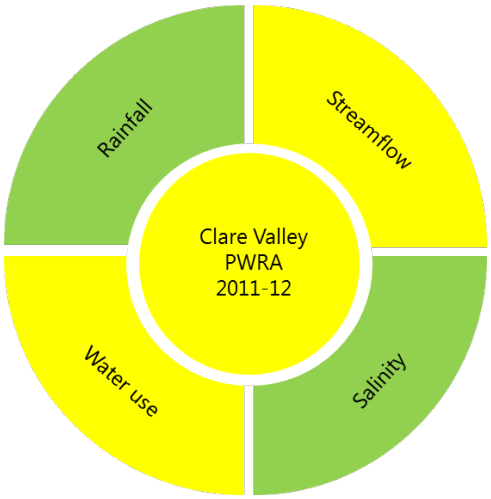
Clare Valley PWRA

Surface water status report

2011–12

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

2011–12 Summary



The Clare Valley Prescribed Water Resources Area (PWRA) has been assigned a yellow status for 2011–12:

Adverse trends indicating low risk to the resource in the short-term

This hydrological status for 2011–12 is supported by:

- above average rainfall at both rainfall analysis sites
- below average streamflow at all streamflow analysis sites
- steady salinity
- high water use compared to annual streamflow.

This status report provides a snapshot of the surface water resources in the Clare Valley PWRA for the financial year 2011–12. Surface water status reports are limited to reporting on the hydrological status of the PWRA. 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 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 (yellow)

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 Clare Valley PWRA is located approximately 100 km north of Adelaide (Figure 1). Surface water (including within watercourses) and groundwater resources in the PWRA have been prescribed under South Australia's *Natural Resources Management Act 2004*. A Water Allocation Plan (WAP) was developed by the Northern and Yorke 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. Data from two long-term meteorological stations were selected for analysis of rainfall trends; Clare (M021075) and Watervale (M021054). Rainfall was above average at both analysis sites in 2011–12.

Data from three long-term gauging stations were selected for analysis of streamflow trends; Hill River (A5070500), Hutt River (A5070501) and Wakefield River (A5060500). Streamflow was below average at all analysis sites in 2011–12.

Data from two medium to long-term gauging stations were selected for analysis of salinity trends; Skillogalee Creek (A5061008) and Wakefield River (A5060500). Salinity was steady in 2011–12 when compared to the range of salinity for the previous year.

Water use was high in 2011–12 when expressed as a percentage of the total available streamflow in 2011–12.

