CENTRAL DARLING SHIRE COUNCIL

DROUGHT MANAGEMENT PLAN

VERSION <2.0>

<31/01/2025>

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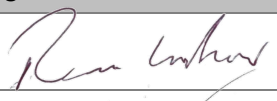
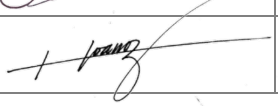
Director of Shire Services	Reece Wilson		31/01/2025
Operations Manager	Thai Hoang Dang		31/01/2025

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EXECUTIVE SUMMARY

Central Darling Shire Council is a local water utility in Far West NSW. The Shire Council was constituted on the 1st of May 1959, and it encompasses an area of almost 52,000 square kilometres, making it the largest Local Government Area (LGA) in New South Wales. Conversely, population figures for the Shire are one of the lowest with 1,725[1] residents dispersed throughout the towns of Ivanhoe, Menindee, White Cliffs and Wilcannia, and villages of Tilpa and Mossgiel with 36.5% of population identified as Aboriginal people[2].

***Table 1**: Water Supplies in the Council*

Locality	**Service Areas**	**Water Sources**	**Customers (properties)**
Wilcannia	• Wilcannia Township • Mallee & Warrali Aboriginal communities	• Surface water: Darling River • Groundwater: Union Bend bores	255
Ivanhoe	• Ivanhoe Township	• Surface water: Willandra Creek & Morrison Dam • Groundwater: Morrison borefield	139
White Cliffs	• White Cliffs Township	• Surface water: Wannara Creek & Wakefield Tank	172
Menindee	• Menindee Township (managed by Essential Water)	• Surface water: Darling River	0
Tilpa	• Tilpa Village	• Surface water: Darling River (self-supply) • Groundwater: Tilpa bore (emergency supply)	1
Mossgiel	• Mossgiel Village	• No supply	0
Total			**537**

[1] 2021 Census, Australian Bureau of Statistics

This Drought Management Plan documents a restriction regime that applies to all customers served by the Central Darling Shire Council water supply. This plan aims to ensure consistency and community acceptance and therefore improve the success of drought management in the shire. The water restrictions triggers contained within this Plan are based on the Council supply system (including natural water sources and water storage level). Each locality water supply may adopt triggers for the introduction of water restrictions developed for their specific water sources/storages.

The drought restriction regime consists of four restriction levels with an "Emergency" situation implemented beyond Level 4 (Table 2). Each restriction level has a target demand and associated water saving measures for potable and non-potable water use. The customers should strictly comply with restrictions and the regime shall be be closely monitored and enforced by Council. If water levels drop further or target demands are not met, higher restriction levels will be applied.

***Table 2**: Water Restriction Levels and Target Reduction in Demand*

Restriction level	**Normal water saving measures**	**Level 1: Low**	**Level 2: Moderate**	**Level 3: High**	**Level 4: Very High**	**Level 5: Extreme**	**Level 6: Critical**
Target water consumption (litre/person/day)		260	240	220	200	160	120

Frequent monitoring and assessing are essential activities for the implementation and ongoing improvement of this plan. The Drought Management Plan will be re-evaluated after every drought event with applied restrictions. The plan may need to be reviewed and amended to address any emerged issues and to prepare better for future droughts.

OVERVIEW

OBJECTIVES

The primary objective of this Drought Management Plan is to ensure continued water supply during drought conditions in order to meet water users, public health and fire-fighting's needs.

This Plan aims to:

- Ensure a robust, timely, efficient, and affordable response to drought;
- Facilitate the application of restrictions at a local level for council-operated water supplies;
- Provide a clear water restriction regime for all water users; and
- Reduce the impact of water extraction on the available resource and other water users while minimising disruption to customers.

The operational objectives relate to preparing for drought as well as the actual implementation of restriction during a drought. The operational objectives are:

- Provide an action plan that will ensure operational standby;
- Ensure regular monitoring of water resource information, climatic conditions and seasonal forecasts;
- Ensure the introduction of water restrictions is well-considered and planned;
- Implement drought management actions at defined trigger points;
- Ensure clear communication to the public and visitors regarding water restrictions requirement and access to information;
- Ensure that operating and managerial staff have a clear understanding of this plan; and
- Continually review the effectiveness of the existing procedures, and developing alternative measures if improvement is needed.

LEGISLATION & REGULATORY

Legislative requirements relating to management of water supplies during drought include:

- NSW Local Government Act, 1993
- NSW Local Government (General) Regulation 2005 – Reg. 137 regulates water supply restrictions
- NSW Water Management Act 2000
- NSW Public Health Act 2010 and Public Health Regulation 2022
- NSW Work Health and Safety Act, 2011 and Regulation.

Other related guidelines and standards include:

- Water Supply and Sewerage Strategic Business Planning and Financial Planning Checklist (NSW Office of Water, 2014)
- Drought Management Guidelines (Water Directorate, 2003)
- Australian Drinking Water Guidelines (NHMRC/NRMMC, 2004)
- NSW Health Guidelines for Water Carters (NSW Health, 2005)
- Penalty Notices – Fixed Penalty Handbook for Local Councils (Infringements Processing Bureau, NSW Police Service).

WATER SAVING MEASURES

The water saving measures will be presented in detail for each water user group and the expected range of water use activities. The restrictions will apply to use of raw water and filtered water includes rainwater tanks that are topped-up with potable town water. The use of standalone rainwater/ bore

water and/or recycled water is not restricted but must be identified by signage at the location of water use.

