

Water Cycle Management Issues Paper

Summary

What is the Issues Paper?

Integrated Water Cycle Management (IWCM) is the process of developing a strategic plan for our water and sewer businesses.

The Palerang Communities Issues Paper has been written following a review of the water and sewer services, testing the health of the services against things like water security, regulatory compliance, capacity, levels of service and more.

The issues are identified and key issues will then be considered in the future IWCM Strategy. In some cases a particular issue may be part of business-as-usual, or could be addressed by monitoring or reporting. The Strategy is likely to focus on key issues where future public works will be considered.

What water supplies does this Issues Paper consider?

Bungendore water supply

Bungendore's water supply comes from bores. Current water demands are very close to the water access licence allocation. We have been working on securing additional water for Bungendore, and development of new subdivisions has been paused in the meantime.

In 2024 water quality sampling was undertaken for Per- and polyfluoroalkyl substances (PFAS), showing that there were low levels of PFAS (below the current Australian Drinking Water Guidelines (ADWG) concentrations) in two of the five town water supply bores.

Braidwood water supply

The Braidwood water supply is through an off-stream storage dam which is filled by water extracted from the Shoalhaven River.

Captains Flat water supply

The Captains Flat water supply scheme draws water from a dam on the Molonglo River.

The following pages summarise 35 issues identified across the water and sewer businesses.



Demographic projections



The major growth factor in the former Palerang LGA is proposed major Greenfield developments at Bungendore. This could more than double the population of Bungendore over the next 10 years. Population growth in Bungendore requires additional water, with a moratorium on subdivision approvals currently in place.

In Braidwood, if growth was to go beyond 2,800 EP, this could lead to yearly water demand in hot dry years exceeding the current allocation, and the load on the sewage treatment plant reaching capacity. This could mean an increased water allocation and secure yield, if that is possible, and both water and sewage treatment capacity may be required within the next 30 years.

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Glossary of key terms

Key term	Definition
ADWF	Average Dry Weather Flow - average daily flow of wastewater during periods without significant rainfall
ADWG	Australian Drinking Water Guidelines
CCP	Critical control point - an activity, procedure, or process that is critical to control a water quality hazard. Must be monitored regularly, or continuously.
C.t.	Contentration time - concentration of a disinfectant such as chlorine and the contact time with the water being disinfected
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DCP	Development Control Plan
DWMS	Drinking Water Management System - framework that guides safe supply of drinking water
EP	Equivalent Persons - refers to the population capacity of a treatment plant
EPA	NSW Environment Protection Authority
headworks capacity	Refers to the maximum volume of water that a system can reliably store and supply
IDEA	A type of wastewater treatment process
inflow and infiltration	Refers to groundwater or stormwater entering sewer systems
licensed allocation	The amount of water that we are licensed to access
non-revenue water	Water that is produced for distribution but does not get billed to customers. May be lost through leaks, theft, or metering inaccuracies.
Per- and Polyfluoroalkyl Substances (PFAS)	Chemicals that are used to make products which resist heat, stains, grease, and water. They remain in the environment for a long time and have been widely used in industrial and consumer products since the 1950s.
PWWF	Peak Wet Weather Flow - maximum rate of wastewater during a rainfall event
secure yield	Maximum amount of water that is reliably available from a water source
septicity	Occurs when wastewater sits stagnant for extended periods. Lack of flow creates an anaerobic environment where certain bacteria thrive. The bacteria break down and create an unpleasant, harmful and corrosive gas.
SPS	Sewage Pump Station
STP	Sewage Treatment Plant
turbidity	Cloudiness or haziness caused by suspended particles
UV	Ultra Violet light can be used to disinfect water
WTP	Water Treatment Plant



Current Issues

General water and sewer issues

Issue Type	Current status
Compliance - BASIX	Council's 2015 DCP increases the minimum rain water tank size for new dwellings in the former Palerang Shire, this contravenes the NSW State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004 .

