
Eyre Peninsula Demand and Supply Statement

Annual Review 2013



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1 EXECUTIVE SUMMARY

The 2012–13 annual review of the demand-supply projections has indicated that based on current population growth and potential climate change impacts, demand for drinking quality water is not projected to exceed supply until 2024–25, slightly later than the 2011–12 annual review suggested. Given the results from the current review, an Independent Planning Process is not considered to be required until 2019–20.

The preparation of annual reviews of the demand-supply projections for water on the Eyre Peninsula follows on from the Eyre Peninsula Demand and Supply Statement (the Statement), released in April 2011. The Statement indicated that under a worst-case scenario, demand for drinking quality water would outstrip supply in 2017-18. At the time it was anticipated that the Independent Planning Process would need to be initiated in 2012-13.

This is the third annual review following reviews of the Statement conducted for 2010-11 and 2011-12 and released in April 2012 and February 2013, respectively. The preparation of annual reviews for regional demand and supply statements is a requirement of *Water for Good*, South Australia's water security plan. The annual reviews also fulfil legislative requirements of the *Water Industry Act 2012*, which states that the *Minister for Water and the River Murray* will produce an annual report providing information about the demand and supply status of the various regions of the State.

The reviews incorporate the latest information on available water and water use, now and in the future. This includes assessment of water demand due to population growth and economic development as well as the impacts of climate change on water supply. The information is obtained from several sources including local government and state government agencies such as the Department of Environment, Water and Natural Resources, SA Water, the Department of Planning, Transport and Infrastructure and the Department for Manufacturing, Innovation, Trade, Resources and Energy. This information is compared to the projections developed in the original 2011 Statement and calculations are made to assess water available in the region into the future.

Because of the nature of Eyre Peninsula's groundwater resources, water supply is particularly sensitive to aquifer recharge rates associated with rainfall. Allocations for potable water from the Southern Basins Prescribed Wells Areas have been rising steadily from 2009-10 to 2012-13. However a decrease of the allocation in 2013-14 (as reported in the 2011-12 annual review of the Statement), meant that the potable water shortfall was projected for 2020-21.

The Southern Basins PWA allocation to SA Water for 2014-15 is around 446 ML higher than the previous year and this has been the primary factor that contributed to delaying the projected shortfall to 2024-25. This is due to higher recharge rates associated with higher rainfall. The Independent Planning Process will not now be required until 2019-20.

During the 2012–13 annual review period, demand for drinking quality water in the Eyre Peninsula region was lower than the best and worst-case scenarios of low and high population growth outlined in the Statement. Mains water consumption for the Eyre Peninsula region was 15.4 GL, compared with projected demands of 19.2 GL in the best-case scenario and 19.3 GL in the worst-case scenario. This is based on metered data from SA Water and licensed water use data from the Department of Environment, Water and Natural Resources. Mains water consumption was around 840 ML lower than the previous year.

A 4045 ML surplus of drinking quality water was recorded in the Eyre Peninsula region, compared with projected best-case and worst-case scenario surpluses of 1270 ML and 1106 ML respectively. If the quantities of drinking quality and non-drinking quality water (i.e. including recycled stormwater and wastewater and other non-prescribed water resources such as groundwater) are combined, there was a surplus of 7345 ML compared with projected best-case and worst-case scenario surpluses of 4032 ML and 3851 ML respectively.

In keeping with the *Water Industry Act 2012*, the assumptions underlying the projections will be reviewed in 12 months' time. Should anything change, such as less water being available from the prescribed wells areas or increased demand from population growth or mining, the timing for the demand-supply projections and associated Independent Planning Process will be adjusted accordingly.

Table 1: Revised demand-supply projections

Scenario	Projection 1: Drinking-quality water demand and supply only	Projection 2: All water sources and all human demands
Actual Population Growth and Future Water Allocations	Demand is not projected to exceed supply until 2024-25	Demand is not projected to exceed supply prior to 2050

2 INTRODUCTION

A key priority for the South Australian Government is ensuring that all South Australians have sufficient water supplies for a sustainable lifestyle, economy and environment.

