



# *Angas Bremer Regional History*

*The majority of the data in this module has been obtained by Terry Sim who painstakingly has scanned all available sources for this information.*

*All the local newspapers (including Adelaide) must be acknowledged for the material used in this module.*

*As well there are 4 local people/ families who need to be recognised for their contributions, they are Mr. Len Potts, Mr. Angas Warren, the Metala families and the late Mr. Ken Turvey*

*Some of the wording and the grammar in this module may appear strange but that is the way it was written up in the press.*

*The content of this module is (loosely) in chronological order*

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## Early History of Water Use

The area around Lake Alexandrina and the Angas and Bremer Rivers was particularly attractive both to the original inhabitants, the Ngarrindjeri, and the European colonisers for the same reasons -- its fertile nature, moderate climate and supplies of permanent water.

The first land taken up in the region by Europeans was around the permanent waters of Lake Alexandrina, the Angas and the Bremer Rivers. Very quickly all the land adjacent to these waters was under occupation.

This meant that the land further away from the permanent water was all that was left to new settlers. Additional supplies of water, to enable this land to be utilised, were required to be located.

Plans, schemes, ideas and dreams to provide this water came and went. Some were only talked about, some were attempted, some proved successful and some failed. Both the local communities and individual farmers attempted to provide this requirement. This took the form of larger community wide undertakings that benefited many; to individuals constructing dams, wells and bores to provide the necessary water for their own requirements.

## IRRIGATION

In the late 1850's South Australian farmers began to look at irrigation as a means of increasing crop yields and better utilising land. Water from both the Angas and Bremer were seen by the settlers as going to waste. The amount that flowed into Lake Alexandrina could be put to better use.

Locally, whether there was a catalyst for discussing it, or if it was just part of the wider interest the colonies farmers were showing in the irrigation subject has been lost through time but meetings were held at Langhorne Creek in 1859 and 1860 on the matter.

Mr Rankine from Strathalbyn, as he pointed out during the meeting, had attempted to dam water on his property but was prevailed upon by his downstream neighbour to allow the water to continue to flow to that property. There may have been others who were also planning similar ventures and it was decided to have a community wide scheme instead of piecemeal ones. Once again we can only speculate.

What is known is that Friend Cleggett and Mr Anderson on the Bremer called a meeting, at the Langhorne's Inn, of their neighbours to discuss the subject of irrigating from the Bremer and Angas. This was held on Thursday 1<sup>st</sup> December, 1859.

Mr JD Cave, a new settler in the district was prevailed upon to chair the meeting. He said he was highly honoured by the position in which the meeting had placed him as he was almost a total stranger in the district but as he intended to reside in the neighbourhood for seven years he hoped '*his conduct might ever merit their friendship and esteem.*' He believed that they met for a very important purpose and even though there would be many different opinions he asked that each speaker be allowed to put his point of view. He also expressed disappointment at the number of settlers present but he hoped that all would join in so important an undertaking.

It was evident, he said, that water from the creek was beneficial to crops as '*where water had run off the road on to the land the crops bore a very improved appearance.*' Therefore as '*there were large tracts of country bearing small crops owing to lack of moisture and at the same time an immense body of water was yearly running away passed the land.*' it made sense to utilise this resource.

He then called on the originators of the meeting to state their views *'so that all present might have a basis to go on.'*

Mr Friend Cleggett stated that he and Mr Anderson had called their neighbours together for the purpose of taking steps to irrigate the land. He also said he *'was not a practical man on these subjects, and he believed that the business of the meeting would be to decide upon the necessary steps to be taken to get water out of the creek. After it was out he should know what to do with it.'*

He proposed, *"That it is desirable to force water out of the creek for the purpose of irrigating the land."*

Much discussion followed on ways in which to achieve this aim. Ideas ranged from dams to floodgates and dams with sluices. Mr M Rankine, who as stated had tried to divert water on his own land, believed that the law would allow them to put a dam across, but at the same time the stream must be kept running in its original course.

