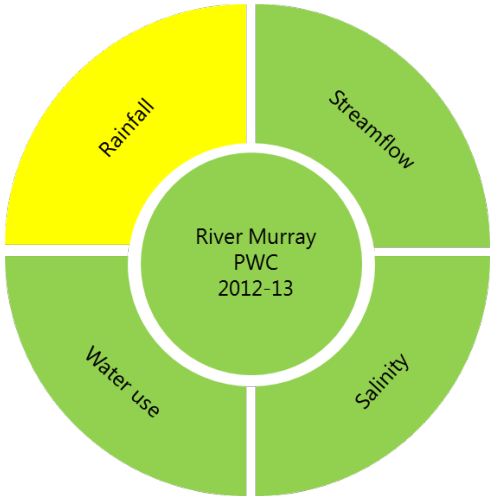
River Murray PWC

Surface water status report

2012–13

Government of South Australia
Department of Environment,
Water and Natural Resources

2012–13 Summary



The River Murray Prescribed Watercourse (PWC) has been assigned a green status for 2012–13:

No adverse trends indicating a stable or improving situation

This hydrological status for 2012–13 is supported by:

- average or below average rainfall across 3 rainfall analysis sites
- above average streamflow at 2 of 2 streamflow analysis sites
- steady to freshening salinity at 4 of 4 salinity analysis sites
- negligible water use compared to annual streamflow (this is a regulated system).

This status report provides a snapshot of the surface water resources in the River Murray PWC for the financial year 2012–13. Surface water status reports are limited to reporting on the hydrological status of the PWC. Available data on climate, streamflow, salinity and water use is summarised and compared with recent and long-term data to provide an indication of the hydrological status of its water resources. Each element is discussed with reference to recent or more long-term trends where, if at all, they are present in the data. These status reports seek to support informed policy-development and management decisions by resource managers and those responsible for, or reliant on, the water resources. Status of the prescribed resource for the previous years is shown below.

2010-11 Status (green)	2011-12 Status (green)	2012-13 Status (green)

This status report does not seek to evaluate the sustainable limits of the resource, nor does it make any recommendations on management or monitoring of the resource. These actions are important, but occur through separate processes.

The River Murray PWC extends from South Australia's eastern border to Lake Alexandrina and Lake Albert (Lower Lakes) (Figure 1). Surface water (including within watercourses) in the PWC have been prescribed under South Australia's *Natural Resources Management Act 2004*. A Water Allocation Plan (WAP) was developed by the South Australian Murray–Darling Basin Natural Resources Management Board in 2009, which seeks to provide for sustainable management of water resources.

Status symbols

No adverse trends, indicating a stable or improving situation (green)

Trends are either stable (no significant change), or have improved over the reporting period, indicating that there is insignificant risk of impact to the beneficial use of the resource.

Adverse trends, indicating low risk to the resource in the short-term (1 to 3 years) (yellow)

Observed adverse trends are gradual and if continued, are unlikely to lead to a change in the current beneficial uses of the surface water resource in the short-term.

Adverse trends, indicating medium risk to the resource eventuating in the short-term (amber)

Observed adverse trends are significant and if continued, moderately likely to lead to a change in the current beneficial uses of the surface water resource in the short-term.

Adverse trends, indicating high risk to the resource within the short-term (red)

Trends indicate degradation of the resource is occurring. Degradation will very likely result in a change in the beneficial use (e.g. reduced ability to access surface water entitlements and/or decline in the condition of environmental assets).

Unclear (grey)

Trends are unable to be determined due to a lack of adequate information on which to base a sound judgement of status.

Data from the same stations summarised in previous reports are used in analysis, for comparison of annual trends. Three long-term meteorological stations were selected for analysis of rainfall trends; Overland Corner (M024012), Murray Bridge (M024521) and Meningie (M024518) (Figure 1). Rainfall was average or below average across all analysis sites in 2012–13.

Flow to South Australia is calculated based on both the River Murray D/S Rufus River (A4260200) and the Mullaroo Creek (A4140211) stations; the calculated flow is reported as the virtual site Flow to South Australia (A4261001) (Figure 1). Streamflow at the barrages has been calculated based on the number of gates open at stations A4260526 (Mundoo Barrage), A4260570 (Boundary Creek Barrage), A4260571 (Ewe Island Barrage), A4261005 (Goolwa Barrage) and A4261006 (Tauwitchere Barrage). Streamflow was above average at all analysis sites in 2012–13.

