Angas Bremer Irrigation Management Zone 2008 – 2009 Annual Report

Project Coordinator: Sylvia Clarke

Angas Bremer Water Management Committee Inc

Supported by

Government of South Australia
South Australian Murray-Darling Basin
Natural Resources Management Board

Report Contents

Angas Bremer Water Management Committee Inc.

Committee Members 2008-2009

Chairman - Terry McAnaney
Vice Chairman - John Pargeter
Treasurer - Guy Adams
Committee
Sarah Keough, Colin Cross, John Follett, Rick Trezona, Phil Reilly, Brian Wyatt, Mac Cleggett and Tony Thomson (DWLBC)

Non-elected members of the Committee
Lian Jaensch -*Langhorne Creek Wine Industry Council*
Secretary - Barbara Blaser
Program/Project Coordinator - Bruce Allnutt/ Sylvia Clarke

Report of the Activities of the Committee 2008-2009

1. Flood Plain Study

The monitoring of well-water-levels and soil moisture along the Angas and Bremer River flood plains has continued since late 2002. The data collected has helped the Committee and DWLBC to understand the groundwater system.

There are currently 23 electronic loggers in Government observation wells, 11 in the confined aquifer (T aquifer) and 12 in the unconfined aquifer (Q aquifer) measuring standing water levels in these wells. As well, there are 8 soil moisture monitoring sites in vineyards on the flood plains and these are located as near as possible to the Govt. observation wells being monitored. The soil moisture logging uses gypsum blocks connected to electronic loggers. The gypsum blocks have a finite life and the Committee decided that each block would not be replaced as the blocks fail but logging is continuing until all the blocks have failed.

Funds were obtained from the SAMDBNRM (South Australian Murray Darling Basin Natural Resource Management) Board to expand the study of water levels by purchasing another 10 loggers. Sites for the new loggers were selected and the new loggers were installed at the end of 2008. Three of these loggers measure salinity in the T aquifer while the remainder are water level loggers.

With the increase in Aquifer Storage and Recovery, now referred to as Managed Aquifer Recharge (MAR) over the last couple of years and the increasing salinity of the water in the confined aquifer, this monitoring network will allow us to keep a close eye on changes

within the groundwater resource. This information will also be used when new modelling of the aquifer is done and allow more informed management decisions to be made.

2. Angas Bremer map layers

The 350+ map layers, including artificial recharge and recovery volumes, allocation volumes, extraction volumes, grower pipeline locations, aquifer pressure-surface contours, aquifer salinity contours and flood boundaries are now available from the AB website www.angasbremerwater.org.au.

3. Angas Bremer Database and Website

The database commissioned by the Committee in 2005-2006 has only had a few minor changes this year. More major changes and an upgrade of the committee's website are needed in the near future and will be completed as soon as funds are sourced for this purpose. One outcome of this will hopefully be that irrigators will have the option of submitting irrigation annual reports on-line next year.

4. Mundulla Yellows Project

The Full report (with photos) can be found on the website (www.angasbremerwater.org.au)

The cause of Mundulla Yellows (MY) is largely unknown but is believed to be related largely to soil properties. It was advised that the use of iron (Fe) implants could improve the health of the trees in the short term.

The ABWMC resolved to conduct a trial at 3 sites in the Angas Bremer Prescribed Wells Area, with the aim to:

1. confirm the diagnosis of MY, and
2. test the effectiveness of Fe implants for treatment of the symptoms of MY.

Three sites were selected:

- Site 1. Brian Meakins Horse Radish Farm
- Site 2. Peter Silvers Lucerne Farm
- Site 3. Wellington Road

Soils were analysed for pH, electrical conductivity (EC) and ion concentrations.
Foliage samples were analysed for total nutrient concentrations. The initial diagnosis of MY as being the primary cause of the decline in tree health was supported by the both the soil and foliage properties. At the Meakins and Silvers sites, iron implants were inserted into holes drilled in 2 trees, while a third tree was left as a control for comparison. At the Wellington Rd site 2 branches on one tree were treated and a third branch left as a control. Photographs of each site and tree were taken prior to inserting the iron implants on 31st August 2007, and again on 14th January, 12th August, 13th November 2008 and 29th May 2009. The purpose of the photographs was to record how the trial trees responded to the treatments.

From the photos taken in January, 6 months after the insertion of the implants, it appeared that the control trees had continued to decline in health, while the results of the iron treatment were mixed. New, deep green growth was observed in at least one of the treatment trees or branches at each site, but others showed no improvement.

Photos have continued to be taken and in general the trees that had appeared to have responded well to the treatment in January, are now displaying yellowing of the leaves

again. However, the climatic conditions have not been ideal for new growth, particulary the lack of spring rainfall. From these results it appears the iron implants have not been highly successful for treating the red gums under these conditions. This project is therefore not officially going to be continued into the future. However, the trees will be opportunistically visited to look for any changes over the next few years.

5. Salt trends

Richard Stirzaker from CSIRO Land and Water and Tony Thomson from DWLBC have provided reports on district salt trends in the Angas Bremer region.

The 2008 report shows a general trend of increase in the district average salt readings through each growing season, peaking in June, then falling to its lowest values at the commencement of the next irrigation season. This is what we would expect if post-season leaching-irrigations and the winter rain do remove salt from the profile. However, there were two unexpected trends; at around 2,000 mg/L, the lowest average salinity readings at the start of each season are quite high, and the highest district average readings – reaching 4,000 to 5,000 mg/L - are above the generally accepted threshold for grapes.

In the last 2 years, the data from the new 30 cm detectors does show cause for concern. Some very high salt readings at this shallow depth demonstrates that salt is accumulating in the top part of the root zone. This is probably a consequence of the sharp rise in the salinity of Lake Alexandrina and of growers using underground water.
Last year's Irrigator's Annual Report is available on the website. This important project is continuing this year. The Fullstop reports from the 2008-2009 season have been sent to CSIRO for analysis and the results should be available early in the new year. Irrigators are reminded that to achieve accreditation they must return their Fullstop record sheet with their Irrigation Annual Report. The Fullstop reports give an indication of where salt is accumulating in the soil profile.

Irrigation Annual Report Forms

Irrigation Annual Report forms (IAR's) were mailed to 142 irrigators, 110 irrigators who returned their completed forms on time have achieved "Accredited Irrigator" status and will be issued with accreditation certificates, 21 IAR's that were received by the Committee after the due date did not achieve accreditation and a further 3 irrigators have not (at the date of this report) returned their IAR forms. The discrepancy in the total numbers is due to the amalgamation of some licenses under one name during the year. The data from 130 irrigators has been collated and that data is presented in the following graphs and tables. Comments are included with each graph/table.

Flooding:- Flooding by diversion or pumping was reported by 10 irrigators. Most of the flooding events were during the month of August 2008 with 1 event at the end of July 2008. 215 ha were flooded; this figure includes some properties that were flooded twice or three times.

Revegetation: - The total area of re-vegetation reported in the Irrigation Annual reports is 1676.28ha. This total is made up of;

- 1369.18ha of privately owned
- 200.4ha jointly owned
- 44ha of leased revegetation
- 54.6ha of Community plantings; and
- 10.6ha of revegetation on Council Reserves for which irrigators have an agreement with the Alexandrina Council.

Red Gum Health:- 76 Irrigators reported on the health of the red gums on their properties. Health, or otherwise, was rated from 0 to 5, 5 being healthy and 0 being dead. Most irrigators reported no change or a decline in the health of their red gums over the year. Many commented that the trees appeared to be suffering under the drought conditions. Only 13 irrigators reported that 100% of their red gums were healthy.

Water Leasing:- Table 1 below shows the amount of water leased in 2008-2009 compared with water leased in 2007-2008. This table shows that there was a great deal of water trading within the Angas Bremer Irrigation Management Zone this year. Both River Murray and Groundwater trading were greater this year within the zone than in 2007-2008. The amount of River Murray water traded to irrigators outside the zone and the amount traded in from outside was lower than the previous year, presumably due to the low allocations meaning that little water was available for trading across the Murray system.

Table 1

Type of Lease	Megalitres 2007-2008	Megalitres 2008-2009
RM water leased from ABIMZ to outside ABIMZ	866	361.10
RM water leased from outside ABIMZ to inside ABIMZ	2981.67	1347.72
RM water leased from inside ABIMZ to inside ABIMZ	415.21	445
Groundwater leased from AB licence to AB licence	1022.6	1613.12

Chart 1. Angas and Bremer Rivers Water Extractions:- Not all of the water taken from these Rivers is accounted for, such as the water diverted through weirs and sluices. The volumes on this graph are metered volumes reported on the Irrigation Annual Reports. It is interesting to note that the amount of water extracted from these rivers has increased this year, despite a moratorium being in place.

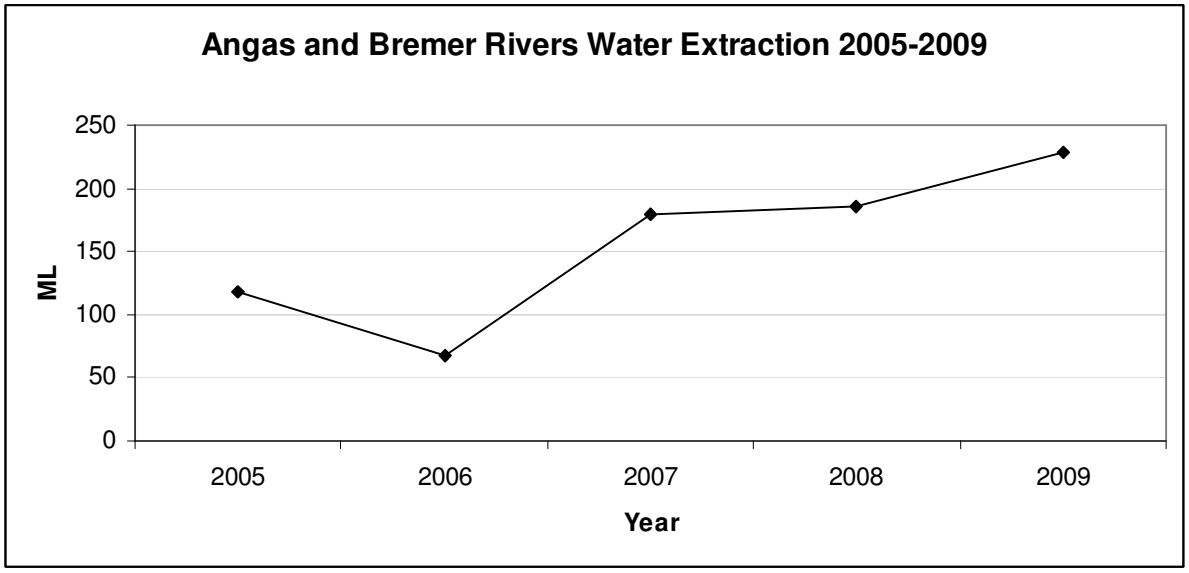


Chart 2. River Murray Water Allocation and Extraction:- Allocation is the volume of water endorsed on licenses and does not include any credits for rollover, recharge etc. Extraction is the volume of water that was used during the irrigation years. The allocation for 2009 was 30,583 ML and the recorded use was 5,442 ML. The amount of River Murray water used during the year was much less than in previous years because of the lack of access to suitable water from Lake Alexandrina.