Under *Water for Good*, the State Government is required to ensure Regional Demand and Supply Statements are in place across the State in consultation with regional communities, building on existing plans and incorporating local knowledge. Developing such statements is one tool to enable the State Government to secure the State's water resources by taking stock of the resources available, the current and projected future demands on them, and the likely timing of any potential demand-supply imbalance.

Water supply to all South Australian regions is a key priority for the State Government. The Eyre Peninsula Statement aims to provide a 40-year overview of water supply and demand in the Eyre Peninsula region by outlining the state of all water resources for drinking and non-drinking water, the major demands on these resources and likely timeframes for any possible future demand-supply imbalance.

The Statement will be used to plan for the timing and nature of future demand management or supply options. It will help ensure that long-term solutions are based on a thorough understanding of the state of local resources, the demand for them, and likely future pressures.

In the event that a Regional Demand and Supply Statement indicates a shortfall in supply it will trigger the State Government to initiate an Independent Planning Process five years prior to when demand for water is projected to exceed supply. This process will assess demand management or supply options to address the shortfall, and will include local community engagement.

The Independent Planning Process will include a cost-benefit analysis and recommendations will be made on how to address the shortfall in supply, including the possible role of Government, funding options and opportunities to engage the private sector in the delivery of the recommended approach.

Water for Good indicates that Regional Demand and Supply Statements will be analysed and reviewed annually as an integral part of an adaptive management framework.

The aim of this report is to review the assumptions behind the demand-supply projections in the Statement. This review will identify how we are tracking against previous projections, and indicate if the timing for the Independent Planning Process requires adjusting.

3 BACKGROUND

The original Demand and Supply Statement, released in April 2011, indicated that under a worst-case scenario, demand for drinking quality water was projected to exceed supply in 2017–18. As such, it was anticipated that an Independent Planning Process would need to be initiated in 2012–13.

The 2011 and 2012 annual reviews of the Statement incorporated new information about the impacts of climate change and population growth in the Eyre Peninsula region as well as future recharge rates for the Southern Basins Prescribed Wells Area (PWA). The 2012 review brought the projected timing of the water shortfall to 2020-21. The current review suggests that the shortfall is now not expected until 2024-25 and this is predominantly due to higher water allocations in the Southern Basins PWA in 2014-15 that have resulted from higher rainfall and aquifer recharge rates.

Table 2 below outlines the projected shortfalls for potable water determined at the time of developing the original Statement and at each annual review including this 2012-13 annual review. The table shows timing for worst-case scenarios only of high population and high emissions and lists the key drivers for changes in the projected timing of the water shortfalls.

Table 2: Drivers for the Eyre Peninsula region demand-supply projections

Document	Time of projected shortfall for worst-case projection	Key drivers for change from original statement
Original Statement 2009-10	2017-18	Not relevant
Annual Review 2010-11	2023-24	<ul style="list-style-type: none"> • Climate change on water resources impacts less severe • Actual population growth higher than low population projection but lower than high population projection • A small 73 ML increase in Southern Basins PWA allocation
Annual Review 2011-12	2020-21	<ul style="list-style-type: none"> • A large 417 ML decrease in Southern Basins PWA allocation • Population growth rate tracking with low population projection
Current Annual Review 2012-13	2024-25	<ul style="list-style-type: none"> • A large 445 ML increase in Southern Basins PWA allocation

It is important to note that the Water Allocation Plans for the Southern Basins and Musgrave Prescribed Wells Areas require an annual assessment of recharge to the groundwater supplies which are used to determine water allocations for the subsequent water year. This adaptive management approach is unique to Water Allocation Plans for the Eyre Peninsula Region and recognises the high degree of responsiveness of the resources to annual rainfall patterns.

Allocations are based on an arithmetic expression of recharge area and calculated volume of recharge using observed changes in groundwater levels within the aquifers. A network of around 250 wells across the Southern Basins and Musgrave PWAs is used to monitor water levels and water quality. On-going monitoring ensures that this important groundwater resource is effectively managed for the benefit of the EP community and the natural environment.

Figure 1 shows the location of the monitoring wells in the Southern Basins and Musgrave PWAs.

