

A wide-angle aerial photograph of a river valley. The foreground is dominated by a dense, lush green forest. In the middle ground, a large, calm body of water, likely a reservoir or a wide river bend, stretches across the landscape. The background shows a flat expanse of land under a bright blue sky filled with scattered white clouds.

THE RIVERLAND WINE INDUSTRY BLUEPRINT

RIVERLAND WINE INDUSTRY BLUEPRINT – STRATEGIC WATER AUDIT

Final Report

12 October 2023

EXECUTIVE SUMMARY

The Riverland wine region is the largest in Australia and is a core component of the local economy. However, due to a range of factors, the industry is facing an uncertain future.

To set a strategic direction for a productive and sustainable sector, the South Australian Government, Riverland Wine, Wine Australia and Wine Grape Growers Council of SA are developing a 10 year Wine Industry Blueprint. Given the importance of water to wine grape production, h2orizons was engaged to undertake a strategic water audit to identify future challenges and opportunities, including:

- An overview of the changing water policy and legislative environment and learning from the Millenium Drought to the present day;
- An assessment of the current status of water and the Riverland wine industry;
- An articulation and analysis of future water related scenarios and potential impact on the Riverland wine sector;
- A review of industry and stakeholder perspectives on future water challenges, opportunities and scenarios;
- Practical recommendations for action.

Drawing on a range of existing information and data, supplemented by one on one interviews with industry stakeholders and a survey of Riverland Wine grape producers, this assessment has confirmed that:

The cost of water delivery and pumping for wine grape production has more than tripled over the last 25 years, whilst returns from irrigation have declined by around 36%.

A significant proportion (more than 40%) of wine grape producers in the Riverland do not hold sufficient permanent water entitlements to meet their annual irrigation needs.

Despite South Australia's annual water entitlement for the River Murray still being guaranteed at 1,850 Gl, it is extremely likely that years of less than 100% allocation against entitlement will be experienced in the future, potentially being around 60% a year on average by the end of the decade.

There has been a significant expansion of permanent plantings over the last decade in the Murray-Darling Basin below the Barmah Choke and it is now likely that, in future extreme dry periods, there will be insufficient water available to meet the irrigation requirements of all permanent crops, with the short-fall estimated at being somewhere between 25% to 60% of the water required.

The near term resumption of water buybacks from willing sellers across the Murray-Darling Basin by the Australian Government will see more water removed from primary production and further exacerbate this demand and supply imbalance in the southern basin.

There will be increased competition for temporary water entitlements in future dry years, with analysis suggesting that this will mean the price of entitlements will rise to over \$1,000 / ML, which is beyond the estimated financial capacity of Riverland wine grape producers to pay (\$400-\$500 / ML).

If Riverland wine grape producers are unable to purchase temporary water entitlements to meet their annual irrigation needs, growers will need to make decisions to either leave the industry, diversify their operations into other crops or business activities, or reduce production.

Riverland wine grape growers are more likely than those in other regions to be planning to exit the industry over the next five years, with potentially between 20% to 30% of producers leaving and selling their water entitlements to larger growers (most likely interstate) or the Australian Government over the coming period.

A consolidation of the industry and the sale of permanent water entitlements out of the Riverland will have flow-on impacts to viability of remaining growers, other irrigators, irrigation trusts and the regional economy.

A coordinated response to these various water challenges is required, alongside other actions relevant to the industry's future to enable it to transition to a more viable and sustainable state.

A number of priority recommendations for action have emerged from this water audit which should be taken forward through the Riverland Wine Industry Blueprint. These are:

1. Design and implement a water bank to purchase and hold permanent water entitlements sold on the open market by Riverland growers for future local primary production and to enable a staged transfer of water entitlements sold to the Australian Government out of the region over a number of years to provide time for remaining irrigators and the economy to adapt and diversify.
2. Proactively engage with the Australian and South Australian governments to co-design a strategic approach to water buybacks from Riverland growers and for an expanded use of different and more flexible market models for environmental water recovery, such as two-way temporary allocation transfers.
3. Design and implement targeted assistance and research programs to enable Riverland wine grape producers to make step changes in water use efficiency and productivity, transition into new production methods, grow alternative commodities, pursue other business prospects and to develop new sustainable irrigation water supplies for the region. This could include:
 - Financial incentives and brokerage support for new irrigation and production technologies and methods;

- Research into options for the treatment and use of groundwater for irrigation activity, opportunistic harvesting of future flood events and the use of managed aquifer recharge for storage and expanding the capture and utilisation of wastewater and stormwater in irrigation networks;
- Financial incentives for investment in new cost effective and renewable energy generation in the Riverland, including the capture of energy from trust networks, to reduce the cost of water access and use and to provide an energy source for economic diversification;
- Develop and implement training packages and other tools to improve the capacity of growers in the Riverland to manage water more effectively as a business asset.

1. Introduction

The Riverland is the largest wine producing region in Australia, home to around 939 wine grape growers and with more than 20,000 hectares of land dedicated to wine grape production.

As an extensive irrigated crop, the wine industry is a significant driver of economic prosperity across the region. However, the global oversupply of red wine which has emerged over recent years, particularly at lower price points, is affecting the future viability of the Riverland wine sector, placing significant pressure on the industry to adapt to an uncertain future.

To establish an agreed long-term vision for the industry and to set in motion on-ground actions to realise a sustainable future, the South Australian Government, Riverland Wine, Wine Australia and Wine Grape Growers Council of SA are developing a 10 year Riverland Wine Industry Blueprint.

Water availability, access, cost and use have always been critical to the wine industry in the Riverland. With a warm climate, irrigation is essential for wine grape production in the region.

Given the central importance of water to the future of the wine industry and the region more generally, h₂orizons has been engaged to undertake a strategic water audit as a key input to the blueprint. This has established a contemporary understanding and quantification of future water related scenarios in terms of their potential impact on the profitability of the Riverland wine sector and has identified practical actions to respond to the challenges and opportunities ahead.

This final report outlines the investigations and analysis conducted, the key findings arising and recommendations for action around water to secure a sustainable future for the wine industry in the Riverland.

2. Scope and Methodology

The original scope for a water audit proposed by the Riverland Wine Industry Blueprint Steering Committee was as follows:

'The value of water allocations is a very significant business consideration for Riverland Wine growers and is the driver of many business decisions across the region. The security of water allocated to the region needs to be understood by the Steering Committee as it develops the Riverland Wine Industry Blueprint.

There is significant existing data and information from a variety of industry and government sources that can inform the Steering Committee on historical water allocation and pricing trends and inform a future industry strategy.

Using available data sources from the Department of Environment and Water, Murray Darling Basin Authority and other sources to undertake an audit of water allocations in the Riverland GI.

The Water allocation report will identify historical trends in water allocations and any trends regarding permanent allocations versus leased water and what crops the water is being used on.

It is recommended the specification for research be further refined and then approved by the Steering Committee.'

Responding to this scope, h₂orizons was engaged to deliver a water audit that included:

- An overview of the changing water policy and legislative environment and learning from the Millenium Drought to the present day;
- An assessment of the current status of water and the Riverland wine industry;
- An articulation and analysis of future water related scenarios and potential impact on the Riverland wine sector;
- A review of industry and stakeholder perspectives on future water challenges, opportunities and scenarios;
- Practical recommendations for action.

The audit draws on a range of existing data sources and analysis, such as from the Australian Bureau of Statistics, Aither, Murray-Darling Basin Authority, Department of Primary Industries and Regions, Department for Environment and Water, Australian Wine Research Institute and the irrigation trusts, supplemented by a grower survey and targeted one on one interviews with key industry and other stakeholders.

Strategic input and guidance were also provided through the Blueprint Water Sub-committee.

3. Water and the Riverland Wine Industry - Policy Reform and the Millenium Drought to the Present

This section briefly provides an overview of the changing nature of the water policy and regulatory environment in the Murray-Darling Basin and Riverland to the present day and the learning from the Millenium Drought, as they both relate to the growth of the wine industry in the region.

Water Management Policy and Regulation

As the irrigation sector across the Murray-Darlin Basin and Riverland has developed over the last 140 or so years, so too has the overarching water management policy and regulatory environment in which they operate.

Through the Constitution, water management responsibility sits with state and territory governments. However, following concerns about surface and ground water extraction from the Murray-Darling Basin in the 1980s and 1990s, water reform was elevated to a national issue through the Council of Australian Governments (COAG).

In 1994, COAG endorsed a new water reform framework in recognition of the fact that the management of Australia's water resources was an issue of national interest that required improved coordination across national, state and territory governments.

This agreement saw a commitment to the separation of water entitlements from land titles and the separation of the functions of water supply (through water utilities) from policy and regulation.

In 1995, a basin-wide cap was agreed, limiting the volume of surface water diverted for consumptive use across the Murray-Darling Basin to 1993-94 levels. South Australia previously adopted a cap on River Murray extractions in 1968.

In 2004, the National Water Initiative (NWI) was agreed by COAG to further improve water management practice across Australia. This included a commitment to restore the balance between environmental needs and consumptive use in Australia's various strategic water resources.

The NWI also included a commitment to recover 500 Gl of water for environmental outcomes, the first time that water was allocated solely for environmental purposes.

Within South Australia, the primary mechanism for managing a water resource and consumptive use is a water allocation plan, first introduced in the *Water Resources Act 1997* (subsequently the *Natural Resources Management Act 2004* and then the *Landscape South Australia Act 2019*). Water allocation plans set the rules for managing the take and use of prescribed water resources¹ to ensure they are used sustainably.

¹ A prescribed water resource is a significant surface water or groundwater resource which has been deemed to require direct management through a water allocation plan to provide security for all water users, including the environment, now and into the future.

