



# Drought Management Plan For The Water Supply Business In The Broken Hill Region

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**FOR PUBLIC RELEASE****PREPARED BY: JUANITA WHITE****AUTHORISED BY: JOHN COFFEY****ASSISTANCE:****DOCUMENT NUMBER:**

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### EXECUTIVE SUMMARY

Essential Energy trading as Essential Water supplies potable water to the towns of Broken Hill and Menindee, and non-potable water to the settlements of Silverton and Sunset Strip. This Drought Management Plan (DMP) has been prepared to provide a strategic mechanism for managing water supply and consumption in the city of Broken Hill and surrounds during times of severe drought.

The DMP provides strategic measures that meet the requirements of the Water Management Act 2000. These measures ensure that water consumption in the centres of Broken Hill, Menindee, Silverton and Sunset Strip will be reduced and controlled within allocations set by the NSW Office of Water.

The DMP estimates future water demand for these centres and compares this with the water available under the regulatory environment when severe drought conditions apply.

The DMP shall be activated, implemented and de-activated at the Head of Water Operations discretion. The plan will be activated when it is perceived that there is a high probability that, if there is no rainfall, water restrictions may need to be imposed.

## 1. INTRODUCTION

This drought management plan established how Essential Energy will manage its water supply scheme during periods of drought.

The plan shall be activated, implemented and de-activated at the Head of Water Operations' discretion. The plan will be activated when it is perceived that there is a high probability that, if there is no rainfall, water restrictions may need to be imposed. The plan will remain in force until:

- There is sufficient quality water in the water supply reservoirs (including Lake Wetherell);
- Water restrictions have been lifted; and
- The post-restriction protocols have been completed.

This plan will need to be reviewed every five years and after each occurrence of drought.

Essential Water has previously implemented a Drought Response Plan (December, 2014) which was predominantly focused on the level of water restrictions applicable in response to the available volume of stored water remaining in the total system storage. Although components of the Drought Response Plan have been incorporated into this DMP.

### 1.1 Purpose of the Drought Management Plan

The aim of this DMP is to ensure the water utility business of Essential Energy, Essential Water, in the Broken Hill region, has an appropriate mechanism in place to allow it to carry out its responsibility to soundly manage water use during droughts. The DMP details the demand and supply issues to be addressed during drought to ensure that town water supplies with a significant storage, such as Broken Hill, minimise the risk of failure in times of drought.

The purpose of this DMP is to:

- Identify what Essential Water does before, during and after a drought,

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- Describe the staged approach Essential Water takes to drought management; and
- Provide a clear, publicly available statement of Essential Water's role and responsibilities during a drought.

In addition, the drought management plan is to be consistent with the Integrated Water Cycle Management Plan (IWCMP) developed for the water business. The plan forms a key water supply business management tool for Essential Water.

### 1.2 Compliance of the Drought Management Plan

Guidance on the development of a DMP is available from a number of sources. The NSW Office of Water Best-Practice Management of Water Supply and Sewerage Guidelines require that all local water utilities in NSW develop a drought management plan as part of their efforts to continue to deliver effective and efficient water supply services. These guidelines also contain a checklist (see Attachment A) for the contents of a DMP. This guideline and associate checklist have been used to guide the preparation of this plan.

## 2. BACKGROUND DATA

The available background data for the development of this DMP is set out in the following sections.

### 2.1 Climate

The climate of the Broken Hill area is arid. Bureau of Meteorology data indicate that the mean annual rainfall for Broken Hill is 255 mm. Evaporation rates are high with the mean daily evaporation rate at Stephens Creek Reservoir (just outside of Broken Hill) being 6.9 mm (BoM, 2003). On this basis, the mean annual evaporation rate is approximately 2.52 m. The lowest daily evaporation rates occur in the month of July, averaging 2.2 mm. Similarly, the mean daily evaporation rate at Umberumberka Reservoir is 7.5 mm, or an annual rate of 2.74 m (BoM, 2003).

### 2.2 Existing Water Supply

Essential Water provides water supply to Broken Hill, Menindee, Silverton, and Sunset Strip. Water supply to Broken Hill, Menindee, and Sunset Strip is treated by filtration before distribution. Water supply to Silverton is chlorinated, but presently unfiltered. Non-potable water is also supplied to rural users along the Menindee pipeline for stock and domestic purposes.

### Water Sources

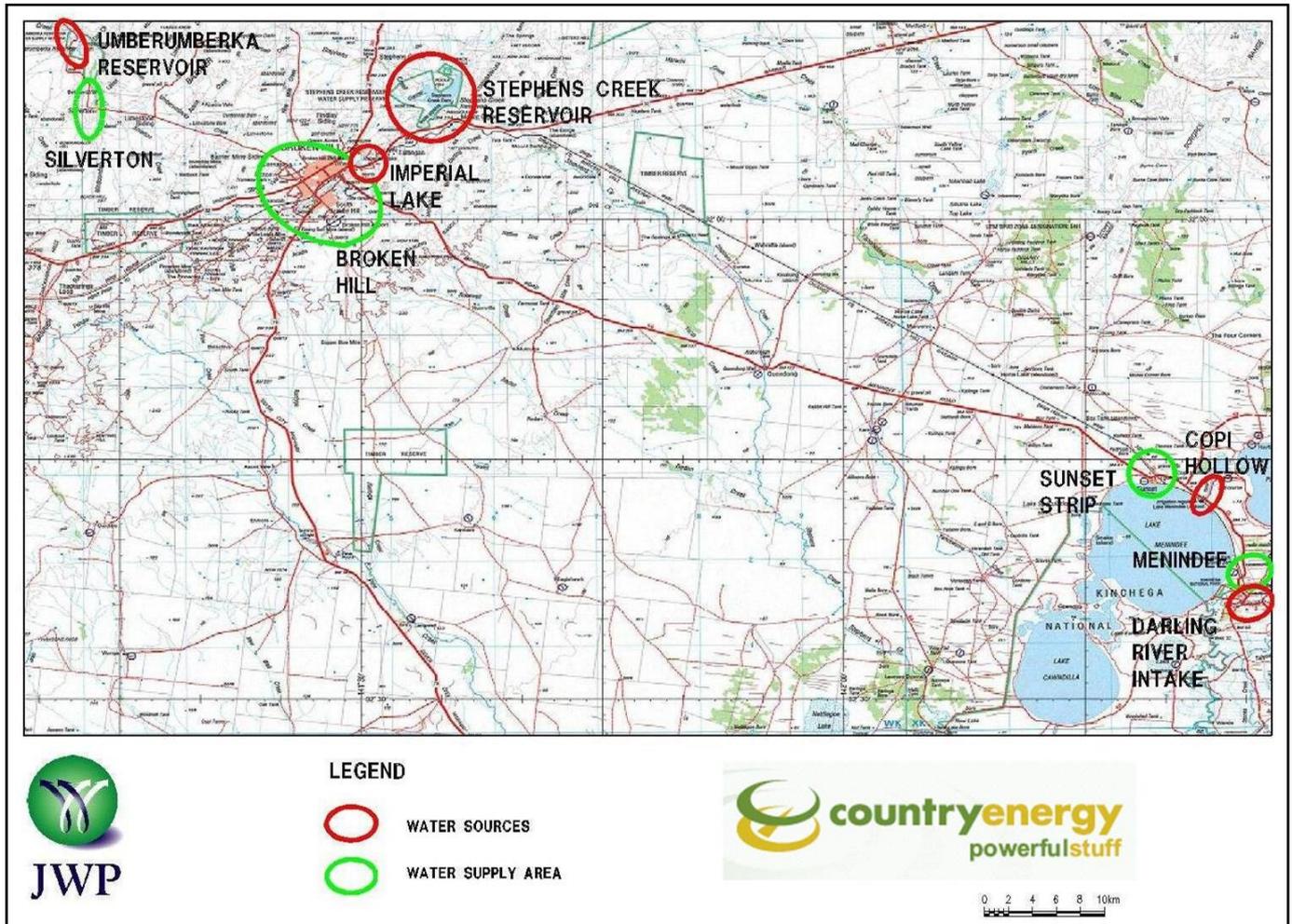
Essential Water utilises five surface water sources (see Figure 1):

- Darling River;
- Copi Hollow;
- Stephens Creek;
- Umberumberka; and
- Imperial Lake.

The Darling River off-take at the Menindee Lakes Scheme is the main source of water for Essential Water (EW). The river is partly regulated through release of water from Lake Wetherell, part of the Menindee Lakes Scheme. The licensed entitlement is 9.975 gigalitres (GL) per year of high security water.

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Figure 1 – Essential Water Service Area



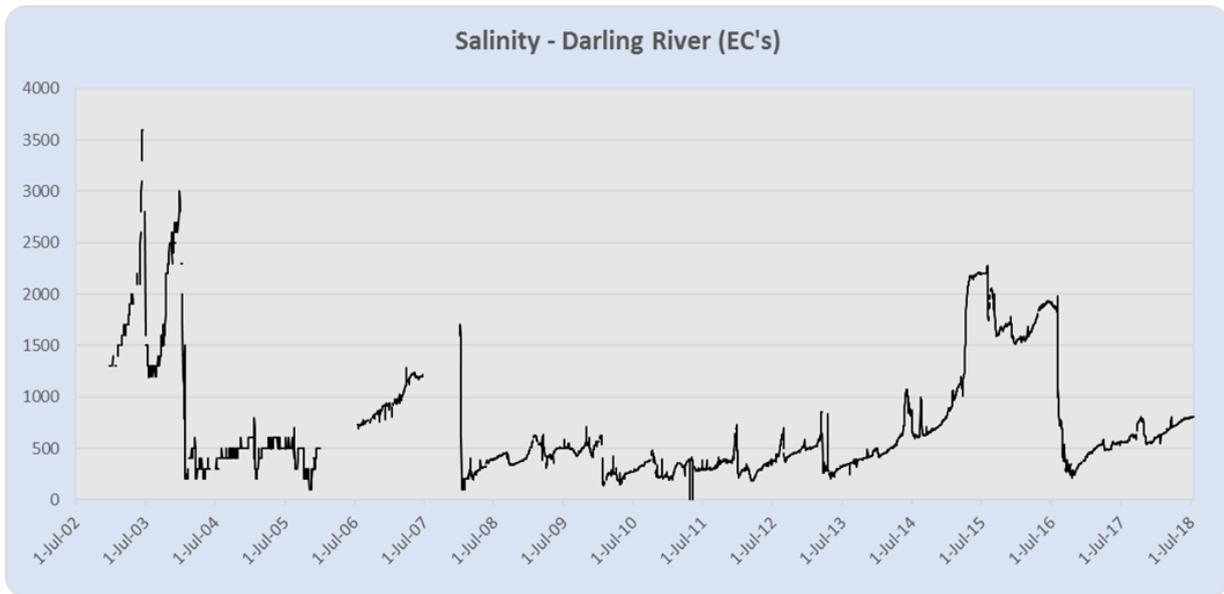
During drought (when the total storage in the scheme falls below 480 GL and until it returns to 640 GL), the management of the Menindee Lakes Scheme, in terms of making available Essential Water’s license entitlement rests with the NSW Office of Water through WaterNSW. At all other times, the management of the lakes scheme rests with the Murray Darling Basin Commission.

A pump station was constructed at Copi Hollow, a regulated channel between Lake Pamamaroo and Lake Menindee, in 2002 as an emergency water supply measure, promoted by low levels of storage in Lake Wetherell. This source is connected to the pipeline from Menindee to Broken Hill.

The quality of water sourced from the Darling River is highly variable. On numerous occasions during the summer of 2003, 2007 and 2015, due to drought conditions, EC’s were well above 1,500 (see Figure 2). Further, the concentration of organic material in the raw water was also high.

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**Figure 2: Measured and modelled salinity in Darling River Source.**



There are three water storages near Broken Hill, owned and operated by Essential Water.

Stephens Creek Reservoir is a 19,000 ML reservoir, with a large surface area and a shallow depth. Hence, evaporative losses from the storage have historically been high and the reservoir's efficiency low. A levy was placed in the reservoir in 2003, which has significantly reduced the evaporative losses. Stephens Creek reservoir receives water from its own catchment, as well as water pumped from the Darling River and Copi Hollow. The quality of water in this reservoir tends to be controlled by the quality of the water transferred to it from the Darling River.

Umberumberka Dam is a 7,800 ML reservoir located 30 km north-west of Broken Hill on Umberumberka Creek. Water is pumped to Broken Hill using diesel pumps. The quality of water from this source is generally very good and tends to be the best of all the available sources. Umberumberka Dam is a deep, efficient storage, but its catchment is unreliable as a sustainable water source.

Imperial Lake is a small, 670 ML reservoir that collects water from its own small catchment which includes part of the Broken Hill urban area. Water can be transferred to Imperial Lake from Stephens Creek and Umberumberka. The lake is used as an emergency storage only. The quality of water from this source is highly variable not only because of its urban catchment, but also the fact that as it is only used in emergency situations, the salt concentrations of the stored water can be high.

A small bore was installed during the 2015/16 drought to supply Menindee's water treatment plant. The Menindee Common bore is only used during times of high salinity for Menindee. This is Essential Water's only groundwater supply.

