



# DROUGHT PREPAREDNESS PLAN NOVEMBER 2017



CENTRAL  
HIGHLANDS  
WATER

Produced by Central Highlands Water, November 2017

*Note on nomenclature: Central Highlands Water is in the process of transitioning from the formerly known Drought Response Plan to a Drought Preparedness Plan. For the purpose of application of CHW's By- Law 405 the Drought Response Plan for each of the systems is contained in the relevant Appendix (Appendices A-O).*

### **Quality Statement**

*The Plan has been prepared in consultation with the following Central Highlands Water staff: Executive Manager Water Supply, Headworks Coordinator, Manager Strategic Asset Management, Manager Network Field Services, Manager Communications and Engagement, Strategic Planner.*

<i>This plan was compiled and prepared by Patrick Russell, Strategic Water Resources Engineer.</i>	<i>15/11/2017</i>
<i>Approved by General Manager Infrastructure Planning and Operations</i>	<i>15/11/2017</i>

### **Traditional Owner Acknowledgement**

*Central Highlands Water acknowledges the traditional owners of the region we work in, including the Dja Dja Wurrung, Wadawurrung, Wurundjeri, Martang and Wotjobaluk, Jaadwa, Jadawadjali, Wergaia and Jupagulk peoples.*

*We pay our respect to the elders of these communities past and present, acknowledging that they have been custodians of land and water for many centuries and that their continuing culture and contribution is important to the life of this region*

### **Disclaimer:**

*This document has been produced to meet Central Highlands Water's requirements for a Drought Preparedness Plan. Every effort has been made to ensure that the information contained herein was accurate at the time of production. Central Highlands Water makes no guarantee that the publication is without flaw of any kind and disclaims any liability for any error, loss or other consequence which may arise from use of this document for purposes other than as intended.*

### **Revision schedule**

<i>draft</i>	<i>May 2017</i>
<i>Version 1</i>	<i>15 November 2017</i>

*Cover photo: Tullaroop Reservoir in 2008*

# Contents

<b>1. Purpose</b>	<b>3</b>
1.1 Background	3
1.2 Objectives	4
<b>2.0 Monitoring Program</b>	<b>6</b>
2.1 Purpose of Program	6
2.2 Key Monitoring Parameters	6
2.3 Weekly Updates	6
2.4 Monthly Water Resource Board Update	6
2.5 Demand Monitoring	6
2.6 Department of Environment Land and Water Planning (DELWP)	6
2.7 BoM Three Month Rainfall and Temperature Outlooks	7
2.8 Water Outlooks	7
<b>3.0 Drought Response Actions</b>	<b>8</b>
3.1 Integrated Water Management	8
3.2 Demand Side Actions	8
3.2.1 Community Information	8
3.2.2 Permanent Water Saving Rules	8
3.2.3 Water Restrictions	8
3.2.4 Water Distributions Losses and Operational Activities	11
3.2.5 Exemptions and Critical Community Assets	11
3.3 Supply Side Actions	13
3.3.1 Supply Yield and Level of Service	13
3.3.2 Qualification of Rights	14
<b>4.0 System Augmentation Triggers</b>	<b>15</b>
<b>5.0 Post Drought Actions – Review and Evaluation</b>	<b>16</b>
5.1 Action Plan review	16
5.2 Impact Evaluation	16
5.3 Gaps in Information	16
5.4 Revisions and Recommendations	16
<b>6.0 Reference and Relevant Resources</b>	<b>17</b>

## 7.0 Glossary of Terms

18

### APPENDICES

Appendix A Amphitheatre

Appendix B Avoca

Appendix C Ballarat and District

Appendix D Blackwood

Appendix E Beaufort

Appendix F Clunes

Appendix G Daylesford

Appendix H Dean

Appendix I Forest Hill

Appendix J Landsborough

Appendix K Learmonth

Appendix L Lexton

Appendix M Maryborough and District

Appendix N Redbank

Appendix O Waubra

# 1. Purpose

The Drought Preparedness Plan (DPP) is essentially a plan of short term actions for CHW to follow in the event of drought. It complements our Urban Water Strategy which is about long term planning and our Water Outlooks which provide a detailed analysis of how each system will perform in the year ahead.