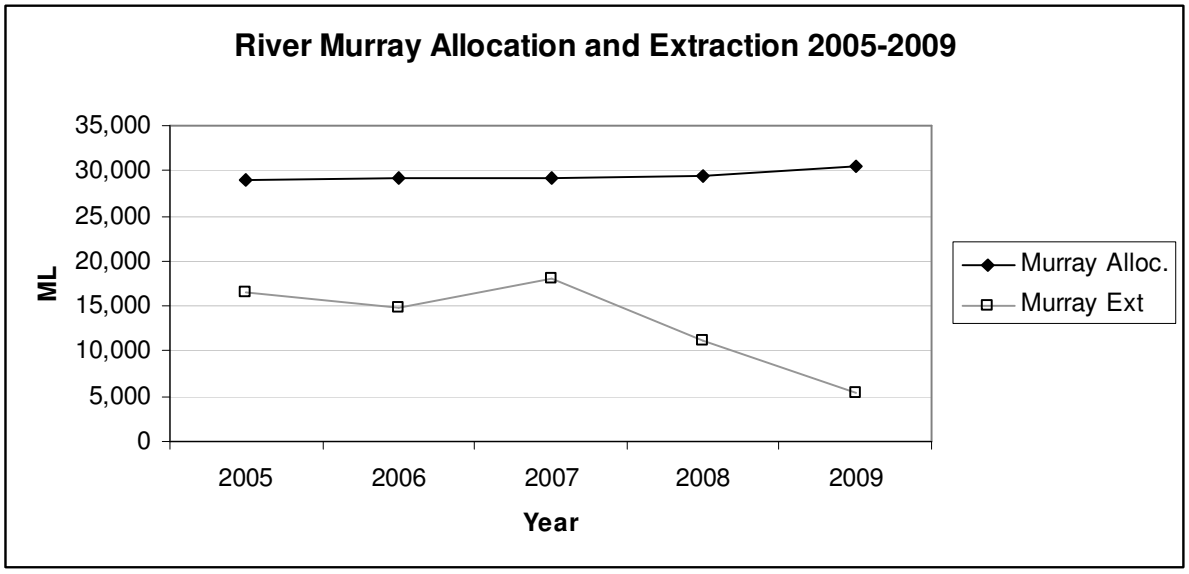


Chart 3. Groundwater Allocation and Extraction- The maximum allocation for 2009 was 6,500ML and the recorded use was 7,694ML. The difference between these amounts is due to the extraction of recharged water and roll over allocations this year by some irrigators.

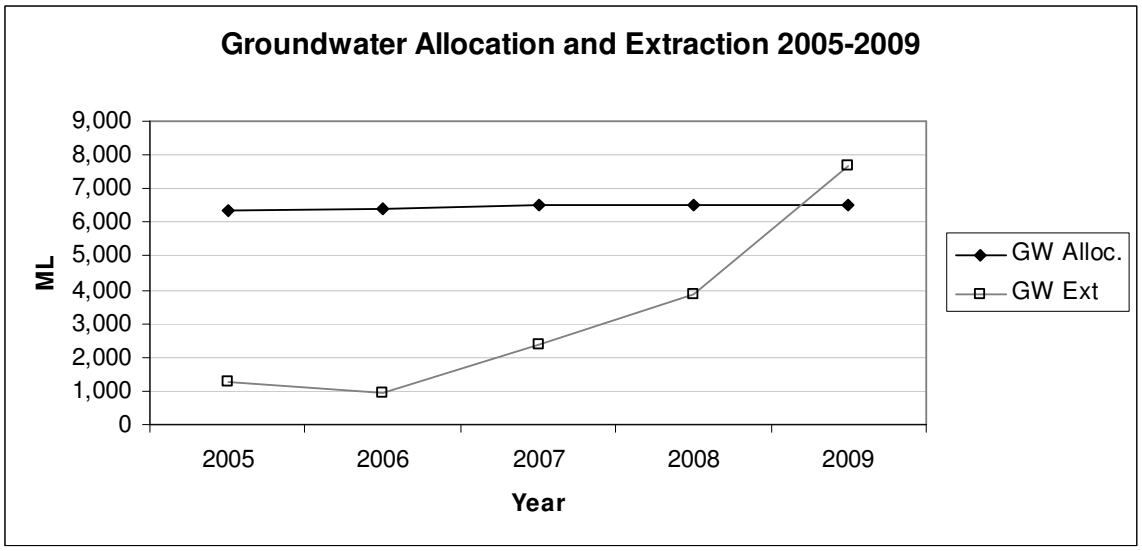


Chart 4 Total volume of water used: - This volume is the total used from all sources; groundwater, watercourse water and River Murray water that was applied to each crop type (grapes excluded). **The total volume of water applied to grapes was 10738.03 ML in 2008-09 compared with 12434.33 ML in the previous year.** The **total volume of water used for all purposes was 14766 ML in 2008-09**, well below the total for the previous year of 19089 ML.

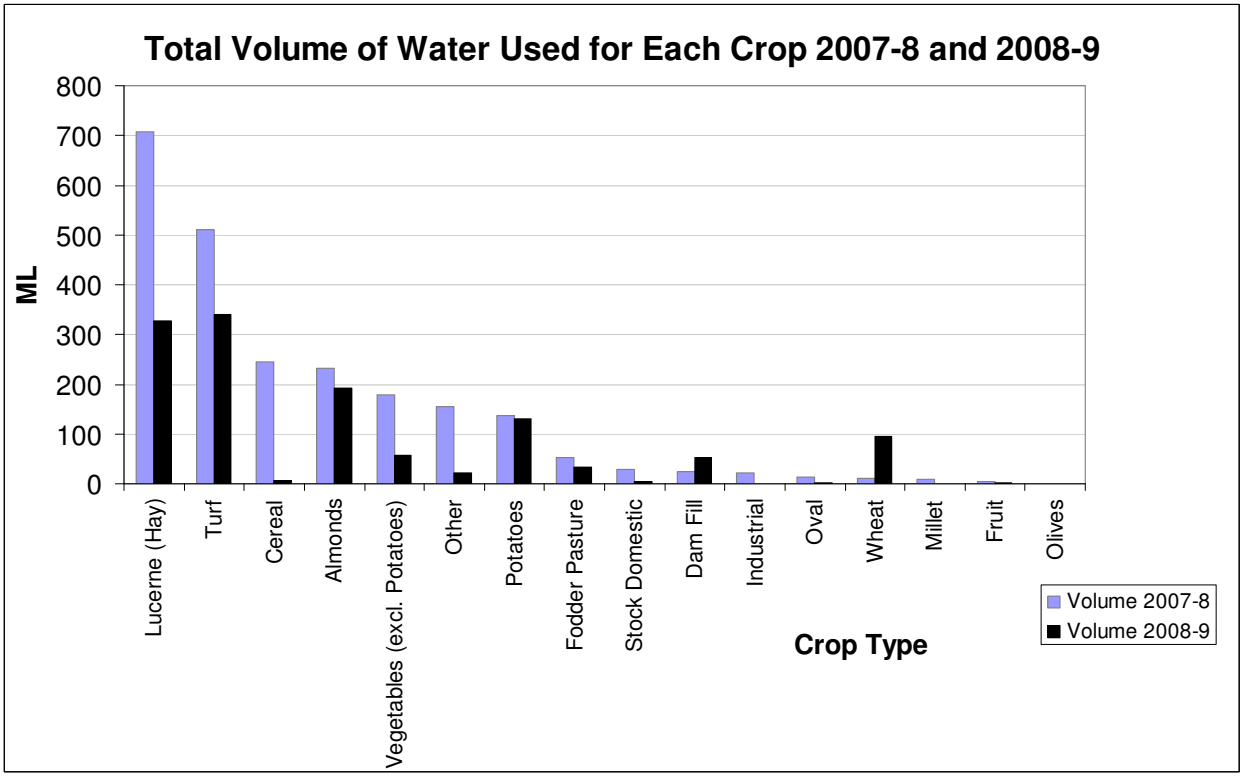


Chart 5 Area Irrigated: - The area of each crop irrigated is shown in hectares. **The area under grapes in 2008-09 was 6198.82 Ha, lower than the previous year's total of 6385.47 Ha, but some of this may be accounted for in reports not yet submitted.** The total area under irrigation in 2008-09 was 6743.02 Ha compared with 7230.82 Ha in 2007-08.

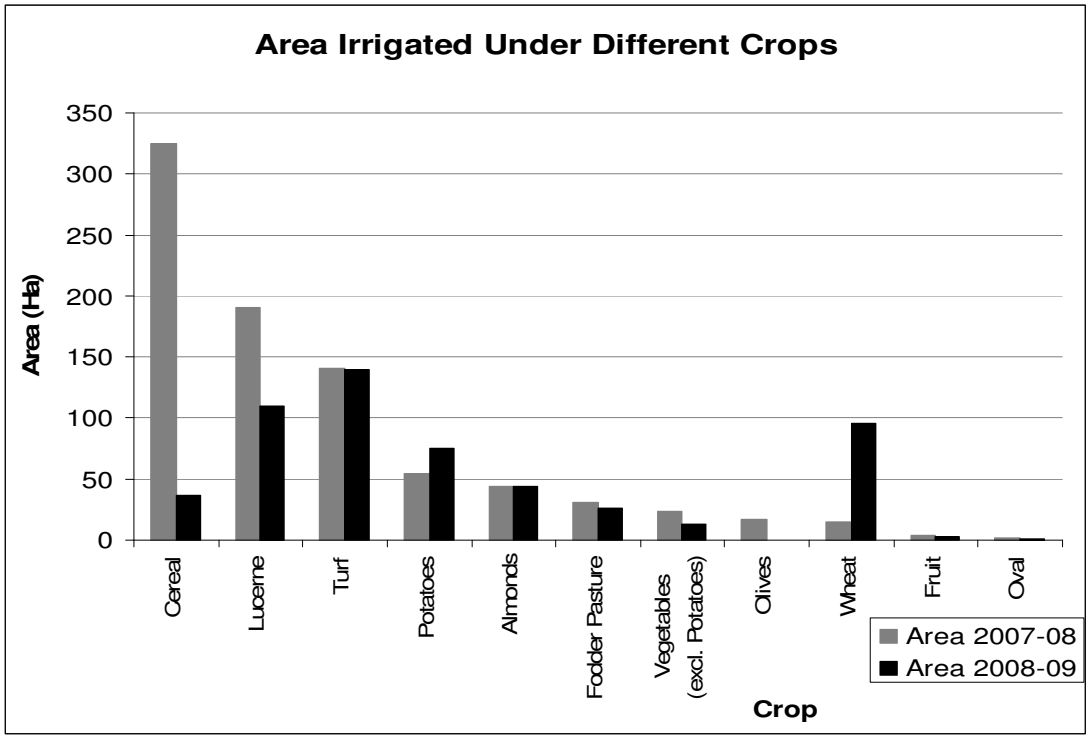


Chart 6:- Irrigators Each Crop: - The charted decrease in the number of grape growers is partly because some growers have not submitted their Irrigation Annual Report.