The chairman suggested that as it may be necessary to have an Act of Parliament passed to enable them to do what they planned he thought that *'competent legal advice'* be taken.

Mr Friend Cleggett proposed *"That a committee be appointed to take the opinion of the Attorney General as to the best manner of procedure, in order to irrigate the land in the neighbourhood and to report to a public meeting to be held this day month, also to take all other necessary steps that may occur to them in the meantime."*

Mr Cave, wrote to the Commissioner of Public Works explaining the outcome of the meeting, and requested that the commissioner discuss it with the Attorney-General. Cave subsequently met with the Attorney-General to seek clarification of whether the settlers on the banks of the Angas and Bremer could legally make use of the waters of those creeks to irrigate adjoining lands. The Attorney-General informed him that the law would not allow the damming up or diverting of a stream of water for the purposes of irrigation; that anyone doing so would be liable to an action. The Attorney-General stated that the case of Crittendon versus Smith had *'settled the law here on that point'*. Mr Smith having diverted Smith's Creek and Mr Crittendon a downstream landholder having brought an action against him to allow the water to run. It was found that Mr Crittendon could not stop the flow of a permanent stream and was obliged to dismantle his dam. Mr Crittendon was awarded costs and recovered damages.

When asked by the Attorney - General to describe what they wanted to do on the Bremer Mr Cave said, *"I stated that dams would be required – the first near the outlet of the creek; and a succession of dams each provided with sluices, at such a distance as would give the necessary depth of water. The Attorney-general considered that a general measure would be required to carry this plan into effect; that then a Commissioner would be appointed, whose duties should be to attend to the sluices, that he should have the power to regulate the times when they should be opened or closed, that the lower one should be closed first, and each one filled in succession. The Attorney-General stated that such a plan was in operation in Chillli (sic), where no rain falls, the water being brought from the Andes, and dammed up as described. The Honourable Gentleman promised to give the subject his attention, and said that he would bring it under the notice of his colleagues, and would endeavour to bring in a measure to meet the necessities of the case in the next Parliament."*

Mr Anderson asked if the Chairman had obtained the opinion of the Attorney-General as to pumping the water from the creek. The Chairman said he put that question to the Attorney-General, who replied that water could only be used for watering cattle, but for no other purpose.



Mr Anderson was of the opinion that the land should be irrigated and those who had use of this water should pay for it. He also stated that *'All persons up the creek were in favour of irrigation'* Mr Wiese (who farmed at Lake Plains) told the meeting that there was talk that water was to be diverted into Mosquito Creek. If this were the case he would not support the scheme. Already neighbours were coming to his place for water and *'he was much afraid that the water would not hold out for the cattle.'*

Mr Cheriton said he *'was not directly interested in the subject; but if it were intended to benefit individuals only, he came determined to oppose the scheme; but as it appeared to be a really national object, he must be in favour of it (hear) He thought that anyone opposing such a measure stood in his own light. (hear)'*

Mr Steer came *'determined to oppose the scheme, but after what the Chairman had stated he must say that he could not object to it. He approved the plan proposed; in every case the lower dam be filled first.'*

Discussion then followed regarding what could be achieved with the water that flowed into the Lake. If such a scheme as had been planned were in place there would be abundant water available. The chairman even suggested that *'irrigation should be made a prominent subject at the next elections.'* The following resolutions were passed by those present,

1<sup>st</sup> That in the opinion of the meeting the time has arrived when all restrictions on irrigating of land should be removed and that a desirable Act of Parliament should be passed for this purpose.

2<sup>nd</sup> That the thanks of the meeting be conveyed to the Attorney—General for the very ready manner in which he had met the wishes of the settlers on the subject of irrigation and expressed hope that he would proceed with a measure on the subject early in the next session of Parliament.

