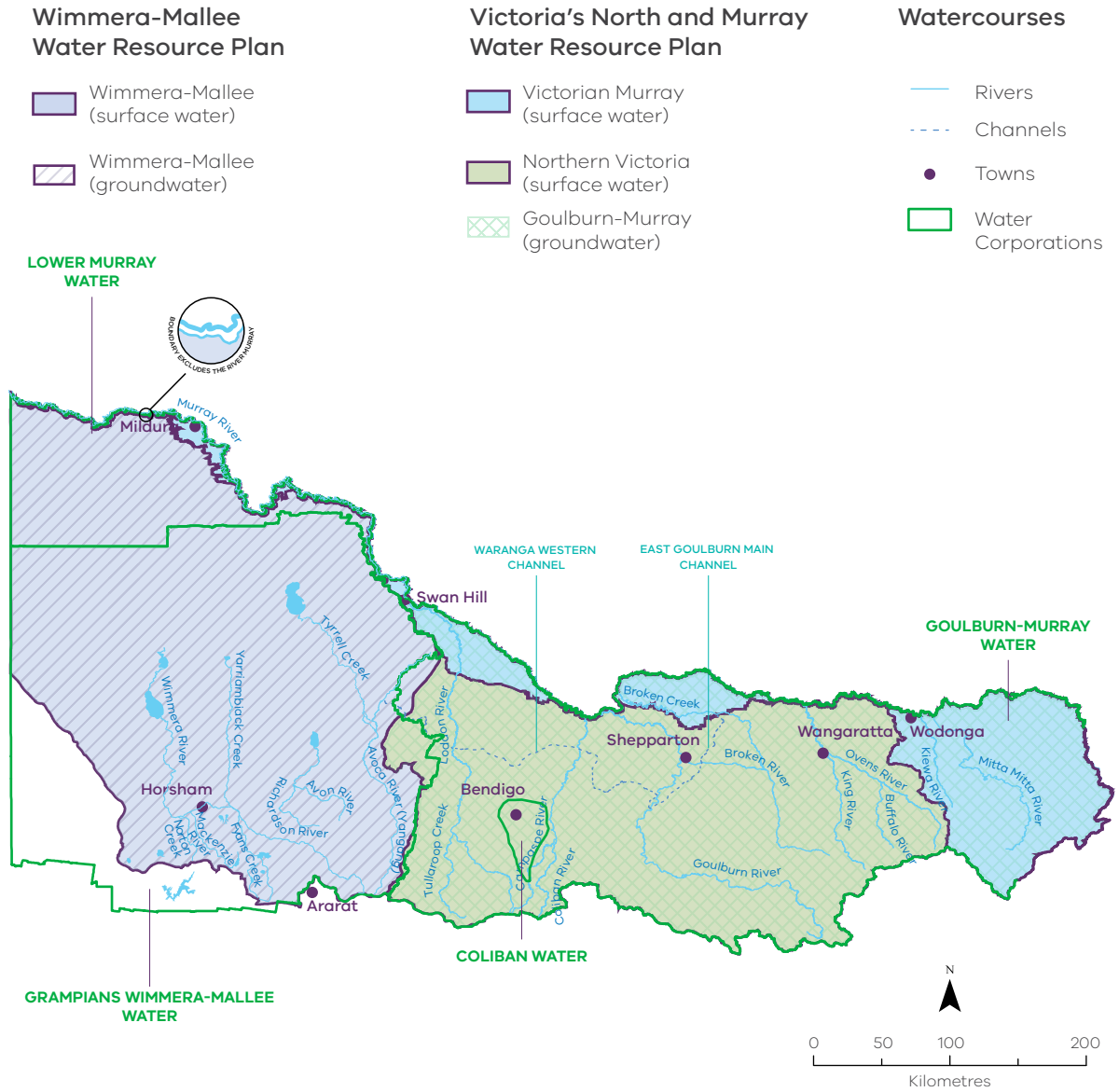




Figure 12: Water corporations operating in Victoria's water resource plan areas

**3.1.2 Catchment management authorities**

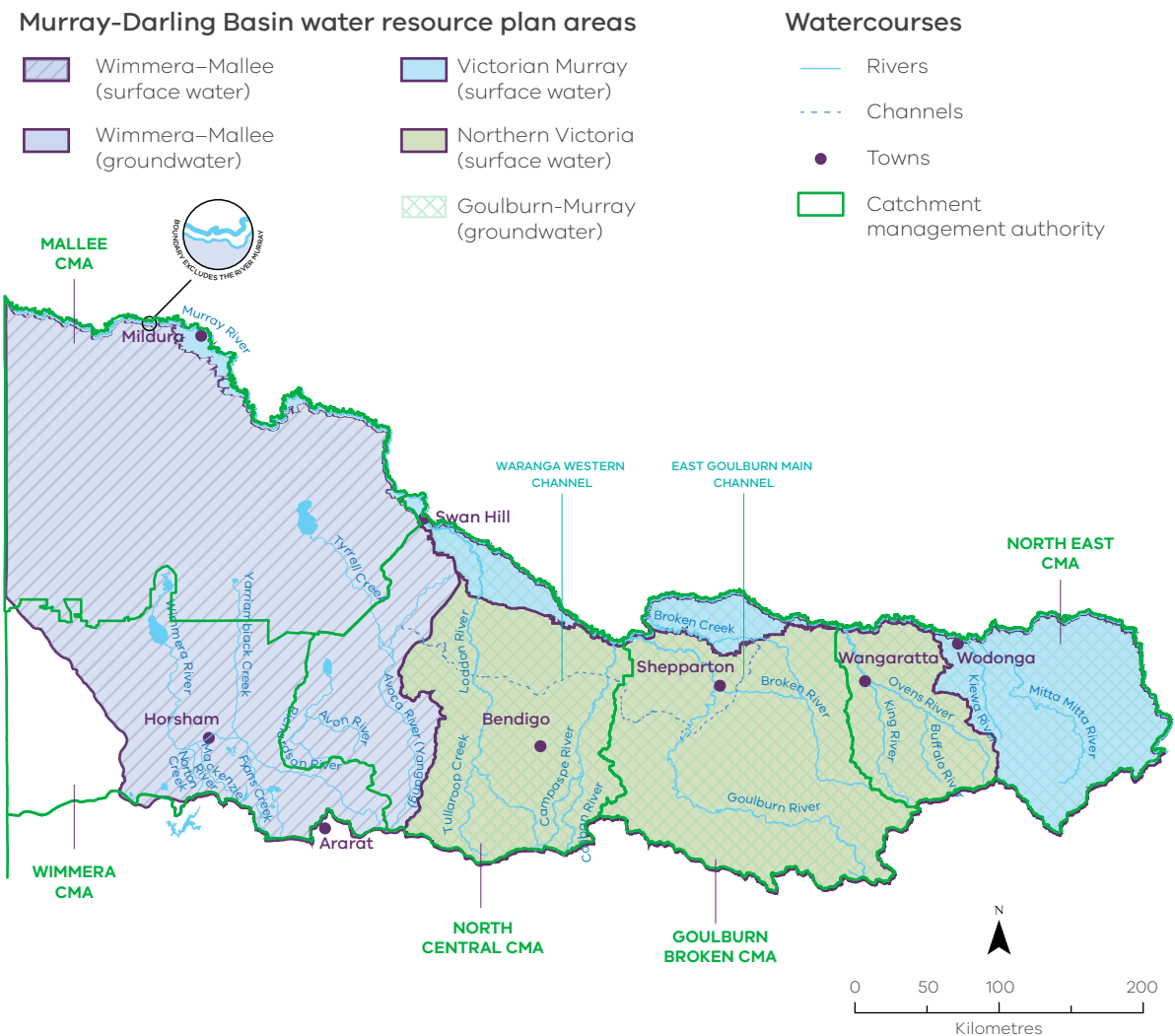
	See the relevant Index Table (Column 4) for catchment management authority obligations under water resource plans
	See Part 5.3 of the Wimmera-Mallee Comprehensive Report
	See Section 6.4 of Victoria's North and Murray Comprehensive Report

waterway management have been given the necessary functions and powers under Part 10 of the Victorian Water Act.

The CMAs' role is to manage regional waterways, floodplains, drainage and environmental water reserves. These authorities are responsible for the integrated planning and coordination of land, water and biodiversity management in each catchment and land protection regions. Community involvement is a vital part of decisions made by the CMAs.

Healthy waterways are essential for the environment and for delivering water. In Victoria, 10 catchment management authorities (CMAs) responsible for

The catchment management authorities operating in Victoria's water resource plan areas are shown in **Figure 13**.



**Figure 13: Catchment management authorities (CMAs) in Victoria's water resource plan areas**



The relevant catchment management authorities for the Wimmera-Mallee Water Resource Plan are the Wimmera CMA, Mallee CMA and North Central CMA. For Victoria’s North and Murray Water Resource Plan they are the North East CMA, Goulburn Broken CMA, North Central CMA and Mallee CMA.

Catchment management authorities provide integral support for Victoria’s environmental watering under the Basin Plan. See [Section 5](#) for more information.

### 3.1.3 Victorian Environmental Water Holder

	<p>See the relevant Index Table (Column 4) for VEWH obligations under water resource plans</p>
	<p>See Part 5.4 and 12.4.2 of the Wimmera-Mallee Comprehensive Report</p>
	<p>See Section 6.5 and 12.3.4 of Victoria’s North and Murray Comprehensive Report</p>

The Victorian Environmental Water Holder (VEWH) is established under Part 3AA of the Victorian Water Act.


The VEWH is responsible for managing the water entitlements it holds to improve the environmental values and health of water ecosystems for uses that depend on environmental condition.

The VEWH uses its water entitlements to meet requirements for environmental watering across Victoria.

The VEWH works closely with catchment management authorities gathering the most up-to-date information to prepare a seasonal watering plan each year. This scopes where, when, how and why environmental water can be used across Victoria’s rivers, wetlands and floodplains.

Like other entitlement holders, the VEWH must comply with any relevant water trading rules. Decisions about applying the VEWH’s water holdings do not come under Ministerial direction.

### 3.1.4 Compliance and enforcement



See Part 5.7 of the Wimmera-Mallee Comprehensive Report

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See Section 6.7 of Victoria's North and Murray Comprehensive Report

Compliance and enforcement under the Victorian Water Act are carried out by the Minister, water corporations and catchment management authorities.

Offences under the Victorian Water Act include those linked to:

- authorisations to take and use water
- authorisation to construct, alter or operate works including, but not limited to, works on waterways to divert, take or use water
- authorisation to discharge into waterways and aquifers
- connection to the works of an Authority.

Under Victoria's water resource plans, rules or obligations that support meeting Basin Plan requirements for water management have been replicated using Basin Plan language. Victoria is required to comply with the rules and obligations contained in our water resource plans and report on compliance annually.

As well as managing compliance under the Victorian Water Act, Victoria also has commitments under the Basin Compliance Compact that was signed by all Basin states and the Commonwealth Government.




For more information on how Victoria is meeting its obligations under the Compliance Compact see <https://www.water.vic.gov.au/mdb/compliance>

### 3.1.5 Managing availability and quality

The Victorian Water Act has a variety of methods to manage impacts and risks on Victoria's continued water availability and the quality of water in the system.

#### 3.1.5.1 Water availability



See Part 9 of the Wimmera-Mallee Comprehensive Report

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See Chapter 10 of Victoria's North and Murray Comprehensive Report

Water corporations are mainly responsible for managing water availability in the system under a range of scenarios. There are various powers available under the Victorian Water Act to manage water delivery and supply in response to reduced water availability.

In severe water shortages the Minister can declare a temporary water shortage to reduce entitlement holders' access to water.


Systems are generally managed to support sustainable levels of take. Limits are placed on the volume of water that can be issued to entitlement holders across surface water and groundwater systems, and water is allocated as it becomes available or restricted as availability declines. In groundwater systems the consumptive limits are set to avoid drawdown or depletion of the resource.

Short or long-term water shortages are managed to make sure that Victoria maintains sufficient water levels to meet critical human needs. Water corporations are responsible for developing long-term and short-term contingency planning to respond to changes in water availability.

For more information see [Section 6.2](#) on extreme events.



### 3.1.5.2 Water quality



See Part 14 & Appendix A of the Wimmera-Mallee Comprehensive Report

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See Chapter 14 & Appendix A of Victoria's North and Murray Comprehensive Report


The Department of Health and Human Services, Department of Environment, Land, Water and Planning (DELWP), Environment Protection Authority (EPA), municipal councils, water corporations, local government and catchment management authorities all have a role in managing water quality in Victoria.

The Department of Health and Human Services, DELWP and the EPA work to regulate water quality requirements and respond to impacts on water quality. In regulating water quality, the Department of Health and Human Services sets standards for drinking water quality and matters of public health.

The Environment Protection Authority implements the State Environment Protection Policy (Waters) (SEPP (Waters)) and regulates discharges into the environment and pollution. SEPP (Waters) also influences planning schemes administered by municipal councils.

Water corporations have a major role in managing Victoria's water resources to help meet water quality targets and objectives and to respond to water quality issues. Catchment management authorities support this role through land management activities.

### 3.1.6 Environmental watering



See Part 5 and 12.4 of the Wimmera-Mallee Comprehensive Report

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See Section 6 and 12.3 of Victoria's North and Murray Comprehensive Report

Water for the environment is managed and delivered through key partnerships and actions by the entire water sector:

- DELWP oversees legislation, policy and investment for water resources, waterway health and environmental water across the state
- catchment management authorities are designated waterway managers and set regional priorities and objectives for waterway health with their local communities, including use of environmental water
- water corporations manage water storage and delivery to meet water demands from entitlement holders and manage licences and set local management rules for take in unregulated systems as the Minister's delegates
- the environmental water holders —VEWH, CEWH, and MDBA —manage environmental water holdings
- Victorian agencies work with upstream and downstream states to plan and deliver coordinated environmental objectives across state borders.

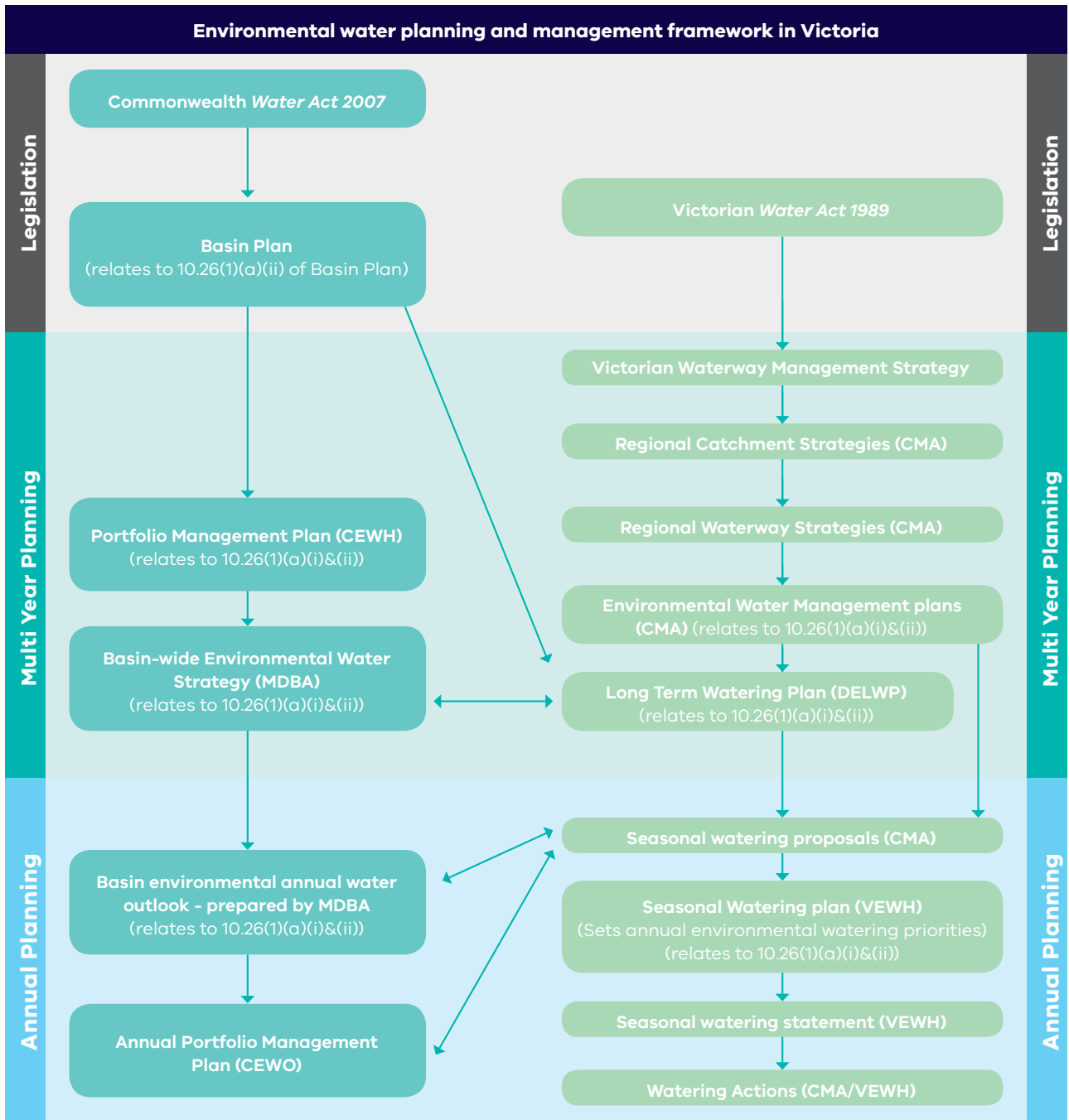


Figure 14: Environmental water planning and management framework in Victoria



*Mirring – Country*

DELWP's Aboriginal Cultural Identity by artist Tom Day of the Gunditjmara, Yorta Yorta and Wemba Wemba tribes

### 3.1.7 Traditional Owners' involvement in water

Traditional Owner groups who contributed to Victoria's water resource plans identified an objective to be recognised alongside other representatives of the water industry, and as equal partners.

#### *Involvement in the development of water resource plans and key findings*

Traditional Owner groups were asked to identify their values, uses, objectives and desired outcomes for water as Victoria's water resource plans were developed.

The main findings were for their cultural perspectives to be included in the early stages of projects, genuine consultation and substantive negotiations to occur in policy development, and to be invited to take part in decision-making about waterways on Country.

Some groups said they expected to be invited to stakeholders advisory and working groups and to elect representatives.

Many groups expressed their aspirations to be involved in achieving cultural outcomes through the use of environmental flows. Their goals to achieve this included:

- consolidating and protecting Traditional Ecological Knowledge and using it to guide the management of waterways and cultural landscapes
- priority watering sites for the environment being influenced by areas of cultural importance
- being included in decisions on site selection, quantities and timing so that the right water is in the right place at the right time to meet the needs of the cultural environment.




See Part 11 of the Wimmera-Mallee Comprehensive Report

See Chapter 8 of Victoria's North and Murray Comprehensive Report



See Traditional Owner objectives and outcomes: Compilation of contributions to Victoria's water resource plans

### Importance of measuring and monitoring for Traditional Owners



**See Part 11.3 of the Wimmera-Mallee Comprehensive Report**

**See Section 8.3 of Victoria's North and Murray Comprehensive Report**

During engagement on Victoria's water resource plans, many Traditional Owner groups highlighted the importance of ongoing measuring and monitoring of cultural indicators for healthy Country. There is a strong desire to monitor and evaluate river and wetland health from a cultural perspective.


This highlights the need to build Traditional Ecological Knowledge into management strategies, including monitoring and evaluation. By including Aboriginal peoples' objectives for healthier rivers and wetlands, this will improve wellbeing and cultural resilience while contributing to better water management.

Several tools developed recently to assess Country from a cultural perspective include Aboriginal Waterway Assessments, cultural flows, use and occupancy mapping and cultural mapping. There have been many examples of how these tools can help Traditional Owner groups' engagement with CMAs, especially around shared benefits for environmental watering.

The main tools relevant for developing water resource plans and putting them into action are the Aboriginal Waterway Assessments and cultural flows described in this section.

### Aboriginal Waterway Assessment Program

The purpose of the Aboriginal Waterways Assessment program, established by the MDBA, was to develop a tool that consistently measures and prioritises river and wetland health so that Traditional Owners can more effectively participate in water planning and management in the Basin.



**Refer to Section 8.4.4.1 of Victoria's North and Murray and Part 11.4.4.1 of the Wimmera-Mallee Comprehensive Reports**

**Information on AWAs in the plan areas can also be found in Traditional Owner group contributions to the plans - Section 8.3 of Victoria's North and Murray and Part 11.3 of the Wimmera-Mallee Comprehensive Reports**

The MDBA ran a pilot program in 2015 and identified three main components for the Aboriginal Waterway Assessments:

- place status: a statement of whether or not the place is an area of cultural significance and whether local Traditional Owners would return to the place in the future
- current use of the place: a measure of the value of a river or wetland to Aboriginal people based on whether food and other resources are available and suitable for cultural use
- cultural stream health: a measure made up of eight stream health indicators such as vegetation, river bed condition and water quality.

At the start of the water resource plan process, Victoria committed to funding six Aboriginal Waterway Assessments in Victoria's share of the Basin. These were done by Murray Lower Darling Rivers Indigenous Nations (MLDRIN) in partnership with Traditional Owners, CMAs and other agencies.

MLDRIN and Northern Basin Aboriginal Nations (NBAN) authorised the design and implementation of the Aboriginal Waterway Assessments project. It is also important to note that the Aboriginal Waterway Assessments are the property of Traditional Owner groups who choose how they use the reports - and if, how or when they wish to share information.

### Victoria's six Aboriginal Waterway Assessments

DELWP funded six Aboriginal Waterway Assessments in the Victorian part of the Murray-Darling Basin in 2016. These were coordinated by MLDRIN over an 18-month period.

Five of the six were done in the Victoria's North and Murray water resource plan area for these groups:

- Barapa Barapa Water for Country Steering Committee
- Dja Dja Wurrung Clans Aboriginal Corporation
- Tati Tati Wadi Wadi Traditional Owners
- Taungurung Land and Waters Council
- the First Peoples of the Millewa-Mallee.

The Dhudhuroa Waywurru Nations Aboriginal Corporation received separate funding to carry out an Aboriginal Waterway Assessment in February 2019.

Many Traditional Owner groups identified Aboriginal Waterway Assessments as a useful tool. They would like to continue using them on a seasonal calendar to document Country, monitor different sites and integrate with environmental watering.


### Cultural flows



See Section 8.6 of Victoria's North and Murray and Part 11.6 of the Wimmera-Mallee Comprehensive Reports for more information on cultural flows

The findings and outcomes of the National Research Cultural Flows project were released in 2018. These included a 10-step water-planning tool for Traditional Owner groups and water managers to develop Cultural Flows Management Plans and quantify the necessary flows to achieve Traditional Owner objectives. This cultural flows tool complements the Aboriginal Waterway Assessments and MLDRIN and NBAN are now looking how to integrate both tools.

### 3.2 Victoria’s water systems




**Table 4-1 of Victoria’s North and Murray Comprehensive Report provides a guide to the rivers and creeks in Victoria’s North and Murray water resource plan area that are regulated, unregulated and declared or undeclared**

Victoria’s water systems hold either:

- regulated surface water, with storages harvesting water to be released downstream. Water can be stored or released as a passing flow, depending on the bulk entitlement rules for that system
- water for use held under entitlements, including bulk entitlements for water corporations to take water and environmental entitlements for the Victorian Environmental Water Holder to manage watering in Victoria’s North and Murray water resource plan area
- unregulated or semi-regulated surface water, where water can be used under take and use licences. These systems either have small storages or none at all
- groundwater in aquifers which can be used under a take and use licence.

### 3.3 Access to water



**See Part 6 of the Wimmera-Mallee Comprehensive Report**

**See Chapter 7 of Victoria’s North and Murray Comprehensive Report**

In Victoria, water is authorised to be taken for consumptive and environmental uses either through a water entitlement or as allowed for under a statutory right.