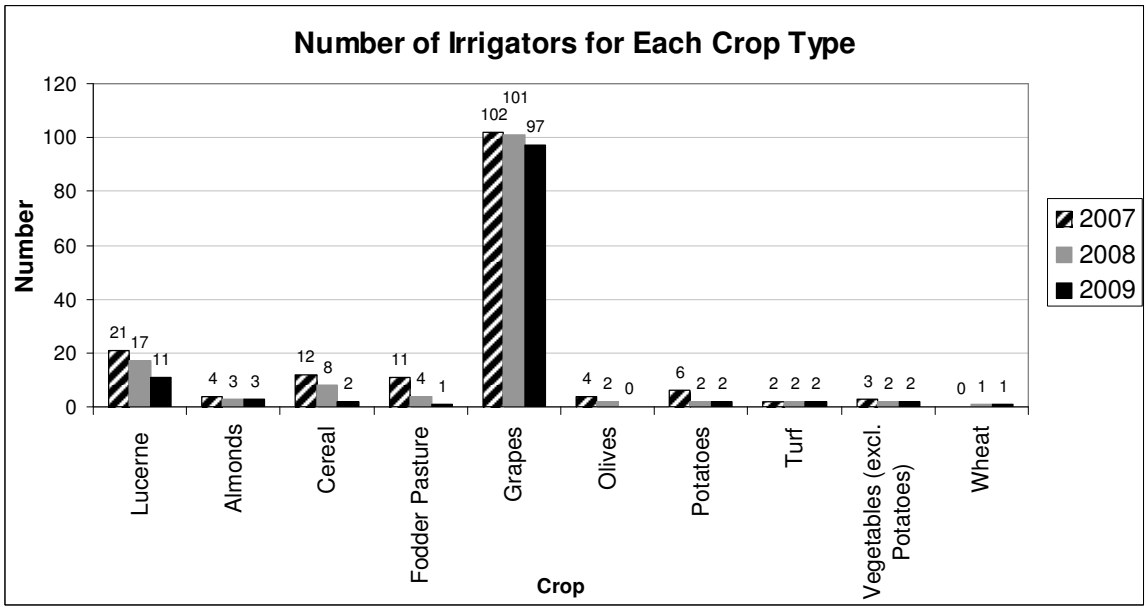
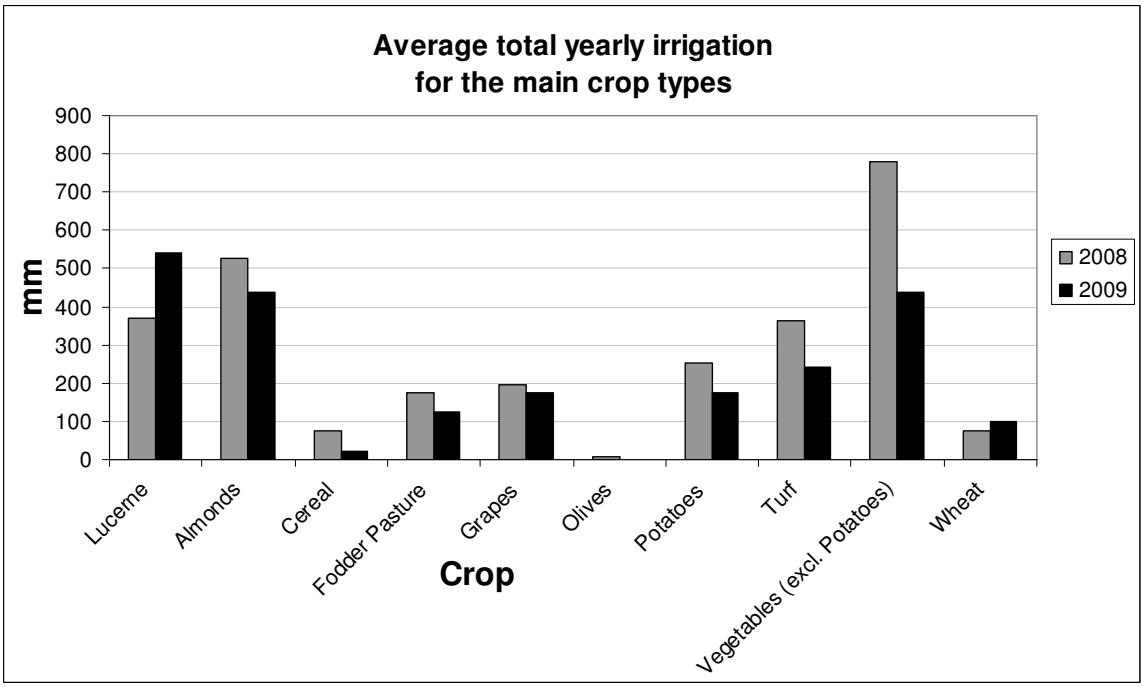
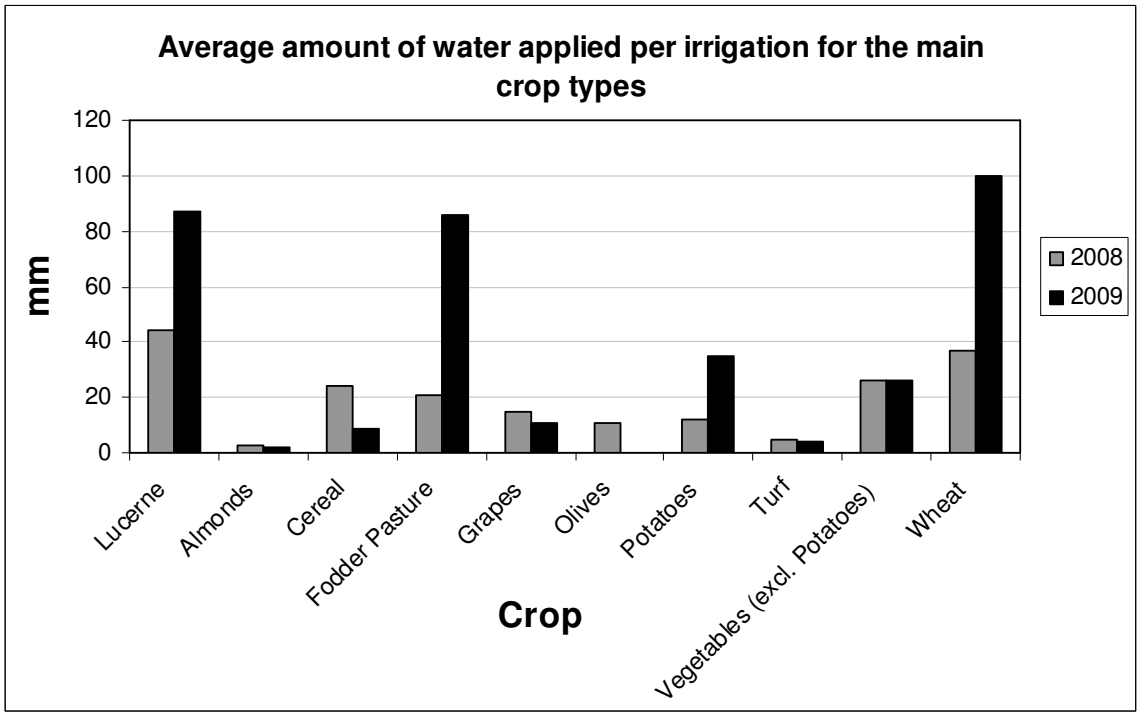


Chart 7:- For each crop, the following 2 charts show the average irrigation in millimetres per year (Chart 7(a)) and the average mm for each irrigation (7b) for the larger crops. Both Charts compare 2008-2009 with the previous year.

7(a):-

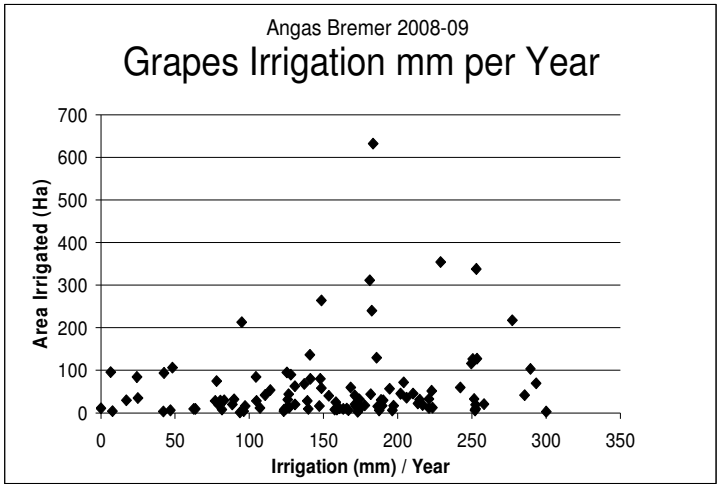


7(b):-

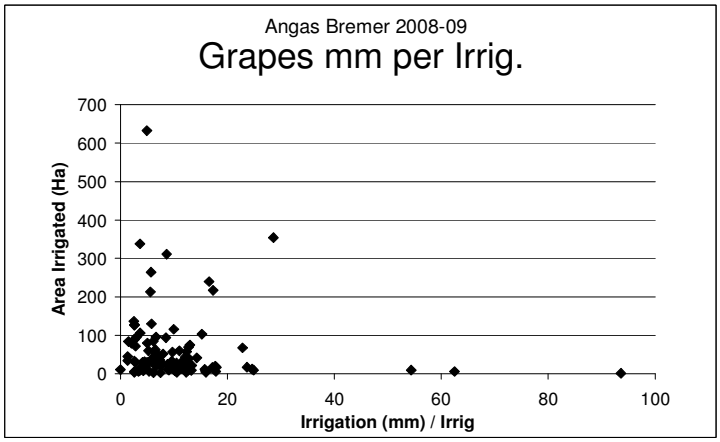


Charts 8 to 13:- These charts are for the larger crops. For each crop one chart shows the mm per year and the second mm per irrigation. For grapes an additional chart (8c) has been included. It excludes those irrigators who used winter flooding using a large volume of water in a single irrigation.

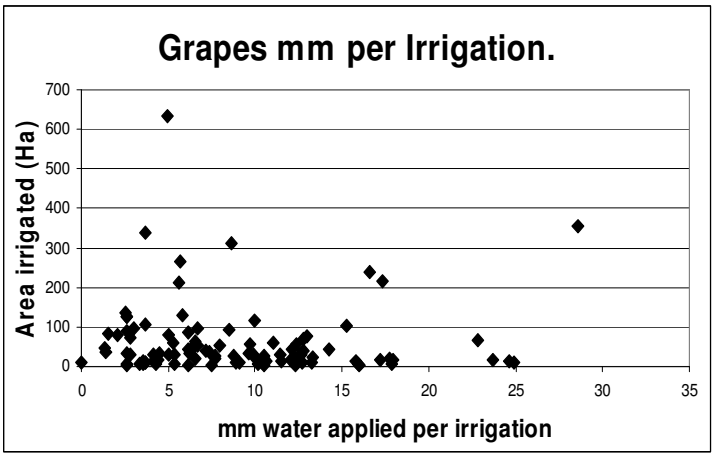
8(a)



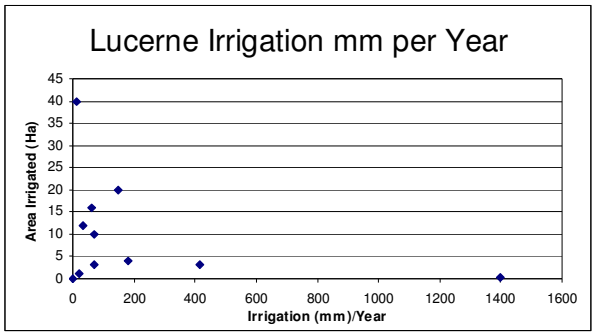
8(b)



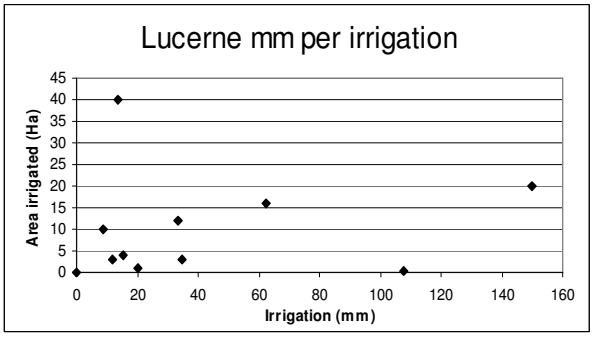
8 (c)



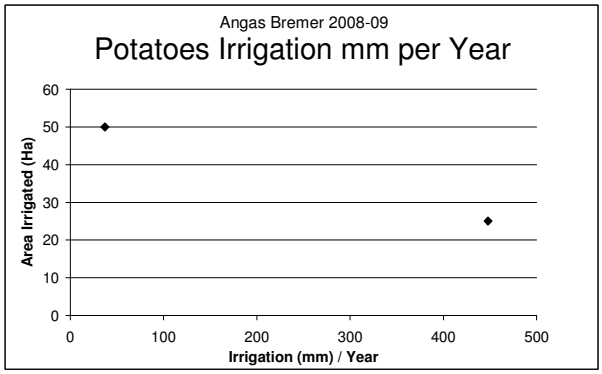
9 (a)



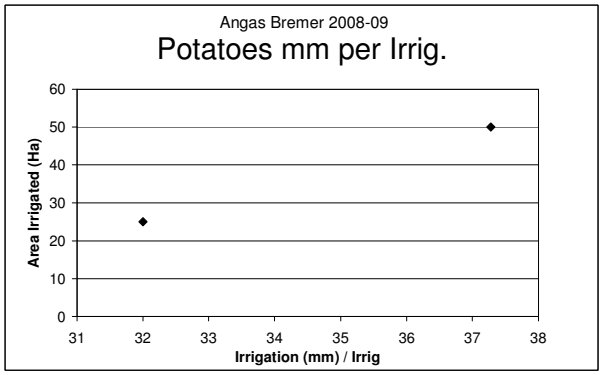
9 (b)