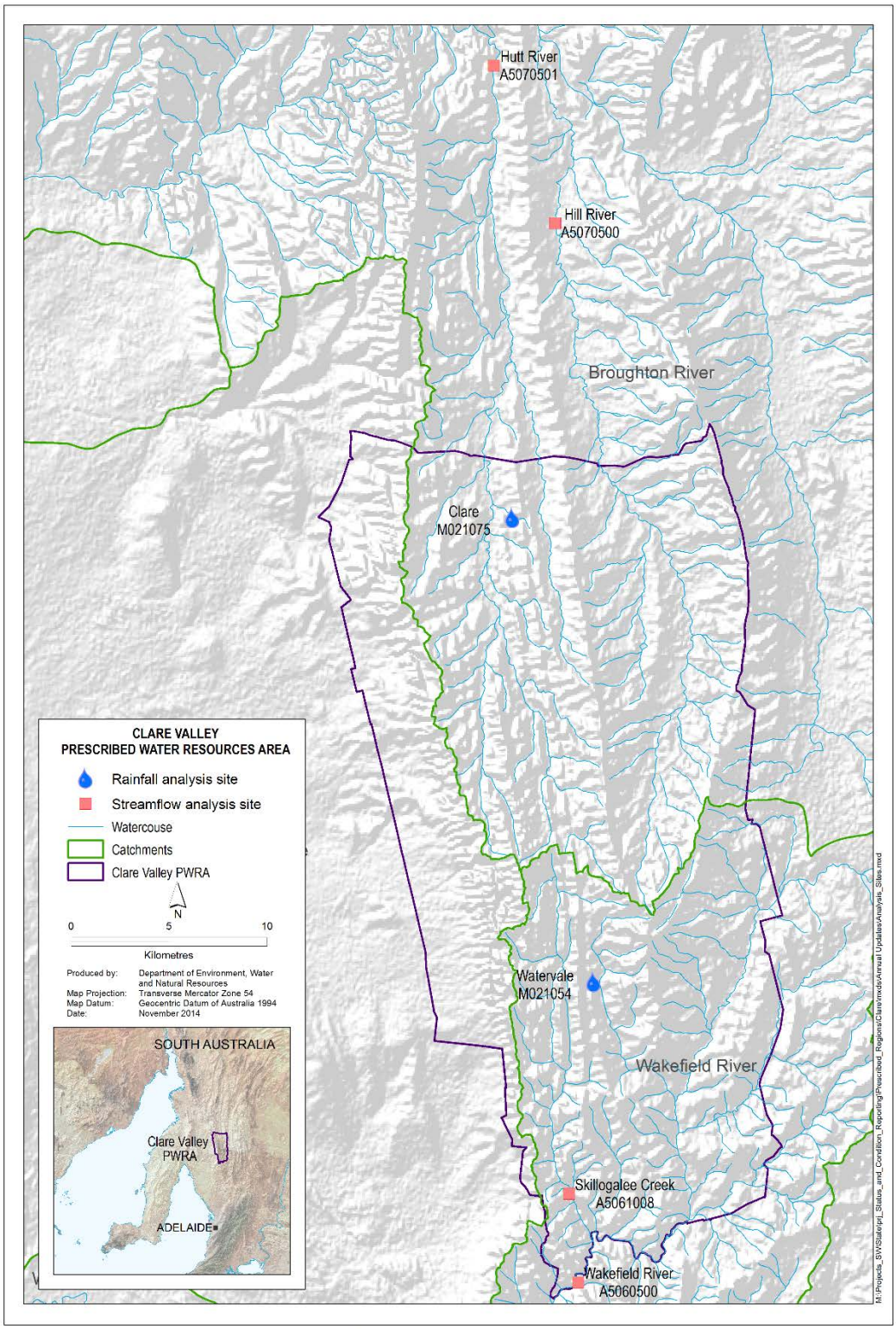


Figure 1. Monitoring analysis sites as used in the Clare Valley PWRA Surface Water Status Report

Rainfall

Status	Degree of confidence	Comments on recent historical context
Above average rainfall at all rainfall analysis sites	High: good coverage of rainfall stations representing the spatial rainfall variation across the region	The third year of above average rainfall at Clare and the third year of average or above rainfall at Watervale meteorological stations

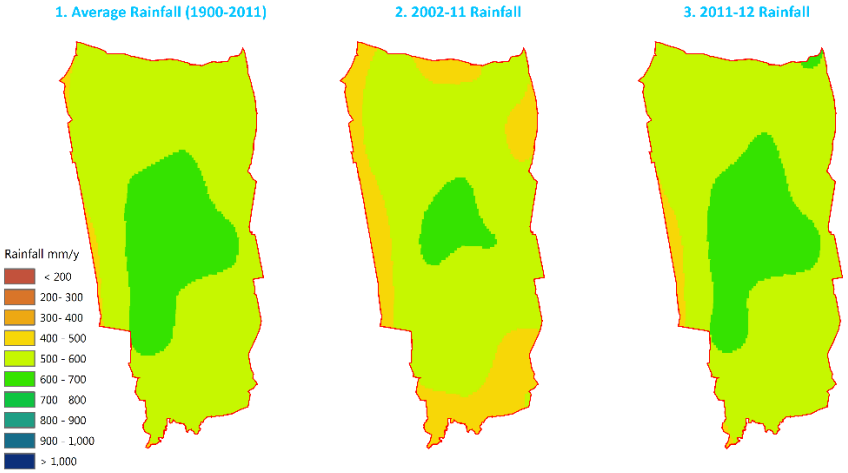


Figure 2. Annual rainfall distributions for the Clare Valley PWRA

Rainfall in the Clare Valley PWRA typically varies from less than 500 millimetres (mm) around the prescribed boundary to over 600 mm in the central region around the township of Clare (Figure 2). The three panels of Figure 2 indicate that over much of the PWRA, rainfall for the year 2011–12 (panel 3) was largely equal to or above the long-term and short-term averages (panels 1 and 2).

