

LIVESTOCK WATER ISSUES: CONSULTATION REPORT

PIRSA

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1. Executive Summary

The Livestock sector in South Australia is a significant contributor to agricultural production and exports. Overall, in 2015-16 South Australian livestock industries (excluding dairy) contributed approximately \$4.8 billion to state revenue (PIRSA Food and Wine Scorecard, 2016-17). The demand boom for Australian agricultural products is being driven by Asia's rapidly growing middle class, who are seeking clean, healthy, high quality food imports.

In this context the limitations on production due to the availability of water has been an issue for some production regions over a long period. In response to specific concerns raised at the Livestock SA AGM in August 2017, Primary Industries and Regions SA (PIRSA) together with Livestock SA (LSA), industry members and the Department of Environment, Water and Natural Resources (DEWNR) undertook a survey and workshops to identify the sector's stock water issues across the State.

There were over 300 responses to the on-line survey, equivalent to slightly less than 10% of the total Livestock SA membership. Putting the response rate and analysis in context a number of factors should be considered: Timing – hay making was in progress in a number of areas over the survey period; stock prices were reasonably high and the industry buoyant; the small, state-wide survey sample was 'self-selecting' i.e. not a randomised sample.

The price of water was identified as an issue in all regions, noting that the Regional Development Australia (RDA) areas are large and diverse e.g. issues across the 'Adelaide Hills, Fleurieu and Kangaroo Island' RDA region are very diverse. The same is true of the 'Riverland & Murraylands' RDA region which includes the Lower Lakes and Coorong.

While expressing concern regarding the cost of water, 72% of those who responded to the survey estimated water costs were less than 10% of their overall business costs. Furthermore 60% predicted there would be less than a 5% reduction in their profit over the next 5 years if there are no changes to water related issues. The survey also revealed that less than 40% of respondents had current, documented business plans.

In addition to water supply issues and impacts, the survey also revealed that respondents were already exploring and using a range of approaches to improve their own water security. These included stock management changes (reducing numbers, agistment, change of stock species – cattle to sheep); improved on-farm water management (additional infrastructure, leak detection); and innovative options to augment existing or access alternative water sources (private pipeline from the Lower Lakes, micro-desalination of groundwater, lined catchments, aquifer storage and recovery).

Earlier work conducted on behalf of the Coorong District Council (2017 Feasibility Study for the Coorong Water Transportation scheme) was considered by the project team. In addition to alternative water supply options, it also suggested access to low-interest loans as a way to assist landholders to fund their water supply augmentation. From a broader perspective it noted:

"Whilst increasingly water and energy security are important regionally and at farm level it is questionable if water security and in particular water pricing alone influence the growth potential of red meat production. As stated by the Project Group, feed availability is still perhaps the greatest limiting factor and this is seasonal in nature."

In this regard PIRSA is already supporting industry through its Premium Food and Wine Co-Innovation Cluster program to improve business productivity across the livestock value chain.

PIRSA has agreed with LSA to continue working with industry to validate and refine issues, determine gaps in information or technology and explore opportunities, through PIRSA programs and industry research funding for future work if required.

2. Background

The Livestock sector in South Australia is a significant contributor to agricultural production and exports. In 2016-17 South Australia produced 107,000 tonnes of beef from its 4,100 beef producers, with a farm gate value of \$605 million. South Australia has around 11 million sheep, which is about 15% of the national sheep flock. Growing demand for Australian lamb from the United States, Europe and Asia has seen the proportion of lamb production exported increase substantially in recent years. Overall, in 2015-16 South Australian livestock industries (excluding dairy) contributed approximately \$4.8 billion to state revenue (PIRSA Food and Wine Scorecard, 2016-17).

Global food demand is estimated to increase anywhere between 59% and 98% by 2050¹. This demand equates to an estimated \$1.7 trillion in agricultural export opportunities, transforming the global food industry. China will drive the growth in global demand for food, accounting for 43% of the total increase. India will account for 13% of growth. The demand boom for Australian agricultural products is being driven by Asia's rapidly growing middle class, who are seeking clean, healthy, high quality food imports.

In this context the limitations on production due to the availability of water, in sufficient volume and quality has been an issue for some production regions over a long period. In response, the South Australian government and producers have made investments in both public and private infrastructure to enhance supply and quality. However, in instances where the enhanced water supply is part of the SA Water state-wide network there have been price increases which have led some in the industry to question the financial viability of these sources for agricultural production.

At the August 2017 Growing SA Conference the Livestock SA AGM passed a motion:

- *That Livestock SA adopt Water Security for Livestock Production as an immediate state-wide producer priority.*
- *Advocate for water security as a state-wide objective for livestock producers, which will deliver a sustainable and equitable price, improved resilience and long-term viability to the South Australian livestock industry.*
- *Engage with State and Federal Governments to provide assistance to livestock producers to invest in water infrastructure.*
- *Promote and encourage competition in the water delivery market in South Australia.*
- *Support SA livestock producers to become independent from the SA Water supply.*

In response, Primary Industries and Regions SA (PIRSA) has partnered with Livestock SA (LSA), industry members and the Department of Environment, Water and Natural Resources (DEWNR) in a project, 'Identifying Water Issues Impacting South Australian Livestock Industries'.

The main activity has been to survey and collate the sector's stock water issues across the State. This has provided an avenue for primary producers and stakeholder groups to document their stock water issues and identify opportunities for fit-for-purpose and sustainable water supplies to support development of their livestock businesses.

The survey outputs detailed in this report can be used to identify priorities for future action. Some issues or actions may potentially be dealt with easily and quickly; other issues may need further investigation and discussion to be resolved; finally, there may be matters that cannot be resolved satisfactorily.

¹ H. Valin et al, (2014), "The Future of Food Demand: Understanding Differences in Global Economic Models", *Agricultural Economics*: 45, 1: 51-67.

3. Introduction

The aim of the 'Livestock Water Issues Project' was to identify water issues impeding the development of the South Australian beef cattle, dairy and sheep sector.

The Project Team, consisting of LSA, Industry members, DEWNR and PIRSA, undertook the work in three stages:

1. Design the investigation methodology.

The project team developed an instrument in Survey Monkey to gather information on industry participants, business activities, water issues, responses to issues and the local water management regime (Attachment 1). In addition, regional focus groups were planned for the Eyre Peninsula, Mid-North and Upper South East.

2. Collate the Responses.

Based on early returns from the survey a spreadsheet was developed to collate the raw survey results, in various combinations, to allow analysis by regions, water sources and issues.

3. Report the Survey Results.

Final responses were analysed to determine the industry characteristics of respondents; relative priorities of issues state-wide; regional priorities; and issues related to specific water resources.

3.1 The Survey

The 'Livestock Water Issues Survey' went live on Tuesday 17 October 2017 and closed Friday 10 November 2017 (Appendix 1). LSA promoted the survey through their networks as did PIRSA and DEWNR. There was good coverage in the rural and regional press.

In total there were 313 responses on Survey Monkey which is slightly less than 10% of the total Livestock SA membership. 218 responses were 'complete' in the sense that they provided regional identification and at least responses to the questions about water issues. Of the remainder (96), 87 respondents did not answer the questions related to water issues (Q's 5, 14 & 15) and 9 respondents provide only their location and role in the industry (Q's 1 & 2).

Putting the response rate and analysis in context a number of factors should be considered:

- Timing – hay making was in progress in a number of areas over the survey period;
- Stock prices were reasonably high at the time and the industry correspondingly buoyant;
- The survey sample is small and covers the whole state; and
- The survey sample was 'self-selecting' as opposed to a randomised sample i.e. those with water security problems were most likely to be interested in the issue and to respond.

3.2 Focus Groups

Livestock SA arranged an industry focus group meeting on 8 November 2017 at Eudunda which was attended by 12 local producers and facilitated by PIRSA (Appendix 2). Meetings at Coonalpyn and Cummins were postponed due to difficulties in bringing people together in a suitable timeframe.

The 2017 report prepared by Seed Consulting Services for the Coorong District Council, is referenced, with permission, in this report (section 4.2, p27) as it contains similar material to that which would likely to have been elicited from the proposed Coonalpyn focus group meeting.

A 'Survey Outcomes' workshop was conducted with LSA, industry and agency members in Adelaide on 22 November 2017. The group reviewed the analysis to date, provided a constructive critique and listed potential response options for each of the eight regions. This is also included in the draft report (Appendix 3) and summarised in Table 1.

4. Survey Results

Figure 1, shows the spread of respondents across the State based on Regional Development Australia (RDA) areas.

The 'Issues' percentage in each region indicates the total number of issues raised in a region by respondents (Question 5 - multiple responses per respondent) in relation to the total number of issues raised across all regions in South Australia. The result is thus affected by the number of respondents in a region and the number of issues each of those nominated.

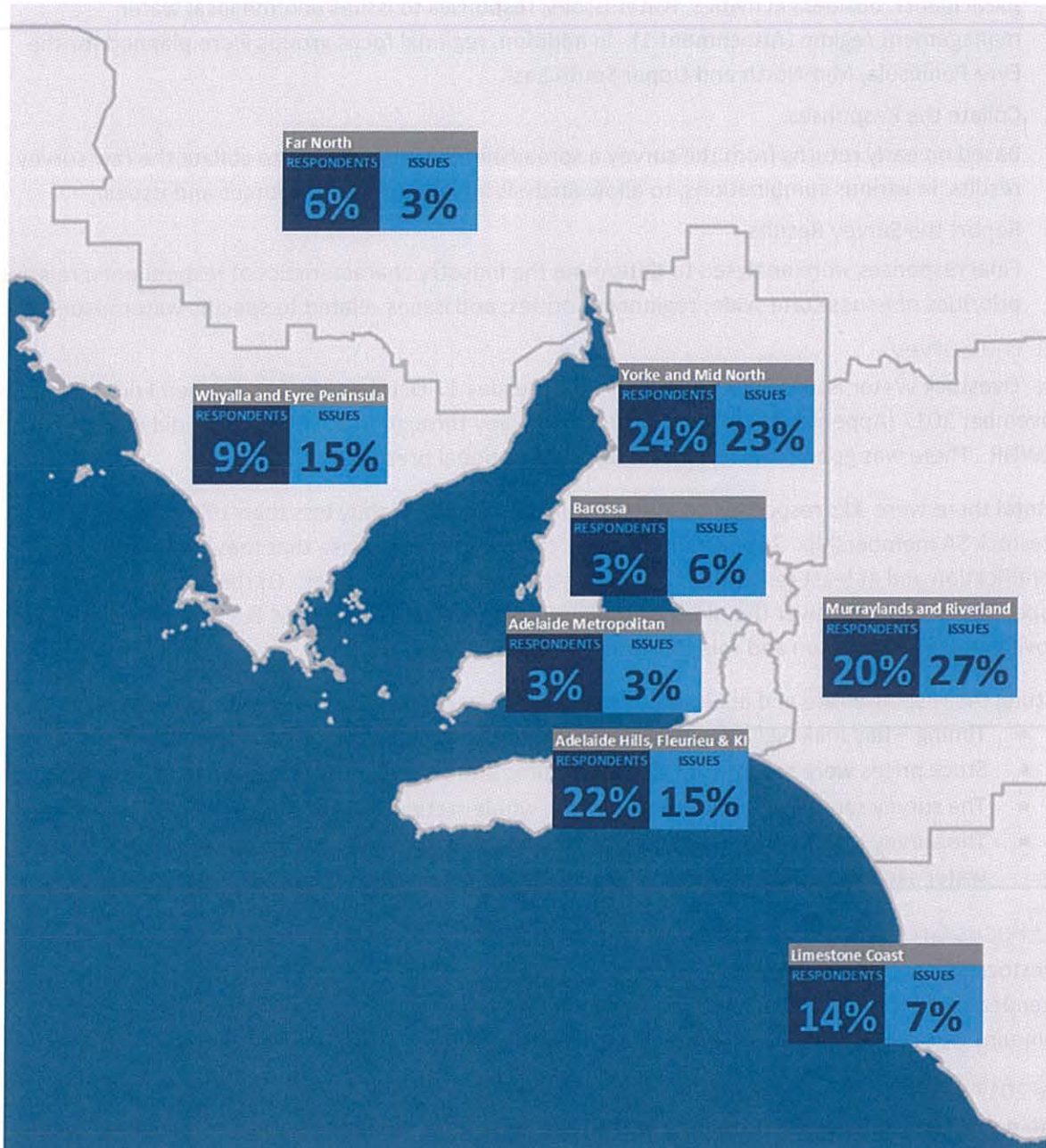


Figure 1. A regional breakdown of the percentage of respondents and issues raised in each region

4.1 Who Are the Respondents?

Q 20: Are you a Livestock SA member?

98 respondents indicated that they are a Livestock SA Member. 17 indicated that they were not and 198 respondents did not answer this question.

Q 2: Please describe your role in the industry

97.4% of the 313² respondents indicated that their role in the industry was as a primary producer. The remaining 2.6% were either a service provider/advisor, community group or other (small hobby farmers/landholders).

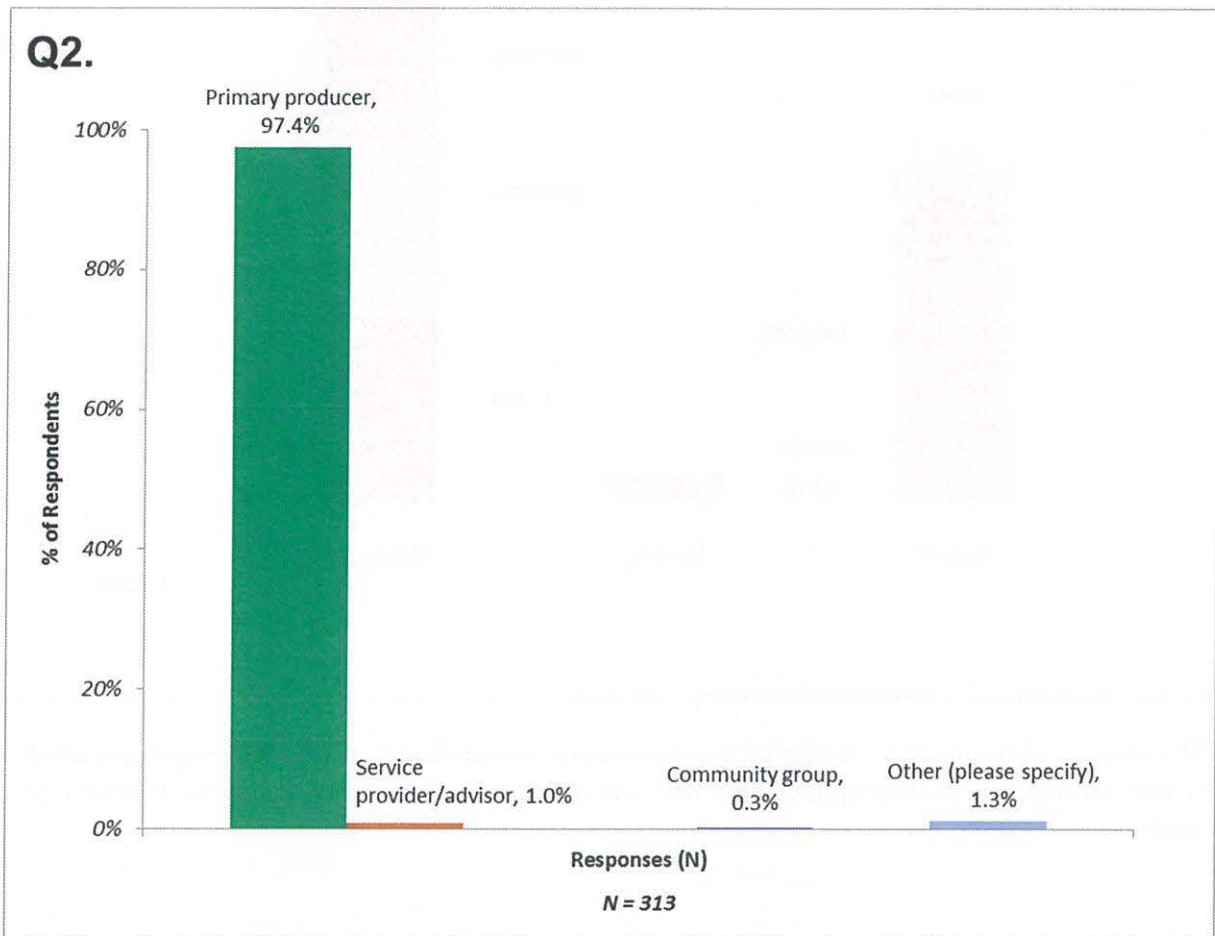


Figure 2. Respondents' role within the industry

² Some respondents chose to not answer every question provided in the survey. The *N* value (as displayed on each chart) is equal to the number of responses received (and not the number of respondents) for a particular question. In the case of multiple choice questions, *N* may be greater than the total number of respondents for the entire survey (313) as each respondent was able to give multiple responses to the question. However, in questions that only permit one answer, the number of responses will be equal to the number of respondents that chose to answer the particular question.

Q3: Please indicate the number of livestock your business runs

This question offered a number of size range options for each of the three stock categories e.g. 1-200 head. The size ranges were chosen based on analysis of PIC numbers for each stock type which divided the flock/ herd sizes into four categories.