Reference should also be made to Integrated Water Management Plans which pick up broader community priorities to support liveability, recreation and the environment via alternative water options. A draft plan has been prepared for Ballarat and other plans will be developed over coming years.

This Drought Preparedness Plan has been structured to allow quick reference and easy use.

The Plan includes a general section, applicable to all areas of Central Highlands Water (CHW). This is followed by 15 Appendices for each of CHW's supply systems with more detailed information of specific drought response actions. Each Appendix contains a Drought Response Plan followed by supporting information.

*The reader may go directly to the Drought Response in each Appendix which contains a concise summary of the actions required.*

The plan has been intentionally made concise and information which is available in other documents is not repeated in the DPP.

## 1.1 Background

Failure to supply water due to severe drought conditions is identified as one of seven key strategic risks to Central Highlands Water. The effective implementation of a drought preparedness plan is recognised as a key control to modify this risk to an acceptable level.

This Drought Preparedness Plan (DPP) is a plan of actions that enables timely and effective responses to deal with the management of potential water shortages in Central Highlands Water's 15 water supply systems.

It also identifies pre-drought planning and activities that are necessary to ensure that Central Highlands Water (CHW) and the community are well prepared to implement the action plan in a timely and efficient manner.

This plan supersedes previous Drought Response Plans developed in 2000 and 2006 and has been updated in light of recent drought experiences, the introduction of Permanent Water Saving Rules and the state wide Uniform Drought Water Restrictions. In particular the learning relating to the customer impacts and water quality issues of the Millennium Drought (1998 – 2011) have been included in the Plan.

Original versions of this plan were developed in accordance with the *Ministerial Guidelines for Developing and Implementing a Drought Preparedness Plan* (August 1998) made under Division 1A of the *Water Industry Act, 1994*. Subsequently the plan has been revised, updated and renamed in accordance with section 11 of the 2016 Guidelines for the Development of Urban Water Strategies. For the purpose of reference to CHW's current By

–Law 405 the Drought Preparedness Plan includes a Drought Response Plan which is included in the relevant system Appendix.

Reference has been made to the Victorian Government’s “Water for Victoria- Water Plan in preparation of this Drought Preparedness Plan. One of the most significant inclusions has been more specific reference to public open space and recognising the need to identify critical community assets, and develop collaborative management approaches with their owners prior to severe drought conditions developing.

In a regulatory sense CHW is required to develop and maintain a Drought Response Plan under the Statement of Obligations (2015) with the Victorian Government. An extract from the relevant section of the Statement of Obligations is included below:

*“6-5 Drought Response Plans for Urban Systems*

1. *The Corporation must:*
  - (a) *develop a Drought Response Plan that governs the management of the supply of water by the Corporation in any period of drought or when the supply of water is limited;*
  - (b) *not rely on the Minister declaring a water shortage and qualifying rights to water under the Water Act 1989 as an option for maintaining supplies as part of a Drought Response Plan;*
  - (c) *comply with any guidelines issued by the Minister for the purpose of drought response planning; and*
  - (d) *make its Drought Response Plan available to the public, unless the Minister consents in writing to not making available a Plan or part of a Plan (urban only).*
2. *The Corporation must review, and if necessary amend, its Drought Response Plan:*
  - (a) *at intervals of no more than five years; and*
  - (b) *within twelve months of either:*
    - (i) *the lifting of any period of water restriction imposed in accordance with the Corporation’s Drought Response Plan; or*
    - (ii) *any major change occurring to works or arrangements for conserving water for, or supplying water to, any water supply system that is relied upon for the supply of water by the Corporation (urban only).*
3. *The Corporations that share water supply systems must cooperate and coordinate with each other when developing, reviewing or implementing their Drought Response Plans”*

## 1.2 Objectives

Drought Preparedness Plans are designed to manage the demand/ supply balance of a water supply system over a short term outlook period. Typically this might be over a summer period. However drought response actions may be required for shorter periods e.g. to manage demands through a period of deteriorated water quality. Conversely the recent experience of the Millennium Drought (1998 - 2011) demonstrates that droughts can last for several years.