General water supply issues

Issue Type	Current status
Level of Service – Minimum pressure with firefighting capability	Council has a calibrated hydraulic model for Bungendore through an engagement with Public Works
Best Practice - Pricing	Council's 2015 DCP increases the minimum rain water tank size for new dwellings in the former Palerang Shire, new dwellings will require significantly less water in average years and nearly as much in hot dry years, increasing the difficulty of achieving an average of 50% of revenue from usage
Regulatory - Fluoridation of Public Water Supplies	The requirement for periodic auditing of the fluoridation systems is not always being met.
Regulatory - Drinking Water Management System	Council is currently revising the DWMS and the nominated critical control points.

Bungendore water supply issues

Issue Type	Current status
Water security - Licensed allocation	<p>Still the biggest issue for the Palerang Communities. History of the past few years of groundwater investigation is now well known.</p> <p>Current strategy is to develop the Queanbeyan to Bungendore pipeline proposal. In the meantime, all greenfield development for Bungendore is stalled.</p>
Water quality - ADWG (Australian Drinking Water Guidelines)	<p>The new ADWG concentration limits for Per- and Polyfluoroalkyl Substances (PFAS) are significantly lower than the previous limits. Council continues to undertake regular testing.</p> <p>Two of the four Bungendore bores tested positive for PFAS and the concentration of Perfluorooctane sulfonic acid (PFOS) has at times exceeded the guidelines (at the site of the bore, but not at reticulation or to the customer).</p>
Level of Service - Headworks capacity	<p>The peak day demand will exceed the combined capacity of the Bungendore and Currandooly WTP soon. The exact timing depends on resolving the water security issue and the extent to which additional development is permitted.</p> <p>If one or two of the existing bores need to be removed from service due to PFAS, this will become an immediate concern.</p>
CCP (critical control point) 1(a) - chlorination in reticulation	<p>Council considers this operational rather than critical. Water from this plant essentially hits the reticulation (and therefore consumers) only 170m from the Bungendore WTP. This test will be added to the daily monitoring field sheets.</p> <p>There is a need for a free chlorine sensor between the 100kL collection tank and the pump to ensure that the water is correctly chlorinated before distribution. Longer term, the plan is to establish a direct rising main between this plant and the reservoirs, improving the chlorine concentration times contact time (C.t.).</p>

Current Issues

Pathogen cross contamination - DWMS	Based on the DWMS, there is a risk of potential pathogen contamination due to breach of pipeline and backflow. Council is currently revising the DWMS.
Minimum C.t. (concentration time) value - Local Water Utility (LWU) Circular 18 - ADWG	Council to strictly monitor and document free chlorine concentration. Longer term, and as part of the Queanbeyan to Bungendore pipeline project, the aim is to install a dedicated rising main from this plant to the service reservoirs. This will address any issues with C.t
Residual risk of chlorine resistant pathogens - Pathogen contamination	Residual risk of chlorine resistant pathogens due to insufficient treatment. Bungendore and Currandooly WTPs do not currently have UV or Ozone. UV or ozone treatment systems to be installed as part of either the next capacity upgrade or WTP replacement or when DCCEEW policy changes

Braidwood water supply issues

Issue Type	Current status
Water security - Secure Yield	The un-restricted annual demand will exceed the secure yield (320 ML/year with 1 degree warming) between 2039 and 2047.
Water security - Licensed allocation	The un-restricted annual demand will exceed the licenced water entitlement (360 ML) between 2038 and 2052.
Capacity - WTP capacity	The un-restricted peak day demand will exceed the WTP capacity (2 ML/day) between 2040 and 2042.

Performance – leaks - Non-Revenue Water	This remains a significant problem. Since last IWCM Council has taken advantage of a DCCEEW funded leak detection program. This was of only limited success. We are now replacing revenue meters; we've rolled out 130 NB-IoT meters with a further 500 to be deployed in 2024/25. Results are already promising, with letters being issued for properties with persistent low flows. The intention is to completely change Braidwood revenue meters to NB-IoT by the end of 2025.
Pathogen Contamination - DWMS	Based on the DWMS, there is a residual risk at dead end in reticulation system leading to stagnation, breach of pipeline through breaks and service works; cross contamination due to backflow and growth of biofilms/sludge causing degradation of water quality. Council is reviewing the DWMS.
Residual risk of chlorine sensitive pathogens - Pathogen contamination	Residual risk of chlorine resistant pathogens due to moderately protected catchment. Disinfection barriers such as UV or Ozone are effective at disabling chlorine resistant pathogens. However, Braidwood WTP does not have UV or Ozone. UV treatment system to be installed as part of either the next WTP capacity upgrade or WTP replacement or when DCCEEW policy changes.