Practically all of the treated effluent generated in Broken Hill's Wills Street and South sewerage treatment plants is used by Essential Water's recycled water customers.

**Water Supply Infrastructure**

The water operation comprises:

- 12 service reservoirs;

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- 3 major capacity dams;
- 9 pump stations;
- 3 water filtration plants; and
- 543 km of water main.

Infrastructure that enables the water supply to Broken Hill is provided and maintained by both Essential Water and WaterNSW.

WaterNSW is the water regulator and the bulk supplier of raw water to Essential Water from Darling River and Copi Hollow, using infrastructure managed by WaterNSW. Infrastructure items managed by WaterNSW include intake works and regulators located on the Darling River and at Copi Hollow.

Essential Water provides and maintains the infrastructure that stores, transfers, treats, and supplies water to the identified service areas. An inventory of Essential Water’s assets is shown in Table 1.

**Table 1: Inventory of Water Service Infrastructure**

Type	System Asset	Function and Service Area
Storage	Darling River and Copi Hollow (9.975 GL/a license)	Regulated storages supplying the majority of water to Broken Hill.
	Stephens Creek Reservoir (19,000 ML capacity)	Collects surface runoff from catchment and stores water from Darling River and Copi Hollow for Broken Hill.
	Umberumberka Reservoir (7, 800 ML capacity)	Stores raw water from surface runoff and supplies water to Silverton and Broken Hill.
	Imperial Lake Reservoir (670 ML capacity)	Collects surface runoff from Broken Hill urban catchment and provides back up emergency storage for Broken Hill and can be supplemented from Stephens Creek and Umberumberka.
Transfer	Menindee pumping station (max. cap. 32 ML/day; with booster stations 38 ML/day; operating head of 150 m)	Transfers water drawn from the Darling River to Menindee, Sunset Strip, Menindee Pipeline users, Broken Hill, and Silverton service areas.
	Copi Hollow Pumping Station (max cap. 31 ML/day from 4 H/lift pumps and 1 booster pump.	Transfers water drawn from Copi Hollow to Menindee Pipeline users, Broken Hill and Silverton (if required) service areas
	Pipeline from Menindee to Broken Hill (116km).	Transfers water drawn from Copi Hollow and Darling River to Menindee pipeline users, Broken Hill, and Silverton (if required).
	Kinalung pumping station Kinalung booster station Menindee booster station (along Menindee pipeline)	Transfers water drawn from Copi Hollow and Darling River to Menindee pipeline users, Broken Hill, and Silverton (if required).
	Stephens Creek pumping station	Transfers water drawn from Stephens Creek to Mica Street WTP and Imperial Lake.
	Pipeline from Umberumberka Reservoir to Broken Hill (rising main of 3.752 km and gravitation main of 26.393 km	Transfers water stored in Umberumberka Reservoir to Silverton, Broken Hill and Imperial Lake.
	Imperial Lake pump station (max cap 23 ML/d; operating head 110 m)	Transfers water stored in Imperial Lake to Mica Street WTP or Raw Water Service Reservoirs.

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Type	System Asset	Function and Service Area
	Umberumberka pump station (max cap. 12 ML/d; operating head 183 m)	Diesel fuelled pumps transferring water from Umberumberka Reservoir to Silverton and Broken Hill
Treatment	Mica Street Water Filtration Plant (31ML/d)	Treats and disinfects raw water before transfer to service reservoirs and distribution to Broken Hill.
	Mica Street Reverse Osmosis Plant (6ML/d)	To be intermittently operated to treat filtered water for salinity and dissolved organics for Broken Hill.
	Menindee Water Filtration Plant (1.25 ML/d)	Treats and disinfects raw water before distribution to Menindee
	Menindee township chlorine dosing plant (max. capacity of 3.84 mg/l)	Doses filtered water with chlorine before distribution to Menindee service area
	Menindee pipeline chlorine dosing plant (max. capacity of 10 mg/l)	Doses raw water with chlorine before transfer to Stephens Creek or Mica Street WTP.
	Sunset Strip water treatment plant	Filters raw water before distribution to Sunset strip
	Silverton Chlorination Plant (max. capacity of 10 mg/l)	Doses raw water with chlorine before distribution to Silverton
Reticulation	Twelve service reservoirs (55 ML capacity) including eight steel reservoirs servicing Broken Hill.	Seven service reservoirs store treated water before distribution to Broken Hill. Two service reservoirs store raw water, for use in watering parks and gardens in Broken Hill
	Water mains, valves, hydrants and meters (167 km of trunk mains and 220 km of reticulation)	Water is reticulated to individual properties and fire-fighting hydrants in Broken Hill

Stage-storage curves for Stephens Creek, Umberumberka and Imperial Lake respectively are presented in **Attachment B**.

The Mica Street water filtration plant (31 ML/d) was commissioned in 2010. It includes oxidation, flocculation, sedimentation, filtration, UV disinfection, pH adjustment and chlorination. The plant was designed to meet the aesthetic water quality objectives unable to be reached during the 2003 drought for drinking water for Broken Hill.

In 2003, in response to the drought and the subsequent poor water quality available from the Darling River sources, a 6 ML/d reverse osmosis plant was purchased by the then Australian Inland. The plant has been commissioned and is now connected to the Brine Disposal dam via pipeline. The newly commissioned water treatment plant has capabilities to integrate the RO plant in the water treatment processes.

A package filtration plant provides treated water to Menindee and a microfiltration plant has been installed for Sunset Strip. The water supply at Sunset Strip is currently filtered and chlorinated but not declared potable.

**Water Service Areas**

Essential Water’s water service areas include:

- Broken Hill;
- Menindee;
- Silverton; and
- Sunset Strip

A small number of predominantly rural property customers located along the Menindee, Stephens Creek and Umberumberka pipelines are also provided with a courtesy service.

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**2.3 Water Supply Customers**

The total population supplied with water services by Essential Water is estimated to be approximately 18,498. This population includes those in the towns as well as the rural population along the pipeline. The populations of Menindee, Sunset Strip, and Silverton are approximately 551, 83, and 50 respectively. It is estimated that approximately 17,814 people in Broken Hill are supplied with water.

**Customer Categories and Assessments**

The number of water supply assessments in each service area is shown in Table 2. The table also shows the number of assessments in each service area by customer category. A total of eight customer categories were identified by Essential Water in order to develop the water efficiency program adopted as part of the IWCMS.

**Table 2: Assessments Identified in each Water Service Area**

Category	Total	Broken Hill	Menindee	Sunset Strip	Silverton
Residential House	9,468	9,114	185	136	33
Vacant premises	270	245	22	3	
Residential flats or strata	112	105	7		
Mine	2	2			
Institutional or Public	215	206	9		
Commercial	588	567	21		
Non-potable	32	25	2		5
Pipeline	48	48			
<b>Total</b>	<b>10,735</b>	<b>10,312</b>	<b>246</b>	<b>139</b>	<b>38</b>
Category	Total	Broken Hill	Menindee	Sunset Strip	Silverton
Residential House	9,468	9,114	185	136	33

**Historical Water Consumption**

In comparison to other utilities, historical trends in the consumption record indicate that water consumption in the Essential Water service areas is high. Available records, dating back to 1997, show that the climate corrected water production per capita has historically been approximately 900 L/d, excluding the impact of periods of restriction.

The current average total water (potable and non-potable) consumption for all of Essential Water’s customers is estimated to be 5,579 ML/a (JWP 2004). Average total potable water consumption was estimated at 5,214 ML/a (JWP 2004). The breakdown of this total water consumption is set out in Figure 3.

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**Figure 2: Breakdown of Total Water Consumption by Customer Category.**

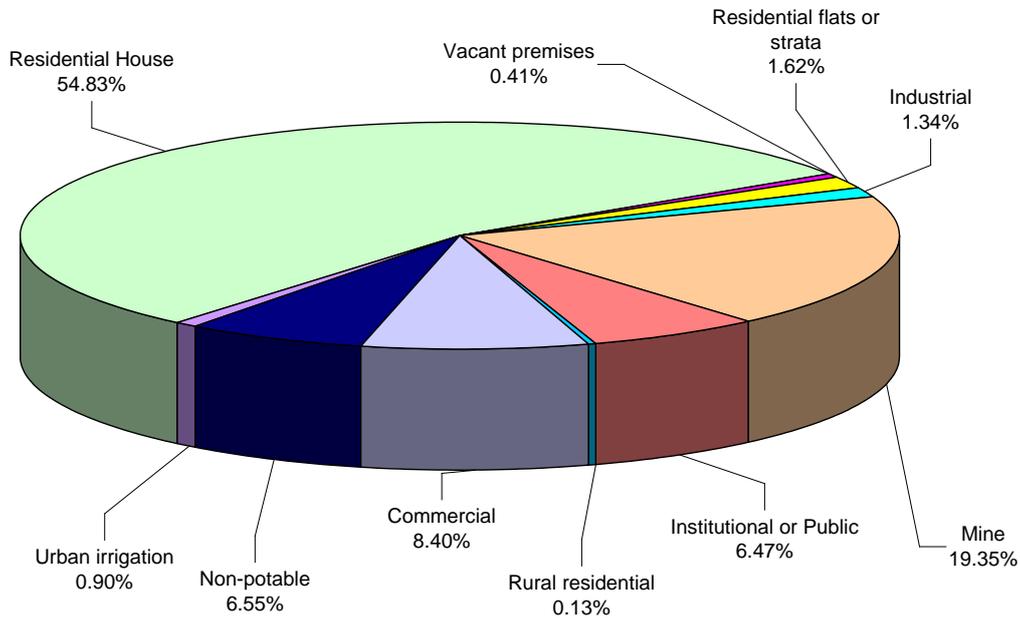


Table 3 presents the observed peak day consumption.

**Table 3: Observed Peak Day Consumption (ML)**

Period of observed peak day consumption	Peak Day	Observed peak day consumption (ML)
1/07/1997 – 30/06/1998	24/11/1997	33.4
1/07/1998 – 30/06/1999	07/01/1999	38.6
1/07/1999 – 30/06/2000	18/01/2000	38.0
1/07/2000 – 30/06/2001	14/01/2001	39.1
1/07/2001 – 30/06/2002	20/01/2002	34.2*
1/07/2002 – 30/06/2003	17/12/2002	25.1*
1/07/2003 – 30/06/2004	03/01/2004	31.1*
1/07/2004 – 30/06/2005	12/01/2005	27.9
1/07/2005 – 30/06/2006	10/01/2006	30.1
1/07/2006 – 30/06/2007	10/12/2006	25.1
1/07/2007 – 30/06/2008	15/03/2008	24.1
1/07/2008 – 30/06/2009	07/02/2009	26.2
1/07/2009 – 30/06/2010	31/10/2009	25.7
1/07/2010 – 30/06/2011	10/02/2011	24.9
1/07/2011 – 30/06/2012	18/01/2012	19.2
1/07/2012 – 30/06/2013	06/01/2013	23.1
1/07/2013 – 30/06/2014	2/02/2014	29.3
1/07/2014 – 30/06/2015	23/02/2015	23.3*

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1/07/2015 – 30/06/2016	25/02/2016	23.9*
1/07/2016 – 30/06/2017	10/02/2017	27.6*
1/07/2017 – 30/06/2018	18/12/2017	30.0*

\* Drought affected years.

**Assessment of Minimum Water Requirements in Service Area**

To plan for drought, it is necessary to understand the minimum water supply (health and sanitary) requirements of the Essential Water, water supply service area. The following is an analysis of these requirements.

Table 4 presents the average water supply requirements of each identified customer category. Average annual residential consumption of potable water was calculated as being 350kL/property.

**Table 4: Customer Drought Requirements (Litres/account/day)**

Consumer Category	Current Potable Water Consumption <sup>1</sup>	Expected 2010 Potable Water Requirements <sup>2</sup>	Minimum Current Potable Water Requirements	Minimum Current Water Requirements for Basic Living Purposes <sup>3</sup>	Minimum Current Water Requirements <sup>5</sup>	Current Non-Potable Water Requirements <sup>6</sup>
Houses	478	438	31 <sup>3</sup>	62 <sup>3</sup>	155 <sup>3</sup>	478
Vacant House	187	0	0	0	0	187
Flats	370	343	38 <sup>3</sup>	75 <sup>3</sup>	188 <sup>3</sup>	95
Industrial	1,222	1,179	Unknown	Unknown	Unknown	305
Mine	0	0	Unknown	Unknown	Unknown	3,078,799
Institutional /Public	4,115	4,063	225 <sup>4</sup>	450 <sup>4</sup>	1125 <sup>4</sup>	1370
Rural	622	610	38 <sup>3</sup>	75 <sup>3</sup>	188 <sup>3</sup>	1886
Commercial	2,463	2,376	Unknown	Unknown	Unknown	615
Courtesy Services	478	438	31 <sup>3</sup>	62 <sup>3</sup>	155 <sup>3</sup>	478
Urban irrigation <sup>7</sup>	0	0	0	0	0	4,333

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- 1 As there is no mechanism at the customer level for separately providing non-potable water inside most premises (with the exception of those customers who have installed and plumbed to the toilet and or laundry a rainwater tank), current potable requirements have been defined as all internal water use;
- 2 Based on the definition in note one and the implementation of water efficiency program 3 identified in the IWCMS;
- 3 Minimum potable water requirements based on 15 L/person/day assuming an average occupancy ratio of 2.06 per house and 2.51 per flat (JWP, 2004). Rural use assumed to have occupancy of 2.51. 15 L/person/day minimum potable allowance for drinking, cooking and personal hygiene (pers. comm. P. Byleveld NSW Health). This does not include water required for evaporative air conditioning. For basic living purposes an additional 15 L/person/day has been added for the use of evaporative air conditioning;
- 4 Assumed that the institutional and public accounts have an average occupancy of 15 persons. There may be some double counting in these assumptions as, for instance, the water requirements of school children and employees would be accommodated in the assessment of the needs of homes. However, allowance has to be made for the limited amount of residential facilities such as hospitals and aged care;
- 5 60 L/person/day minimum allowance for drinking, cooking and personal hygiene (potable), flushing toilets and washing clothes (the last two by bucket only) (pers. comm. P. Byleveld NSW Health) and air-conditioning (15 L/person/day);
- 6 Drawing from the definition in note one, the current non-potable requirements have been defined as all external water use;
- 7 Broken Hill City Council is a significant water customer of Essential Water but does not provide urban water services in this local government area; and
- 8 Fire fighting requirements are sourced from potable water. Under all demand reduction options, preference is given to accommodating fire fighting requirements.