The rationale for application of water saving measures is that:

- There is a range of restrictions for all water supply users which aims to minimise the impacts on the community while reducing unnecessary water use as the restriction level increases;
- The focus is on reducing outdoor residential water use first as:
  - o Public health risks are not increased by reducing outdoor water use;
  - o It is not feasible to enforce restrictions on indoor water use and leakage; and
  - o Internal water use is likely to also reduce when outdoor drought water restrictions are in place due to greater public awareness.
- Early reductions to residential water use are more severe than for business and commercial premises due to:
  - o The residential sector accounts for the majority of usage in the region; and
  - o There is minimal direct financial impact to the residential sector whereas many business and commercial premises rely on the water supply to continue operation.
- As water restriction levels increase, businesses and commercial premises will be required to reduce water usage; and

PENALTY

Section 637 of The Local Government Act (1993) and Sections 159-160 of Local Government Regulations (2005) confer on councils the authority to prevent waste or misuse of water generally and specifically to prevent water use *"contrary to a council notice restricting the use of water"*. A water authority (Council) has a number of legal avenues available, including formal warnings, fines and the installation of flow restriction devices to premises for the misuse of water.

FORECAST & PREPARATION

Extreme drought conditions are becoming increasingly more common across Australia especially in Far West NSW as the climate change conditions are worsen over the years. Recent events showed that circumstances can change quickly, and rainfall can vary substantially.

SEASONAL CLIMATE FORECASTING

Any forecasting of future climate will assist water operation by determining the short-medium term likelihood of a water restriction event via a risk assessment process. This key information can influence decision making and preparations for restrictions demand reduction practices. Results of climate forecasts and implications for drought management actions will need to be assessed on a case by case, year by year basis.

The Bureau of Meteorology provides a range of climate forecasting elements and reports on their website with outputs available in many visual and quantitative forms. Climate forecasts are regularly updated so its website is the most reliable and the most accessible channel of obtaining vital information for climate predictions.

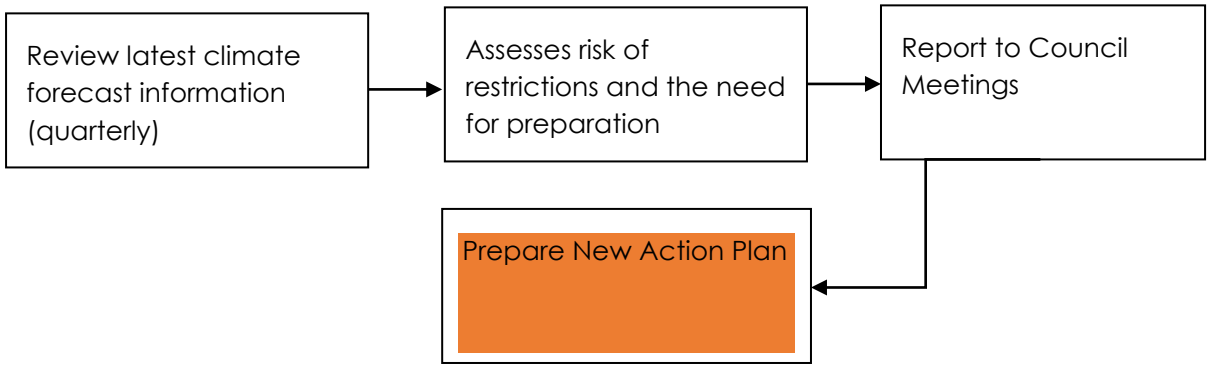
The rainfall and temperature climate outlook maps show the likelihood of experiencing wetter/drier (and warmer/cooler) than median weather for the upcoming three months. A table showing details for separate months are also provided. The maps can be used to analyse the likelihood of certain rainfall scenarios in a specific area.

The condition of **El Niño** refers to the extensive warming of the central and eastern tropical Pacific Ocean which leads to a major shift in weather patterns across the Pacific. This occurs every three to eight years and is associated with drier conditions in eastern Australia.

Central Darling Shire Council should maintain a simple Microsoft Excel Spreadsheet that contains the historical record required for drought analysis, managed by the Utilities Engineer, including these data:

- Historic climate data;
- Historic Darling river flows and dams' storage levels;
- Historic raw water daily production.

Ongoing assessment of climate forecasts and interaction with drought management actions will follow a process as below:



EMERGENCY WATER SUPPLIES

During drought conditions, main water sources will be exhausted due to the net demand at a particular restriction level. As a drought progresses, Council will need to provide alternative supplies to supplement existing sources. When drought conditions occur, Central Darling Shire Council has a number of water source options that can be implemented with relatively short lead times to allow more time to implement water carting if required.

Potential emergency supply options include:

- Groundwater (bores) extraction;
- Water cartage from neighbouring supply systems;

Each option requires individual lead-in times and activation tasks. Due to the vast distance and large variation of natural water sources in the Shire, each township's options and actions will be analysed separately in following sections.