3<sup>rd</sup> That a committee be appointed to draw up a memorial and obtain signatures to it, to be presented to the Government on the subject and that the following gentlemen form the committee, Messrs JD Cave, M Rankine, J Rankine, Cheriton, J McCallum, Borrett, Latser, F Cleggett, Anderson, Bellingham, Steer, Capner, Kemp and May. Mr Borrett was appointed treasurer.

As time has shown no such scheme, as discussed then, was ever realised.

## PROBLEMS ON THE ANGAS

Stopping and diverting of the waters of the Angas were also being practised around the same time. An item in the South Australian Gazette and Colonial Register in February 1861 explains that Mr Gollan has suggested that all matters in dispute regarding the problems with the Angas at Blackwood (Park?) should be referred to arbitration.

Each party involved was to select and appoint an arbitrator to represent them.

## REGULATING FLOODING

Frank Potts of Bleasdale in about 1863 had a large swamp on his property that he decided to drain. He not only wanted to drain it but also to fill it with silt from floodings so that it could be used for vineyards. To achieve this he cut a small drain from the Bremer to the swamp. The desired result was getting rid of the water and having several feet of mud fill the depression.



What was not wanted was that the small drain, over the intervening years should have been deepened and widened. Eventually it was said up to half of the floodwaters of the Bremer were now finding their way along it. The resultant damage caused to the vineyard by logs and debris necessitated that a floodgate be erected to regulate the flow of water into the property.

Frank Potts built a dam at the start of this gutter where it was about fifteen feet wide and twelve feet deep. According to a report in the press '*First four massive sawn gum posts were put in, and a huge head piece securely bolted to them. The two outside posts are firmly imbedded in substantial mason work with which the banks are lined for some distance on both sides of the dam. The bottom is made of concrete, and the waterways are three in number each four feet wide. The flood gates are very simple and strong, being merely gum planks nicely fitted and dropped into grooves in the posts.*'

## RECREATIONAL DAM

On the Angas, at Strathalbyn, in 1872 there were plans to put in a dam. This was not to use the water for agricultural purposes but as a recreational Lake in the town centre.

Floods along both the Angas and Bremer were often mentioned in the Southern Argus. However it is obvious that they were a fairly commonplace event and not all were reported upon. In fact, at least on the Bremer, they were then, as now, not only regarded as being good for the country, but also seen as something that was to be lived with.

## POLLUTED WATERS

It is interesting to note that as early as 1878 the Bletchley correspondent mentioned pollution of the Bremer. In his column to the Southern Argus he remarks '*Bremer has at times been high, indicating heavy rains have fallen in the hills. The creek is also very foul, the slush and muck of Mount Barker find their way down this creek, the smell is anything but enjoyable.*' This is a recurring theme over the years. 1880, '*Bremer came down usual slush and mud and stink.*'

1881, '*Bremer flooded again, usual rubbish and sewage etc. in it.*' '*Usual quantities of incense in solution came down creek.*'

Blue Green algae is mentioned as being present in Lake Alexandrina during early 1878. At Wellington stock were poisoned and large quantities of fish were killed. During February it was noted that '*The green water in Lake Alexandrina is still killing horses, horned cattle and sheep, also crows and other birds.*'

At Bletchley '*A little water in some of the holes in the creek turned to a nasty greenish colour, and will no doubt be found injurious to stock.*'

## DAMMING THE ANGAS

Matthew Rankine, in 1886, on the Angas at his Angas Plains property erected a dam to capture water to enable him to irrigate. The structure consisted of a concrete wall seventy feet long being



sixteen feet at base and tapering to four feet at the top. It had an opening twenty feet wide by eight feet deep into which an iron sluice gate could be fitted.

It had the capability to discharge half a million gallons per minute and flood irrigate seven hundred acres. It was a very short lived structure because a log became jammed in it making the sluice gate inoperable. The water flowed around the dam down rabbit burrows at its base undermining the walls. A new channel for the river was created which bypassed the structure.