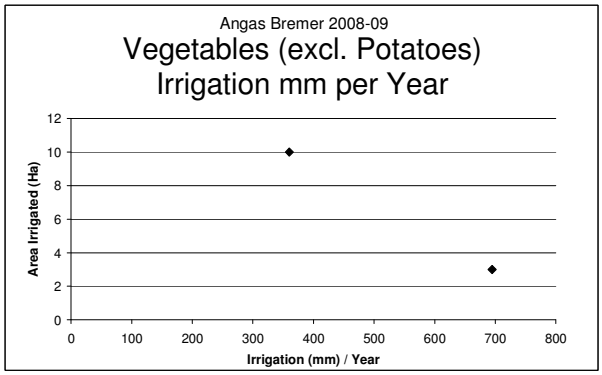
10 (a)



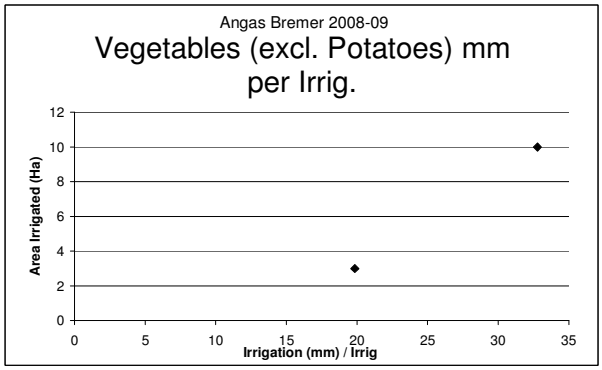
10 (b)



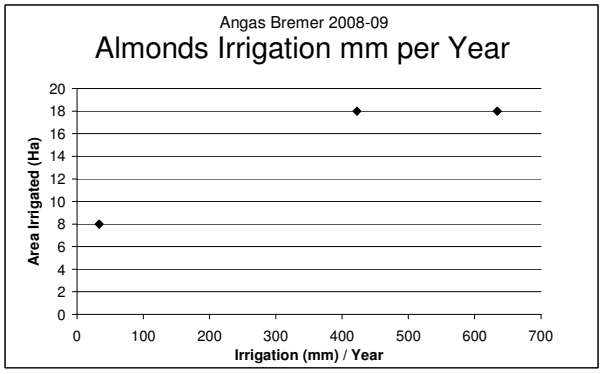
11(a)



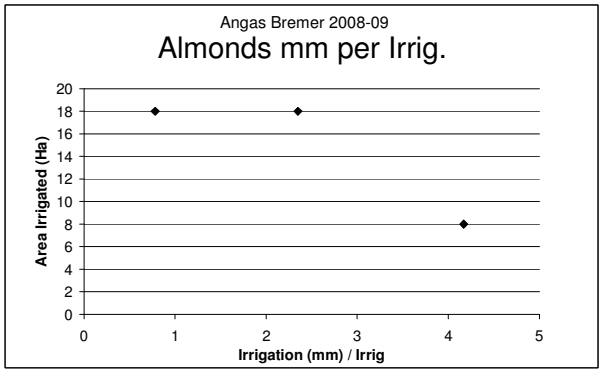
11(b)



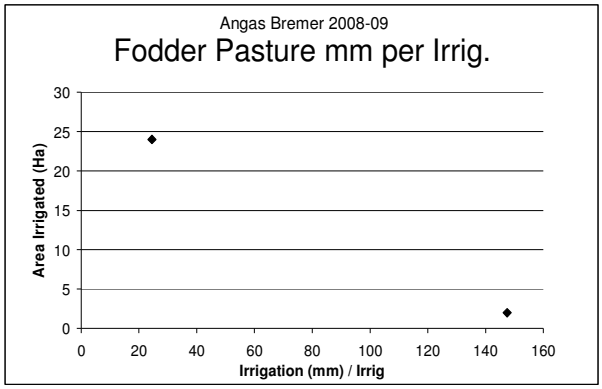
12(a)



12(b)



13(a)



13(b)

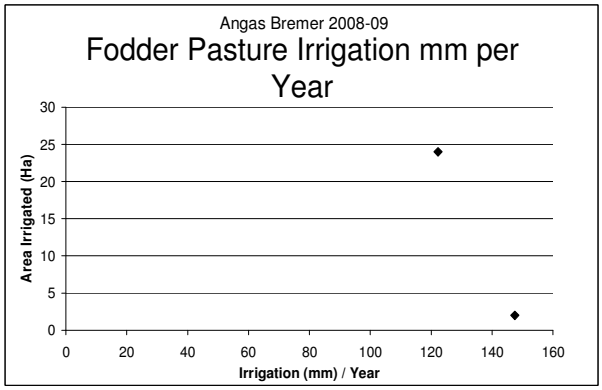


Chart 14:- Number of growers using Soil Moisture Monitoring devices:- "Resistance" includes Gypsum Blocks. "Capacitance" includes Agwise soil moisture probes, Agrilink C probe, Dataflow Gopher, Sentec Diviner and Sentec Enviroscan. "Dig hole" includes Dig stick, spade, auger and post hole digger.

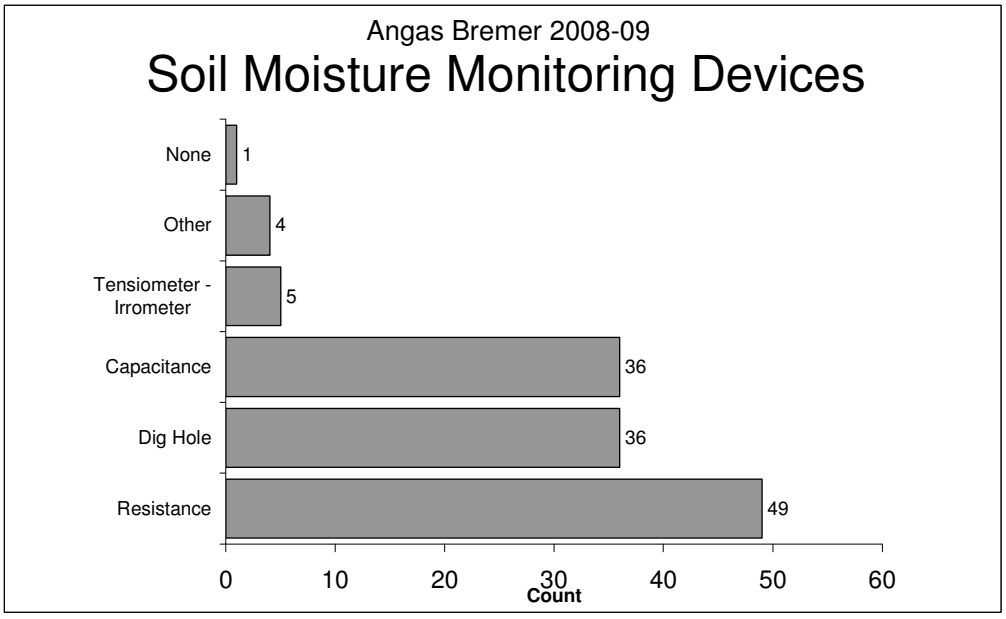


Chart 15:- Managed Aquifer Recharge (formally termed Aquifer Storage and Recovery (ASR)):- This chart shows the total volume of water artificially recharged to the aquifer from 1985 to 2009. The amount recharged in 2008-2009 is higher than 2007-2008 but not as high as 2006-2007 when water from Lake Alexandrina was accessible and of lower salinity. The majority of the water artificially recharged in 2008-2009 was from the Angas and Bremer Rivers and the Murray river via Wellington. Some desalinated ground water was also recharged. The salinity of the water recharged to the aquifer varied between 490 and 1280 ppm.

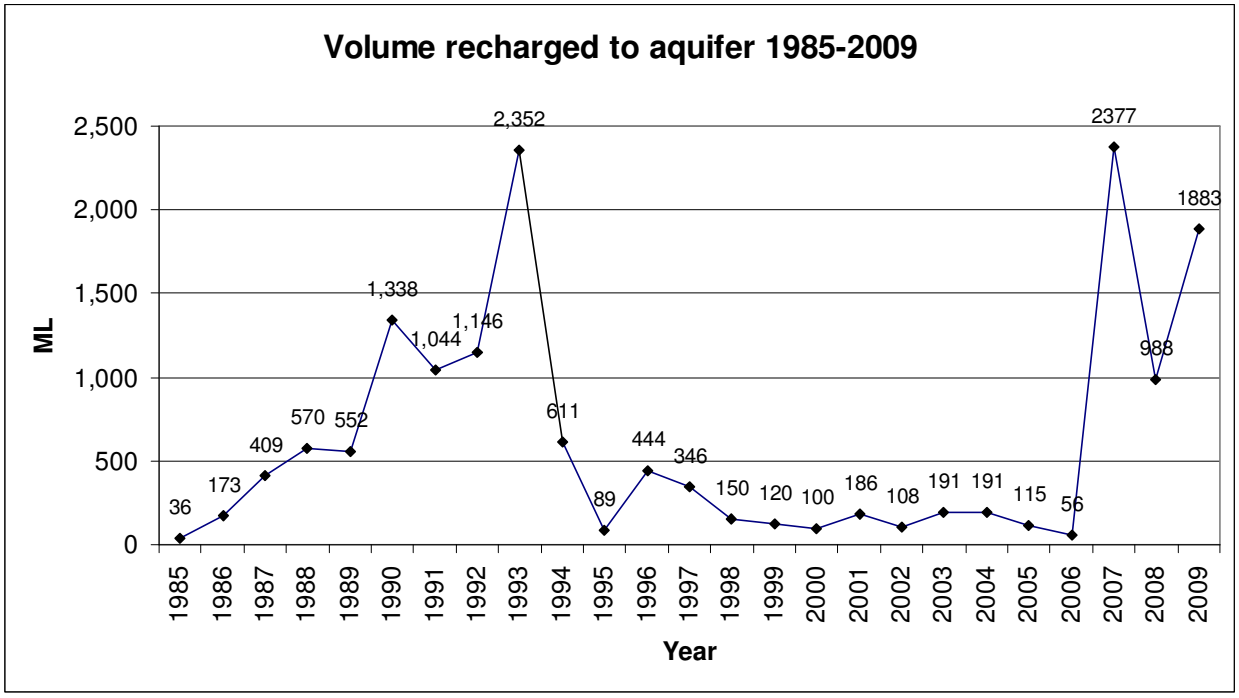


Table 2 Average ML/ha per crop per year:- This table shows the average ML/ha of irrigation water applied to different crop types and compares 2009 with previous years. This information is also displayed in the following chart.