Based on Table 2 and Table 4, it can be calculated that the minimum known daily water requirements for the service area are in the order of 335kL/d. As the total number of accounts for which the minimum potable water requirement is unknown represents approximately 6% of the total number of assessments, allowance for this additional percentage may see the minimum better stated as 355kL/d.

Similarly, the known daily water requirements for basic living purposes are 670kL/d, which, with the similar 6% allowance, may be better stated as 705kL/d.

Additional work is required to appropriately ascertain the exact requirements of customer categories highlighted as “unknown” in Table 4. The gathering would be facilitated by the implementation of the auditing of large water using businesses recommended as part of the IWCMS water efficiency program. This information will assist in the on-going monitoring and revision of this DMP.

## **2.4 Drought History**

Although the supply area has suffered a number of droughts over the past 50 years, little historical information has been kept. The available information is listed in Table 5. During the drought of 1982-83 it has been reported that restrictions were in place in the Broken Hill region. These restrictions were based on an “Odds and Evens” scheme. There are no details recorded in the reduction of demand for this period.

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**Table 5: Drought and Response.**

Drought	Restriction Level	Estimated Effect of Restriction on Demand	Emergency Sources Utilised
5/9/2002 – 16/4/2003	Level 2*	20% reduction in per capita demand	Copi Hollow and Imperial Lake
16/1/2004 – 28/2/2004	Level 2*	Maintained the existing 20% reduction in per capita demand	Copi Hollow and Imperial Lake
8/12/2014 – 31/08/2015	Level 1*	12% reduction in per capita demand	Copi Hollow and Imperial Lake
1/09/2015 – 3/01/2016	Level 2*	18% reduction in per capita demand	Copi Hollow and Imperial Lake
24/1/2016 – 28/08/2016	Level 3*	9% reduction in per capita demand	Menindee Bore Imperial Lake
29/08/2016 – 8/12/2016	Level 1*	15% reduction in per capita demand	Imperial Lake

\* Drought response plan detail contained in Sections 1.13 – 1.19

The historical performance of water resources utilised for the supply of water to the identified service areas was examined in the Bulk Supply Analysis undertaken as part of the IWCMS. The yield of the system was derived by hydrological modelling of the four sources, based on climatic and demand data. The yield is also dependant on the operating rules of the system.

Overall, the water supply system reliability is reducing. However, emergency works (comprising of a new pumping station on the connecting channel from Copi Hollow to Menindee Lake) were undertaken in 2002 when the storage at Lake Wetherell was low.

The quality of source water has been known to deteriorate between rainfall events due to the large evaporation losses resulting in concentration of salinity and organic compounds in Lake Wetherell. In Figure 2, the results of electrical conductivity for Weir 32, Wilcannia Main Channel and Lake Cawndilla Outlet are provided for approximately 10 years. A reverse osmosis plant with a capacity of 6 ML/d was purchased in 2003 to improve the quality of treated water. This plant was expanded with leased equipment and construction of brine disposal facilities to increase the output to 10ML/d for the 2016 event.

The Murray to Broken Hill pipeline due to be commissioned in 2019 will provide added security of supply for Broken Hill.

### 3. MANAGEMENT PLAN

#### 3.1 DMP Objectives

The primary objective of this DMP is to provide for the successful maintenance of a restricted water supply during drought without compromising public health and also meeting fire-fighting needs. Several sub-objectives have been identified. These relate to the:

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- overall direction of the utility business (strategic drought management objectives which clearly link to the IWCMS);
- system requirements to manage drought (planning objectives which link to the IWCMS capital works program); and
- Utility response to the occurrence of drought (operational objectives to facilitate plan implementation during drought).

Table 6 sets out the DMP objectives. These objectives will be used to assess the effectiveness of this plan and trigger plan review.

**Table 6: DMP Objectives.**

Component	Role	Objective
Strategic Objectives	Overall purpose of the DMP	<ul style="list-style-type: none"> <li>• To ensure a timely, effective, efficient and affordable response to drought that minimises consumer disruption.</li> </ul>
Planning Objectives	System requirements necessary to deliver the strategic objectives	<ul style="list-style-type: none"> <li>• To ensure the viability of the water supply by providing and maintaining infrastructure</li> <li>• To ensure that, in the long term, restrictions are not required more than 5% of the time and that the average frequency of restrictions is less than once every 10 years (the level of service)</li> <li>• To develop and implement strategies to deliver this level of service and minimise the risk of the community running out of quality water</li> <li>• To define trigger points for implementing management actions; and</li> <li>• To develop procedures to effectively monitor and review the strategies developed.</li> </ul>
Operational Objectives	Implementation of restrictions and drought response measures	<ul style="list-style-type: none"> <li>• To ensure that operating and managerial employees are aware of the steps to implement this plan</li> <li>• To ensure that operating and managerial employees are aware of the community sensitivities and perceptions during periods of drought and water restrictions.</li> <li>• To ensure customers and other stakeholders are aware of this drought management plan</li> <li>• To ensure clear communication to the public of details of restrictions, enforcement policies and the impact of restrictions when implemented</li> <li>• To ensure water quality continues to meet all relevant health standards and guidelines</li> <li>• To ensure a minimum supply of 15 litres per person per day (minimum health and sanitary requirements, not including air conditioning); and</li> <li>• To ensure the plan is monitored during drought and adjusted where necessary.</li> </ul>

**3.2 Drought Management Team**

During implementation of the plan, the Head of Water Operations will lead the drought management team (DMT). This team will include:

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- Head of Water Operations
- Manager, Water Supply and Quality
- Manager, Operations (Water)
- Manager, Customer Support
- Manager, Engineering & Technical
- Manager, Water Business

The Head of Water Operations may delegate the leadership role to any other officer as deemed appropriate. From time to time, at the discretion of the Manager, Water Operations, other persons may form part of the DMT.

The DMT will implement the plan using the available skills and resources of Essential Water. The DMT will meet during periods of plan implementation in accordance with the drought management action plan (see **Section 3.4**).

### 3.3 Drought Plan Communication and Information

An important aspect of ensuring the success of the DMP is the communication of the plan, especially during the operation of restrictions. Communication tools will be provided to assist customers during implementation of the plan and enable them to gain details of restrictions.

Social, economic and environmental values clash as competition for scarce water resources intensifies. It is essential that all groups that have a stake in drought planning be identified and their interests clearly established.

A preliminary assessment has identified the following key stakeholder groups:

- Urban residential customers
- Industrial consumers
- Commercial consumers, including tourism interests
- Rural residential consumers connected to the supply
- Rural consumers who currently rely on rainwater tanks, groundwater or minor surface water sources
- Environmental groups
- Business Groups
- Broken Hill City Council
- Central Darling Shire
- Mining Companies.
- Raw water customers
- State Member
- Federal Member
- NSW Department of Health
- Groups that manage infants eg. Preschools and Kindergartens

The DMT will contain a Manager, Community Relations with responsibility for the communication of the plan to the public.

The Manager, Community Relations will use the local media (print and radio) and the Essential Water website to:

- notify the public and stakeholders of the level of restrictions in place and the penalties for non-compliance;

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- publish activities exempt from the restrictions and outlining the processes for applying for exemption; and
- publish tips for saving water.

The Manager, Community Relations will ensure that all drought management plan communications to the public and stakeholders include colour-coding consistent with the stages of the drought action plan (see **Section 3.4**).

The Community Relations office will also be responsible for ensuring other written and verbal feedback given to Essential Water Officers is also be collected and entered into the feedback database.

It is the role of the Head of Water Operations, to communicate the plan to operating and managerial employees and ensure they have sufficient knowledge and resources to implement it during times of drought (see **Section 3.4**).

The Head of Water Operations, will notify the relevant government agencies, when dictated by the action plan, including NSW Health and NSW Office of Water. Liaison with NSW Health will also include ensuring appropriate information is issued to the community in relation to the use of grey-water (a practice that tends to increase during drought restrictions).

During operation of the plan, the Manager, Water Operations, will ensure that signage is placed at boundaries of the service area in order to ensure visitors to the area are aware of the restriction regime in force at the time.

### 3.4 Drought Management Action Plan

The Essential Water drought management action plan is set out in Table 7. The drought management action plan sets out the actions to be taken during each phase of the implementation of this DMP.

The action plan has eight (8) levels of implementation. These levels are consistent with the eight levels defined in the Water Directorate technical guidelines and have been colour-coded as per these guidelines. The levels of implementation commence with 'pre-activation activities' and then seven (7) implementation stages from low to extreme drought conditions. For each level, the following have been defined:

- A trigger: to define the points at which each consecutive level should be implemented. Any one or more of the triggers can be used to activate a stage;
- An objective: to define the aims of the level with respect to managing drought;
- Actions and responsibilities: a list of activities to be undertaken during drought to achieve the objectives and a statement of those who are responsible for putting each activity in place. Activities were defined giving consideration to the environmental, social and cost impacts of each action. Actions also include the collection of data to monitor and review the plan over time; and
- A target: defining the expected consumption level to be realised as a result of the implementation of the actions stated for each level.

**Table 7: Drought Management Action Plan**

Level	Trigger(s)	Objective	Actions	Responsibility	Cost	Target <sup>6</sup>
Pre-activation	Total system storage <sup>1</sup> less than 24 months quality production <sup>2</sup> (130,500 ML).	To ensure preparedness of Essential Water employees for drought response.	Record date of introduction of pre-activation stage.	Manager, Water Supply and Quality	Within operating budget.	850 litres/ account/day or 16.8 ML/d at Mica Street WTP
			Drought management team activation including review of appropriate team members (must include Manager Community Relations).	Manager, Water Supply and Quality		
	Unseasonably hot and/or dry conditions (when compared to long term monthly temperature, evaporation and rainfall averages).	To raise public and stakeholder awareness of potential drought.	Review drought management action plan and ensure all operating and management employees are aware of the plan and have recently had training (as appropriate) in its implementation.	Manager, Water Supply and Quality		
			Review of drought communication materials (flyers, website, community feedback mechanisms) appropriate for level one.	Manager, Community Relations		
	Promote water saving tips and voluntary level one restrictions through media releases.	Manager, Community Relations				
	Identify customers likely to be significantly impacted by the introduction of level one restriction (Council irrigation activities, pensioner accounts and other recreational garden irrigators).	Manager, Community Relations				
	Weekly review of water quality: salinity (total dissolved solids - TDS), alkalinity and algae levels in water sources.	Manager, Water Supply and Quality				
	Record date of the removal of stage or the increase of restrictions.	Manager, Water Supply and Quality				

Level	Trigger(s)	Objective	Actions	Responsibility	Cost	Target <sup>6</sup>
Level 1	Total system storage less than 18 months quality production (100,125 ML) (quantity parameter)	To ensure Essential Water employees implement appropriate drought management protocols and maintain restricted supply.	Review the availability of emergency sources, Copi Hollow and Imperial Lake.	Manager, Water Supply and Quality	Within operating budget	810 litres/account/day or 16.0 ML/d at Mica Street WTP
	Advice from the Bureau of Meteorology of an adverse climatic forecast that may be prolonged for more than 6 months.	To raise public and stakeholder awareness of emerging drought and reduce non-essential demand <sup>3</sup> .	Place signage at boundaries of the service area.	Manager, Water Supply and Quality		
			Notify in writing, NSW Health and the NSW Office of Water of the restrictions to be put in place.			