Consumptive uses include the water supplied for urban use such as household consumption, irrigation, industrial uses and power generation.

Environmental uses include water delivered to important environmental sites like wetlands.

The Victorian Water Act sets out the statutory rights and entitlements that authorise the take and use of water. It protects the resource and existing entitlement holders’ interests through:

- setting out offences for unauthorised take of water and responsibilities for compliance and enforcement
- matters to consider when dealing with applications for new entitlements or amending an entitlement
- a limit on the total amount of water that may be authorised for extraction – including a permissible consumptive volume
- notification requirements for a bulk entitlement, and provision for either house of Victoria’s Parliament to disallow the creation of a bulk entitlement.

The Commonwealth Water Act refers to these rights and entitlements as ‘water access rights’. The Basin Plan also defines the domestic and stock right described in section 8 of the Victorian Water Act and the Traditional Owner right described in section 8A of the Victorian Act as a ‘basic right’.



**More about how the volume of water is taken under statutory rights or basic rights is outlined in Table 9-4 of Chapter 9 and Table 6 of the Methods Report at Appendix C of Victoria’s North and Murray Comprehensive Report, and in Table 17 Part 8 and Table 5 at Appendix C of the Wimmera-Mallee Comprehensive Report**

The Victorian water management framework is consistent with Basin Plan requirements which specify that a water resource plan must identify the types of water access rights, rights or entitlements, available in the water resource plan area to authorise the take and storage of water. See Table A and B of the relevant water resource plan Index Table.

There is more detail in [Section 3.3.1](#) and [Section 3.4](#) about the formal obligations imposed on holders of water access rights.

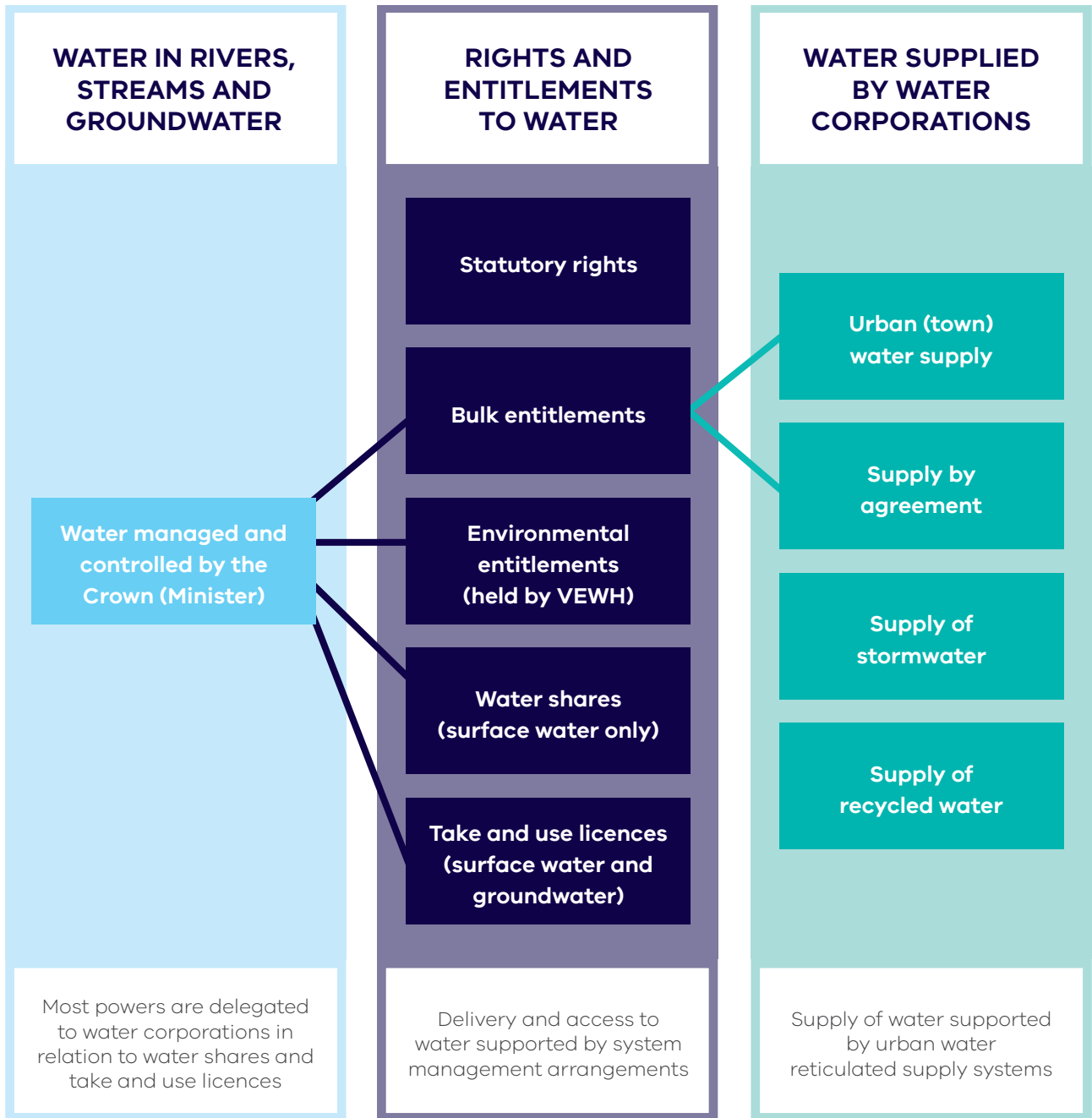


Figure 15: An overview of Victoria’s water system including rights and entitlements

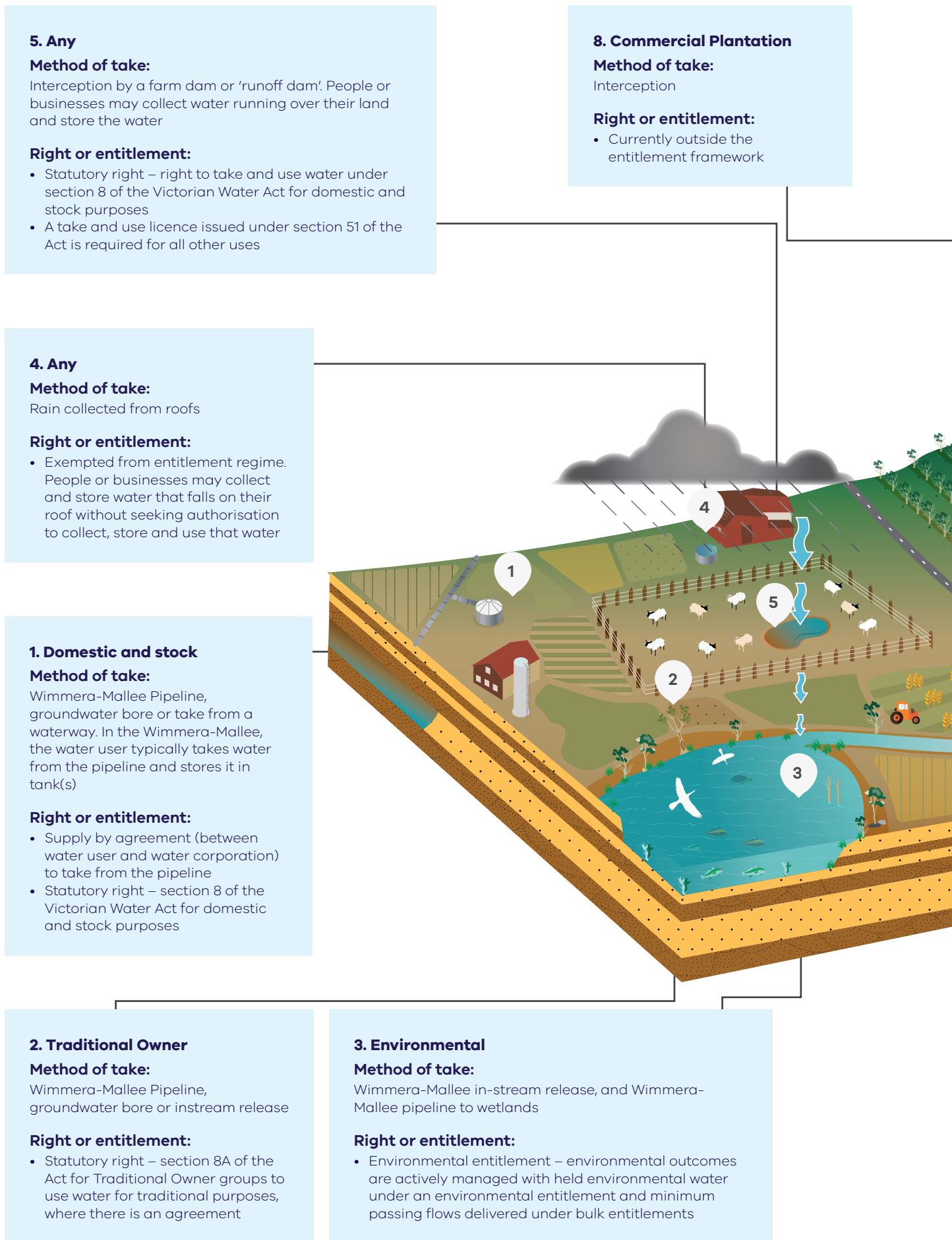


Figure 16: Take and use of water in the Wimmera-Mallee water resource plan area



**9. Regulating flows**

**Method of take:**

Harvesting inflows and managing losses

**Right or entitlement:**

- Storage and system losses are effectively shared between the entitlement holders as they are deducted before allocations are made. Grampians Wimmera Mallee Water (GWMWater) holds a bulk entitlement for losses associated with operating the Wimmera-Mallee Pipeline

**10. Recreational**

**Method of take:**

Wimmera-Mallee Pipeline for nominated recreational lakes

**Right or entitlement:**

- GWMWater holds a bulk entitlement for delivery to nominated lakes via the Wimmera-Mallee Pipeline

**Method of take:**

Headworks storages and waterways

**Right or entitlement:**

- No specific entitlement for shared benefits

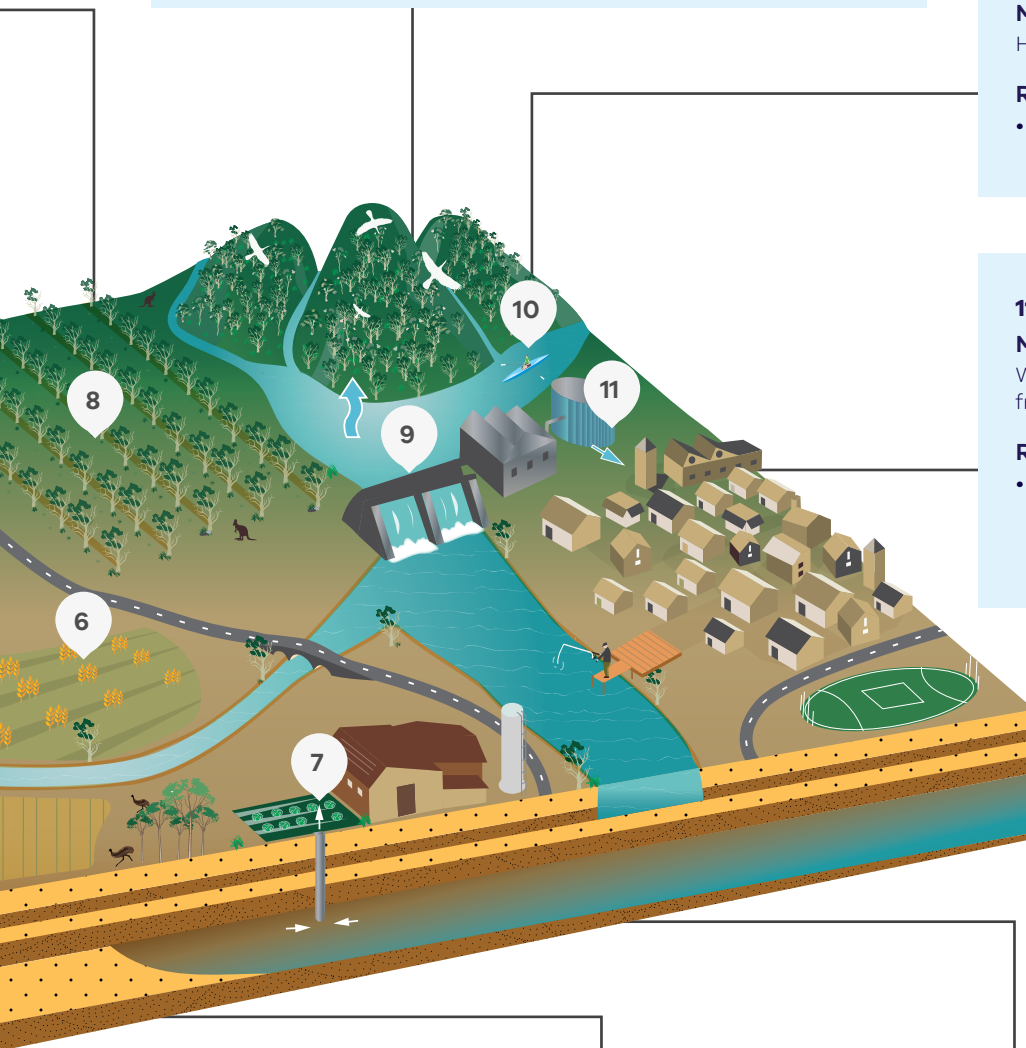
**11. Town water supply**

**Method of take:**

Wimmera-Mallee Pipeline or pump from a waterway

**Right or entitlement:**

- Bulk entitlement held by water corporation (no right or entitlement required by individual households)



**6. Irrigation or commercial**

**Method of take:**

Wimmera-Mallee Pipeline, interception by farm dams or pump from a waterway

**Right or entitlement:**

- Take and use licence issued under section 51 of the Act and supply by agreement. This can be from surface water

**7. Any**

**Method of take:**

Groundwater extraction. People or businesses may construct a bore (subject to authorisation under a works licence) to pump groundwater

**Right or entitlement:**

- Statutory right – right to water under section 8 of the Act for domestic and stock use.
- Take and use licence issued under section 51 of the Act for all other uses

**4. Any**

**Method of take:**

Rain collected from roofs

**Entitlement:**

- Exempted from requirement to hold entitlement. People or businesses may collect and store water that falls on their roof without seeking authorisation to collect, store and use that water

**6. Irrigation or commercial: surface water**

**Method of take:**

Take from a waterway or channel where there is a dam controlling flow (regulated surface water system), and take from a waterway where there is no dam controlling flow (unregulated surface water system)

**Entitlement:**

- Water share if take is from a system which is a declared water system
- A take and use licence issued under section 51 of the Victorian Water Act
- Supply by agreement

**2. Traditional Owner**

**Method of take:**

Take from a waterway (surface water) or from an aquifer (groundwater)

**Entitlement:**

- Statutory right – section 8A of the Act for Traditional Owner groups to use water for traditional purposes, where there is a relevant agreement

**10. Recreational**

**Method of take:**

Instream use (surface water)

**Entitlement:**

- There is no specific entitlement for recreational water in Victoria’s North and Murray water resource plan area, and no fees or service charges to recreational water users for water resources

**3. Environmental**

**Method of take:**

Take from a waterway or instream take (surface water)

**Entitlement:**

- Bulk entitlement, environmental entitlement or water share held by Victorian Environmental Water Holder, Murray-Darling Basin Authority and Commonwealth Environmental Water Holder (held environmental water)
- Where applicable rules-based water including minimum flows for rosters and bans set out in management plans (planned environmental water)
- Other water that contributes to the environment including above cap water and system water



Figure 17: Take and use of water in Victoria’s North and Murray water resource plan area

### 11. Town water supply

**Method of take:**

Take from a waterway or channel where there is a dam controlling flow (regulated surface water system), and take from a waterway where there is no dam controlling flow (unregulated surface water system), or from a bore (groundwater)

**Entitlement:**

- Bulk entitlement held by water corporation (no right or entitlement required by individual households)
- Water corporations may hold water shares in declared water systems, or take and use licences under section 51 of the Victorian Water Act in undeclared water system
- Water corporations may also hold a take and use licence under section 51 of the Victorian Water Act to access groundwater to supply towns



### 9. Regulating flows (including system water)

**Method of take:**

Harvesting inflows and managing losses

**Entitlement:**

- Bulk entitlement held by water corporation

### 8. Plantation

**Method of take:**

Interception

**Entitlement:**

- Currently outside the entitlement framework

### 5. Any

**Method of take:**

Interception by a farm dam or 'runoff dam' (surface water)

**Entitlement:**

- Statutory right – section 8 of the Victorian Water Act for domestic and stock purposes
- A take and use licence issued under section 51 of the Victorian Water Act

### 7. Any

**Method of take:**

Take from an aquifer (groundwater)

**Entitlement:**

- Statutory right – right to water under section 8 of the Act for domestic and stock use
- Take and use licence issued under section 51 of the Victorian Water Act

### 1. Domestic and stock


**Method of take:**

Take from a waterway (surface water) or from an aquifer (groundwater)

**Entitlement:**

- Statutory right – section 8 of the Victorian Water Act for domestic and stock purposes

### 3.3.1 Statutory rights



See Part 6.2 of the Wimmera-Mallee Water Resource Plan

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See Section 7.2.1 of Victoria's North and Murray Comprehensive Report

Statutory rights allow a person to take and use water in certain circumstances and under certain conditions. They are available only in those circumstances and for the specific uses set out in the Victorian Water Act, and there are limitations on who can exercise this right.

Sections 8 and 8A of the Victorian Water Act provide for statutory rights to take water that apply without the need to obtain further authorisation from the Minister.

These two statutory rights are a domestic and stock right under section 8 and a Traditional Owner right under section 8A.

### 3.3.2 Statutory entitlements



See Parts 6.3 - 6.4 of the Wimmera-Mallee Water Resource Plan

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See Section 7.2.2 of Victoria's North and Murray Comprehensive Report

Under the Victorian Water Act, the Minister can authorise the take of water by issuing:

- a bulk entitlement order
- an environmental entitlement order
- a water share through allocations in declared water systems
- a take and use licence.

Registration licences were issued for a limited time for certain farm dams to authorise the take and use of water from a dam, spring or soak. These are a form of section 51 licence and recognise historical take and use. See [Section 3.3.2.4](#).

The type of entitlement required depends on the system where the water is taken and who holds the entitlement.

The Victorian Water Act provides for the Minister to authorise an existing entitlement holder to take water not used in one season in a subsequent

season, where the Minister has made a declaration to authorise that practice. This is referred to in practice as 'carryover'.

#### 3.3.2.1 Bulk entitlements


Under the Victorian Water Act, the Minister for Water can make an order granting a bulk entitlement to allow the holder to take a volume of water subject to specified conditions. Bulk entitlements can only be issued to water corporations, certain power-generating companies, the Minister administering the *Catchment and Land Protection Act 1994* and the Victorian Environmental Water Holder.

Bulk entitlements exist in both declared and undeclared systems. See [Section 3.4](#).

#### 3.3.2.2 Environmental entitlements

The Minister for Water can allocate water to the Victorian Environmental Water Holder under an environmental entitlement. Environmental entitlements are designed to contribute to the environmental water reserve, improve the environmental values and health of water ecosystems, including their biodiversity, ecological functioning and water quality, and for other uses that depend on good or improved environmental condition.

#### 3.3.2.3 Water shares



See Part 6.4.3 of the Wimmera-Mallee Comprehensive Report

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See Section 7.2.2.2 of Victoria's North and Murray Comprehensive Report

Once an order is made to make the system a 'declared' water system, the entitlements in that system are 'unbundled'. This results in the clear separation of water rights from land.

In 2007, water rights that were a form of statutory right but not a section 8 or section 8A right, and take and use licences in declared systems in Victoria's North and Murray water resource plan area were converted into three separate components:


- a water share which is an ongoing entitlement to a share of water available in a declared water system. The volume of water that may be taken in any year will depend; on the allocation in relation to the share. Carryover may also be available if a declaration has been issued to that effect

- a water-use licence, or water-use registration for uses apart from irrigation, which authorises water use on land with specified conditions
- shares in districts, or extraction shares on waterways, provided for in the relevant works licence issued under section 67 of the Victorian Water Act and under the conditions of the licence. Delivery shares or extraction shares support management of system’s capacity so that entitlements holders can access their available water.

Water shares can be high-reliability or low-reliability and the reliability is about the level of security and how allocations are made to water shares. Allocations are made against high-reliability water shares before low-reliability water shares. The rules about when allocations are made to water shares are described in the bulk entitlements of the respective water systems.

There are no declared water systems in the Wimmera-Mallee water resource plan area and so no water shares have been issued in that area.

**3.3.2.4 Take and use licences and registration licences**

	<b>See Part 6.4.1 of the Wimmera-Mallee Comprehensive Report</b>
	<b>See Section 7.2.2 of Victoria’s North and Murray Comprehensive Report</b>

A take and use licence, also known as a section 51 licence, is an entitlement issued for a fixed term to take and use surface water or groundwater from a specified source like a waterway, catchment dam, spring, soak or aquifer. Each licence is bound by any specified conditions.

The maximum term for this licence is 15 years, or 30 years for power generation companies, but a licence can be renewed.

Take and use licences authorise access to water from undeclared surface water systems and groundwater from aquifers in the Wimmera Mallee and northern Victoria. They are also used to access water in the undeclared Coliban Water regulated surface water system.

The relevant water corporation can issue take and use licences unless there is a conflict of interest. In this case the Minister will make a decision about the licence application.

In the Wimmera-Mallee water resource plan area, the Minister for Water has delegated responsibility for licensing to Grampians Wimmera-Mallee Water.


In Victoria’s North and Murray water resource plan area, the Minister has delegated licensing responsibilities to Goulburn- Murray Water, Lower Murray Water and Coliban Water.

Apart from any specific conditions on the take and use licence, water take is controlled under the Victorian Water Act. This can limit the place where water can be taken and the times or rate of take, as specified in a section 67 works licence. A person who needs infrastructure works to access water, like a pump on a waterway or bore, must hold a works licence.

Registration licences also authorise take and use. A registration licence is perpetual and does not attract a licence fee.

Registration licences are attached to land. They cannot be traded as entitlements, but they do transfer when the land is transferred. The licence holder can apply to convert a registration licence into a section 51 licence which can then be traded.

### 3.4 Managing take of water from a water system

 For more information on regulated water systems see Part 6.7.2 of the Wimmera-Mallee Water Resource Plan and Section 7.2.2.5 of Victoria's North and Murray Comprehensive Report

#### 3.4.1 Declared regulated surface water systems

In regulated surface water systems that have been declared, the volume of water that can be taken in any water season is determined by the allocations made against each water share.

Decisions about allocations are made by an Authority, the water corporation appointed by the Minister under the Victorian Water Act. These decisions are based on factors that include how much water is available in the system and by considering any estimated future inflows.


Goulburn-Murray Water is the water corporation appointed for the Murray, Goulburn, Loddon, Campaspe, Broken and Bullarook declared water systems.

#### 3.4.2 Non-declared regulated surface water systems

Limits are used to manage the volume of water taken and its impact on the environment and other users in regulated water systems that have not been declared, and in unregulated surface water systems. These limits are specified in bulk entitlements and take and use licences.

The volume of water that consumptive users can extract is limited further by restricting or banning licence holders from taking water when river flows are low.

'Above cap' water is the water 'above' any limits set on the volume that can be licensed for extraction. While this water remains in the unregulated system, it provides environmental and other shared benefits.

 See Parts 6.6 and 12.2.3.1 of the Wimmera-Mallee Water Resource Plan  
See Sections 7.2.2.4 and 12.4.3.1 of Victoria's North and Murray Comprehensive Report




*Little Lake Meran*  
Credit: North Central CMA

### 3.4.3 Unregulated surface water systems


Unregulated catchments are all undeclared which means that entitlements held in the system are tied to land. Bundled entitlements provide for both the take and use of water. In unregulated catchments, entitlements to water include take and use licences and bulk entitlements.