ACTION PLAN

***Table 3**: Central Darling Shire Council Drought Management Plan Action Plan*

Water Level	Drought Management Plan (DMP) Actions	Time
Normal	Ongoing water storage, streamflow, production monitoring	Daily
	Prepare and update seasonal climate forecast	Quarterly
	Design and prepare communication materials	By Oct 2024
	Prepare/update water restriction webpages and social media pages	By Oct 2024
	Design, approve and install road signs	By Oct 2024
	Develop restriction enforcement regime and training for Council staff	By Oct 2024
	Review options for emergency source	By Oct 2024
	Survey to confirm water level	When required
75% Level 1	Prepare activation of existing groundwater bores: • Check bores' pumps and electrical, access condition; • Test pumping for quantity and quality; and • Determine expected supply and treatment requirements.	Level at 75%
	Commence river extraction monitoring	Daily
	Leakage detection and immediate repair	Daily
60% Level 2	Drought WMP guidance provided to non-residential customers.	Level 1 restrictions are introduced
	Activate existing bores	Level 1 restrictions are introduced
	Commence monitoring of groundwater extraction, bore drawdown and water quality	Daily
	Compare production with target demand	Weekly

45% Level 3	Additional supply from existing bores	Level 2 restrictions are introduced
	Compare production with target demand	Weekly
30% Level 4	Additional supply from existing bores	Level 3 restrictions are introduced
	Compare production with target demand	Weekly
	Frequent and random meter reading for DMP compliance monitoring	Daily
20% Level 5	Prepare and arrange for water carting	to be confirmed by planning
	Compare production with target demand	Daily
10% Level 6	Activate water carting	Emergency Level restrictions are introduced
	Compare production with target demand	Daily

RESTRICTIONS

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

Usage purpose	Restriction level	Allowable use
Private Gardens & Lawn Public Gardens & Lawn Sports ground or recreational area	1	Watering systems, micro sprays, drip systems, soaker hoses, non-fixed sprinklers handheld hoses only. **Summertime** between 6 pm – 9 am only. **Wintertime** 6 am -10 am and 4 pm – 10 pm.
	2-3	Watering systems, non-fixed sprinklers, handheld hoses, micro sprays, drip systems, soaker hoses on designated days using an Odds and Evens system as determined by Council Odds: Tuesday, Thursday and Saturday Evens: Wednesday, Friday and Sunday **Summertime** between 6 am-9 am and between 6 pm-9 pm every second day as per odds and evens system. **Wintertime** between 7 am-10 am and between 4 pm-7 pm every second day as per odds and evens system.

	4-6	Not permitted
First fill of private swimming pools	1-2	Only between hours of 7 am-9 am and between 6 pm-8 pm
	3-4	Only with Council permission and provided pool covers are used.
	5-6	Not permitted
Swimming pools or spas: filling or topping up	1-4	A swimming pool or spa which: (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. (b) Has previously been filled must not be either emptied or re-filled; and (c) Has not previously been filled must not be filled, without Council's prior written authority. Between hours of 7 am-9 am and between 6 pm- 8 pm, every day provided pool covers are used.
	5-6	Not permitted
Cleaning Private and Commercial vehicles	1-4	(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.
	5-6	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.
Construction activities	1-6	Water may only be used; (a) for the purpose of compaction by means of trigger hose (b) for the purpose of dust suppression
Windows and building facades: cleaning	1-6	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.

Evaporative Air Coolers	1-3	No restrictions
	4-5	Permitted between the hours of 7 am to 12 am
	6	Permitted between the hours of 6 pm to 10 pm.
Fire Fighting	1 to Emergency	No restrictions

EXEMPTIONS

In cases of extreme hardship, Council 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 accompanied by a drought management plan for the garden and the drought management plan has previously been approved by Council);

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).

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:

- the structural integrity of the swimming pool; or
- 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.

COMMUNICATION PLAN

Clear communication of information in a timely manner between Council, relevant state authorities, businesses, and the community, is crucial in successfully delivering objectives of this Drought Management Plan.

A community awareness media campaign is essential for making the public aware of actions that directly impact them, such as water restrictions and any enforcement measures. The community also needs to be given details on how to minimise the restriction impact and methods on saving water at their properties. The community will be regularly informed with the status of water restrictions, next steps if target reductions is not achieved, and water supply status.

Key state government agencies will be involved in decision-making process are:

- NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW) – Water Department
- NSW Health
- Far West LHD & Wilcannia, Ivanhoe, White Cliffs Hospitals
- Environmental Protection Agency (EPA)

The relevant agencies will be consulted and informed when significant impacts on the community, the environment or other stakeholders are expected as a result of actions arising from implementation of the plan.

There are several components of a successful communication plan including:

- Pre-drought messaging – demand management requirements, everyday water saving measures and the forecast level of risk that water restrictions may need to be introduced in the near future. This prepares the community for the possible introduction of restrictions and encourages reduction in water use where possible to reduce the need for restrictions;
- Regular communication of the level in rivers and dams and associated restriction levels to be imposed;
- Once restrictions are introduced, provide regular feedback on the effectiveness of restrictions in reducing demand; and
- A range of media and communication tools to convey drought messages to the whole community.