4 ASSESSMENT OF DEMAND-SUPPLY PROJECTIONS

The Eyre Peninsula Statement developed demand-supply projections out to 2050 based on four prudently chosen scenarios – high and low population growth and climate change impact. They are intended to illustrate the possible water demand and supply levels in any given year, depending on a range of assumptions including population, climate change and the available supply from the Southern Basins and Musgrave Basin Prescribed Wells Areas and River Murray supply. When released, the Statement projected that under a worst-case scenario of high population growth and climate change impact, demand for drinking quality water was projected to exceed supply in 2017-18. The 2012-13 annual review revised this projection to 2024-25.

4.1 2012–13 SUPPLY AND DEMAND

Rainfall for South Australia as a whole in 2012 was 77 per cent of the long-term annual average (i.e. 23 per cent below normal) – the lowest since 2006. The start of 2012, however, saw cooler and wetter-than usual conditions for South Australia (BOM, 2013a).

Spring of 2012 was very warm and dry across the State and rainfall averaged across South Australia was very much below normal. Drier than normal conditions persisted through to the end of spring with the fifth driest October on record and November rainfall the lowest in 16 years (BOM, 2012).

Rainfall for the 2012-13 summer period across South Australia was widely below average. Across the State it has been the driest summer since the summer of 1985-86 with rainfall only 41% of the summer average. While rainfall totals were average to below average in agricultural districts only the far western districts and parts of the Flinders Ranges saw near normal rainfall for the summer period. Summer temperatures were widely above average. For South Australia the summer daily average temperature was 1.5 °C warmer than the long term summer average (BOM, 2013b).

The winter of 2013 experienced rainfall totals that were widely above average with rainfalls averaging 100 to 200 mm in the Western Agricultural Districts. The mean temperature for South Australia as a whole in winter 2013 was 1.4 °C warmer than the average (BOM, 2013c).

Analysis of four groundwater lenses conducted by DEWNR in the Southern Basin Prescribed Wells Area (PWA) over 2013 has identified a widespread rise in groundwater levels compared to 2012 data, in response to the above average rainfall.

For the Musgrave PWA, Poldra Lens groundwater levels were lower in 65% of wells when compared to 2012, with a further 24% wells recording a rise in groundwater level. A significant freshening of shallow aquifer was also observed. The Bramfield Lens recorded a rise in groundwater level when compared to 2012.

During 2012–13, demand for drinking quality water in the Eyre Peninsula region was lower than the best and worst-case scenarios of low and high population growth in the Statement. Mains water consumption for the Eyre Peninsula region was 15.4 GL, compared with projected demands of 19.2 GL in the best-case scenario and 19.3 GL in the worst-case scenario.

4.2 2012–13 ACTUAL AND PROJECTED AVAILABLE SUPPLY

Significantly lower actual demand from the mains water supply compared to projections in the Statement resulted in a surplus in available supply for the Eyre Peninsula region over 2012–13.

A 4045 ML surplus of drinking quality water was recorded in the Eyre Peninsula region, compared with originally projected best-case and worst-case scenario surplus of 1270 ML and 1106 ML respectively (see Figure 2).

There was a surplus of 7345 ML of all drinking and non-drinking water in the region including recycled water, stormwater and other prescribed water resources such as groundwater (see Figure 2). The Statement’s original projections for the best-case and worst-case scenarios in 2012-13 were surpluses of 4032 ML and 3851 ML, respectively.