All water taken for commercial or irrigation use in unregulated catchments must be licensed, including water taken from harvesting dams. Water taken by urban water corporations is authorised under a bulk entitlement or a take and use licence. The licences are called take and use licences or section 51 licences after the relevant section of the Victorian Water Act. The use of water, and trade of licences between users, is managed by Goulburn-Murray Water (GMW) in accordance with Ministerial trading rules (Minister for Water, 2014).



**Table 4-1 of Victoria’s North and Murray Comprehensive Report provides a guide to the rivers and creeks in Victoria’s North and Murray water resource plan area that are regulated, unregulated and declared or undeclared**

In unregulated surface water systems, the volume of water taken and the impact on the environment is managed by specifying limits on the timing and the rate of take in bulk entitlements and take and use licences. The volume of water which can be extracted by consumptive users is further limited by restricting or banning take by licence holders when flows are low. While above cap water remains in the unregulated system, it provides for environmental and other shared benefits.




**For more information on above cap water see Part 6.6 of the Wimmera-Mallee Comprehensive Report and Section 7.2.2.4 of the Victoria’s North and Murray Comprehensive Report**

Any water not allocated through entitlements is above cap water. When above cap water in an unregulated system flows into a storage it becomes regulated and supports the needs of the regulated system. Depending on the rules in the bulk entitlement for the regulated system, this water may be stored or released as a passing flow.

### 3.4.4 Groundwater systems

No bulk entitlements have been issued for groundwater in either Victoria’s North and Murray water resource plan area or the Wimmera-Mallee water resource plan area.




**See Section 12.5.5 of Victoria’s North and Murray Comprehensive Report**

Groundwater is important to the environment apart from its use for purposes like household consumption and agriculture. It supports ecosystems that rely on groundwater for all or part of their water needs, such as river reaches that gain or lose groundwater and wetlands that rely on shallow aquifers.

Groundwater licensing decisions are made by considering these environmental and ecosystem factors.

No groundwater-dependent assets were identified for the Wimmera-Mallee water resource plan area.



**See Part 4.1.3 of the Wimmera-Mallee Comprehensive Report**  
**See Section 4.1.3 of Victoria’s North and Murray Comprehensive Report**

Most systems of aquifers where there is high demand for groundwater or which need specific protection have been capped by the declaration of ‘permissible consumptive volumes’ (PCVs).

A permissible consumptive volume sets the total volume of water that can be taken from the specific groundwater system.

### 3.5 What we do in Victoria to monitor resources

#### Basin Plan requirements

Under Part 10 of Chapter 10 of the Basin Plan, Victoria must measure and monitor water resources.

A water resource plan must include the following information in relation to each class of water access right relating to the water resources of the water resource plan area:

- the best estimate of the total long-term annual average quantity of water taken that is measured (section 10.44(a) of the Basin Plan)
- the best estimate of the total long-term annual average quantity of water taken that is not measured (section 10.44(b) of the Basin Plan)
- how the quantities estimated above were calculated (section 10.44(c) of the Basin Plan); and
- the proportion of the quantity referred to above that is measured in accordance with standards for measuring agreed by the Basin States and the Commonwealth (section 10.44(d) of the Basin Plan)
- identify how the proportion of take that is measured will be maintained or improved (section 10.45 of the Basin Plan)
- how Victoria’s monitoring will support reporting required under Schedule 12 of the Basin Plan (section 10.46 of the Basin Plan)



See Part 15 of the Wimmera-Mallee Comprehensive Report

See Chapter 15 of Victoria’s North and Murray Comprehensive Report

Appropriate measuring and monitoring of water are critical for sound management of water resources. This informs policy, evidence-based decision making and management of Victoria’s water resources to adapt to changing conditions. It supports strong compliance and enforcement.

Accurate and reliable measuring and monitoring means Victoria can protect the reliability of water for the environment and existing entitlement holders. It gives water users and the community confidence that our water resources are managed well.

The Basin Plan requires Victoria to identify how its measuring and monitoring will support reporting against the matters in Schedule 12 of the Basin Plan. It also expects a program of continued improvement, especially for measuring water actually taken from the system.



See response to Part 12 of the table Wimmera-Mallee Index Table and Victoria’s North Index Table



See Section 15.2 of the Victoria’s North and Murray Comprehensive Report

Regional Water Monitoring Partnerships and a State Observation Bore Network in Victoria have been established to collect data on the quantity and quality of surface water and groundwater. This is to meet legislative and regulatory compliance requirements and for performance monitoring, policy development and operational decisions.



The Regional Water Monitoring Partnership is made up of 40 partner organisations. It routinely monitors surface water and collects surface water data from around 780 monitoring sites across Victoria. The data identifies how much water is there, where it is, the water quality and the volume and purpose of water being used.

The Groundwater Monitoring Partnership involves the Department of Environment, Land, Water and Planning (DELWP) and the rural water corporations Southern Rural Water, Grampians Wimmera Mallee Water, Central Highlands Water and Goulburn-Murray Water. It routinely monitors groundwater and collects data from the 1,400 bores in the State Observation Bore Network. This monitoring includes an annual spring sampling program to analyse groundwater quality parameters.

All surface water and groundwater data collected through the Regional Water Monitoring Partnerships is stored and managed in the Water Management Information System. This publicly-accessible web site has data on surface water and groundwater levels and water quality, and surface water discharge.

It includes all telemetered water data which is published within one hour of collection. Verified water data is published within two weeks of being collected.



Victorian Water Management Information System [https://www.vvg.org.au/cb\\_pages/wmis.php](https://www.vvg.org.au/cb_pages/wmis.php)

### 3.5.1 Monitoring through Water for Victoria



See response to section 10.44 and 10.45 in the Wimmera-Mallee Index Table and Victoria's North and Murray Index Table

Victoria's water resource plans outline how the state proposes to support its annual reporting requirements and continually improve the monitoring and measurement of water resources in each water resource plan area.


Victoria has committed to certain measures under Water for Victoria for maintaining and, where practicable, improving the proportion of take measured in the water resource plan area, and the standard to which take is measured. These are:

- the Implementation Plan under the Basin Compliance Compact to improve metering against the National Standard for metering. This is in accordance with the approved exemptions published by December 2019 under Action 3.1 (including Actions 3.1 - 3.5) and supported by Actions VIC 3.1-3.7. It is subject to revised timeframes negotiated with the MDBA
- maintenance of stream gauges by water corporations and DELWP according to national standards over the next seven years
- installation and maintenance of meters by water corporations according to national standards over the next seven years
- upgrades to non-urban metering according to the National Metering Standards for Non-Urban Water Meters consistent with the Victorian policy for non-urban water metering and the state-wide implementation plan over the next seven years
- continued investment in ongoing state-wide surface water and groundwater monitoring networks over the next seven years
- investment in infrastructure upgrades and new technologies to improve the quality, accuracy and timeliness of monitoring data over the next seven years
- investigation into the introduction of a reasonable use limit for domestic and stock rights to improve monitoring and reporting of the quantity of water used under these rights over the next seven years.

### 3.5.2 Reporting requirements under Schedule 12 of the Basin Plan

As well as Victoria’s commitment to improved monitoring, the water resource plans outline how we will meet our reporting requirements under Schedule 12 of the Basin Plan. Victoria is using different methods to further support this reporting, these include:

- an approach for monitoring the hydrological, physical or ecological response to environmental watering in the Wetlands Monitoring and Assessment Program
- the Aboriginal Waterways Assessment tool to assess the cultural health of waterways and the outcomes of environmental watering.



See response to section 10.46(1) in the Victoria’s North and Murray Index Table and Table 15.2 of Victoria’s North and Murray Comprehensive Report

Existing monitoring will support reporting against the matters listed in Schedule 12 of the Basin Plan in these ways:

- Matters 4, 8, 12, 14, and 18 – asset scale indicators and data from the Murray-Darling Basin Fish Survey, Living Murray Program, Long-term Intervention Monitoring, blue-green algae monitoring, water quality monitoring, routine monitoring and data collection by the Groundwater Monitoring Partnership from the State Observation Bore Network including the annual spring sampling program to analyse groundwater quality parameters
- Matters 16 and 18 - monitoring groundwater take and use of through the Victorian Water Register and reported in the Victorian Water Accounts
- Matter 14 - existing monitoring relating to the Basin Salinity Management 2030 (BSM2030) to support reporting to the Ministerial Council and the Basin Officials Committee
- Matter 18 - reporting will be informed by the reporting on the matters already identified here.

### 3.5.3 The Victorian Water Register



<https://waterregister.vic.gov.au/>

All water entitlements are recorded in the Victorian Water Register. This is an authoritative record of the entitlement volumes and associated transactions, including allocations and trade.

There is useful information for water users about water entitlements and relevant arrangements like water trading on the Water Register website.

## 3.6 Water markets and trade

### Basin Plan requirements


Under Part 8 of Chapter 10 of the Basin Plan, Victoria must consider water trading rules.

A water resource plan must:

- set out the circumstances in which trade is permitted between two locations within a groundwater SDL resource unit
- when setting out the circumstances, a water resource plan must ensure that each condition set out in sections 12.24, 12.25 and 12.26 will be met in relation to the proposed trade (10.37(1)).

If the water resource plan applies a conversion rate to meet the condition in paragraph 12.26(d), 12.25(e) or 12.26(e) the water resource plan must either:

- specify the conversion rate, or
- set out the way in which the conversion rate will be determined from time to time and made generally available.



**See Part 6.11 of the Wimmera-Mallee Comprehensive Report**

**See Section 7.3 of Victoria's North and Murray Comprehensive Report**

Water markets offer a fair and efficient way to access and share finite water resources through trade. This involves buying and selling water entitlements or transferring access to allocation water held under entitlements. The Victorian water markets are based on a cap and trade system.

Although Basin state governments mainly manage water markets, the states operate in a Basin Plan framework under certain water trading rules set by the Murray-Darling Basin Authority (MDBA). These rules cover aspects of market operations that are designed to reduce trade restrictions, improve transparency and access to information and maintain market integrity and confidence.

Under the Victorian Water Act, the Minister is responsible for overseeing the water market and that trade is managed in line with Ministerial trading rules.

The Act provides for the trade of entitlements and allocations made to those entitlements for bulk and environmental entitlements and water shares. Most unregulated surface water systems have been fully allocated so licences are traded to transfer authorisations to access water in those systems.

Trading zones are important to define the areas in which water can either be traded freely, sometimes or not at all.


The Victorian Water Act has trading rules that describe when and how entitlements and allocation can be bought or sold between different trading zones. These rules aim to make trade possible while minimising its impact on other users and the environment.

Trading rules reflect the hydrologic links between water systems and the circumstances in which trades can happen and vary depending on the region.

Victoria's Trading Rules for Declared Systems applied on 1 July 2007. Rural water corporations manage trade of take and use licences in unregulated systems in line with the Victorian Water Act and the Ministerial Policies for Managing Take and Use Licences (2014) setting out requirements for trade.

Surface water trade is covered in Chapter 12 of the Basin Plan, which sets out the surface water trading rules that came into effect in Victoria on 1 July 2014 under the Basin Plan. It does not require general surface water trading arrangements to be included in water resource plans.

### 3.6.1 Groundwater trade under Basin Plan



**See Part 6.13 of the Wimmera-Mallee Comprehensive Report**

**See Section 7.4 of Victoria's North and Murray Comprehensive Report**

Trade of a groundwater water access right, or take and use licence, is prohibited unless:

- a. there is sufficient hydraulic connectivity between the two locations of where the water is currently taken from and the place of take after trade
- b. any resource condition limits in the SDL resource unit will not be exceeded
- c. either water access rights in the two locations have substantially similar characteristics of timing, reliability and volume or measures are in place to achieve that, and
- d. measures are in place to address the impact on water availability where a water access right is held by a third party.

This is detailed in [Figure 18](#).

To meet the requirements under paragraph (c), Victoria's North and Murray Water Resource Plan includes a separate circumstance for approving trade in the Upper Ovens River Water Supply Protection Area (WSPA).

For the upstream trade of full year licences in this area, the licence needs to be converted to a winter-fill licence before being traded. Goulburn-Murray Water will need to identify a process for managing this type of trade before a trade is approved. This will ensure decisions are consistent with Victoria's North and Murray Water Resource Plan and Chapter 12 of the Basin Plan.



For more information about trade in the Upper Ovens River Water WSPA see Section 7.4.2.10 of Victoria's North and Murray Comprehensive Report

*Cohuna Channel near Leitchville*  
Credit: DELWP

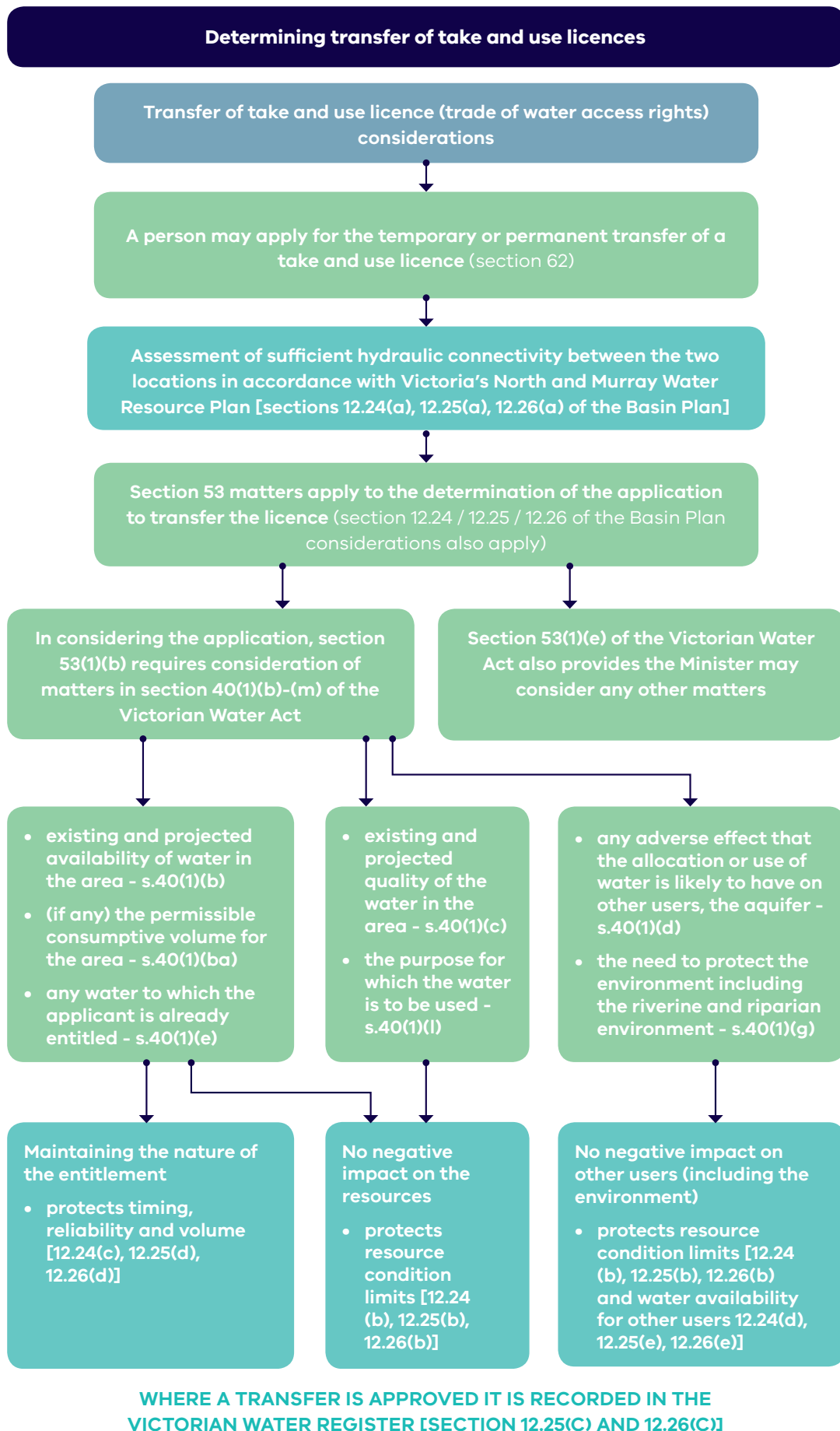


Figure 18: Determining the transfer of a take and use licence

## 4. Meeting Sustainable Diversion Limits

### Basin Plan requirements

Under the Basin Plan, a water resource plan must:

- Set the method for determining annual limits for consumptive use to support compliance with the relevant SDL (section 10.10 of the Basin Plan)
- Set the method for determining annual actual take (section 10.15 of the Basin Plan)
- Ensure that actual take does not exceed permitted take (section 10.11 of the Basin Plan)
- Identify how increase in take from interception activities will be managed so they do not exceed the relevant SDL (section 10.13 of the Basin Plan)

### 4.1 Baseline diversion limits and sustainable diversion limits under water resource plans



See Part 2 of the Wimmera-Mallee Comprehensive Report

See Chapter 2 of Victoria's North and Murray Comprehensive Report

The water resources in each water resource plan area are divided into smaller units called sustainable diversion limit (SDL) resource units. SDL resource units are used to manage consumptive limits in specific catchments in the relevant water resource plan area.

SDL resource units for groundwater are based laterally rather than geographically. This means a groundwater SDL resource unit can cover one or more aquifers and Victorian groundwater management units.



*Farm irrigation*  
Credit: DELWP

Sustainable diversion limits for each SDL resource unit identify the long-term average volume of water that can be taken for consumptive use. The relevant sustainable diversion limits and expected reduction by SDL resource units are outlined in:

- Table 15 and Table 16 of the Wimmera-Mallee Comprehensive Report and Appendix C to the Wimmera-Mallee Comprehensive Report
- Table 1-1 of Victoria’s North and Murray Comprehensive Report and Appendix C to Victoria’s North and Murray Comprehensive Report.

## 4.2 Managing compliance with SDLs

### 4.2.1 Managing water take in Victoria to meet Basin Plan sustainable diversion limits

Under water resource plans, Victoria must identify how we will meet the relevant sustainable diversion limit including setting annual limits, measurement of actual take and managing compliance with limits. Take for consumptive purposes is regulated on an annual basis under Basin Plan as described in [Section 5.2.2](#).

In response to section 10.11 of the Basin Plan, Victoria is required to ensure that the water taken for consumptive use does not exceed the relevant annual permitted take.



See response to section 10.11 of the relevant Index Table

Victoria already has measures in place to limit water take in an SDL resource unit. These include conditions for restrictions on take and use licences and adjusting allocations in relation to water shares.

Both water resource plans place an obligation on the Minister for Water or the Minister's delegates to prevent access to any more water where this would contribute to exceeding the permitted annual take for that SDL resource unit.

Victoria's Department of Environment, Land, Water and Planning (DELWP) must monitor the actual volume of water taken each year and investigate if this is more than the SDL. If this happens, the Minister must decide whether to restrict the relevant take and use licences, or the water corporation must decide whether to adjust allocations to water shares to limit how much water is taken for use.



**See response to section 10.08(2) of the relevant Index Table**

Water resource plans require water users to comply with the conditions of their entitlement for the take and storage of water. This obligation responds to section 10.08(2) of the Basin Plan and works with the response to sections 10.11 and 10.13 so that Victoria does not exceed the relevant sustainable diversion limit.



**See Part 8.6 of the Wimmera-Mallee Comprehensive Report and response to section 10.13 of the Wimmera-Mallee Index Table**

**See Section 9.4 of Victoria's North and Murray Comprehensive Report and response to section 10.13 of Victoria's North and Murray Index Table**


Water resource plans also identify how Victoria will respond to increases in take through specific interception activities, including domestic and stock use by runoff dams and commercial plantations. It is expected that any unforeseen increase above the relevant sustainable diversion limit would be addressed through accounting for total water take from the water resource plan area. If not, the process outlined in response to section 10.13 of the Basin Plan applies.

The Victorian water management framework already limits the amount of take and the Victorian Water Act has compliance and enforcement provisions to deal with any unauthorised water take. Victoria's water resource plans include an offence for breach of a licence condition by the holder of a water access right.

During dry conditions the Minister can declare a water shortage if necessary, and temporarily qualify rights (a temporary change to a legal entitlement to water) including all statutory water rights and entitlements.



**4.2.2 Setting annual limits on water taken for consumptive use**




See Table 5 and Table 8 in Appendix C to the Wimmera-Mallee Comprehensive Report

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See Table 6 and Table 11 in Appendix C to Victoria’s North and Murray Comprehensive Report

As sustainable diversion limits are long-term average limits on water taken for consumptive use, water resource plans must set out a method for how much water can be taken annually. Under the Basin Plan, this is referred to as the methods for determining ‘permitted take’.

Hydrological models are used to determine annual limits for take from regulated surface water systems, using data on rainfall and temperature recorded in that financial year. This type of take makes up the majority of all water use in Victoria. Permitted take is a long-term average volume for take from unregulated systems, domestic and stock purposes, commercial plantations and farm dams. See [Table 4](#).



See Table 6 and Table 9 in Appendix C to the Wimmera-Mallee Comprehensive Report

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See Table 8 and Table 12 in Appendix C to Victoria’s North and Murray Comprehensive Report




Connectivity of the resource, separate accounting for held environmental water and consideration of trade and carryover are among the matters that must be accounted for in determining the methods for annual permitted take.

Victoria’s water resource plans must demonstrate how the matters identified in section 10.12 of the Basin Plan have been considered.

Victoria must also report annually on water used for consumption. This accounting is referred to the method for determining ‘actual take’.

A summary of the permitted take and actual methods for each form of take are explained in [Table 4](#).

**Table 4: Take in Victoria**

Basin Plan 'Form of take'	How water is taken in Victoria	Summary of permitted take method	Summary of actual take method
<b>Surface water take</b>			
<p>Take from a regulated river and some take from a watercourse (excluding basic rights)</p> 	<p>Take from a river that's water is regulated via release from dam or weir</p> <p>Bulk Entitlements (covers water shares)</p> <p>Some section 51 take and use licences from unregulated rivers in the Kiewa, Ovens and Victorian Murray systems</p>	<p>An annual volume estimated by updating hydrological models with observed rainfall and evaporation data.</p> <p>See the model reports here: Victoria's North and Murray models:</p> <p><a href="https://www.mdba.gov.au/publications/mdba-reports/northern-victoria-water-resource-plan">https://www.mdba.gov.au/publications/mdba-reports/northern-victoria-water-resource-plan</a></p> <p>Wimmera-Mallee model: <a href="https://www.mdba.gov.au/publications/mdba-reports/victoria-wimmera-mallee-surface-water-water-resource-plan">https://www.mdba.gov.au/publications/mdba-reports/victoria-wimmera-mallee-surface-water-water-resource-plan</a></p>	<p>Annual usage data recorded on the Victorian Water Register</p>
<p>Take from a watercourse (excluding basic rights)</p>	<p>Take from all other unregulated rivers under section 51 take and use licences</p>	<p>A long-term average volume is used, based on historic average use estimated in the Basin Plan.</p> <p>This is an interim method to be reviewed in two years.</p> <p>Annual actual take is recorded on the Victorian Water Register, however, the long-term average will be used as actual take until the interim method is reviewed.</p>	
<p>Take under basic rights</p> 	<p>Take from a regulated or unregulated river for domestic and stock purposes (not commercial) and for Traditional Owner purposes Section 8 rights</p> <p>Section 8A rights</p>	<p>A long-term average volume estimated using a model based on access to crown frontage and stock drinking requirements. Also includes expected demand for Traditional Owner purposes.</p> <p>The long-term average volume will be reviewed every 5 years to ensure we are still complying with the SDL.</p>	
<p>Take by runoff dams (excluding basic rights)</p> 	<p>Take by farm dams located off waterways for commercial purposes under section 51 take and use licences and registration licence</p>	<p>Sum of the total volume of licences and registrations associated with runoff dams based on the volume of existing entitlements in the Victorian Water Register as at July 2016. Will be reviewed every 5 years to ensure we are still complying with the SDL.</p>	

Basin Plan 'Form of take'	How water is taken in Victoria	Summary of permitted take method	Summary of actual take method
Take by runoff dams under basic rights	Section 8 rights for domestic and stock use by farm dams located off waterways	A long-term average volume estimated using a hydrological model of farm dam volumes, by using aerial imagery and excluding licensed dams. Will be reviewed every 5 years to ensure we are still complying with the SDL..	
Net take by commercial plantations 	The net difference between take by commercial plantations (for example, almond plantations and forestry) before European settlement to 2019 conditions, by considering changes in evapotranspiration	A long-term average volume estimated using a SoilFlux model of evapotranspiration and based on land use data. Estimates will be reviewed every 10 years to ensure we are still complying with the SDL, by capturing any long-term changes in plantation types.	
Floodplain harvesting	Not applicable to Victoria as there are no instances of floodplain harvesting.		
<b>Groundwater take</b>			
Take from groundwater (excluding basic rights) 	Take from an aquifer by a bore under a section 51 take and use licence that authorises the maximum volume the user is permitted to take in a year, the place of take and the time and rate of take. Licensed groundwater take is limited by permissible consumptive volumes set by the Minister for Water	For each SDL resource unit, the permitted take is equal to the SDL as prescribed in schedule 4 of the Basin Plan, minus the annual permitted take for take from groundwater under basic rights.	Annual usage data recorded on the Victorian Water Register.
Take from groundwater (basic rights)	Take from an aquifer by a bore for domestic and stock purposes (not commercial) and for Traditional Owner purposes  Section 8 rights Section 8A rights	Estimated 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 2009.	