A drought preparedness plan can be seen as one of the many incident response plans which CHW has to cover its operations. However the drought hazard is characteristically unique and may develop slowly and unnoticed without appropriate monitoring by those with expertise in the field.

The plan is designed to meet operational requirements of Central Highlands Water in terms of capturing relevant operational information about the system so that appropriate actions can be implemented.

The triggers used by CHW for its drought responses are also the metrics used to define the Level of Service (LOS) for the systems. The Level of Service affects yield calculations for the system (the higher the LOS the lower the yield). Hence DPPs are closely aligned with Urban Water Strategies (UWS) and have a major impact on long term planning considerations for the system.

Central Highlands Water has Urban Water Strategies for each of its water supply systems which are available on <http://www.chw.net.au/>. These should be referred to for information regarding the yield and level of service for the system. Information contained in the UWS is purposefully not repeated in the DPPs.

## 2.0 Monitoring Program

### 2.1 Purpose of Program

Accurate, consistent and frequent monitoring of the water supply system is the key to understanding the water supply system performance and identifying when drought response actions are required.

Monitoring is required at all times, and while the frequency and detail of monitoring may need to be increased during a drought, continuous records provide the fundamental information to support water resource management prior to and during droughts.

### 2.2 Key Monitoring Parameters

All CHW systems are comprehensively monitored. Monitoring covers reservoir levels and volumes in store, groundwater levels, bulk flows and volumes pumped and transferred at key system points, rainfall and evaporation. For more detail of CHW's Hydrometric Monitoring Program refer to "Water Plan 3\_BE and Groundwater Monitoring Management Plan\_Dec 2011" (internal CHW document).

All monitoring data collected is quality controlled and stored in CHW's HYDSTRA hydrologic data base. Central Highlands Water also provides much of the information to the Bureau of Meteorology under the requirements of the Federal Water Act where it may be accessed <http://www.bom.gov.au/index.php>.

### 2.3 Weekly Updates

CHW maintains a weekly update of all systems. This is currently compiled by the Water Resources Engineer and distributed to key CHW staff.

The information is also provided to various media and public information outlets, with the degree of detail varying according to the prevailing water resource status.

### 2.4 Monthly Water Resource Board Update

A water resources update is provided to the CHW Board on a monthly basis. This tracks storage levels and consumption as well as rainfall outlooks. Details may vary depending on circumstances.

The Sustainability Committee (a Board subcommittee) monitors water resources and water efficiency within its terms of reference.

### 2.5 Demand Monitoring

Demands in CHW systems are monitored and reported to key CHW staff. This is also included in the monthly Board reporting.

### 2.6 Department of Environment Land and Water Planning (DELWP)

It is important to keep DELWP informed on water resources status and they currently require an end of month update on resource status.

As with Board reports, DELWP required more detailed information as system became more stressed during the Millennium Drought (1998-2011) and through 2015/16.

## 2.7 BoM Three Month Rainfall and Temperature Outlooks

The BoM provide rainfall and temperature outlooks and this information can help in formulating short term actions. The BoM information is presented in terms of the probability of receiving e.g. above average rainfall.

Here is an example of how this information could be used:

*System projections indicate that above average stream flow is required to avoid the need for restrictions over the next 3 months.*

*The BoM outlook is for only 40% of above average rainfall.*

*Conclusion: it is unlikely that the system will recover to the level required to avoid restrictions and hence preliminary preparatory actions on this front should be commenced.*

## 2.8 Water Outlooks

A current requirement of Urban Water Strategies is for Water Outlooks to be produced on an annual basis. The outlooks give a statistical analysis of where the system might track under various climatic scenarios. Notwithstanding the regulatory requirement, the outlooks are an essential tool for short term water resource planning and, if produced at the start of summer, will give a good indication of whether water resource issues will be experienced in the year ahead.

CHW has developed methods for producing the outlooks which vary depending on the nature of the system. SOURCE modelling is used for the more complex surface systems. Recorded trends are used for groundwater supplies. Under severe drought conditions a “worst case” outlook is useful if prepared on simple water balance based on best estimates of demand, inflow, and system losses. This approach proved useful during the worst years of the Millennium Drought (1998 - 2011).