## TALK OF DAMMING THE BREMER

In 1891 there was talk, because of a lack of rain for the desirability of building a dam several miles upstream on the Bremer. It was hoped that this would enable enough water to be stored so that a constant flow of water could be assured to those downstream. This would enable numbers of smallholdings to irrigate their land.

## BORE WATER

Probably, because of the dry year in 1891, boring for water was *'the order of the day at Milang. Two gentlemen have succeeded in striking it. Mr WP Dunk has erected a windmill and tanks.'*

## IRRIGATING LARGE AREAS WITH LAKE WATER

At Milang, in 1892, the feasibility of irrigating land within a five mile radius of Milang was looked into. The plan being to pump water from the Lake to a reservoir on Tod's Hill and then reticulate it towards Angas Plains. It was thought that the land was capable of growing fruit trees and vines. Buckland and Cooke, two local men, were representatives of an English syndicate who were financing the venture. At the time irrigation areas were being established along the Murray at Renmark and Mildura.

W Barnes of Blinman North, after a visit to the area, expressed surprise that there was opposition to this plan. In a letter to the editor of the Southern Argus he said *' I am more than surprised to find good land lying idle, and I stake my reputation that there is no land more suitable for irrigating... There are thousands of acres needing only one thing – "Water" I for one cannot see what objections can be raised against carrying out the proposed scheme. The land and the water are both all that could be desired, and the Government can by carrying out this scheme sell or lease the land, populate the country, increase railway traffic and the general revenue, and in a few years the enormous sums spent in currants, raisins etc will be kept in our own colony, thus making us all the richer'.*

## LOCK ON THE LOWER BREMER

EH Hallack provides the following description of T Dodd's method of watering his pasture during a trip along the Bremer in 1892 *'Further on the first of his methods of water-locking was observable. Raised banks stretch across the flat to the banks of the stream (when there is one) the intervening*



or channel space being occupied by the lock, which is constructed of wood and iron. The lock when lowered for the retention of water throws it back over the adjoining flats for a considerable distance, and the gates of the lock can be raised at any time when floods mean business. Wire ropes attached to the wooden piles are stretched to prevent the carrying away of the moveable portion of the structure. It is a capital method of irrigating, or rather flooding the rich alluvial slopes which here abound – that is when the creek is running – but it and the land adjoining were both very arid when I was there. A road and crossing place traverse the creek close to the lower lock, the latter being kept well in repair at the expense of Mr Dodd. In fact the sanction of the District Council was obtained previous to this system of conserving the water being affected – “with mutual benefit to both the district and myself,” observed Mr Dodd, whom I subsequently met, and undoubtedly he was correct, as the water here conserved is the source of soakage’s and springs lower down in dry seasons. There are not however many dwellers on the land lower down, but the local “Plains” school occupies a site on the bank below the causeway. The second lock is situated higher up the creek near the homestead, and it throws the water over some forty acres of lucerne’. Mr Dodd was described as a practical cattle and horse breeder.

## WHY IS IT SO DRY?

In March 1892, a farmer at Angas Plains complaining of the hot weather muses ‘I often wonder how it is that the one time fertile plains are becoming yearly more dry and barren. Is it because the tall waving gums which one time grew here are being slowly but steadily removed? Well, perhaps so, at any rate the fact remains they are becoming more dry every year.’

## ARTESIAN WATER

Once again in 1893, at Langhorne Creek, irrigation was talked about. It was thought that the difficulty in gaining a supply of water could be overcome with artesian bores. The appearance of the country to those who ‘had experience’ between Langhorne Creek and Strathalbyn was most suitable. ‘Perhaps if a company could be formed to find the necessary capital the Government might be induced to lend a drill. In all events it is worth testing.’