MEDIA AND COMMUNICATION TOOLS

Media Releases

A media release is a standard, formal official written summary, or update, alerting the local media about a matter for editorial comment and free publication. Media releases will be submitted electronically in an editable format. Timing for publishing of media releases will aim to give the community at least 2 weeks' notice of the introduction of water restrictions and at least 1 week notice for a change in restriction level. Potential media outlets are, but not inclusive as below:

***Table 4**: Media outlets for water restriction communication at CDSC*

Name of media outlets	Council Liaison Officer	Contact
Local Print Media		
Wilcannia News	Community Engagement Officer	editor@wilcannianews.com.au (08) 8091 5294
Barrier Truth	Community Engagement Officer	enquiries-admin@barriertruth.com.au (08) 8087 2354
Local Radio Stations		
Wilcannia River Radio 103.1FM	Community Engagement Officer	info@redie.org.au 1800 035 721
2WEB - Outback Radio 585 AM	General Manager	(02) 6872 2333
ABC Broken Hill Radio	General Manager	1300 462 222
Social Media		
CDSC Facebook Page	Community Engagement Officer	
CDSC LinkedIn Page	Community Engagement Officer	

A standard template for drought media releases will be produced to ensure consistency and expedite approval. The template will contain an outline of the required content including:

- Current water level;
- Water restriction level in place;
- Dates when water restrictions come into effect;
- A summary list of water saving measures required for that level and detail of how to access the full list of water saving measures (e.g. link to webpage, contact number/email);
- Target demand reduction for that level;
- Update on current trends in demand including acknowledgement of any reductions achieved so far;
- Enforcement details; and
- Details of the seasonal climate forecast.

Social Media

Social media such as Facebook present opportunities to expand the reach of drought management messaging quickly and easily in the community. Social media is used by a large cross-section of the community but is particularly useful in targeting those members of the community that may not necessarily be reached by traditional newspaper and radio media. Cross-promotion across the different media types will increase the use of social media (e.g. newspaper/radio advertisements would refer members of the public to the social media sites).

Council will utilise social media to provide a means for information to be communicated in real-time and disseminate updates about water storage levels and water restriction levels, as well as providing relevant links to further information, contact details and tips on water saving measures.

Websites

Council website should provide a real-time communication tool and links to further information, contact details and tips on water saving measures. Council will maintain separate page with a link dedicated to Water Restrictions in which information will be regularly updated.

The Water Restrictions webpage will contain information about everyday water saving measures, a summary of forecasted weather conditions, potential water restrictions and contact details for further information. As the water restriction level 1 starts, the webpage will be updated with key drought information as listed for media releases.

The webpage will also contain links to:

• Water restrictions guidance for residential use;

• Water restrictions guidance for business and commercial use;

• Summary of seasonal outlook;

• Water level information; and

• This Drought Management Plan.

Town Signs

The town signs referred to here in this communication plan are Transport for NSW and Council approved road signs, informing the community and visitors to the region that water restrictions are in place. They are to be installed at pre-approved locations on main roads at major town/village entry roads and other key locations in the region. Council will design and produce roads signs, installing, maintaining, and adjusting signs in Central Darling Shire LGA.

Printed Leaflets

Printed leaflets provide another layer in the community awareness campaign to further emphasise the drought message and have been a standard tool in past droughts. Leaflets can provide a brief message alerting water users about the need for water restrictions including:

- Water restriction level in place;
- Summary of water restrictions;
- Water saving tips and how to access detailed water restrictions information;

- Target demand reduction for the restriction level; and
- Details of enforcement and applicable fines.

Due to the economic and environmental cost of printed materials and the prevalence and popularity of online messaging, the distribution of printed leaflets will only be considered at higher restriction levels. Printed leaflets would be distributed to households and businesses via Australia Post or a private contractor. Leaflets can also be included with water bills if billing cycles coincide with water restriction periods. In addition, leaflets can be left at council offices, post offices, tourist accommodations and supermarkets.

WILCANNIA

WATER SOURCES

Wilcannia draws its water from a weir pool on the Darling River which adjoins the town. The raw water is pumped to a non-potable storage reservoir. Wilcannia has a dual water supply. Non potable water represents about 65% of the total water consumed. It is generally unmetered at individual properties. The non potable supply is reticulated untreated. About 35% of the water pumped is treated and reticulated as potable water.

During times of low to no flow in the Darling river, the raw water for treatment is sourced from bore supply at Union Bend Crown Reserves with 3 bores (Bore 1, Bore 2, Bore 3) in operation.

Bore 1 (commissioned 2003) was re-lined with stainless steel casing in February 2024. All 3 bores were thoroughly cleaned with chemical and high-pressure wash to maintain integrity in Feb 2024.

A new weir pool will be constructed 5km downstream of the existing weir. Construction is expected to be completed by 2026.

HISTORICAL CONTEXT

The Darling River flow is getting lower and lower in recent the years. Poor water management practices and excessive extraction are the primary causes of declining flow and the poor state the river. In addition, more and more extreme weather events with less rainfall contributed to many severe droughts in the Murray-Darling basin over the last two decades, including Wilcannia.

***Table 5**: Recent droughts with water restrictions in Wilcannia*

№	Date	Events & Water Restriction	Remedial action
1	27/08/2002	Darling River flow was 30 ML/day. Water restriction was introduced. The river ceased to flow during September 2002, completely dry out by Oct 2002. River flows again in Apr 2003. The longest recorded period of no flow from 1902 to 2003.	Usage restrictions. Pumps placed on the riverbed to transfer water from one weir pool to the next. Maintain a water supply (with reduced volume) for a period of twelve (12) months of no flow
2	01/10/2006	Darling River ceased flow at the Wilcannia weir.	Pumps to transfer water from one weir pool to the next.