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<b>Level 1</b>	<p>Loss of reduction of capacity at or along Menindee pipeline for a period of two days or loss of water treatment capacity.</p> <p>Reduction in water allocation by regulatory authority (MDBC or NSW Office Of Water).</p>	<p>To raise public and stakeholder awareness of emerging drought and reduce non-essential demand<sup>3</sup>.</p>	<p>Prohibit<sup>4</sup>, without prior written permission from Essential Water:</p> <ul style="list-style-type: none"> <li>• Use of domestic and public sprinklers, automatic watering systems and fixed or hand-held hoses for irrigation of gardens and lawns between 10am and 7pm based on quantity parameter trigger.</li> <li>• The washing of vehicles other than in accordance with section 8.4.2. An exemption may be applied for where the cleaning of a vehicle is necessary either to avoid contamination of the tanker's contents or to ensure public safety based on quantity parameter trigger</li> <li>• The use of fixed or hand-held hoses to clean hard or paved surfaces including windows and building facades. An exemption may be applied for in relation to occupational health and safety issues for commercial, industrial or public areas based on quantity parameter trigger</li> <li>• The filling of an empty swimming pool, spa, pond, lake or other water based on quantity parameter trigger</li> <li>• The filling or topping up of a farm dam or tank. An exemption may be applied for where a dam or tank provides water for domestic or stock consumption or fire fighting based on quantity parameter trigger</li> <li>• The filling of mobile water tankers for any purpose other than a fire, public health or an emergency situation based on quantity parameter trigger.</li> </ul>	<p>Head of Water Operations and Manager, Water Supply</p>	<p>Within operating budget</p>	<p>810 litres/account/day or 16.0 ML/d at Mica Street WTP</p>
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<b>Level 1</b>	Restrictions to urban residential customers in response to reduced water supply availability to agricultural customers.		Continue public awareness program focusing on limiting external water use. Advertise prohibitions, exemptions, methods of obtaining exemption and enforcement measures. Target customers identified in pre-activation.	Manager, Community Relations	Within operating budget	810 litres/account/day or 16.0 ML/d at Mica Street WTP
	Water quality deterioration in Darling River or Menindee Lakes Scheme (raw water greater than 1,200 EC, quality parameter)		Enforce restrictions through written warnings to identified offenders.	Manager, Engineering & Technical		
	The high use of filtered water (16ML/d for three consecutive days) and a concern that the capacity of major pipelines will temporarily be insufficient.		Review daily production records at Mica Street water treatment plant to monitor the impact of introducing level one restrictions.	Manager, Water Supply and Quality		
	To allow storages to recover from the effects of drought.		Daily collection and weekly review of water quality: salinity (total dissolved solids - TDS), alkalinity. Weekly or more often as required collection of algae levels in water sources.	Manager, Water Supply and Quality		
			Record date of the removal of stage or the increase of restrictions.	Manager, Water Supply and Quality		

Level	Trigger(s)	Objective	Actions	Responsibility	Cost	Target <sup>6</sup>
Level 2	Total system storage less than 12 months quality production (60,750 ML) (quantity parameter)	To ensure Essential Water employees implement appropriate drought management protocols and maintain restricted supply.	Review the availability of emergency sources, Copi Hollow and Imperial Lake, including a weekly assessment of water quality: salinity (total dissolved solids - TDS), alkalinity and algae levels.	Manager Water Supply and Quality	Within operating budget.	765 litres/account/day 15.0 ML/d at Mica Street WTP
	Water quality deterioration in Darling River or Menindee Lakes Scheme (raw water greater than 1,250 EC, quality parameter)		Review signage at boundaries of the service area and update to level two.	Manager Water Supply and Quality		
			Notify in writing, NSW Health and the NSW Department of Water and Energy of the increase in restrictions to be put in place.	Head Water Operations and Manager Water Supply and Quality		

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	<p>Critical loss or reduction of pumping capacity at or along Menindee pipeline or loss of water treatment capacity for a period of more than three days.</p>	<p>To raise public and stakeholder awareness of drought and further reduce non-essential demand<sup>3</sup>.</p>	<p>Prohibit<sup>4</sup>, without prior written permission from Essential Water:</p> <ul style="list-style-type: none"> <li>• Use of domestic and public sprinklers, automatic watering systems and fixed or hand-held hoses for irrigation of gardens and lawns other than on designated days in accordance with section 8.4.2.</li> <li>• The washing of vehicles other than in accordance with section 8.4.2.</li> <li>• The use of fixed or hand-held hoses to clean hard or paved surfaces including windows and building facades.</li> <li>• The filling of an empty, or topping up of an existing, swimming pool, spa, pond, lake or other water body.</li> <li>• The filling or topping up of a farm dam or tank.</li> <li>• Construction activities utilising water.</li> <li>• All exemptions based on Public Health or quantity parameters.</li> </ul>	<p>Head of Water Operations and Manager, Water Supply and Quality</p>		
	<p>Daily demand exceeding capacity of system to supply (31 ML/d) for two consecutive days.</p>		<p>Continue public awareness program focussing on limiting external water use. Advertise prohibitions, exemptions, methods of obtaining exemption and enforcement measures. Target susceptible customers identified in pre-activation.</p>	<p>Manager, Community Relations</p>		
	<p>Consumption target of level one not achieved.</p>		<p>Enforce restrictions through written warnings to identified offenders.</p> <p>Review daily production records at Mica Street water treatment plant to monitor the impact of introducing level two restrictions.</p>	<p>Manager, Water Supply and Quality</p>		

	Daily collection and weekly review of water quality: salinity (total dissolved solids - TDS), alkalinity. Weekly collection of algae levels in water sources.	Manager, Water Supply and Quality		
	Operate RO plant if available	Manager, Water Supply and Quality		
	Review business case and approvals for all options for alternate emergency water supply including rail or emergency bores	Manager, Engineering & Technical		

Level	Trigger(s)	Objective	Actions	Responsibility	Cost	Target <sup>6</sup>
<b>Level 3</b>	Total system storage at 9 months quality supply (5,500 ML) (quantity parameter)	To ensure Essential Water employees implement appropriate drought management protocols and maintain restricted supply.	Review the availability of emergency sources, Copi Hollow and Imperial Lake, including a weekly assessment of water quality: salinity (total dissolved solids - TDS), alkalinity and algae levels.	Manager Water Supply and Quality	Within operating budget.	660 litres/account/day 13.0 ML/d at Mica Street WTP
	Consumption target of previous level not achieved		Continue use of RO plant – triggered by quality parameter.	Manager Water Supply and Quality		
	Critical loss or reduction of pumping capacity at or along Menindee pipeline or loss of water treatment capacity for a period of more than five days		Review signage at boundaries of the service area and update to level three.	Manager Water Supply and Quality		
		Notify in writing, NSW Health and the NSW DWE of the increase in restrictions.	Head of Water Operations, Water and Manager Water Supply and Quality			
		To raise public and stakeholder awareness of drought and further reduce non-essential demand <sup>3</sup> .				

<p>Daily demand exceeding capacity of system to supply (31 ML/d) for three consecutive days</p> <p>Water quality deterioration in Darling River or Menindee Lakes Scheme (raw water greater than 1,300 EC, quality parameter)</p>	<p>Ramp up preparations to commence options for alternate emergency water supply including rail or emergency bores at 3 months supply or unmanageable quality</p>	<p>Manager Engineering and Technical</p>		
	<p>Continue public awareness program focussing on limiting external water use. Advertise prohibitions, exemptions, methods of obtaining exemption and enforcement measures. Target susceptible customers identified in pre-activation.</p>	<p>Manager Community Relations</p>		

Level 3		<p>Prohibit<sup>4</sup>, without prior written permission from Essential Water:</p> <ul style="list-style-type: none"> <li>• Use of domestic and public sprinklers, automatic watering systems and fixed or hand-held hoses for irrigation of gardens and lawns other than on designated days in accordance with section 8.4.2.</li> <li>• The washing of vehicles other than in accordance with section 8.4.2.</li> <li>• The use of fixed or hand-held hoses to clean hard or paved surfaces including windows and building facades. The filling of an empty, or topping up or emptying of, an existing, swimming pool, spa, pond, lake or other water body.</li> <li>• The filling or topping up of a farm dam or tank.</li> <li>• Construction activities utilising water based on quantity parameter trigger.</li> <li>• All exemptions based on Public Health or quantity parameters.</li> </ul>	<p>Head of Water Operations and Manager Water Supply and Quality</p>			
		<p>Enforce restrictions through fines and penalties.</p>		<p>Manager, Engineering and Technical</p>		
		<p>Review daily production records at Mica Street water treatment plant to monitor the impact of introducing level three restrictions.</p>		<p>Manager Water Supply and Quality</p>		
		<p>Daily collection and daily review of water quality: salinity (total dissolved solids - TDS), alkalinity and algae levels in water sources.</p>		<p>Manager Water Supply and Quality</p>		

	Record date of the removal of stage or the increase of restrictions.	Manager Water Supply and Quality		
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Level	Trigger(s)	Objective	Actions	Responsibility	Cost	Target <sup>6</sup>
<b>Level 4</b>	Total system storage at 6 months quality supply (3,300 ML) (quantity parameter).	To ensure Essential Water employees implement appropriate drought management protocols and maintain restricted supply.	Review the availability of emergency sources, Copi Hollow and Imperial Lake, including a weekly assessment of water quality: salinity (total dissolved solids – TDS), alkalinity and algae levels.	Manager, Water Supply and Quality	Operating budget	615 litres/account/day 12.1 ML/d at Mica Street WTP
	Widespread contamination of the water source or supply.		Ramp up preparations to commence options for alternate emergency water supply including rail or emergency bores to town to commence at 3 months supply or unmanageable quality	Manager, Engineering & Technical	\$50k	
	Consumption target of previous level not achieved.	To raise public and stakeholder awareness of drought and further reduce non-essential demand <sup>3</sup> .	Continue to operate the 6 ML/d reverse osmosis plant at Mica if available and shandy the water supply.	Manager, Water Supply and Quality	Within operating budget	
	Critical loss or reduction of pumping capacity at or along Menindee pipeline or loss of water treatment capacity for a period of more than two days.		Review signage at boundaries of the service area and update to level four.	Manager, Water Supply and Quality		
	Daily demand exceeding capacity of system to supply (31 ML/d) for five consecutive days.		Notify in writing, NSW Health and the NSW Office of Water of the increase in restrictions. Highlight restricted use of evaporative coolers and the potential need to access and treat local groundwater. Liaise with Health and NSW Office of Water on these issues.	Head of Water Operations and Manager, Water Supply and Quality		

**Level 4**

Water quality deterioration in Darling River or Menindee Lakes Scheme (raw water greater than 1,600 EC, quality parameter)

Prohibit<sup>4</sup>, without prior written permission from Essential Water:

- Use of domestic and public sprinklers, automatic watering systems for irrigation of gardens and lawns.
- Use of hand-held hose for irrigation of gardens more than once per day between 6 am and 9 am or on designated days between 7 pm and 10 pm in accordance with section 8.4.2.
- The operation of evaporative coolers between 9 pm and 10 am.
- The washing of vehicles unless in accordance with section 8.4.2.
- The use of water to clean hard or paved surfaces including windows and building facades.
- The filling of an empty, or topping up or emptying of, an existing, swimming pool, spa, pond, lake or other water body.
- The filling or topping up of a farm dam or tank.
- Construction activities utilising water based on quantity parameter trigger
- All exemptions based on Public Health or quantity parameters.

Head of Water Operations and Manager, Water Supply and Quality

Continue public awareness program focussing on limiting external water use. Advertise prohibitions, exemptions, methods of obtaining exemption and enforcement measures. Target susceptible customers identified in pre-activation.