The outlooks are posted on. <http://www.chw.net.au/>

## 3.0 Drought Response Actions

### 3.1 Integrated Water Management

Integrated Water Management (IWM) involves the use of alternative water, including rainwater, recycled water and other local sources, at all times through the natural spectrum of droughts to floods. Ultimately this means that systems will be better placed during droughts to maintain essential supplies. As conditions dry, there may be opportunity to increase use of alternative supplies for uses such as gardens and other non-potable purpose thus preserving essential reserves for potable use. CHW's IWM initiatives are aligned with the state governments Water for Victoria.

Integrated Water Management also embodies the concept of contribution by all members of the community. Hence it is important that cooperative arrangements be established with relevant councils and other organisations prior to drought conditions developing. This will also link closely with community information and communication programs.

### 3.2 Demand Side Actions

#### 3.2.1 Community Information

Community awareness of the water resource status via media and advertising campaigns is an effective means of curbing water consumption. During the Millennium Drought (1998 - 2011) CHW observed a marked change in community water use which has persisted even though the drought conditions have now ended. It is evident that significant modification of water use can be achieved with the right community messages and programs.

#### 3.2.2 Permanent Water Saving Rules

Permanent water savings rules apply at all times in line with CHW's Permanent Water Savings Rules. The Permanent Water Saving Rules are available on the CHW website.

#### 3.2.3 Water Restrictions

CHW has a Water Restrictions By-Law 405 which is based on a model by law developed by the Victorian government. All Victorian water corporations use this model by-law which means that a consistent approach is adopted across the state. While the by law is common, it is important to understand that the savings achieved by restrictions will vary from system to system depending on the characteristics of the system. CHW's By Law 405 is available at <http://ww/w.chw.net.au>

The underlying intent of the 4 restriction stages, as captured in the By Law, is explained in Table 1 below.

**Table 1**

<b>Restriction stage</b>	<b>Description</b>	<b>Purpose</b>
<b>Stage 1</b>	alert	The main purpose is to get the message out that water shortages are possible
<b>Stage 2</b>	save	This is where most of the reductions in the demand will be achieved
<b>Stage 3</b>	just enough	This level captures the experience of the Millennium Drought (1998 - 2011) where some easing of stage 4 was implemented to allow communities to keep valuable plants alive
<b>Stage 4</b>	critical	This means that all out of house use is excluded. These are extreme measures.

Triggers to implement the 4 stages of restriction may be based on reservoir level, groundwater levels or other parameters of a system. A number of assumptions are made about how restriction will affect demand including:

1. Actual demand may vary significantly from the average annual demand e.g. demand during a hot dry summer may be much higher than that in a cool wet season with corresponding variation in savings from restrictions.
2. CHW system demands are significantly reduced since the Millennium Drought (1998 - 2011) which implies that restrictions may reduce demand less than in the past.
3. Understanding the split of demand between in house and outdoors, as well as the relevant proportion of residential, industrial and other users is important in terms of quantifying the expected reduction in demand due to water restrictions.
4. While water restrictions are designed to reduce out of house demand it is evident that reductions in the whole spectrum of consumption is achieved when restrictions are applied.
5. Base demand is taken to be the minimum requirement for in house use. Traditionally this was assumed to be mid-winter use. The experience of the recent drought is that even with high level restriction there is still a seasonal variation and more water is required in summer.

The following considerations and observations listed in Table 2 below may help in deciding when and if restrictions should be implemented.

**Table 2**

Changing restrictions	It is generally desirable to make only one change of restriction level rather than several over a summer period.
When to commence	Restrictions would not normally be commenced in winter. Savings at this time would be low and it is better to wait until the prospect of winter spring inflows is passed.
Seasonal outlooks	Reference Bureau of Meteorology seasonal outlooks and other information regarding the expected conditions for the season ahead.
Local impacts	Local impacts (e.g. water quality issues, distribution system problems, bushfire) may require short term restrictions to manage water consumption.
Communications	Good communications and awareness of water resource shortfalls may affect overall consumption (including in house usage) as much, or more, than official restrictions.
System losses	System losses may increase demand on the system to the point of creating shortfalls.
System pressure	System pressure can affect system losses as well as consumption
Board approval	Consider time requirement for Board approval and community communication
Exit strategy	If lifting or exiting restrictions, take a conservative approach and be sure that restrictions will not be required again in the near future.