Long-term gauging stations selected for analysis of salinity trends include; Morgan (A4260554), Murray Bridge (A4261003) and sites representing Lakes Alexandrina and Albert (Figure 1). Salinity was steady to freshening in 2012–13 when compared to the range of salinity for the previous year.

Water use in the Murray Darling Basin is determined by a cap on diversions and transition to sustainable diversion limits. For the purpose of this assessment, water use was negligible in 2012–13 when expressed as a percentage of the total available streamflow in 2012–13.

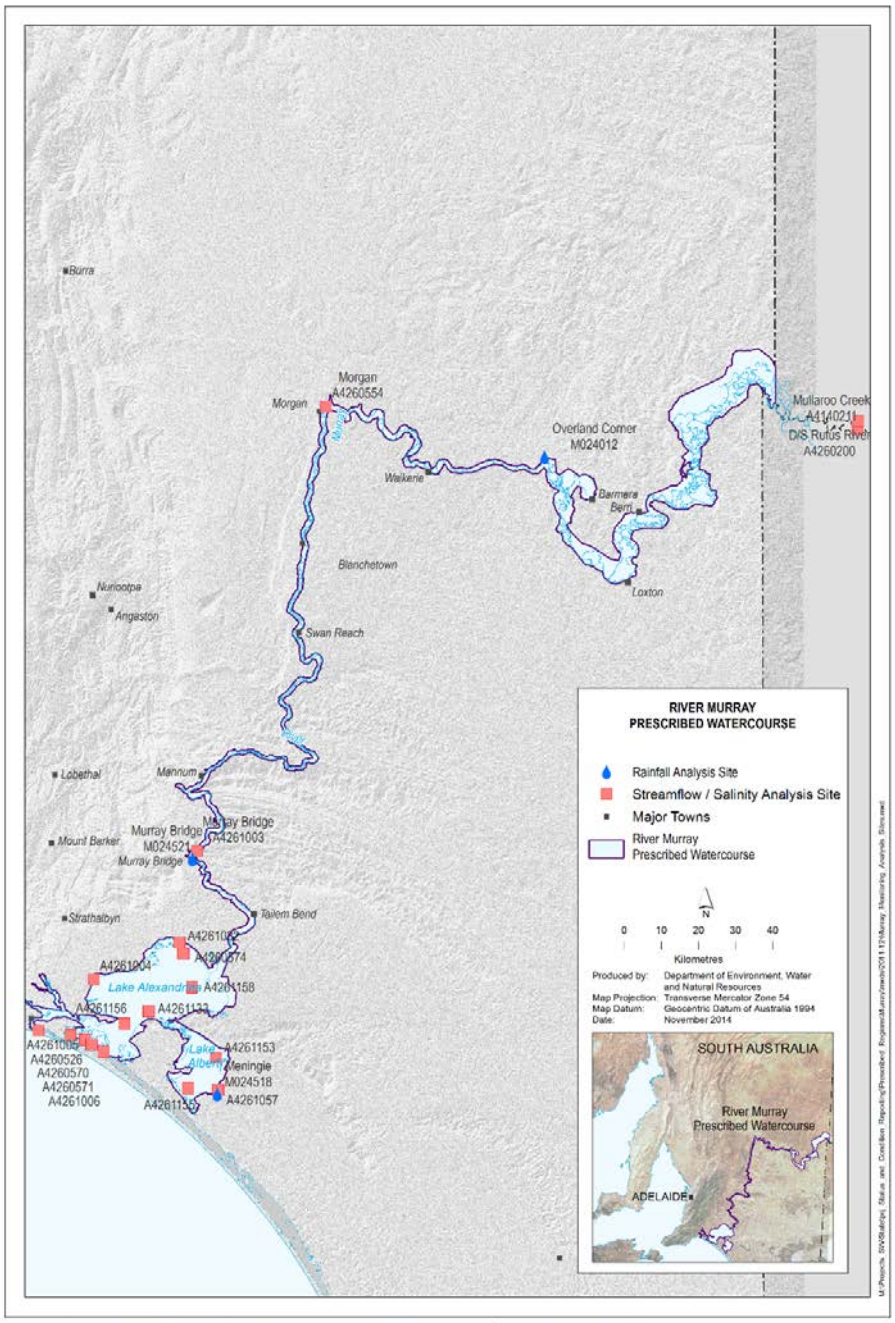


Figure 1. Monitoring analysis sites as used in the River Murray PWC Surface water status report