The first water allocation plan relevant to the Riverland region was the Water Allocation Plan for the River Murray Prescribed Watercourse, adopted by the Minister on 1 July 2002, and covering the River Murray downstream from the Victorian border, Lakes Alexandrina and Albert, part of Currency Creek and the Finniss, Angas and Bremer Rivers.

Water allocations endorsed on licences under the plan when adopted were in excess of the actual demand for water at that time. For irrigation, 503.8 Gl of water was provided for under licence annually, while demand was around 383.5 Gl².

Given this balance between water allocation and use, there were no major water security issues experienced in the Riverland until around 2005-06, due then to drastically reduced inflows to South Australia during the Millennium Drought.

The Millennium Drought

The Millennium Drought from 1996 to 2010 was the most severe dry period since federation, significantly affecting the Murray-Darling Basin and virtually all southern cropping zones.

For South Australia, the Millennium Drought saw the lowest River Murray inflows ever experienced, far exceeding previous modelling of worst case scenarios of potential flows across the border. 2006 to 2009 was the height of the drought for South Australia, with this period seeing River Murray flows into the state falling to 960 Gl per year, or around half of the annual entitlement.

Due to less water being in the system and a need to maintain a level of protection for natural ecosystems, annual irrigation allocations against licenced entitlements across the River Murray Prescribed Watercourse fell dramatically, with this only being reversed with inflows recovering around 2010. This scarcity led to significant trade of water into the state and an associated rapid increase in the price of temporary allocations to over \$1,000 / MI, compared to under \$200 / MI prior to that point.

The Renmark Irrigation Trust estimates that, at the peak of the drought, Riverland irrigators had to purchase around 67% of the water required to keep their permanent crops alive³.

This period saw a significant re-structuring of irrigation activities across the South Australian River Murray. Industries that relied on high security water, such as perennial horticulture and dairy, were required to either resort to alternative options, such as purchasing feed, changing crops and reducing irrigation. Data shows that as diversions reduced during the drought, the area of land irrigated also reduced⁴.

Across the Murray-Darling Basin, water trading facilitated a shift of water towards 'highest value use', which in primary production was generally to permanent plantings such as wine

² Source - Water Allocation Plan for the River Murray Prescribed Watercourse (2023)

³ Source – Renmark Irrigation Trust, 2022, Our Story presentation slides

⁴ Source - Source - Water Allocation Plan for the River Murray Prescribed Watercourse (2023)

grapes. This transfer allowed these sectors to remain in some level of production, or to at least keep permanent plantings alive.

A reduction in water use was seen in rice, cotton, pasture and dairy, which resulted in water moving from New South Wales into Victoria and South Australia. The high prices for water during this period resulted in growers taking on significant debt to purchase the water required⁵. For the wine industry in the Riverland, this was also enabled by the relatively high price paid for wine grapes at that time.

Various government assistance programs during the drought were implemented to reduce impacts on the farming sector and communities across the basin. At an Australian Government level, these included the:

- Sustainable Rural Water Use and Infrastructure Program, which purchased water saved through irrigation infrastructure and efficiency improvements;
- Small Block Irrigators Exit Grant Package, which purchased water entitlements from willing sellers, allowing them to leave the irrigation industry.

Additional financial support was also provided through the South Australian Government to enable the purchase of water for permanent plantings in the Riverland.

Overall, the Millennium Drought demonstrated that during low flow periods the River Murray is unable to meet total irrigation demand in South Australia⁶.

The key factors that enabled the Riverland wine industry to survive the drought were:

- A reasonable existing level of water efficiency in wine grape production;
- Industry restructuring and consolidation;
- A reduction in water use on-farm to maintain plantings;
- Relatively high wine grape prices as against other agricultural products across the southern basin, enabling greater financial capacity for water purchase by wine grape growers;
- Access to external financing for water purchase;
- Various government assistance packages.

Together, these enabled the wine industry in the region to maintain a minimum viable state until flows returned to normal in 2010-11.

Through the various material used in this water audit and one on one interviews with key stakeholders (see Section 6 below), a range of learning has emerged from the drought that are important for the wine industry to consider as it determines a future strategy for the sector.

⁵ Source - Water Allocation Plan for the River Murray Prescribed Watercourse (2023)

⁶ Source - Water Allocation Plan for the River Murray Prescribed Watercourse (2023)

These are:

- The importance of regular information flow to growers to allow individual business decisions on water use to be made;
- The importance of coordination across various government, industry and academic entities to respond to the challenges as they emerged in an efficient, targeted and timely manner;
- That a range of unintended negative impacts can result from lower irrigation water use during periods of low water availability (eg resting of vineyards), such as a slower than expected timeframe to return to full production and the emergence of pests and disease;
- That negative impacts can result from an uncoordinated approach to industry consolidation and growers leaving the industry (eg the Small Block Irrigators Exit Grant Package), such as increased risks of disease, pests and fires, psychological impacts on growers and potential off-farm irrigation infrastructure financial viability issues from the retiring of blocks from production and the 'swiss cheese' effect;
- The importance of the age profile of growers in terms of their willingness to continue in the industry (with the average age of growers now higher than during the drought);
- The levels of understanding by growers of the water market and water related business practices;
- The relative market position of various commodities produced across the southern-Murray-Darling Basin on the financial competitiveness of growers to purchase water and trade excess capacity as an alternative income source.

Post Millenium Drought

The post Millenium Drought period saw the finalisation of the Basin Plan and the commencement of its implementation, with the plan being endorsed by basin states and coming into law in 2012 through the *Water Act 2007*.

The Basin Plan aims to *'bring the basin back to a healthier and sustainable level, while continuing to support farming and other industries for the benefit of the Australian community'*⁷.

At the heart of the Basin Plan is a commitment to recover 2,075 Gl of water from consumptive use for environmental purposes and an additional 450 Gl of environmental water, subject to neutral socio-economic impacts, originally by 2024. For South Australia, the plan has required the recovery of 131.8 Gl.

An important initiative implemented by the South Australian Government to achieve part of the water recovery target and also drive improved irrigator productivity and profitability in the Riverland region was the South Australian River Murray Sustainability Program (SARMS).

⁷ <https://www.mdba.gov.au/water-management/basin-plan/key-elements-basin-plan>

SARMS was a \$265 million funding package from the Australian and South Australian governments, comprising of two areas for investment:

- The Irrigation Industry Improvement Program (SARMS-3IP);
- A suite of regional development, research and innovation programs, including redevelopment of the Loxton Research Centre.

SARMS-3IP provided \$240 million for a competitive grants program to drive improved irrigator efficiency, business performance and recovery of water for the environment across the South Australian River-Murray system. At completion, the program supported 255 projects and recovered 40 GL of water.

In addition, the program also supported improvements in water delivery infrastructure and saw land previously retired from use be brought back into production. The Renmark Irrigation Trust saw around 278 Ha of land added back into productive capacity as a result of the program.

Other developments that occurred in the post drought period to the present day which have changed the water environment for the Riverland wine industry were:

- The further development of the water market, including an expansion of water related products available to irrigators;
- Additional years of starting allocations being less than 100% due to lower than average inflows upstream;
- Greater focus on the regulation of the water market through the Australian Competition and Consumer Commission;
- Lower risk appetites for agriculture related finance in the banking sector;
- A significant increase in permanent plantings across the southern basin;
- Trade restrictions being applied due to potential negative community impacts and capacity constraints of river channels;
- A transition in priority for government funding towards off-farm efficiency projects and away from buybacks and on-farm efficiency measures.

Summary of Key Points

National water reform initiatives since 1994 have significantly changed the environment in which irrigators operate across the whole of the Murray-Darling Basin, with water being returned to the environment from consumptive use, a water trading market emerging to transfer water to highest value use and a cap on diversions limiting the amount of water than can be utilised in primary production.

In the Riverland, these reforms were able to be implemented without impacting significantly on water security, with issues only emerging during the Millenium Drought and the lowest inflows to the South Australian River Murray system being recorded. These inflows were significantly lower than any worst case scenarios previously modelled.

Wine grape production in the region was able to survive this period of low water availability due to a number of important factors, particularly the capacity of growers to purchase

temporary water allocations to maintain plantings, industry consolidation, government assistance programs and effective coordination across different stakeholders.

Despite this, a range of negative impacts emerged, including growers taking on additional debt and due to the ad hoc removal of land from productive use (pests, disease).

Since the end of the drought in 2010, there have been further challenges for Riverland growers associated with the implementation of the Basin Plan, water recovery and the rapid expansion of permanent plantings across the southern Basin.

In addition, growers have also experienced years of less than 100% starting allocation against their water entitlements, which has caused uncertainty for decisions on water use on-farm.

Whilst the SARMS program provided additional water efficiency improvements both on and off-farm and strengthened water related business practices by growers, the declining price for wine grapes, water entitlement ownership movements in the southern basin, an increase in permanent crops and difficulties in the recovery of water to meet Basin Plan targets in the other states have combined to now create an uncertain future for wine grape production and industry viability in the Riverland.

4. Current Status of Water and the Riverland Wine Industry

This section provides a current perspective on the wine industry and water in the Riverland to provide a baseline for evaluating the potential implications of future water access and policy reform scenarios on the sector.

Water Availability

The Murray-Darling Basin Plan, through Sustainable Diversion Limits and the Sustainable Diversion Limit Adjustment Mechanism, set South Australia's water recovery target at a long-term equivalent of 131.8 Gl. The volume of water recovered from South Australia to date through buy backs and efficiency projects (such as SARMS) means that no further water recovery is required to meet this target⁸. However, water recovery efforts across the remainder of the Murray-Darling Basin have been mixed and may ultimately impact the Riverland region and the wine industry over time.