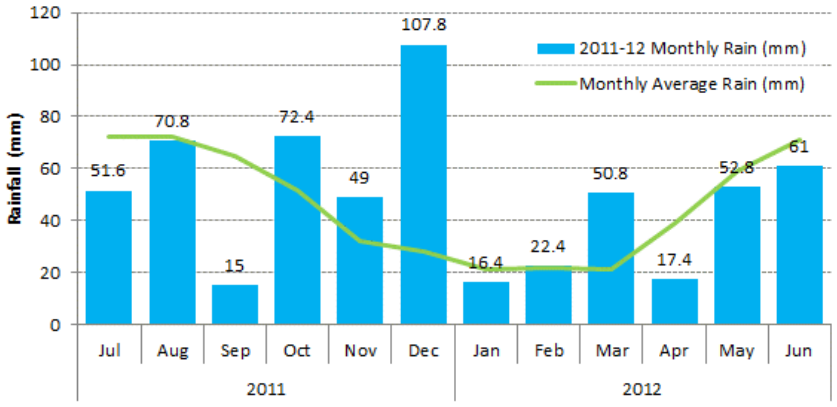


Figure 3. Monthly rainfalls at Clare (Calcannia) (M021075)

The Clare Bureau of Meteorology (BoM) rainfall station received an above average rainfall of 587 mm in 2011–12 in comparison to its long-term average of 554 mm (Figure 3). Above average rainfall was experienced predominantly in the late spring and summer months across 2011–12 with December receiving almost 4 times the monthly average rainfall.

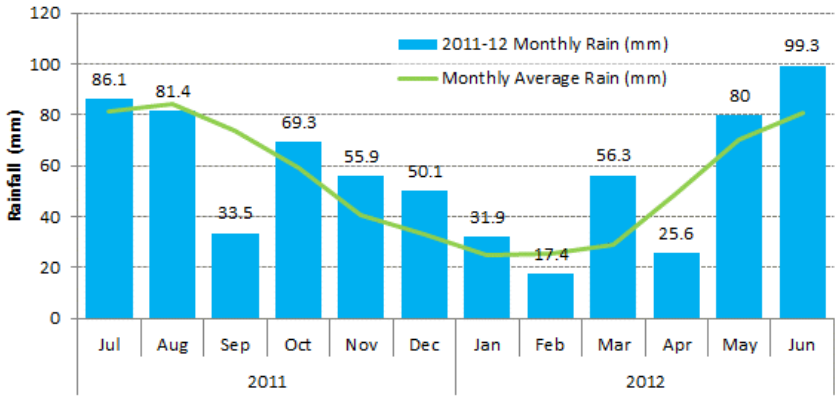


Figure 4. Monthly rainfalls at Watervale (M021054)

The Watervale BoM rainfall station received an above average rainfall of 687 mm in 2011–12 in comparison to its long-term average of 653 mm (Figure 4). Above average rainfall was experienced in 8 months across 2011–12. As was recorded at Clare BoM rainfall station, the early spring month of September and autumn month of April received well below average rainfall.

Streamflow

Status	Degree of confidence	Comments on recent historical context
Below average streamflow at all streamflow analysis sites	High: data derived from long-term gauging stations	A year of below average streamflow at all streamflow analysis sites after well above average streamflow recorded at all sites in 2010–11

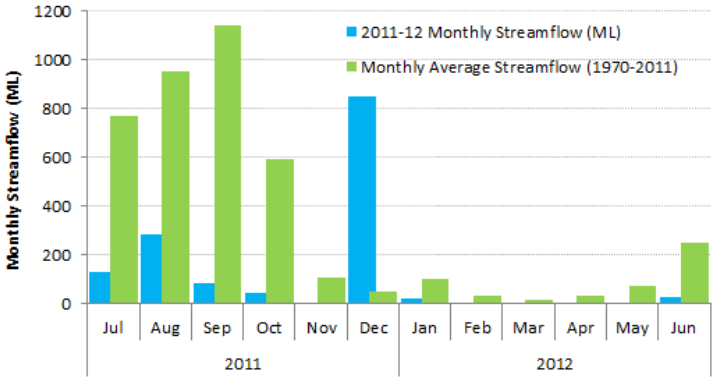


Figure 5. Monthly streamflow at Hill River (A5070500)