Year	Grape	Lucerne	Other	Vegetable	Potato	Pasture	Almond	All Crops
1997-1998	1.6	4.2	2.6	3.9		4.1	2.4	2.5
1998-1999	2.2	5.1	1.3	4.5		3.8	2	2.7
1999-2000	2.1	6	1.7	6.3	3.7	3.7	2.8	2.6
2000-2001	2.1	4.8	2.4	5.7	3.6	4.7	3.1	2.6
2001-2002	2.1	4.4	1.7	5.1	4	3.3	4.5	2.5
2002-2003	2.2	6.8	2.4	6	3.8	4.3	4	2.61
2003-2004	1.97	4.5	2.5	8.8	3.5	2.7	4.2	2.28
2004-2005	1.99	5.22	1.69	5.18	3.67	2.74	4.79	2.25
2005-2006	1.8	4.23	1.53	5.04	2.99	1	4.06	2.95
2006-2007	2.04	5.13	1.05	6.43	4.12	1.7	5.23	3.67
2007-2008	1.97	4.36	1.57	7.8	2.51	2.36	5.24	2.07
2008-2009	1.73	2.99	1.81	4.38	1.74	1.24	1.04	1.78

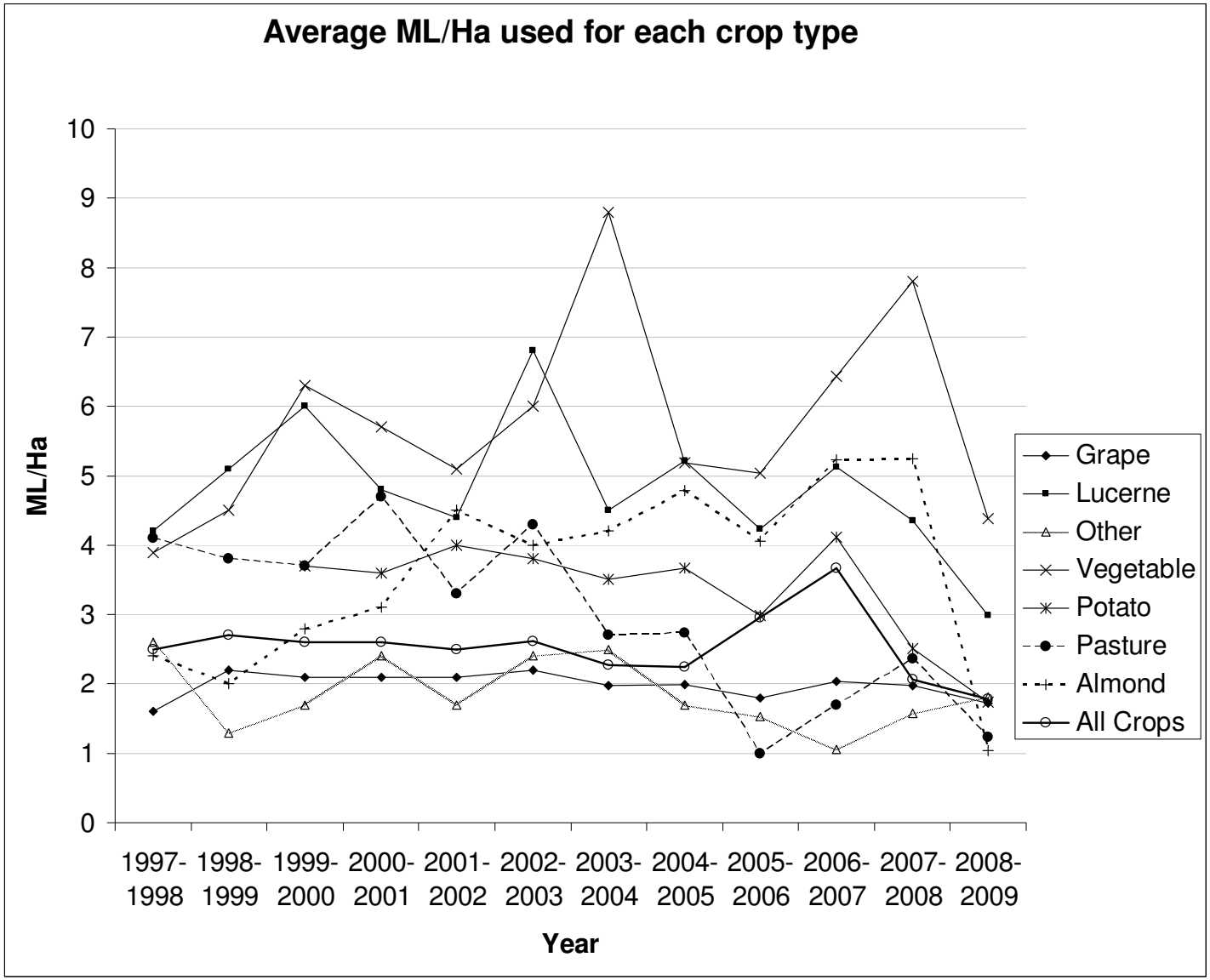
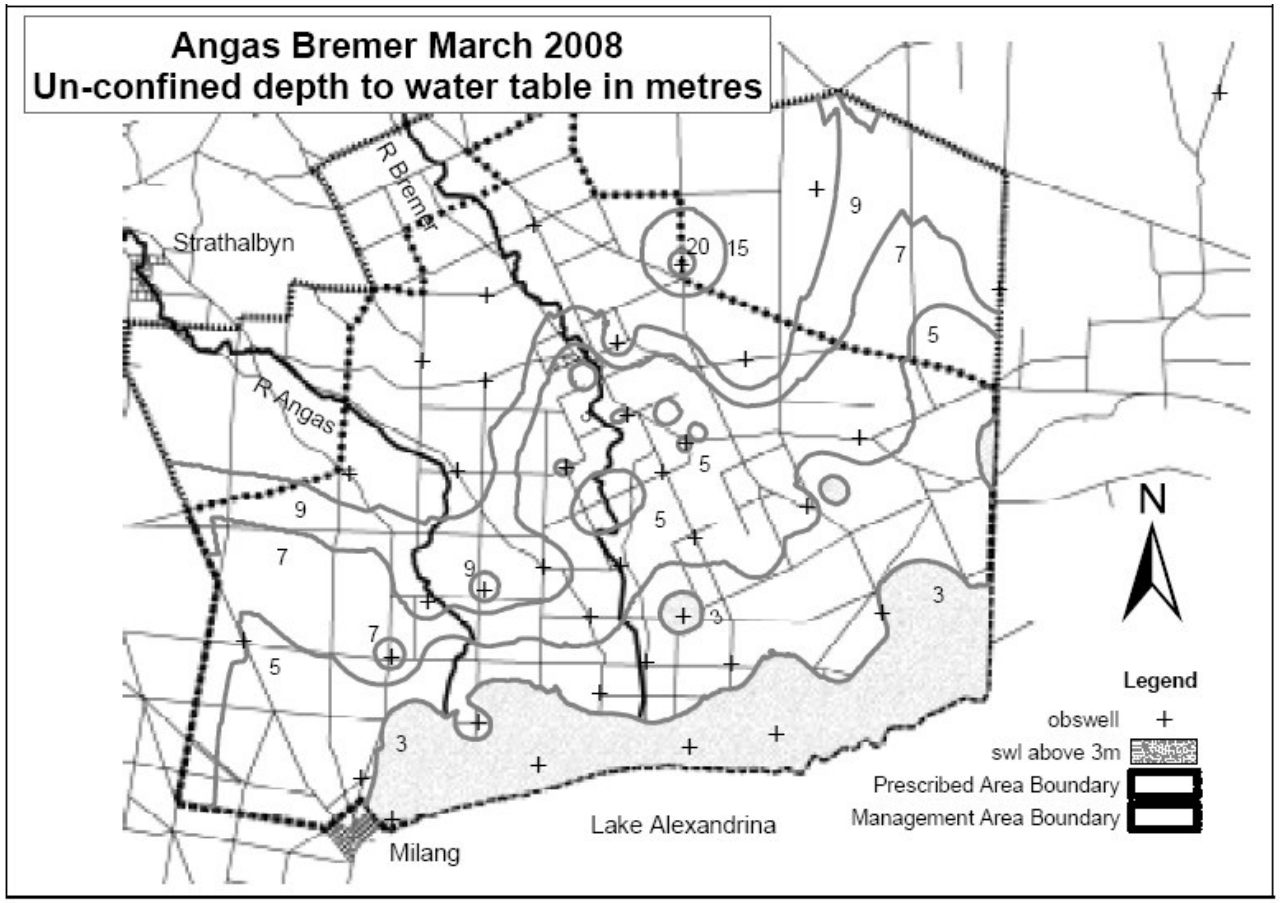

Average ML/Ha used for each crop type
ML/Ha
10
9
8
7
6
5
4
3
2
1
0
1997-1998
1998-1999
1999-2000
2000-2001
2001-2002
2002-2003
2003-2004
2004-2005
2005-2006
2006-2007
2007-2008
2008-2009
Year
Grape
Lucerne
Other
Vegetable
Potato
Pasture
Almond
All Crops

Table 3 - ML used and ha irrigated comparison chart:-

	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-2008	2008-2009
Total ML	**16,509**	**16,961**	**17,467**	**17,428**	**20,715**	**17,154**	**17,719**	**15,811**	**20,911**	**14,743**	**12,001**
Total ha	**6,153**	**6,625**	**6,788**	**7,089**	**7,934**	**7,509**	**7,869**	**7,739**	**8,370**	**7,049**	**6,748**
Grape ML	8,864	10,021	10,626	11,159	13,165	11,927	11,.688	11,293	12,827	12,330	10,738
Grape ha	4,084	4,665	4,991	5,357	6,059	6,059	5,876	6,170	6,271	6,245	6,199
Lucerne ML	3,526	2,491	2,040	2,051	2,560	1,608	1,791	1,378	1,437	675	326
Lucerne ha	698	418	429	471	376	354	343	325	280	155	109
Veg ML	2,355	761	769	651	647	605	638	363	373	179	57
Veg ha	518	121	134	103	108	69	123	72	58	23	13
Potato ML		1,812	1,773	1,719	1,504	1,280	1,278	1,171	1,200	136	131
Potato ha		485	490	425	394	360	348	392	291	54	75
Fodder ML	906	358	742	316	752	399	505	144	222	53	32
Fodder ha	241	96	157	97	173	146	184	144	130	23	26
Almond ML	119	164	172	246	188	203	230	195	251	231	193
Almond ha	61	58	55	55	47	48	48	48	48	44	44
Other crops ML	738	1,354	1,259	1,286	1,899	1,132	1,589	900	2,004	795	524
Other crops ha	555	777	533	583	777	443	936	588	906	505	282

Chart (s) 16 The next 2 charts are contour maps of the Quaternary (Q) (unconfined) aquifer. The first is from March 2008 in the previous (2007-2008) irrigation season. The second is from the 2008-2009 irrigation season. In this case, the shallowest reading from each monitoring site over the season has been mapped. The data for each map came from the growers monitoring wells and from Government Quaternary aquifer observation wells. The numbers on the maps are metres below ground level of the standing water table. The charts were produced by the Dept of Water Land and Biodiversity Conservation.