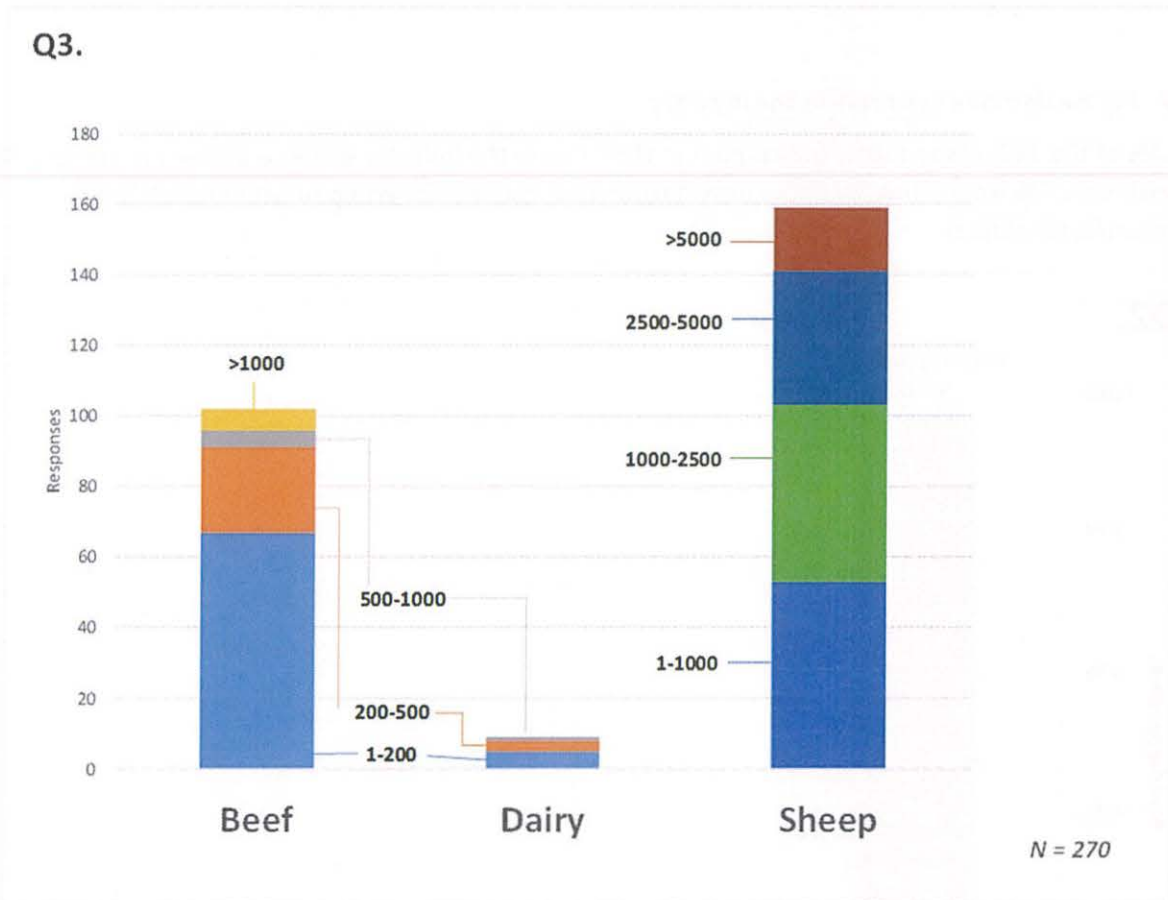


Figure 3. Indication of the size ranges of enterprises in each sector

The majority of respondents identified themselves as sheep producers, with a fairly even spread of responses across all flock categories. The beef and dairy producers typically run under 500 head of cattle.

Q4: How much water are you using for your stock over an average year (kL/yr)?

The following charts overleaf show the number of stock and the yearly water use in KL/yr. Climatic differences across regions, sources of water used and the size of businesses account for the ranges of water use displayed in the charts for question 4.

Volumes are presented at the mid-point of the enterprise size-range categories for each sector.

Water use volumes reported in the survey varied greatly with some responses appearing to be over-estimated by orders of magnitude in regard to the number of stock reported (attributed to wrong units used and input error). This small number of outliers were removed from the analysis.

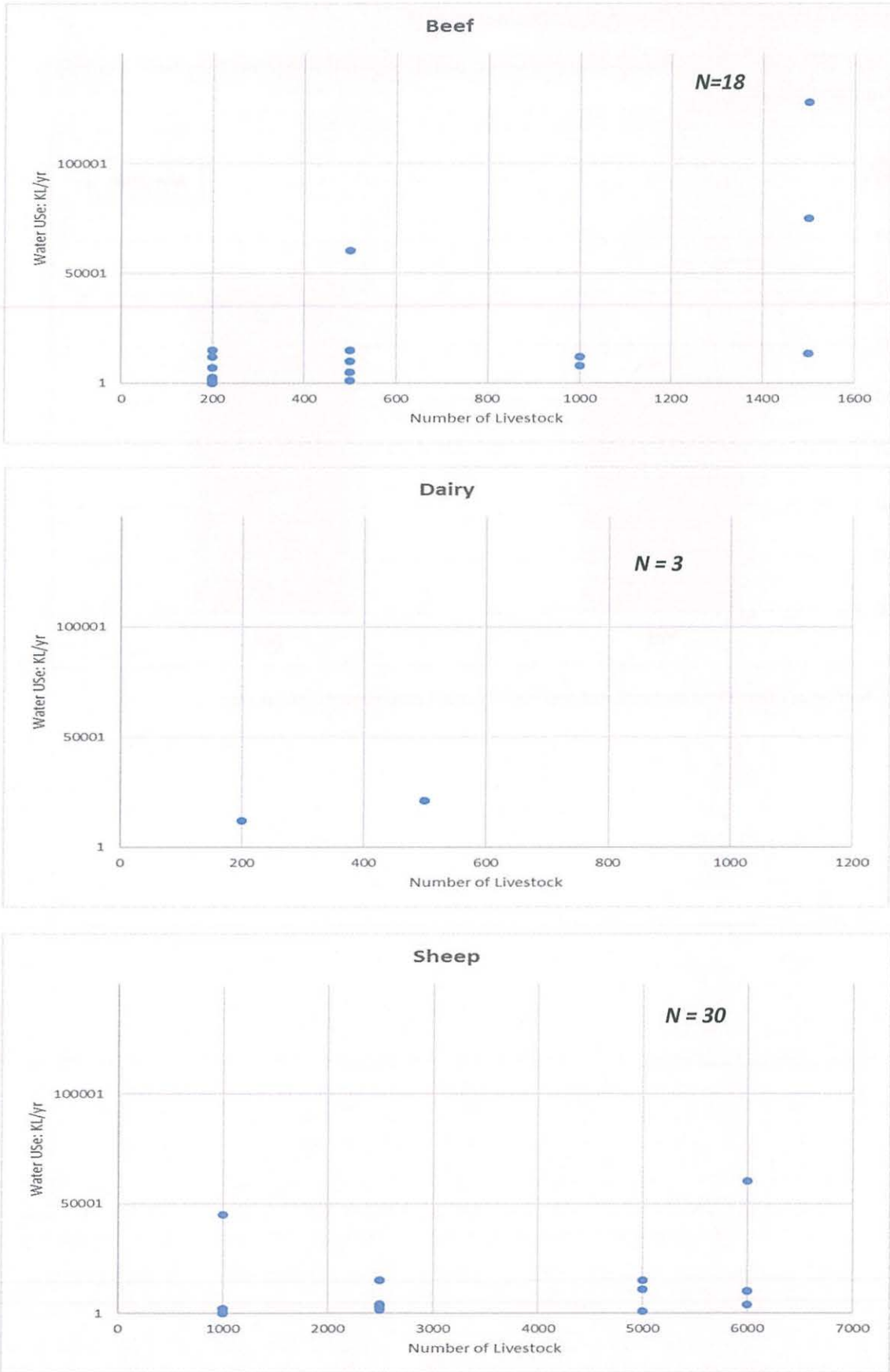


Figure 4. Estimated yearly water use of livestock enterprises (size range categories) for each species

Q9: Do you have a current, documented business plan?

Just under 40% of the respondents who answered question 9 indicated that they have a current documented business plan.

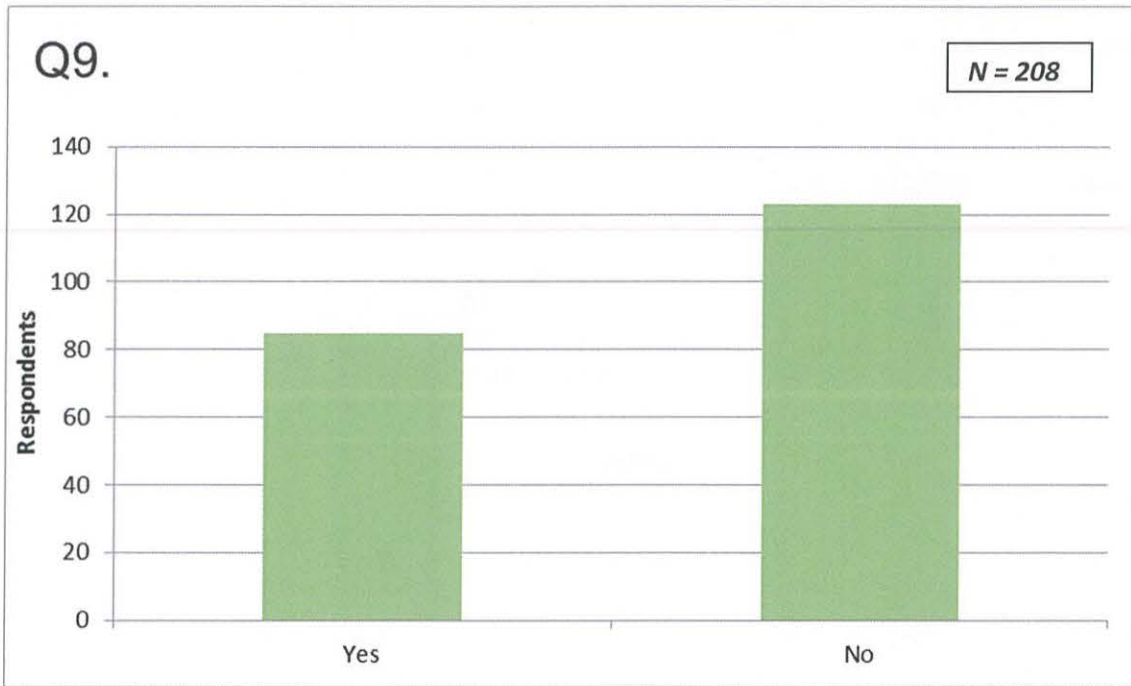


Figure 5. Number of respondents that indicated they have a current documented business plan

Q12: What stock water resources do you currently have available?

The major water resources (mains, groundwater and farm dams) account for supply to 80% of respondents (Figure 6).

A more detailed breakdown of water sources by region is presented in section 3.4 (p15).

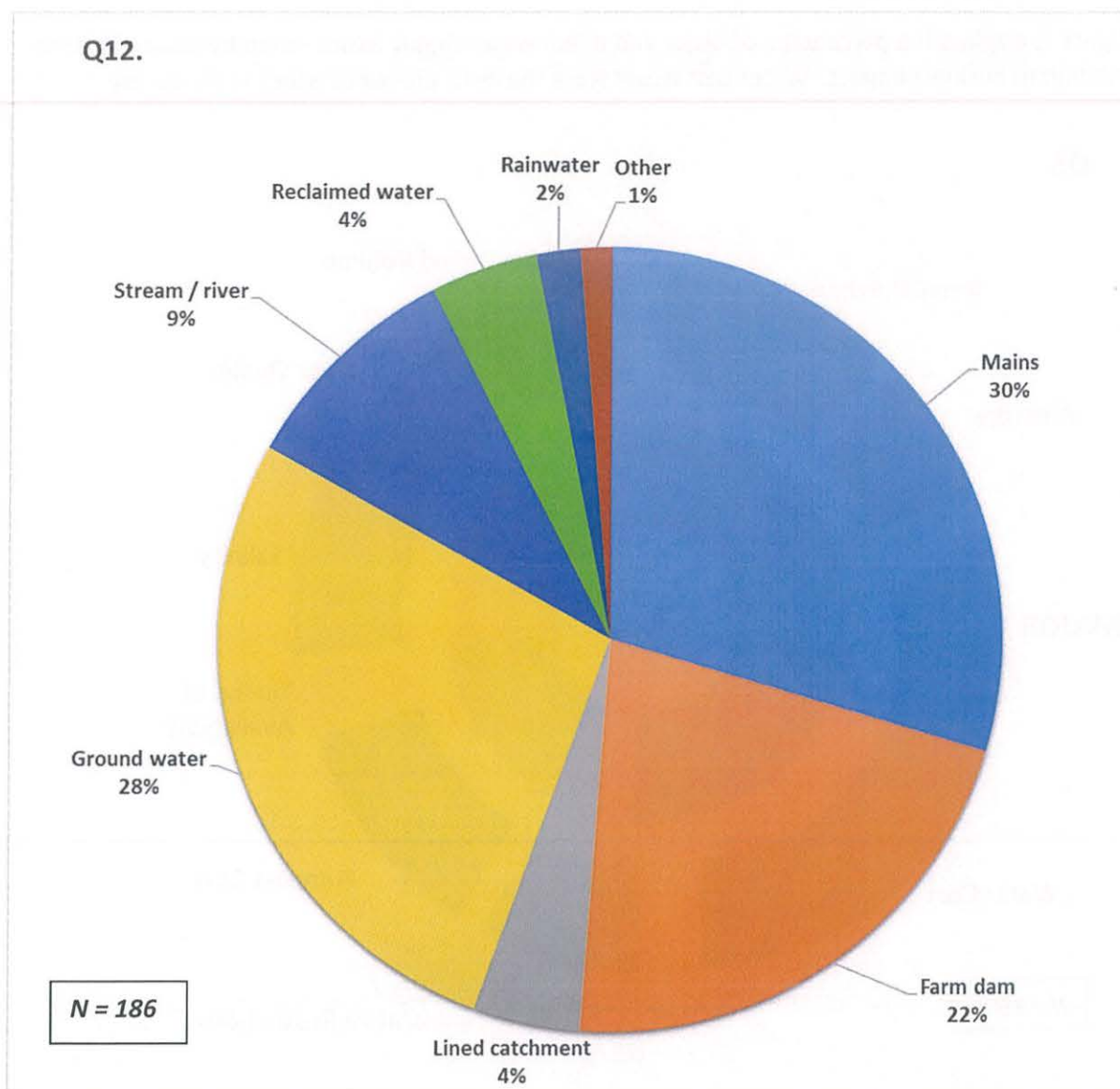


Figure 6. Major Water resource used by livestock enterprises

4.2 Water Issues and Impacts

Q5: What are the water supply related issues impacting on business?

Respondents were offered multiple choices from a list of potential issues. This included a text based response option for 'Other issues / comments'. Respondents were also given an option to nominate an issue as major or minor.

Figure 7, displays the percentage of major and minor water supply issues raised by respondents in relation to business impact. Water cost issues were the most prevalent issues in the survey.

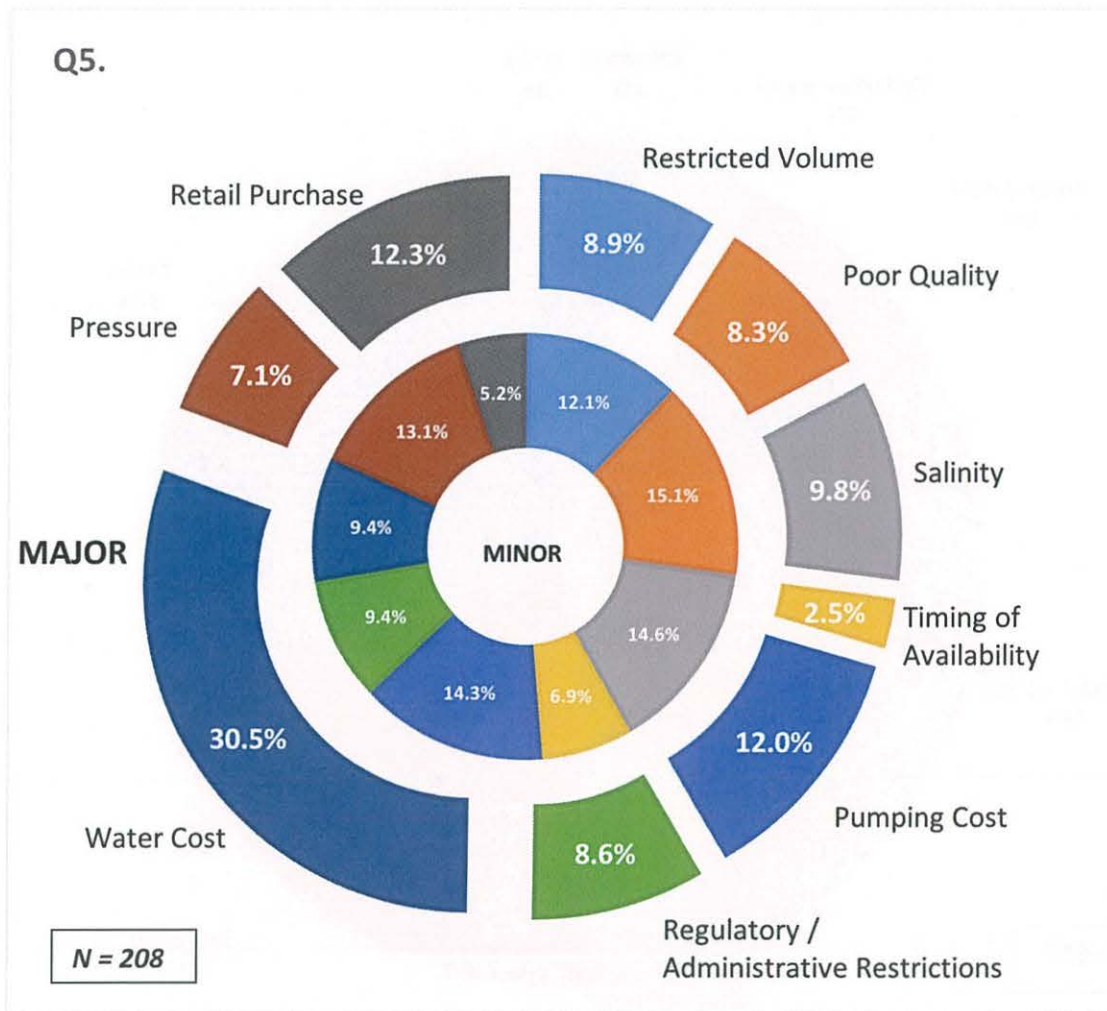


Figure 7. Major and minor water supply issues raised in relation to business impact

Feedback at Focus Group and Survey Outcome meetings indicated there was confusion between the categories 'retail purchase' (purchase of licenced water), 'water cost' (purchase of mains water) and 'pumping cost' (cost of electricity to access surface or groundwater). This confusion may be reflected in the survey results.