Hill River gauging station (A5070500) experienced a below average annual streamflow of 1453 megalitres (ML) for 2011–12 (65% lower than the 4111 ML long-term average). The monthly breakdown of streamflow for 2011–12 (Figure 5) highlights that December was the only month to receive well above average streamflow. December alone received 58% of the annual total, with streamflow being more than 17 times the average for that month. This was the result of an intense summer rainfall event in early December.

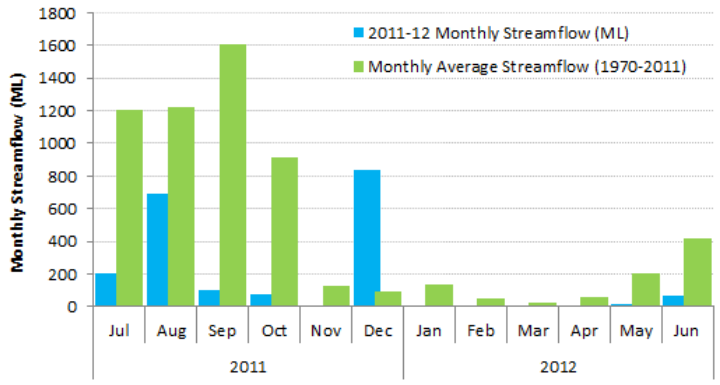


Figure 6. Monthly streamflow at Hutt River (A5070501)

Hutt River gauging station (A5070501) experienced a below average annual streamflow of 1994 ML for 2011–12 (67% lower than the 6033 ML long-term average). The monthly breakdown of streamflow for 2011–12 (Figure 6), like that for Hill River, highlights that December was the only month to receive well above average streamflow. December alone received 42% of the annual total, with streamflow being more than 9 times the average for that month. All other months received below average streamflow with no streamflow recorded from February to April.

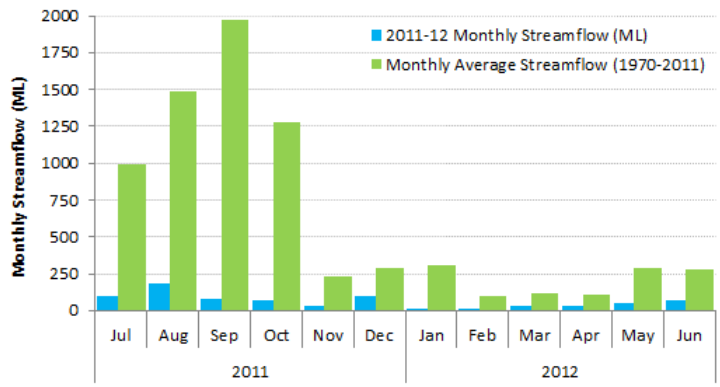


Figure 7. Monthly streamflow at Wakefield River (A5060500)

Wakefield River gauging station (A5060500) experienced a below average annual streamflow of 778 ML for 2011–12 (90% lower than the 7448 ML long-term average). The monthly breakdown of streamflow for 2011–12 (Figure 7) highlights that all months received well below average streamflows. Monthly streamflow reductions against the long term monthly averages range from a 67% reduction during December to over 90% reductions from July to October.