		Water restriction was introduced. River flows again in August 2007.	Used bore pumps Maintain a water supply (with reduced volume) for a period of six (6) months of no flow
3	19/10/2009	Darling River ceased flow at the Wilcannia weir. Water restriction was introduced. River flows again in Jan 2010.	Pumps placed on the riverbed to transfer water from one weir pool to the next. Used bores pumps. Maintain a water supply (with reduced volume) for a period of six (6) months of no flow
4	10/2018	Darling River ceased flow at the Wilcannia weir. Level 4 Water Restrictions was activated. River flows again on 6/3/2020	Used bores pumps.

2002

The Darling River in Wilcannia ceased flow on 30 September 2002. Pumping from pool 2 commenced 2 January 2003 and lasted 3 months until flow spilled at the weir on 1 April 2003. This was a nil flow situation of six (6) months.

The millennial drought continued with a cease to flow situation commencing 1 September 2006 and continued throughout the remaining period of the decade which was not alleviated until the “Deluge Years” of 2010, 2011 and 2012.

2007

The first stage of restrictions was introduced in Wilcannia on 1st October 2007. The restrictions applicable from that day were “that watering of Council’s parks and oval and the Golf Club fairways cease immediately and the use of fixed hoses and sprinklers not be used. Watering by hand held hose is permitted between 6.00 and 9.00pm only.” Cessation of recreational watering reduces consumption by 50% and the restrictions on consumers result in a further 25% reduction.

Notices of restrictions were published on community notice boards and in the local paper for two weeks.

Concessions were made to both motels, the Shell Roadhouse, Wilcannia Hospital, Wilcannia Preschool, and the Wilcannia Golf Club for the permitted use of a sprinkler for 1 hour per day to maintain their immediate surrounds.

The Wilcannia emergency bore at Union Bend was put back into operation 1 September 2007, when flow ceased at the weir. This provides adequate water to meet the demands of the treated supply for Wilcannia.

2014

Low flow conditions re-emerged during early 2014 within the catchment sufficient to re-establish the Barwon Darling Drought Teleconference process. Notwithstanding this catchment wide response circumstances within the Central Darling Shire Council did not warrant water restriction be implemented at this time.

These catchment wide conditions were alleviated with good rainfall during the 2nd half of 2014 and the *Barwon Darling Drought Teleconference* process was discontinued.

The Minister approved funds for the equipping of Production Bore 2 with necessary mechanical, electrical and telemetry infrastructure to complete the bore and bring on-line in conjunction with existing Union Bend Bore 1 in 2015.

2017-2020

Rainfall and runoff within the catchment were greatly assisted by the 2017 Environmental Flow which reinvigorated the catchment in a material way and provided significant relief and deferment of low flow/no flow conditions within the Darling River at Wilcannia.

In early 2018 the Barwon Darling River was again at low flows/cease to flow stage conditions and the Barwon Darling Town Drought Teleconferences process was re-commenced.

On 12 November 2018, The Federal and New South Wales Governments have committed $30 million to replace the Wilcannia Weir. A third bore at Union Bend was drilled and commissioned.

WATER CONSUMPTION

Wilcannia has low-cost non-potable water due to its proximity to the Darling River where pumping costs are similar to a typical irrigation block. Council's parks, recreation areas and the Wilcannia Golf Club are the major users of the untreated supply. Recreation consumption per capita in Wilcannia is significant.

The normal monthly consumption of water in Wilcannia (population: 735[3]) and the minimal (drought) water requirements are set out in the table below. The restrictions to be imposed when water ceases to flow over the weir should reduce consumption to the levels listed below. The bore supply must be used to produce the potable supply only.

***Table 6**: Wilcannia Water Consumption*

	Normal Water Consumption			Minimal (Drought) Water requirements		
Month	**Potable**	**Non-Potable**	**Total**	**Potable**	**Non-Potable**	**Total**
January	5.1	34.6	39.7	nil	8.6	8.6
February	4.6	29.0	33.6	nil	7.2	7.2
March	4.2	29.4	33.7	nil	7.3	7.3
April	4.1	22.7	26.8	nil	5.7	5.7

[3] 2021 Census, Australian Bureau of Statistics

May	4.2	13.3	17.5	nil	3.3	3.3
June	3.3	12.5	15.8	nil	3.1	3.1
July	3.4	14.9	18.3	nil	3.7	3.7
August	3.3	19.2	22.5	nil	4.8	4.8
September	4.1	22.1	26.2	nil	5.5	5.5
October	4.2	23.8	28.0	nil	6	6
November	4.1	28.8	32.9	nil	7.2	7.2
December	5.1	31.6	36.6	nil	7.9	7.9
Total	49.8	281.9	331.7	nil	70.3	70.3

***Table 7**: Wilcannia historical water consumption in drought (9/2002 – 12/2003)*

Month	Potable Consumption	Non-Potable Consumption	Total Consumption
September 2002	4.1	5.5	9.6
October 2002	4.5	6	10.5
November 2002	5.1	7.2	12.3
December 2002	5.5	7.9	13.4
January 2003	5.4	8.6	14
February 2003	5.5	7.2	12.7
March 2003	5.3	7.3	12.6
April 2003	River Flow 1 April		

WATER RESTRICTION MEASURES

The Wilcannia weir is deemed to be 3 metres high however the crest is about 2.8 metres higher than the downstream siltation and water level.