Estimating what savings will be achieved at each level of restrictions is a complex but inexact science. Previous methods included:

- Estimating a base (unrestrictable) demand based on winter use
- Determining a restrictable component being the difference between base and total demand
- Applying industry adopted restriction factors to the restrictable component.

In general the experience of the recent drought is that:

- Summer base demand will always be higher (showering and washing, air conditioners and other in house activities use more water in summer)
- The percentage restrictions assumed previously were not achieved
- Overall demand reduced due to changed personal habits and new water saving appliances, gardens
- Savings are achieved throughout the year, not just in summer.

For this drought preparedness plan a new approach has been used to estimate the demand savings as follows:

- An unrestricted demand was based on the highest consumption in recent years (since lifting of restrictions following the breaking of the Millennium Drought). This is typically higher than the adopted Average Annual Demand for the system.
- A base demand was used based on average winter use but with a seasonal pattern to give higher summer base demand and also taking account of demands achieved when restrictions were in force
- The assumed reductions of restrictions were modified somewhat from previous to take account of the intent of the new by – law with the bulk of the savings achieved with stage 2. The savings assumed are shown in Table 3 Assumed Savings with Restrictions, below:

**Table 3 Assumed Savings with Restrictions**

<b>Stage 1</b>	14% of restrictable demand
<b>Stage 2</b>	65% of restrictable demand
<b>Stage 3</b>	85% of restrictable demand
<b>Stage 4</b>	100% of restrictable demand

- Details of demand analysis and derivation of restriction triggers for each of CHW’s systems are contained in the relevant Appendix.

### 3.2.4 Water Distributions Losses and Operational Activities

There are a number of measures which can be implemented in terms of management of the water distribution system. These are listed in Table 4 Water Distribution System Actions below:

**Table 4 Water Distribution System Actions**

Increase monitoring for system losses and responding to and repairing leaks
Reduce system pressure where possible (while still maintain minimum requirements)
Reduce or stop system flushing and scouring programs (if considering this then the impacts on water quality needs to be carefully evaluated and the costs and difficulties of reinstating pre drought conditions to the system).

### 3.2.5 Exemptions and Critical Community Assets

By-Law 405 outlines what water uses are permitted under the various water restriction stages. However the By-law is necessarily generic and there will be circumstances when exemptions to the By Law will be appropriate. In making exemptions the following should be followed:

1. Victorian State Government “Exemption Principles for Victorian Uniform Drought Water Restrictions”. These guidelines provide a good basis for assessing an exemption request, particularly when the applicant will be required to provide
2. Consideration of Critical Community Assets. During the Millennium drought many community assets, such as sporting fields, gardens waterways suffered with an overall loss of amenity value. The State government in its new Guidelines for the Development of Urban Water Strategies has indicate that increased consultation with these asset owners should be done in the pre drought period to ensure that all assets are identified and that appropriate processes are understood before the critical period. To this end extensive consultation was carried in the 2016/17 review of this plan. Critical assets and relevant comments are included in the individual appendices for each system. Further follow up consultation will be made as part of CHW’s Pricing Review 18 commitment to identify community amenity values.

### 3.3 Supply Side Actions

#### 3.3.1 Supply Yield and Level of Service

The agreed water supply Level of Service (LOS) for CHW systems, based on the latest Water Supply Demand Strategy, is summarised in Table 5 below.