Salinity

Status	Degree of confidence	Comments on recent historical context
Steady	Fair: Data are representative of the Wakefield River catchment only	The salinity trend at both stations shows the high range of salinity in 2011–12 being comparable to 2010–11

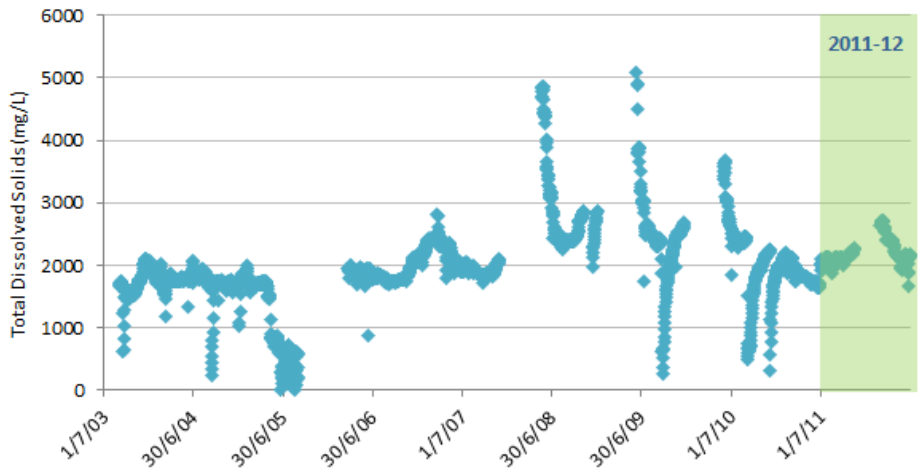


Figure 8. Salinity data at Skillogalee Creek from 2003–12

Of the total record for Skillogalee Creek, 7% was recorded as <1000 mg/L, 83% of the record was between 1000–2500 mg/L and 10% was >2500 mg/L. The salinity range in 2011–12 is comparable to the previous year, but less than the high salinity levels recorded around 2008–09 when streamflow was well below average.

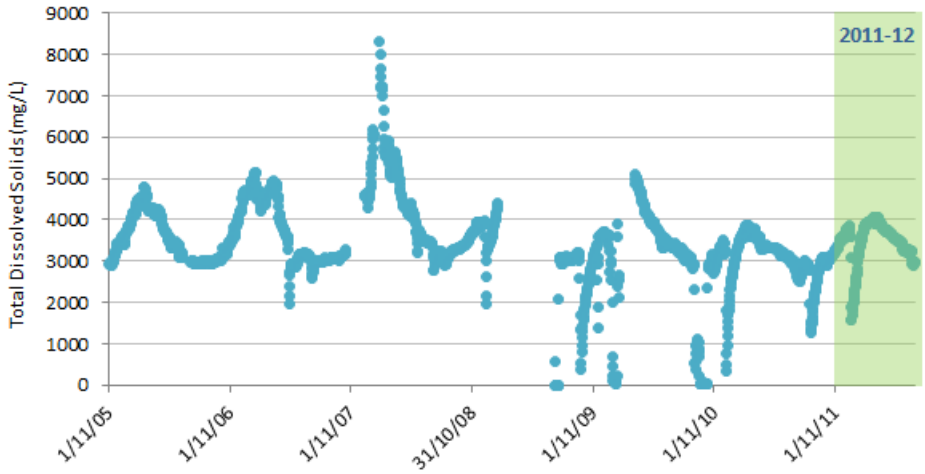


Figure 9. Salinity data at Wakefield River from 2005–12

For Wakefield River, 4% was recorded as <1000 mg/L, 5% was between 1000–2500 mg/L, 74% of the record was between 2500–4000 mg/L and 17% was >4000 mg/L. The salinity range in 2011–12 is comparable to the previous year, but less than the high salinity levels recorded around 2007 when streamflow was well below average.

Surface water use

Status	Degree of confidence	Comments on recent historical context
High use compared to annual streamflow	High to medium: high confidence in metered data, medium confidence in estimated data	Water use from licensed surface water resources has fallen whilst imported water use has risen during 2011–12

Surface water use is summarised by licensed extractions and estimated non-licensed demand, together with supply from outside of the PWRA (Table 1). The Clare Valley Water Supply Scheme (CVWSS) brings filtered water from the River Murray for the purpose of municipal water supply and irrigation of high value crops, including wine grapes.