Current Issues

Captains Flat water supply issues

Issue Type	Current status
Water loss - Major Water Residential User	Council suspects serious leakage issues and investigation is underway.
Water loss - Water Balance	Historical average unit water loss 1.4 times the state medium. Network investigations ongoing.
Regulatory - Drinking Water Management System	Turbidity monitoring at Captains Flat is now continuous online and monitored. Membranes were replaced in May 2024. Regular membrane integrity testing still to be enacted and included in field sheets.

General sewerage system issues

Issue Type	Current status
Unserviced communities - On-site sewage management systems	<p>Majors Creek – potential issue due to the following reasons: small lot sizes (some around 3,000 & several around 1,000 m²), inadequate buffer distance from the creek, moderately well to imperfectly drained soil.</p> <p>Nerriga – potential issue due to the following reasons: small lot sizes (various sizes below 3,000 m²), some properties may have inadequate buffer distance from Bindi Brook.</p> <p>Araluen – potential issue due to the following reasons: small lot sizes (several properties less than 1,500 m² bordering each other), moderately permeable, imperfectly drained soil.</p>

Bungendore sewerage system issues

Issue Type	Current status
Regulatory - EPA Licence non-compliance	Council has undertaken several sewer relining projects since last IWCM. This was informed by precursor cleaning and CCTV work. Council also conducted targeted smoke testing for catchment 4 (a new development area) to try and resolve an emerging inflow problem. Wet weather flows exceeded the licence limits more often during the recent wet years. Licence is being reviewed as part of the upgrade process.
Pump sizing at Peak Wet Weather Flow (PWWF) - Sewer catchment performance	Since last IWCM, Catchment #2 and #4 have had pumps upgraded. Catchments #8 & #9 to be upgraded in the future.
Odour/septicity potential	Catchments #7 and #8 have a risk for odour/septicity with detention time greater than 4 hours. Both Sewage Pump Station (SPS) 7 & SPS8 will increase capacity and throughput as northern greenfield development progresses. This will lower rising main detention times.
Capacity - Sewage Treatment Plant	Design engagement currently underway for a tender ready package (+7,000 EP giving a total capacity of 12,000 EP) by 30 June 2025. The construction will commence once additional water for Bungendore has been secured. The spare 2,000 EP IDEA was re-commissioned in March 2023.
STP inflow - ADWF compliance	Council undertaking CCTV inspections and targeted relining.
STP Capacity - STP Capacity Compliance	Design engagement currently underway to add 7,000 EP giving a total capacity of 12,000 EP.
Odour/septicity potential - WSAA Guidelines	Rising mains that have residence time greater than eight hours are potential to septicity for SPSs. Council to monitor.

Current Issues

Braidwood sewerage system issues

Issue Type	Current status
Regulatory - EPA Licence non-compliance	Inflow/Infiltration study completed. Large program of relining subsequently conducted. Inflow continues to be an issue in wet years.
Odour/septicity potential - Sewer catchment performance	Previous IWCM identified Catchments #3 and #5 to have a medium risk for odour/septicity with detention time greater than 4 hours. No current action.
Increase dry weather flow - Sewage inflow compliance	Council to investigate potential factors contributing to these high flows.
PWWF - Pump rate	Pump rate expected to be lower than estimated PWWF, as Summerfield retirement village is completed. Council to investigate and monitor.

Captains Flat sewerage system issues

Issue Type	Current status
Regulatory - EPA Licence non-compliance	Previous IWCM noted that plant exceeded volumetric discharge limit. Inflow/Infiltration study completed. Large program of relining subsequently conducted. Inflow continues to be an issue in the La Nina years.
Performance - Sewage Treatment Plant compliance	The plant has been augmented. 2018 issue now resolved after a significant investment of capital.

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P | 1300 735 025

M | PO Box 90, Queanbeyan

E | council@qprc.nsw.gov.au

W | www.qprc.nsw.gov.au