The weir has two relatively independent ponds behind it. The first is 5km long and the second 22km long. It is understood that the rock bar between the two pools is about 600mm below the crest level of the weir. For the following tables and graphs, it is assumed that the two pools are independent, which is the case some six (6) weeks after the river ceases to flow.

Advice from Works Staff at Central Darling Shire is that the first weir pool could be accessible to a depth of 2.0 metres below the weir crest spillway level. When this level is reached, arrangements will have been made to transfer water into a shortened weir pool.

By consultation, riparian users above the weir have requested that Council not transfer water across the bar from the second pool as lowering the level in this second pool creates problems of livestock crossing the river and reduces their supply at more than double the evaporation rate.

***Table 8**: Wilcannia first weir pool storage*[4]

Height below weir crest	Average Width	Length	Area	Volume in each layer	Cumulative Volume
M	m	m	Square m	ML	ML
Full	50.0	5200	260000		
-0.1	49.3	5200	256533	26	26
-0.2	48.7	5200	253067	25	51
-0.3	48.0	5200	249600	25	76
-0.4	46.3	5200	240933	25	101
-0.5	44.7	5200	232267	24	125
-0.6	43.0	5200	223600	23	147
-0.7	42.5	5200	221000	22	170
-0.8	42.0	5200	218400	22	192
-0.9	41.2	5200	214240	22	213
-1.0	40.4	5200	210080	21	234
-1.1	39.6	5200	205920	21	255
-1.2	38.8	5200	201760	20	276
-1.3	38.0	5200	197600	20	296

Note At -1.3m this pool is reduced in length to approximately 4500m and can only be pumped to -2m below the weir crest.

***Table 9**: Wilcannia second weir pool storage*[4]

Height below weir crest	Average Width	Length	Area	Volume in each layer	Cumulative Volume
m	m	m	Square m	Ml	Ml
Full	45.0	21800	981000		
-0.1	44.3	21800	966467	97	97
-0.2	43.7	21800	951933	96	193
-0.3	43.0	21800	937400	94	288
-0.4	41.7	21800	908333	92	380
-0.5	40.3	21800	879267	89	469
-0.6	39.0	21800	850200	86	556
-0.7	38.3	21800	833850	84	640
-0.8	37.5	21800	817500	83	723
-0.9	36.7	21800	800060	81	804
-1.0	35.9	21800	782620	79	883
-1.1	35.1	21800	765180	77	960
-1.2	34.3	21800	747740	76	1036
-1.3	33.5	21800	730300	74	1110
-1.4	32.0	21800	697600	71	1181
-1.5	30.5	21800	664900	68	1249
-1.6	29.0	21800	632200	65	1314
-1.7	27.5	21800	599500	62	1376
-1.8	26.0	21800	566800	58	1434
-1.9	25.2	21800	549360	56	1490
-2.0	24.4	21800	531920	54	1544

Note At 2.00m below weir crest level, water for transfer becomes inaccessible.

[4] Wilcannia Water Supply Darling River Weir Study (February 1987), Appendix B, Public Works Department NSW, Dubbo District Office.

***Table 10**: Wilcannia weir pools' evaporation Rates, volumes, and levels*

Month	Consumption	Evaporation	Volume Consumed	Volume evaporated	Water Level at Start of Month First Weir Pool	Water Level at Start of Month Second Weir Pool
	litres per person / day	mm / month	Ml / month	Ml / month	mm below weir crest	mm below weir crest
Oct 2002	250	190	5.4	232	full	full
Nov 2002	250	240	5.3	285	-211	-190
Dec 2002	300	315	6.5	338	-472	-430
Jan 2003	300	345	6.5	342	-816	-745
Feb 2003	300	245	5.9	230	-1000	-1134
Mar 2003	250	210	5.4	184	-1000	-1458
April 2003	250	150	5.3	117	-1000	-1742
May 2003	250	85	5.4	63	-1000	-1957
June 2003	200	65	4.2	47	-1000	-2086
July 2003	200	55	4.3	39	-1000	-2186
Aug 2003	200	80	4.2	55	-1000	-2273
Sept 2003	250	125	5.3	78	-1000	-2396
Oct 2003	250	190	5.4	106	-1000	-2597
Nov 2003	250	240	5.3	114	-1000	-2917
Dec 2003	300	315	6.5	130	-1000	-3367

The water restrictions level 1 will reduce raw water consumption at parks, ovals, and the Golf Club to nil.

With the restrictive measures adopted by Council and subject to sustainable bore supply, Wilcannia may have adequate water supply to service Wilcannia residents for an ongoing basis in a period of 12 months. Additional bore supply capacity can be provided at Union Bend from three established production bores.

In the event of complete diminish of the river pools at Wilcannia, bore supplies and water restriction at emergency level, a water carting plan for Wilcannia will be activated.

WATER CARTING PLAN & COST ESTIMATE

Water carting to Wilcannia would only occur in the emergency event of both the emergency bore and the Darling River weir pool supply fails through depletion or is rendered unfit due to quality or should the water treatment plant (WTP) fail and be irreparable within 48 hours. Provided the WTP is operational, the preferred option is to cart raw water from pools within the Darling River from either up or downstream to the Wilcannia WTP for processing.