Q6: What is the cost of water to your farm business on an average year (estimated percentage of production cost)?

This question offered five range options for each of the three stock categories.

Figure 8, indicates the cost of water to farm business on an average year (estimated percentage of production cost) presented by sector.

The overall results indicate that 72% (majority of users) estimated their cost of water fell in the 0-10% range of the annual production cost across all sectors represented. 44% (under half of the users) estimated the cost of water in the 0-5% range; and 28% were in the 5-10% range.

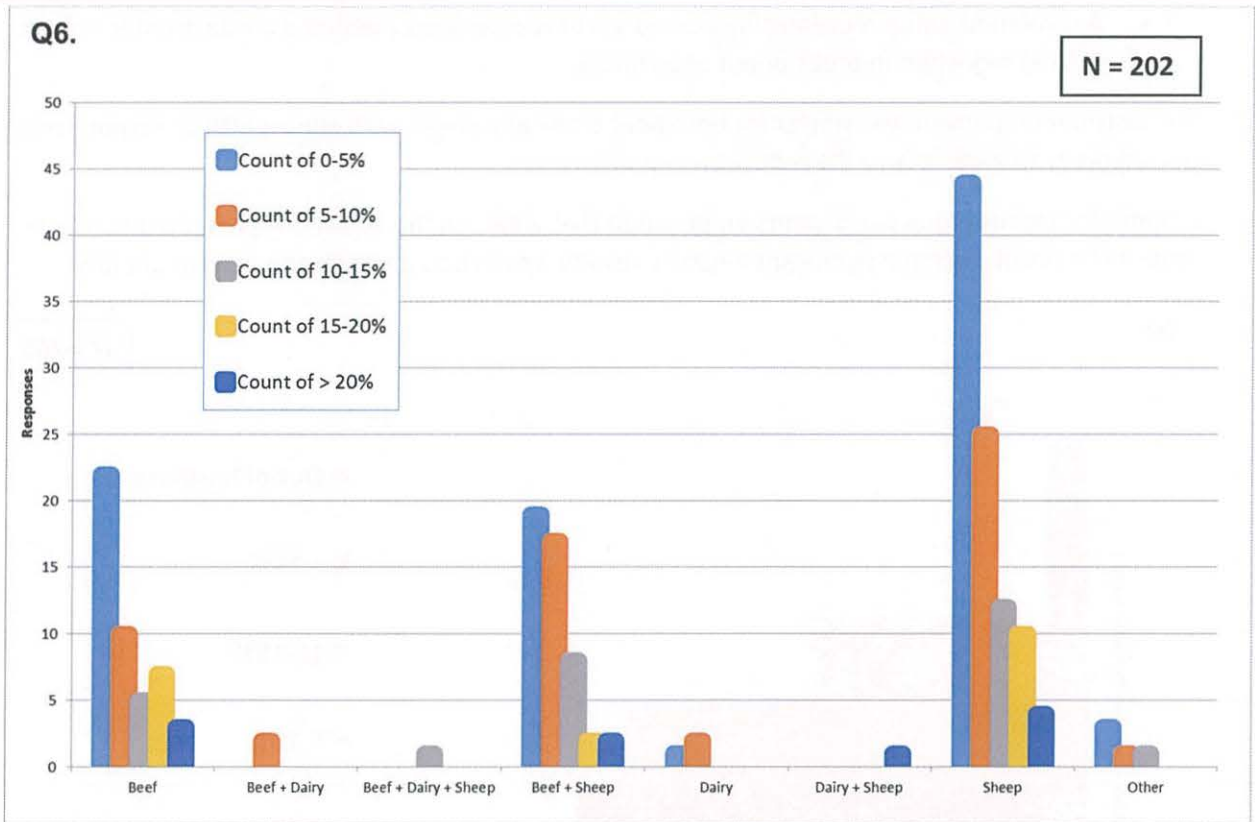


Figure 8. The cost of water for farm business (as a percent of annual production cost)

Commentary on these findings at focus group meetings emphasised that the current cost of mains water, though generally considered high, was manageable while the price of livestock was high, as at present. However, a combination of the significant price rises for mains water over recent years at times of depressed stock prices would significantly impact on the profitability of all livestock sectors.

Q7: What will be the impact on your business (% reduction in profit) in the next 5 years if there are no changes to water related issues impacting on your business?

The impact of unresolved water related issues on livestock businesses, with respect to a percentage (%) reduction in profit is displayed in figure 9. As with the previous question, five range options were offered.

- A single group representing around 34% of respondents, predicted a relatively small (0-2%) reduction in profit.
- A combined group representing around 62% of respondents predicted ‘intermediate’ impact (3% to 15%) reduction in profit.
- A combined group representing around 4% of respondents predicted a catastrophic impact ($\geq 15\%$) reduction in profit or out of business.

The distribution pattern was similar for both beef cattle and sheep with almost 60% of respondents overall predicting less than a 5% reduction in profit.

A number of focus group participants emphasised that what, on this scale, is represented as ‘lower’ impacts on profit can have significant negative results when costs are high and returns are low.

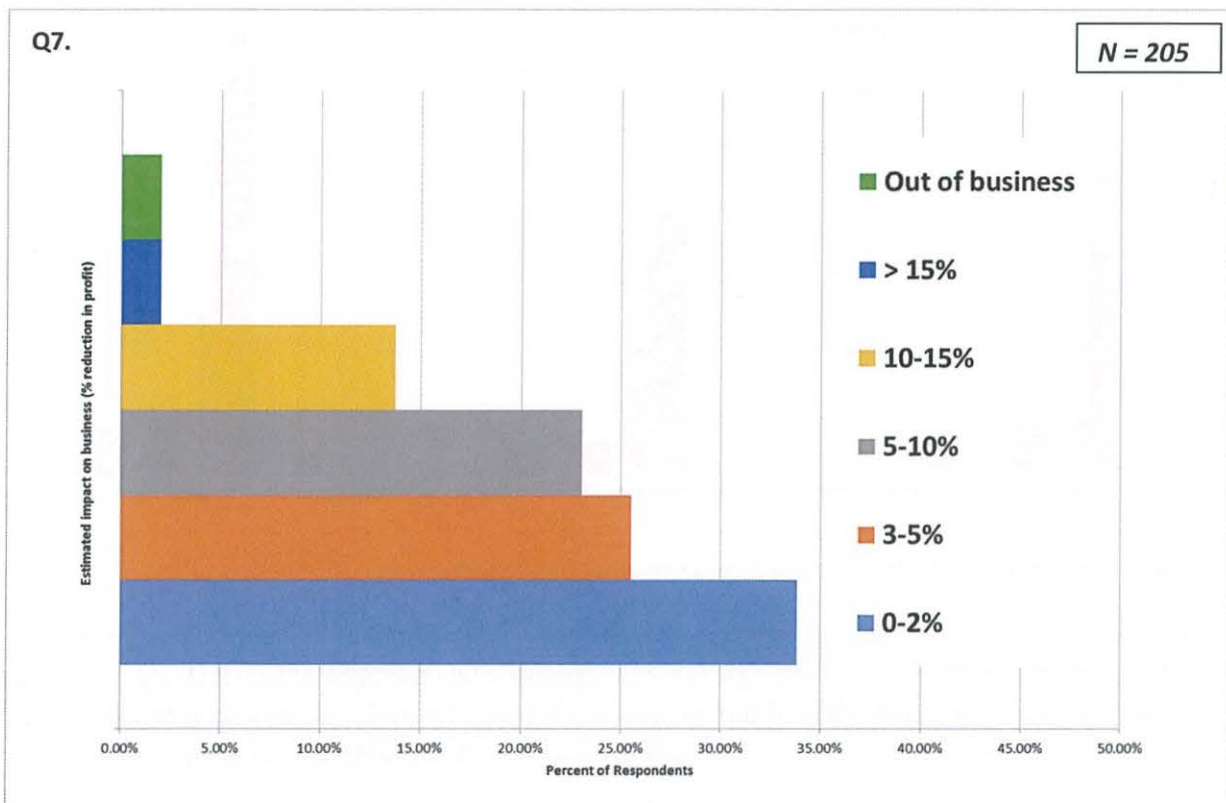


Figure 9. Estimated impact on business (% reduction in profit) in the next 5 years if there are no changes to water related issues that impact on business?

Q8: If water was not a limiting restriction, would you likely plan to expand your business in the short to medium term (2-5years)? If yes, how would your business grow? (Multiple choice answer).

The responses to question 8 represent about 65% of survey participants. 77 of these respondents nominated options for expanding their business if water was not a limiting factor. The 'Other' category (text responses) mainly referred to improving on farm water infrastructure.

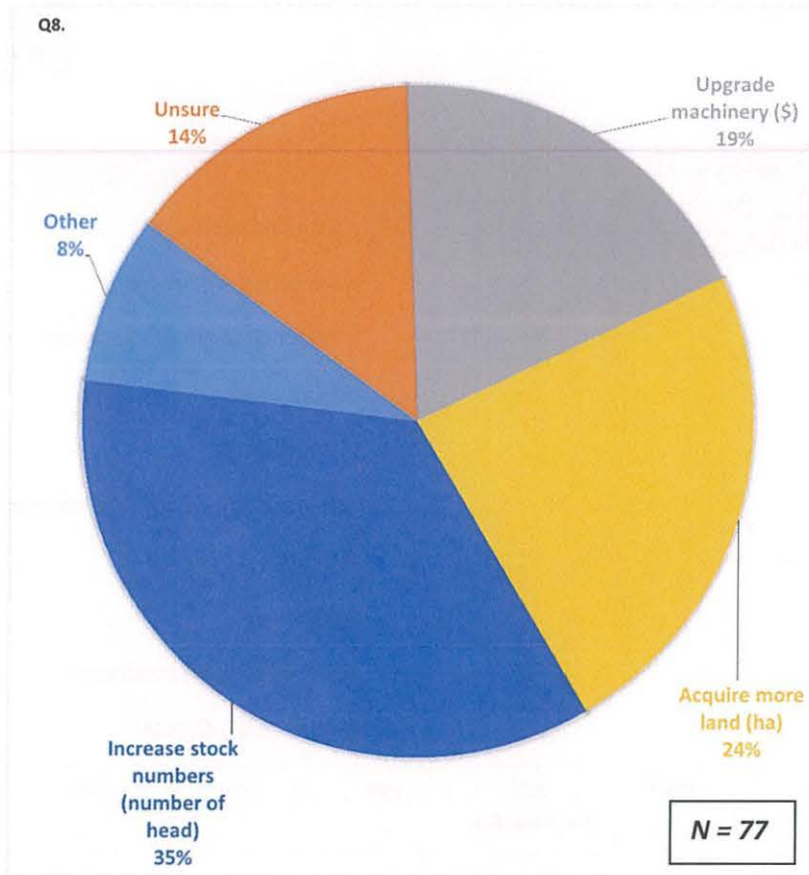


Figure 10. Percentage of responses indicating business expansion

There were 66 responses to the multiple choice option 'Estimate of overall business expansion (%)'. While estimates of business expansion varied widely, 40% of respondents choosing to answer this question estimated they would expand their business by 10 to 25%.

69% of respondents who indicated a potential business expansion were in the RDA Regions for: Yorke and Mid North (25%); Murraylands and Riverland (25%); or Adelaide Hills, Fleurieu and Kangaroo Island (19%).

The mean estimated business expansion for each of these RDA regions were: Yorke and Mid North (29%); Murraylands and Riverland (60%); or Adelaide Hills, Fleurieu and Kangaroo Island (21%).

Q13: Are there any water regulatory or administrative requirements impacting on your business?

65% of respondents reported that planning approvals and reporting requirements were the main cause for concern within the context of quantifying regulatory and administrative requirements impacting their businesses. The remaining eight categories of regulatory and administrative requirements amounted to 35% of responses.

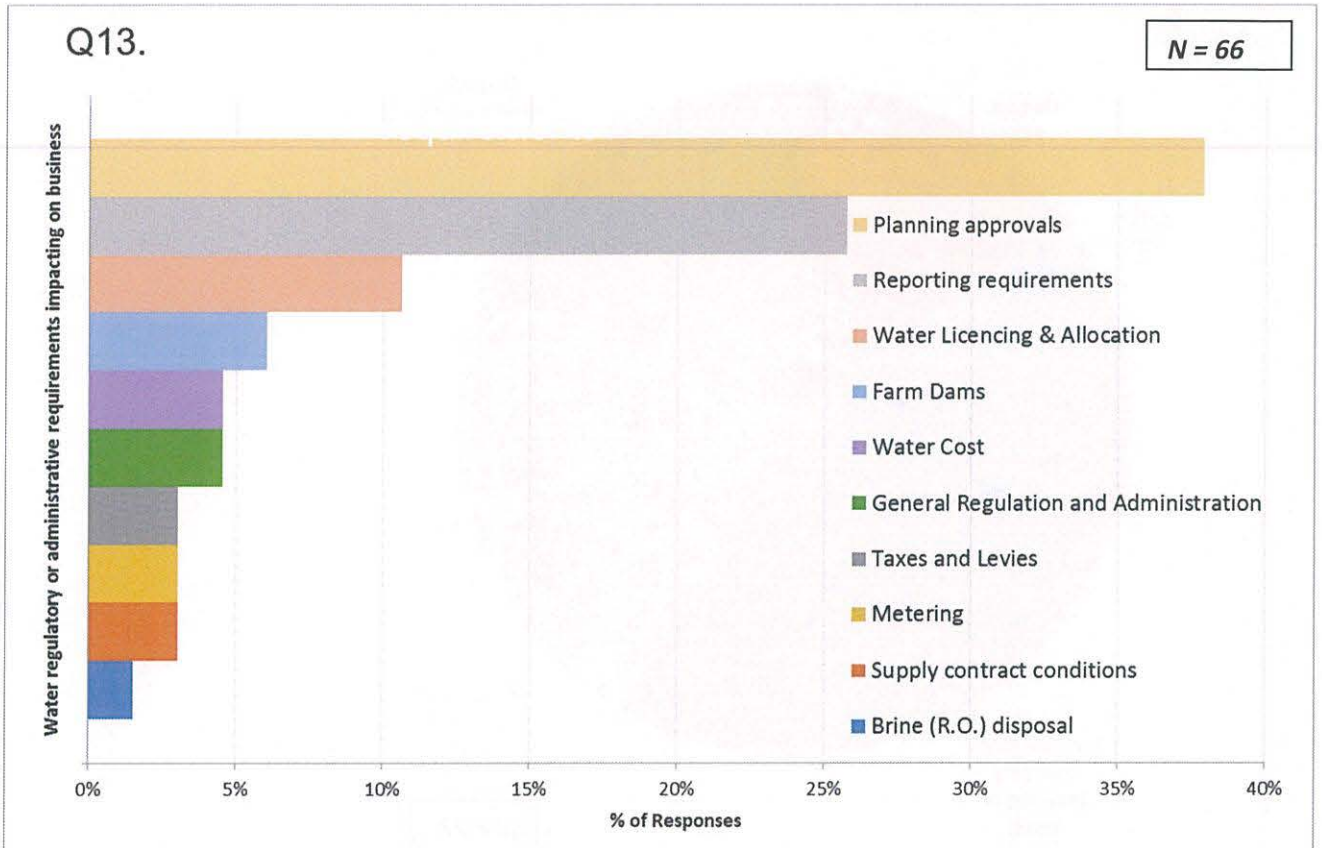


Figure 11. Water regulatory / administrative requirements that impact on business

Q14: Do you have any other ideas on water management that you would like us to explore? Any other comments?

85 text based responses related to water issues which fitted into the categories analysed under question 5 (refer to Figure 7). 39% related to regulatory issues, 20% to water cost and 16% to on farm steps which individual land-holders have taken to address water issues – this is explored in question 10 (Figure 20).

4.3 Non producer responses

Only 8 respondents indicated that they were non-producers (service provider/advisor, community group, hobby farmers), a small sample to reliably indicate broader issues impacting the non-producer community.

Respondents were asked (Q15), 'What are the water issues impacting on your sector/region/community?' and (Q16), 'In what areas are you seeing effects due to these water issues?'

Water cost, timing of availability, restricted volume and water pressure were the major issues raised with business productivity being nominated as the main effect.

In response to Q17, which asked respondents to identify previous investigations or development of solutions for water related issues that might be relevant, the 'South Australian Murray-Darling Basin Water Allocation Plan' and 'Water Allocation Plans from other regions' were nominated as well as the (Adelaide Hills) low flow by-pass project.

Other ideas on water management to explore/comments (Q18) were:

- 'Decrease price for water used for livestock';
- 'the low flow by-pass project could make a difference';
- 'Animals affecting water quality in catchment areas';
- 'Landholders access to water reuse programs'; and
- 'Look at grants for water capturing infrastructure for primary producers.'

4.4 Review of issues broken down by region and available water sources

The water supply issues raised in the survey varied across the regions, with the available water resources for production a key factor in the variety of issues raised. For example, mains water supply users were most likely to raise issues in relation to the cost of water.

The following analysis breaks down the top five issues nominated by respondents (question 5) in each region. In addition, the top five issues for users that accessed the three main water supplies surveyed - mains water, farm dams and groundwater (question 12) are also presented.