#### 4.2.3 Measuring actual take of water

Water taken from Victoria’s rivers and groundwater is monitored and use is metered where practical.

Victorian water corporations measure and monitor water taken by users who hold entitlements, such as water taken under a bulk entitlement, environmental entitlement or take and use licences (see [Section 3.3.2.4](#) for more information on take and use licences).

Where water is taken under a statutory right, as basic rights, or by way of interception as with commercial plantations, Victoria makes its best estimate in accordance with the methods outlined in the water resource plans.

Entitlement holders must keep records collected from their metering program and provide reports to the Minister on request. Each year the Minister asks water corporations to report on their take and use of water in annual reports which are tabled in Parliament. Like other specified authorities holding bulk entitlements, the Victorian Environmental Water Holder (VEWH) has to prepare metering programs to show how it complies with the requirements of its environmental entitlements.

Victoria has also committed to improve measuring by funding stream gauges and the progressive upgrade of non-urban water metering consistent

with the National Framework for Non-Urban Water Meters and Victoria’s state-wide implementation plan.

The Victorian Government made three commitments in the Victorian Government’s 2016 plan *Water for Victoria* to improve information on water use and to:

1. monitor and report on the impact of water use on other users and the environment, and report on significant uses of water in the annual Victorian Water Accounts
2. periodically review the long-term risks to the state’s water resources through long-term water resource assessments and sustainable water strategies
3. work with water corporations and catchment management authorities to continue to invest in state-wide monitoring networks, improve the quality and accuracy of monitoring data and strengthen water resource assessments and modelling.

These actions will be detailed in progress reports on implementing *Water for Victoria*.

### 4.3 Assessing compliance with sustainable diversion limits

Each year, Victoria must assess whether it has complied with the sustainable diversion limits and report to the Murray-Darling Basin Authority. This self-assessment is done by comparing the annual actual take with the annual permitted take explained previously.

Figure 19 shows how annual permitted take and annual actual take can vary from year to year in a regulated system, but ultimately must meet the sustainable diversion limit.

Sustainable diversion limit compliance is effectively like an accounting balance sheet. If the annual actual take exceeds the permitted take for that year, a debit is recorded. The cumulative debit cannot equal or exceed 20 percent of the relevant SDL (Figure 20).

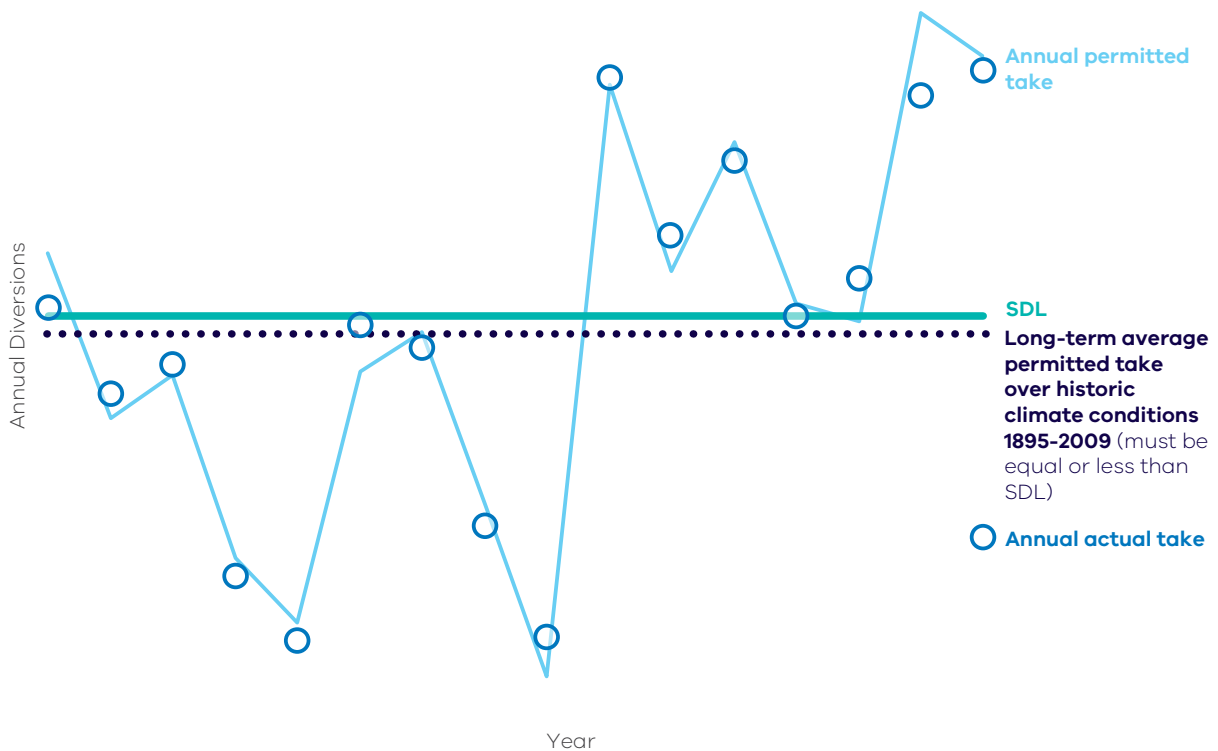


Figure 19: Actual take, permitted take and sustainable diversion limits for regulated surface water diversions



**Figure 20: Compliance with SDL**

Where actual take exceeds permitted take for several consecutive years, there are numerous steps to investigate the cause of the exceedance. This may be because of growth in water use over time or errors in the hydrological models used to determine permitted take in regulated systems.

How Victoria will respond to increases in annual actual take where the volume exceeds annual permitted take is outlined in the response to section 10.11 of the Basin Plan under Victoria's water resource plans and outlined in [Section 5.2.1](#).

The MDBA is required to publish a register of the volume of water taken each year across the Basin.



More information on this process and how the MDBA and Basin states will respond to not meeting sustainable diversion limits can be found at: <https://www.mdba.gov.au/publications/policies-guidelines/sustainable-diversion-limit-reporting-compliance-documents>



*Lake Cooper*  
Credit: DELWP

## 5. Environmental watering

### 5.1 Environmental watering in Victoria

Under the Basin Plan, a water resource plan must:

- Identify held environmental water and planned environmental water including the recording of the water on a register (s.10.09 Basin Plan)
- Identify whether rules are necessary to ensure the water resource plan does not compromise environmental watering (sections 10.17-10.21 of the Basin Plan)
- Ensure environmental watering occurs in a way that is consistent with Basin Plan (section 10.26 of the Basin Plan)
- Ensure environmental watering is coordinated across connected systems included where connections cross Basin state borders (section 10.27 of the Basin Plan)
- Ensure there is not net reduction in the protection of planned environmental water (section 10.28 of the Basin Plan)

The Victorian Water Act provides a strong foundation for considering and reducing the environmental impacts of taking and using water from a system and the construction of works for take and use.

Although the Victorian Water Act predates the Basin Plan, Victoria's legal arrangements for managing environmental water entitlements closely align with Basin Plan requirements.

The main foundations of Victoria's Water Act that support the management of water resources and set up protections for the environment are:


- limits on authorisation for the take and use of water within the limits of resource conditions
- consideration of environmental impacts and water quality impacts before authorising extraction, which applies to both new authorisations or amendments to existing extraction
- consideration of the impact that proposed additional extraction will have on other users, including environmental water holders
- requirements to maintain the environmental water reserve
- consultation between water corporations and catchment management authorities for managing water across Victoria.





*Lake Cullen*  
Credit: North Central CMA

### 5.1.1 Who is responsible for environmental watering?

 See Part 12.4 of the Wimmera-Mallee Comprehensive Report

See Section 12.4 of Victoria’s North and Murray Comprehensive Report

Water for the environment is managed and delivered through key partnerships between the Victorian Government, environmental water holders, catchment management authorities (CMAs) and rural water corporations.

Water for the environment is managed and delivered through partnerships and actions where:

- the Department of Environment, Land, Water and Planning (DELWP) oversees legislation, policy and investment for water resources, waterway health and environmental water across the state
- catchment management authorities are designated waterway managers, and set regional priorities and objectives for waterway health with their local communities, including environmental water
- water corporations manage water storage and delivery to meet entitlements and, as delegates of the Minister, manage licences and set local management rules for take in unregulated systems

- the environmental water holders —Victorian Environmental Water Holder (VEWH) and Commonwealth Environmental Water Holder (CEWH) —manage environmental water holdings
- these Victorian agencies work with Basin states to plan and deliver coordinated environmental objectives upstream and downstream across state borders.

The roles of DELWP, the CMAs, water corporations, VEWH and CEWH as the principal managers of environmental water in Victoria are explained further in [Section 3](#).

### 5.1.2 Carrying out environmental watering

Victoria’s environmental water planning and management framework coordinates and defers responsibility for different tasks to different partners for positive environmental results for rivers, wetlands and floodplains.



See Part 12 of the Wimmera-Mallee Comprehensive Report

See Section 12 of Victoria’s North and Murray Comprehensive Report

Each year the VEWH’s seasonal watering plan outlines the potential use of its environmental entitlements for the state’s waterways, including those in Victoria’s water resource plan areas. The amount of water these waterways receive varies from year to year.

The VEWH and CMAs consider annual conditions and environmental objectives are considered when planning environmental watering, along with community consultation.

There are four planning scenarios to help achieve environmental watering outcomes.



#### **Drought**

- Main objective: Protect
- Avoid critical loss
- Maintain key refuges
- Avoid catastrophic effects



#### **Dry**

- Main objective: Maintain
- Maintain river functioning with reduced reproductive capacity
- Maintain key functions of high priority wetlands
- Manage within dry-spell tolerances



#### **Average**

- Main objective: Recover
- Improve ecological health and resilience
- Improve recruitment opportunities for key animals and plant species



#### **Wet to very wet**

- Main objective: Enhance
- Restore key floodplain wetland linkages
- Enhance recruitment opportunities for key animal and plant species



Source: VEWH




Source: VEWH

The Victorian water planning framework is supported by key policy documents which sit under the legislation.

These detail how water resources are shared, provide guidance on integrated waterway health management, emphasise shared or multiple benefits of environmental water and support resource management under climate change.

Tools for environmental outcomes include annual seasonal watering proposals and the resulting seasonal watering plans, long-term watering plans, the Victorian Waterway Management Strategy, regional waterway strategies and environmental water management plans.

 See Part 12.2.1 of the Wimmera-Mallee Comprehensive Report  
See Section 12.4.1 of Victoria's North and Murray Comprehensive Report

Managing environmental objectives in Victoria's surface water systems depends on whether the water resources are unregulated or regulated and whether the system is declared or undeclared.

For more information about water resource management in regulated and unregulated and declared and undeclared systems see [Section 3.4](#).

In unregulated surface water systems, there is no held environmental water that can be stored and released from storage to manage for specific and measurable environmental objectives.

Environmental objectives in unregulated systems are to protect the existing conditions in the habitat, rather than provide a specific flow to meet targets for fish, vegetation or connectivity. No priority environmental assets or priority ecosystem functions have been identified in unregulated surface water systems.


The environmental impact in unregulated surface water systems is managed by specifying limits on the timing and rate of take in bulk entitlements and take and use licences.

There can be further limits on the volume of water that consumptive users can extract by restricting or banning take for licence holders when flows are low. Note that domestic and stock take is still permitted during bans on take and use that apply to irrigation and industry.

Where river systems are regulated to secure water supplies by operating major storages or weirs, this impacts significantly on the system's environmental values. Environmental water is used to ease the impact of regulation and consumptive uses of water by providing flows for priority environmental assets and priority ecosystem functions.

Environmental watering is coordinated to achieve objectives across systems and the water resource plan areas in northern Victoria.

Environmental water managers work with river operators to identify how all types of water can be used to meet many different objectives. They collaborate with storage operators and land managers to get the best results by delivering environmental in coordination with other flows, including consumptive water.

 See Part 12.6.4 of the Wimmera-Mallee Comprehensive Report  
See Section 12.7.4 of Victoria's North and Murray Comprehensive Report

5.1.3 Co-ordinating environmental watering




Figure 21: Victorian Environmental Water Holder coordinated watering and tools

Source: VEWH

**Interstate coordination**

The Victorian Environmental Water Holder helps align and coordinate objectives and outcomes for the broader Murray-Darling Basin by representing Victoria’s priorities and aims at interstate and Commonwealth environmental watering coordination forums.

There are no significant surface water connections from the Wimmera-Mallee water resource plan area to other water resource plan areas, so no coordinated environmental watering occurs across state borders. Surface water connections are identified between water resource plan areas within Victoria’s North and Murray water resource plan area and from the plan area to water resource plan areas of New South Wales and South Australia.



**See Section 4.1.4 of Victoria’s North and Murray Comprehensive Report for information on the Southern Connected Basin**

**See Figure 12-8 of Victoria’s North and Murray Comprehensive Report for the process of coordinating watering in the River Murray system**


The VEWH supports environmental watering in the southern- connected Murray-Darling Basin through its membership of the Southern Connected Basin Environmental Watering Committee.

The committee coordinates the delivery of all environmental water in the southern-connected Basin and especially the River Murray system. This includes the allocation and management of The Living Murray portfolio to support the Basin Plan Environmental Water Plan and its objectives.

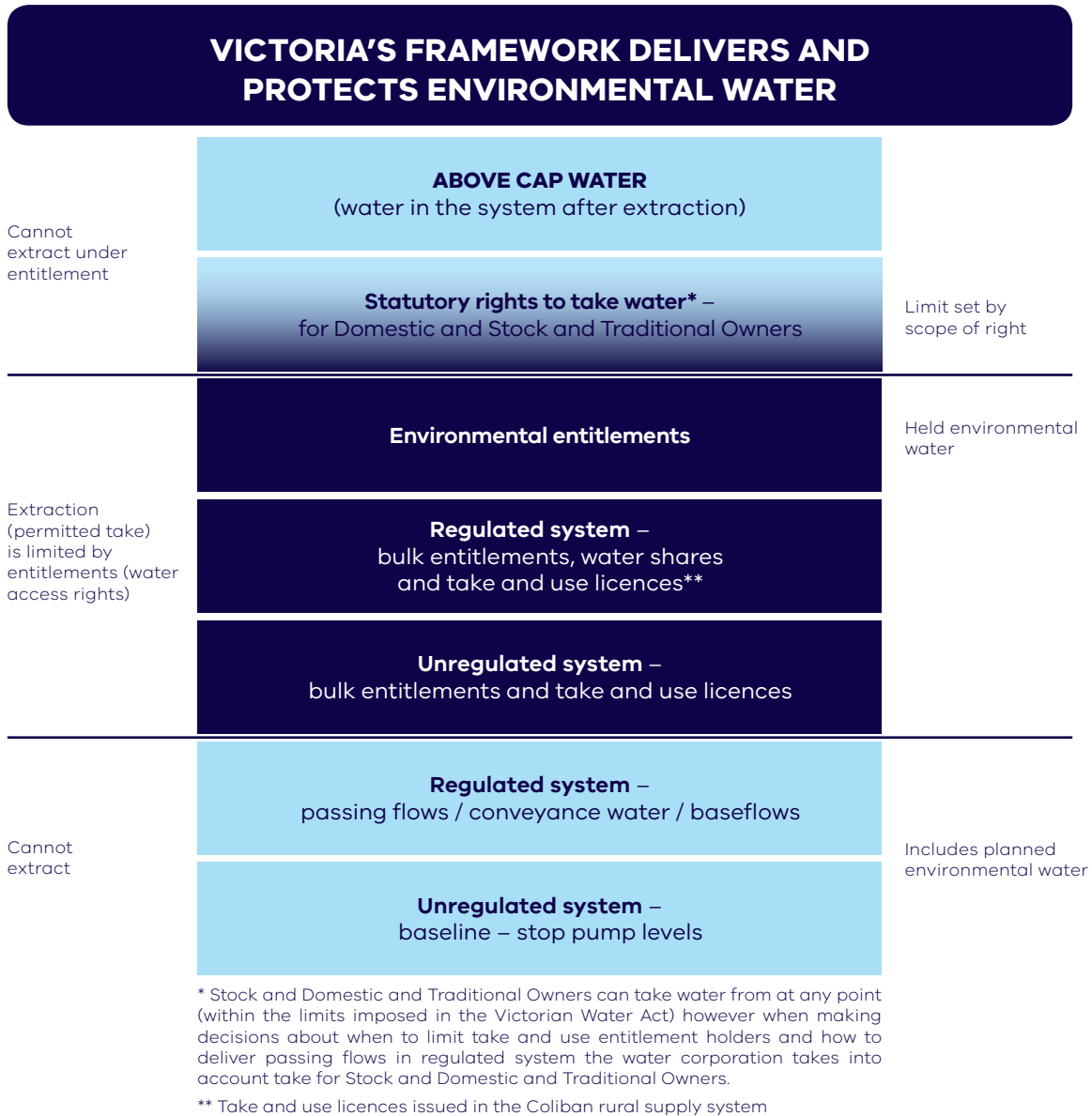
**5.2 Types of environmental water under the Basin Plan**

Victoria’s water management meets environmental objectives across all water resource plan areas in three main ways:

1. Environmental water entitlements such as bulk entitlements and environmental entitlements and water shares that are held or managed by the Victorian Environmental Water Holder or Commonwealth Environmental Water Holder (CEWH). These are known as held environmental water under the Basin Plan.
2. Passing flow requirements specified for environmental purposes under bulk entitlements or water supply protection area water management plans. These are known as planned environmental water under the Basin Plan.
3. Other water managed through water system management rules, including passing flows not specified as having an environmental purpose, and unregulated river diversion rules. This includes water called ‘above cap’ which remains in the system after consumptive and environmental entitlements are taken out, and water which is used mainly for consumptive purposes but can also benefit the environment.




**How all water in the system is used to contribute to the efficient use of environmental water and environmental outcomes is outlined in Part 12.2 of the Wimmera-Mallee Comprehensive Report & Section 12.4 of Victoria’s North and Murray Comprehensive Report**



**Figure 22: Victorian entitlement framework protects environmental water**

**5.2.1 Held environmental water**

 **Part 12.4.2.1 of the Wimmera-Mallee Comprehensive Report**  
**Section 12.4.2.1 of Victoria’s North and Murray Comprehensive Report**

In Victoria, held environmental water (HEW) is any water held under an entitlement for an environmental purpose. This water is also considered held environmental water under the Commonwealth definition because it is water specifically committed to environmental purposes under a water access right.

We often work to combine the use of held environmental water with other types of water use. The VEWH works closely with catchment management authorities and storage managers and

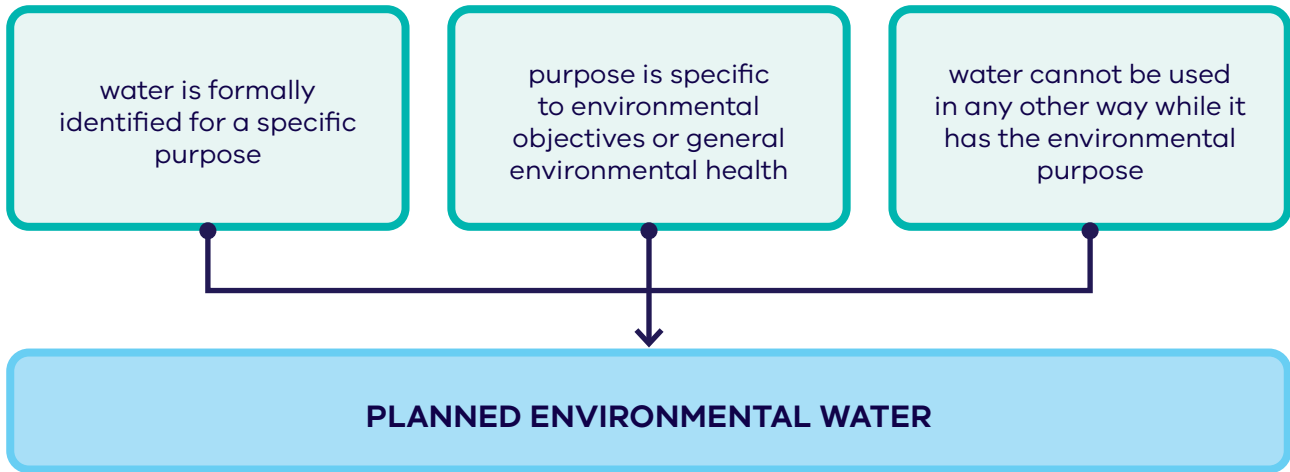
looks for practical opportunities to adjust the timing and route when delivering consumptive water to achieve environmental objectives efficiently.

This can include ‘piggy-backing’ the delivery of environmental water with consumptive water or passing flow obligations to get the best ecological benefits as efficiently as possible.

**5.2.2 Planned environmental water**

Victoria’s base flows and above cap water do not fall within the definition of planned environmental water (PEW).

Planned environmental water has three key elements:




**Figure 23: Planned environmental water**



### 5.2.2.1 Where Victoria does not meet the definition of planned environmental water

Minimum passing flows that appear in some bulk entitlements are generally not preserved exclusively for an environmental purpose or outcomes as required by the Commonwealth Water Act for the flows to be identified as planned environmental water. Passing flows in Victoria tend to serve multiple outcomes to provide shared benefits and are rarely identified as being for an environmental purpose only. For example, passing flows in many of the older bulk entitlements were designed to manage downstream water quality for the purpose of urban supplies.



See Part 12.2.2.2 of the Wimmera-Mallee Comprehensive Report

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See Section 12.4.2.2 of Victoria's North and Murray Comprehensive Report

No planned environmental water was identified in the Wimmera-Mallee water resource plan area.

There are three instances in Victoria's North and Murray water resource plan area where instruments meet the Basin Plan definition of planned environmental water as described here. These are:

- minimum passing flows available under the *Bulk Entitlement (Broken System – Goulburn-Murray Water) Conversion Order 2004*
- minimum passing flows available under the *Bulk Entitlement (Ovens System – Goulburn-Murray Water) Order 2004*
- minimum passing flows available under the Upper Ovens River Water Supply Protection Area: Water Management Plan (Goulburn-Murray Water 2011).

## 5.3 Setting objectives for environmental watering



See Part 12.4 of the Wimmera-Mallee Comprehensive Report

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See Section 12.6 of Victoria's North and Murray Comprehensive Report

The Victorian Water Act and the Commonwealth Water Act, including the Basin Plan, set out the objectives for environmental water management in Victoria. Basin Plan environmental watering is based on priority environmental assets and priority ecosystem functions.