***Table 11**:* Estimated quantity of carted water for Wilcannia

Category	Amount	Approved Rate	Estimate	Quantity
Residents	650	160 L/head/day		104,000
Hospital Patients	4	330 L/person/day		1,320
Nursing Home Patients	0	154 L/person/day		0
School Students (non-residents)	0	37 L/person/day		0
Hotels	1		2000	2,000
Clubs	1		3000	3,000
Restaurants/take aways	2		1000	2,000
Tourists	10		95 L/p/day	950
Motels	2		3000	6,000
Public Toilets	3		300	900
Offices	6		200	1200
Total				**122,970 L**
				123 kL

Carting raw water

Carting raw water for treatment at the Wilcannia WTP is preferred to carting treated water.

Raw water should be sourced from:

- pools within the Darling River either upstream or downstream from Wilcannia
- Morrison Dam in Ivanhoe
- Broken Hill water line (pumped from Murray River)

Earthworks will be required to improve access to the riverbanks for the tank trucks.

Carting filtered water

In case of exhaustion in the Darling river or raw water quality is too bad for treatment in Wilcannia, filtered water will be carted from:

- Menindee (155km) via unsealed roads
- Broken Hill (200km) via Barrier Highway
- Cobar (260km) via Barrier Highway

***Table 12**:* Cost estimation of carting water for Wilcannia

Items	Unit Price	Quantity	Cost per day
Semi tanker truck 31kL per hour From Menindee	$200	5 x 4 = 20 hrs/day	$4,000
Semi tanker truck 31kL per hour From Broken Hill	$200	5 x 4 = 20 hrs/day	$4,000
Semi tanker truck 31kL per hour From Cobar	$200	7 x 3 = 21 hrs/day (short of 30 kL/day)	$4200

Central Darling Shire water revenue (2023-2024) per day: $4/KL x 123 = $492
NSW Government & CDSC co-contribute the shortfall of $3,508/day

***Table 13**:* Potential contractors for water carting

Contractor	Number of tank trucks		Contact
Danson Bros Ivanhoe	1 semi tanker 32 kL	2 tank trucks 18 kL	02 6995 1126 0429 951 122
Greg Wilkins Industries Broken Hill	3 tank trucks 25 kL	2 tank trucks 16.5 kL	0418 600 308
Blore's Rural Menindee	1 tank trucks 22 kL	1 tank trucks 19 kL	0419 515 768

IVANHOE

WATER SUPPLIES

Ivanhoe obtains its water from the Lachlan River via a weir at Wallanthery, diverting water into Willandra Creek, a regulated stream. Water from Willandra Creek is then pumped to a 365 ML off creek storage (Morrison Dam) and then pumped through a 30 km pipeline to a 55 ML withholding Balance tank (dam) at the Ivanhoe treatment plant. In addition to the Dam, 5 bores on a field nearby about 2kms towards Ivanhoe, can also supply water with reasonable quality for treatment. As both these sources share the same rising main, it is not possible to pump from both sources simultaneously.

Generally, a release into Willandra Creek occurs during the autumn when there is sufficient water in the Lachlan system. The topping up of the off-creek storage is dependent upon these releases. When full, there is sufficient water in the off-creek storage to maintain the Ivanhoe supply for two years. Utilising the bores to supplement the supply, the creek water would probably be extended by six months.

The bore pumps are controlled to deliver 1.5 L/sec and 3.0 L/sec relatively from Bore 1 & Bore 2 established in 2005 and 3 L/s from the new bores' pump equipped in 2015. Whilst these low pumping rates are adhered to, it is not envisaged that bore failure will occur.

Water in Ivanhoe township is reticulated in a dual system (potable/raw and non-potable/filtered).

HISTORICAL CONTEXT

Ivanhoe has never been on water restrictions.

However, the integrity of the Morrison Dam and bore field must be maintained at all times.

WATER CONSUMPTION

Ivanhoe has a small population of 261[5] with no significant business except a pub, a caravan park and 2 bed & breakfasts. A village of Tronox mine consists of 26 residential properties (used to be the Ivanhoe Correctional Centre) will possibly add around 40 more to the total population.

WATER CARTING PLAN & COST ESTIMATE

***Table 14**:* Estimated quantity of carted water for Ivanhoe

Category	Amount	Approved Rate	Estimate	Quantity
Residents	300	160 L/head/day		31,800
Hospital Patients	5	330 L/person/day		1,650
Nursing Home Patients	0	154 L/person/day		0
School Students (non-residents)	5	37 L/person/day		185
Hotels	1		2000	2,000
Clubs	1		1000	1,000
Restaurants/take aways	1		1000	1,000
Tourists	10		95 L/p/day	950
Motels/B&B	2		3000	6,000
Public Toilets	1		300	300
Offices	2		200	400
Total				**45785 L**
				46 kL

In case of exhaustion in the Morrison Dam and bores or raw water quality is too bad for treatment in Ivanhoe, filtered water will be carted from:

- Wilcannia (180km) via Cobb Highway
- Balranald (220km) via Balranald Road (MR67)

[5] 2021 Census, Australian Bureau of Statistics

***Table 15**:* Cost estimation of carting water for Ivanhoe

Items	Unit Price	Quantity	Cost per day
Semi tanker truck 31kL per hour From Wilcannia	$200	5 x 2 = 10 hrs/day	$2,000
Semi tanker truck 31kL per hour From Balranald	$200	6 x 2 = 10 hrs/day	$3,000

WHITE CLIFFS

WATER SUPPLIES

White Cliffs water supply has an off-creek storage (Wakefield Dam) adjoining Wannara Creek. Water is pumped directly from Wakefield Dam to the water treatment plant or to a second ground tank (Tank 2) in the town area. There is also a surface catch ground tank to the west of the town (Tank 1).