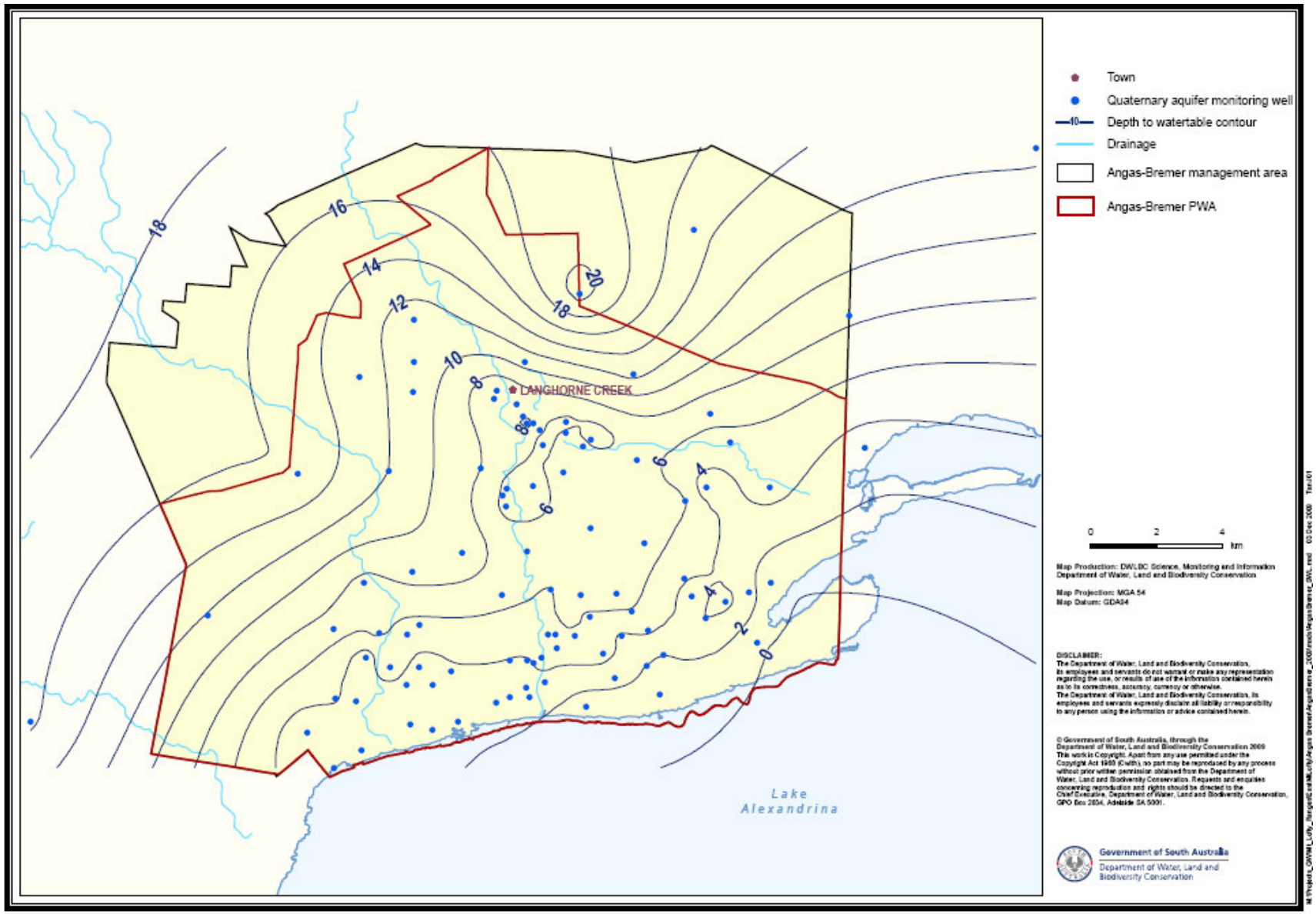

Town
Quaternary aquifer monitoring well
Depth to watertable contour
Drainage
Angas-Bremer management area
Angas-Bremer PWA
LANGHORNE CREEK
Lake Alexandrina
18
16
14
12
10
8
6
4
2
0
20
0
2
4
km
Map Production: DWLBC Science, Monitoring and Information Department of Water, Land and Biodiversity Conservation
Map Projection: MGA 54
Map Datum: GDA94
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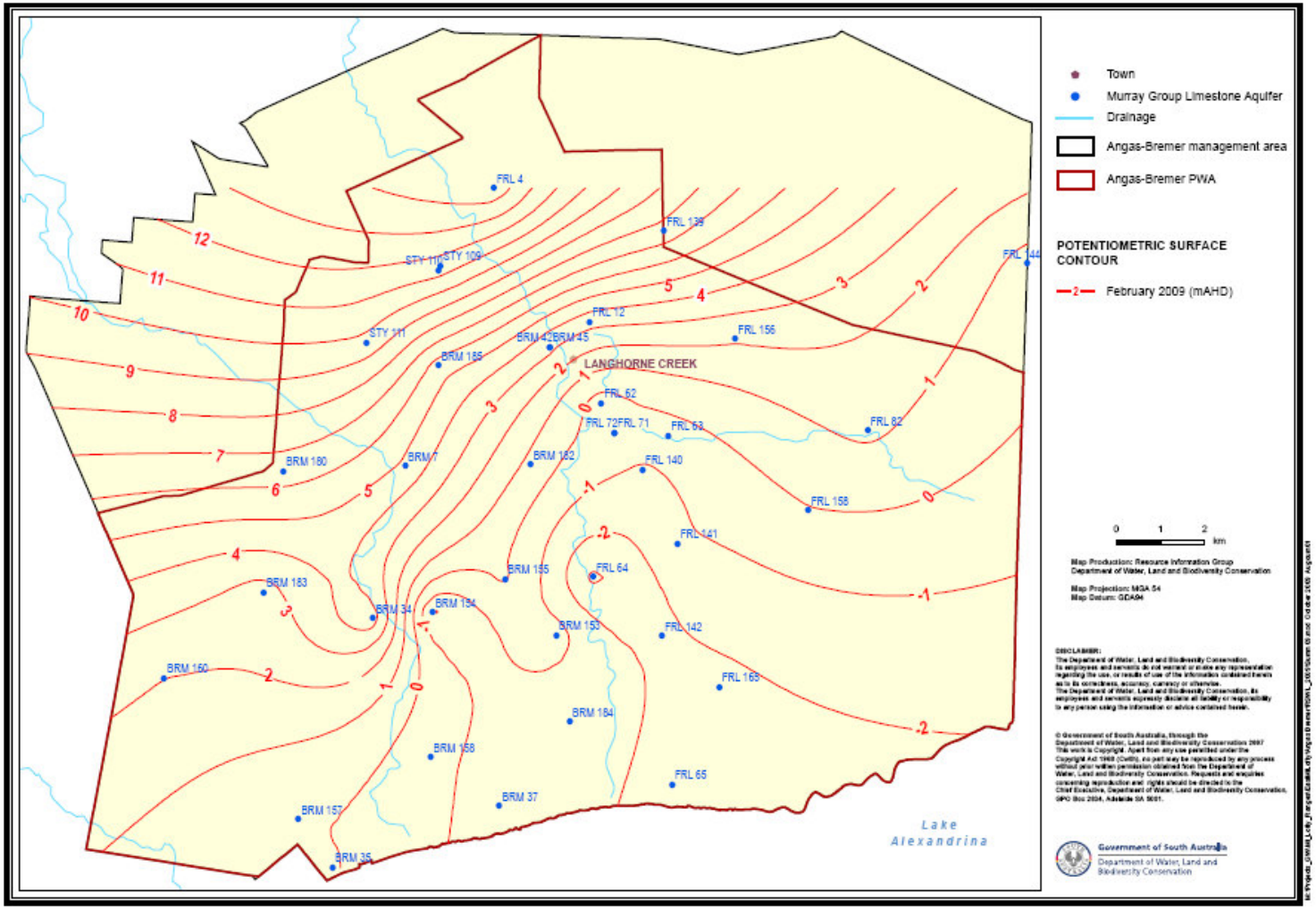
Chart (s) 17 The next 2 charts show contours of the potentiometric surface contours of the Tertiary (T) confined aquifer in February 2009 and August 2009. The data for the charts came from the Government confined observation wells. The main points to note are the formation of two cones of depression can be seen near the rivers in chart 15a. Chart 15b shows the recovery of the drawdown following irrigation season.



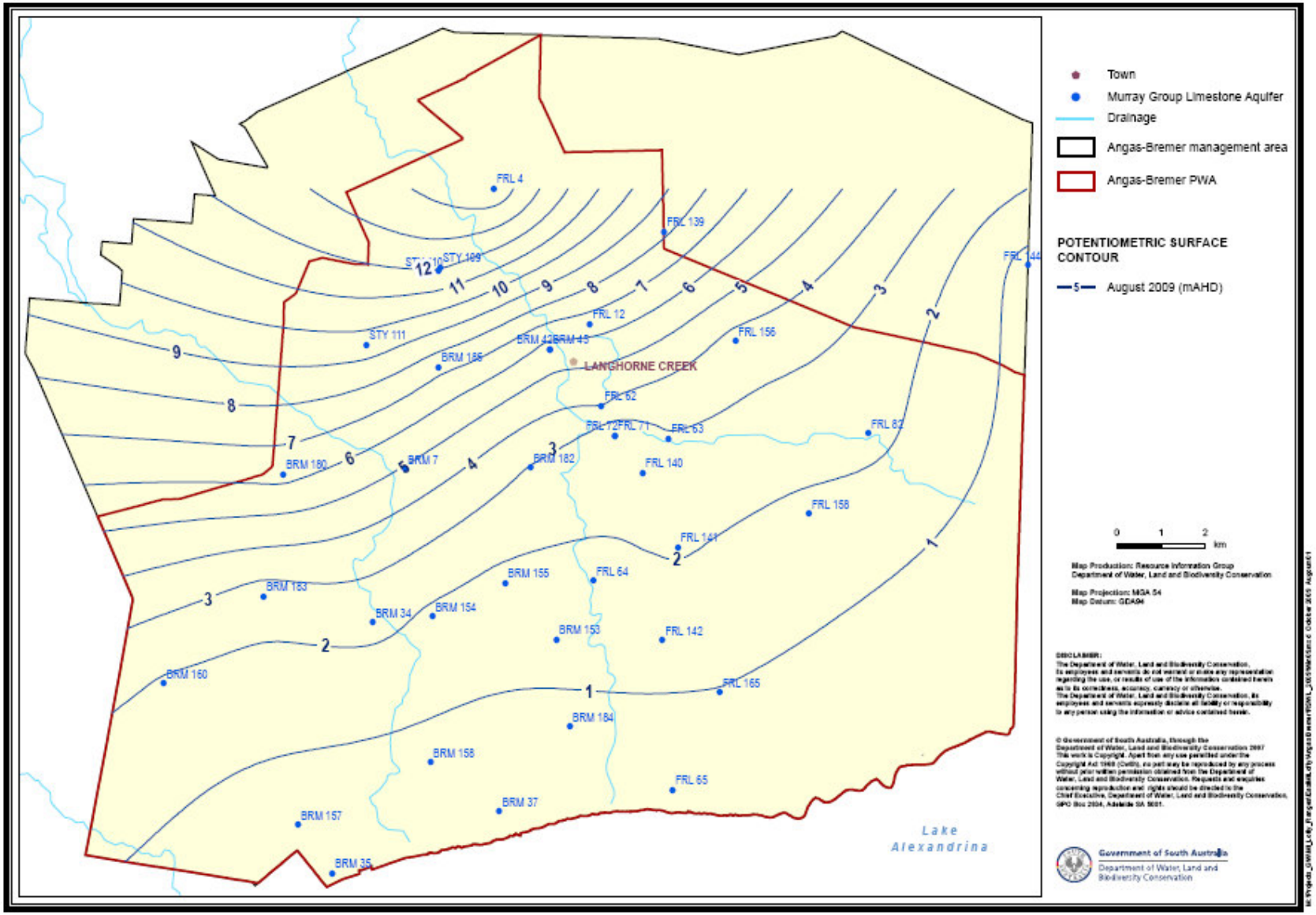
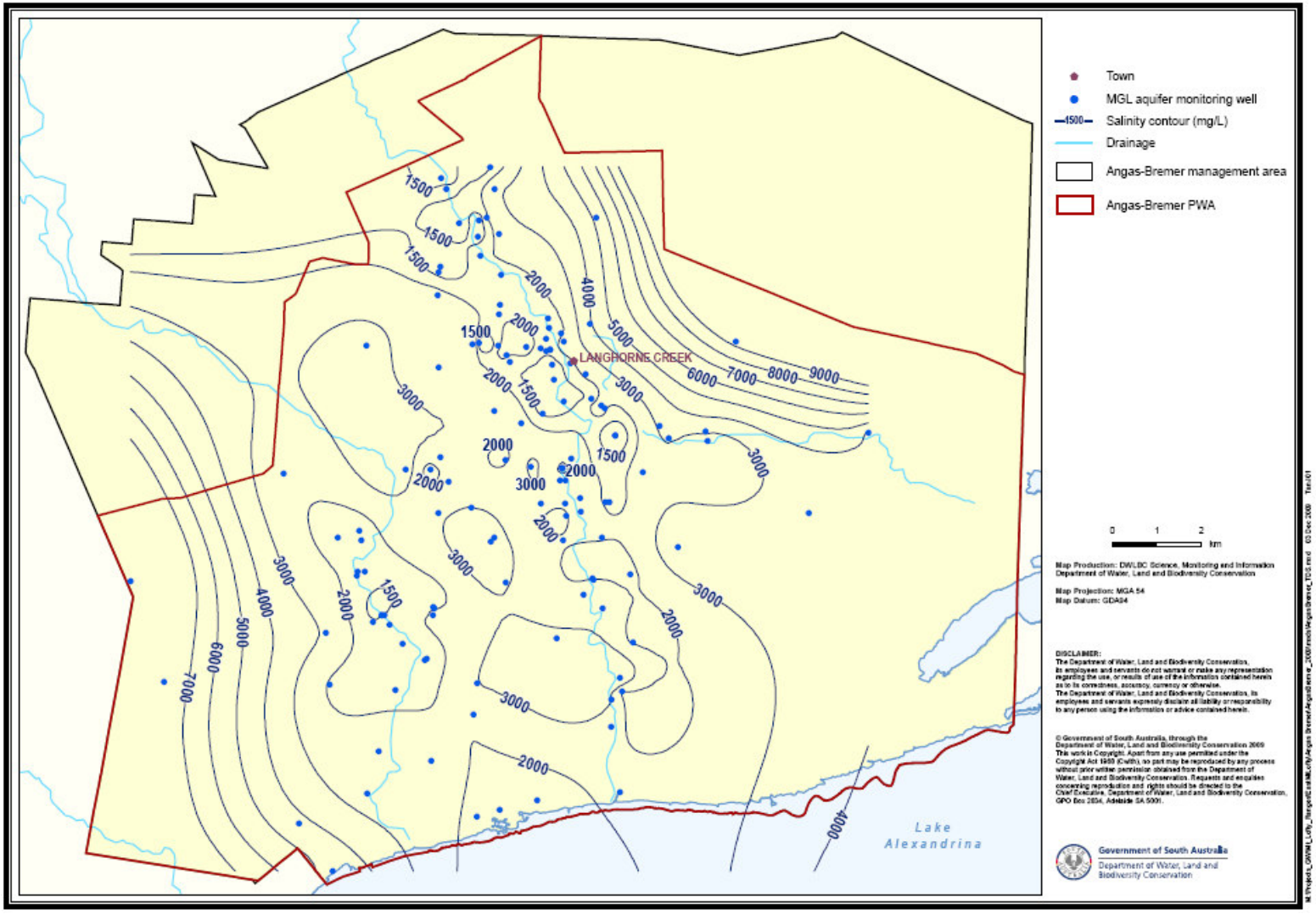