Manager, Community Relations

Operating budget

		Review daily production records at Mica Street water treatment plant to monitor the impact of introducing level four restrictions.	Manager, Water Supply and Quality	Within operating budget	
		Daily collection and daily review of water quality: salinity (total dissolved solids – TDS), alkalinity and algae levels in water sources.	Manager, Water Supply and Quality		
		Record date of the removal of stage or the increase of restrictions.	Manager, Water Supply and Quality		

Level	Trigger(s)	Objective	Actions	Responsibility	Cost	Target <sup>6</sup>
<b>Level 5</b>	Total system storage at 4.5 months quality supply (2,500 ML) (quantity parameter)	To ensure Essential Water employees implement appropriate drought management protocols and maintain restricted supply.	Commence operation of emergency sources, Copi Hollow and Imperial Lake, including a weekly assessment of water quality: salinity (total dissolved solids – TDS), alkalinity and algae levels.	Manager, Water Supply and Quality	Operating budget	525 litres/account/day 10.4 ML/d at Mica Street WTP
	On-going widespread contamination of the water source or supply.		Ramp up and finalise preparations of infrastructure for riling water to town or other emergency supply contingency to commence at 3 months supply or unmanageable quality	Manager, Planning and Design	\$100k	
	Previous consumption target not achieved.	To raise public and stakeholder awareness of drought and further reduce non-essential demand <sup>3</sup> .	Continue to operate the 6 ML/d reverse osmosis plant if available at Mica and shandy the water supply, based on quality parameter trigger.	Manager, Water Supply and Quality	Within operating budget	
	Critical loss or reduction of pumping		Review signage at boundaries of the service area and update to level five.	Manager, Water Supply and Quality		

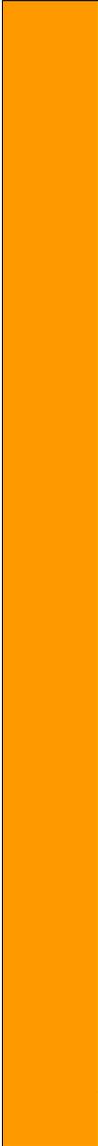
<b>Level 5</b>	capacity at or along Menindee pipeline or loss of water treatment capacity for a period of more than two days.		Notify in writing, NSW Health and the NSW Office of Water of the increase in restrictions. Highlight restricted use of evaporative coolers and the potential need to access and treat local groundwater. Liaise with Health and NSW Office of Water on these issues.	Head of Water Operations and Manager, Water Supply and Quality		
	Water quality deterioration in Darling River or Menindee Lakes Scheme (raw water greater than 1,800 EC, quality parameter)		<p>Prohibit<sup>4</sup>, without prior written permission from Essential Water:</p> <ul style="list-style-type: none"> <li>• Use of domestic and public sprinklers, automatic watering systems for irrigation of gardens and lawns.</li> <li>• Use of hand-held hose for irrigation of gardens more than once per day between 6 am and 9 am or on designated days between 7 pm and 10 pm in accordance with section 8.4.2.</li> <li>• The operation of evaporative coolers between 7pm and 10am.</li> <li>• The washing of vehicles unless in accordance with section 8.4.2.</li> <li>• The use of water to clean hard or paved surfaces including windows and building facades.</li> <li>• The filling of an empty, or topping up or emptying of, an existing, swimming pool, spa, pond, lake or other water</li> <li>• The filling or topping up of a farm dam or tank.</li> <li>• Construction activities utilising water.</li> <li>• All exemptions based on Public Health or quantity parameters.</li> </ul>	Head of Water Operations and Manager, Water Supply and Quality	Within operating budget	525 litres/account/day 10.4 ML/d at Mica Street WTP

			Continue public awareness program focussing on limiting external water use. Advertise prohibitions, exemptions, methods of obtaining exemption and enforcement measures. Target susceptible customers identified in pre-activation.	Manager, Community Relations		
			Actively enforce restrictions through patrols of urban areas, on the spot fines, and restriction of supply.	Manager Engineering & Technical	\$15k	
			Review daily production records at Mica Street water treatment plant to monitor the impact of introducing level five restrictions.	Manager, Water Supply and Quality	Within operating budget	
			Daily collection and daily review of water quality: salinity (total dissolved solids – TDS), alkalinity and algae levels in water sources.	Manager, Water Supply and Quality		
			Record date of the removal of stage or the increase of restrictions.	Manager, Water Supply and Quality		

Level	Trigger(s)	Objective	Actions	Responsibility	Cost	Target <sup>6</sup>
<b>Level 6</b>	Total system storage at 3 months quality supply (1,700 ML) (quantity parameter)	Eliminate non-essential use of water and minimise risk of potable water shortage.	Continue operation of emergency sources, Copi Hollow and Imperial Lake, including a weekly assessment of water quality: salinity (total dissolved solids - TDS), alkalinity and algae levels.	Manager, Water Supply and Quality	Operating budget	250 litres/account/day 4.9 ML/d at Mica Street WTP
	Consumption target of previous level not achieved.		Commence raling water to Broken Hill or other emergency water supply contingency at 3 months supply or unmanageable quality	Manager, Engineering & Technical	\$300k/month	

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<p>Critical loss of pumping capacity at or along Menindee pipeline or loss of water treatment capacity for a period of more than 10 consecutive days.</p> <p>Daily demand exceeding capacity of system to supply (31 ML/d) for more than 10 days.</p> <p>Water quality deterioration in Darling River or Menindee Lakes Scheme (raw water greater than 2,650 EC, quality parameter)</p>	<p>Continue to operate the 6 ML/d reverse osmosis plant if available at Mica and shandy the water supply.</p>	<p>Manager, Water Supply and Quality</p>	<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Within operating budget</p>	
	<p>Review signage at boundaries of the service area and update to level six.</p>	<p>Manager, Water Supply and Quality</p>		
	<p>Notify in writing, NSW Health and the NSW Office of Water of the pending emergency situation. Highlight restricted use of evaporative coolers. Liaise with Health and NSW office of Water on these issues.</p>	<p>Head of Water Operations and Manager, Water Supply and Quality</p>		



	<p>Prohibit<sup>4</sup>, without prior written permission from Essential Water:</p> <ul style="list-style-type: none"> <li>• Use of domestic and public sprinklers, automatic watering systems for irrigation of gardens and lawns.</li> <li>• Use of hand-held hose for irrigation of gardens more than once per day between 6 am and 9 am or on designated days between 7 pm and 10 pm in accordance with section 8.4.2.</li> <li>• Restrict commercial and industrial use of water supply to that required for health and safety practices only</li> <li>• The operation of evaporative coolers between 9 pm and 10 am.</li> <li>• The washing of vehicles unless in accordance with section 8.4.2.</li> <li>• The filling of an empty, or topping up or emptying of, an existing, swimming pool, spa, pond, lake or other water.</li> <li>• The filling or topping up of a farm dam or tank.</li> <li>• Construction activities utilising water.</li> <li>• All Exemptions based on Public Health or quantity parameters.</li> </ul>	<p>Head of Water Operations and Manager, Water Supply and Quality</p>	<p>Within operating budget</p>	<p>250 litres/account/day 4.9 MI/d at Mica Street WTP</p>
	<p>Continue public awareness program focussing on eliminating external water use. Raise community attention to possible emergency situation. Advertise prohibitions, exemptions, methods of obtaining exemption and enforcement measures.</p>	<p>Manager, Community Relations</p>		
	<p>Actively enforce restrictions through patrols of urban areas, on the spot fines, and restriction of supply.</p>	<p>Manager, Planning and Design</p>		

		Review daily production records at Mica Street water treatment plant to monitor the impact of introducing level six restrictions.	Manager, Water Supply and Quality		
		Daily collection and daily review of water quality: salinity (total dissolved solids - TDS), alkalinity and algae levels in water sources.	Manager, Water Supply and Quality		

Level	Trigger(s)	Objective	Actions	Responsibility	Cost	Target <sup>6</sup>
<b>Level 7</b>	<p>Total system storage at 2 months quality supply (1,100 ML) (quantity parameter)</p> <p>Consumption target of previous level not achieved)</p> <p>Other critical system failure or emergency drought circumstance.</p>	<p>Total system storage at 2 months quality supply (1,100 ML) (quantity parameter)</p> <p>Consumption target of previous level not achieved)</p> <p>Other critical system failure or emergency drought circumstance.</p>	Continue operation of emergency sources if they are available, Copi Hollow and Imperial Lake, including a weekly assessment of water quality: salinity (total dissolved solids - TDS), alkalinity and algae levels.	Manager, Water Supply and Quality	Within operating budget	60 litres/person/day 1.0 ML/d at Mica Street WTP
			Continue and increase railing water to Broken Hill or other emergency water supply contingency at 2 months supply or unmanageable quality	Manager, Engineering & Technical		
			Continue operation of RO plant if available	Manager, Water Supply and Quality		
			Review signage at boundaries of the service area and update to level seven.	Manager, Water Supply and Quality		
			Notify in writing, NSW Health and the NSW Office of Water of the emergency situation. Highlight restricted use of evaporative coolers and the potential need to access and treat local groundwater. Liaise with Health and NSW Office of Water on these issues.	Head of Water Operations and Manager, Water Supply and Quality		
			Prohibit all non-essential <sup>5</sup> use of water in accordance with Section 8.4.2.	Head of Water Operations and Manager, Water Supply and Quality		

Level	Trigger(s)	Objective	Actions	Responsibility	Cost	Target <sup>6</sup>
			Intermittent reticulation of water supply for non-potable purposes.	Head of Water Operations		
			Continue public awareness program focussing on emergency procedures.	Manager, Community Relations		
			Actively enforce restrictions through patrols of urban areas, on the spot fines, and restriction of supply.	Manager Engineering & Technical		
			Review daily production records at Mica Street water treatment plant to monitor the impact of introducing level seven restrictions.	Manager, Water Supply and Quality		
			Daily collection and daily review of water quality: salinity (total dissolved solids - TDS), alkalinity and algae levels in water sources.	Manager, Water Supply and Quality		
			Record date of the removal of stage.	Manager, Water Supply and Quality		

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### Reference Notes

1. Total system storage includes: Lake Wetherell, Weir 32 pool, Copi Hollow interconnecting channel, Stephens Creek Reservoir, Umberumberka Reservoir and Imperial Lake.
2. Production: defined as the water metered at Mica Street water treatment plant.
3. The quantity of commercial and industrial water consumption will not be restricted until level 6. However, all consumption not required for business activity should be reduced according to the above restrictions.
4. The specific detail for each level will be further defined during the event via advertising.
5. Essential use of water limited to 60 L/person/day minimum allowance for drinking, cooking and personal hygiene (potable), flushing toilets and washing clothes (the last two by bucket only)
6. Conversion of account targets to production targets is based on assessment of current population (18,498 people). This will need to be revised in light of changes in population.

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### 4. MONITORING AND REVIEW

#### 4.1 Drought Planning

The collection of drought and drought management information is critical to the on-going review and refinement of this drought management plan to ensure that the plan is responsive and flexible. A number of the actions for each stage of the action plan involve the collection and review of drought and drought management data. At the conclusion of any given drought occurrence (ie. at the conclusion of any plan implementation) the information collected will be used to critically review the existing plan and modify accordingly. This responsibility shall lie with the Manager, Water Supply and Quality. The review will include a de-brief with all operating and managerial employees to continue to promote the continued growth of drought management knowledge within Essential Water.

#### 4.2 Monitoring Consumption

Water pumped from the river and local reservoirs is recorded each day on network management system databases.

When water restrictions are applied, the water pumped each month will be used to estimate the annual quantity based upon the historical monthly patterns of consumption. Should these indicate that consumption may exceed those set out in Table 7, then more severe restrictions will be applied.

These consumption figures will also be reported to the community on a regular basis to encourage efficient water usage and conservation practices.

The water supply and quality section, also on a daily basis, undertakes monitoring of the following items:

1. Storage levels for Umberumberka and Stephens Creek reservoirs
2. Continuous monitoring of service reservoir levels within the Broken Hill township.

### 5. RESTRICTIONS AND EXEMPTIONS

#### 5.1 Introduction

This Drought Response Plan is made under the Water Management (General) Regulation 2011.

The purposes of this Plan are to:

1. Define acceptable uses of water;
2. Set out the stages of restrictions on the use of water;
3. Define events which lead to each stage of restriction being imposed;
4. Specify principles for considering applications for exemptions; and
5. Specify principles for when restrictions are lifted.

#### 5.2 Stages of Restriction

Four stages of restrictions may apply

- Early Warning
- Stage 1 (Mild) Restrictions
- Stage 2 (Medium) Restrictions

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- Stage 3 (High) Restrictions
- Stage 4 (Critical) Restrictions.

These stages may apply when Total System Storage, including Lake Wetherell, Copi Interconnecting Channel and local reservoirs, reaches the levels detailed below.

Total System Storage	Level of Drought	Water Restriction Level
24 months	Early Warning	Pre-activation
18 months	Stage 1 (Mild)	Level 1
12 months	Stage 2 (Medium)	Level 2, Level 3
6 months	Stage 3 (High)	Level 4, Level 5, Level 6
2 months	Stage 4 (Critical)	Level 7

These stages may also apply when it is reasonably concluded that:

- 1 Because of the high use of water in preceding days, it is possible that the capacity of major pipelines supplying water will temporarily be insufficient to meet the demands of EW's customers; or
- 2 Either or both in the interests of promoting effective management of drought, and allowing storages to recover from its effects, it is desirable temporarily to limit the supply of water; or
- 3 Because of the failure of a major pipeline, pumping station, treatment plant or other key water supply work, EW will temporarily be unable to meet the demands of EW's customers; or
- 4 An existing stage of restriction has failed to provide the combined estimated savings for the relevant stage, either as set out in the table of Restrictions; or
- 5 A higher stage of restriction should be introduced to conserve Total System Storage by publishing a notice in accordance with the Act.

**5.3 Restrictions**

When a stage of restriction is imposed the following restrictions on water use shall apply.

Purpose	Restriction Level	Allowable Use
Private Gardens	1	(a) An automatic watering system used between 7pm and 10am; or (b) A manual watering system used between 6pm and 10 am.
	2 and 3	On designated days using an Odds and Evens system as determined by Essential Water: Odds: Tuesday, Thursday and Saturday Evens: Wednesday, Friday and Sunday (a) An automatic watering system used between 11 pm and 6 am; or (b) A manual watering system used once per day between 6am and 10 am; or between 6pm and 10pm.