On 22 August 2023, the Minister for the Environment and Water announced a new agreement between the Australian, New South Wales, South Australian, Queensland and Australian Capital Territory governments, that provides:

- More time to deliver the remaining water, based on expert advice. This includes the recovery of the 450 Gl of water for the environment by 31 December 2027, and the delivery of water infrastructure projects by 31 December 2026;
- More options to deliver the remaining water, including water efficiency infrastructure projects and voluntary water purchases;
- More funding to deliver the remaining water, and to support communities where voluntary water purchasing has flow-on impacts;
- More accountability for all Murray-Darling Basin governments, including the Federal Government, to deliver on their obligations⁹.

The critical element to note from this announcement for wine grape production in the Riverland is the resumption of buybacks as a core water recovery instrument.

Whilst there is no onus on South Australia to return more water to the environment, it is possible that irrigators in the state may seek to sell their water entitlements through this new buyback process as a way of exiting the industry and capturing a return on their water assets whilst it is possible to do so, particularly given that such buybacks have historically occurred at a price higher than the prevailing market rate.

Over 20% of Riverland wine grape growers surveyed in the 2021 Australian Wine Research Institute Irrigation Efficiency and Practice Change Survey indicated their intention to exit the

⁸ Source - <https://cdn.environment.sa.gov.au/environment/docs/implementation-of-sdls-through-the-wrp-factsheet.pdf#:~:text=Under%20the%20Basin%20Plan%2C%20South%20Australia%20must%20recover,to%20the%20Basin%20wide%20target%20of%202%2C750%20GL>.

⁹ Source - <https://minister.dcceew.gov.au/plibersek/media-releases/historic-deal-struck-guarantee-future-murray-darling-basin>

industry over the following five years, a proportion which is higher than in other wine grape growing regions in the Murray-Darling Basin.

Water entitlements sold through government buyback programs will be lost to primary production in the Riverland permanently.

South Australia's entitlement flow of 1,850 Gl per annum continues to be guaranteed through the Murray-Darling Basin Agreement, with this made up of:

- A consumptive entitlement up to 1,154 Gl per year;
- A dilution and loss entitlement of 696 Gl per year (or 58 Gl per month); and
- Additional quantities for dilution as determined by the Murray-Darling Basin Ministerial Council.

This water is the only recognised source of water for the South Australian River Murray system, with this managed through the current Water Allocation Plan for the River Murray Prescribed Watercourse (2023).

The consumptive entitlement of up to 1,154 Gl per year is the maximum volume of water that is able to be allocated to various end uses, including the environment. Any additional 'unregulated' flows received into the state, such as the recent floods, are not allocated for consumption/extraction under the water allocation plan.

Irrigation water is provided for as one component under an All Purpose Consumptive Pool category from the overall entitlement volume. In years where flows into South Australia are 1,850 Gl a year or higher, Riverland irrigators will have 100% allocation against their licenced water access entitlement. This equates to approximately 973.8 Gl of water across the full length of the South Australian River Murray System. No data is available to determine the proportion of this water that is used for wine grape production in the Riverland.

River Murray irrigators have 100% allocations for the current (2023-24) water year and are likely to see this allocation also be in place in the 2024-25 year given the current state of storages across the basin. In such years, if an irrigator needs a greater volume of water to either increase production, or because their entitlement volume is not sufficient, they can purchase temporary water allocations on the water market.

Where the volume of water available to South Australia in any one year is below 1,850 Gl, the water allocation plan specifies a method for determining the amount of water available for each consumptive pool. Irrigation allocations in the Riverland will be a proportion of this, at a level of less than 100%. To cover any gap in allocations, irrigators have the option of buying water through the market, or reducing their use accordingly.

As demonstrated in Table 1, there has continued to be years since the drought where opening allocations have been less than 100%. This has resulted in a level of uncertainty for growers in making outward decisions on water use and trade.

Table 1 - Summary of Class 3 (High Security) Opening Water Allocations¹⁰

Water Year	Opening Minimum Allocation
2009-10	2%
2010-11	21%
2011-12	100%
2012-13	100%
2013-14	100%
2014-15	100%
2015-16	100%
2016-17	36%
2017-18	100%
2018-19	100%
2019-20	26%
2020-21	40%
2021-22	100%
2022-23	100%
2023-24	100%

Given climatic predictions across the Murray Darling Basin, it is reasonable to assume that years of less than 100% allocation will again occur in the future. Ruralco Water have estimated that, by 2028-29, allocations by the end of the water year for irrigators could be around only 60% on average¹¹.

Under the current water allocation plan, where annual allocations to irrigation are less than 50%, access to carry-over provisions may be available for the following water year for Class 3 (High Security) licence holders, on the decision of the Minister for Environment and Water. This mechanism enables irrigators to carry-over any unused water from that year to the next, providing some flexibility in water access and security during low flows.

A further issue in regard to future water access by Riverland wine grape growers is the growing proportion of irrigators that have insufficient entitlement to irrigate their crops on

¹⁰ Source – DEW

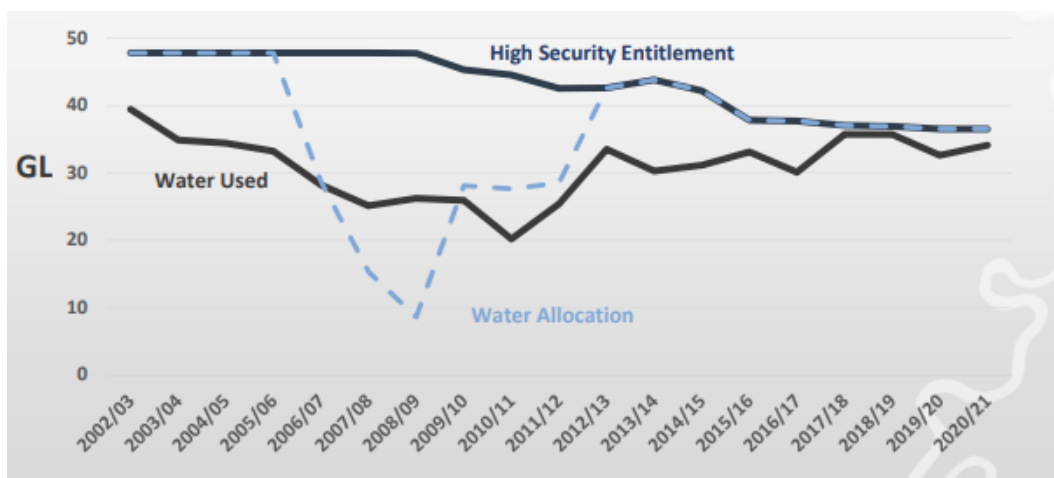
¹¹ Source – Ruralco Water, 2023, Peter Duggin Presentation Slides

an annual basis, even at 100% allocation. Some growers have no permanent entitlement at all and rely solely on temporary allocation trade for their annual water use.

The Central Irrigation Trust has advised that there are currently 333 accounts with irrigation outlets that do not hold a permanent entitlement, which equates to 23% of all of their irrigation customers. Anecdotally, the trust has observed that the number of accounts without permanent entitlements has continuously increased since the Millenium Drought¹².

Overall, water access now for Riverland irrigators is tighter than it has been in the past. As an example, the water profile for the Renmark Irrigation Trust now compared to that historically is detailed in Figure 1.

Figure 1 – Renmark Irrigation Trust Water Entitlements and Use¹³



It has been suggested through the interviews conducted with key stakeholders (Section 6) that irrigation water security in the Riverland is now greater than during the Millenium Drought due to the various provisions of water allocation plan, such as carryover.

Current and Emerging Water Demand and Supply Pressures

The water demand and supply balance across the southern Murray-Darling Basin highlights some potential future risks regarding water access and cost for the Riverland and wine grape production.

Climate variability, the increase in permanent plantings below the Barmah Choke and water recovery for the environment are all impacting on water availability and storage across the southern basin.

¹² Source – Data request response from CIT

¹³ Source – Renmark Irrigation Trust, 2022, Our Story presentation slides

A 2019 report by Aither (Water Supply in the Southern Murray Darling Basin - An assessment of future water availability and permanent horticulture irrigation water demand) prepared for the Victorian Government, highlights the emerging pressures in regard to water demand and supply for primary production.

Over the last decade, the demand and supply balance in the southern basin has shifted, due to:

- Increased investment in and development of permanent irrigated horticulture with long-term fixed water demands (such as almonds and citrus);
- The volumes of water recovered for the environment, reducing the available consumptive supply for irrigation activity.

This has led to questions being raised by government and industry stakeholders *'about how much of the consumptive water supply in the southern Murray-Darling Basin in any given future year will be required by permanent irrigated horticulture and therefore how much water may be available for use by other irrigated industries (such as dairy, cotton and rice)'*.¹⁴

Aither estimate that water demand for permanent plantings only in the lower Murray¹⁵ is approximately 1,315 GJ per year. This equates to approximately 95% of estimated permanent horticulture water demand across the connected Murray system as a whole. However, this is considered a worst case scenario, as the analysis does not allow for trade from the Goulburn, Murray above the Barmah Choke and Murrumbidgee and does not account for the potential use of groundwater as an additional resource for irrigation¹⁶.