Town
Murray Group Limestone Aquifer
Drainage
Angas-Bremer management area
Angas-Bremer PWA
POTENTIOMETRIC SURFACE CONTOUR
5 August 2009 (mAHD)
LANGHORNE CREEK
Lake Alexandrina
FRL 4
FRL 139
FRL 144
FRL 12
FRL 156
FRL 62
FRL 71
FRL 63
FRL 82
FRL 140
FRL 158
FRL 141
FRL 64
FRL 142
FRL 165
FRL 65
BRM 42
BRM 45
BRM 186
BRM 180
BRM 7
BRM 182
BRM 183
BRM 155
BRM 34
BRM 154
BRM 153
BRM 160
BRM 184
BRM 158
BRM 37
BRM 157
BRM 35
STY 111
0 1 2 km
Map Production: Resource Information Group
Department of Water, Land and Biodiversity Conservation
Map Projection: MGA 54
Map Datum: GDA94
Government of South Australia
Department of Water, Land and Biodiversity Conservation

Chart (s)18 The salinity map below shows the salinity contours of the confined aquifer. It was produced using the most recent value obtained from each monitoring point during 2008 and 2009. The data for these maps comes from the Govt. observation wells and from the water samples submitted by the growers at the start and end of the irrigation season. The numbers on the maps are in mg/litre (same as ppm)



Angas Bremer Water Management Committee
Annual Public Meeting
24th August 2009
Langhorne Creek Football Clubrooms

MINUTES

Attendees:
Sylvia Clarke, Sarah Keough, Lyz Risby, Mardi Van der Weilen, Rick Trezona, Ray McDonald, John Follett, Terry McAnaney, Mike Reynolds, John Pargeter, John Newell, Robert Rodgers, Rob Giles, Bruce Nelson, Mac Cleggett, Linley Cleggett, Brett Phillips, Jim Natt, Barry Featherston, Heather Webster, David Hender, Len Case, Rob Tonkin, David Kropp, Peter Eckert, George Borrett, Brian Wyatt, Brian Meakins, Brett Cleggett, Mark Cleggett, Barrie Williams, Ian Rothe, David Eckert, Michael Eckert, Peter Osborne, Lian Jaensch, Michael Clements, Dennis Elliott, Judy Cross, Phillip Cross, Trevor McLean, Nick McDonald, Stephen Stafford-Brookes, Rob Potts, Roger Follett.

Apologies:
Dale Wenzel, Ron Nurse, Phil Reilly, Angus Warren, Guy Adams, Mayor Kym McHugh

Meeting opened: 7:40 pm

Chairman's report:

A very difficult year for committee and the irrigation community with many irrigators using water of high salinity and limited quantity. The completion of the COAG funded pipeline will provide some good quality water for the new season although allocations remain very low at 5%. The better quality water regions of the aquifer remain at risk with withdrawals exceeding hydrogeological advice on sustainable use. The new water allocation plan is proposing a reduced limit of 3000 megalitres a year requiring licence reduction of around 50%. The Angas Bremer committee is suggesting the reduction should be over a five year period on a scale of 5%, 5%, 10%, 10% & 20% in the last year to assist irrigators adjust in the current drought. The water allocation plan is also proposing a 90% return on recharge water from all resources. The new committee will have a difficult task in consulting with community and providing advice on the fairest way for these cuts to be implemented.

The ABWMC continues to receive good support from the NRM board with funding to allow our monitoring and annual reporting as well as support for projects and our much appreciated assistance from Lyz Risby and Cameron Welsh during her leave. Unfortunately our long term relationship with DWLBC and the much appreciated membership of Tony Thomson does not seem likely to continue.

After four years as presiding member I have not renominated for committee as I intend to spend more time travelling and feel it is time for new leadership in what is still a very important part of this community. The issue of sustainability in the uncertain climate we now live in will require a big commitment from the next generation of irrigators to continue the work of previous committees.

A special thanks to Barb for her help and support and to Sylvia for managing a difficult first year and to Bruce for filling in. Thanks to the committee for their support with special thanks to deputy John Pargeter, treasurer Guy Adams, Rick Trezona and Lian Jaensch.

Terry McAnaney
Presiding Member

Groundwater Allocation Reduction, Rollover and ASR – Lyz Risby SAMDBNRM Board with Steve Barnett (DWLBC) and Cameron Welsh (SAMDBNRM Board) in attendance.

Lyz explained to those in attendance of the necessity to reduce groundwater allocations by approximately 50% through the new Water Allocation Plan in order to be consistent with the National Water Initiative and ensure that the use of the water from the aquifer is sustainable in the long term. The manner in which the reduction would be rolled out is open for discussion. A copy of slide from talk is attached at end of minutes.

There was a lot of discussion from the floor about whether this was actually necessary. There was scepticism about the validity of the claims that a greater allocation than 3200 ML was not sustainable, as historically there has been a different understanding of the hydrogeological behaviour of the area. Many felt that not enough information had been made available to the community. The time frame available for allocation adjustment (by 2014) was also thought to be too short.

It was pointed out that this current understanding of the resource behaviour had in fact been out in the community for the last couple of years. It had been created using information collected by others with new information from the dataloggers and radio carbon dating. Five years ago this monitoring data was not available. Previous reports, such as the 2002 AWE report, had also suggested very little recharge was going into the aquifer and the 1992 Management Plan also highlighted that reductions would be necessary over a number of years.

An announcement was made that money had become available to produce a sophisticated model of the area by a consultant in collaboration with the DWLBC and the NRM board. The new model would be ready next year and would provide a better understanding of the water going in and out of the aquifer and the salinity behaviour. Thorough modelling would be carried out and this will inform the process to refine the sustainable limits for the area. The community will be kept informed of the results of the new modelling.

The State including the NRM board is committed to the National Water Initiative and is using the most up to date information available to make its recommendations. The draft Basin Plan is due out within 12 months and it will set sustainable diversion limits for the all water resources in the Basin including the River Murray, Angas Bremer groundwater and all prescribed EMLR water sources. The risk is that if the latest information is not used, the Commonwealth Minister can come over the top and stipulate how it must be done. The community currently has an option to have a say. The board needs to show that it has policy that will meet sustainable limits of extraction. But the option of smaller reductions could be taken or none in the first couple of years, but greater cuts in the following years, and with new information coming in, the policy could be amended.

The possibility of the Angas Bremer region being excluded from the WAP until more information is gathered was suggested but the response was that the DWLBC is unlikely to consider this.

Discussion also centred on whether irrigators that gave up groundwater licenses would have access to water through the pipeline. But it appears this has not been formally discussed with either the pipeline committee or the government. Water is, however, still available for allocation from the high salinity areas of the zone.

The issue of compensation was raised, as last time there was an allocation reduction there was an alternative water source, now there is no alternative. However, other regions that have had their underground water allocations cut (or will require allocation reductions) have not received any compensation to date. These areas include:
Padthaway, McLaren Vale, Northern Adelaide Plains, Tatiara, Lower Limestone Coast, Barossa & Baroota. Cameron Welsh (SAMDBNRM) will take the issue of compensation to the state government.

In terms of recharge, the validity of leaving 10% of Murray water in the aquifer when this river was also over taxed was raised. Steve Barnett explained that banking extra each year builds up a reservoir of fresher water for the future. Water allocations coming in the pipeline from the Murray were theoretically sustainable amounts of water from this resource.

Dennis Elliott moved that the community is not happy with 50% cuts. They suggest no allocation cuts in the first 2 years, while more information comes in from the new model. If the model shows that cuts are necessary then the total allocation cut in the life of the first plan should not exceed 25%. Seconded – John Follett.
CARRIED.

Julie Cann from DWLBC was to discuss Trade and River Murray separated WAP questions but was an apology to the meeting.

Peter Croft discussed the future for the lower lakes.
Notes from his talk are attached at the end of this report.

Mardi Van der Weilen (SAMDBNRM Board)- was to discuss **Environmental Water Requirements** but as too much time had been taken up with the preceding discussion this talk was postponed to a later date.

Project Coordinator Sylvia Clarke gave a presentation of the interim Irrigators Annual Report and an update of the committee's other projects

John Pargeter – Pipeline update
The pipeline itself is complete, only the connections are now required. The new staff, Mike ? and Evan ? were introduced and the position of the new office was explained. Filling has commenced at Milang and is shortly to commence at Jervois to pressure test the pipeline. Pump stations 3 and 2 are complete and No. 1 is nearing completion. The electricity infrastructure is well underway. Meters should be installed very soon. With electricity connected dry commissioning will commence, with wet commissioning throughout September and flow will then be needed. The AGM will be held in November with a tour of the infrastructure to follow. The share certificates have gone out.
The use of excess water capacity in the pipeline to be used to make up lack of groundwater has not been discussed.

Nominations for committee:
1. David Eckert
2. Sarah Keough
3. Colin Cross

Nominations were called from the floor. Rob Tonkin nominated.
Rick Trezona moved that they all be accepted as members of the committee, joining with John Pargeter, Brian Wyatt, John Follett, Rick Trezona, Phil Reilly, Mac Cleggett and Tony Tomson.
Seconded – John Follett.
Carried.

General Business
None

The outgoing Chair thanked all for attending

Meeting closed 10:10pm.

Langhorne Creek Wine Industry Council

Activities under the *Environmental Management in Viticulture – Langhorne Creek* EMS program, 2008 – 2009.

Environmental work has continued this year under the regional EMS program with support from Goolwa to Wellington Local Action Planning Board. Activities include:

- Acknowledgement of participants' efforts in the program with a 'farm gate' or 'cellar door' sign.
- A Climate Change workshop with speakers presenting on *Alternative wine grape varieties,* the *Impact of periods of extreme heat on vines* and the *Australian Government's Carbon Pollution Reduction* program.
- A field day to look at the waste water management initiatives at Matilda Plains Winery, the revegetation demonstration site at Cross Road, the seedling nursery and revegetation work at CMV Vineyards and an inspection of Belvidere Winery.
- The establishment of 3 photo monitoring sites of remnant native vegetation to track the impacts of climate change over an extended period.
- A workshop was supported for the trial of the Wine Industry Sector Agreement Carbon Calculator.
- A pilot workshop was conducted for the Winemakers' Federation of Australia's environmental stewardship program, EntWine Australia. Supporting this initiative, a Waste Management Plan template and regional Vegetation and Environmental Assets map have been developed for the use of participating growers.
- A poster "A Regional Approach to Climate Change Planning" has been produced for use at industry conferences.