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Purpose	Restriction Level	Allowable Use
	4, 5, and 6	Hand-held hose used once per day between 6am and 10am; or 6pm and 10pm on designated days using an Odds and Evens system as determined by Essential Water: Odds: Tuesday, Thursday and Saturday Evens: Wednesday, Friday and Sunday
	7	Total ban
Private Lawns	1	(a) An automatic watering system used between 7pm and 10am; or (b) A manual watering system used between 6pm and 10 am.
	2 and 3	On designated days using an Odds and Evens system as determined by Essential Water: Odds: Tuesday, Thursday and Saturday Evens: Wednesday, Friday and Sunday Hand held hose used once per day between 6am and 10 am; or 6pm and 10pm.
	4, 5 and 6	Total ban
	7	Total ban
Public Gardens	1	(a) An automatic watering system used between 7pm and 10am; or (b) A manual watering system used between 7pm and 10am.
	2 and 3	(a) An automatic watering system used between 11pm and 6am; or (b) A manual watering system used once per day between 6am and 10am; or 6pm and 10pm.
	4, 5, and 6	(a) With written permission from Essential Water an automatic watering system, used between 11 pm and 6 am; or (b) A manual watering system used once per day between 6am and 10 am; or 6pm and 10pm.
	7	Total ban
Public Lawns	1	(a) An automatic watering system used between 7 pm and 10 am; or (b) A manual watering system used between 6 pm and 10am.
	2 and 3	(a) An automatic watering system used between 11 pm and 6 am; or (b) A manual watering system used once per day between 6am and 10am; or 7pm and 10pm.
	4, 5 and 6	Total ban
	7	Total ban
Private and public gardens: filling or topping up ponds and lakes	1	(a) An empty pond or lake must not be filled without Essential Water's prior written approval; or (b) The level of water in a pond or lake that has previously been filled with water may only be topped up or maintained with water from a hand-held hose, bucket or watering can.
	2 and 3	(a) An empty pond or lake must not be filled without Essential Water's prior written approval; or (b) The level of water in a pond or lake that has previously been filled with water may only be topped up or maintained with water from a hand-held hose, bucket or watering can.
	4, 5 and 6	(a) An empty pond or lake must not be filled or the level of water increased; or (b) The level of water in a pond or lake, which has previously been filled, with water may only be topped up or maintained with a bucket or watering can, filled directly from a tap (and not by means of a hose).

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Purpose	Restriction Level	Allowable Use
	7	<p>(a) The level of water in a pond or lake which has previously been filled with water; and sustains either or both of fish and birds, may only be topped up or maintained with a bucket or watering can filled directly from a tap (and not by means of a hose).</p> <p>(b) Any other pond or lake must not be topped up, maintained or filled.</p>
Swimming pools or spas: filling or topping up	1	<p>A swimming pool or spa which:</p> <p>(a) Has previously been filled must not be either emptied or re-filled; and</p> <p>(b) Has not previously been filled must not be filled, without Essential Water's prior written authority.</p>
	2 and 3	<p>A swimming pool or spa which:</p> <p>(a) The level of water in a swimming pool or spa that has been previously filled with water may only be topped up or maintained with water from a hand-held hose, bucket or watering can.</p> <p>(b) Has previously been filled must not be either emptied or re-filled; and</p> <p>(c) Has not previously been filled must not be filled, without Essential Water's prior written authority.</p>
	4, 5 and 6	<p>(a) An empty swimming pool or spa must not be filled, without Essential Water's prior written authority.</p> <p>(b) The level of water in a swimming pool or spa that has been previously filled with water may only be topped up or maintained with water from a hand-held hose, bucket or watering can.</p>
	7	<p>(a) A swimming pool or spa which:</p> <p>(i) has previously been filled must not be either emptied or re-filled; and</p> <p>(ii) has not previously been filled must not be filled, without Essential Water's prior written authority.</p> <p>(b) The level of water in a swimming pool or spa, which has been previously filled, with water may only be topped up or maintained with water from a bucket or watering can, filled directly from a tap (and not by means of a hose).</p>
Farm dams or tanks: filling or topping up	1 to 7	<p>(a) A farm dam or tank must not be topped up, maintained or filled with water supplied by Essential Water without Essential Water's prior written authority, except for a dam or tank which provides water:</p> <p>(i) for domestic or stock consumption; or</p> <p>(ii) for fire-fighting.</p> <p>(b) Water supplied by Essential Water must not be used for any other purpose or in a way that is inconsistent with any requirement of this Plan concerning the prevailing stage of restriction.</p>
Sports ground or recreational area	1	<p>(a) An automatic watering system, used between 7 pm and 10 am;</p> <p>(b) A manual watering system, used between 6 pm and 10 am.</p>
	2 and 3	<p>(a) An unspecified playing surface only watered with Essential Water's prior written authority; or</p> <p>(b) A specified playing surface only watered by:</p> <p>(i) an automatic watering system, used between 11 pm and 6am; or</p> <p>(ii) a manual watering system, used once per day between 6am and 10am; or 6pm and 10pm.</p>

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Purpose	Restriction Level	Allowable Use
	4, 5, and 6	(a) An unspecified playing surface only watered with Essential Water's prior written authority; or (b) A specified playing surface only watered by: (i) A hand-held hose if the surface is to be used for a scheduled national or international professional sporting competition; or (ii) With a bucket or watering can filled directly from a tap (and not by a hose).
	7	Total ban
Wholesale or Retail garden or nursery	1	No restrictions
	2 and 3	No restrictions
	4,5 and 6	(a) A watering system used between 11 pm and 6 am; or (b) A trigger hose between 7pm and 10pm.
	7	A watering system or hand-held hose with Essential Water's prior authority
Mobile water tankers: filling	1 to 7	(a) For fire, public health and emergency purposes (b) All other purposes require prior written authority of Essential Water
Motor vehicle dealers: cleaning vehicles	1	(a) By means of a watering can or bucket filled directly from a tap (and not by means of a hose); or (b) By means of a trigger hose, used only for the purpose of wetting, and rinsing a vehicle after it has been washed; or (c) By a commercial car wash
	2 and 3	(a) By means of a watering can or bucket filled directly from a tap (and not by means of a hose); or (b) By means of a trigger hose, used only for the purpose of wetting, and rinsing a vehicle after it has been washed; or (c) By a commercial car wash
	4, 5 and 6	Water must not be used to clean a vehicle, except the inside of the tank of a tanker vehicle by means of a trigger hose where such cleaning is necessary either to avoid contamination of the tanker's contents or to ensure public safety
	7	Water must not be used to clean a vehicle, except the inside of the tank of a tanker vehicle by means of a trigger hose where such cleaning is necessary either to avoid contamination of the tanker's contents or to ensure public safety
Cleaning Food transport Vehicles	1 to 7	(a) By a commercial car wash; or (b) By means of a bucket or watering can; or (c) By means of a trigger hose, used only for the purpose of wetting, and rinsing a vehicle after it has been washed; or (d) To clean inside a tank of a tanker vehicle by means of a trigger hose, where such cleaning is necessary either to avoid contamination of the tanker's contents or to ensure public safety.
Cleaning Private and Other vehicles	1	(a) By a commercial car wash; or (b) By means of a bucket or watering can filled directly from a tap (and not by means of a hose); or (c) By means of a trigger hose, used only for the purpose of wetting, and rinsing a vehicle after it has been washed; or (d) To clean inside a tank of a tanker vehicle by means of a trigger hose, where such cleaning is necessary either to avoid contamination of the tanker's contents or to ensure public safety.

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Purpose	Restriction Level	Allowable Use
	2 and 3	(a) By a commercial car wash; or (b) By means of a bucket or watering can filled directly from a tap (and not by means of a hose); (c) By means of a trigger hose, used only for the purpose of wetting, and rinsing a vehicle after it has been washed; or (d) To clean inside the tank of a tanker vehicle by means of a trigger hose where such cleaning is necessary either to avoid contamination of the tanker's contents or to ensure public safety.
	4, 5 and 6	Water must not be used to clean a vehicle, except the inside of the tank of a tanker vehicle by means of a trigger hose where such cleaning is necessary either to avoid contamination of the tanker's contents or to ensure public safety.
	7	Water must not be used to clean a vehicle, except the inside of the tank of a tanker vehicle by means of a trigger hose where such cleaning is necessary either to avoid contamination of the tanker's contents or to ensure public safety.
<b>Paved areas:</b>	1 to 7	Only if necessary as a result of an accident, fire, to ensure the health and welfare of animals using the area or other emergency unless prior written approval granted by Essential Water.
<b>Windows and building facades: cleaning</b>	1 to 7	By a bucket or watering can filled directly from a tap (and not by means of a hose) unless it is necessary to do so as a result of an accident, fire, or other emergency.
<b>Construction activities</b>	1 to 7	Water may only be used; (a) for the purpose of compaction by means of trigger hose (b) for the purpose of dust suppression
<b>Evaporative Air Coolers</b>	1	No restrictions
	2 and 3	No restrictions
	4, 5 and 6	Operated between the hours of 10 am to 9 pm
	7	Total ban

**5.4 Exemptions**

In cases of extreme hardship Essential Water will consider requests for exemptions. If an exemption is issued, it will end if a restriction level changes. Written exemptions may be issued in full or in part based on any of the following principles:

- a) To avoid an unreasonable impact upon the livelihood of the applicant which would be caused by the current level of restrictions;
- b) To result in less water being used by the applicant than if the applicant was not issued with an exemption;
- c) To consider the special needs of the applicant, without increasing the total number of hours when water may be used by the applicant under the current stage of restrictions;
- d) To avoid or minimise physical damage to a building or other structure owned or occupied by an applicant;
- e) To avoid any adverse effect on public health or safety;
- f) To consider the special needs of gardens open for public inspection (for example, a garden which is either usually or periodically open for public inspection, whether or not a fee is payable, if the application is

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accompanied by a drought management plan for the garden and the drought management plan has previously been approved by Essential Water); and

- g) To consider other reasons (for example, the exemption would not, in combination with other exemptions, have a significant impact upon the total daily water demand).

**5.5 Exemptions will not be considered**

- (a) To empty and refill a swimming pool, unless the person is reasonably satisfied that emptying and refilling the swimming pool are both necessary to ensure:
  - I. the structural integrity of the swimming pool; or
  - II. to avert a risk to the health or safety of any person; or
- (b) To fill a mobile water tanker, if the water is to be used to water grass.

**5.6 Lifting a Stage of Restriction**

Essential Water may lift a current stage of restriction and substitute a lesser stage of restriction; or lift a current stage of restriction, by publishing a notice in accordance with the Act.

Essential Water may decline to lift a current stage of restriction if it reasonably concludes that the change in circumstances, which would otherwise justify Essential Water in lifting the stage of restriction, is likely to be so temporary that the public inconvenience caused by lifting and subsequently re-imposing a stage of restriction would outweigh the benefits to Essential Water's customers of temporarily lifting the prevailing stage of restriction.

**5.7 Penalties for Non-Compliance**

Part 9, Division 3 of the Water Management (General) Regulation 2011 specifies the circumstances in which a person who receives a supply of water from Essential Water will be guilty of an offence for contravening a restriction or prohibition on the use of water imposed under this plan. The penalty at the date of this Plan is up to twenty penalty units. (A penalty unit is \$110). Essential Water may restrict the supply to a person who contravenes the Act or regulations in relation to misuse or taking water

**FOR PUBLIC RELEASE****6. DEFINITIONS**

The following definitions apply in this Plan.

“**Act**” means the *Water Management Act 2000*

“**AI**” means Australian Inland Energy Water Infrastructure

“**automatic watering system**” is a system for watering, operated by a device that turns the system on and off automatically, at predetermined times.

“**designated days**” means Tuesday, Thursday & Saturday for odd numbered houses; Wednesday, Friday & Sunday for even numbered houses.

“**Drip-feed irrigation system**” - means an irrigation system (including a micro-spray system) that delivers water to plants in drops or other small quantities by means of underground or surface pipes or tubes.

“**External paved area**” - means any area outside a building (whether or not it is sheltered by a roof) that is covered in paving, concrete, bitumen or other material. Walls, windows and roofs are excluded.

“**garden**” means any of flowers, shrubs, pot plants, bushes, greenhouses, vegetables, trees and excludes a grassed area.

“**hand held hose**” means a hose attended at all times and held by hand, and excludes hoses in any other position including lying on the ground.

“**High pressure low volume water cleaner**” - means a device, fitted with a trigger nozzle, that forces water, by means of a pump, at high pressure through the trigger nozzle at a flow rate of less than 9 litres per minute.

“**lawn**” means grassed area excluding garden

“**manual watering system**” means a system for watering which is not an automatic watering system and includes buckets, hand held hoses, tap timers, manually operated drippers and sprays.

“**Micro-spray system**” - means an irrigation system that delivers water through water-misting spray heads at a flow rate of not more than 0.5 litres of water per minute per outlet.

“**Minister**” means the Minister administering the Act.

“**private garden**” includes land used or intended to be used as a garden, associated with:

- (a) a dwelling; or
- (b) a commercial or industrial building; or
- (c) a hospital, nursing home or similar institution; or
- (d) school, university, research institute or similar institution, from which produce is not sold

and any adjacent nature strip in an adjoining road.

“**public authority**” means any body:

- (a) constituted by or under an Act; or
- (b) exercising powers under an Act, for a public purpose and includes a Council under the *Local Government Act 1989*.

“**public garden**” includes any garden, nature strip, plantation, park or reserve (other than a sports ground) managed or controlled by a public authority, but does not include a private garden.