Rainfall

Status	Degree of confidence	Comments on recent historical context
Average or below average rainfall across all rainfall analysis sites	High: good coverage of rainfall stations representing the rainfall variation across the region	After three years of above average rainfall, Overland Corner and Murray Bridge received below average and average rainfall respectively while Meningie received around average rainfall after four years of above average rainfall

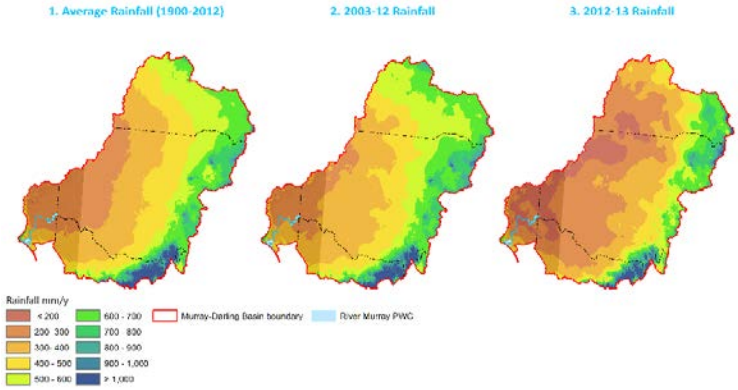


Figure 2. Annual rainfall distributions for the Murray–Darling Basin

Rainfall in the River Murray PWC typically varies from 250 millimetres (mm) at the border to over 450 mm around the Lower Lakes (Figure 2). The three panels of Figure 2 indicate that rainfall was largely below average across the majority of the Murray Darling Basin (MDB) for the year 2012–13 (panel 3) in comparison to the long–term and short-term averages (panels 1 and 2).

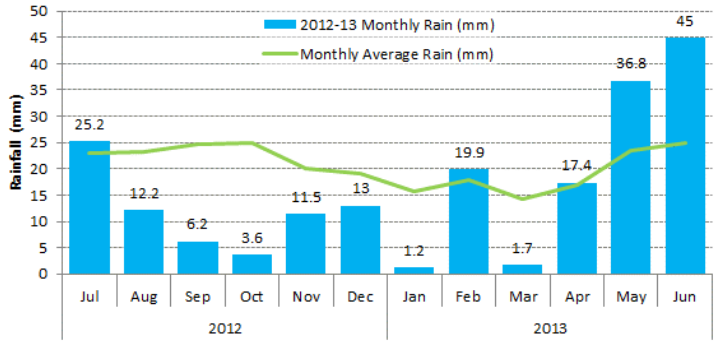


Figure 3. Monthly rainfalls at Overland Corner (M024012)

Overland Corner Bureau of Meteorology (BoM) rainfall station received a below average rainfall of 194 mm in 2012–13 in comparison to its long-term average of 248 mm (Figure 3). Above average rainfall was experienced in 5 months across 2012–13 with the months of August to January and also March receiving well below the monthly average rainfall.

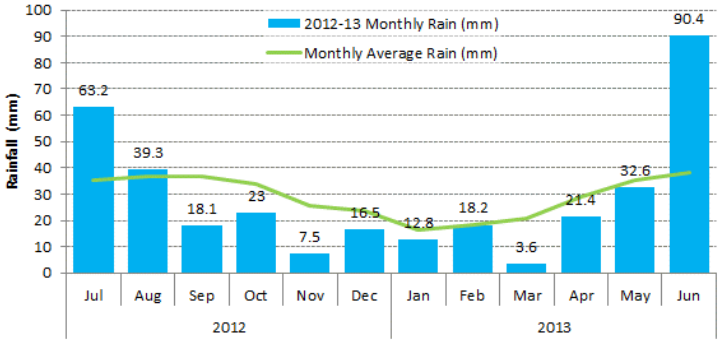


Figure 4. Monthly rainfalls at Murray Bridge (M024521)

Murray Bridge BoM rainfall station received an average rainfall of 347 mm in 2012–13 in comparison to its long-term average of 350 mm (Figure 4). Above average rainfall was experienced in 3 months across 2012–13. The months of September to May all received below average rainfall in contrast to June, which received more than double the monthly average rainfall.