It should be noted that in the presentation of the issues based on water supply sources, respondents may have access to more than one source of supply. In addition, issues raised e.g. salinity or quality may be nominated as the reason they are using mains water i.e. they may be in a saline groundwater area.

A further confounding issue is the degree to which respondents may have differentiated or conflated the categories 'retail purchase' (purchase of licenced water), 'water cost' (purchase of mains water) and 'pumping cost' (cost of electricity to access surface or groundwater).

In 3.4 the number at the top right of each chart indicates the percentage of responses covered by the top five issues displayed.

Water cost was the leading issue for the following regions:

- Whyalla/Eyre Peninsula;
- Yorke and Mid North;
- Barossa;
- Murraylands and Riverland;
- Adelaide Metro; and
- Limestone Coast (equal with salinity).

Pumping Cost was the leading issue (with Regulatory/ Administrative restrictions second) for:

- Far North;
- Adelaide Hills, Fleurieu and Kangaroo Island.

As has been previously noted, these regions are large and diverse. The issues across the Adelaide Hills, Fleurieu and Kangaroo Island are very different. The same is true of the Riverland and Murraylands which includes the Lower Lakes and Coorong.

4.4.1 Analysis by Region

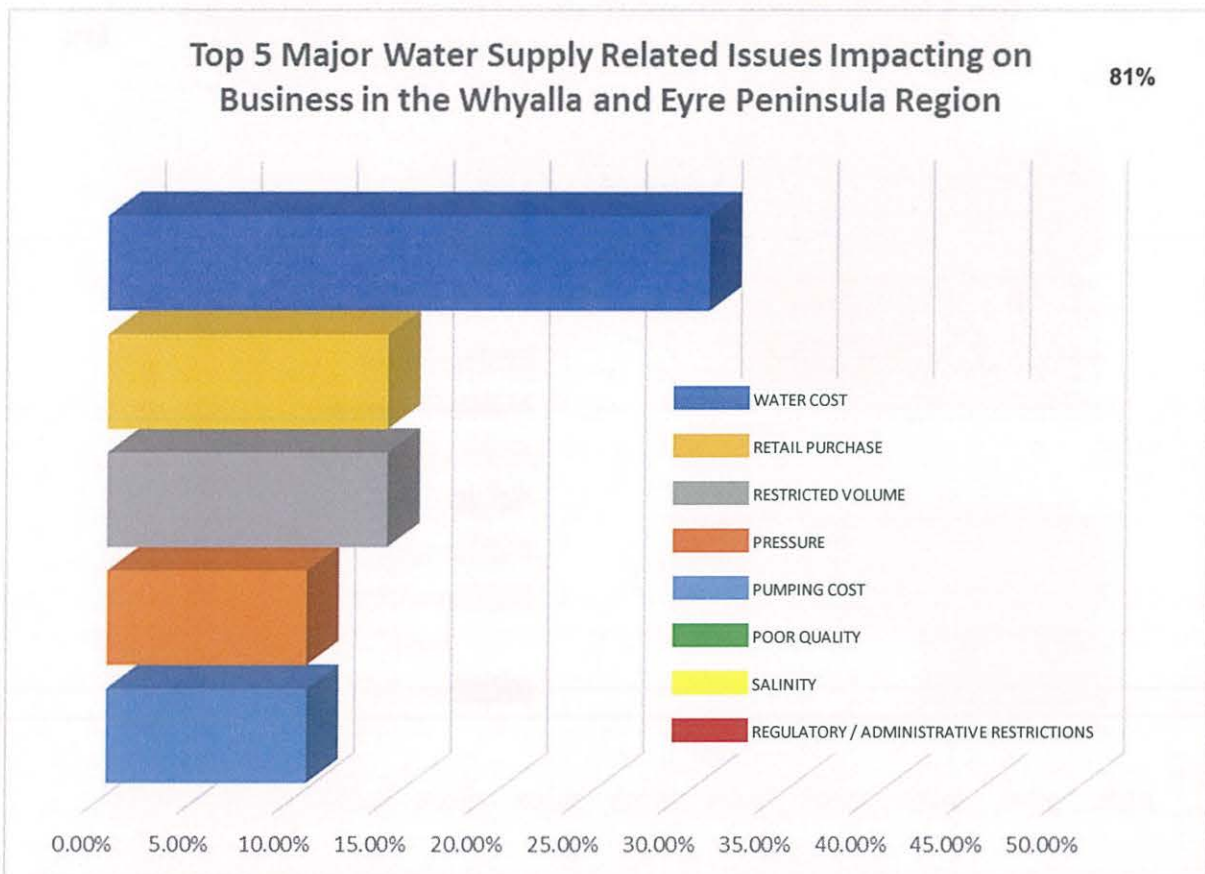
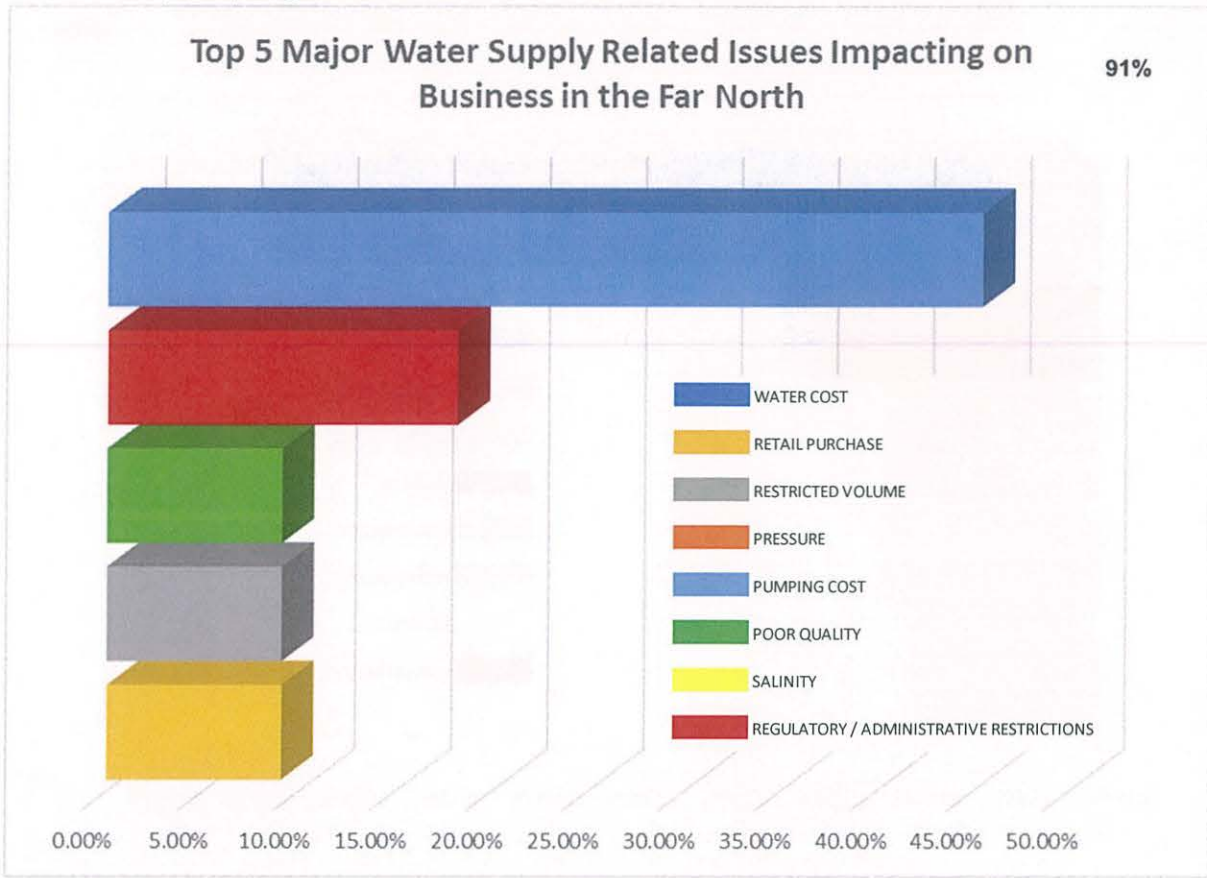


Figure 12. Analysis by region – Far North and Whyalla & EP RDA Regions (% of responses)

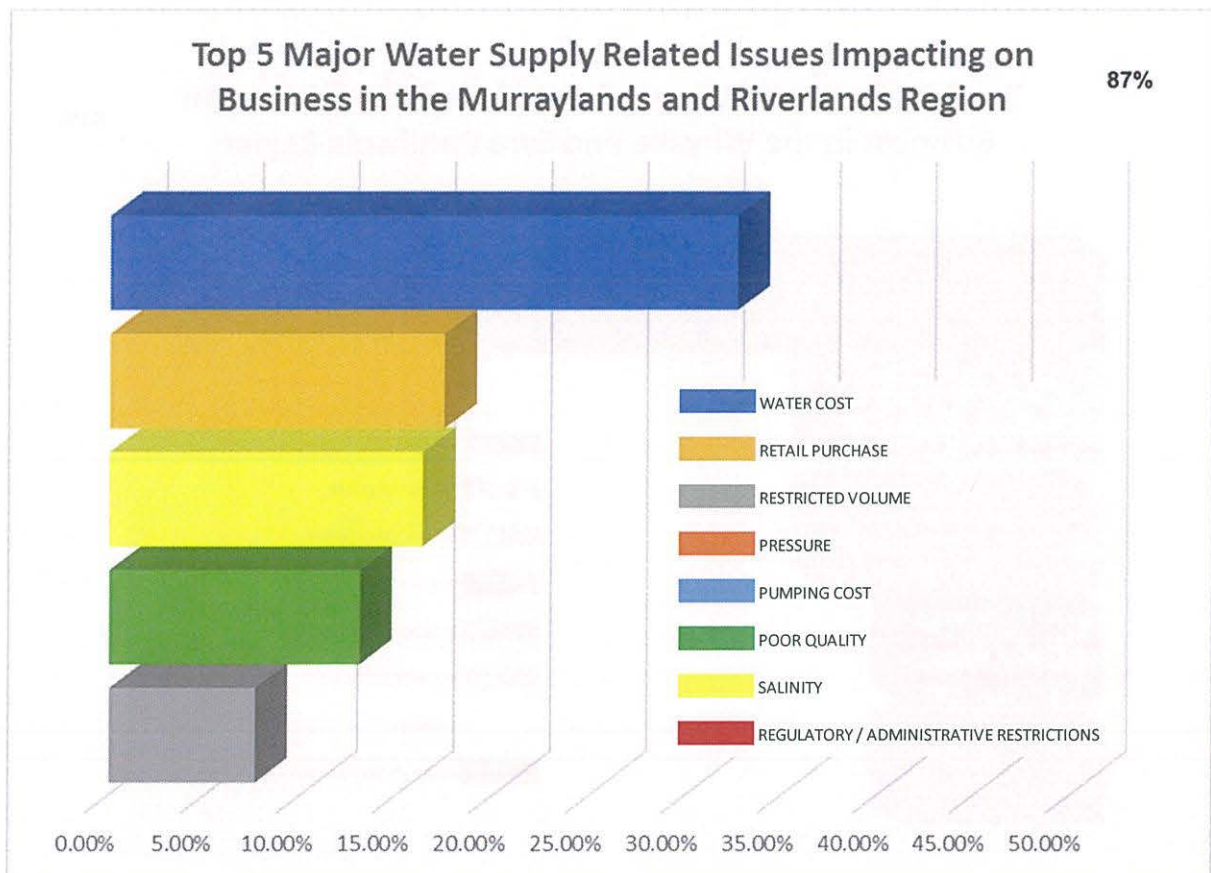
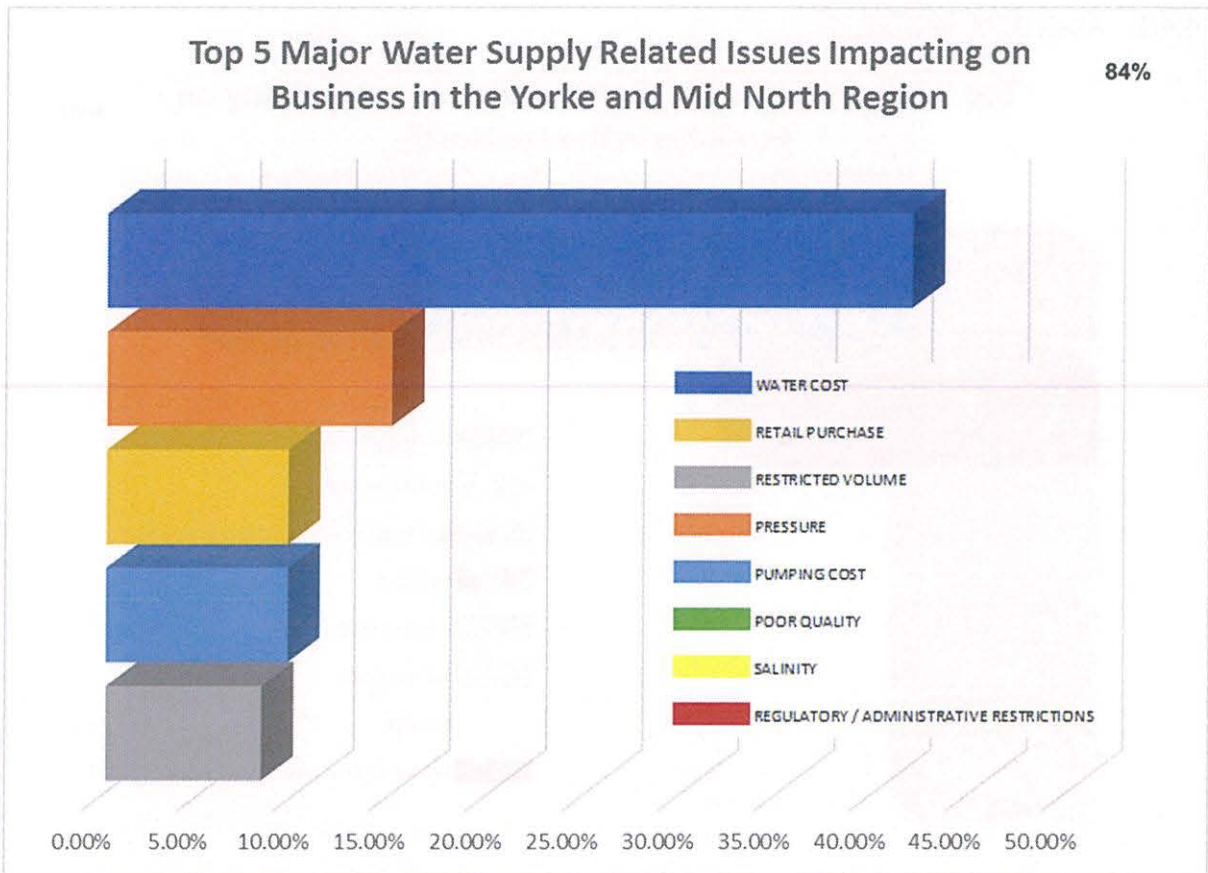


Figure 13. Analysis by region – Yorke & Mid North and Murraylands & Riverland RDA Regions (% of responses)