“**specified playing surface**” means a made grass cricket pitch; a golf green; a croquet lawn; a bowling green; a grass or synthetic tennis court; a synthetic hockey ground.

“**Total System Storage**” means the total volume of water stored in the Stephens Creek Reservoir, Umberumberka Reservoirs and Menindee Lakes Storage available to Broken Hill at any time.

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“**trigger hose**” means a hose fitted with a nozzle, controlled by a trigger that must be continuously depressed by hand for water to flow.

”**Trigger nozzle**” - means a device that automatically shuts off the flow of water through a hose or other item to which it is attached (or of which it forms a part) unless pressure is maintained by hand on a trigger or other mechanism forming part of the device.

“**unspecified playing surface**” means:

- (a) any area adjacent to a made grass cricket pitch;
- (b) any tee area or fairway at a golf course;
- (c) any grassed area of a sporting oval (except a made grass cricket pitch); or
- (d) any other area that is not a specified playing surface.

“**vehicle**” includes every type of vehicle and any vessel or aircraft.

“**wholesale or retail garden or nursery**” includes any land primarily used to propagate, grow or display plants of any description or their produce for the purpose of sale or other distribution for profit, primarily to retailers, rather than the public.

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**7. ATTACHMENTS**

**ATTACHMENT A – NSW OFFICE OF WATER DROUGHT MANAGEMENT PLAN**

**Checklist**

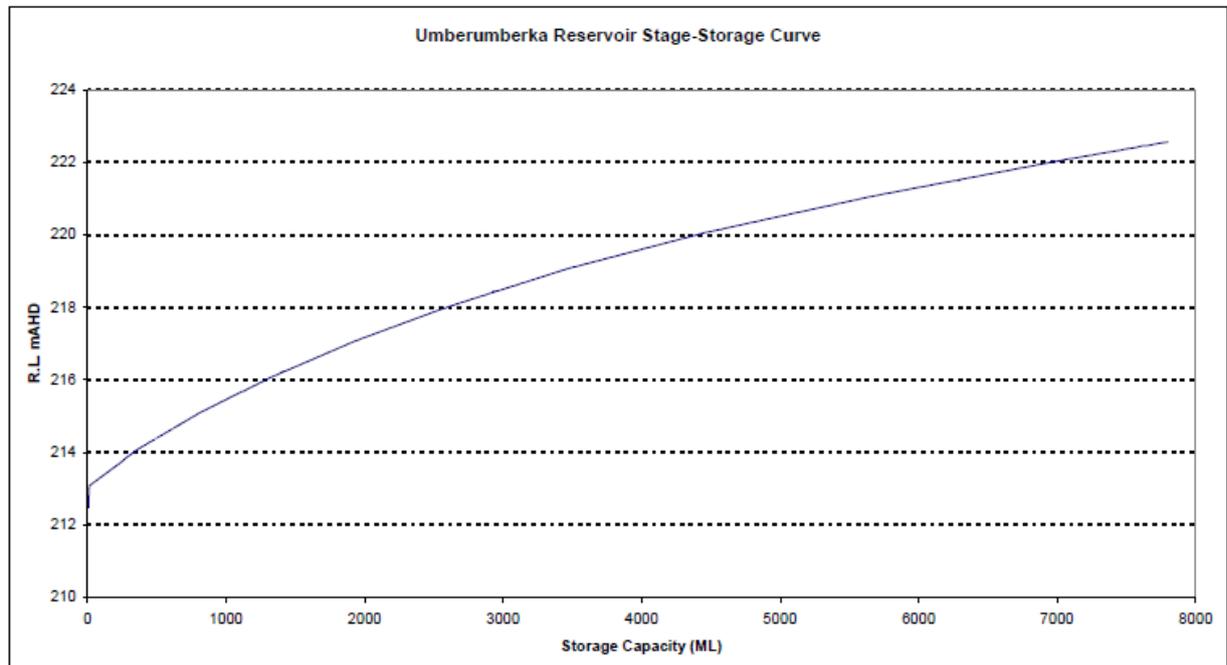
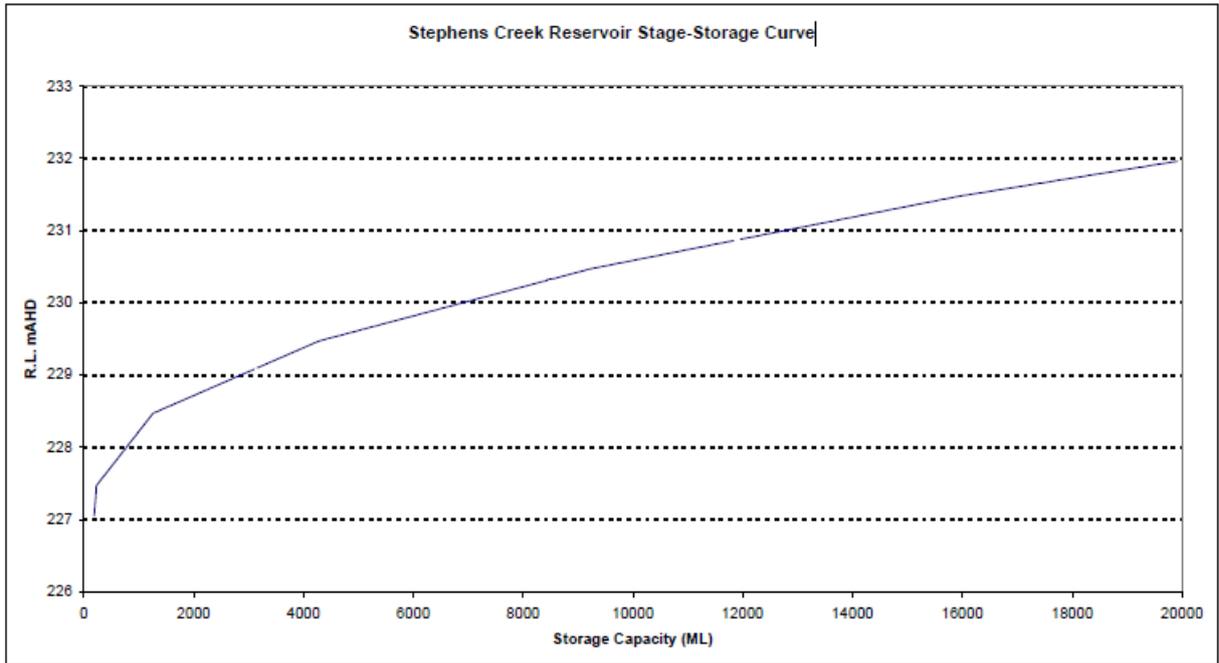
Topic		Outcome Achieved
1. Executive Summary	<input type="checkbox"/>  <input type="checkbox"/>	Covers all major issues, objectives, planning, strategies and monitoring for existing essential supplies of water to the service area(s). Includes a summary of the drought management plan. <b>Refer to action plan set out in Section 3.4.</b>
2. Background	<input checked="" type="checkbox"/>  <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	Includes the existing water supply system(s) in the service area(s) and a locality map. Includes history of past droughts. Includes information on the impact of past droughts on water services, eg. Restrictions, effect of restrictions on demands, any emergency sources identified, etc.
3. Objectives	<input checked="" type="checkbox"/>  <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	Identifies key objectives required to maintain a basic/restricted supply to all users. There is a need to consider social and environmental impacts. Tailor strategies relevant to the service areas. Endorse and implement a plan that minimises the risk of the community running out of water.
4. Data	<input checked="" type="checkbox"/>  <input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	Identification of all communities served by the LWU's reticulated water supply, those with private reticulated water services and those with no reticulated water services within the service area(s). Identification of any properties, businesses, other LWUs etc. that may seek water in times of drought. Identification of all water requirements. Identify the normal and minimum potable and non-potable water requirements. Identify water dependent industry/businesses, any fire fighting requirements and opportunities for recycled water use. Includes a description and plan of all water supply schemes in the service area(s). Includes height/storage volume and height/surface area graphs for all water supply dams and weirs. Historical performance of rivers, dams, weirs and bores in previous droughts. Includes the average rainfall figures and evaporation rates.
5. Plan	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	Demand management options. Restriction strategies including means and methods for the enforcement of restrictions and the expected results of imposing restrictions. Availability of alternative water sources (including estimated costs and times to implement). Water cartage options. <b>NA</b> Identify legislation, local laws and council policies affecting the contingency arrangements. Links to water sharing plans/committees, water management plans/committees, irrigators, etc. <b>NA</b> Impact of extraction on downstream stakeholders. Impact of reduced flows in watercourses. <b>NA</b> Level of prediction and intervention – trigger points. Identify human resource requirements.

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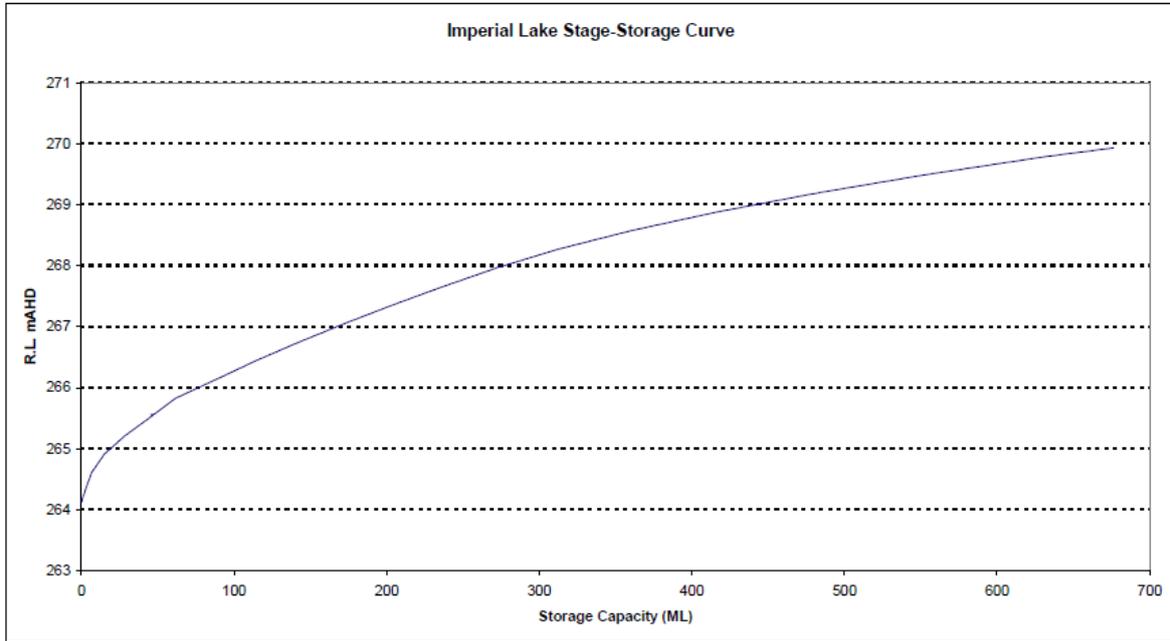
Topic		Outcome Achieved
6. Monitoring During Drought	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	Daily monitoring of demands. Daily monitoring of water supply sources (dams, bores and streams). Monitoring impact of restrictions on consumption. Monitoring the electrical conductivity, alkalinity and algae levels in the water sources.
7. Consultation	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	Comprehensive media strategy and public consultation. Regular consultation with appropriate government agencies (DEUS, DEC, NSW Health, DNR etc).
8. Operation of Drought Management Plan (DMP)	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	DMP should discuss, analyse and identify any impact on other regions and localities ie. Upstream, downstream or conjunctive water users. DMP should demonstrate a sustainable strategy that considers all other stakeholders. DMP documents an agreed procedure for progressive implementation of water restrictions.