The Southern Argus 16 February 1892 carried the following letter in support of the notion of boring for water. ‘Sir, - In your issue of the 2<sup>nd</sup> instance your correspondent at Langhorne’s Creek suggested that it would be well worth a trial to bore for water somewhere on the plain country this side of the hills. Well, sir, that is a thing I have often thought of myself, and I, like your other correspondent, am pretty sure good results would come of it. I have heard experts in water boring say that the look of the country is exactly suitable for artesian wells. If the springs lead from the hills, then the water would rise from the surface with great force, and it is quite reasonable to suppose that the underground springs on the plain country between the plain country and the hills do rise from the hills. Suppose a bore was put down at Belvidere or higher up at New Hamburg and a strong spring leading from the hills struck, just imagine the result – what amount of good it would do, another river wending its way down seawards, watering an immense track of country as it wends its way along. There is perhaps no more favourable spot in the colony for water boring than between the hills and the lake, yet we find the Government boring for water away in the far North. We want





*water down here for many purposes, yet nothing has yet been done in the matter. Why not ask the Government to put down a bore, and see what would come of it? The cost would be trifling – all it wants is agitating for, we will get but little from our government unless we ask for it. In Queensland immense good is got from artesian well boring. The great drawback to South Australia is the want of water in the interior, yes, and in many places near the coast, and I predict that unless something is done in this line the population will never be very great. I am yours etc., ADVOCATE'.*

## IRRIGATION FROM BREMER

Fred Potts of Langhorne Creek had an irrigation set up on the Bremer in 1893 the following description appeared in the Southern Argus ' *Some time ago we mentioned that Mr Fred Potts had imported a four horsepower portable engine with which he intended to irrigate part of his land along the Bremer. As Mr Potts now has his plant in working order, perhaps a few remarks may be interesting to our readers, especially those who are engaged in this type of work: The area at present under treatment is about four acres of rich black loam, so deep that it requires far more moisture than the natural rainfall supplies. It is splendidly situated for irrigating having a slope of about 1 in 300 across the rows and 1 in a 100 along them. The well which is situated in the bank of the creek, is five feet six inches square and twenty feet deep, neatly timbered with two inch red gum cut on the premises. From the bottom of the well a drive thirty feet long is put into the creek, this drive also being substantially timbered with gum. The pumps – two in number – the owner made himself of two and a half inch jarrah. They are six inches square in the clear, and of the pattern made by Mr Frank Potts senior over thirty years ago, and working with a two foot stroke at thirty strokes to the minute they throw eleven thousand gallons per hour. The pumps are ingeniously rigged, and are driven by a two and a half inch single rope belt, travelling round a red gum pulley on the engine shaft, so arranged that the pulley makes three revolutions to every stroke of the pump. The engine works sweetly, burns very little wood, and is capable of doing three times the work now required of it. In short, the whole plant reflects great credit upon the mechanical skill of its owner, and is well worthy of inspection by anyone contemplating starting irrigation works'.*

## BENEFITS OF IRRIGATION

In 1894 vines on Frank Pott's property that were irrigated from the Bremer (as opposed to flooded) grew eight feet in the first season. Likewise, mangolds (a member of the turnip family) also had grown well. One specimen, that weighed sixty-three pounds, prompted the calculation '*that such a crop if planted three feet apart would yield 1134 tons per acre'.*

Samples of lucerne grown with and without irrigation by J Cross of Woodchester in 1895 were displayed at the Argus Office for all to see. Both were grown for twenty one days, the sample from irrigated land was three feet in length, that grown without the aid of irrigation was only one foot in length.

The method of raising the water was by a '*very cheap mill supplied by WA Wenzil of Strathalbyn.*' Landseer of Milang in 1899 erected a '*pumping and irrigating plant*' with the intention of seeing if it was feasible to irrigate and use what had previously been considered waste lands.

## SALT PROBLEM IN LAKE ALEXANDRINA

A salt problem was developing with the water in Lakes Alexandrina and Albert in 1902 due to large amounts of water being drawn from the Murray for irrigation projects upstream of the Lakes, coupled with a dry season, an influx of seawater into the Lakes was evident.

A deputation met with the Premier of SA (Hon JG Jenkins) to try and find a solution. It was feared that if nothing were done that in a few years the lakes would be transformed into saltwater ones.