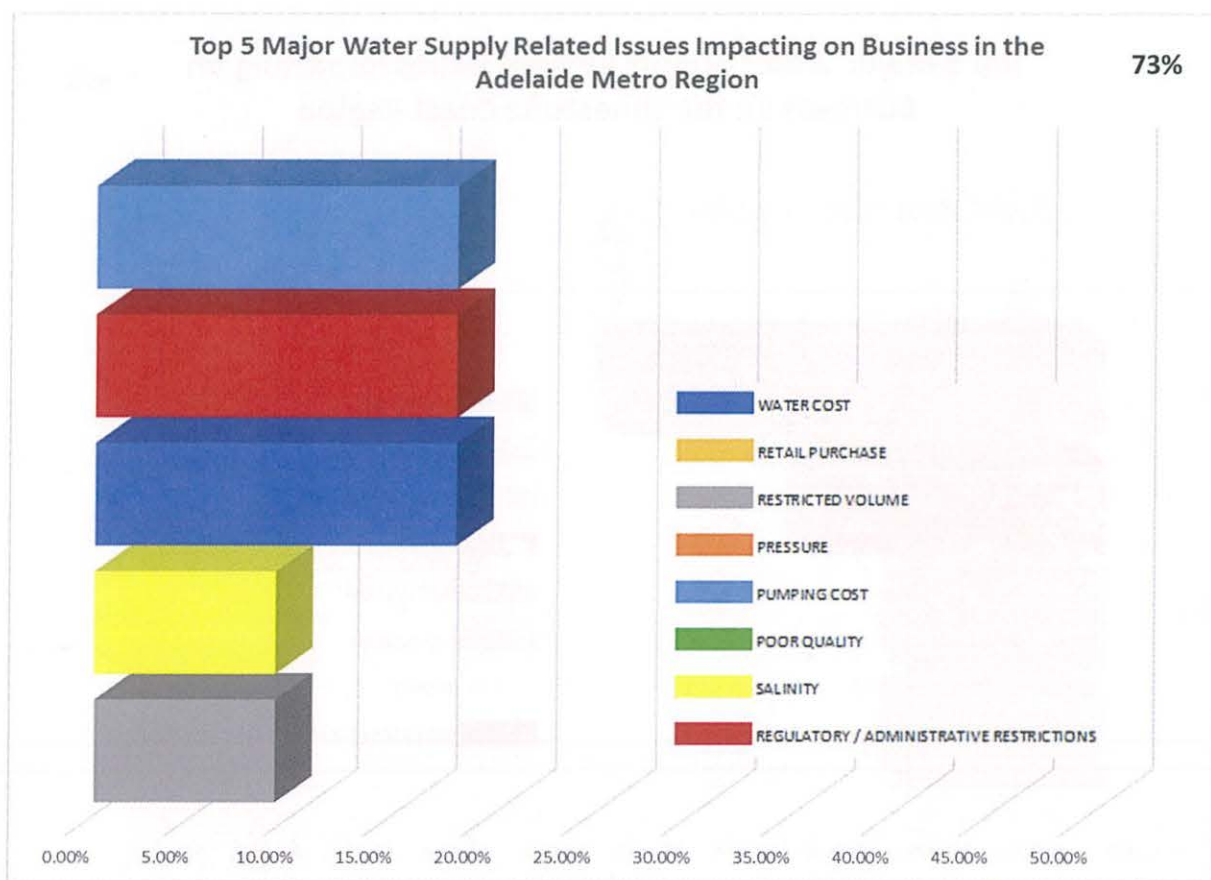
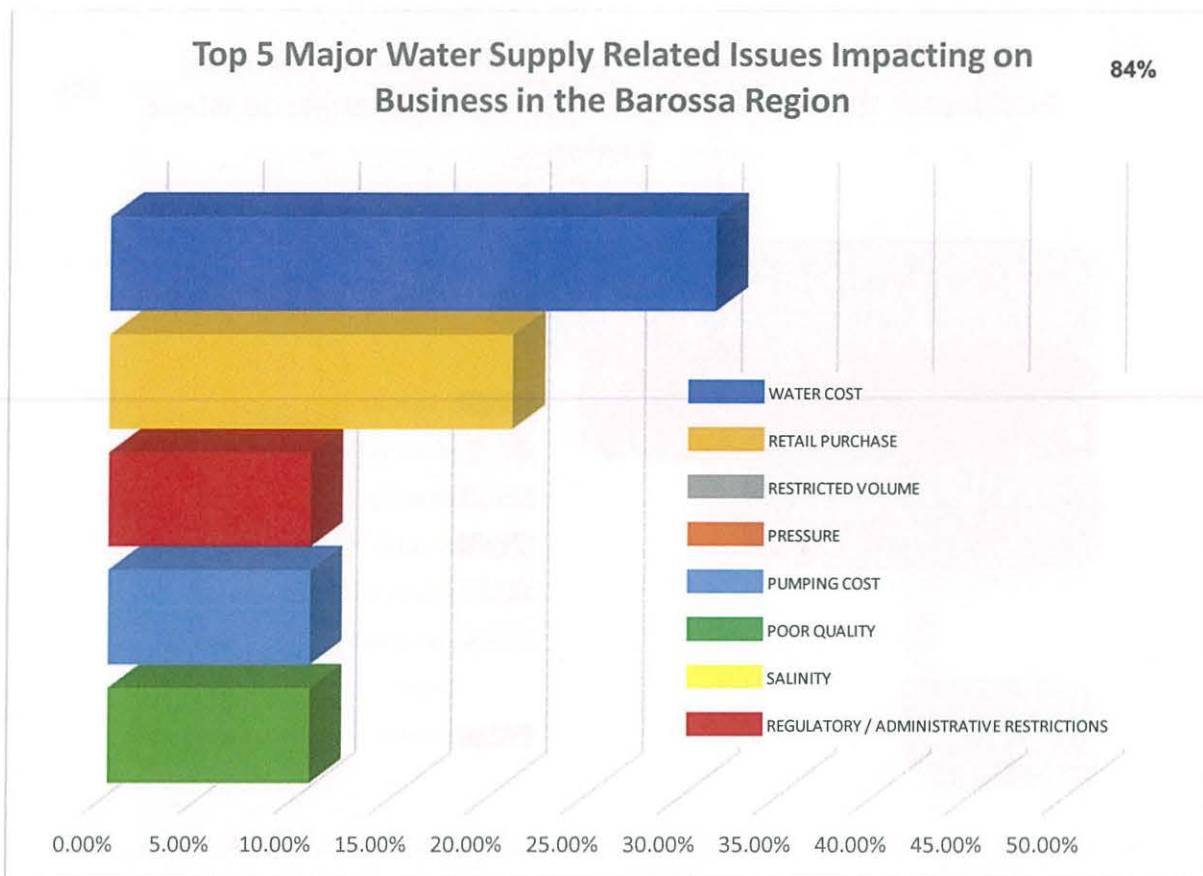


Figure 14. Analysis by region – Barossa and Adelaide Metro RDA regions (% of responses)

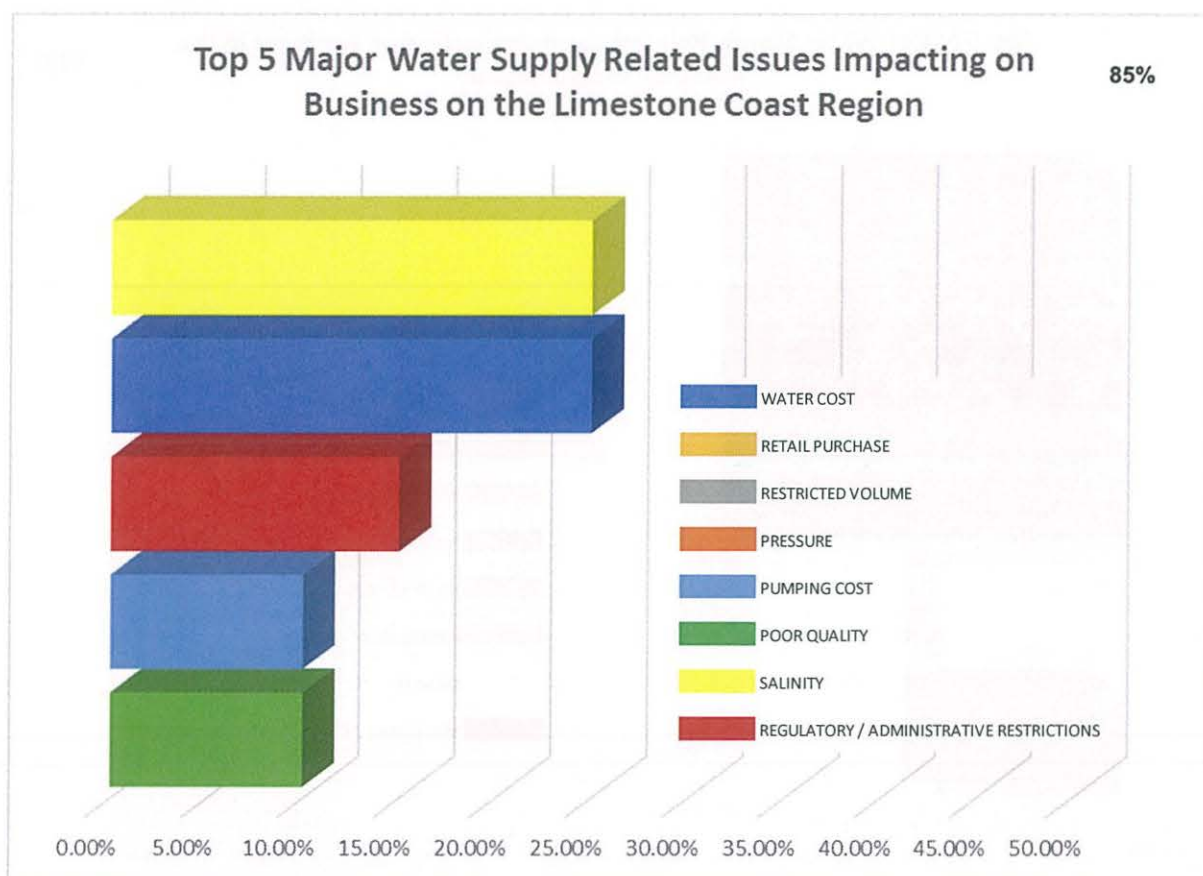
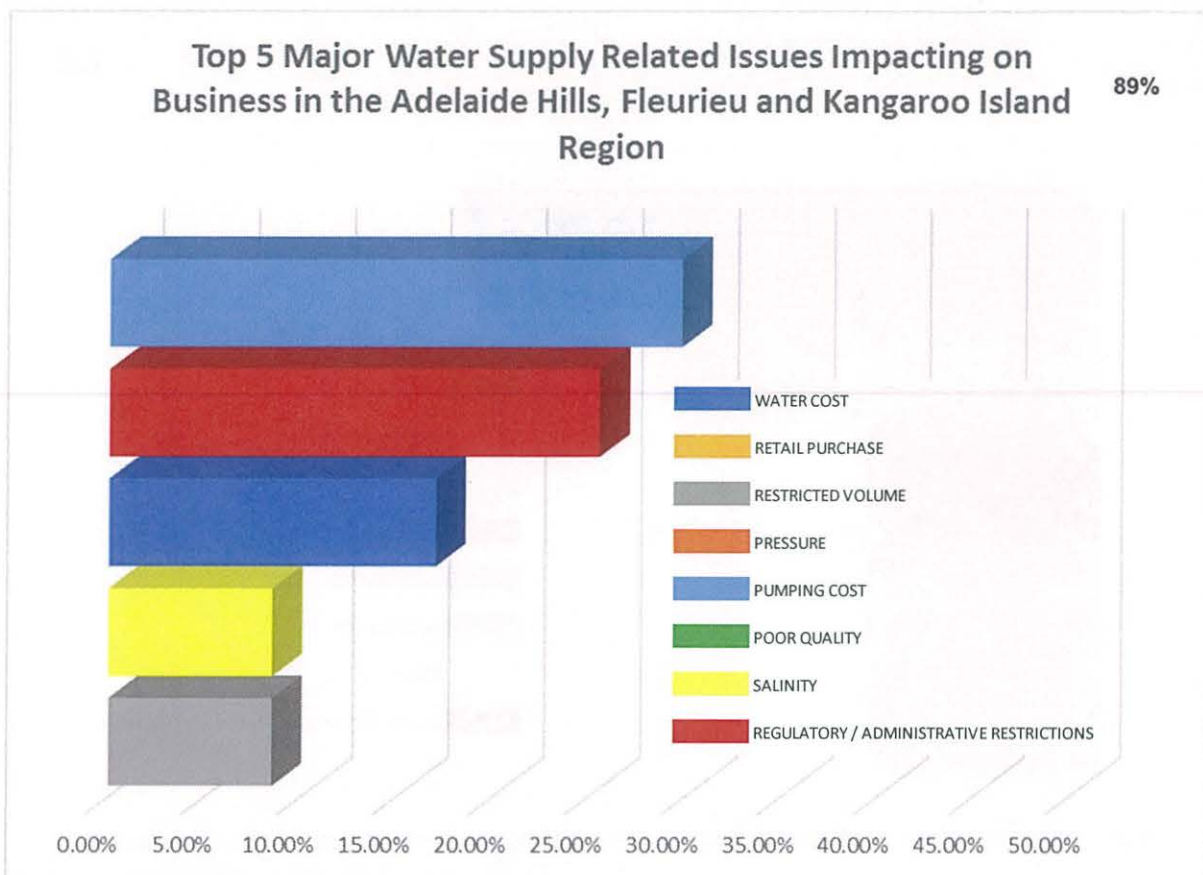
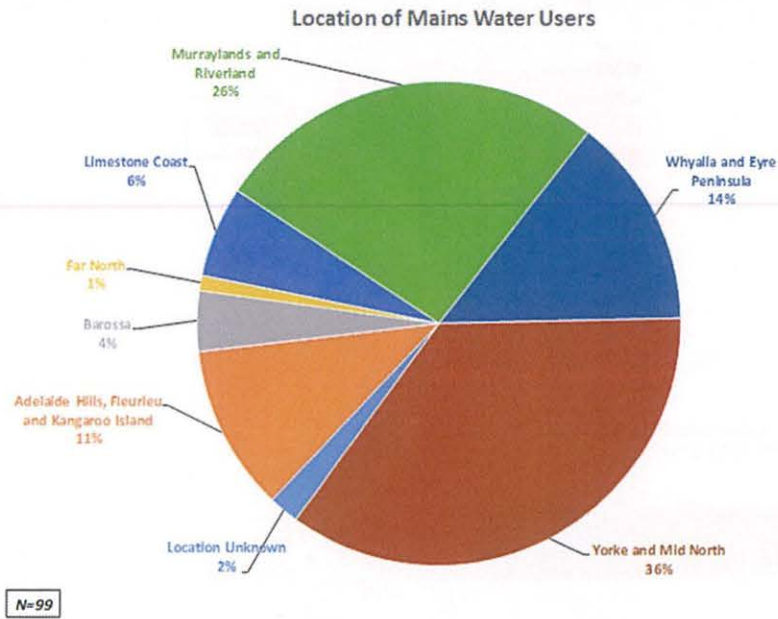


Figure 15. Analysis by region – Yorke & Mid North and Adelaide Hills, Fleurieu & KI RDA regions (% of responses)

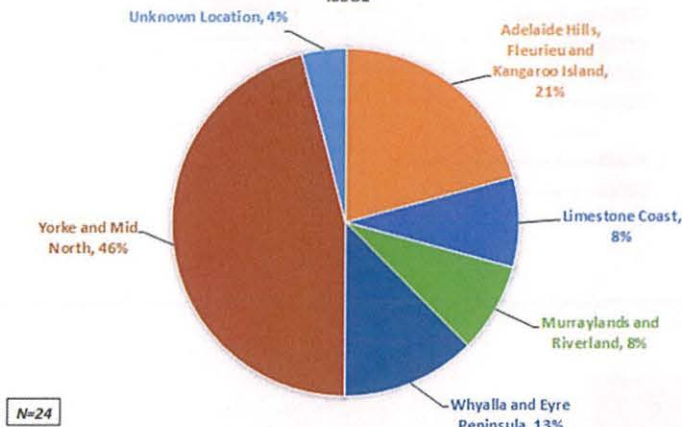
4.4.2 Analysis by Water Resource - Mains

The three regions that use the majority of mains water were the: Murraylands and Riverland; Whyalla and Eyre Peninsula; and Yorke and Mid North. Some users of mains water did not identify water cost as a major issue. Mains water users with access to dam and/or groundwater are also identified.



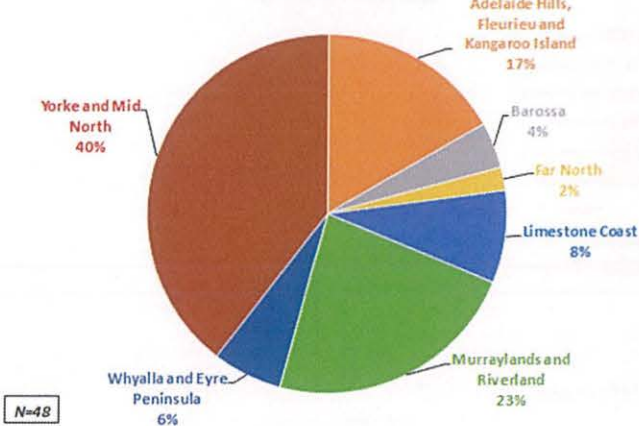
Water cost is the consistent major issue because of reliance on SA Water pipelines to deliver stock water in these regions.

MAINS WATER USERS WHO DID NOT IDENTIFY WATER COST AS AN ISSUE



Some mains water users did not identify cost as a major issue.

LOCATION OF MAINS WATER USERS WHO ALSO ACCESS FARM DAM AND GROUNDWATER SUPPLIES



Some mains water users have access to other water sources.

Figure 16. Analysis by Water Resource – Mains

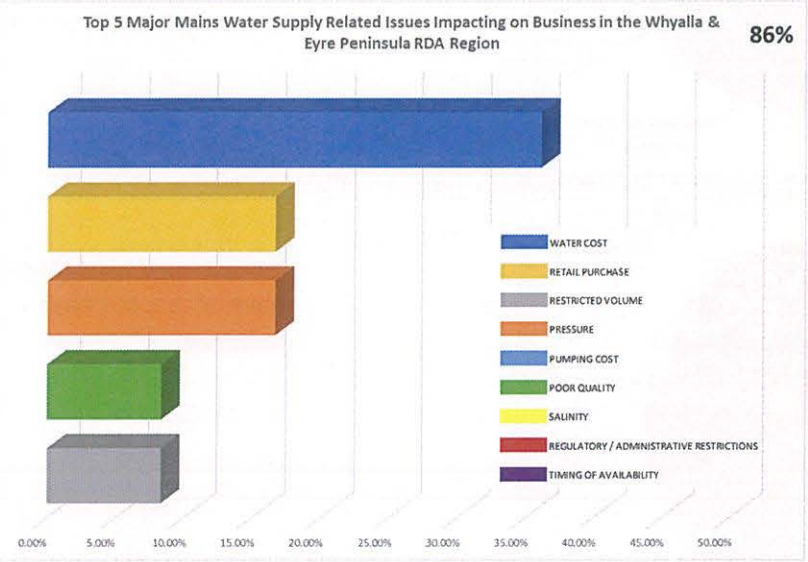
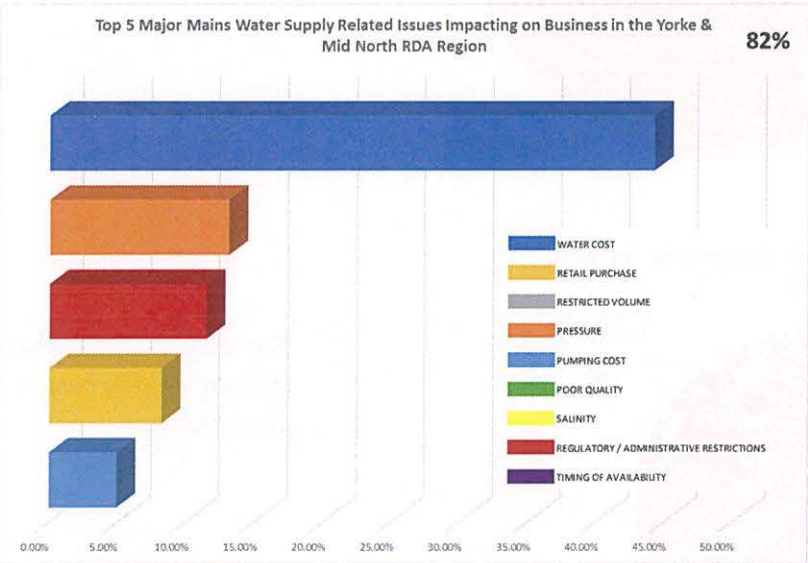
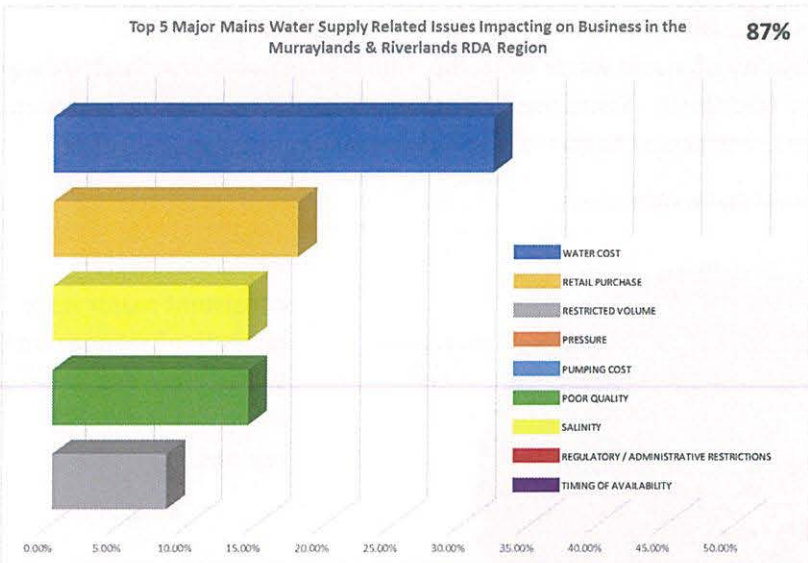


Figure 17. Top 5 Issues Impacting on Mains Users by RDA region

4.4.3 Analysis by Water Resource - Farm Dams

The majority of farm dam water users came from the Adelaide Hills, Fleurieu, and Kangaroo Island. Based on the text responses received in the survey, the 'water cost' or 'pumping cost' responses were related to the pumping and running cost (electricity) to enable access or reticulation of the water resource and the cost of the NRM levy. Regulatory and administrative restrictions was also a key issue.