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**ATTACHMENT B – DAM STORAGE DETAILS**



**Figure 6: Imperial Lake Stage-Storage Curve**



**FOR PUBLIC RELEASE****ATTACHMENT C – WATER SAVING TIPS**

# WATER SAVING TIPS

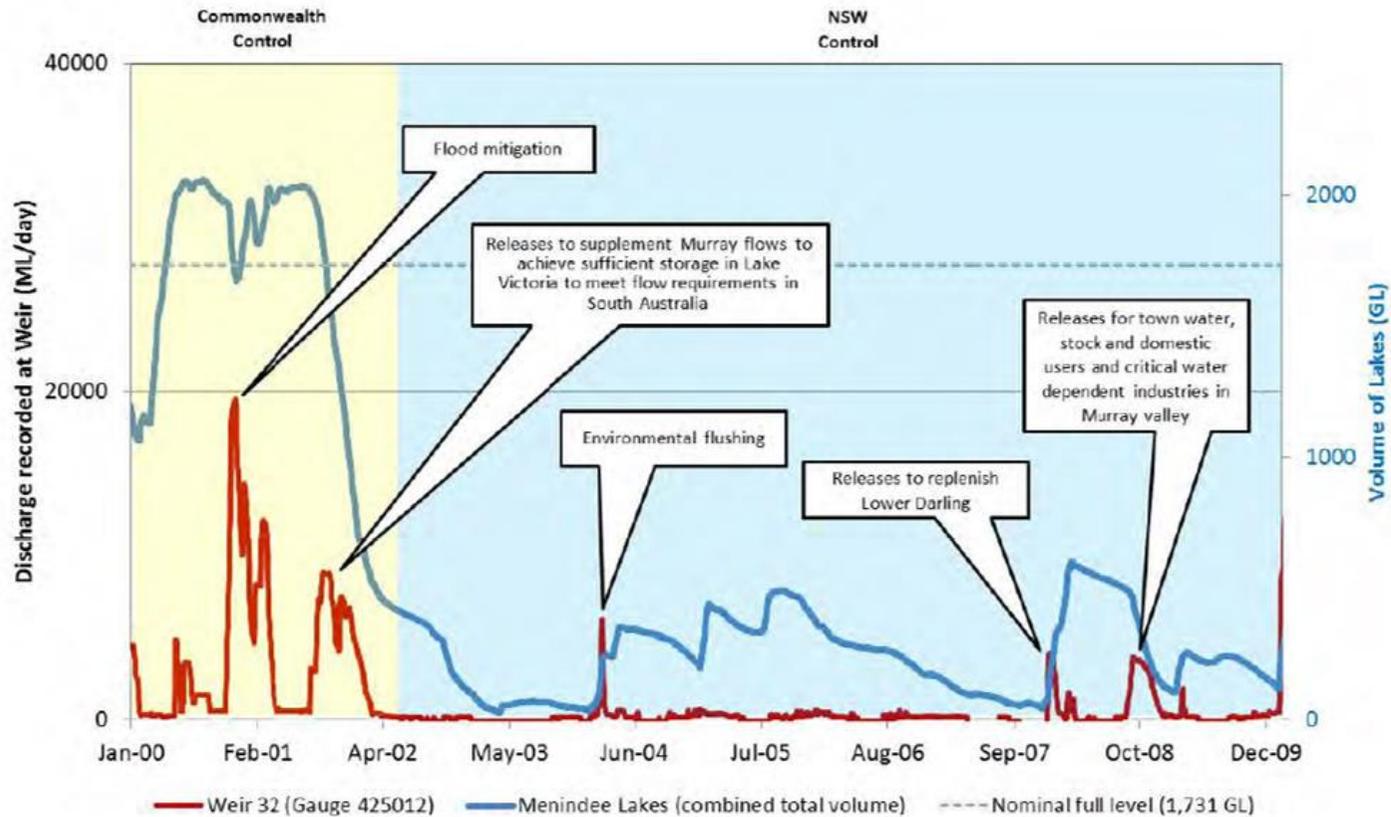
## > Here are some ways you can reduce the amount of water you use in your home and garden:

- Collect the water that runs through the tap or shower while you wait for the water to get hot and use it to water your plants
- Fix dripping taps and leaking toilets. Regularly check your dishwasher hoses and replace tap washers
- Install a water efficient shower head. You'll save as much as 10 litres of water per minute
- Operate dishwashers and washing machines when you have a full load. Use the suds saving function on your washing machine if you have it, as it will significantly reduce the amount of water you use
- Shorten your showers to 5 minutes or less
- Turn off the tap while you brush your teeth and use a glass of water to rinse. Put some water in the sink to rinse your razor – don't leave the tap running
- Aerate your soil and add water crystals to improve water retention
- Condition your soil and improve its water holding capacity by adding compost and manure to about a spade's depth. Veggie scraps are great to use in your compost bin and worm farm
- Consider reducing or replacing your lawn with pavers, groundcover, paths or native plantings
- Divert your laundry grey water to lawns and gardens
- Mulch gardens with pine bark, leaves, pebbles, lucerne or straw to reduce evaporation and keep down weeds
- Reduce your lawn's water needs by mulch-mowing – set the mower blades at about 5cm, and leave the clippings on the lawn
- Test the soil with your finger to check if plants need watering. If it's damp 2cm down, you won't need to water. For an accurate measure, use a water gauge in the garden bed.

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ATTACHMENT D – MENINDEE LAKES RELEASES 2000 - 2010

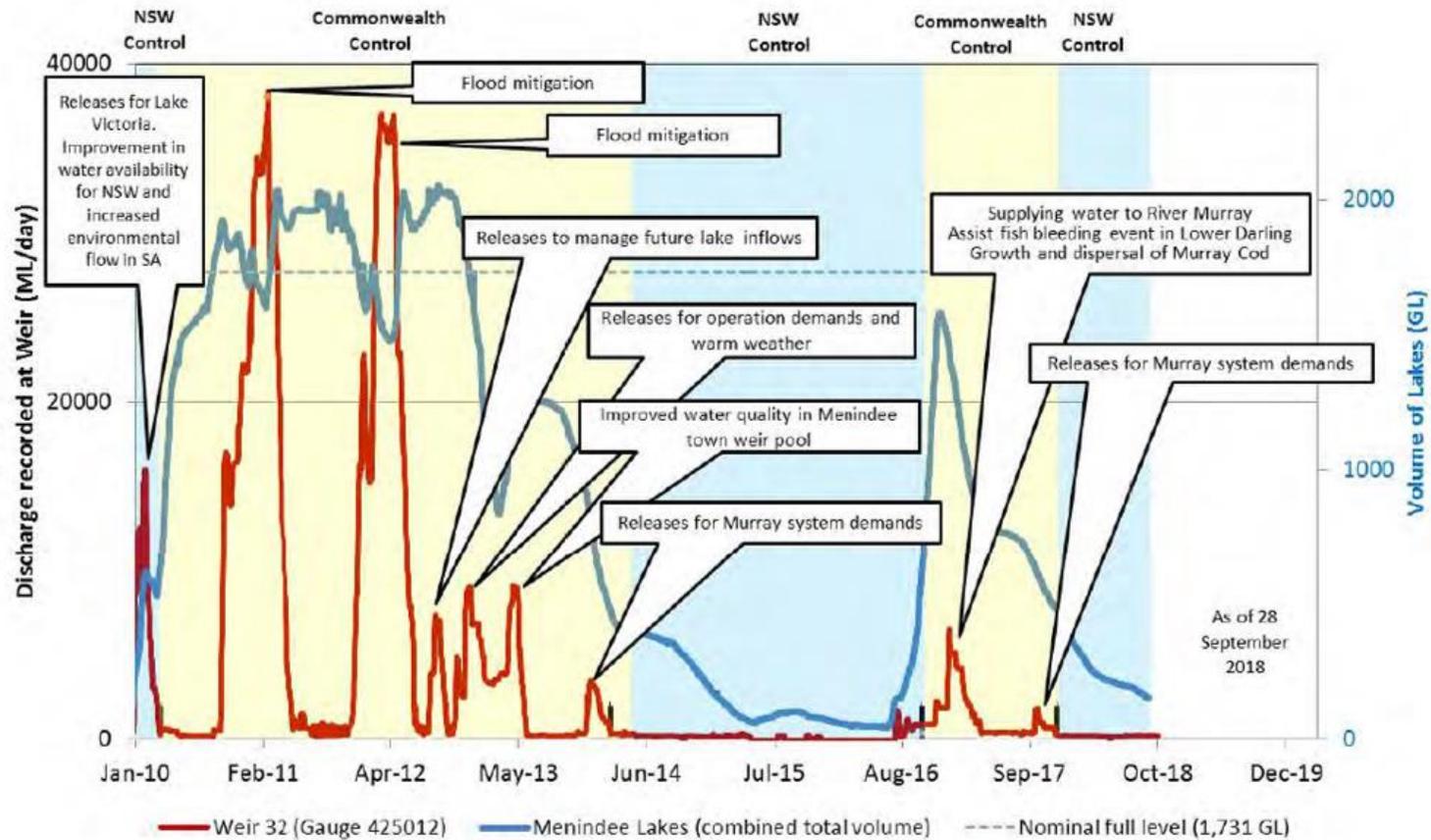
# Menindee Lakes Releases 2000 - 2010



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ATTACHMENT E – MENINDEE LAKES RELEASES 2010 - 2020

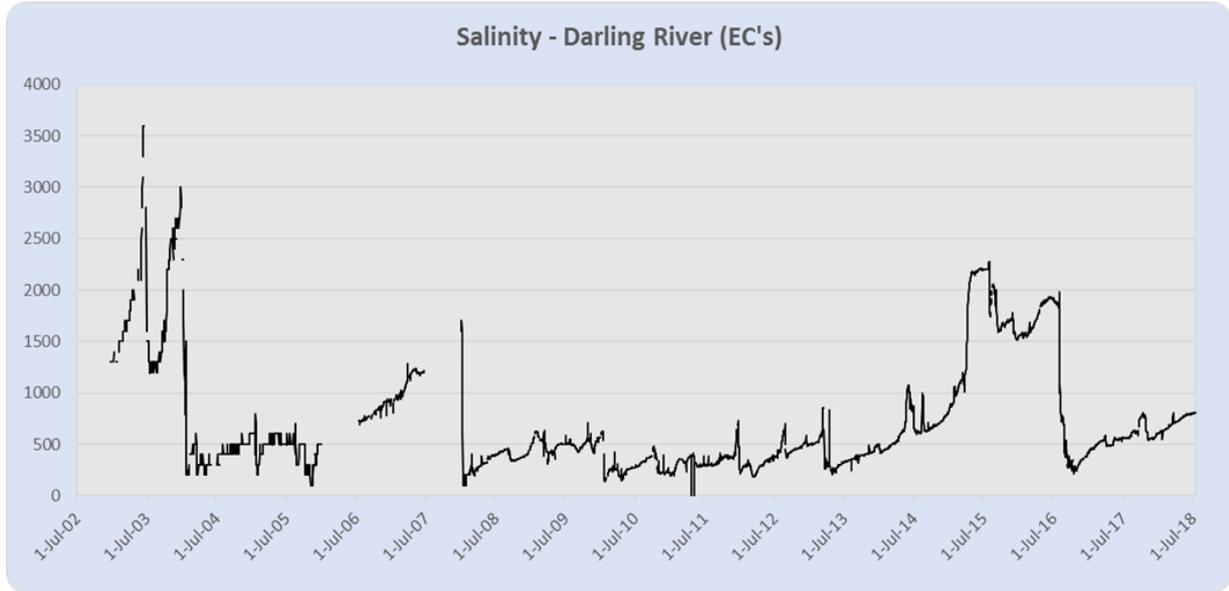
# Menindee Lakes Releases 2010 - 2020



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**FOR PUBLIC RELEASE**

**ATTACHMENT F – MEASURED AND MODELLED SALINITY IN DARLING RIVER SOURCE**



## ATTACHMENT G – EXAMPLE ADVERTISEMENT OF LEVEL 1 WATER RESTRICTIONS

# WATER RESTRICTIONS

## > Level 1 water restrictions are now in place across Broken Hill, Menindee, Sunset Strip and Silverton

- > Under Level 1 water restrictions:
- Watering of private gardens is permitted only with:
    - An automatic watering system between 7pm and 10am; or
    - A manual watering system between 6pm and 10am.
  - Watering of private lawns is permitted only with:
    - An automatic watering system between 7pm and 10am; or
    - A manual watering system between 6pm and 10am.
  - Private vehicles may be cleaned:
    - By a commercial car wash; or
    - By means of a bucket or watering can filled directly from a tap (and not by means of a hose); or
    - By means of a trigger hose, used only for the purpose of wetting, and rinsing a vehicle after it has been washed; or
    - To clean inside a tank of a tanker vehicle by means of a trigger hose, where such cleaning is necessary either to avoid contamination of the tanker's contents or to ensure public safety.
  - Paved areas: may be cleaned by means of a trigger hose, only if necessary as a result of an accident, fire, to ensure the health and welfare of animals using the area, or other emergency, unless prior written approval is granted by Essential Water.
  - Windows and building facades may be cleaned: by a bucket or watering can filled directly from a tap (and not by means of a hose) unless it is necessary to do so as a result of an accident, fire, or other emergency.
  - Construction activities: water must not be used, except by means of a trigger hose.
  - Swimming pool or spa which:
    - Has previously been filled – must not be emptied and refilled, it may only be topped up or maintained with water from a hand-held hose, bucket or watering can; or
    - Has not previously been filled – must not be filled without Essential Water's prior written authority.
  - Private and public gardens: filling or topping up ponds and lakes:
    - An empty pond or lake must not be filled without Essential Water's prior written approval; or
    - The level of water in a pond or lake that has previously been filled with water may only be topped up or maintained with water from a hand-held hose, bucket or watering can.

**Please note: If water restriction levels change exemptions cease immediately and exemption applications must be submitted again.**

- > To apply for an exemption or for more information call **13 23 91** or visit **essentialwater.com.au**

Essential Energy trading as Essential Water



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## 8. REFERENCES

DEUS (2004) Best-Practice Management of Water Supply and Sewerage Guidelines

DHI (2004) Broken Hill WATHNET analysis Draft Report, published as part of JWP (2004) Australian Inland Water 2023 Integrated Water Cycle Management Strategy

Water Directorate (2003) Technical Guidelines, Drought Management Guidelines

## 9. REVIEWS

Revision Number	Section	Details of Changes in this Revision
1		Original Issue

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