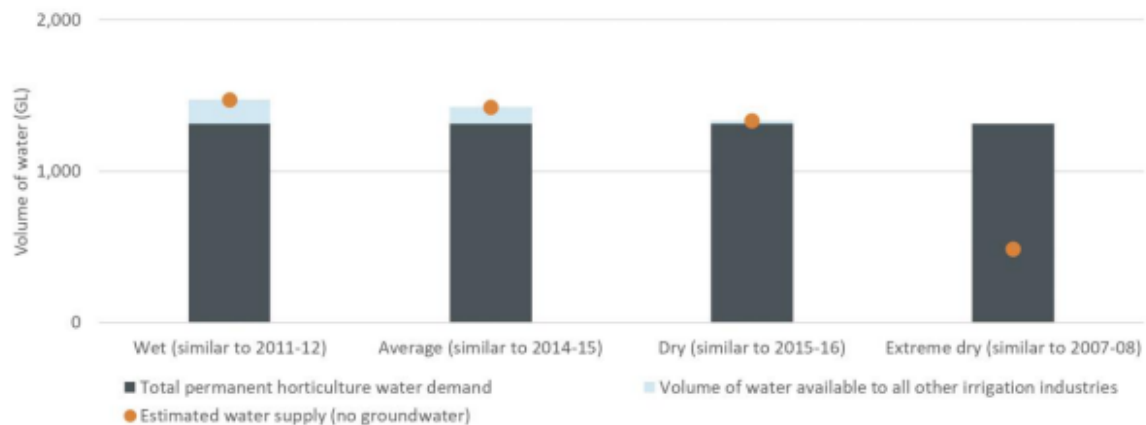
Aither also assesses several water availability scenarios in the lower Murray region (wet, average, dry and extreme dry) against the projected demand for water for permanent plantings (see Figure 2).

¹⁴ Source – Aither, 2009, Water Supply in the Southern Murray Darling Basin - An assessment of future water availability and permanent horticulture irrigation water demand

¹⁵ The lower Murray is a subset of the Murray system that includes regions downstream of the Barmah Choke, such as the Victorian Sunraysia, New South Wales Murray and South Australian Riverland regions

¹⁶ Source – Aither, 2009, Water Supply in the Southern Murray Darling Basin - An assessment of future water availability and permanent horticulture irrigation water demand

Figure 2 - Water Availability Scenarios and Existing Permanent Horticulture Water Demand (at full maturity), Lower Murray Region¹⁷



This suggests that, in the lower Murray in a future dry scenario, permanent planting water demands will match total water availability, hence meaning that no or limited water will be available for annual crops in such periods.

The analysis also points to a significant shortfall of water as against permanent planting demands under an extreme dry scenario. In this case, only 40% of permanent planting water demand will be met from the existing supply.

Aither notes that it is unlikely that this full demand can be addressed through trade, concluding that this situation *'is likely to have serious implications for irrigated industries in connected water trading zones'*¹⁸.

This analysis also does not take account of future planned developments in the lower Murray and additional water demands from these, as well as further water buybacks by the Australian Government. Demand from future developments has been estimated at around 165 GL per annum, further elevating the risk of insufficient water availability.

Overall, given the development in place now, in a future extreme dry year, temporary water allocation prices will increase substantially (if they are available in sufficient volumes at all) and irrigators will need to balance production against the water that is available. Riverland wine grape producers will need to compete with other crops and regions for water in these years.

¹⁷ Source – Aither, 2009, Water Supply in the Southern Murray Darling Basin - An assessment of future water availability and permanent horticulture irrigation water demand

¹⁸ Source – Aither, 2009, Water Supply in the Southern Murray Darling Basin - An assessment of future water availability and permanent horticulture irrigation water demand

Water Cost, Trade and Delivery Issues

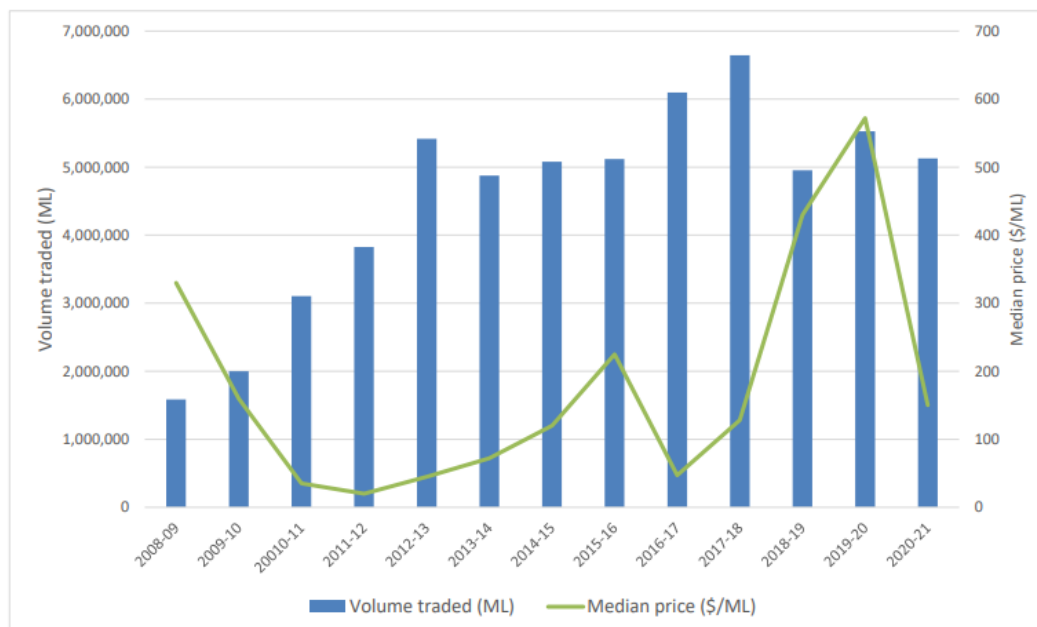
The cost of water for irrigation in the Riverland is determined by the following:

- Purchase of entitlements and temporary allocations through the water market as required;
- The applicable water levy determined by the Murraylands and Riverland Landscape South Australia Board;
- Costs associated with the pumping of water from the river, distribution to farm gate and on-farm use, which are primarily dictated by electricity prices.

Average water costs are the largest component of total variable grape production costs per hectare in the Riverland, representing 28% of total costs at a rate of \$2,221 / Ha (followed by contract and labour costs at 16% and \$1,063 / Ha). Actual water related costs are, however, variable across different growers, given variances in water ownership and trading strategies¹⁹.

The purchase of water entitlements and allocations is the most significant component of the overall water cost for Riverland irrigators, but only applies when irrigators enter the water trade market. As highlighted in Figure 3, the median water allocation trade price (temporary water) across the southern Murray-Darling Basin has steadily increased from 2016-17 to 2019-20, only decreasing recently due to high flow conditions.

Figure 3 - Southern Murray–Darling Basin Historical Water Allocation Volume Traded and Median Price²⁰



¹⁹ Source – Wheeler et al, 2022, The Economics and Financial Benchmarking of Riverland Grape Production, and Potential Benefits of Vitivisor Technology

²⁰ www.bom.gov.au/water/dashboards/#/water-markets/mdb/at

This increase in price is resulting in a significant addition to the cost of wine grape production for Riverland growers that do not hold sufficient or any entitlement, or when allocations are less than 100%.

It has been suggested through the stakeholder interviews conducted for this audit (Section 6) that the ‘tipping point’ for many wine grape growers in the Riverland in terms of future viability is a market price for temporary water allocations of \$400-500 / ML.

As with other wine producing regions, the Riverland has seen increasing electricity costs over recent years. No analysis of the impact of energy prices on grower viability, either through the cost of water provided by trusts or directly pumped from the river and from on-farm use, has been identified through this audit.

In regard to the water levy, water licence holders in the Riverland contribute a flat fee of \$200 per year, or a levy based on the number of entitlement shares or allocation volume held on their water licence on 1 July each year, whichever is greater. This is set each year by the Landscape Board. The 2023-24 levy for Class 3a water licences is \$7.58 / ML²¹.

Murray-Darling Basin Water Market

The current status of the water market across the southern basin has most recently been assessed by Aither in its Water Markets Report (2022-23 Review and 2023-24 Outlook)²².

The market price for temporary allocations across the Murray-Darling Basin in the last water year was the lowest for a number of years, due primarily to higher than average rainfall. But the price is widely anticipated to increase again over the coming years.

In 2022-23, the Aither assessment highlights that²³:

- Whilst allocation prices were low, there were other water issues affecting irrigation production, including water access, the flooding of properties and crop degradation;
- In regard to temporarily allocations, the combination of high supply and suppressed demand drove prices down across most of the year. The annual volume weighted average price across the year was \$27 / ML, with this trending to \$0 / ML in some parts of the system due to limited private carryover, a high risk of spill from storages and an expectation of full allocations against entitlements in 2023-24;
- In regard to the temporary market, interstate and inter-valley trade was lower than recent years;
- For water entitlements, the price of most high reliability and high security entitlements continued to increase to record highs, although at a slower rate than previous years. In addition, strong demand continued for carryover and, due to the new Goulburn to Murray trade rule, prices for low reliability entitlements increased for a third year in a row. For general security entitlements, prices also increased, but

²¹ <https://www.landscape.sa.gov.au/mr/about-us/about-the-levies/about-the-water-levy>

²² <https://aither.com.au/wp-content/uploads/2023/08/2022-23-Water-Markets-Report.pdf>

²³ <https://aither.com.au/wp-content/uploads/2023/08/2022-23-Water-Markets-Report.pdf>

began reducing towards the end of the water year due to a forecast El Niño period and decline in water availability for these classes.

Water Delivery Constraints

The capacity of the Murray-Darling Basin system to transfer water to its final location of use has changed significantly in recent years and the current state of play has potential implications for future horticultural production across the southern basin.

A 2020 report by the MDBA (Managing Delivery Risks in the River Murray System – Ensuring a functional system for the future) assesses water delivery constraints and the associated risks in shortfalls in the lower Murray system from the Barmah Choke to the barrages.

This analysis concludes that, due to a decreasing capacity of the Barmah Choke, economic and environmental water transfers and demand in the lower Murray and changing irrigation patterns due to climate, *‘it is clear that shortfall risks in the lower Murray are increasing and the River Murray system and its tributaries, the Barmah Choke and its forests are being operated at flows in excess of tolerable seasonal rates’*²⁴.