Environmental water uses and environmental outcomes focus on the priority assets and ecosystem functions that have been identified. Extra requirements are imposed where those priority environmental assets are also Ramsar sites.

Victoria's environmental water management plans outline how waterway managers will meet long-term ecological objectives and required watering regimes for identified environmental assets. These environmental water management plans form the basis of the long-term watering plans developed under the Basin Plan. The environmental assets in Victoria's plans have also been identified as priority environmental assets for the Basin Plan.

Victoria has developed one long-term watering plan for each surface water resource plan area.



Victoria's long-term watering plans are available at <https://www.water.vic.gov.au/waterways-and-catchments/rivers-estuaries-and-waterways/environmental-water/long-term-watering-plans>



Environmental water management plans are available at <https://www.water.vic.gov.au/waterways-and-catchments/rivers-estuaries-and-waterways/environmental-water/environmental-water-management-plans>

### 5.3.1 Identification of priority environmental assets and priority ecosystem functions

Priority environmental assets support ecological values that are significant at Commonwealth and state level, and meet criteria in Schedule 8 of Basin Plan, as outlined in the long-term watering plans.

An asset may be a single wetland or waterbody, a wetland complex like the Wimmera-Mallee Pipeline Wetlands, or a river at a geographic location like Mount William Creek. A wide range of aquatic plants, wildlife and ecosystem processes rely on wetlands and rivers. Ecosystem functions that support these ecological values include the condition of the landscape and hydrological connectivity.

A set of priority ecosystem functions for the Basin Plan have also been identified in Victoria's long-term watering plans. The management arrangements for these functions and for priority environmental assets that benefit from environmental water planning are detailed in those plans.

Ecosystem functions are the basic physical, chemical and biological processes that support environmental assets. They include the transport of nutrients, organic matter and sediment in rivers, wetting and drying cycles, and supporting plants and animals to migrate and re-establish along rivers and across floodplains.



*Reed Bed Swamp*  
Credit: DELWP

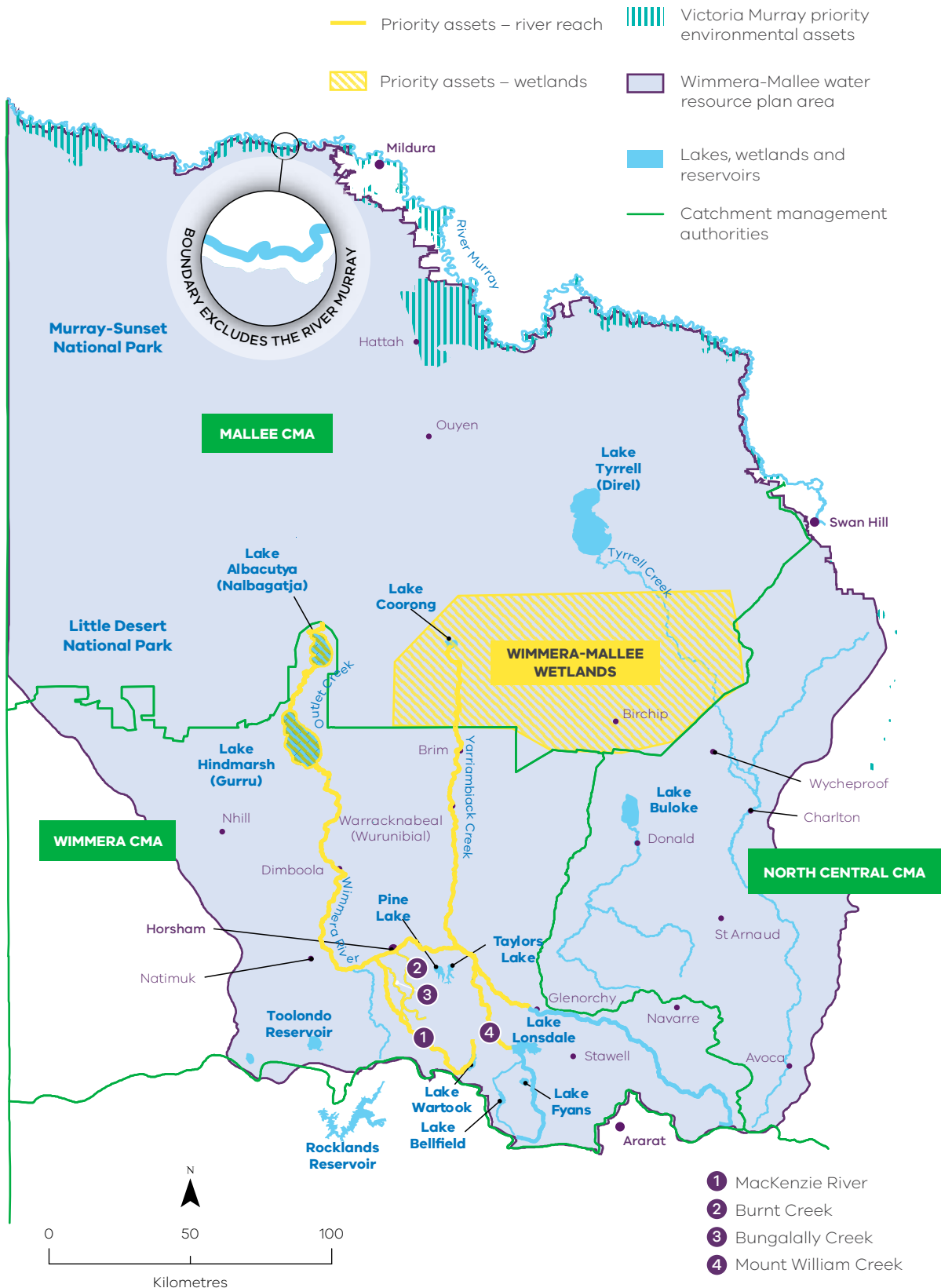



Figure 24: Priority environmental assets in the Wimmera-Mallee water resource plan area

### 5.3.1.1 Wimmera-Mallee water resource plan area

 See Part 12.3 of Wimmera-Mallee Comprehensive Report

The priority environmental assets for the Wimmera Mallee water resource plan area are the ecosystems depending on water in the rivers, wetlands or floodplains in **Figure 24. Table 5** shows the priority ecosystem functions in the Wimmera-Mallee water resource plan area.

The Murray floodplain’s flat landscape means that several environmental assets extend from the Victorian Murray water resource plan area into the Wimmera-Mallee water resource plan area. These assets, including Hattah Lakes, are not connected to surface or groundwater in the Wimmera-Mallee water resource plan area and get all their source water from the River Murray.

Assets identified as priorities in the Victorian Murray long-term watering plan will be included under the Northern Victoria Water Resource Plan.

Ramsar sites are recognised for holding representative, rare or unique wetlands or wetlands vital for conserving biodiversity. They must satisfy one or more of the criteria for identifying wetlands of international importance to be on this list.

 Ramsar priority environmental assets are discussed at Part 12.3.3 of the Wimmera-Mallee Comprehensive Report

The Wimmera-Mallee water resource plan area supports one Ramsar site, Lake Albacutya. This terminal lake in the Wimmera system gets water only in exceptionally wet years when Lake Hindmarsh spills and overflows into Outlet Creek, which then carries water in to Lake Albacutya.

Implementation of the Basin Plan helps to maintain the ecological character of Ramsar wetlands. Basin states and the Commonwealth are responsible for keeping the ecological character of Ramsar wetlands through various strategies, investment, partnerships and actions on the ground.

**Table 5: Priority ecosystem functions in the Wimmera-Mallee water resource plan area**

Ecosystem function	Function characteristics
Longitudinal hydrological connectivity (between river reaches for fish movement)	Supports the transportation and dilution of nutrients, organic matter and sediment
Provides connections along a watercourse (longitudinal connections)	
Surface water salinity (for growth and reproduction of aquatic vegetation)	Supports the creation and maintenance of vital habitats
Refuges (for native fish species)	Supports the creation and maintenance of vital habitats and populations
Geomorphic habitat	Supports the creation and maintenance of vital habitats

### 5.3.1.2 Victoria’s North and Murray water resource plan area


 See Section 12.5 of Victoria’s North and Murray Comprehensive Report

The priority environmental assets and priority ecosystem functions that benefit from environmental water planning and management arrangements are detailed in the Victorian Murray and the Northern Victoria long-term watering plans. These plans set out the ecological objectives and targets for priority environmental assets and the corresponding environmental watering requirements to achieve them.

Many more waterways in the Northern Victoria and Victorian Murray water resource plan areas are not connected to regulated water supply systems and

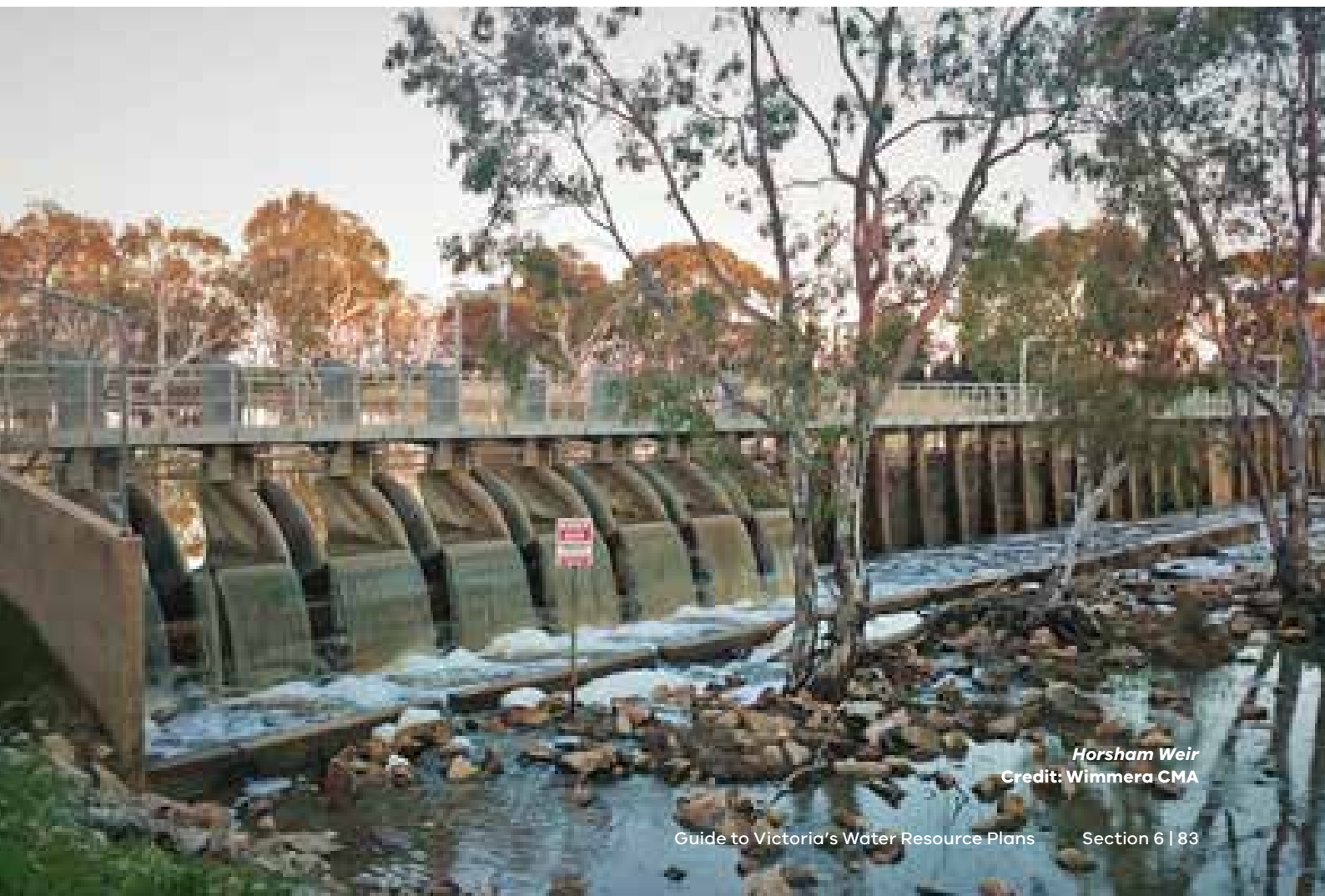
cannot receive held environmental water. These include unregulated rivers noted in the long-term watering plans.

For this reason, Victoria has not identified these as priority environmental assets for the purposes of Basin Plan.

 A list of the priority environmental assets is in Table 4 and Table 5 of Appendix E to Victoria’s North and Murray Comprehensive Report

The priority environmental assets in the Victorian Murray water resource plan area are shown in [Figure 25](#).

Priority environmental assets in the Northern Victoria water resource plan area are shown in [Figure 26](#).



*Horsham Weir*  
Credit: Wimmera CMA

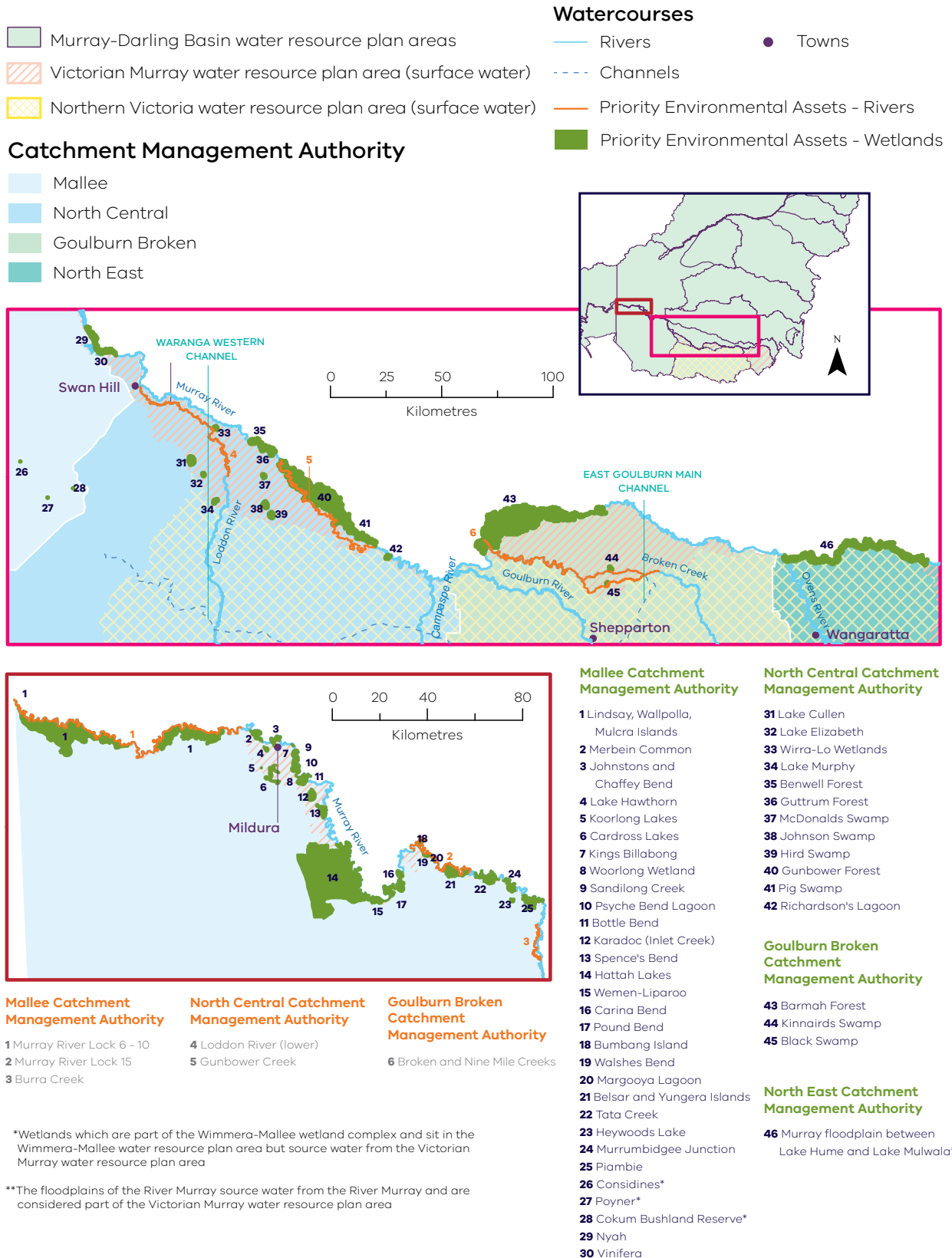


Figure 25: Priority environmental assets in the Victorian Murray water resource plan area

### Murray-Darling Basin water resource plan areas - surface water

Northern Victoria water resource plan area

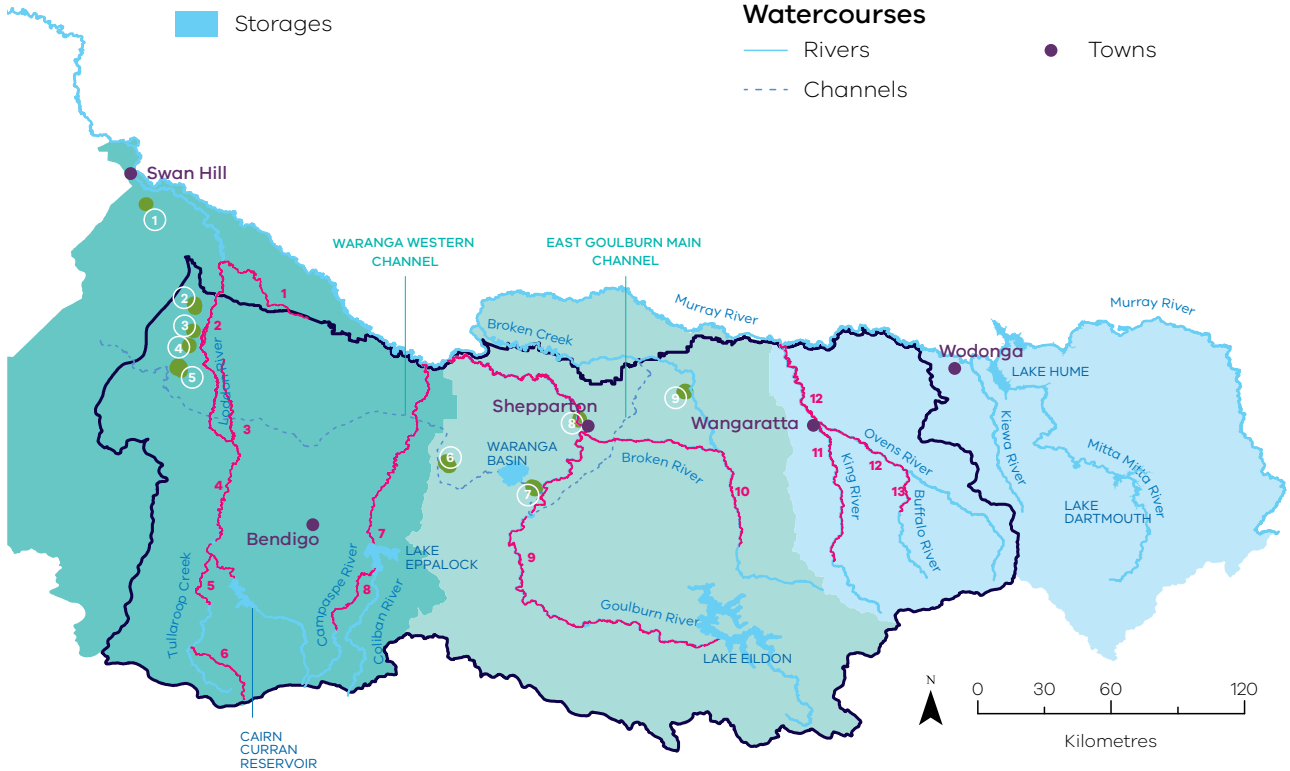
- Priority Environmental Assets - Rivers
- Priority Environmental Assets - Wetlands
- Storages

### Catchment Management Authority

- North Central
- Goulburn Broken
- North East

### Watercourses

- Rivers
- Channels
- Towns



### Priority Environmental Assets

#### North Central Catchment Management Authority

- 1 Round Lake
- 2 Meran Lakes Complex
- 3 Lake Leaghur
- 4 Lake Yando
- 5 Lake Boort

#### Goulburn Broken Catchment Management Authority

- 6 Gaynor Swamp
- 7 Doctors Swamp
- 8 Reedy Swamp
- 9 Moodies Swamp

#### North Central Catchment Management Authority

- 1 Pyramid Creek
- 2 Twelve Mile Creek
- 3 Serpentine Creek
- 4 Loddon River (Middle and Upper)
- 5 Tullaroop Creek
- 6 Birch's (Bullarook) Creek
- 7 Campaspe River
- 8 Coliban River

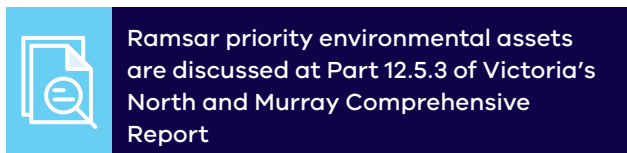
#### Goulburn Broken Catchment Management Authority

- 9 Goulburn River
- 10 Broken River

#### North East Catchment Management Authority

- 11 King River
- 12 Ovens River
- 13 Buffalo River

Figure 26: Priority environmental assets in the Northern Victoria water resource plan area



The Victorian Murray and Northern Victoria water resource plan areas support four of the Murray-Darling Basin's Ramsar sites. These are all priority

environmental assets and are supported by priority ecosystem functions. Three of the four Ramsar sites are Living Murray icon sites.

The long-term watering plan identified two priority ecosystem functions for the Victorian Murray water resource plan area and three for the Northern Victoria water resource plan area.

**Table 6: Priority ecosystem functions in the Victorian Murray water resource plan area**

Ecosystem Function	Function characteristics
Lateral hydrological connectivity (between floodplains, anabranches and wetlands)	Supports the transportation and dilution of nutrients, organic matter and sediment
	Provides connections across floodplains, adjacent wetlands and billabongs (lateral connections)
Water quality (that allows for ecosystem processes)	Supports the creation and maintenance of vital habitats and populations
	Supports the dilution of carbon and nutrients from the floodplain to the river system

Source: Long-term watering plan Victorian Murray (DELWP, 2015)

**Table 7: Priority ecosystem functions in the Northern Victoria water resource plan area**

Ecosystem Function	Function characteristics
Longitudinal hydrological connectivity (between river reaches and the River Murray)	Supports the transportation and dilution of nutrients, organic matter and sediment
	Provides connections along a watercourse (longitudinal connections)
Water quality (that allows for ecosystem processes)	Supports the creation and maintenance of vital habitats
	Supports the dilution of carbon and nutrients from the floodplain to the river system
Geomorphic habitat	Supports the creation and maintenance of vital habitats

Source: Northern Victoria Long-term Watering Plan (DELWP, 2015)



### 5.3.2 Monitoring environmental outcomes

DELWP invests in staff and projects at catchment management authorities (CMAs) for managing and delivering local waterway health and environmental water results. This includes work with local communities to set aims and priorities for their waterways.

DELWP also invests in VEWH staff to manage Victoria's held environmental water and to carry out long-term intervention monitoring of held environmental water in rivers and wetlands with the Arthur Rylah Institute. This is done under the Victorian Environmental Flows Monitoring and Assessment Program and the Wetlands Monitoring and Assessment Program.

Both programs include monitoring that links to the objectives and targets in Victoria's long-term watering plans and to objectives in Victoria's asset-scale environmental water management plans prepared by the CMAs. These also link to the objectives listed in both the Basin-wide Environmental Water Strategy and in Chapters 5 and 8, Schedules 7 and 8 in the Murray-Darling Basin Plan.

Other programs with monitoring relevant to Basin Plan outcomes include The Living Murray program, Victoria's Native Fish Report Card and the Commonwealth Long-Term Intervention Monitoring sites located on the Goulburn River.