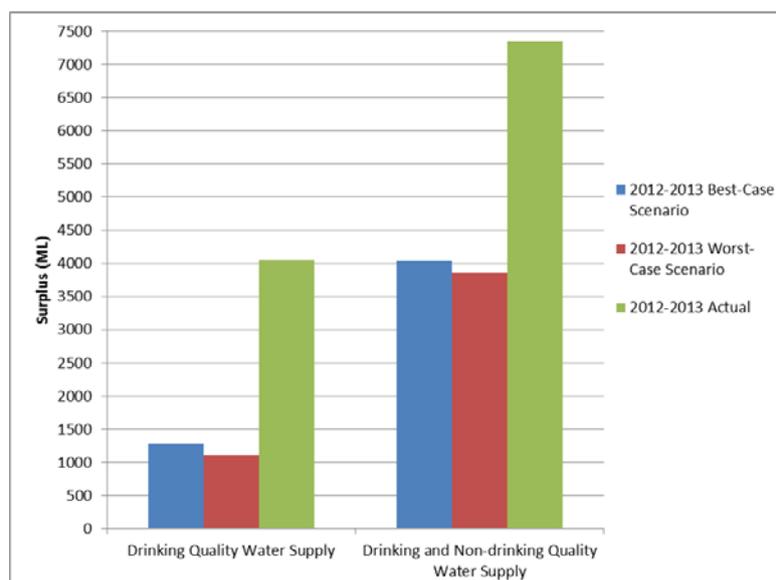
The original Demand and Supply Statement for Eyre Peninsula projected that demand for potable water would outstrip supply in 2017-18 and 2022-23 for worst-case and best-case scenarios, respectively. This baseline projection shows that the water surplus will continue to decrease with each annual review eventually reaching zero when demand is equal to supply at the identified times. The surplus projected in the original Statement for 2012-13 is shown in Figure 2 as the best-case (blue) and worst-case (red) scenarios.

As new information becomes available the original projections are reviewed and amended to indicate new timeframes that identify future shortfalls. For example, information about climate change reported in the 2010-11 annual review indicates that the impacts of climate change on water resources will be lower than the best-case scenario outlined in the original Statement. Population growth is also trending closer to the low population projection. The impact of this information is that water shortfalls are anticipated later than projected in the original Statement.

The dependence of groundwater recharge on rainfall and the resulting variability in water allocations for the groundwater basins appears to have a significant influence on the timing of anticipated water shortfalls. There is a 445 ML increase in water allocation for the Southern Basins PWA in 2014-15 when compared to the allocation of the previous year. The result of this increase is that the water shortfall is now not anticipated until 2024-25.

For all drinking and non-drinking water, projections indicate that sufficient water will be available to meet demand until at least 2050.

Figure 2: Eyre Peninsula 2012–13 available supply compared to projections



4.3 REVIEW OF ASSUMPTIONS

During development of the Statement a number of factors were identified that could affect the demand supply balance for the Eyre Peninsula region and lead to a surplus or deficit. To better understand the future water supply and the demands it will face, it is important to recognise the influences. The table below illustrates the key drivers for the demand and supply projections.

Table 3: Drivers for the Eyre Peninsula region demand-supply projections

KEY SUPPLY DRIVERS	KEY DEMAND DRIVERS
River Murray supply	Total demand for water
Southern Basins Prescribed Wells Area supply	Population growth
Musgrave Prescribed Wells Area supply	Mining
Alternative supplies	Stock
Climate change	
Mining supply	

4.4 SUPPLY DRIVERS

River Murray supply

Under normal flow and operating conditions, South Australia has a minimum entitlement of 1850 GL per year, of which SA Water has a licence for 50 GL per year for country town water supply purposes. In extreme circumstances, i.e. drought or periods of low flow conditions, special water-sharing arrangements are triggered to ensure South Australia has access to water for Critical Human Needs.

In 2012–13 SA Water supplied approximately 10 GL of River Murray water (including losses) to the Eyre Peninsula Region (the Statement assumed a maximum supply capacity of 11.2 GL), the majority of which is used in Whyalla.

Demand for water in the region in 2012–13 did not require that SA Water utilise the full system capacity.

Southern Basins Prescribed Wells Area supply

After long periods of declining groundwater levels in the Southern Basins PWA, above-average rainfall since 2009 has increased recharge and led to watertable rises of up to 0.6 m in some areas. During 2011, despite small localised declines in some areas, there has been an overall general increase in groundwater levels across the majority of the PWA when compared to water levels at the same time the previous year (DFW, 2012).

During 2013, rainfall stations around the Southern Basins PWA recorded around 580 mm of rainfall and although this is around 5 mm above the long-term average annual rainfall for that area, the winter rainfall was well above average. This resulted in a widespread rise in groundwater levels across the PWA of up to 0.3 m compared to the previous year, including the Uley South (DEWNR, 2014a), Coffin Bay-A (DEWNR, 2014b), Lincoln Basin (DEWNR, 2014c), and the northern part of Uley Wanilla lens (DEWNR, 2014d).