The report also notes that *‘things are likely to get worse in the future if the capacity of the Barmah Choke further declines, if the ecological tolerances are factored into river operations to mitigate and avoid ongoing damage to tributaries and as climate change results in more severe heatwaves’*.

On this issue, the MDBA concludes that:

- Shortfall risks exist and will never go away, but are also likely to increase as the capacity of the Barmah Choke continues to decline;
- The authority needs to continue to understand the ecological tolerances of river systems and factor these into operations to mitigate and avoid ongoing damage;
- Jointly, governments and water users need to actively manage this risk and mitigate it to the extent that is cost-effectively possible to do so;
- The residual risk must be assigned and communicated to individual water users who should be responsible for implementing their own business risk mitigation measures;
- The authority must understand the risks, monitor them and communicate to water users how the risk is varying on a week to week basis;
- When various risk scenarios eventuate, the authority and partner governments must enact a pre-planned and coordinated mitigation strategy;
- The level of shortfall that is unable to be mitigated should be managed by restrictions on diversions by each relevant state and territory government.

²⁴ MDBA, 2020, Managing Delivery Risks in the River Murray System – Ensuring a function system for the future

Alternative Water Supply Options

Through the River Murray Prescribed Watercourse Water Allocation Plan, any additional flows received into South Australia above the 1,850 GL annual entitlement are not allocated for consumptive use. Theoretically, there is scope for a policy change to allow Riverland irrigators to access these additional volumes when they occur.

Given that climate change is generally anticipated to result in more frequent flooding events in between more severe droughts across the Murray-Darling Basin, the ability to capture and store additional water during high flows could be of benefit for Riverland irrigators, subject to understanding the associated environmental impacts of such extractions. Above-ground storage is unlikely to be viable in this situation due to high rates of evaporation, but managed aquifer recharge could be used as a viable alternative option.

There is also a significant groundwater resource in the Riverland region which is not extensively utilised. This water is, however, highly saline and would require treatment for use on irrigated crops. In addition, the brine waste stream from treatment would need to be managed in an environmentally sensitive manner to not further degrade groundwater, other water resources and land.

The One Basin CRC has an early research project exploring the potential use of desalination to treat groundwater in the region to a quality that is fit for purpose for irrigation, with the associated disposal of brine into a deeper aquifer system. This research will provide more guidance on the economics and technical feasibility of expanded groundwater use for agricultural production in the Riverland.

The other water sources that exist in the region are treated wastewater (effluent) and runoff from urban areas (stormwater). There is no available data on these resources in terms of potential volumes and quality to determine if these are a viable additional water resource for Riverland irrigation use.

Wine Grape Irrigation Practices and Industry Performance

Water access, cost and use has a significant impact on wine grape irrigator income and profitability. For Riverland growers, farm size and water entitlement ownership are the most important influences on farm returns. Large farms and those with greater levels of water entitlement ownership have higher net farm income²⁵.

For Riverland growers, it is important to note in this context of profitability that, the percentage of farmers who generate additional off-farm income is larger than in other wine grape growing regions, being approximately 67% in the Riverland compared to 25% in the New South Wales Murray-Darling²⁶.

The South Australian Research and Development Institute (SARDI) recently benchmarked irrigation practices for wine grape production in three regions of the Murray-Darling Basin

²⁵ Source – Wheeler et al, 2022, The Economics and Financial Benchmarking of Riverland Grape Production, and Potential Benefits of Vitivisor Technology

²⁶ Source – Australian Wine Research Institute, 2021, Irrigation Efficiency and Practice Change Survey

(Riverland, Sunraysia and Riverina), giving a current perspective on irrigation performance across the following indicators²⁷:

- Yield per hectare;
- Yield per megalitre of water applied (or water use efficiency);
- Gross return per megalitre;
- Cost of water per tonne of fruit;
- Return per dollar of water cost and;
- Return per dollar of irrigation efficiency.

These metrics were also contrasted against each grower's target markets, water supply, scheduling and infrastructure to understand irrigation use on a daily through to seasonal basis.

Overall, the individual wine growing sites covered performed differently against different indicators, with each having a broad performance range between the best and worst sites.

The strongest impacts on irrigation performance were grape variety class, with white wine grape performing better than red grapes, due to a combination of higher yields and higher returns per tonne in white varieties in the 2021-22 season.

Other relationships, such as water delivery method, irrigation scheduling method, target market and irrigation system were weaker.

Comparisons were also undertaken with a 1997 benchmarking exercise utilising the same methodology, highlighting significant changes in the cost structures for wine grape production over the last 25 years. The cost of water delivery and pumping has more than tripled on average during this time, whilst returns have declined by 36% on average (although from a historical high point).

Complementing this picture on irrigation practices in wine grape production, the Australian Wine Research Institute has also benchmarked the relative performance of different regions in the southern Murray-Darling Basin in its 2021 Irrigation Efficiency and Practice Change Survey. This highlights a range of interesting comparisons between the Riverland and other growing regions²⁸.

Median water use for wine grape production across the southern basin varies significantly. Use is highest in the New South Wales Murray-Darling at 8 MI / Ha, followed by the Riverland at 7.1 MI / ha. This compares to 4.7 MI / ha in the Riverina. The lower level of usage in the Riverina is anticipated to have been driven by lower yields due to yield caps and lower planting densities. In regard to productivity of use, the Riverland ranks second at 3.5 tonnes / MI, behind the Riverina at 4.1 tonnes / MI.

²⁷ Skewes et al, 2022, Irrigation Benchmarking in the Murray-Darling Basin, unpublished

²⁸ Source – Australian Wine Research Institute, 2021, Irrigation Efficiency and Practice Change Survey

Other relevant findings from this study include:

- In 2019-20, all regions gave their vines their full water requirement. Where this was not the case, the decision was based on high water costs, low yields and low grape prices;
- 33% of growers in all regions have not upgraded any part of their irrigation system since it was installed, with over half of growers in the Riverland not upgrading since installation, even though 80% of these are over 10 years old;
- Most growers across all regions are satisfied with their irrigation system performance, although 20% of Riverland growers are unsatisfied;
- Only 76% of growers in the Riverland monitor their water use, compared to more than 90% in the New South Wales Murray-Darling, Victoria/Swan Hill and Riverina.

As a further assessment of the current levels of performance of Riverland grape growers, the AWRI Irrigation Best Practice Water Use Optimisation study (2022) notes that *'irrigation is an increasing cost for most Riverland wine grape growers and, in conjunction with poor irrigation practices, can threaten the financial viability and the social license of one of the region's major horticultural industries. Wine grape growers continue to make significant productivity improvements, although there is constant pressure to identify further efficiencies. At \$400 per ML and an average of 7.5 ML / ha applied in a typical season, irrigation can easily represent a third or more of production costs if purchased on the open market'*²⁹.

However, despite the importance of water efficiency to the overall costs of operation and productivity, the study identified that *'many irrigation systems across the Riverland winegrape industry may not be performing within the commonly accepted standards'*. In particular, variability in dripper output can result in some vines receiving less water than others, impacting on growth, yield and fruit quality.

Whilst the study also noted that most irrigation systems in the Riverland are well designed, issues exist in regard to the deterioration of system performance over time as a result of insufficient maintenance and an aging of the infrastructure.

In addition to water application efficiency on-farm, there may also be opportunities for water quality improvements in distribution infrastructure off-farm to achieve additional water savings. The Central Irrigation Trust have noted issues with bryozoa³⁰ forming in their networks and increased sedimentation during high flow events, which then requires significant filtration at farm-gate for removal prior to irrigation. This also requires significant backflushing of filtration systems to maintain effectiveness. The water used for backflushing is then left to evaporate. If the need for backflushing could be reduced, the water saved could be used for irrigation purposes.

²⁹ <https://www.awri.com.au/wp-content/uploads/2022/10/landscapes-sa-irrigation-best-practice-water-use-optimisation-final-report.pdf>

³⁰ Bryozoa is an aquatic invertebrate that is known to grow in irrigation systems and cause clogging, requiring filtration for removal

Summary of Key Points

The current status of water across the southern Murray-Darling Basin and wine grape production in the Riverland suggests that there are a range of critical challenges for the industry. Despite the historic investments made in improving the sustainability and profitability of wine grape irrigation in the region, such as SARMS, the industry is likely to be vulnerable over the coming years.

Whilst the overall entitlement flow to South Australia is nominally guaranteed through the Murray-Darling Basin Agreement and with the current water allocation plan establishing a number of mechanisms that will improve water security during dry periods, it is likely under future climate change scenarios that there will be years when less than 100% allocations against water entitlement will be available for irrigation in the region. This will require wine grape producers to compete in the temporary water allocation market against other regions and crops, or reduce water use, to maintain a level of viability.

Given the current depressed state of the wine grape market, the financial capacity of Riverland growers to compete as prices rise in drier years is limited compared to growers of other commodities. If they are unable to access water at an economic rate, they will need to reduce their water use or exit the industry. This challenge is greater for growers that do not hold adequate permanent water entitlements for their annual water needs.

Compounding this has been the rapid expansion of permanent crops across the southern basin. In future dry and extreme dry scenarios, there is insufficient water available at the volume needed for existing plantings, let alone for additional demands that will emerge as plantings come to maturity and as further primary production expansion occurs.

Delivery constraints in the southern basin also complicate the water access scenario for Riverland wine grape growers. As irrigation scheduling changes in response to shifting climatic conditions and demand for irrigation water delivery overlaps with environmental water delivery needs, there is an increasing risk for irrigators of not being able to access water they hold when needed. The actual level of risk for the Riverland is difficult to quantify.

The resumption of water buybacks under the Basin Plan, although with limited detail currently available around how this will be implemented, will likely place further pressure on the available water supply for irrigation use and the capacity of the river system to deliver water for different needs.