Future activities include a carbon calculator workshop, a workshop for using online mapping resources, photo monitoring, support for the bush garden being developed at Mosquito Creek, maintenance and further development of revegetation sites, conference attendance plus support for growers developing their EMS under the EntWine Australia program.

Angas Bremer Irrigators Revegetation Association Inc.

19/11/09
The deep rooted vegetation that the association has planted and maintained has flourished during the last 12 months.

The excellent winter rains have given a significant flush of growth to all areas.

There have been minimal losses due to the extreme heat last summer, and most of these areas have been replanted and are thriving.

Thanks again to the land holders who have co-operated with ABIRA, the framework under which we operate has been accepted by the Government, but we are still waiting for the final paper work, which has now been over 12 months in coming.

Apart from acting as a drawdown the vegetation has changed some de-nuded roadsides and bare sandy paddocks to green and visually pleasing areas.

Simon Chinner has stepped down as Secretary, and Nic McDonald has accepted that position.

The association continues to adequately fill the need of providing vegetation areas for irrigators, and would welcome any one who needs our resource.

Yours sincerely,
John Hodges.
Chairman.

Sub-surface Drainage Trial
Kayinga Vineyard

FABAL Operations

30th July, 2009

Introduction

Areas of Kayinga Vineyard are threatened by shallow water tables. Sub-surface drainage has been installed to lower the water table in order to sustain vine growth. Funding from the Angas Bremer Water Management Committee (ABWMC) via the Natural Heritage Trust allowed for a trial of varying drain spacing. The aim of the trial is to determine whether closer drain spacing increases their efficiency in dropping the water table. This is the seventh annual report.

Background

There are 2 main sites at Kayinga Vineyard which had sub-surface drainage installed in 2000. Site 1 covers 5.62ha while Site 2 covers 0.75ha. Site 1 had drains installed every 10m. However in a small section drains were installed every 5m. Site 2 had drains installed every 20m. However, again, in a small section drains were installed every 10m. In order to measure whether narrower drain spacings have an effect on water table height test wells were installed in the middle of each drain spacing.

Season 08-09

Water table depth is directly related to rainfall. During season 08-09 the vineyard received 24% less rainfall than the long term average. This has meant the water table within the drainage areas remained at a low level and was never at a depth that would have a negative effect on vine growth.
Static water level data collected over FY09 from test wells installed in the middle of the various drain spacings, as described above, have continued to show that:

1. All drains have maintained a water table depth for the 12 month period that is considered adequate for sustainable vine growth.
2. The narrower drain spacings at each site continue to maintain a lower depth to water table than the wider drain spacings.

Conclusions

1. All drain widths have increased the depth to water table.
2. The narrower drain spacings have a greater depth to water table than the wider drain spacings.

A summary of the presentation made by Peter Croft (Murray Futures: Lower Lakes and Coorong recovery)

The Coorong, Lower Lakes and Murray Mouth: Long Term Plan

Current Issues

- Reduced freshwater inflows and levels
- **Acid Sulfate Soils**
- Salinity
- Biodiversity loss
- Sea level rise
- Socio-economic impacts

Acid sulfate soils (ASS) are soils that either contain *sulfuric acid*, or have the potential to form *sulfuric acid* when exposed to oxygen in the air.

On exposure - Release and transmission of; acid, iron, aluminium (dissolved & colloidal flocs), other metals, Na Mg sulfate salts and nutrients, as well as consumption of oxygen.

The primary management response is **prevention**: maintain saturation of acid sulfate soils

A secondary management response is **treatment**: control flows/contain water body, add limestone, organic matter (revegetation) and/or iron to water bodies and exposed sediments (to allow bacteria to function at depth)

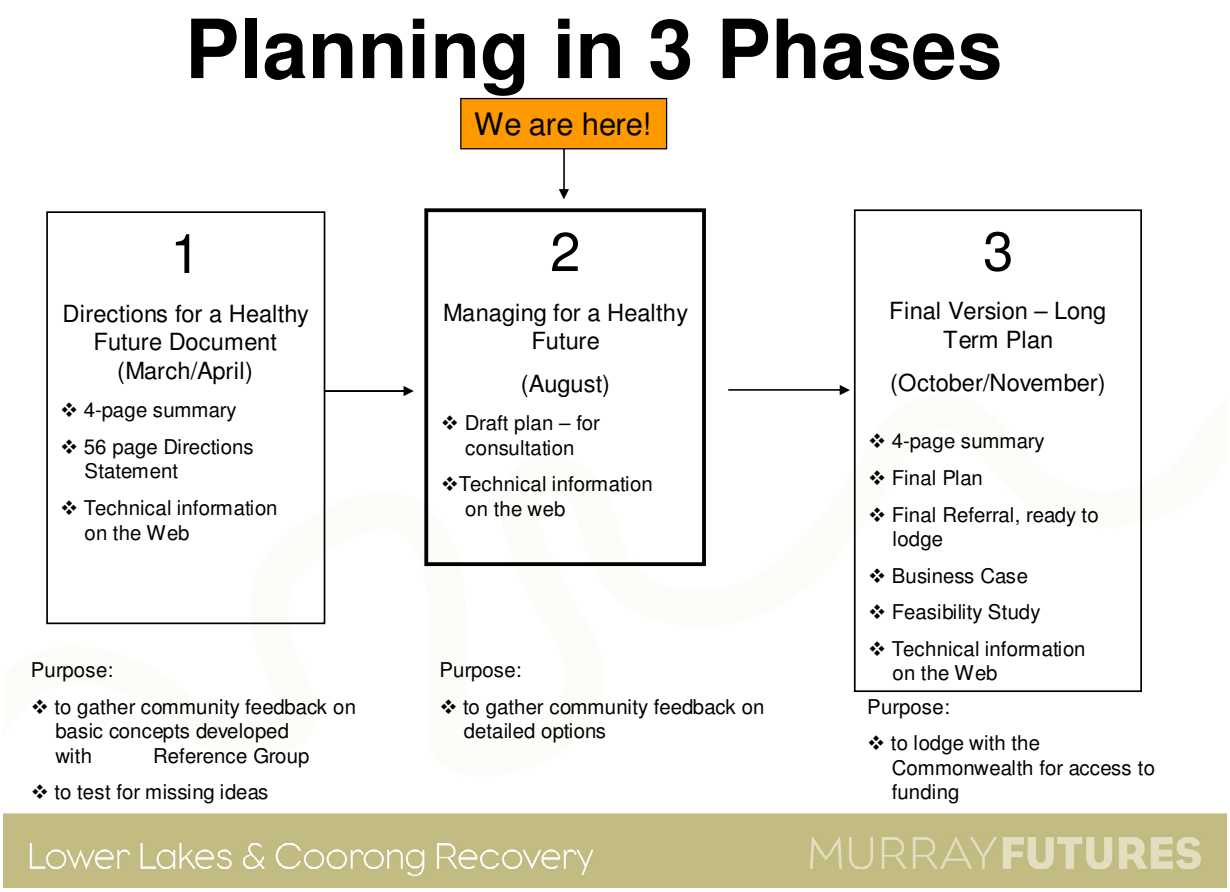
Regulator Rationale

- Modeling indicates a major acidification event will occur when water levels reach - 1.2 m AHD in the Goolwa channel
    - Mobilization of acid due to surface flow
- Best option is to prevention acidity generation through maintaining saturation
- 2nd best option is to TREAT acidity with limestone and contain the water body
    - Requires treatment every year
- Re-vegetation to bind soils and provide carbon (for sulfate reducing bacteria) on re-inundation
    - Crop types critical to not exacerbate
    - Does not TREAT acid generation

Bioremediation

- Encouraging sulfate-reducing bacterial activity that converts dissolved sulfate to sulfide minerals while consuming acid
- Bioremediation can only occur under reducing conditions, e.g. saturation
- Revegetation can assist bioremediation – by providing a future source of organic matter for sulfate-reducing bacteria to consume
- Revegetation will assist in soil erosion control, and if done appropriately, produce ecological outcomes for the region

- However, revegetation can also exacerbate acidity generation – as plants draw up water, acid sulfate soils become less saturated and more exposed to air



Our goal is to secure a future for the Coorong, Lower Lakes and Murray Mouth as a healthy, productive and resilient wetland system that maintains its international importance. Achieving this will directly support the local economy and communities.

Community Engagement Activities; Targeted Meetings, Meetings in response to community organisation invitation, Focus Groups, Community Events and Shows, Field visits and informal interviews, 1800 number, CLLMM email, School & youth engagement

If you have any further questions in regards to the consultation process for the Managing for a Healthy Future document please call our Community Engagement Team on: 8204 9453 or email gemma.cunningham@sa.gov.au

Climate Scenarios

	Environmental impacts on the Coorong & Lower Lakes region				
Climatic Scenario	**Flows to Murray Mouth**	**The effect of flows on the Murray Mouth**	**Water levels in Lower Lakes**	**Wetland system**	**Biodiversity - plants & animals**
Wet scenario	**5550 gigalitres / year**	Frequent flooding. Mouth open	Water levels in Lake Alexandrina maintained between 0.3 and 0.85m above sea level in most years. In some years water levels may be higher due to the sheer volume of water available.	Wetland systems (including Lakes Alexandrina and Albert, the Coorong, the Murray Mouth and Estuary, the Goolwa Channel and the Tributaries) connected, healthy, resilient and productive.	Ruppia species present in both the North Lagoon and South Lagoon of the Coorong. The salinity gradient present in the lagoons promotes the survival of the diversity of biota for which the Coorong is renowned.
Climatic Scenario	**Flows to Murray Mouth**	**The effect of flows on the Murray Mouth**	**Water levels in Lower Lakes**	**Wetland system**	**Biodiversity - plants & animals**
Median scenario	**3482 gigalitres / year**	Slightly increased the average period between flood events that flush the Murray mouth. Maximum period between flood events that flush the Murray mouth increased to nearly 1 in 8 years Dredging required to maintain an open Murray Mouth sometimes.	Water levels in Lake Alexandrina maintained between 0.3 and 0.85m above sea level for more than 50% of the time.	Wetland systems (including Lakes Alexandrina and Albert, the Coorong, the Murray Mouth and Estuary, the Goolwa Channel and the Tributaries) connected during these periods. Outside of these times, the Coorong, Murray Mouth and Estuary could experience periods of disconnection. Average annual volumes of environmentally beneficial floods close to halved.	Ruppia would start to disappear from the South Lagoon of the Coorong.

Climatic Scenario	Flows to Murray Mouth	The effect of flows on the Murray Mouth	Water levels in Lower Lakes	Wetland system	Biodiversity - plants & animals
Dry scenario	**1417 gigalitres / year**	Dredging would be required to maintain an open Murray Mouth most of the time. Increased the average period between flood events that flush the Murray mouth to 1 in 3 years. Maximum period between flood events that flush the Murray mouth increased to over 1 in 16 years.	Water levels in Lake Alexandrina dropping. Water level in Lake Albert dropped to levels close to the acidification trigger of 0.5m below sea level.	Water being pumped from Lake Alexandrina into Lake Albert to avert acidification of the latter i.e. these wetland systems would be artificially connected.	The ecology of the Coorong would likely be significantly altered, with Ruppia species almost absent from the South Lagoon and contracting from the North Lagoon.
Climatic Scenario	**Flows to Murray Mouth**	**The effect of flows on the Murray Mouth**	**Water levels in Lower Lakes**	**Wetland system**	**Biodiversity - plants & animals**
Extreme dry scenario	**366 gigalitres / year**	No flows over the barrages most of the time.	Lower than 0.5m below sea level. Shallow.	Lake Alexandrina a shallow water body disconnected from Lake Albert, the Coorong, Murray Mouth and Estuary, the Goolwa Channel and the Tributaries. Large areas of exposed acid sulfate soils in Lakes Alexandrina and Albert, the Goolwa Channel and Tributaries.	Coorong becomes hypermarine, and the salinity gradient that supports the diversity of species characteristic of the Coorong non-existent in the South Lagoon and parts of the North Lagoon.