The Commonwealth Environmental Water Holder carries out the long-term intervention monitoring program across the Murray-Darling Basin, including at sites on the Goulburn River in Victoria. This monitoring and Victoria's state-based monitoring will be used to report on outcomes of environmental water use for Victoria's first Schedule 12 Matter 8 reporting on environmental outcomes at the asset scale. See Section 15.7 of Victoria's North and Murray Comprehensive Report for more information on reporting under Schedule 12 of the Basin Plan.

#### 5.3.2.1 Monitoring, evaluation, reporting and adaptive management

Victoria has two main environmental water monitoring programs, the Victorian Environmental Flows Monitoring and Assessment Program and the Wetland Monitoring and Assessment Program for environmental water.

Both programs include monitoring that connects to the objectives and targets outlined in Victoria's long-term watering plans. These directly link to objectives outlined in Victoria's asset-scale environmental water management plans prepared by the CMAs, as well as the objectives listed in both the Basin-wide Environmental Water Strategy and in the Murray-Darling Basin Plan in Chapters 5 and 8, Schedules 7 and 8.

Other programs with relevant monitoring for Basin Plan outcomes include The Living Murray program, Victoria's Native Fish Report Card and the Commonwealth Long-Term Intervention Monitoring sites on the Goulburn River. These monitoring programs will be used by Victoria to report on 'achievement of environmental outcomes at the asset scale' in Schedule 12 Matter 8. DELWP will draft a monitoring, evaluation and reporting strategy to outline how Victoria will report on Matter 8.

The results and learning from the Victorian Environmental Flows Monitoring and Assessment Program and Wetland Monitoring and Assessment Program for environmental water are fed into decisions and management of Victoria's Basin waterways. Results from monitoring at each site are communicated immediately after surveys to the Catchment Management Authorities environmental water reserve managers. Managers can then adjust their planning for the delivery of environmental water as necessary. This cycle is shown in [Figure 27](#).

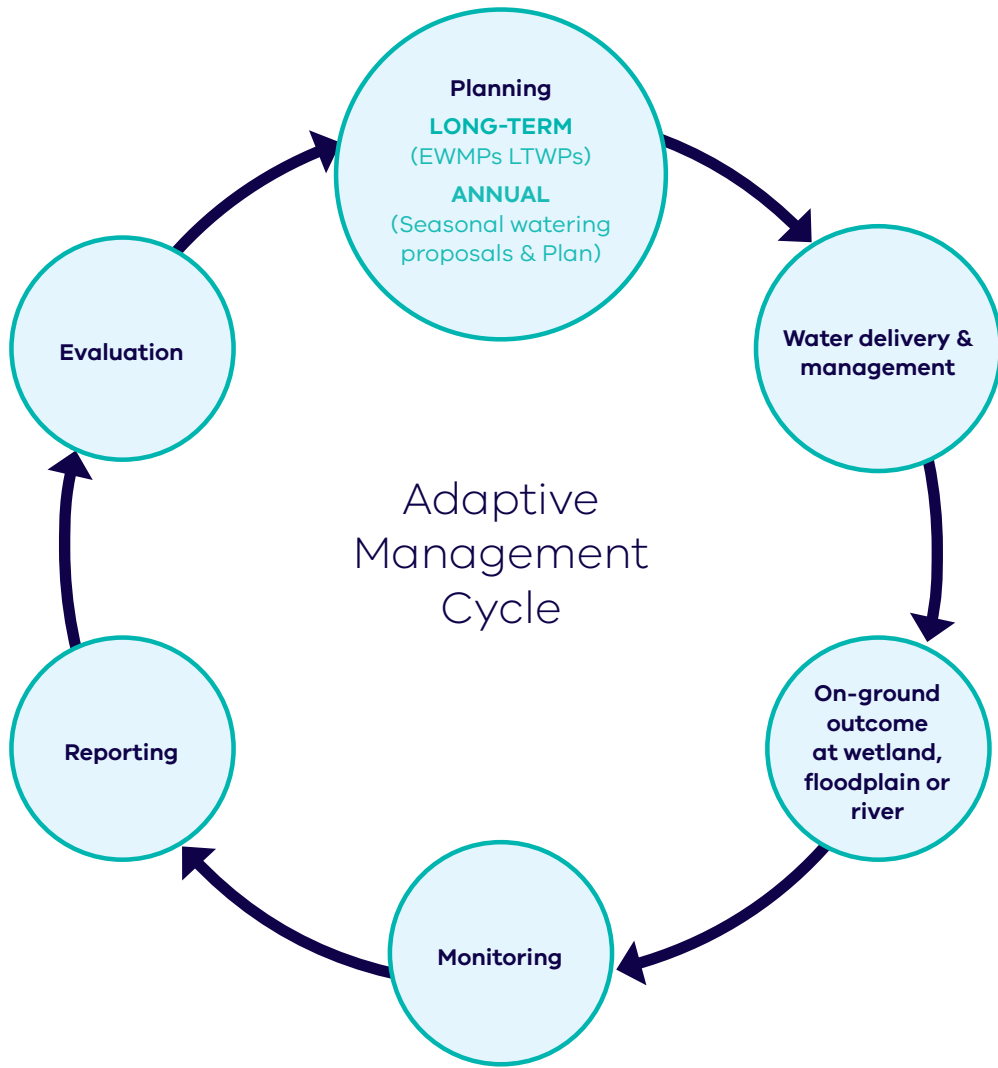


Figure 27: Adaptive Management Cycle

## 5.4 Meeting Basin Plan requirements

Basin Plan water resource plan requirements for environmental watering have three main components:

- identification of water available for the environment (under section 10.09 of the Basin Plan), being either held environmental water (entitlements) or planned environmental water (water protected for the environment by rules)
- management of environmental watering (under Part 6 of Chapter 10 of the Basin Plan) in a way that is (a) consistent with Chapter 8 of the Basin Plan (b) coordinated and (c) does not reduce the protection of planned environmental water
- management of the resource (under Part 4 of Chapter 10 of Basin Plan) to ensure that meeting environmental watering requirements is not compromised.

The Basin Plan's objectives and targets have been integrated into the annual and long-term processes of Victoria's environmental water planning. The Victorian Waterway Management Strategy commits all environmental water managers to comply with Victorian and Basin Plan environmental water planning under state policy and investment.

Victoria's water resource management framework is designed to support environmental watering and there are strong processes in place to consider impacts on the environment. Victoria does not consider it necessary to include rules in its water resource plans to ensure the state's environmental watering requirements are met.

As a result, Victoria's water resource plans do not contain rules in response to section 10.17 of the Basin Plan.

**Figure 14** on **page 40** shows Victoria's environmental water planning and management framework.

### 5.4.1 Wimmera-Mallee water resource plan response



See response to Part 6 of the Wimmera-Mallee Index Table

See response to section 10.26 in the Wimmera-Mallee Index Table

Victoria's response to Basin Plan requirements varies between the two water resource plans because of the different nature of the resources in the Wimmera-Mallee and Victoria's North and Murray water resource plan areas.

In addressing the environmental watering requirements under Part 6 of Chapter 10 of the Basin Plan it is important to note that:

- no planned environmental water was identified in the Wimmera-Mallee water resource plan area so the requirement to ensure there is no net reduction in the protection of planned environmental water did not apply under the Wimmera-Mallee Water Resource Plan.
- no significant connections between the surface water of the Wimmera-Mallee water resource plan area and adjacent water resource plan areas, so the requirement to coordinate environmental watering across two water resource plan areas did not apply to the Wimmera-Mallee Water Resource Plan.

In response to section 10.26 of the Basin Plan, Victoria has recognised the obligation to carry out environmental watering in a way that supports meeting the Basin Plan's environmental objectives.


The Wimmera-Mallee Water Resource Plan imposes these requirements for environmental watering:

- that the VEWH ensures its environmental watering is consistent with the Basin-wide environmental watering strategy and contributes to the objectives of Basin Plan
- the VEWH must consider the relevant long-term watering plan when performing its functions
- DELWP must consider regulated and unregulated systems when developing long-term watering plans.

### 5.4.2 Victoria’s North and Murray water resource plan response

The significant differences in Victoria’s approach to responding to environmental watering requirements in the two surface water areas is that planned environmental water has only been identified in the Northern Victoria water resource plan area and there are connections between Victoria’s North and Murray water resource plan area and adjacent surface water plan areas in New South Wales and South Australia.

#### Meeting Basin Plan objectives for environmental watering



See response to section 10.26 in Victoria’s North and Murray Index Table

In response to section 10.26 of the Basin Plan, Victoria has recognised the obligation to carry out environmental watering to support meeting the Basin Plan’s environmental objectives.

Victoria’s North and Murray Water Resource Plan imposes the following requirements for environmental watering:

- that the VEWH ensures its environmental watering is consistent with the Basin-wide environmental watering strategy and contributes to the objectives of Basin Plan
- the VEWH must consider the relevant long-term watering plan when performing its functions
- DELWP must consider regulated and unregulated systems when developing long-term watering plans.


As well as these requirements for Victoria, the response to section 10.26(1) of the Basin Plan includes an outline of how Victoria’s water resource management framework supports environmental watering and how other water can contribute to meeting environmental watering outcomes.

This information was included to respond to concerns from the MDBA that Victoria’s baseflows and above cap water were not captured as planned environmental water under the Basin Plan.

Unless an entity is identified in Column 4 of Victoria’s North and Murray Index Table, the response to section 10.26(1) does not impose a requirement on Victoria to manage its water in a particular way.


#### 5.4.2.1 Coordinating environmental watering between water resource plan areas

Victoria has committed the VEWH to carrying out environmental watering in a coordinated way. Setting this rule in Victoria’s North and Murray Water Resource Plan does not require the VEWH to change its current operating strategy and approach to environmental watering.



See response to section 10.27 in Victoria’s North and Murray Index Table for formal obligation on the VEWH

#### No net reduction in planned environmental water



See response to section 10.28 in Victoria’s North and Murray Index Table and Section 12.4.2.3 of Victoria’s North and Murray Comprehensive Report

Section 10.28 of the Basin Plan requires that there is no net reduction in the protection of planned environmental water from that provided under state law immediately before the start of the Basin Plan.

Of the three identified cases of planned environmental water identified in Victoria’s North and Murray water resource plan area, there have been no changes to instruments or rules for the water in the Ovens system.

There was a change to the instrument *Bulk Entitlement (Broken System - Goulburn-Murray Water) Conversion Order 2004* (Broken BE) for the Broken system in 2017 which altered the arrangements to provide flexibility to manage extreme events.

The provision gives the Authority (Goulburn-Murray Water) and the waterway manager (Goulburn-Broken CMA) the ability to agree to a reduction in minimum flows or an increase in maximum passing flows.

Victoria considers that the arrangements in place supported the discretion to provide extra protection to planned environmental water under the bulk entitlement.

However, the Murray-Darling Basin Authority considered it necessary to provide greater certainty to the protections, so the process for managing changes to minimum environmental passing flows under the bulk entitlement were included in Victoria's North and Murray Water Resource Plan.

Goulburn-Murray Water and the Goulburn-Broken Catchment Management Authority are required to support the ongoing protection of planned environmental water in the Broken by:

- a. keeping a record of the modifications made to the volume of water passed as environmental flows in accordance with clause 12.4 of the Broken bulk entitlement
- b. keeping a record of the total volume of water which would have been passed in accordance with the rules in the bulk entitlement, and which constitutes the planned environmental water, over a rolling two-year period
- c. calculating the difference between the modified volume that is passed and the volume of water that would otherwise have been passed in accordance with the rules in the Broken bulk entitlement
- d. making the volume calculated as set out in paragraph c) available for release as agreed with the waterway manager in accordance with the relevant environmental water management plan.

## 5.5 Supporting environmental watering

### Basin Plan Requirements

Under Part 4 of Chapter 10 of the Basin Plan, Victoria is required to ensure that the operation of Victoria's water resource plans do not impact on environmental watering (section 10.17 of the Basin Plan) including where:

- watering relates to groundwater-dependent ecosystems or groundwater-dependent assets (section 10.18 of the Basin Plan)
- watering relates to resources with a significant connection between groundwater and surface water (section 10.19 of the Basin Plan).

Part 4 of Chapter 10 of the Basin Plan also requires consideration of the management risks to the structural integrity of an aquifer (section 10.20 of the Basin Plan). Rules must apply in respect of the Goulburn-Murray: Sedimentary Plain SDL resource unit for this requirement (section 10.21 of the Basin Plan for Victoria's North and Murray Water Resource Plan)



See Part 12.7 of the Wimmera-Mallee Comprehensive Report

See Section 12.8 of Victoria's North and Murray Comprehensive Report

The difficulty in determining the most appropriate response to these requirements has been the need to consider how the operation of Victoria's North and Murray Water Resource Plan itself impacts on meeting environmental watering requirements.

Victoria maintains the situation would not develop where the rules set in water resource plans would compromise the state in meeting its environmental watering requirements because:

- the water resource plans operate within Victoria's water resource management framework under the Victorian Water Act, with safeguards against the impact of water resource management and water use on the environment and other users in the system
- the water resource plans reflect Victoria's enabling and adaptive water resource management

framework, with the flexibility to manage a range of scenarios but also requiring decision makers to consider the impacts on the environment before making a decision

- the Victorian Environmental Water Holder uses its held environmental water to meet all watering requirements and is a key stakeholder in deciding on arrangements to manage the system
- Victoria has not included any rules in its water resource plans to override the environmental and water user protections provided in the Victorian Water Act.

Part 4 of Chapter 10 also requires consideration of water quality risks, identified in response to section 10.21 in the Wimmera-Mallee Index Table. This is discussed in [Section 6](#).

The response to Part 4 of Chapter 10 of Basin Plan should be read together with Part 6 of Chapter 10.

For discussion of environmental watering requirements see [Section 5.3](#).



### 5.5.1 Wimmera-Mallee Water Resource Plan response

Under the Wimmera-Mallee Water Resource Plan no rules were included to respond to Part 4 of Chapter 10 of Basin Plan.



See response to Part 4 of the Wimmera-Mallee Index Table

As outlined before, Victoria’s response to Basin Plan requirements is different between the two water resource plans because of the different nature of the resources in the water resource plan areas.

The differences in the Wimmera-Mallee are that:

- there are no significant connections between surface water and groundwater, so there are no formal requirements under the Wimmera-Mallee Water Resource Plan to respond to section 10.19 of the Basin Plan
- there are no groundwater-dependent priority environmental assets and priority ecosystem functions, so there are no formal requirements under the Wimmera-Mallee Water Resource Plan to respond to section 10.18 of the Basin Plan
- no risks were identified for the structural integrity of aquifers, and so no rules were included in response to section 10.20 of the Basin Plan.

### 5.5.2 Victoria’s North and Murray Water Resource Plan response

The rules included in Part 4 of Victoria’s North and Murray Index Table support the continued application of a key Ministerial policy to groundwater licensing decisions and the use of statutory management plans to address high risks to Victoria’s resources.



See Part 4 of Victoria’s North and Murray Index Table



See Section 12.8 and Table 12-4/12-5 of Victoria’s North and Murray Comprehensive Report

Victoria’s North and Murray Water Resource Plan does not contain requirements, obligations, measures or strategies that would cause environmental watering to be compromised.

However, rules are included to address potential emerging risks that may arise during the operation of the Basin Plan and should prevent environmental watering being compromised under the Plan.

The rules proposed in Victoria’s North and Murray Water Resource Plan are consistent with current arrangements under the Victorian Water Act and relevant statutory management plans approved for declared water supply protection areas in this water resource plan area.

#### 5.5.2.1 Environmental watering generally – section 10.17 of the Basin Plan



See response to section 10.17 and 10.26 of Victoria’s North and Murray Index Table

Victoria’s North and Murray Water Resource Plan imposes an obligation on the relevant storage manager to provide clarity about how Victoria’s water resource management framework supports the VEWH in meeting its environmental watering requirements.




This rule recognises the storage manager’s role in supporting the VEWH as a water user that can use its environmental entitlements effectively and efficiently to meet environmental outcomes.

Including this rule does not change how the storage manager is required to manage the system, but recognises the storage manager’s role supporting the VEWH.

### 5.5.2.2 Meeting environmental watering requirements where there is groundwater connectivity


A major consideration in groundwater management in Victoria is the impact of groundwater take and use on connected surface water systems and groundwater dependent priority environmental assets.



See section 4.4 of Victoria’s North and Murray Comprehensive Report for more information on connectivity

For more detail on which priority environmental assets are groundwater dependent in Victoria’s North and Murray water resource plan areas see [Section 5.3.1.2](#).

Victoria’s existing arrangements informed our response to Part 4 of Chapter 10 of the Basin Plan. These include the Victorian Water Act, Ministerial guidelines and statutory management plans.



See Section 12.8.3 and 12.8.4 of Victoria’s North and Murray Comprehensive Report

Rules are included in Victoria’s North and Murray Water Resource Plan which ensure Victoria continues to support environmental watering but also remains adaptive and can deal with emerging risks and new water resource management challenges. Rules are included to respond to sections 10.18 and 10.19 of the Basin Plan and reflect Victoria’s water resource management framework.

The rules require:

1. a review of risks to groundwater-dependent ecosystems (section 10.18 Basin Plan) or surface water flows as they relate to environmental ecosystems (section 10.19 Basin Plan) where there is groundwater take under a take and use licence, and where no statutory management plans are in place
2. where a statutory management plan is being prepared for a declared water supply protection area, it would need to consider whether prescriptions are necessary in that plan to address risks to environmental watering. The considerations must relate to the impact on a priority environmental asset or ecosystem function dependent on groundwater (section 10.18 Basin Plan), or surface water where a significant hydrological connection between surface water and groundwater has been identified (section 10.19 Basin Plan).


The first rule recognises the application of the Minister’s Guidelines for Groundwater Licensing and the Protection of High-Value Groundwater-Dependent Ecosystems (DELWP, 2015), which outline the decision-making process when assessing a new licence or trade of a groundwater licence. It sets out the requirements for assessing the risk posed by a licence application and takes a risk-based approach to identify where a proposed take may impact on a groundwater-dependent ecosystem or surface water flows. Conditions can be imposed to reduce those adverse impacts where risks are identified.

Where there is an approved statutory management plan in place for a declared water supply protection area, the Minister’s guidelines do not apply. This is because the prescriptions in the relevant statutory management plan apply to all licensing decisions in that water supply protection area and would override the application of the policy.

The second rule addresses the requirements for statutory management plans developed in areas with priority environmental assets or priority ecosystem functions depending on groundwater, or where there is identified significant hydrological connectivity between surface water and groundwater.




It identifies the matters to be considered when developing prescriptions or rules under a statutory management plan.

 See response to section 10.18 and 10.19 of Victoria’s North and Murray Index Table

The Upper Ovens Case Study provided in section 12.8.4 of Victoria’s North and Murray Comprehensive Report shows how the rules provided in the Upper Ovens River Water Supply Protection Area Statutory Management Plan are consistent with the rules in response to section 10.18 and 10.19 of Victoria’s North and Murray Index Table.

**5.5.2.3 Structural integrity of aquifers – 10.20 and 10.21 of the Basin Plan**

 See response to section 10.20 and 10.21 in Victoria’s North and Murray Index Table

 See Katunga Case Study in Section 12.8.5 of Victoria’s North and Murray Comprehensive Report

Section 10.20 of the Basin Plan requires consideration of whether the content of Victoria’s North and Murray Water Resource Plan would compromise:

- the structural integrity of an aquifer, whether within or outside the water resource plan area, arising from take within the long-term annual diversion limit for an SDL resource unit and hydraulic relationships and properties between groundwater and surface water systems, between groundwater systems and within groundwater systems.

Victoria considers there are no structural risks to the aquifers because the amount of take is limited by the permissible consumptive volumes (PCV) set for intensive use areas. The PCV level and prescriptions included in the approved statutory management plans will not cause significant drawdown and structural risk to the aquifers.

As a result, it is not considered necessary to include rules in Victoria’s North and Murray Water Resource Plan to respond to section 10.20 of the Basin Plan. However, section 10.21 of the Basin Plan requires that a rule to meet the objectives of section 10.20 must be included in a water resource plan that relates to the Goulburn-Murray: Sedimentary Plain SDL resource unit.

The rule identified to meet the objectives of section 10.21 for this SDL resource unit has been applied to the whole Goulburn-Murray water resource plan area by including it as a response to section 10.20(3) of the Basin Plan in Victoria’s North and Murray Index Table.

This supports Victoria’s approach to water resource management, which is fundamentally consistent across the state, but can adapt to respond to localised issues.

If a risk emerges to the structural integrity of an aquifer and the hydraulic relationships within groundwater systems or between groundwater and surface water, the Minister can prepare guidelines that require setting prescriptions in a statutory management plan where a water supply protection area has been declared.

The current statutory management plans in place in the Goulburn-Murray water resource plan area are consistent with the rules to respond to section 10.20 of the Basin Plan.

## 6. Responding to water challenges

### 6.1 Assessing current and future risks, management and mitigation strategies

#### Basin Plan Requirements

Under Part 9 of Chapter 10 of the Basin Plan, Victoria is required to undertake a risk assessment.

A water resource plan must:

- be prepared having regard to current and future risks to the condition and continued availability of the water resources of the water resource plan area (10.41(1)),
- describe each risk which is defined as having a medium or higher level of risk and the factors that contribute to those risks (10.42), and
- describe a strategy for the management of the water resources of the water resource plan area to address the risk in a manner commensurate with the level of risk (10.43(1)).

Under the Basin Plan, water resource plans must deal with matters including risks to the health and uses of water resources in or connected to a plan area. Victoria's risk assessment is complex because it is so comprehensive.

This section outlines how Victoria did its risk assessment and is a guide to reading Appendix B to both Comprehensive Reports. Please refer to the relevant report referenced here for a complete understanding of the risk assessment.

A risk assessment must consider current and future risks associated with:

- water availability
- water not being of a suitable quality for use, including because of salinity
- water requirements for priority environmental assets, ecosystem functions, and the health of ecosystems depending on water
- groundwater systems, including structural damage and groundwater/surface water connections
- interception activities
- water quality degradation
- extreme events.

These risks can affect consumptive and other economic uses of water to maintain social, cultural, Indigenous and other values for public benefit.



*Bushfire*  
Credit: DELWP

Victoria manages or addresses these risks through four key elements:

- environmental watering plans
- a water quality and salinity management plan
- water trading rules
- a risk-based approach to water resource planning and management.

Managing flows to get the best outcomes across different water uses and effective monitoring and evaluation also contribute to mitigating risks as the Basin Plan is put into action. This involves promoting and enforcing compliance with the Basin Plan and water resource plans, and by improving knowledge about the requirements for environmental watering and the social, spiritual and cultural uses of water in the Basin.

In managing and mitigating risks, we consider:

- the impact of climate change on water requirements
- the water required to deliver social and economic benefits to Basin communities
- interception activities and land use change, including floodplain harvesting and peri-urban and industrial take
- improved measurement of groundwater and surface water resources to understand causes of

water quality degradation, and its effect on environmental assets and ecosystem function.

### 6.1.1 Doing the risk assessment

Victoria has used a single common and consistent framework for assessing risks under the state's two water resource plans and five water resource plan areas. This provides a transparent, comprehensive assessment and allows all risks to be documented and explicitly considered. Risks were assessed based on the requirements of International Organisation for Standardisation -ISO 31000:2009 as required by the Basin Plan.

An internal DELWP working group and technical advisory panel were involved in the assessment. It included a review of data used, the identification of risks, method, scenarios to be assessed, and the outcomes. The assessment adopted a detailed analysis of specific risks and grouped them into themes for broader analysis of the issues.

Risks were identified as causes and threats that may impact the beneficial uses of water. The risk assessment includes 17 separate causes, 13 threats and 37 beneficial use categories. See [Table 8](#) for a summary of identified causes, threats and beneficial uses.

An extensive literature review and engagement process identified potential causes of risk. The causes identified from the literature review and consultation, such as climate change, were then assigned a specific scenario that would generate an adverse threat.

It is important to note that scenarios cover a range of possible future situations and are not forecasts of a most likely future. For example, possible causes of water quality degradation do not necessarily mean that degradation is happening now. See [Section 6.3](#) for more information.