Water treatment process is rudimentary with coagulation to reduce turbidity and chlorination to disinfect. The water is classified as non-potable. Residences, both living above ground and in dug outs, generally have rainwater tanks for their potable supply.

All three storages are replenished from surface water catch. When all are full, there is sufficient water to maintain this non-potable supply for at least one year. Storm rain of 50mm in the catchment of Wakefield Dam will replenish this 150 ML storage in 12 hours. More rain is needed to replenish both Tank 1 and Tank 2 storages, total capacity of approximately 8 ML.

It has been found that imposition of water restrictions has resulted in increased consumption.

Many bore holes have been sunk in the White Cliffs area since the early 1900's and again in 2015 using drought management grant funding. These have yielded either no water or water too brackish for human consumption. Investigations to date indicate there is no alternate local supply to that yielded from rainfall and runoff within the Wannara Creek catchment.

HISTORICAL CONTEXT

Council nearly prepared to cart water to White Cliffs in 2016, however it rained just a week before the carting schedule. However, the risk of running out of water in White Cliffs is always around the corner.

WATER CONSUMPTION

White Cliffs has a small population of 156[6] with a few businesses include a pub, a caravan park and 2 motels. Population dwindles in summer due to many residents moves to other parts of the country to avoid extreme hot weather.

[6] 2021 Census, Australian Bureau of Statistics

WATER CARTING PLAN & COST ESTIMATE

***Table 16**:* Estimated quantity of carted water for White Cliffs

Category	Amount	Approved Rate	Estimate	Quantity
Residents	180	160 L/head/day		28,800
Hospital Patients	52	330 L/person/day		660
Nursing Home Patients	0	154 L/person/day		0
School Students (non-residents)	0	37 L/person/day		0
Hotels	1		2000	2,000
Clubs	1		300	300
Restaurants/take aways	1		1000	1,000
Tourists	10		95 L/p/day	950
Motels/B&B	2		1000	2,000
Public Toilets	1		200	200
Offices	1		200	200
Total				**36110 L**
				36 kL

Water carting to White Cliffs would only occur when supply and ground tank storages falls through depletion or is rendered unfit for treatment and when residents run out of rainwater. The reticulated system throughout White Cliffs is a non-potable supply. Filtered water will be carted from:

- Wilcannia (90km) via Opal Miners Way (sealed road)
- Broken Hill (260km) via Barrier Highway, Dry Lake Road (unsealed) and Opal Miners Way

***Table 17**:* Cost estimation of carting water for Ivanhoe

Items	Unit Price	Quantity	Cost per day
Semi tanker truck 31kL per hour From Wilcannia	$200	5 x 2 = 10 hrs/day	$2,000
Semi tanker truck 31kL per hour From Broken Hill	$200	7 x 2 = 14 hrs/day	$2,800

MENINDEE

WATER SUPPLIES

The Menindee water supply is operated by Essential Water, a division of Essential Energy based in Broken Hill. Raw water is drawn from the Darling River at Menindee. The township has a single reticulation system with only filtered water.

A new modern water treatment plant for Menindee was commissioned in 2021 which can provide high quality filtered water even in the events of poor-quality raw water from Menindee Lakes & Darling River.

HISTORICAL CONTEXT

Central Darling Shire Council is not responsible for supplying water to Menindee township and surrounding rural properties. However, in drought and poor-quality water events (2021 & 2023), Council received funding from NSW Department of Primary Industries – Water to arrange and supply water to residents who do not have access to town's water.

Residents who are located south of the Darling River and in surrounding rural properties, have no access to clean water when the river flow stops, and blue-green algae contaminated the river water. In December 2018, January 2019 and March 2023, mass fish deaths occurred and covered a 40 km stretch of the Darling River, downstream of Menindee Lakes near Menindee township. This significantly affected the environment and the local community.

WATER CARTING PLAN & COST ESTIMATE

Water carting for Menindee shall be decided by Essential Water and NSW relevant authorities. Central Darling Shire Council plays a role of cooperating in a joint effort to cart water for designated customers, subjected to funding grants.

TILPA

WATER SUPPLIES

The village of Tilpa with a population of around 50[7] rely on rain, river, and ground water for domestic and stock needs. Number of permanent residents in the centre of the village is around 10.

Council provided a solar pump system to pump water from Tilpa weir, around 12 km away, to a tank located at the Tilpa Hotel, then reticulated to individual's properties via private connections. An emergency bore was also commissioned in 2023 with a water access licence (WAL) for usage is still in the process of applying by Council.

HISTORICAL CONTEXT & WATER CARTING PLAN

The supply pump in Tilpa is likely to be affected by flood which occurred in 2022. Residents evacuated due to transport access cut off from all unsealed road to nearby towns like Cobar & Wilcannia.

The emergency bore should provide sufficient water in drought. Regular maintenance of the electrical system & the pump is essential before any emergency event.

[7] 2021 Census, Australian Bureau of Statistics