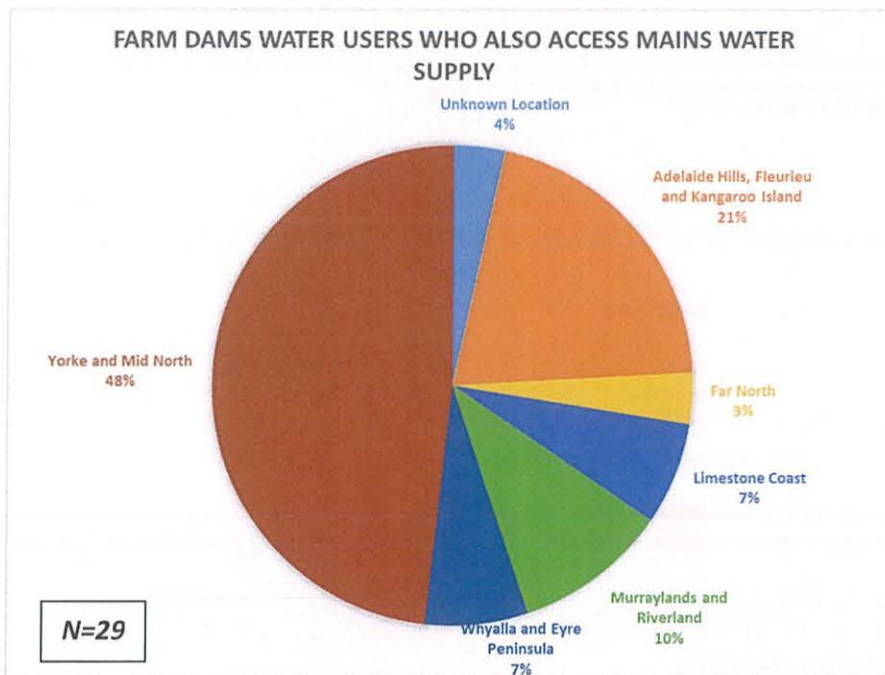
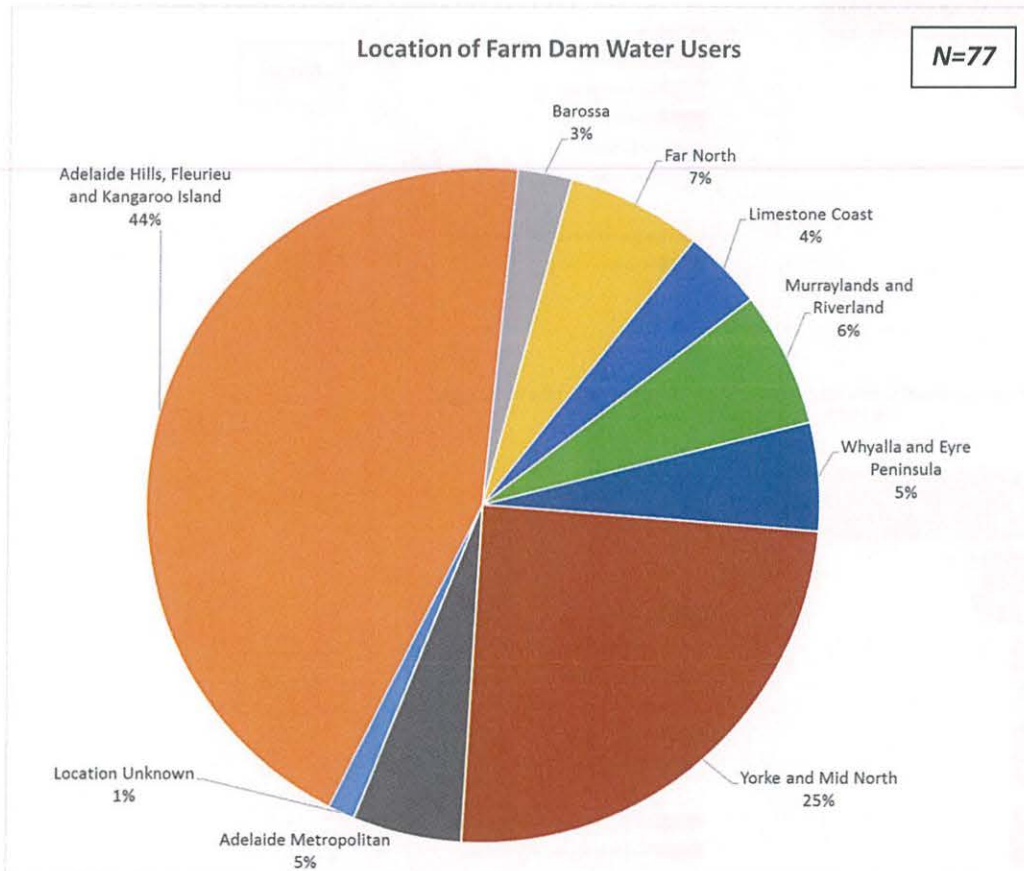


Figure 18. Analysis by Water Resource - Farm Dams

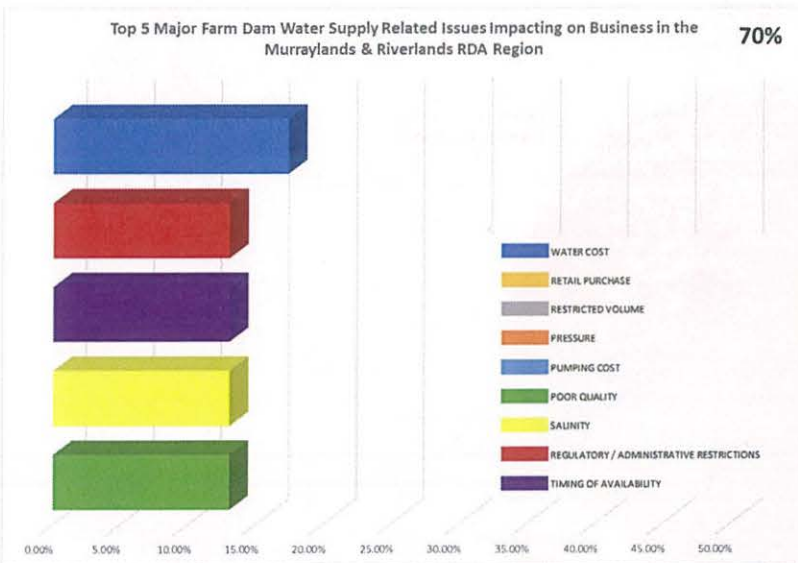
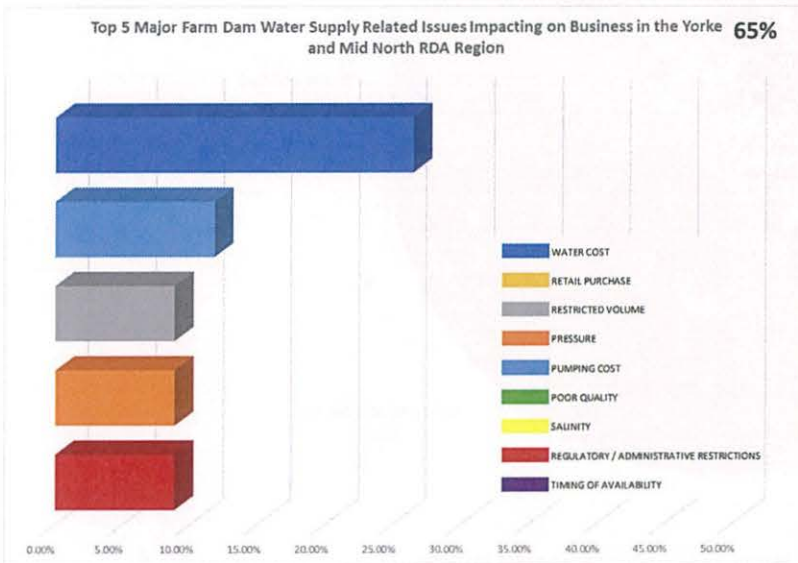
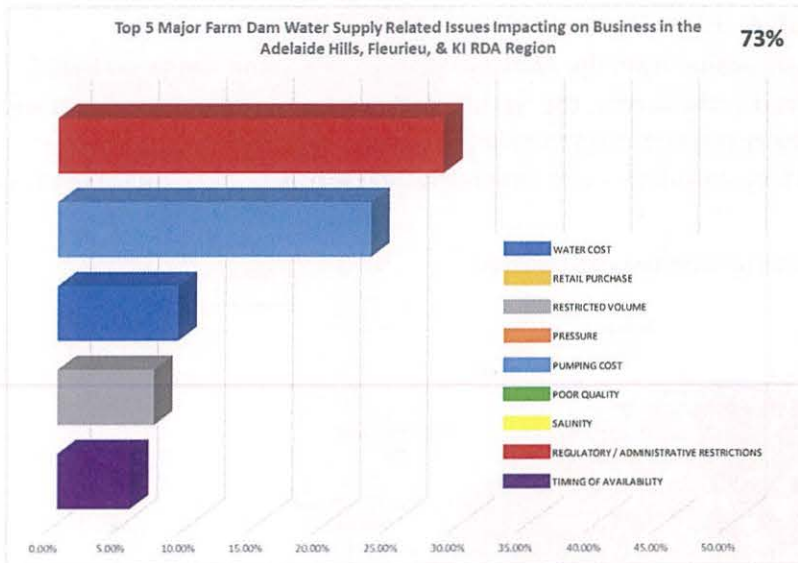


Figure 19. Top 5 Issues Impacting on Farms Dam Users

4.4.4 Analysis by water resource - Groundwater

Regulatory and administrative restrictions make a strong appearance as well as water quality and salinity issues. Based on the text responses received in the survey, the 'water cost' or 'pumping cost' responses were most likely related to the pumping and running cost of the pumps (electricity) to enable access or reticulation of the water resource.

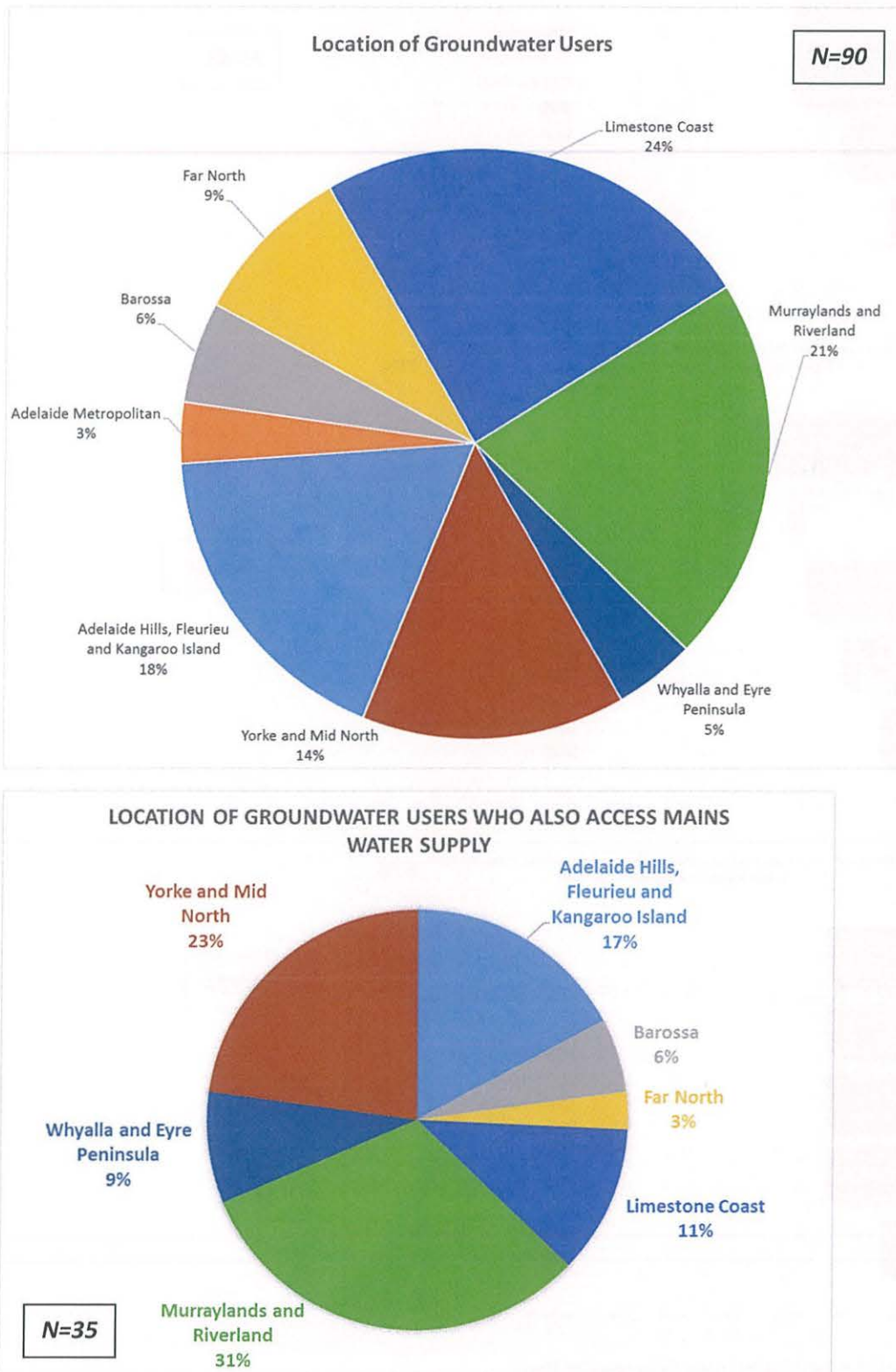


Figure 20. Analysis by water resource - Groundwater

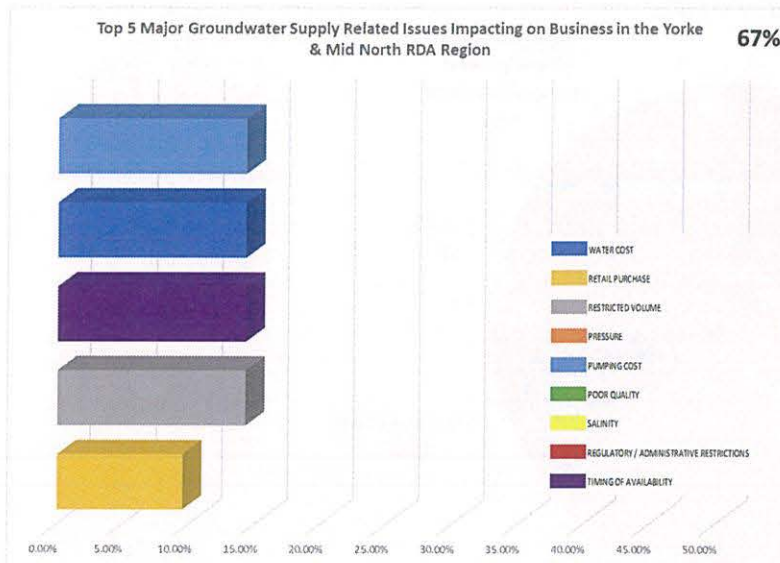
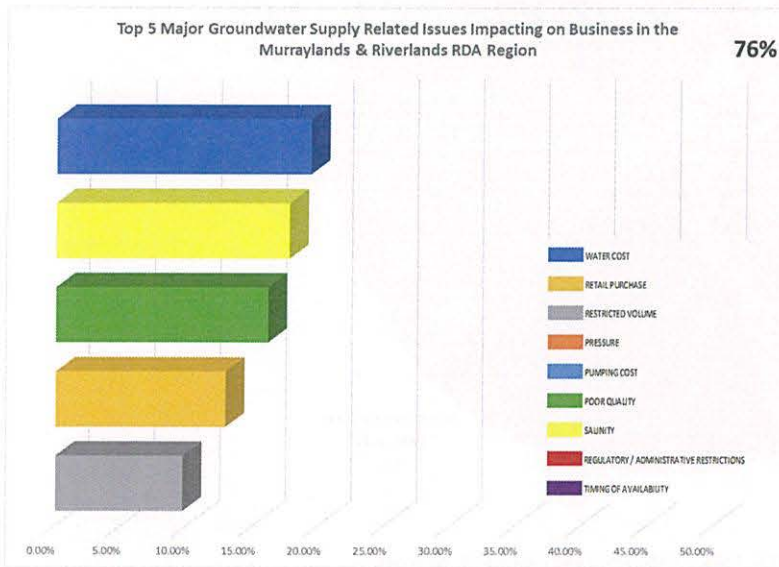
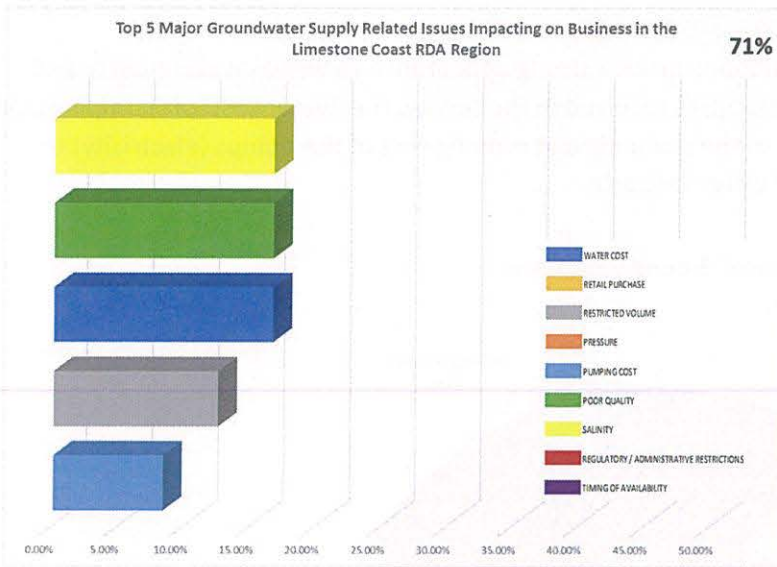