Salinities recorded in 2013 in the Coffin Bay-A and the Uley Wanilla lenses are between 300 and 800 mg/L and are similar to those recorded in 2012 or slightly lower. The Lincoln lenses recorded salinities between 800 and 1300 mg/L with those outside 1000 mg/L outside the known extent of the Lincoln lenses.

The total available licensed allocation for the Southern Basins PWA in 2012-13 was 8.6 GL. Allocations have decreased to 8.2 GL in 2013-14 and then increased to 8.6 GL in 2014-15.

Musgrave Prescribed Wells Area supply

The Musgrave PWA is highly dependent on recharge from rainfall. After a long period of declining groundwater levels (2 to 3 m over 20 years) and below-average rainfall in the Musgrave PWA, good winter and spring rainfall in both 2009 and 2010 had increased recharge and led to watertable rises of up to 1.7 m in Polda lens and up to 2.1 m in other minor lenses.

In 2013, rainfall at Elliston (486 mm) was 56 mm above average and consequently, water levels in the Bramfield Lens were up to 0.18 m higher compared to 2012. There was also no significant change in salinity (DEWNR 2014e).

In the Polda Lens, declines in the maximum recovered groundwater level of up to 0.2 m were recorded in 65% of wells when compared to 2012. Another 24% of wells recorded rises of up to 0.16 m and 14% recorded no overall change in water level. About 80% of monitoring wells recorded a decrease in salinity concentration when compared to 2012 data of up to 75 mg/L (DEWNR 2014f).

For the Musgrave PWA the total available licensed allocation in 2011-12 was approximately 2,300 ML. This has decreased slightly to 2,245 ML in 2012-13, and then increased to 2,248 ML in both 2013-14 and 2014-15. Despite these levels of allocation, a Notice of Prohibition has restricted extraction which reached only 0.6 ML in 2013.

Alternative supplies

Local Government throughout the Eyre Peninsula region have well developed capacities for capturing and reusing stormwater and reusing treated wastewater for non-drinking purposes. The annual review showed that less stormwater was being captured and reused than had been projected, and that less treated wastewater from community wastewater management schemes was being reused than had been projected. However, this is likely to be due to difficulties in obtaining data rather than actual reductions in stormwater and wastewater capture and reuse.

Climate change

The 2012 Department for Water report on the Impacts of Climate Change on Water Resources in the Eyre Peninsula NRM region continues to provide the most relevant information on this issue (Green et al., 2012). The results of the report were outlined in the 2012 annual review of the Statement and indicate that by 2050 climate change will result in:

- a 24 per cent reduction to the Southern Basins PWA recharge (i.e. a simplified gradual reduction of 0.4 per cent per annum)
- a 26 per cent reduction to the Musgrave Basin PWA (i.e. a simplified gradual reduction of 0.43 per cent per annum), and
- a run-off reduction of 45 per cent into the Tod Reservoir (i.e. a simplified gradual reduction of 0.75 percent per annum).

While recharge and run-off remained steady during the reporting period compared to the previous year, year-to-year natural variability is not unusual and is expected, even in an environment of long-term climate change.

Mining supply

As outlined in Water for Good, it is State Government policy that securing water for mining activities is the responsibility of the company.

The information regarding supply of water for mining purposes in the demand-supply projections in the Eyre Peninsula Demand and Supply Statement is sourced from the Resources and Energy Sector Infrastructure Council's (RESIC) Infrastructure Demand Study 2009. The 2011-12 annual review of the Statement has revised the supply of water for mining purposes based on the RESIC Infrastructure Demand Study 2011 (RESIC 2011).

Based on the updated information, there is currently a greater volume of water being supplied for mining purposes, from the 2011-2012 projected volume of approximately 2.3 GL to approximately 4 GL from private desalinated seawater.

This information will be updated once the Regional Mining and Infrastructure Planning project currently being conducted by the Department of Planning, Transport and Infrastructure is finalised.