Alongside the declining grape price, the increasing cost and complexity of securing water and its delivery to the farm gate will likely result in growers leaving the industry. Riverland wine grape growers are more likely to be looking to retire over the next five years than those in other regions in the southern basin.

Wine grape producers also have the option of reducing water use in drier years to remain viability in the short-term and to survive until higher grape prices return, although there is no certainty that this will occur. That Riverland wine grape growers generally have higher levels of off-farm income than growers in other regions may assist in this regard.

There may be scope to develop alternative water sources for irrigation in the Riverland in response to future supply and cost pressures. The ability to capture water from high flow events and to store this water for future use through managed aquifer recharge may be an economic additional water source for irrigation in the Riverland. Groundwater is also a potentially prospective supplementary water source, if treatment and brine waste challenges can be addressed.

Water costs for wine grape irrigation are increasing and are now a significant proportion of variable cost structures. Efficiency of use continues to be important for ongoing grower profitability. Whilst Riverland wine grape irrigators are generally recognised as being highly efficient compared to other irrigation regions, recent benchmarking has highlighted a number of areas where irrigation efficiency could be further enhanced.

In addition, improving water quality in irrigation networks may also further increase water efficiency overall through a reduced need for the backflushing of filters.

5. Future Water Related Scenarios and Implications

This section outlines potential future water related scenarios and their anticipated impact on the future profitability and sustainability of the Riverland wine industry and wine grape production in the region.

Climate Scenarios and Water Availability in the Riverland

To provide an overarching perspective, the following water availability scenarios for the Riverland have been extrapolated from historical allocation calculations for this audit:

- An extreme wet year, equating to conditions experience in 2022-23;
- A wet year, equating to conditions experienced during 2011-12;
- An average year, equating to conditions experienced during 2016-17;
- A dry year, equating to conditions experience in 2019-20;
- An extreme dry year, equating to conditions experienced in 2008-09.

Table 2 outlines the potential allocations for Riverland irrigators under each scenario. It is likely that these are somewhat worst case scenarios, as factors such as access to carryover and the use of the Adelaide Desalination Plant for critical human water needs in drier periods have not been accounted for.

Table 2 – Future Climate and Water Scenarios for the Riverland

Scenario	Estimated Allocations Against Entitlement
Extreme wet year	100%
Wet year	100%
Average year	30/50% to 100%
Dry year	20% to 70%
Extreme dry year	0% to 20%

For the two wet scenarios, allocations will be set at 100% against entitlement at the start of the year, however, in the extreme wet scenario, significant unregulated flows will likely cause flooding and water quality issues for irrigators. These flows, however, could be a viable supplementary water source for Riverland irrigation.

In the average year scenario, allocations will likely start somewhere in the range of 30% and 50% at the beginning of the water year, but will reach 100% throughout the year.

In the dry and extreme dry scenarios, allocations will start low (0% in an extreme dry year) and will not reach 100% across the remainder of the year, potentially only reaching 20%, as was the case during the Millennium Drought.

Water Trade, Costs and Delivery Scenarios

All factors contributing to the cost of water for wine grape irrigation in the Riverland will likely continue to rise.

In regard to the water market, the Aither 2023-24 outlook highlights that³¹:

- Whilst major southern basin storages remain full, irrigators are expecting another year of low allocation prices. However, this may be tempered by a dry weather forecast, which may place upward pressure on prices at the back end of the season;
- In regard to temporary allocations, if the current El Niño forecast eventuates in early August 2023, allocation prices could remain steady or increase, with the state of play at the end of the water year in 2024 depend on the draw down from storages and the forward climate outlook;
- For the temporary allocation market, downstream trade will likely remain limited, with trade into NSW remaining restricted due to the risk of storages spilling. Water demand for annual crops in the Murrumbidgee could have an impact, with a dry summer potentially seeing higher allocation prices in the Murrumbidgee than across the rest of the lower Murray system;
- On water entitlements, a potential Commonwealth Government buyback could drive an increase in entitlement prices, but there will be a degree of short-term uncertainty due to rising interest rates and soft demand, meaning that the long-term outlook is very uncertain. Access to carryover will continue to be an important risk management tool and high demand will continue to drive upward pressures on prices for low reliability entitlements, but the market may have peaked.

It is generally anticipated that the cost of water products will start to rise again in line with historic trends, with drier conditions forecast for future years. It is likely that the price of temporary allocations will be in the range of \$500 / ML to \$1,000 / ML during average and dry years and in excess of \$1,000 / ML in extreme dry years. Although, actual prices are difficult to estimate and will be determined by the market behaviour of water holders and the capacity of growers to pay, which in turn is heavily influenced by commodity prices.

If new irrigation development continues to expand across the southern basin, the potential price of temporary allocations may increase further as the demand and supply balance additionally deteriorates.

The resumption of water buybacks by the Australian Government may also impact on the actual prices of water allocations and entitlements on the market, but at this stage there is no detail on how buybacks will be structured, as well as the extent to which they will be used for water recovery against other on and off-farm efficiency projects.

In regard to electricity costs, it is widely anticipated that prices will continue to rise as renewable energy capacity continues to be developed and added to the grid. There is hence

³¹ <https://aither.com.au/wp-content/uploads/2023/08/2022-23-Water-Markets-Report.pdf>

no expected reduction in this element of the cost structure for Riverland wine grape growers at least for the next three to five years.

On the issue of delivery constraints, it is difficult to predict what impact this will have on Riverland wine grape growers, particularly in the medium term. It is, however, a risk that should be continually reviewed and assessed.

Potential Policy Reforms

With the recent announcement by the Minister for the Environment and Water on an extension to the timeframes for the delivery of the Murray-Darling Basin Plan, including the resumption of buy backs and additional funding for on-farm irrigation efficiency improvements, there are a range of potential scenarios for the Riverland wine industry.

The resumption of water buybacks will likely lead to additional upward pressures on the market prices of both permanent entitlements and temporary allocations due to the removal of further water from consumptive use and the transfer of these water rights to the Commonwealth Environmental Water Holder.

Water sold through this mechanism from the Riverland will never be returned to production.

There is potential for a loss of water in primary production in the Riverland to be offset through the commitment by the Australian Government to fund new options to recover water, with this likely to mean that financial support will be available for on-farm water efficiency improvement. The extent to which this would deliver a financially viable wine grape production industry in the Riverland into the future is difficult to assess. Given that SARMS did not enable a sustainable and secure industry, further investments in irrigation improvement may not be enough to secure a viable future for the sector in the region, unless they enable a step change in industry performance, such as through undercover cropping.

The parallel commitment of the government to support communities to adjust to situations where *'voluntary water purchasing has flow-on impacts'*, could provide an opportunity to support a structured transition in wine grape production in the Riverland. In this instance, funding could theoretically be used to enable:

- A staged exit of growers from the industry and the transfer of water from consumptive use to the Commonwealth Environmental Water Holder over time;
- Effective management of farm blocks out of production in a way that minimises future risks around pests, disease and fire and without impacting on the cost structure of irrigation trusts for remaining growers;
- A diversification in the Riverland economy overall and a transition of primary production into more profitable market segments over time.

The irrigation trusts have strongly indicated through this audit that the removal of land from productive use is not desirable and will have significant implications for their future operational viability.

Potential Implications for the Riverland Wine Industry

The scenarios explored above suggest an uncertain water environment for the Riverland wine industry, particularly in the short-term. Without an increase in the price paid for wine grapes, the financial capacity of growers to adapt is compromised.

Ruralco Water³² has forecast that future irrigation seasons under dry conditions will see irrigators across the southern basin:

- Start the water year using opening allocations and carryover, if available (July to September);
- Starting to notice an emerging shortfall between September and November (particularly in Victoria and South Australia), with them then seeking to purchase temporary water allocations;
- Experiencing significant competition from other permanent plantings for temporary allocations, raising the price above \$1,000 / ML during extreme dry periods;
- Start to abandon or mothball their plantings based on crop type and their financial position (between December and January).

For Riverland wine grape producers, the cost of temporary allocations being higher than \$400 / ML into the future will see growers needing to make a decision about the viability of remaining in the industry, either retiring from primary production overall or diversifying their crop types. Riverland wine grape irrigators have been estimated to be more likely to retire over the next five years than those in other growing regions of the Murray-Darling Basin.

Where wine grape producers leave the industry, their water entitlements will likely be sold, either to the Federal Government, or on the open market. In both situations, this will see either water rights move out of the Riverland (given the development and investment interstate) or from primary production altogether. However, there is potential for water to be traded back in to the Riverland in time, if the profitability of remaining irrigators improves.

With likely higher than market prices for permanent entitlements offered for government buybacks, there may be an additional short-term incentive for growers to leave the industry to capitalise on their existing water assets. The extent to which growers will leave wine grape production in the Riverland as a direct result of this is, however, difficult to quantify.

For those remaining in the industry, even in a temporary capacity to test if grape prices will start to recover, operational costs associated with irrigation will continue to rise both on and off-farm. Energy costs in particular will have a significant impact on profitability. In addition, the irrigation trusts may become uneconomic to operate over time as the costs are borne by fewer growers.

³² Source – Ruralco Water, 2023, Peter Duggin Presentation Slides

There may, however, be scope for some growers to remain profitable through improvements in irrigation practices and water use efficiency, or remain in primary production in other commodities.

A reduction in economic activity will have flow on implications to both downstream and upstream businesses in the wine production value-chain, which could be a disincentive for continued wine production in the Riverland.

From the analysis conducted and the various information sourced for this water audit, it would appear inevitable that a convergence of issues facing the industry will see it contract over the next decade. The degree of this contraction and the economic cost associated with it is difficult to quantify given the complexity and uncertainty of how the industry will respond.