Table 1. Summary of surface water use in the Clare Valley PWRA

Clare PWRA surface water use (ML)		Licensed surface water extractions (dams)	841
		Licensed watercourse extractions	100
		Estimated non-licensed water demand	675
Clare Valley Water Supply Scheme (ML)		CVWSS	241
		Third party transportation	471
Total water extractions (ML)			**2328**

Water usage from licensed surface water sources in 2011–12 totalled approximately 941 ML (841 + 100), which is down from the previous year's total of 1191 ML. Water use from the CVWSS is up to 712 ML (241 + 471) from the previous year's total of 568 ML.

Existing stock and domestic dams are not managed through the Clare Valley WAP (i.e. the volume taken from them is not limited to an allocated volume and they are not metered), therefore an estimate is used to report on non-licensed water demand. The estimated non-licensed water demand is 675 ML and this volume equates to approximately 30% of the existing stock and domestic dam capacity. As long as the estimated non-licensed dam capacity remains unchanged from one year to the next, so too will the estimated non-licensed surface water demand, irrespective of variations in annual rainfall and streamflow. As such, the limitations of this estimation method should be kept in mind when considering estimated non-licensed surface water demand.

The distribution of water use across the PWRA from 2006-12 is shown in Figure 10.

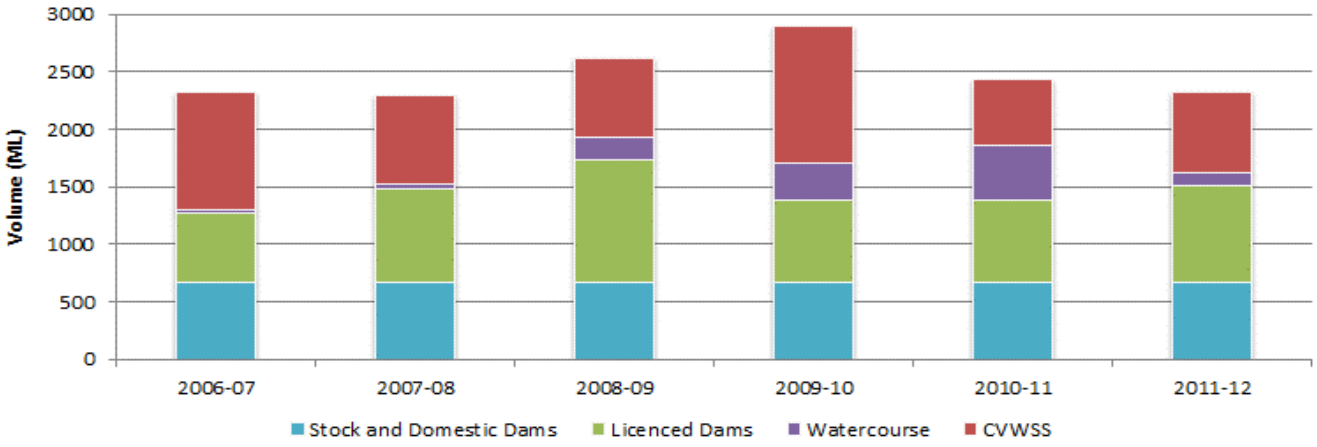


Figure 10. Surface water use in the Clare Valley PWRA from 2006–12 Headings in figure above are not sentence case

Recorded streamflow for the PWRA in 2011–12 was approximately 3260 ML (scaled to the PWRA), with approximately 1616 ML (sum of licensed and non-licensed extraction) recorded or estimated as being extracted. As such, of the 4876 ML (3260 plus 1616 ML) total estimated PWRA surface water volume for 2011–12 (not including evaporation from farm dams), it is estimated that 33% was extracted for use (8% in 2010–11).

The PWRA has been assigned a use rating of 4 (High use) for 2011–12.

Table 2. 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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ISBN 978-1-922255-24-2

Preferred way to cite this publication

DEWNR, 2015, Clare Valley *PWRA Surface water status report 2011–12*, Government of South Australia, through Department of Environment, Water and Natural Resources, Adelaide.

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

To view the *Clare Valley PWRA 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 Clare Valley PWRA please see the *Water Allocation Plan for the Clare Valley PWRA* on the Natural Resources Northern and Yorke 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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