Risk levels range from no plausible risk to very high. These were determined as a product of likelihood and the consequence of a risk occurring. A rating on the level of confidence about probability, susceptibility and sensitivity was also applied to each risk. The consequence of the risk occurring was

considered on a water resource plan scale rather than a local scale.

[Figure 28](#) and [Figure 29](#) explain how to read and understand the risk assessment of Victoria’s North and Murray Water Resource Plan and Wimmera–Mallee Water Resource Plan.

- See step 1 to understand specific information on the data and methods used to assess the risks, especially categories for causes and scenarios, threats and beneficial uses.
- See steps 2 and 5 for general outcomes or a summary of the risk assessment in the water resource plan areas.
- See steps 3, 4 and 6 for specific and detailed outcomes of the risk assessment in the water resource plan areas.

### Worked example

A cause – like climate change – is almost certain to result in a threat occurring, like a decline in water availability. This then impacts on a beneficial use of water, such as cropping using low-reliability entitlement water. When likelihood and consequence are combined, this could then be considered very high risk. Breaking this down into its parts:

**The assessment of likelihood:** is the probability of a particular cause occurring, given existing management arrangements.

**Susceptibility:** is the scale of threat that will arise from a particular cause. The likelihood of climate change occurring over the 10-year life of the water resources plan could be considered certain in a particular area and the adopted scenario, like a long-term representation of the Millennium Drought.

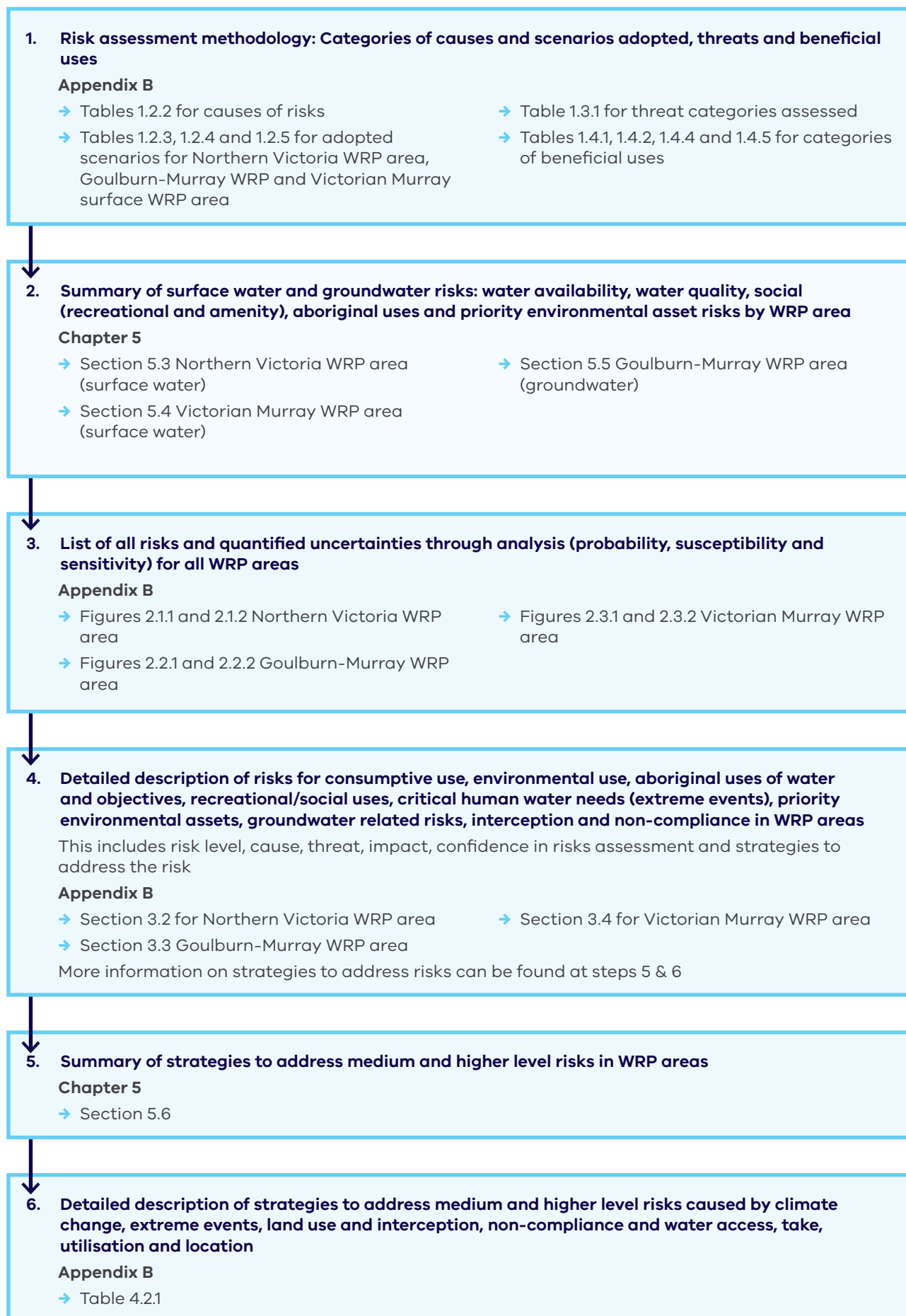
The threat of a reduction in the volume of available surface water is highly susceptible to climate change. Susceptibility considers the scale of threat that will arise from a particular cause, taking into account its magnitude and the area covered and length of time.

**The assessment of consequence:** is that if a threat like a reduction in the volume of available surface water is realised, the consequences will vary between different beneficial users. The assessment of consequence considers how sensitive each beneficial use is to a particular threat. In this case the beneficial use of water for irrigated cropping using low-reliability water is highly sensitive to changes in the water’s availability.

**Table 8: Summary of the identified causes, threats and beneficial uses considered in the risk assessment**

 <b>CAUSE</b>	 <b>THREAT</b>	 <b>USE</b>
<p>An event or events that can lead to a threat.</p>	<p>A deviation from an agreed starting point that may affect beneficial uses.</p>	<p>The water resource plans protect the 'condition and continued availability' of Basin water resources for beneficial uses.</p>
<p>Causes considered in this assessment:</p> <ul style="list-style-type: none"> <li>• climate change</li> <li>• extreme drought</li> <li>• extreme wet periods</li> <li>• flooding</li> <li>• land use change (affecting availability)</li> <li>• land use change (affecting condition)</li> <li>• farm dams</li> <li>• bushfires</li> <li>• increased utilisation of water access rights</li> <li>• increase in the number of rights and volume of entitlements</li> <li>• non-compliance with the <i>Water Act 1989</i></li> <li>• changes to timing and location of demands</li> <li>• earth resource extraction</li> <li>• failure to continue to invest in best practice land use initiatives</li> <li>• point source discharges</li> <li>• major asset failures</li> <li>• pest animals and weeds</li> </ul>	<p>Threats are:</p> <ul style="list-style-type: none"> <li>• adverse changes in the volume or pattern of water</li> <li>• continuation or changes in water quality that renders it not fit for purpose</li> </ul> <p>Threats considered in this assessment to:</p> <p>Availability</p> <p>Surface water:</p> <ul style="list-style-type: none"> <li>• reduction in volume</li> <li>• changes to seasonal pattern</li> <li>• changes to the interannual pattern</li> </ul> <p>Groundwater:</p> <ul style="list-style-type: none"> <li>• decline in inflow to the aquifer</li> <li>• adverse change to the seasonal pattern of inflow to the aquifer</li> <li>• condition of the (water) resource</li> </ul> <p>Water quality:</p> <ul style="list-style-type: none"> <li>• elevated levels of salinity</li> <li>• elevated levels of suspended sediment and/or nutrients</li> <li>• elevated levels of toxicants (pesticides, herbicides, heavy metals, hydrocarbons)</li> <li>• pathogens (giardia, cyanobacteria)</li> <li>• other (water temperature, pH and/or dissolved oxygen)</li> </ul> <p>Structural form of priority environmental assets - wetlands and rivers:</p> <ul style="list-style-type: none"> <li>• longitudinal connectivity</li> <li>• lateral connectivity</li> <li>• instream physical habitat</li> </ul> <p>Structural form of aquifers</p>	<p>Beneficial uses have been assessed in terms of:</p> <ul style="list-style-type: none"> <li>• consumptive uses</li> <li>• environmental uses</li> <li>• social/recreational uses, and</li> <li>• indigenous/Aboriginal uses</li> </ul> <p>These beneficial uses have been assessed based on assessment of risk to:</p> <ul style="list-style-type: none"> <li>• surface water availability based on categories that define the legal entitlement or right to water</li> <li>• groundwater availability based on categories that reflect the physical attributes of the aquifer from which water is derived</li> <li>• water quality condition based on the State Environment Protection Policy (Waters)<sup>1</sup> beneficial use categories</li> </ul>

*1 - The State Environment Protection Policy (Waters of Victoria) was originally in place when the risk assessment was completed, it defined the beneficial uses which are used in this risk assessment. The policy has since been replaced with the State Environment Protection Policy (Waters) which continues to use the same beneficial uses.*



**Figure 28: How to read and understand the risk assessment in Victoria’s North and Murray Water Resource Plan Comprehensive Report**



**Figure 29: How to read and understand the risk assessment in the Wimmera-Mallee Water Resource Plan Comprehensive Report**

### 6.1.2 Key findings


The risk assessment identified multiple potential risks in the Wimmera-Mallee water resource plan area and Victoria’s North and Murray water resource plan area. Risks were identified for environment, consumptive, social and Indigenous uses assessed against water availability, structural form and condition (water quality).

More than 95 percent of the high and medium risks identified were associated with:

- causes such as climate change, extreme drought and land use practices if there is a failure to proceed with existing strategies and improved management programs
- threats such as suspended sediment and nutrients, salinity, other water quality issues and a reduction in the volume of water available
- lack of information about the availability or absence of water for Traditional Owner use, either for cultural flows or for Traditional Owner environmental outcomes as proposed by the Murray-Darling Basin Authority.

These causes and threats usually have a negative impact on all water uses, but lack of information about the availability or absence of water for Traditional Owner cultural uses was assessed as having significantly more risks than any other beneficial use. This is because there was limited information to work out how Traditional Owner cultural uses of water might be affected by changes in water resources. See discussion on Traditional Owner water use risk on the next page.

The assessment found there were limited medium-level risks of compliance breaches that impacted on water condition affecting consumptive, environmental and Aboriginal water uses in the Northern Victoria and Victorian Murray water resource plan areas.



**Detailed information on interception risks can be found in Chapter 11 of Victoria’s North and Murray Comprehensive Report and Chapter 10 of the Wimmera Mallee Comprehensive Report**

No interception activities were identified as posing a significant risk to the water resources in Victoria’s North and Murray water resource plan area.

**Table 9: Causes of risk by water resource plan area**

Victoria’s North and Murray water resource plan area	Wimmera-Mallee water resource plan area
<p>Causes associated with the highest occurrence of medium to very high risk were:</p> <ul style="list-style-type: none"> <li>• climate change</li> <li>• extreme drought</li> <li>• land use change: availability</li> <li>• land use change: condition</li> <li>• earth resource development</li> <li>• point source discharges</li> <li>• failure to continue to invest in best practice land use initiatives</li> <li>• farm dams</li> <li>• major asset failure</li> <li>• pests and weeds</li> </ul>	<p>Causes associated with the high occurrence of medium to very high risk:</p> <ul style="list-style-type: none"> <li>• climate change</li> <li>• extreme drought</li> <li>• extreme wet</li> <li>• existing land use practice</li> <li>• farm dams</li> <li>• major asset failure</li> <li>• pests and weeds</li> <li>• earth resource development</li> </ul>



**Inter-valley transfer risk assessment updates**



See Section 12.9 of Victoria’s North and Murray Comprehensive Report

Inter-valley transfer risks are changes to the timing, volume and shifts in water demands. These risks are mainly caused by the increased use of the water market to move water from one area to another. Inter-valley transfers risk assessment updates were developed in 2016 and 2018.

The main findings are that inter-valley transfer risks are changing the timing and location of demand, especially in the volume and/or timing of water demands from the Goulburn, Loddon, or Campaspe rivers to the lower Murray. These are linked to growth in intensive horticulture and/or changing environmental water demands like the shift of 400 GL in water demand from the Goulburn-Murray Irrigation District (GMID) to the Mildura and Lower Murray areas.

Communities experiencing this trend are concerned about the movement of water downstream and out of the GMID, the continued viability of irrigation in northern Victoria because of significant volumes of water recovered from the consumptive pool under Basin Plan, high water prices and less water security across the system.

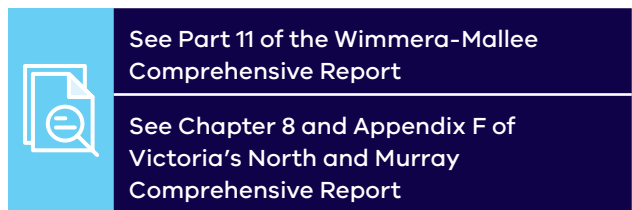
**Risks linked to Traditional Owner use of water**

Because Traditional Owners have been excluded historically from water ownership and management, some very high risks to the availability and condition or quality of surface water to support Aboriginal values and uses have been identified in the risk assessment for the Wimmera-Mallee Water Resource Plan and Victoria’s North and the Murray Water Resource Plan.

Continued availability of water is connected to Aboriginal communities being able to access water either at a particular time or in a particular volume. The identified causes or impacts on continued availability can change when water is available in a season or the volume of water available for all users in the system.

Rating the risks to Aboriginal water use as medium to very high recognised the very limited information available to show how Aboriginal water uses might be affected by changes in the water resource. As an example, Aboriginal water use may be affected by salinity, pathogens or changes in surface water seasonality, but there was not enough information then to confirm this causal relationship.

As a result, Aboriginal water use is assumed to have a medium to very high sensitivity to any changes to surface water or groundwater.



See Part 11 of the Wimmera-Mallee Comprehensive Report

See Chapter 8 and Appendix F of Victoria’s North and Murray Comprehensive Report

Better understanding of Aboriginal values and uses for water is a result of the engagement with Traditional Owner groups as described in their individual contributions to Victoria’s water resource plans. These contributions will inform our continuing work to monitor and reduce risks.

Under the risk assessment, the strategy for recognising and managing for Aboriginal values is the main strategy for addressing risks to Aboriginal values and uses. See Strategy 31 in Appendix B to the Comprehensive Reports. This strategy is cited for every risk associated with Aboriginal values and uses. It reconfirms Chapter 6 in *Water for Victoria* and the four actions there on recognising and managing for Aboriginal values.

### 6.1.3 Strategies to manage risks

Victoria manages its water resources at the local, catchment, regional and state-wide scale and our water resource planning framework has different processes, plans and strategies with practices to manage risks.

The medium to high-level risks identified in the risk assessment will continually be addressed through existing policies and improvement programs in the Victorian Government’s plan Water for Victoria (DELW, 2016). Victoria will continue developing policies and programs, collaborating with regional water managers and engaging with the community, regional stakeholders and interstate water planning agencies to address risks.



There is more information on *Water for Victoria* at <https://www.water.vic.gov.au/water-for-victoria>

The Comprehensive Reports for the Wimmera Mallee and Victoria’s North and Murray Water Resource Plans identified 35 strategies in Victoria’s water and catchment management framework and highlighted sustainable water strategies and Strategy 23 as ways of addressing risks.

Sustainable water strategies are statutory processes for long-term state-wide water resource planning in Victoria’s four regions. They identify threats to water availability and outline policies and actions to help water users, water corporations and catchment management authorities manage and respond to those threats in each region over the next 50 years.


The Northern Region Sustainable Water Strategy (Department of Sustainability and Environment, 2009) made reforms so that individual entitlement

holders had more flexibility to manage their own water supply and business risks. They removed barriers to trade, improved carryover arrangements and introduced an early reserve policy so the distribution system can be run, even in severe drought years.

Strategy 23 links to Action 9.6 in *Water for Victoria* on maximising the effectiveness of the water grid and markets across the state. Under this strategy to improve trading rules in northern Victoria, the government will continue examining broader issues like changes resulting from environmental water holdings and delivery and changing patterns of land and water use in agriculture.

Long-term water resource assessments, the water corporations’ statements of obligations, urban water strategies and drought preparedness plans, regional catchment strategies and climate change guidelines are also used to manage water risks in Victoria.

Complementary strategies include delivering long-term watering plans, environmental water management in a changing climate and improving public reporting on water availability and use, especially clear information and reporting designed for water users.



See table 4.2.1 in Appendix B to Victoria’s North and Murray Comprehensive Report

For information on strategies please follow steps 4, 5 and 6 of **Figure 28** and **Figure 29** that explain how to understand and read the risk assessment of the Wimmera-Mallee and Victoria’s North and Murray comprehensive reports



*Blue green algae*  
Credit: Alison Pouliot

## 6.2 Extreme events

### 6.2.1 Victoria's framework for extreme events

#### Basin Plan requirements

Under Part 13 of Chapter 10 of the Basin Plan, Victoria is required to consider extreme events. A water resource plan must describe how the water resources of the water resource plan area will be managed during the following types of events:

- an extreme dry period
- a water quality event of an intensity, magnitude and duration that is sufficient to render water acutely toxic or unusable for established local uses and values
- any type of event that has resulted in the suspension of a statutory regional water plan in the past 50 years (including a transitional water resource plan or interim water resource plan).

Victoria's water planning framework is designed for critical human water needs to be met throughout extremes of climate. This is achieved by integrating long-term planning, short-term planning and contingency planning.

Since the early 1990s, state and federal water management policy has emphasised the responsibility of individual water users to manage their farming to respond to climate variability, especially drought. This recognises they are in the best position to make decisions that affect their livelihoods.

Regional sustainable water strategies guide management from a longer-term perspective, through the collaborative development of policies aimed at ensuring security and flexibility for stakeholders in the water system.

This strategic planning focuses on making sure stakeholders have the tools to make the most effective decisions about their water resources. These include the opportunity to trade allocation water and water shares on the water market and the ability to carry allocated water over from one year to the next. These tools enable individuals to estimate their own needs during the season and act accordingly.

Trade and carryover are available to urban water corporations and environmental water managers to manage water in many large regulated supply systems across Victoria.

Conditions during the Millennium Drought demanded special measures to meet essential water needs, sometimes on an unprecedented scale. Significant lessons were learned about delivering water to entitlement holders on regulated systems under low water availability scenarios.

### 6.2.2 Defining critical human need

The Commonwealth Water Act defines critical human need as the minimum amount of water needed to meet core human consumption requirements and the non-human consumption costs that would cause high social, economic and national security costs.

Victoria has developed measures based on its own definition of critical human need that addresses the requirements of the Commonwealth definition and also meets the needs of Victorian communities.

In Victoria, critical human water needs are defined as the amount of water required:

- to supply Stage 4 restricted demand in urban areas
- to supply essential domestic and stock and emergency water supply points to meet water carting requirements for rural customers
- to operate the distribution system to deliver that water.

Victoria's Stage 4 urban water restrictions limit almost all outside water use. The details of each restriction imposed under each stage of restrictions can be found on the relevant urban water corporations' websites.

There are more than 300 emergency water supply points throughout Victoria that enable water carting for emergency stock and domestic purposes. Essential domestic and stock needs include rural users who access domestic and stock water from pipelines.

Water to support critical human water needs is supplied through distribution systems for towns that are too big to rely on carting, to deliver to emergency water supply points and to supply rural domestic and stock customers who are connected to pipelines.

### 6.2.3 Meeting Basin Plan requirements

Victoria has identified that its existing arrangements for managing water resources during an extreme event are adequate to meet critical human needs. No new measures have been identified for inclusion in Victoria's water resource plans.

To meet Basin Plan requirements Victoria's water resource plans:

- describe the measures currently in place to respond to extreme dry events and extreme water quality events under Victoria's water resource management framework
- identify how Victoria will respond to new scientific information.

Other extreme events were considered in the risk assessment, including bushfire, extreme drought, extreme wet periods, flooding and overbank inundation, major asset failure and point source discharge. These risks were considered for their impact on the ability to meet various water uses, including consumptive, environmental and critical human need.

## 6.3 Water quality & salinity

### Basin Plan Requirements

Under Part 7 of Chapter 10 of the Basin Plan, Victoria is required to consider water quality objectives.

- A water resource plan must include a water quality management plan. The water quality management plan must:
  - a. for water resource plan areas made up of only surface water SDL resource units—be made in accordance with Division 2;
  - b. for water resource plan areas made up of only groundwater SDL resource units—be made in accordance with Division 3;
  - c. for water resource plan areas made up of both surface water SDL resource units and groundwater SDL resource units—be made in accordance with:
    - i. Division 2 in relation to surface water SDL resource units (as if a reference in Division 2 to the water resource plan area were a reference to the surface water SDL resource units of the water resource plan area); and
    - ii. Division 3 in relation to groundwater SDL resource units (as if a reference in Division 3 to the water resource plan area were a reference to the groundwater SDL resource units of the water resource plan area).

The Basin Plan sets out objectives for water quality ([Table 10](#)) and requires a water resource plan to set up a water quality management plan. This is to consider the impacts of wider natural resource management and land management on water quality in the water resource plan area.

Water quality management plans must include practical economic measures that help achieve the

water quality objectives in Chapter 9 of the Basin Plan. They must also replicate the water quality objectives set out in that chapter.

Water quality management plans are concerned with continuously maintaining and improving water quality so that water is suitable for different beneficial uses. The plans identify aims and targets for water quality and measures to achieve these aims over time.

The intended result of water quality planning is that the Basin's water resources remain suitable for different uses outlined in section 5.04 of the Basin Plan.

Water quality events such as blue-green algae outbreaks or blackwater events are managed as extreme events. See [Section 6.2](#).

### 6.3.1 Water quality management framework

Victoria has well-established planning mechanisms and frameworks to support water quality.

Surface water and groundwater quality and land salinity are affected by many processes and sources including:

- natural catchment processes like runoff from uncleared catchments and groundwater discharges to waterways
- Environment Protection Authority permitted point source wastewater discharges from wastewater treatment plants and industry
- small dispersed point source discharges such as septic tanks
- diffuse sources, including runoff from dryland farms, drainage from irrigated land and stormwater from roads and towns
- changes in catchment water balances like dryland salinity
- naturally occurring minerals in aquifers that dissolve in groundwater.

Victoria addresses these issues through our water quality management framework which is an all-purpose arrangement of regulation, policy and strategy to protect water quality. This will be used to deliver on the Basin Plan's water quality and salinity requirements.

**Table 10: Water quality objectives in the Basin Plan**

Use	Objective
<p><b>Fresh water-dependent ecosystems (section 9.04 of the Basin Plan)</b></p>	<ul style="list-style-type: none"> <li>• <i>For Ramsar wetlands:</i> Quality of the water is sufficient to maintain the ecological character of those wetlands</li> <li>• <i>For other fresh water-dependent ecosystems:</i> Quality of the water is sufficient to:                             <ul style="list-style-type: none"> <li>– protect and restore the ecosystems</li> <li>– protect and restore the ecosystem functions of the ecosystems</li> <li>– ensure that the ecosystems are resilient to climate change and other risks and threats</li> </ul> </li> </ul>
<p><b>Raw water for treatment for human consumption (section 9.05 of the Basin Plan)</b></p>	<ul style="list-style-type: none"> <li>• To minimise the risk that the quality of drinking source water results in adverse human health effects</li> <li>• To maintain the palatability rating of drinking source water at the level of ‘good’ as set out in the Australian Drinking Water Guidelines (2011)</li> <li>• To minimise the risk that quality of drinking source water results in odour of drinking water being offensive to consumers</li> </ul>
<p><b>Irrigation water (section 9.06 of the Basin Plan)</b></p>	<ul style="list-style-type: none"> <li>• That the quality of surface water, when used in accordance with best irrigation and crop management practices and principles of ecologically sustainable development, does not result in crop yield loss or soil degradation</li> </ul>
<p><b>Recreational water (section 9.07 of the Basin Plan)</b></p>	<ul style="list-style-type: none"> <li>• To achieve a low risk to human health from water quality threats posed by exposure through ingestion, inhalation or contact during recreational use of Basin water resources</li> </ul>
<p><b>Maintaining good levels of water quality (section 9.08 of the Basin Plan)</b></p>	<ul style="list-style-type: none"> <li>• If the value of a water quality characteristic (e.g. salinity, nutrients, pH) is at a level that is better than the target value for water quality (in Part 4 of Chapter 9 of the Basin Plan), an objective is to maintain that level</li> </ul>
<p><b>Salt export (section 9.09 of the Basin Plan)</b></p>	<ul style="list-style-type: none"> <li>• For the River Murray System: To ensure adequate flushing of salt from the River Murray System into the Southern Ocean                             <ul style="list-style-type: none"> <li>– This objective is expected to be achieved by the discharge of an average of two million tonnes of salt from the River Murray System into the Southern Ocean each water accounting period, and takes into consideration cyclical climate influences, existing works and measures like salt interception schemes that prevent substantial quantities of salt entering the River Murray System, and which complement this approach</li> </ul> </li> </ul>

### 6.3.1.1 Traditional Owner aspirations for involvement in managing water quality

Traditional Owners want to be involved more in managing water quality to support better cultural outcomes, including deciding the standards to support culturally significant plants and animals.