6. Industry and Stakeholder Perspectives on Water and the Future of the Industry

To complement the extensive range of existing data and analysis that is already available in regard to water and the wine sector, there is significant additional anecdotal information which is important to collate and assess as part of this strategic water audit.

To capture this, a number of stakeholder interviews were conducted with strategic contacts relevant to the future of water in the Riverland and the growth of the wine industry. In addition, a survey of Riverland Wine growers was also distributed.

The results from the interviews and survey are presented below.

Stakeholder Interviews

A number of standard questions were used to interview key industry and regional stakeholders, with these undertaken with:

- Peter Duggin, Private Client Relationship Manager, Ruralco Water;
- Brenton Fenwick, Sustainable Irrigation Officer, Murraylands and Riverland Landscape Board;
- Rosalie Auricht, CEO, Renmark Irrigation Trust;
- Amy Goodman, Water Manager, Central Irrigation Trust;
- Paul Petrie, Principal Scientist and Program Manager, Irrigated Crops, South Australian Research and Development Institute;
- Ben Fee, CEO, Regional Development Australia, Murraylands and Riverland.

Question 1: The irrigation sector and the wine industry in the Riverland have faced a range of different water challenges over the previous decades, including the Millenium Drought, and has responded in different ways to maintain viability and profitability. Are there any key lessons from the previous efforts of the wine industry in regard to these that may be useful to consider in the blueprint?

All respondents indicated that the wine industry in the Riverland had adapted well to past challenges, particularly the Millenium Drought, but there was diminished capacity now in the sector to maintain viability during another dry weather scenario.

Riverland wine grape irrigators are highly efficient and have benefited from the adoption and localised development of various irrigation technologies. The ability to invest in such technologies and improved production practices has been possible in the past due to historically high grape prices and the availability of government assistance programs.

The importance of coordination and collaboration across the region was noted as being important for responding effectively to future severe dry periods. The importance of community leaders assisting in such coordination was raised in this regard. The role of the irrigation trusts in providing water related information to growers was also raised in this context.

The Small Block Irrigators Exit Grant Package and the use of deficit irrigation during the Millennium drought were noted as having had a range of negative impacts on the industry. With properties removed from production in an ad hoc manner through the exit grant, increased risks were experienced in the form of pests, disease and fire where these blocks were not managed or rehabilitated in some form. Also, there were broader psychological impacts associated with growers exiting the industry, with some seeing themselves as 'failures'.

In situations where growers were able to survive the drought through lower levels of water use, delays were experienced when water was subsequently available in bringing crops back into production. It was generally recognised that this would not be a preferred strategy for grape growers during a next dry period.

The water market was noted as being important for maintaining permanent plantings during the drought, but growers' limited relative knowledge of the water market at that time did see some pay higher prices for temporary allocations than they should have.

Another matter raised was the reliance of irrigators in the Riverland on government support programs and ad hoc grants to adjust to various negative scenarios in the past. It was noted that, despite the significant investment made to improve irrigation practices in the region, at this point wine grape production is not sufficiently resilient to survive future low water availability scenarios.

Question 2: What is different about the water environment and the wine sector in the Riverland now compared to when previous challenges have arisen?

The most significant matters raised in response to this question were the related issues of lower permanent water holdings by Riverland irrigators and an increase in permanent plantings across the southern basin.

It was suggested that a relatively significant proportion of Riverland wine grape growers have gradually sold part or all of their permanent water entitlements and now rely on temporary allocations to adequately irrigate their vineyards. As permanent plantings have increased across the whole of the southern Murray-Darling Basin over the last decade, there has been an associated reduction in water available for trade during dry periods. It was noted that this means that temporary allocation prices are likely to be higher during a next dry period than that historically, as demand will extend beyond the available supply.

Anecdotally, it was suggested that this imbalance is a result of much of the upstream development being driven by bigger corporate operations, who are unlikely to have financial incentives to trade water in the short-term as their crops mature. There was a general consensus that, if growers haven't secured water for the year(s) ahead, they will struggle to compete for water on the temporary market, particularly also given that wine grape prices are unlikely to rebound significantly in the near future.

Another related point raised was the higher level of debt held by growers now and a decrease in the availability of finance, as well as limited cashflows, to invest in water purchase.

The further development of the water market and the products available were also highlighted as a significant difference now than compared to the past. However, whilst some growers are aware of market based options for water security, there was a common view that many are not across the market sufficiently to make timely decisions on water trade options for future business viability, particularly in a more competitive marketplace.

It was also noted that the Riverland wine industry is still too fragmented overall and that it will likely remain a price taker.

Other matters raised regarding differences with the past included:

- A lower relative value of land versus water assets;
- Higher water access and use costs;
- Smaller average land-holdings and the part time nature of wine grape production;
- Water related pinch points occurring earlier in the growing season due to climate change;
- Rice and cotton growers being likely to commit to production in the next water year off the back of recent high flows, reducing the likelihood that their temporary allocations will be released into the trade market;
- A higher average age of growers in the Riverland, impacting on their capacity to manage through a future dry period and potentially meaning that they are now more likely to leave the industry and sell their water entitlements.

Question 3: What does this mean for the capacity and capability of the industry to respond to future water issues in the region?

Overall, the capacity of the wine industry to respond to future water related shocks was considered to be less than what it has been historically, due to a combination of the following:

- Lower wine grape prices and a global oversupply of red wine;
- Lower financial capacity (cashflow) and a lower risk appetite from financial institutions to loan to the sector, particularly for short-term water purchase;
- The older age profile of growers;
- Water not being a core part of growers' business and succession planning;
- Lower water availability across the whole of the southern Murray-Darling Basin due to the expansion of permanent plantings;
- No overarching policy to manage new irrigation developments;
- Marginal scope for more water efficiency as against the levels of productivity required to remain viable;
- Less annual flexibility in grape production compared to other crops.

It was generally agreed that Riverland wine grape growers are under the most pressure in regard to future profitability than those in other regions and those irrigating other crops across the Murray-Darling Basin.

Question 4: What are the potential future water scenarios in the Riverland and the Murray-Darling Basin more generally that are likely to have greatest implications for the future viability of the wine sector?

It was commonly agreed that a future dry period is likely to place significant financial pressure on wine grape growers, particularly those in the Riverland that do not currently have sufficient permanent water entitlements for their annual irrigation needs. Growers are unlikely to be able to compete and pay the market price for temporary allocations, compared to larger corporate operations and those growing other crops. This will likely see some growers exiting the industry, with others potentially trying to maintain plantings until grape prices recover, which is unlikely in the short-term.

There was a consensus that even a mild drought will have a significant impact on wine grape growers in the Riverland given the range of factors involved, particularly the growth of permanent plantings across the southern basin.

The resumption of water buybacks by the Australian Government will likely place additional upward pressure on water entitlements and allocations, due to the reduction in the volumes of water available for primary production. It was anecdotally suggested larger water holders would not release water into the market in a dry period as they seek to maintain their overall asset profile.

It was noted that the Riverland does have a competitive advantage against other wine grape growing regions in the Murray-Darling Basin (lower incidences of pests and disease) and there is potential scope for further water use efficiencies to be adopted, but without a sufficient improvement in the price for wine grapes, the long-term viability of grape production remains uncertain.

It was also suggested that, whilst there is scope for growers to diversify their income, including through alternative plantings, the financial capacity to do so is limited.

A reduction in the proportion of land in primary production due to people exiting the industry was noted as having a residual impact on remaining growers and therefore not being a desirable outcome. For irrigation trusts, this will mean that the costs of water supply will be borne by a smaller number of customers, whilst unkept retired blocks will increase the risk of pests and disease.

Under all potential future scenarios, it was generally agreed that a business as usual approach would not be sustainable.

Question 5: The wine grape growing sector will need to compete with other irrigated crops for water. What are the likely scenarios for wine grape growers when dryer conditions return across the basin?

It was commonly agreed that wine grape growers in the Riverland would not be able to compete against other water users in the purchase of temporary allocations and that this would result in additional incentives for growers to leave the industry in the short and medium-term. This was due mainly to other crops types being more viable than wine grapes at this point in time.

It was noted that there will be less water available for primary production the further downstream from the Barmah Choke and that this may mean that the greatest volumes of water in the Riverland in future years will be environmental water.

There was a general concern about permanent water rights leaving the region over the next decade and not returning for primary production.

Question 6: What practical measures could be adopted or developed further to translate water from being a potential constraint to wine industry growth to it being an enabler of improved productivity, profitability and resilience for the sector?

A range of potential measures were identified by respondents to this question of what can be done. These included:

- Establishing a water bank for primary production in the Riverland, purchased from growers exiting the industry and selling their water entitlements. This could be enabled through the South Australian Government, as the purchase of water by the public sector is not regulated by the Australian Competition and Consumer Commission;
- Actively facilitating a structured departure from wine grape production across growers, with the potential transfer of water assets to the trusts and other local productive uses;
- Incentives for further increases in water use efficiency by growers;
- Reviewing zoning and development policy for the region to reduce planning related barriers to farm consolidation and to enable alternative productive land use where possible;
- Reviewing regulations applying to irrigation trusts to enable them to directly buy water and facilitate trade between their customers;
- Diversifying cropping in the region, including towards niche wine grape varieties and those more suited to a Mediterranean climate, as well as into other commodities with more stable market futures;
- Providing incentives for private investment in undercover cropping;
- Establishing improved communication channels between wineries and growers;
- Strategic investment in the wine value-chain to open up current bottlenecks with grape transport and processing;

- Providing short-term access arrangements to water when sold to government for the environment, to allow for a staged exit from the industry and to minimise negative impacts on the rest of the Riverland economy;
- Improving business practices by growers, including through training and decision making tools;
- Investing in more efficient water treatment technologies to enable use of marginal water sources (groundwater);
- Using managed aquifer recharge for water banking (such as in periods of unregulated flows) and to provide storage across distribution networks to reduce costs of operation;
- Investing in targeted energy infrastructure, including the recovery of energy from irrigation trust networks, to reduce the cost of water access and to establish energy supplies for new economic development opportunities;
- Providing extension services for growers in business development, management and innovation.