Figure 21. Top 5 Issues Impacting on Farms Groundwater Users

5 Response Options

The 'Water Issues Impacting South Australian Livestock Industries' project, as the name implies, was focused on determining the problems facing the sectors. However, it was clear from early discussion that individuals and groups were already taking steps to address these problems.

5.1 Actions taken

Q10: What on-farm steps taken, if any, to address your water issues

A wide variety of actions have been taken by the respondents to deal with their water issues, as depicted in Figure 24.

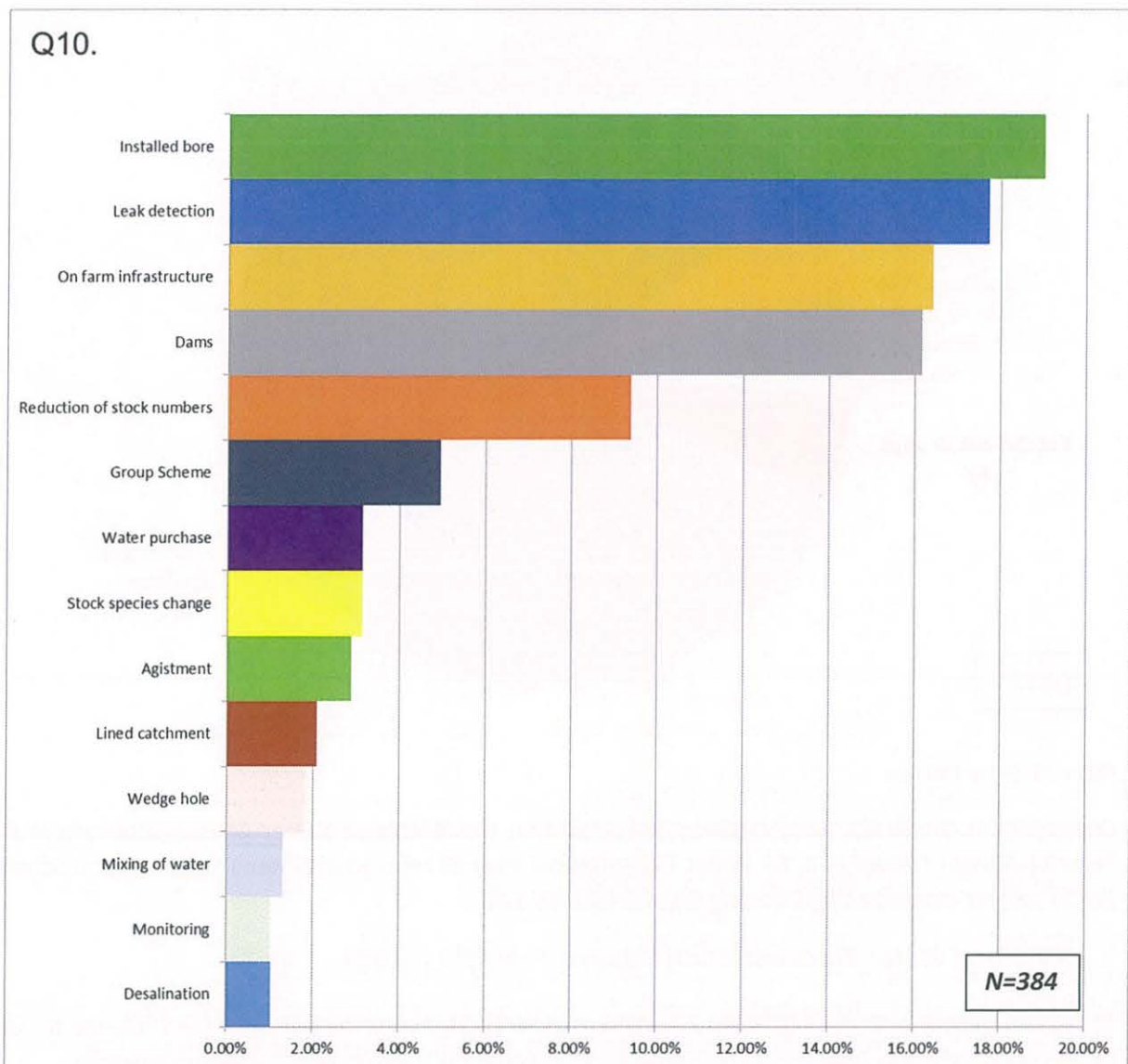


Figure 22. On-farm steps taken to address water issues, % of responses

Group schemes

The term 'group schemes' refers generally to private pipelines or water transport schemes using SA Water infrastructure to deliver off-peak supply or delivering water allocations owned by the participants e.g. River Murray water allocations. Several group schemes were highlighted by the 19 respondents that answered question 11.

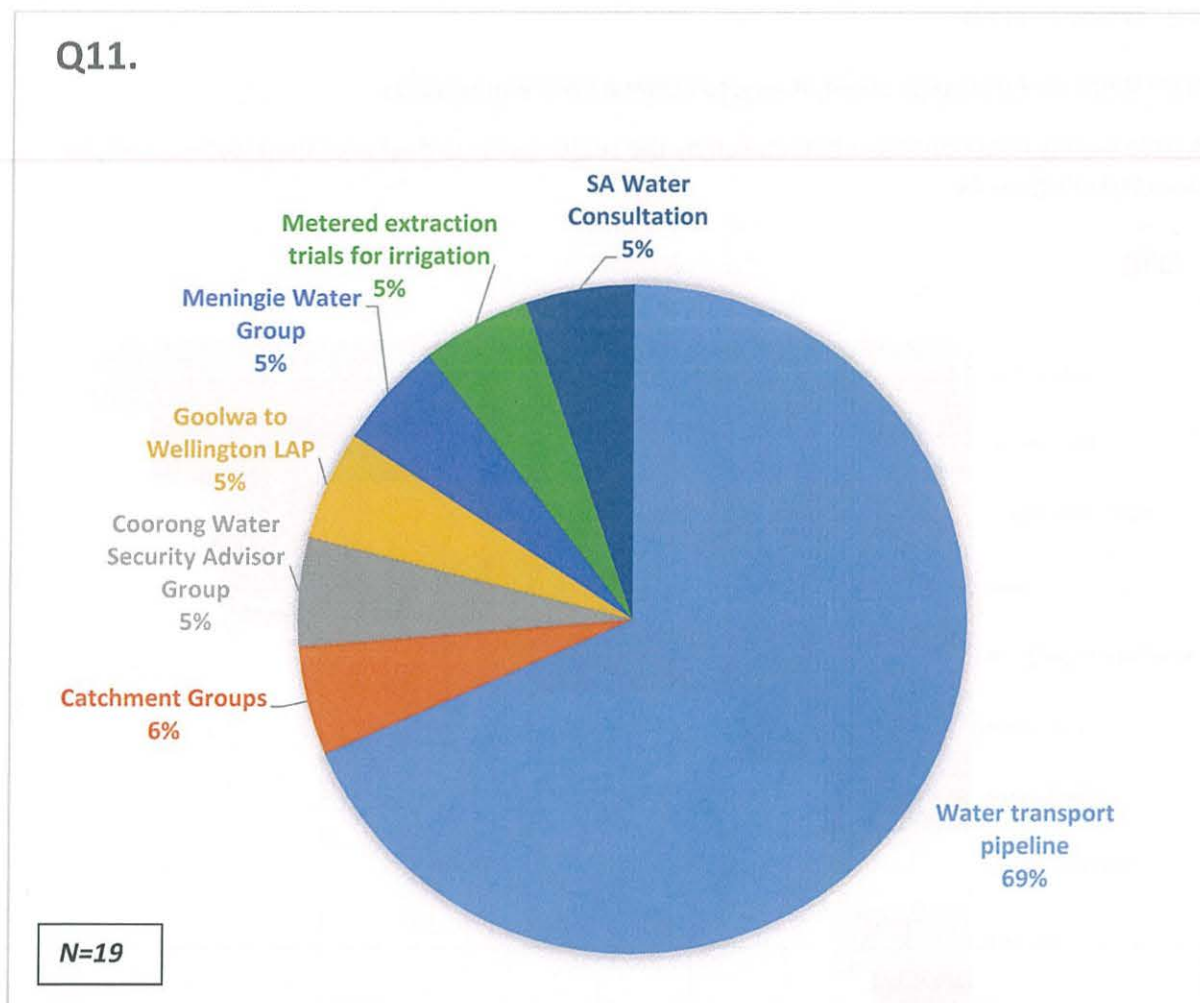


Figure 23. Group schemes

Comments at the Outcomes Workshop indicated that the 'Meningie Water Group', 'Coorong Water Security Advisor Group' and 'SA Water Consultation' may all refer to a Water Transportation Scheme (WTS) project conducted by Coorong Council (see below).

5.2 Coorong Water Transportation Scheme Feasibility Study

The Coorong District Council (CDC) in 2016 discussed with SA Water the potential for a scheme to use excess capacity in the Taillem Bend to Keith water pipeline for transporting River Murray water allocations held by local landholders. The proposal, similar to the Clare Valley Water Transport Scheme, was aimed at providing lower water prices for commercial users in the region.

With a grant from the Minister for Regional Development, together with in-kind and financial support from CDC as well as some landholders, Seed Consulting Services (Seed) was engaged to deliver a feasibility study on a Coorong Water Transportation Scheme (CWTS). An Expression of Interest (EOI)

was distributed via an on-line Survey Monkey questionnaire with hard copies posted out to regional landholders by CDC.

The 148 EOI responses indicated that 730ML of water was being used by respondents (all of whom were interested in participating in a water transportation scheme) out of a total delivery volume of 4,000 ML across the region. It was estimated that respondents would use an additional 161ML of water from a CWTS. The EOI information was shared with SA Water which advised that their analysis indicated there was insufficient growth potential to proceed with a CWTS and withdrew from the process.

The Seed report concluded that information gaps in regard to the value and growth potential of the regional meat and livestock sector together with the lack of a sub-regional group to champion the sectoral interests were shortcomings in the ability to develop a convincing business case for the CWTS.

In an ancillary process to the EOI the Coorong and Tatiara Local Action Planning (LAP) group and CDC contacted landholders and collected information on actions that landholders are already taking to supplement, reduce or move off the SA Water supply. With the conclusion of consideration of a CWTS the project group decided to focus on these on-farm solutions opportunities which included:

- Access to Tintinara-Coonalpyn Prescribed groundwater via a non-potable supply for stock;
- Private pipeline from the Lower Lakes;
- Micro-desalination of groundwater;
- Lined catchments;
- Leak detection; and
- Aquifer Storage and Recovery (ASR) with off-peak SA Water supply or private pipeline diversions.

Access to low-interest loans was highlighted as a way to assist local landholders to fund these alternatives to improve their security of water supply. It was also noted that there are State water policy implications to be considered in regard to sustainable use of regional water resources.

More broadly the Seed report noted:

‘While increasingly water and energy security are important regionally and at farm level it is questionable if water security and in particular water pricing alone influence the growth potential of red meat production. As stated by the Project Group, feed availability is still perhaps the greatest limiting factor and this is seasonal in nature.’

In regard to the above, PIRSA is funding an initiative, through its Premium Food and Wine Co-Innovation Cluster Program, to develop greater collaboration across the red meat value chain in the Limestone Coast. The Red Meat Cluster program aims to deliver broader benefits to regional livestock producers (<http://limestonecoastredmeat.com.au/>).

5.3 Regional issues and options summary

A summary of regional issues, comments and response options has been compiled from the survey results, group workshops and the earlier Coorong District Council / LAP Group outlined above (Table 1). Further detail can be found in Appendices 2 and 3.

Table 1 Summary of Regional Issues and Response Options from Industry Respondents (Survey, Focus Groups, Coorong WTS Report)

Region	Water Issues ³	Comments	Response Options
Far North	<ol style="list-style-type: none"> 1. Water Cost 2. Regs/Admin 3. Poor Quality 4. Restricted Volume 5. Retail Purchase 	<ul style="list-style-type: none"> • No SA Water mains water used here costs involved in pumping from A&T Basin & maintenance of bases. • Pastoral Board restricted management around watering points & stock numbers etc. • Cost to recover water from Artesian Basin: Diesel cost, solar extraction • Drilling of bores is highly restricted 	<ul style="list-style-type: none"> • Potential funding for improved infrastructure - 250k to replace bores • PIRSA/DEWNR drive a spread of watering points and issues of land delegation. • On property cost • Pressure Pastoral board for more watering points • Explore rational around water restrictions • Alternate land use: Deal with feral goats by farming them. • Infrastructure upgrades to deliver existing water
Whyalla & Eyre Peninsula	<ol style="list-style-type: none"> 1. Water Cost 2. Retail Purchase 3. Restricted Volume 4. Pressure 5. Pumping Cost 	<ul style="list-style-type: none"> • Much of the region has a high reliance on SA Water • Water cost + retail purchase = water cost • End of a long line for water = restricted volume • Pumping cost could be related to alternative water sources & SA Water due to restricted volume (pumping to tanks) • Lack of alternative sources for water 	<ul style="list-style-type: none"> • Water harvesting- lined catchment • Desalination • Move to full cropping • Better SA Water infrastructure for supply • On property storage • Grants, loans or incentives • Ground water/shandying • Solar Power, wind power and header tanks • On-Farm infrastructure upgrade: leak detection, pressure reducing devices
Yorke & Mid-North	<ol style="list-style-type: none"> 1. Water Cost 2. Pressure 3. Retail Purchase 4. Pumping Cost 5. Restricted Volume 	<ul style="list-style-type: none"> • Water cost + retail purchase • Water Pressure (both high and low)- high producing on-farm leaks; Low pressure because infrastructure is old • Wide area therefore pumping cost is an issue • Bottom of Yorke Peninsula has more livestock 	<ul style="list-style-type: none"> • Water harvesting- More dams • Desalination • Shandying • Improved SA Water delivery infrastructure, elevate pressure issues • May be some options for underground water • Access to new technology to reduce evaporation & leak detection • Water transportation scheme • With high pressure- leak detection must be a focus
Barossa	<ol style="list-style-type: none"> 1. Water Cost 2. Retail Purchase 3. Regs/Admin 4. Pumping Cost 5. Poor Quality 	<ul style="list-style-type: none"> • Poor quality • Retail purchase may not be same as water cost • Broader range of water sources- mains, underground, water licensing, dams, 'non -potable' water delivery • Low response rate with less issues Lots of small properties, not much livestock 	<ul style="list-style-type: none"> • Quality can be an issue with alternative sources, but there are options for that too-find alternative source • Water transportation scheme • Water filters & water treatment • Explore ability to dam water

³ Top five issues for regions from survey analysis at 3.4.1

Murraylands and Riverland	<ol style="list-style-type: none"> 1. Water Cost 2. Retail Purchase 3. Salinity 4. Poor Quality 5. Restricted Volume 	<ul style="list-style-type: none"> • Diverse region with some areas completely reliant on mains, then some areas with underground sources. • Water quality issue with ground water • Water hardness more than salinity • Very diverse region- mixed farming 	<ul style="list-style-type: none"> • Lined catchments water harvesting • Desalination • Private pipelines from Lakes • Leak detection units • Grants, loans, rebates & incentives (e.g.- Grants for leak detection) • Rainwater • Private Pipeline from Lake Albert • Poor quality from underground water • Salinity from Lower lakes • Local (micro)desalination of groundwater & brine disposal • Access to Tintinara-Coonalpyn Prescribed groundwater via a non-potable supply for stock • Aquifer Storage and Recovery (ASR) with off-peak SA Water supply or private pipeline diversions
Adelaide Metro	<ol style="list-style-type: none"> 1. Water Cost 2. Retail Purchase 3. Restricted Volume 4. Pressure 5. Pumping Cost 	<ul style="list-style-type: none"> • Restricted volume is high because of volume of uses • Low pressure or high pressure 	<ul style="list-style-type: none"> • Leak detection- A priority everywhere • On Farm Storage • Subsiding on farm solutions • More test bores/ Electromagnetic surveys to ensure we have groundwater sources.
Adelaide Hills, Fleurieu & Kangaroo	<ol style="list-style-type: none"> 1. Pumping Cost 2. Regs / Admin 3. Water Cost 4. Salinity 5. Restricted Volume 	<ul style="list-style-type: none"> • Higher rainfall plus alternative water sources • Diverse area: lot are not reliant on mains water; some reliant on SA Water • Regulatory : NRM water levies on water allocation are fresh in the minds of users in this region 	<ul style="list-style-type: none"> • Alternative power sources: Gravity feed; Solar power; wind Power • Review Water Allocation Plans • Leak detection • Shandyng
Limestone Coast	<ol style="list-style-type: none"> 1. Salinity 2. Water Cost 3. Regs/ Admin 4. Pumping Cost 5. Poor Quality 	<ul style="list-style-type: none"> • Groundwater salinity • Similar issues to the Murraylands/Coorong but also issues related to underground water • Higher rainfall, particularly to south • More water sources / more options 	<ul style="list-style-type: none"> • Leak detection on farm • Enable easier / cheaper water trade: information, policy changes • Improve Irrigation efficiency

6 Next Steps

On the 24 January 2018, a meeting between PIRSA and Livestock SA considered the next steps in this project. It was noted that:

- The current report identifies that water issues vary significantly across the regions and are dependent on the water options available to the producer.
- There is a lack of clarity from the survey results about the relative impacts of the various costs associated with access to water, water cost, cost of licence or cost of infrastructure.
- The report has not provided a strong evidence that water issues are a major barrier for producers to enter the livestock industry or to increase their production. Only 35% of respondents indicated that if water wasn't limiting they would increase their stock numbers.
- The report provides an indication that water may have an effect on profitability, however, the responses are qualitative, with no verification of the actual impact.
- The survey itself did not canvass the comparison of water issues against other impediments producers may need to address to increase production. However the Coorong Water Transportation Scheme Feasibility Study, which industry asked to be considered in the report, concluded in part that feed availability was perhaps still the most limiting factor for the growth potential of red meat production in the region.