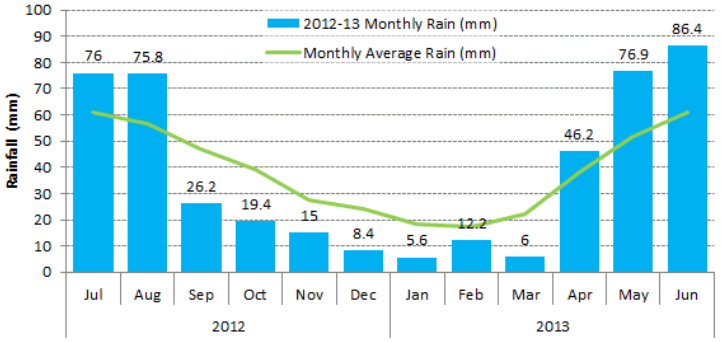


Figure 5. Monthly rainfalls at Meningie (M024518)

Meningie BoM rainfall station received an average rainfall of 454 mm in 2012–13 in comparison to its long-term average of 464 mm (Figure 5). Above average rainfall was experienced in 5 months across 2012–13. The months of September to March all received below average rainfall.

Streamflow

Status	Degree of confidence	Comments on recent historical context
Above average streamflow at all streamflow analysis sites	High: data derived from long-term gauging stations	Third year of above average streamflow after nine years of below average streamflow

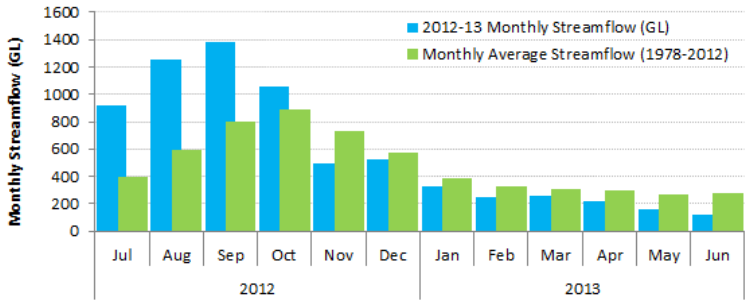


Figure 6. Monthly streamflow to South Australia

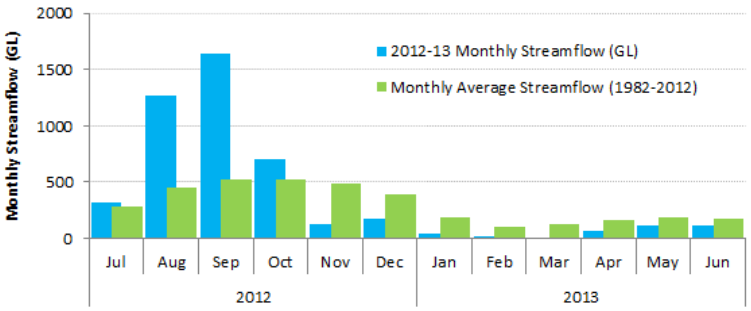


Figure 7. Monthly streamflow at the barrages

An above average annual streamflow of 6964 gigalitres (GL) flowed to South Australia for 2012-13 (19% higher than the 5859 GL long-term average). The monthly breakdown of streamflow for 2012–13 (Figure 6) highlights that 4 months received above average streamflow. July and August received more than double the monthly average streamflow while November to June received below average streamflow.

Flow at the barrages experienced an above average annual streamflow of 4579 GL for 2012–13 (27% higher than the 3599 GL long-term average). The monthly breakdown of streamflow for 2012–13 (Figure 7), highlights that 4 months received above average streamflow. The months of August and September received streamflow at the barrages that was around 3 times the monthly average streamflow. November to June received below average streamflow.