Question 7: Are there specific areas of research or innovation you think the Riverland wine sector should develop and uptake to help improve access to and use of irrigation water?

In the innovation space, the following areas were noted as potential priorities by those interviewed:

- Treatment methods to improve water quality through distribution networks (particularly addressing sediment and bryozoa) to reduce the need for filter flushing and associated water loss at farm gate;
- Irrigation techniques to improving the quality of grapes produced;
- Ag-tech enablers for improved overall farm productivity;
- Psychological barriers to change and adoption of new practices/technologies in the sector;
- Alternative business management practices and tools for wine grape production;
- Pathways for policy and regulation to drive new innovation;
- Crop surveys for managing the approval of new planting;
- Alternative grape varieties.

Question 8: Do you have any further thoughts on key water risks and opportunities that have not been covered in the previous questions?

Other issues raised in response to this question included:

- Water entitlements that are sold out of the region will not likely come back in the short-term, particularly those sold to the government and larger commercial operations;
- Irrigation trusts need land to be maintained in productive use and water assets being available to underpin their viability to continue to supply growers in a cost effective manner;

- There is a general need for growers to be more strategic about how water is used from a business and profitability perspective;
- It is important for various organisations in the region to listen more to people in the industry to secure their engagement in the transition to a sustainable future.

Grower Survey

During September 2023, a water specific survey of Riverland Wine grape growers was undertaken through the AWRI. Survey questions were developed with input from AWRI, Evidn, Purple Giraffe, CCW Cooperative, the Riverland Wine Industry Blueprint Steering Committee and the Blueprint Water Sub-committee.

84 responses to the water survey were received from growers, with a summary of these for each question posed provided below.

Question 1: Do you own sufficient permanent water entitlements to irrigate your entire vineyard?

Yes: 59.5% No: 40.5% Don't Know: 0%

Question 2: Do you own more permanent water entitlements than you need to irrigate your entire vineyard?

Yes: 38.1% No: 61.9% Don't Know: 0%

Question 3: Is the current market value of your permanent water entitlement higher than the current market value of your land and vineyard?

Yes: 48.8% No: 32.1% Don't Know: 19%

Question 4: Do you lease water from the water market when your permanent water entitlement is not sufficient to irrigate your entire vineyard?

Yes: 70.2% No: 29.8% Don't Know: 0%

Question 5: Do you understand how the water market works?

Yes: 86.9% No: 13.1% Don't Know: 0%

Question 6: Do you feel confident using the water market to lease water for your vineyard?

Yes: 78.6% No: 21.4% Don't Know: 0%

Question 7: What proportion of your total grape production costs is irrigation water?

Between 0% and 49%:	59.5%
Between 50% and 100%:	17.9%
More than 100%:	4.8%
Don't Know:	13.1%
N/A:	4.8%

Question 8: Would you consider selling some of your permanent water entitlement to re-invest in your property and use leased water in the future?

Yes: 22.6% No: 77.4%

Question 9: Would you consider selling your vineyard and keeping the permanent water entitlement to fund your retirement or to start or purchase another business?

Yes: 53.4% No: 47.6%

Question 10: Can you rate the following issues in regards to water access and use in the Riverland in terms of the potential impact on your business? (scale of 1 to 10)

Water buybacks:	average rating 6.9
Delivery constraints:	average rating 6.6
Cost fluctuations:	average rating 7.2
Efficiency of use:	average rating 6.6
Additional water recovery/efficiency targets:	average rating 5.9
Climate variability:	average rating 6.4
Scope for further water use efficiency:	average rating 3.4
Uncertainty of annual allocations against entitlement:	average rating 7.3

Question 11: Are there any other offsets that you could use in your business to manage a decrease in water access in future years? What are they?

Yes: 21% No: 46% Don't know: 32%

Nothing more can be done:	24%
Remove vines:	33%

The results of the survey align with the other analysis conducted for this water audit.
Noteworthy observations include:

- A more significant proportion of growers do not hold sufficient water entitlements than was estimated though anecdotal evidence presented by the irrigation trusts (40.5% compared to 23%);
- A reasonable proportion of growers have more permanent water entitlement than their annual irrigation needs (38.1%), with this being a potentially significant un-utilised water source for the Riverland economy;

- The water market is a key mechanism for providing access to additional water for irrigation (70.2% of growers access temporary allocations to address any shortfall), with most growers understanding how the market operates (86.9%) and a majority feeling comfortable operating in the water market (78.6%);
- Irrigation water costs are most likely to be in 0% to 50% proportion of overall operating costs;
- Most growers are unlikely to sell water to raise capital to invest in their business (77.4%), with around half willing to sell their vineyards yet maintain their water entitlements (53.4%);
- The most significant water related issues for growers are water buybacks, cost fluctuations and uncertainty around future allocations;
- Most growers either do not believe or do not know if there is anything that they can do to offset water insecurity in future years (78%), with the removal of vines being the most relevant option reported.

7. Findings and Recommendations for Action

Drawing on a range of existing information and data, supplemented by one on one interviews with industry stakeholders and a survey of Riverland Wine grape producers, this audit has confirmed that:

The cost of water delivery and pumping for wine grape production has more than tripled over the last 25 years, whilst returns from irrigation have declined by around 36%.

A significant proportion (more than 40%) of wine grape producers in the Riverland do not hold sufficient permanent water entitlements to meet their annual irrigation needs.

Despite South Australia's annual water entitlement for the River Murray still being guaranteed at 1,850 GI, it is extremely likely that years of less than 100% allocation against entitlement will be experienced in the future, potentially being around 60% a year on average by the end of the decade.

There has been a significant expansion of permanent plantings over the last decade in the Murray-Darling Basin below the Barmah Choke and it is now likely that, in future extreme dry periods, there will be insufficient water available to meet the irrigation requirements of all permanent crops, with the short-fall estimated at being somewhere between 25% to 60% of the water required.

The near term resumption of water buybacks from willing sellers across the Murray-Darling Basin by the Australian Government will see more water removed from primary production and further exacerbate this demand and supply imbalance in the southern basin.

There will be increased competition for temporary water entitlements in future dry years, with analysis suggesting that this will mean the price of entitlements will rise to over \$1,000 / MI, which is beyond the estimated financial capacity of Riverland wine grape producers to pay (\$400-\$500 / MI).

If Riverland wine grape producers are unable to purchase temporary water entitlements to meet their annual irrigation needs, growers will need to make decisions to either leave the industry, diversify their operations into other crops or business activities, or reduce production.

Riverland wine grape growers are more likely than those in other regions to be planning to exit the industry over the next five years, with potentially between 20% to 30% of producers leaving and selling their water entitlements to larger growers (most likely interstate) or the Australian Government over the coming period.

A consolidation of the industry and the sale of permanent water entitlements out of the Riverland will have flow-on impacts to viability of remaining growers, other irrigators, irrigation trusts and the regional economy.

A coordinated response to these various water challenges is required, alongside other actions relevant to the industry's future, to enable it to transition to a more viable and sustainable state.

Recommendations for Action

A number of priority recommendations for action have emerged from this water audit which should be taken forward through the Riverland Wine Industry Blueprint. These are:

Recommendation 1: Design and implement a water bank to purchase and hold permanent water entitlements sold on the open market by Riverland growers for future local primary production and to enable a staged transfer of water entitlements sold to the Australian Government out of the region over a number of years to provide time for remaining irrigators and the economy to adapt and diversify.

Recommendation 2: Proactively engage with the Australian and South Australian governments to co-design a strategic approach to water buybacks from Riverland growers and for an expanded use of different and more flexible market models for environmental water recovery, such as two-way temporary allocation transfers.

Recommendation 3: Design and implement targeted assistance and research programs to enable Riverland wine grape producers to make step changes in water use efficiency and productivity, transition into new production methods, alternative commodities and other business prospects and to develop new sustainable irrigation water supplies for the region. This could include:

- Financial incentives and brokerage support for new irrigation and production technologies and methods;
- Research into options for the treatment and use of groundwater for irrigation activity, opportunistic harvesting of future flood events and the use of managed aquifer recharge for storage and expanding the capture and utilisation of wastewater and stormwater in irrigation networks;
- Financial incentives for investment in new cost effective and renewable energy generation in the Riverland, including the capture of energy from trust networks, to reduce the cost of water access/use and to provide an energy source for economic diversification;
- Develop and implement training packages and other tools to improve the capacity of growers in the Riverland to manage water more effectively as a business asset.

Other recommendations for action arising from the strategic water audit that could also be considered in the blueprint include:

- Develop a suite of initial information products to enable improved water business decision making by wine grape growers in the coming water year;
- Establish a formal mechanism to enable better two-way and regular communication between growers and wine producers on future market pressures and prices;
- Establish a mechanism to coordinate the required restructuring of the wine industry across all industry players and other water using sectors in the Riverland, similar to a coordinator general type role used in bushfire recovery;
- Establish a support program to manage the retirement of land from production to minimise the immediate risks of disease, pests and fire;
- Assess zoning and land-use policies to identify and remove barriers to industry consolidation and the transition of land into other productive uses where possible;
- Improve the monitoring of new irrigation developments in the southern Murray-Darling Basin and ensure that approval processes assess the impact of these on incumbent growers;
- Research potential treatment methods and systems for irrigation networks to address filtration issues at the farm-gate caused by bryozoa and sediments and reduce the need for backflushing and associated water loss.



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