The following points were identified during discussion as potential indicators for future investigation:

- Regulation and administrative restrictions; half of the regions identified regulation and administrative restrictions in their top five issues impacting on their business. This was particularly an issue for the use of dam water supply, and in the mid-north for mains water supply. Planning approval and reporting requirements were the dominating regulatory / administrative issues impacting the business (65% of respondents).
- Profitability: When asked what the impact on your business (% reduction in profit) in the next 5 years if there is no change to water related issues impacting on your business, 34% of respondents predicted a small or no reduction, 3-5% predicted an intermediate impact (2-15%) and 4% predicted a catastrophic impact (>15%). Whilst the survey has discovered a potential issue, there needs to be verification of the claims. Investigation to better understand what the cause of the effect on profitability is may also be warranted. This could include consideration of water costs (infrastructure, licencing), loss of production due to salinity or restricted volumes.
- Salinity: salinity has been identified as an issue for three regions. Research, development or extension on understanding the problem and identifying solutions may be warranted.

It was recommended that a meeting of the Project Team be held to further discuss the findings and explore opportunities, through PIRSA programs and industry research funding for future work (if required).


7 Appendices

Appendix 1: Survey Instrument

Appendix 2: Eudunda Focus Group – Agenda and Summary

Appendix 3: Survey Outcomes Workshop – Agenda and Summary

7.1 Appendix 1: Survey Instrument

Livestock SA Survey 2017

Identifying Stock Water Issues for the Livestock Industry

Introduction

Livestock SA is advocating for water security as a state wide objective for livestock producers to deliver improved resilience and long term viability to the South Australian livestock industry.

Primary Industries and Regions SA (PIRSA) are partnering with Livestock SA in conducting this on-line survey to collate the sector's stock water issues across the State.

The survey provides an avenue for primary producers and stakeholder groups to tell us what their stock water issues are and where they can see opportunities for fit-for-purpose and sustainable water supplies to support development of their livestock businesses.

Livestock SA will use the survey results to identify issues for future action. Some issues or actions may potentially be dealt with easily and quickly; other issues will need further investigation and discussion to be resolved; finally, there may be matters that cannot be resolved and the reasons will be detailed.

This survey is available at LivestockSA and will be **open until COB Friday 10 November**. Questions regarding the online survey or the livestock project can be sent to PIRSA.livestockwater@sa.gov.au

Instructions

Before commencing the survey you may want to refer to any data that you have on water use, water cost or related issues as they affect your business.

The value of the survey results are dependent on respondents providing as complete and accurate information as possible. Your responses will be confidential and the outputs from the analysis will not identify individuals or groups.

If you have multiple properties, please identify and focus on the main property or enterprise with the water related issues that are priorities for you.

If you check Question 2 as anything other than a producer you will be automatically directed to a sub-section of the survey. If you want to see the full survey you can check Question 2 as a producer and see the full set before returning to the start.

*** 1. Property PIC / Hundred Name / Nearest Township**

* 2. Please describe your role in the industry

(Note: questions are allocated according to industry selected below)

- Primary producer
- Service provider/advisor
- Processor
- Other (please specify)
- Council
- Community group
- Industry group



Water Related Business Issues

3. Please indicate the number of livestock your business runs

	Beef	Dairy	Sheep
Number	<input type="text"/>	<input type="text"/>	<input type="text"/>
Other (please specify)	<input type="text"/>		

4. How much water are you using for your stock over an average year? (kL/yr)

5. What are the water supply related issues impacting on your business? (tick all relevant boxes)

	N/A	Minor	Major
Restricted volume	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Poor quality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Salinity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Timing of availability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pumping cost	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Regulatory / administrative restrictions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Water Cost	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pressure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Retail Purchase	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other Issues/ Comments

6. What is the cost of water to your farm business on an average year (estimated percentage of production cost)?

7. What will be the impact on your business (% reduction in profit) in the next 5 years if there are no changes to water related issues impacting on your business?

8. If water was not a limiting restriction, would you likely plan to expand your business in the short to medium term (2-5 years)? If yes, how would your business grow? (choose all that are relevant)

No (indicate with an 'N')	<input type="text"/>
Unsure (indicate with a 'U')	<input type="text"/>
Acquire more land (ha)	<input type="text"/>
Increase stock numbers (number of head)	<input type="text"/>
Upgrade machinery (\$)	<input type="text"/>
Estimate of overall business expansion (%)	<input type="text"/>
Other	<input type="text"/>



Potential Responses to Water Issues

9. Do you have a current, documented business Plan?

- Yes
- No

10. What on-farm steps have you taken, if any, to address your water issues?

- None
- Desalination
- Dams
- Lined catchment
- Leak detection
- Installed bore
- Stock species change
- Reduction of stock numbers
- Agistment
- Water purchase
- Wedge hole
- Other (e.g. Pipeline, Shandy water)

11. What group schemes, if any, have you been involved in to address the issues?

Water transport pipeline

Other (please specify)



Water Management Regime

12. What stock water resources do you currently have available?
Indicate volumes in all categories that apply (kL/year)

Mains	<input type="text"/>
Farm dam	<input type="text"/>
Lined catchment	<input type="text"/>
Ground water	<input type="text"/>
Stream / river	<input type="text"/>
Reclaimed water	<input type="text"/>
Other	<input type="text"/>

13. Are there any water regulatory or administrative requirements impacting on your business? What are the requirements?

- Brine (R.O.) disposal
- Supply contract conditions
- Planning approvals
- Reporting requirements
- None
- Other (please specify)

14. Do you have any other ideas on water management that you would like us to explore? Any other comments?



Non-Producer Respondents

15. What are the water issues impacting on your sector / region / community (tick all relevant boxes)

	N/A	Minor	Major
Restricted volume	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Poor quality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Salinity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Timing of availability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pumping cost	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Regulatory / administrative restrictions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Water Cost	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pressure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Retail purchase	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other Issues / Comments

16. In what areas are you seeing effects due to these water issues?

- Business productivity
- Business expansion
- Decreased employment
- Decreased amenity
- Other (please specify)

17. If you know of any previous investigations or development of solutions for water related issues that you believe might be relevant to your industry sector / region / community, please provide details / reference e.g. report title / description / location / industry

18. Do you have any other ideas on water management that you would like us to explore? Any other comments?



Thank you for taking the time to complete this survey.

Please note this is an optional section.

Please only complete if you are happy to be contacted by a PIRSA / Livestock SA representative for follow up questions.

19. Contact details

Name	<input type="text"/>
Address	<input type="text"/>
Email	<input type="text"/>
Phone number	<input type="text"/>

20. Are you a Livestock SA member

- Yes
- No



Thank you for taking the time to complete the Livestock SA survey.

By completing this survey you are agreeing to Livestock SA using this information to conduct further research. Your personal information will not be shared. Survey data will be available in collated form on the Livestock SA website by end of 2017.

www.livestocksa.org.au

7.2 Appendix 2: Eudunda Focus Group – Agenda and Summary

Livestock Water Issues Workshop

Eudunda Wednesday 8 November 2017

Purpose

The workshop will bring stakeholders together to focus on identifying water supply issues for the regional livestock sector and potential responses.

Facilitator: Gerry Davies (PIRSA) with support from Marina Bogdan (PIRSA).

There were twelve participants.

Agenda:

Item	Topic	Speaker	Time
1	Welcome and Outcomes for workshop	Deane	11am
2	Brief overview of the project <ul style="list-style-type: none">➤ Scope➤ Questions➤ Objectives of workshop	Deane / Gerry	11.10am
3	Brainstorming the issues <ul style="list-style-type: none">➤ What do the stakeholders see as the issues ('Lens' process: brainstorm, group, name)	All	11.30am
4	Lunch Break	All	12.15pm
5	Priorities / Actions We will collate the issues and work in small groups to: <ul style="list-style-type: none">➤ Develop pathways to resolve issues	All	12.45pm
6	What next? <ul style="list-style-type: none">➤ Review outputs / Next steps	All	1.30pm
7	Workshop close.		2.00pm

Livestock Water Focus Group Workshop: Summary Report, Eudunda, 8 November 2017

Issues Raised:

- Main issues are the cost of water & the price for Primary Production Vs Domestic Production. Stock water cost should be cheaper than any other
- Mains infrastructure not adequate, SA Water maintenance is not good enough causing leaks left for weeks
- Lack of main pressure
- Age of Infrastructure
- Bees and birds contaminating Livestock drinking water
- Feral Kangaroos from lifestyle blocks are increasing therefore the cost of them drinking water from adjacent properties is increasing and farmers are absorbing this cost.
- Wombats destroying pipelines
- White ants attacking water lines
- Vermin

Options Discussed:

- Harvest own water - ground sheeting with subsidy/ rebate
- Approach SA Water for a subsidy for groups of Primary Producers
- Dams- maintain holding ability with liners
- Buy megs/ML of water
- Water Scheme
- Grant to destroy Kangaroos
- Or a subsidy for watering the wildlife
- Water Transportation Scheme- Store/ Transport

Questions Asked:

- Clare Valley Scheme – What is the pumping cost
- Why is the Barossa Valley water cheaper for Vineyards / wine makers?
- Will bore water ever be metered

Observations:

There are more issues across this region than just the cost of water. Farmers are having to bear the extra cost of water from increased influx of feral animals (Kangaroos and other wildlife) who access drinking water set aside for farm animals.

A few felt that there was unfairness between the water cost across other industries such as wine makers (vineyards) and other food producers. Water sources and water quality varies and it is for this reason that there is such reliance on potable water from SA Water.

7.3 Appendix 3: Survey Outcomes Workshop – Agenda & Summary

Livestock Water Issues Project – Survey Outcomes Workshop

Wednesday 22 November 9.30am to 12.30pm

Adelaide: Meeting Room 1, Level 7, 101 Grenfell Street

Purpose

The workshop will bring key stakeholders together to focus on reviewing the outputs from the Survey and Focus Group meeting, reviewing key issues, examining options and next steps.

PIRSA provided facilitation support through:
Gerry Davies, Stuart Wright, Marina Bogdan and Gerard Ferrao.

Draft Agenda

Item	Topic	Speaker	Time
1	<i>Welcome and Outcomes for workshop</i>	Livestock SA / PIRSA	9.30am
2	<i>Overview of the project</i> <ul style="list-style-type: none">➤ <i>Survey results</i>➤ <i>Questions</i>	Gerry Davies / Stuart Wright All	9.35am
3	<i>Review of key issues</i> <ul style="list-style-type: none">➤ <i>Regional issues (incl. focus group output)</i>➤ <i>Small groups review of main themes</i>➤ <i>Group report-back</i>	Gerry Davies / Stuart Wright All	10.30am
4	<i>Tea break</i>		11.00am
5	<i>Response Options</i> <ul style="list-style-type: none">➤ <i>Select main issues</i>➤ <i>Small groups: Options development</i>➤ <i>Group report-back</i>	All	11.15am
6	<i>Next steps?</i>	Livestock SA	12.00noon
7	<i>Workshop close. Light Lunch</i>		12.30pm

Participant Preparation:

Participants are asked to familiarise themselves with the preliminary analysis of Survey Results

WHYALLA & EYRE PENINSULA

Issues:

- Much of the region has a high reliance on SA Water
- Water cost & retail purchase = water cost
- End of a long line for water = restricted volume
- Pumping cost could be related to alternative water sources & SA Water due to restricted volume (pumping to tanks)
- Lack of alternative sources for water

Options:

- Water harvesting - lined catchment
- Desalination
- Move to full cropping
- Better SA Water infrastructure for supply
- Leak detection – ground water, desalination, harvesting and pressure reducing devices
- Upgrade infrastructure
- On property storage
- Grants, loans or incentives
- Shandying
- Solar Power, wind power and header tanks
- On-Farm infrastructure upgrade
- Management Options - Not many cattle, 90% sheep - drink water, over 50% crop comes from this Region

FAR NORTH

Issues:

- Not a mains water issue - there are costs involved in pumping from A&T Basin & maintenance of bores.
- Pastoral Board restricted management around watering points & stock numbers etc.
- No SA Water used here
- Cost to recover water from Artesian Basin Diesel cost, solar extraction
- Cannot move watering points due to native veg restrictions.
- Drilling od bores is highly restricted

Options:

- Putting pressure on the Pastoral Board
- Potential funding for improved infrastructure (already been a round of funding for this in recent drought).
- 250k to replace bores
- PIRSA and DEWNR need to drive a spread of watering points and issues of land delegation.
- On property cost
- Pressure Pastoral Board for more watering points
- Explore rational around water restrictions
- Alternate land use: Deal with feral goats by farming them
- Infrastructure upgrades to deliver existing water

YORKE & MID NORTH

Issues:

- SA Water, some bores and dams
- Water Pressure (both high and low) - Lower pressure because infrastructure is old
- Bottom of Yorke Peninsula has more livestock
- Wide area therefore pumping cost is an issue
- Water cost and retail purchase

Options:

- Water harvesting- More dams
- Desalination
- Leak detection units
- Shandyng
- Improved SA Water delivery infrastructure, elevate pressure issues
- May be some options for underground water
- Access to new technology to reduce evaporation & leak detection
- Water transportation scheme
- Similar to EP- Infrastructure improvements through SAW to help with low pressure issues
- With high pressure- leak detection must be a focus

BAROSSA

Issues:

- Water Cost
- Poor Quality
- Retail Purchase may not be the same as water costs
- Broader range of water sources- mains, underground, water licensing, dams, 'non potable' water delivery
- Low response rate with less issues and they have access to a wider range of alternative water sources
- Lots of small properties with not much livestock
- Predominantly region is horticulture (grapes) and not Livestock

Options:

- Quality can be an issue with alternative sources, but there are options for that too- Find alternative source
- Water Transportation Scheme
- Water filters & Water Treatment
- Explore ability to dam water

ADELAIDE

Issues:

- Restricted volume is high because of volume of uses
- Low pressure or high pressure

Options:

- Leak detection- A priority everywhere
- On Farm Storage
- Subsidizing on farm solutions
- More test bores/ Electromagnetic surveys to ensure we have groundwater sources.

ADELAIDE HILLS, FLEURIEU & KI

Issues:

- Pumping cost followed by regulation restrictions
- Higher rainfall plus alternative water sources
- Need to remember key issues of reliance on SA Water
- A lot are not reliant on mains water
- Regulatory relates to levies of water allocation
- NRM water levies are fresh in the minds of users in this region
- Gravity feed
- Solar power
- Wind Power

Options:

- Review Water Allocation Plans
- Leak detection
- Shandying

MURRAYLANDS AND RIVERLAND

Issues:

- Diverse region with some areas completely reliant on mains, then some areas with underground sources.
- Water quality is with ground water
- Water hardness more than salinity
- Very diverse region- mixed farming

Options:

- Lined catchments water harvesting
- Desalination
- Private pipelines from Lakes
- Leak detection units
- Grants, loans, rebates & incentives (e.g.- Grants for leak detection)
- Rainwater
- Private Pipeline from Lake Albert
- Poor quality from underground water
- Salinity from Lower lakes
- Measures to introduce local desalination and Brine disposal

LIMESTONE COAST

Issues:

- Ground water
- Salinity
- Irrigation efficiency
- Water cost
- Similar issues to the Murraylands/Coorong; additional issues related to underground water
- Higher rainfall, particularly further south
- Generally, more alternative water sources so may be more options

Options:

- Leak detection on farm