4.5 DEMAND DRIVERS

Total demand for water

During the reporting period, demand for drinking quality water in the Eyre Peninsula region was approximately 3.9 GL lower than the Statement's projections. Demand for drinking and non-drinking quality water combined was approximately 2.5 GL lower than the Statement's projections.

Population growth

Department of Planning, Transport and Infrastructure (DPTI) indicates that the most likely future population growth rates, when averaged out to 2050, are tracking in line with the low population growth scenario used in the Statement.

Mining demand

As discussed in the supply drivers, it is State Government policy that securing water for mining activities is the responsibility of the company.

The information regarding demand of water for mining purposes in the demand-supply projections in the Eyre Peninsula Demand and Supply Statement is sourced from the RESIC Infrastructure Demand Study 2009 as well as advice from the then-Primary Industries and Resources South Australia. The annual review has revised the demand of water for mining purposes based on the RESIC Infrastructure Demand Study 2011.

Based on information reported in the 2011-12 annual review of the Statement, there is a greater demand for water for mining purposes, from the 2011-12 projected volume of approximately 2.9 GL to the actual volume of approximately 4 GL.

The 4 GL is provided from private desalinated seawater. It is anticipated that there will be significant growth in the demand for water for mining purposes. The majority of this water is expected to be sourced from private seawater desalination plants, with a smaller portion sourced from non-prescribed groundwater resources.

The Regional Mining and Infrastructure Planning project currently being conducted by the Department of Planning, Transport and Infrastructure will further inform and update water supply and demand from the mining industry.

The growth in demand from the mining sector is not expected to have a detrimental impact on the current mains water supply in the region as mining companies suggest they will supply the water for their operations from desalinated seawater or non-prescribed groundwater resources.

Stock

Based on advice from the then-Primary Industries and Resources South Australia, the Statement's projections assume that stock demand will increase by 1.5 per cent on the 2009–10 level for 10 years and then remain constant. Current advice from Primary Industries and Regions South Australia is that the Statement's projections remain valid.

5 CONCLUSION

The annual review of the assumptions underlying the Statement’s demand-supply projections provides for the opportunity to revise the timing of when an Independent Planning Process is required.

The key factor that has led to the updated demand-supply projections for drinking quality water in 2012–13, in comparison to the revised projections in 2011–12, is that SA Water’s total licensed allocations from the Southern Basins PWA will increase in 2014–15 based on recharge to the aquifers by approximately 445 ML.

In light of this, the demand-supply projections have been revised. As in the Statement, two different demand-supply projections are considered:

- Projection 1: Drinking-quality water demand and supply only
- Projection 2: All water sources and all human demands

The first projection refers to water supply and demand of high-quality, treated water from the SA Water mains distribution network. The second refers to drinking quality water and non-drinking quality water supplies; and demand for water for all human and other purposes such as domestic use, stock use, irrigation, industrial, commercial and mining.

Table 3 outlines the impact on demand-supply for both projections based on current population growth and the new information described previously. The impacts of climate change have been retained from the demand-supply projections developed in 2011-12. As in the 2011-12 projections, there is no difference between the projected high and low climate change impact out to 2050.

Table 3: Revised demand-supply projections

Scenario	Projection 1: Drinking-quality water demand and supply only	Projection 2: All water sources and all human demands
Actual population growth	Demand is not projected to exceed supply until 2024-2025	Demand is not projected to exceed supply prior to 2050

Upon review of the demand-supply projections, based on current population growth, demand for drinking quality water is not projected to exceed supply until 2024–25. Therefore an Independent Planning Process will not be required until 2019–20.

This annual review indicates that, due mainly to the increase to SA Water’s total licensed allocations from the Southern Basins PWA in 2014–15, the timeframe to initiate an Independent Planning Process is four years later than the 2011–12 annual review suggested.

However, in keeping with the *Water Industry Act 2012*, the assumptions underlying the projections will be reviewed in 12 months’ time. Should anything change, such as less water available from the prescribed wells areas or increased demand from population growth or mining, the timing for the demand-supply projections and associated Independent Planning Process will be adjusted accordingly.

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