**Table 5**

System	Frequency of stage 1 restrictions	Frequency Stage 3 restrictions	Other	Yield (ML/yr)	Average Annual Bulk Demand (ML/yr)
<b>Ballarat</b>	1 in 20 years	1 in 1000 years	Frequency of Lal Lal and White Swan Reservoirs below 20% capacity - 1 year in 1000	21,000	11858
<b>Maryborough</b>	1 in 20 Year	1 in 1000 year	-	1400	1259
<b>Daylesford*</b>	1 in 10 year		-	652	619
<b>Beaufort</b>	1 in 20 years	-	-	249	156
<b>Avoca</b>	1 in 10 years	--	-	154-195	118
<b>Clunes</b>	1 in 10 years	-		256-346	198
<b>Forest Hill</b>	1 in 10 years	-		158-316	157
<b>Blackwood</b>	1 in 10 years	-		43	28
<b>Waubra</b>	1 in 10 years	-		70	22
<b>Learmonth</b>	1 in 10 years	-		100	39
<b>Lexton</b>	1 in 10 years	-		26	23
<b>Landsborough</b>	1 in 10 years	-		63-130	28
<b>Amphitheatre</b>	1 in 10 years	-		25	13
<b>Dean</b>	1 in 10 years	-		30	17
<b>Redbank</b>	1 in 10 years	-		10	50

\* Note: for Daylesford the LOS will change to 1 in 20 years with the completion of proposed augmentation works.

The system yield is the average annual demand which can be supplied at the adopted Level of service.

While LOS requirement should be understood when making drought response decisions, the driver for drought response actions is to ensure that supply is ongoing and that an essential base supply can always be met. For example if drought conditions dictate that restrictions are required, then these are applied even if it is evident that in the short term the frequency of restrictions may be greater than that specified in the LOS.

### 3.3.2 Qualification of Rights

Ministerial qualification of rights is a short term emergency response which has been used in the past during extreme drought circumstances. Qualifications typically change the sharing of the resource to provide more for essential human requirements.

The Statement of Obligations specifically notes that water corporations should not rely on qualification of rights as a drought response action.

## 4.0 System Augmentation Triggers

Drought Preparedness Plans have traditionally been concerned primarily with short term management of water supply systems through periods of low rainfall and inflow. The underlying assumption has been of stationarity of stream flows. However it is now evident that hydrologic events outside the range of historical records can occur. In addition permanent reductions in stream flow and yield may occur.

On the demand side, systems may experience increased consumption due to increased population and urban expansion.

Hence it is appropriate to include additional triggers designed to identify when system augmentation should be commenced. These triggers need to be set such that appropriate time is allowed for the planning, design and construction of the project.

Water resource planning for the Central Highlands region does indicate that shortfalls may develop over the 30-40 year planning horizon under various scenarios for some systems.

More analysis is required to formulate augmentation triggers, although in a simplistic sense it would be evident that augmentation was required if deployment of the various secondary resources failed to prove an acceptable level of restrictions. CHW is fortunate in having access to the water market via the Goldfields pipeline for Ballarat and this provides much opportunity to purchase additional water entitlements. Similarly many of the groundwater supplied systems could be effectively augmented by purchase of additional groundwater licence.

Water quality and water resources are very closely related and another trigger for implementation of a system augmentation could be ongoing difficulties in treating water to acceptable water quality standards.

---

## 5.0 Post Drought Actions – Review and Evaluation

This drought preparedness plan will be reviewed every five years as part of a rolling process for all water supply systems, or earlier in the event of drought and /or major system upgrade. The post-drought phase presents an ideal opportunity to evaluate and review the preparedness plan in light of the recent experiences.

### 5.1 Action Plan review

How effective were the actions? Were actions implemented at the right time? Were there warning signs which were missed or other actions which should have taken place?  
Did the business communicate appropriately with the community?

### 5.2 Impact Evaluation

Drought can have severe impacts on communities, the environment and economics. Such impacts should be understood and opportunities to minimise them considered in the planning activities of CHW.

### 5.3 Gaps in Information

The post-drought phase presents an ideal opportunity to review the wide range of monitoring and data collection programs within the system with a view towards identifying any relevant gaps in information and making recommendations for improvements.

### 5.4 Revisions and Recommendations

All of the reviews and evaluations that are performed during the post-drought phase should be used to develop recommendations and make revisions to the drought preparedness plan.