Salinity

Status	Degree of confidence	Comments on recent historical context
Steady to freshening	High: data derived from long-term salinity monitoring	Salinity trends show the high range of salinity in 2012–13 being comparable to or less than 2011–12

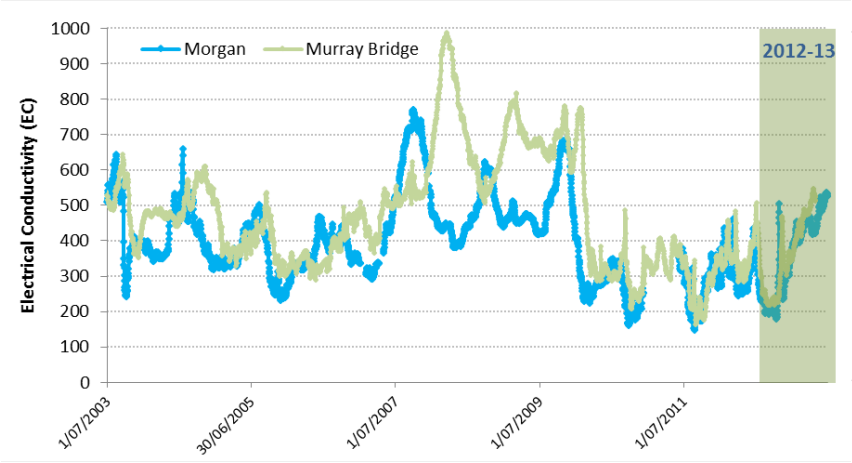


Figure 8. Salinity data at Morgan and Murray Bridge from 1997–2012

Target salinity levels of less than 800 EC (µs/cm) at Morgan and less than 830 EC (µs/cm) at Murray Bridge for 95% of the time are set in the Basin Plan. Salinity at Morgan (A4260554) and Murray Bridge (A4261003) was steady in 2012-13 as a result of above average streamflow to South Australia, with the high range of salinity below 550 EC. Prior to 2010–11, salinity levels at Morgan and Murray Bridge were higher due to lower streamflows in the River Murray. From 2003 to 2013, salinity at Morgan has not exceeded 800 EC. Over the same period, salinity at Murray Bridge has exceeded 830 EC for one event of ninety–three days in 2008 (2.55% of total days).

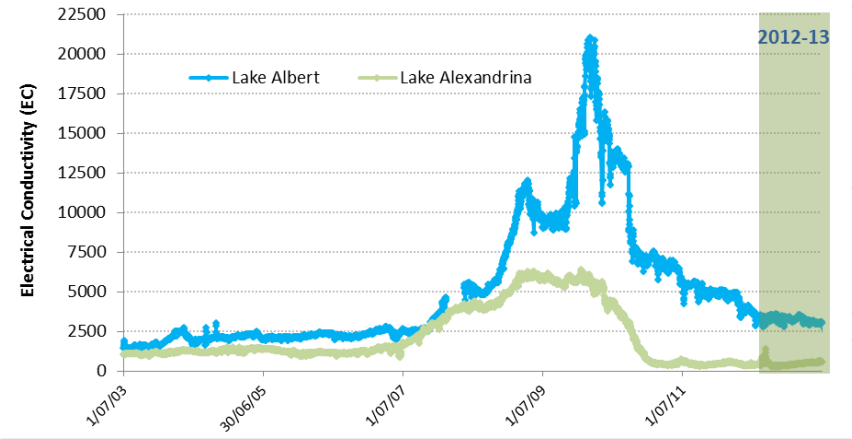


Figure 9. Salinity data at Lakes Alexandrina and Albert from 2002–2012

Although salinity levels remain higher than the long-term average in Lake Albert, salinity is freshening due to increased streamflow and lake level manipulation that have allowed some salt to be exported from Lake Albert through the Narrows to Lake Alexandrina, and then to sea through the Murray Mouth. The Basin Plan includes a salinity target for Milang (Lake Alexandrina) of less than 1000 EC 95% of the time. This can be compared to the calculated Lake Alexandrina salinity that was less than 1000 EC 26% of the time from 2003-13 (not a representative 10 year sample due to the drought period). A maximum salinity of 1420 EC and an average salinity of 467 EC was recorded across 2012–13 for Lake Alexandrina. Salinity exceeded 1000 EC for one event of two days in September of 2012–13.