The risk assessment for Victoria's water resource plans identified significant uncertainty about the impact on Aboriginal values and uses from various water quality threats.

There is a need for more engagement with Traditional Owners on policies and procedures for managing extreme events and how they can be involved in managing water quality. This work is continuing and is supported by Victoria's commitment under *Water for Victoria* and in our water resource plans.

Many Traditional Owner groups have identified culturally significant sites that need healing. They wish to play a key role in developing and carrying out plans to protect and rehabilitate waterways, cultural landscapes and cultural heritage sites. This includes:

- identifying and protecting cultural heritage and significant sites
- maintaining water quality at a standard to support culturally important animals and plants, and especially to bring back the freshwater status of waterbodies impacted by salinity
- revegetating native plants for traditional harvesting such as food, fibre, medicine and ceremony and revegetating ecological species to provide habitat and food for animals
- eradicating, controlling and managing pest plants and animals
- restocking native fish in culturally suitable locations

- restoring flows so that important species return or thrive at culturally significant sites
- introducing native and/or endangered fauna back onto Country i.e. quolls, dingoes, emus, native fish
- whole of catchment management, with focus on activities/infrastructure that may degrade the health of sites, such as upstream land use and farming activities
- sustainable management of recreational waterways users like anglers, boaters, swimmers, joggers, four-wheel drivers and trail bike riders so they do not encroach on culturally significant sites.

### 6.3.2 Monitoring water quality



For more information on measuring and monitoring see Part 15 of the Wimmera-Mallee Comprehensive Report and Chapter 15 of the Victoria's North and Murray Comprehensive Report

Surface water and groundwater quality are monitored as part of Victoria's Regional Water Monitoring Partnerships, the State Observation Bore Network and the Groundwater Monitoring Partnership. At times catchment management authorities, water corporations, local government and other agencies may also monitor water quality beyond these networks. Water quality data is stored and managed through the publicly-accessible Victorian Water Management Information System website. See [Section 3.5](#) for further information.



Victorian Water Management Information System [https://www.vvg.org.au/cb\\_pages/wmis.php](https://www.vvg.org.au/cb_pages/wmis.php)



## 6.4 Meeting Basin Plan requirements

### 6.4.1 Difference between Wimmera-Mallee and Victoria’s North and Murray requirements

Victoria’s water quality management plans for the Wimmera-Mallee Water Resource Plan and Victoria’s North and Murray Water Resource Plan are slightly different.

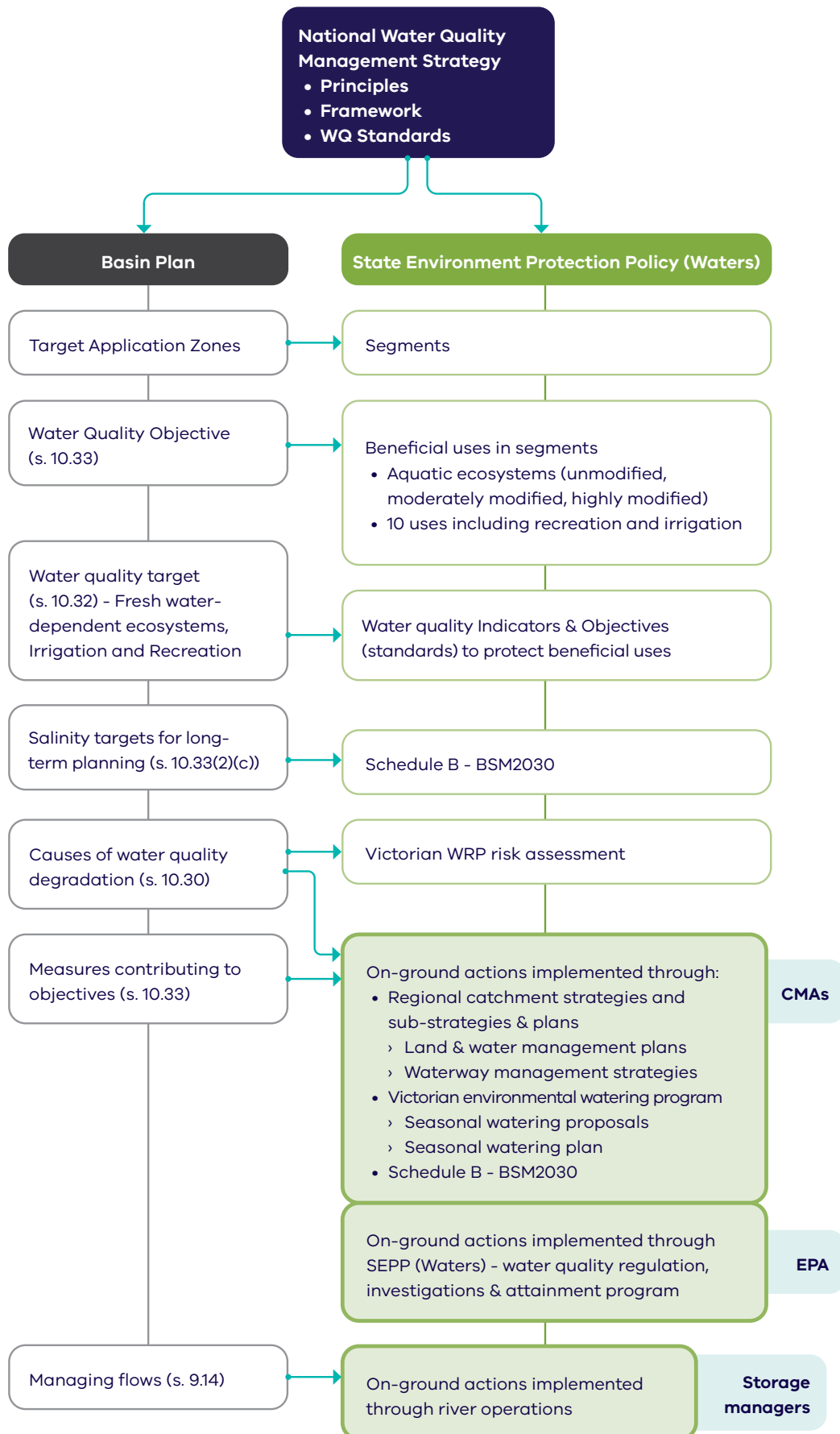
Under the Wimmera-Mallee Water Resource Plan, all requirements for water quality apply equally to surface water and groundwater resources. Under Victoria’s North and Murray Water Resource Plan, groundwater requirements were updated and did not reflect all of the surface water requirements.

A requirement previously addressed under Part 4 of Chapter 10 on rules to support environmental watering is addressed in Victoria’s North and Murray water quality management plan instead.

**Figure 30** shows how the Basin Plan requirements are linked to existing water quality and salinity management in Victoria. The left-hand side of the figure shows the requirements of a water quality management plan as specified in the Basin Plan. The right-hand side of the figure shows the Victorian framework and how the two are connected.

As a result, Victoria can meet Basin Plan requirements through its existing arrangements for managing water quality.





**Figure 30: Alignment between Basin Plan water quality requirements and Victoria's water quality management arrangements**

## 6.4.2 Wimmera-Mallee Water Quality Management Plan

### 6.4.2.1 Water quality

Surface water quality in the Wimmera-Mallee water resource plan area is highly variable depending on the water sources and system of flows.

The Wimmera Waterway Strategy 2014–2022 (Wimmera CMA 2014) identifies ‘improved water quality in priority areas’ as one of its four goals. It identifies the priority areas as those reaches contributing the flows harvested into storages for the Wimmera–Glenelg water supply system and reaches containing headworks storages and used to transfer water within the headworks systems.

Management actions have been identified to address water quality impacts in these priority areas.

Many of the activities done by the Wimmera CMA, landholders and Landcare groups lead to better water quality, like riparian and wetland revegetation works to filter out nutrients and silt before they enter waterways. Improved vegetation combined with other engineering works reduces stream instability, which then cuts down sediment and nutrients going into the water.

### 6.4.2.2 Causes of degradation

When Victoria was developing the water quality management plan it did not use the types of degradation identified in the risk assessment. Instead we assessed water quality in the Wimmera-Mallee water resource plan area and where degradation was identified, the water quality management plan identifies the causes or likely causes of that deterioration.

No water quality degradation has been identified in the groundwater resources of the Wimmera-Mallee (groundwater) water resource plan area. The aquifers of this region are generally highly saline, and extraction for use is only from a few specific locations where yield and water quality have been identified as viable. No water quality risks were identified in the Wimmera-Mallee Water Resource Plan that required rules in response to section 10.21 of the Basin Plan.

Where there is intensive use of groundwater mainly in the border zone with South Australia and including part of the Murrayville Groundwater Management Area, salinity is monitored to protect groundwater quality. Salinity monitoring under the Local Management Plan for the Murrayville Groundwater Management Area has shown no degradation in water quality since 2001.

### 6.4.2.3 Measures to address risks to water quality



The Wimmera-Mallee risk assessment report relating to water quality is in Appendix B to the Wimmera-Mallee Comprehensive Report

The water quality management plan includes measures to address risks identified by the risk assessment. The Wimmera-Mallee risk assessment report is in Appendix B to the Wimmera-Mallee Comprehensive Report.

The Basin Plan also requires the water quality management plan to identify measures to address the risks from elevated levels of salinity or other types of water quality degradation. The measures identified are in [Table 11](#) and [Table 12](#).

**Table 11: Measures contributing to water quality objectives (surface water)**

Water quality objective	Contributing measures	
	<b>Measure 1: Implementation of SEPP (Waters)</b>	<b>Measure 3: Implementing the Border Groundwaters Agreement – South Australia–Victoria</b>
Freshwater-dependent ecosystems	✓	✓
Raw water for treatment for human consumption	✓	✓
Irrigation water	NA	NA
Recreational water	✓	✓
Maintaining good levels of water quality	✓	✓
Salt export	NA	NA

**Table 12: Measures contributing to water quality objectives (groundwater)**

Water quality objective	Contributing measures	
	<b>Measure 1: Implementation of SEPP (Waters)</b>	<b>Measure 3: Implementing the Border Groundwaters Agreement – South Australia–Victoria</b>
Freshwater-dependent ecosystems	NA	NA
Raw water for treatment for human consumption	✓ where relevant aquifers used locally	✓ where relevant aquifers used locally
Irrigation water	There is no distributed groundwater for irrigation	There is no distributed groundwater for irrigation
Recreational water	NA	NA
Maintaining good levels of water quality	✓	✓
Salt export	NA	NA

Victoria does not consider other measures are necessary because water quality risks are addressed through strategies identified in the risk assessment for the Wimmera-Mallee Water Resource Plan.

Section 10.35 of the Basin Plan requires that the measures developed in the water quality management plan must consider the impact on another Basin state’s ability to meet water quality targets and any adverse impacts on other Basin states’ water resources.

Any measures or absence of measures in the Wimmera-Mallee water resource plan area have little to no impact on another state as surface water and groundwater are not connected significantly to other water resources. See [Section 2.8](#).

 <https://www.mdba.gov.au/publications/mdba-reports/basin-salinity-management-2030>


Victoria is contributing to the water quality objectives of the Commonwealth Water Act and the Basin Plan 2012 as a signatory to the Murray-Darling Basin Agreement and the Basin Salinity Management 2030 strategy.

The Wimmera-Mallee Water Resource Plan considered whether rules were required to manage water quality risks to groundwater resources under Part 4 of that plan. No rules were included. Refer to [Section 5](#) for further information on Part 4.

 See response to Section 10.21 of the Wimmera-Mallee Index Table

### 6.4.3 Victoria’s North and Murray water quality management plan


#### 6.4.3.1 Water quality

 See Section 4.1 of Appendix A to Victoria’s North and Murray Comprehensive Report

Surface water quality varies greatly across the Victorian Murray and Northern Victoria water resource plan areas, but generally water quality decreases from east to west in the River Murray and from south to north in the tributary valleys.

These trends are linked to the high-yielding forested areas at the headwaters of catchments that contribute significant runoff and base flows, and the intensively-developed areas on floodplains that receive less rain and contribute lower volumes to streamflows.

The trend in declining water quality from east to west is most obvious in salinity concentrations along the River Murray, with big increases in concentration between the Torrumbarry Weir and Swan Hill caused by lower inflows and higher salt loads.

 See Section 5.1 of Appendix A to Victoria’s North and Murray Comprehensive Report

Like surface water, good quality, low-salinity groundwater is generally found in the upland areas of the north east and ranges to the south.

Water quality declines to the west and north as shown in Figure 5 of Victoria’s North and Murray water quality management plan. Groundwater salinity in these areas is naturally very high where the water table is shallow and evaporation is much higher than recharge.

Saline groundwater can occur above and beside aquifers containing fresher groundwaters. The areas of elevated salinity are considered natural and do not reflect groundwater degradation.

In the Goulburn-Murray: Shepparton Irrigation Region SDL resource unit, there is higher salinity because of rising water tables that have mobilised salt naturally stored in the soil. Saline groundwater can happen in other areas where evaporation exceeds rainfall recharge, or from seawater in sediments when the sea extended up along the Murray Basin to the Loddon River, or from aquifer minerals dissolving into the water.

Where saline groundwater is recognised, groundwater management areas and water supply protection areas consider the effects of naturally-occurring high salt levels on land and usable groundwater, and monitor this and take action if there are impacts on water quality.

**6.4.3.2 Causes of degradation**


 See Table 3 in Appendix A to Victoria’s North and Murray Comprehensive Report

Significant changes to regional waterways over time have affected the quality of the surface water in the Victoria’s North and Murray water resource plan area. These include regulation of the river systems and construction of dams, as well as major changes to land use in catchments. Active and accidental discharges of wastewater have caused more impacts over the last several hundred years.

Degradation or decline in water quality can significantly impact on beneficial uses, either from natural causes like drought and fire or human-induced causes like land clearing and changing land use. Sections of the catchments like mountains and highlands with a large amount of native vegetation have been less affected by water quality degradation than the highly modified flat lands.

Some of this degradation in the northern sections caused by a big shift in catchment land and water use has led to a ‘step change’ in water quality. Although we can act to alleviate or reduce these impacts, water quality cannot be returned to the state that existed before European settlement.

Many risks and causes of water quality degradation occur locally and do not affect the overall condition at a water resource plan scale. Victoria’s North and Murray water quality management plan considers risks and causes of water quality degradation across the water systems and at local levels.


 See Section 5.2 of Appendix A to Victoria’s North and Murray Comprehensive Report

Victoria did an assessment of groundwater quality and identified that there has been no degradation.

The groundwaters in the Goulburn-Murray water resource plan area have not experienced significant degradation.

Because there has been no degradation of water quality of groundwater in this water resource plan area there are no causes, or likely causes, of water quality degradation of groundwater.

### 6.4.3.3 Measures to address risks to water quality

 See Section 5.2 of Appendix A to Victoria's North and Murray Comprehensive Report

To support meeting this requirement, the Basin Plan requires a water resource plan to be prepared having regard to the current and future risks to the condition and availability of the water resources of a water resource plan area (section 10.41 of the Basin Plan).

This requirement has not been applied to groundwater resources under the Basin Plan, however Victoria's North and Murray Water Quality Management Plan does provide a summary of risks to the condition of groundwater resources.

The measures to address the surface water risks are:

- the implementation of SEPP (Waters)
- BSM2030 which protects the waters of the River Murray and its tributaries.

It is not considered that any other measures are necessary because water quality risks are addressed in Victoria's North and Murray water resource plan

area through strategies identified in Victoria's North and Murray Risk Assessment Report (Appendix B to Victoria's North and Murray Comprehensive Report). The measures here are also used to contribute to water quality objectives.

Victoria's comprehensive and active water quality management framework has parallels to many aspects of the Basin Plan's clauses on water quality management. The strategies to address medium to high risks to the condition of water resources identified in the risk assessments for Victoria's North and Murray Water Resource Plan show this framework is active and always improving to address water quality.

Beyond these strategies, Victoria has done a detailed review to identify and specify measures for each of the Northern Victoria and Victorian Murray water resource plan areas that will help achieve the Basin Plan's water quality objectives. This work considered the causes, or likely causes, of water quality degradation and the water quality targets of these water resource plan areas, and the salinity targets for long-term salinity planning and management set out in Chapter 9 of the Basin Plan.

The measures are summarised in [Table 13](#).



**Table 13: Measures contributing to water quality objectives in Victoria’s North and Murray water resource plan areas**

Water Quality Objective	Measures contributing to the achievement of each water quality objective in the Northern Victoria and Victorian Murray water resource plan areas			
	Implementation of SEPP (Waters), or future equivalent		Implementation of Victoria’s commitments under BSM2030 (the Basin Salinity Management Strategy)	
	Northern Victoria WRP Area	Victorian Murray WRP Area	Northern Victoria WRP Area	Victorian Murray WRP Area
Fresh water-dependent ecosystems	✓	✓	✓	✓
Raw water for treatment for human consumption	✓	✓	✓	✓
Irrigation water	✓	✓	✓	✓
Recreational water	✓	✓	✓	✓
Maintaining good levels of water quality	✓	✓	✓	✓
Salt export	NA		✓	





**See Section 4.5.5.1 of Appendix A to Victoria's North and Murray Comprehensive Report**

Section 10.35 of the Basin Plan requires that the measures developed in the water quality management plan must consider the impact on another Basin state's ability to meet water quality targets and any adverse impacts on other Basin states' water resources.

The Victorian Murray water resource plan area is connected to the New South Wales Murray and Lower Darling water resource plan area and the South Australian River Murray water resource plan area. In developing these measures, Victoria has consulted with New South Wales and South Australia under the Murray-Darling Basin Agreement through the Basin Salinity Management Advisory Panel.



**See Column 5 of the response to Section 10.35C and 10.35D in Victoria's North and Murray Index Table**



**See Section 5.5.1 of Appendix A to Victoria's North and Murray Comprehensive Report**

The Basin Plan does not require the water quality management plan to include measures to address risks to groundwater quality. However, requirements for Victoria have been included in Victoria's North and Murray water quality management plan in response to section 10.35C to help maintain water quality in the Goulburn-Murray water resource plan area.

That plan requires that when the Minister is developing guidelines under section 31 of the Victorian Water Act, there are certain matters to identify and consider for a statutory management plan to support managing water quality risks.

The rule does not affect existing statutory management plans, but it means the matters identified in Victoria's North and Murray Water Resource Plan must be considered when new plans are developed. These requirements reflect existing prescriptions for Victoria's statutory management plans where water quality issues have been identified.

The response to section 10.35C also recognises the continuing implementation of SEPP Waters, the State Environment Protection Policy (Waters) to protect and improve the health of Victoria's water environments.

In response to the specific requirements for the Goulburn-Murray: Sedimentary Plain SDL resource unit under section 10.35D of the Basin Plan, measures have been included that reflect existing requirements under Victoria's current water supply protection area management plans. This supports management water quality against the effects of elevated levels of salinity and other types of water quality.

The rule identified in response to section 10.35C of the Basin Plan also applies in response to section 10.35D.



### Setting targets for water quality

The Basin Plan gives water quality target values for water resource plans and these are to be considered when developing measures for each water resource plan area.

They are:

- water quality targets for fresh water-dependent ecosystems (section 9.16 of the Basin Plan)
- water quality targets for irrigation water (section 9.17 of the Basin Plan)
- water quality targets for recreational water (section 9.18 of the Basin Plan).

The Basin Plan also allows states to adopt alternative targets rather than applying the default targets set out in Chapter 9 of the Basin Plan.



See Part 4.6 (surface water) and Part 5.5 (groundwater) of Appendix A to the Wimmera-Mallee Comprehensive Report



See Section 4.6 (surface water) and Section 5.4 (groundwater) of Appendix A to Victoria's North and Murray Comprehensive Report

In most circumstances, Victoria has identified alternative targets consistent with our water management framework and targets in SEPP (Waters), that offer the same or better level of protection than those in the Basin Plan.

No groundwater water quality targets were identified for irrigation water or recreational water where groundwater is used for those purposes.

**Table 14** summarises the target values taken on by Victoria, and where alternative targets have been adopted.

Monitoring and reporting of water quality is outlined in Part 6 of the Wimmera-Mallee water quality management plan.

**Table 14: Summary of the water quality targets adopted under Victoria’s water quality management plans**

Basin Plan section	Target values for	Surface water		Groundwater	
		Target values: Northern Victoria and Victorian Murray water resource plan area	Target values: Wimmera-Mallee (surface water) water resource plan area	Target values: Goulburn-Murray water resource plan area	Target values: Wimmera-Mallee (groundwater) water resource plan area*
10.32(2)(a)	<b>Fresh water-dependent ecosystems</b>  Lakes and wetlands non-Ramsar	<b>Alternative target:</b> SEPP (Waters) water quality objectives for rivers and streams	<b>Alternative target:</b> SEPP (Waters) water quality objectives for rivers and streams		<b>N/A</b> as no groundwater is classified as fresh water
	Ramsar	<b>Alternative target:</b> SEPP (Waters) water quality objectives for wetlands and lakes	Basin Plan targets adopted		
10.32(2)(b)	<b>Irrigation water</b>	<b>Alternative target:</b> ‘That the quality of water distributed by Rural Water Corporations for the primary purpose of irrigation is representative of the quality of source water which is managed for quality through intergovernmental agreements, and Victoria’s water quality management framework.’	<b>N/A</b> as no irrigation infrastructure operator (under the definition of irrigation infrastructure operator in section 7(4) of the Commonwealth Water Act) operate in the area		<b>N/A</b> as no groundwater is distributed for irrigation

Basin Plan section	Target values for	Surface water		Groundwater	
		Target values: Northern Victoria and Victorian Murray water resource plan area	Target values: Wimmera-Mallee (surface water) water resource plan area	Target values: Goulburn-Murray water resource plan area	Target values: Wimmera-Mallee (groundwater) water resource plan area*
10.32(2)(c)	Recreational water	<b>Alternative target:</b> SEPP (Waters) water quality objectives for recreational water	<b>Alternative target:</b> SEPP (Waters) water quality objectives for recreational water		<b>N/A</b> as no groundwater is used for recreational purposes
10.35B(2)(a)	Fresh water-dependent ecosystems			<b>Alternative target:</b> SEPP (Waters)	
10.35B(2)(b)	Irrigation water			<b>N/A</b> as no groundwater is distributed for irrigation	
10.35B(2)(c)	Recreational water			<b>N/A</b> as no groundwater is used for recreational purposes	

\*Under the Wimmera-Mallee Water Resource Plan, all requirements for water quality apply equally to surface water resources and groundwater resources. The Wimmera-Mallee Water Resource Plan will be updated in two years to reflect the amendments to the Basin Plan. See section 7.1.2 which explains the different versions of the Basin Plan.