## 6.0 Reference and Relevant Resources

Bulk Entitlements: CHW Bulk entitlement conversion orders may be viewed on the Water Register web site. ( <http://waterregister.vic.gov.au/>)

Groundwater licences: held by CHW

Weekly Update: posted in local media and available internally to CHW

DRP Guidelines: Department of Natural Resources & Environment, (1998). Ministerial guidelines for developing and implementing a Drought Preparedness Plan, August 1998 (made under Division 1A of the Water Industry Act 1994)

DELWP Guidelines for Development of Urban Water Strategies and the Melbourne Water System Strategy

Urban Water Strategies: <http://www.chw.net.au/>

Permanent Water Saving Rules: <http://www.chw.net.au/>

Restriction By- Law 405 <http://www.chw.net.au/>

Annual Water Outlooks : <http://www.chw.net.au/>

Statement of Obligations: [http://www.chw.net.au](http://www.chw.net.au/)

Water Act 1989: <http://www.legislation.vic.gov.au>

Water for Victoria- Water Plan Victorian State Government 2016

DELWP Climate Change Guidelines

[https://www.water.vic.gov.au/\\_data/assets/pdf\\_file/0014/52331/Guidelines-for-Assessing-the-Impact-of-Climate-Change-on-Water-Availability-in-Victoria.pdf](https://www.water.vic.gov.au/_data/assets/pdf_file/0014/52331/Guidelines-for-Assessing-the-Impact-of-Climate-Change-on-Water-Availability-in-Victoria.pdf)

## 7.0 Glossary of Terms

Term	Description
Aquifer	A layer of underground sediments which water flows through
Augmentation	Works required to increase water supply
Base Demand	The level of water demand which is not targeted by water restrictions (largely consists of indoor consumption)
Bulk entitlement (BE)	The right to water held by authorities as defined in the Water Act. The BE defines the amount of water that an authority is entitled to from a river or storage, and may include the rate at which it may be taken.
Catchment	An area of land where run-off enters a particular river system
Demand management	Initiatives that endeavor to reduce water consumption and encourage more efficient water use
Diversion	Water harvested from a weir without the use of an on-stream storage
Diversion weir	A structure across a stream that facilitates the diversion of water into a pipeline
Drought Preparedness Plans	This Plan
Drought Response Plans	Short term action plans that provide effective responses to deal with the occurrence of droughts
Exemption Guidelines	Key principles that outline the management of water restriction exemptions for customers with special circumstances
Greywater	Uncontaminated household water from sources such as bathtubs, washing machines, and kitchen sinks.
Groundwater	All subsurface water, generally occupying pore spaces and fractures in rock and soil
LOS (Level of Service)	The level of service is typically defined in terms of agreed frequency of water restrictions or other parameters relating to the supply.
Megalitre (ML)	1,000,000 litres
Minimum passing flow requirement	A requirement to provide a minimum flow below a water diversion point
Permanent Water Saving Rules	Ongoing mandatory rules that are designed to prevent inefficient water usage practices

---

Potable	Suitable for drinking
Recycled water	Water from sewage or industrial processes that is treated to appropriated standards for its intended use
Reliability of supply	Refers to the actual likelihood of water restrictions being implemented. It is a calculation achieved using simulation modeling based on current demand and climatic variations over a historical period.
Restrictable water demand	The portion of water use that can be restricted through the implementation of water restrictions
Salinity	The total amount of water soluble salts present within water or soil
Security of supply ( <i>suspended term; no longer in use, refer to 'Reliability of Supply'</i> )	A term used to describe the adopted standard of service. (i.e. for a standard of service where the water restriction target is 1 in 10 years on average, the security of supply is 90%)
Standard of service	Refer to level of service
Stormwater	Rainfall runoff from urban areas
System yield	A notional figure that refers to the average annual demand that can be supplied from a water supply system at the adopted level of service.
Unrestricted water demand	The total volume of water used by consumers during periods without water restrictions
Urban Water Strategy	A long term plan that looks at maintaining an appropriate balance between urban water supplies and demand over the next 50 years
Water Restrictions	Mandatory rules that maximise water conservation during times of drought to assist in conserving available water supplies
Water Supply-Demand Strategy (WSDS)	Now replaced by Urban Water Strategies

---