Surface water use

Status	Degree of confidence	Comments on recent historical context
Negligible use compared to annual streamflow	High: data derived from long–term water use monitoring	Water use increased in 2012–13 in comparison to use reported in 2011–12 (421 GL; 4% of total streamflow)

In 2012–13 total use (diversions) from the River Murray PWC was 546 GL, higher than the 421 GL diverted in 2011–12. The diversions for 2012-13 comprised of:

- 81.7 GL for metropolitan Adelaide and associated country areas
- 37.4 GL for country towns
- 20.9 GL for the Lower Murray swamps (including Environmental Land Management Allocation)
- 406.3 GL for all other purposes (metered and non-metered consumption).

The distribution of water use across the PWC from 2004-13 is shown in Figure 10.

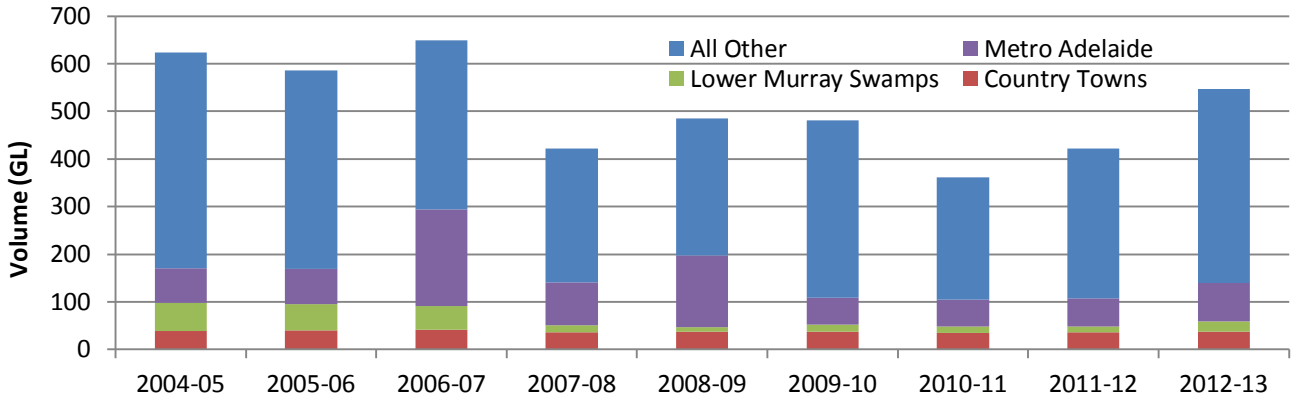


Figure 10. Surface water diversions from the River Murray PWC from 2004–13

Recorded streamflow for the PWC in 2012–13 was approximately 6964 GL (Flow to South Australia), with approximately 546 GL (excluding environmental water) recorded as being diverted from the PWC. As such it is estimated that 8% was extracted for use (4% in 2011–12).

Water use in the MDB is determined by a cap on diversions and transition to sustainable diversion limits. For the purpose of this assessment, the PWC has been assigned a use rating of 1 (Negligible use) for 2012–13.

Table 1. Use rating system

Rating	% of resource capacity used in current year	Description
1	0 – 10 %	Negligible use
2	11 – 20 %	Low use
3	21 – 30 %	Moderate use
4	31 – 40 %	High use
5	41 – 50 %	Very high use
6	Greater than 50 %	Extremely high use

Department of Environment, Water and Natural Resources

25 Grenfell Street, Adelaide

GPO Box 1047, Adelaide SA 5001

Telephone	National	(08) 8463 6946
	International	+61 8 8463 6946
Fax	National	(08) 8463 6999
	International	+61 8 8463 6999
Website	www.environment.sa.gov.au	

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This Surface water status report is available online at http://www.waterconnect.sa.gov.au

To view the *River Murray PWC Surface water status report 2010–11*, which includes background information on location, rainfall, streamflow, salinity, water use and relevant water dependent ecosystems, please visit the Water Resource Assessments page on WaterConnect.

For further details about the River Murray PWC please see the *Water Allocation Plan for the River Murray PWC* on the Natural Resources South Australian Murray–Darling Basin website.

Gridded rainfall data was sourced from the Bureau of Meteorology (BoM). Station rainfall data was sourced from SILO and is Patched Point Data. Further information on SILO climate data is available at: http://www.longpaddock.qld.gov.au/silo/index.html.

Streamflow and salinity data are available via WaterConnect: http://www.waterconnect.sa.gov.au.

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