Already, the water for many miles along the lakes and river shorelines were unfit for stock, the herbage was being affected. Land which had been purchased from the Government at high figures *'owing to the beautiful freshwater frontage'* was decreasing in value. *'It would be a national calamity if the valuable country in the district were rendered useless.'*

The Premier said *"it would be necessary to obtain the best scientific advice before attempting to do anything.'* He did not think that the *'lower reaches of the river had been materially affected.'* But the *'Government might be depended upon to look after South Australia's rights.'*

A conference was to be held on the subject of the Murray, between New South Wales and Victoria *'but so far no invitation had been extended to South Australia's representatives.'*

Twelve months later the problem was still evident. Locals were in no doubt as to the cause *'*

*Through the joint influences of long continued drought and an increasing diversion of its waters in its upper course, the River Murray has so steadily lowered its levels that its lower reaches and the Lakes which for centuries it had supplied with a constant flow of freshwater, have fallen to sea level, with the result that instead of the river "rushing out to sea" the tides of the ocean have flowed in.'*

## FIXING THE PROBLEM

A parliamentary party visited the Murray Mouth and surrounds to gain knowledge of the problem.

The Engineer-in-Chief, Mr Moncrieff and the Conservator of Water, Mr JW Jones explained to the party what had been proposed in the past and what was proposed now.

The present solution was three weirs – *'one across the Murray proper connecting Hindmarsh Island at a point three or four miles below Goolwa, the second connecting Hindmarsh and Mundoo Islands, and the third connecting Mundoo and Ewe Islands with the strip of mainland known as Younghusband Peninsula, this plan shutting off not only the Murray and the Lake, but the Coorong also from the sea. Viewing the fact that the Coorong is more an arm of the sea than an offshoot of the river system, and that it would be almost impossible to get rid of the salt water in that long deep channel, a modified plan had been worked out which provided for an embankment being constructed from Pelican Point by way of Towadjerie, Ewe and Mundoo Islands to Hindmarsh Island.'*

A consequence of the change in water quality of the Lake water was that bores were beginning to be drilled in large numbers. The problem was not confined only to the farming community seeking supplies for stock. Salty water was also having a detrimental effect on the boilers of the riverboat engines.

To rectify this in 1903 WP Dunk sunk a bore at the end of the Milang jetty striking water at about sixty eight feet. *'At this depth a strata of hard rock was encountered, the seam running about ten feet in thickness. Immediately this was pierced water gushed up, so the bore was carried a foot or two lower, by which time the artesian water – beautifully clear and sweet – had risen to about three*



*feet above the level of the Lake, at which point it continues to stand, despite the fact that the supply has been heavily drawn upon.'*

C Landseer also put down a bore near the Lake. The water was struck at sixty feet and rose to several feet above the ground. When a pump was installed it delivered about one thousand gallons per hour. From this he grew several paddocks of lucerne used to feed to a herd of sixty dairy cows.

## PUMPING FROM BREMER

In 1905 part of Burnside Estate was broken up into smaller holdings. One of these block 99 of two hundred and ninety acres was allotted to H Howard. On the banks of the Bremer, which at this point was thirty feet deep, he installed a fourteen horsepower Blackstone oil engine and halfway down the bank he placed a six-inch centrifugal pump connected and driven from the engine by a belt and pulley. In this way fifty thousand gallons of water per hour could be lifted fifteen feet by suction and forced the rest of the way. Zante currants, about forty acres, were to be irrigated by this means.

Levelling and grading on land adjacent would provide land for fruit trees and lucerne.

The only downside being that as there was no waterhole Mr Howard was able to pump only when there was a freshet (flood) in the creek or it was running strongly.

In addition to this he has a well with an eight foot Samson windmill on a twenty foot tower to provide an additional water supply.

## WATERWORKS SCHEME FOR STRATHALBYN AND PLAINS

A meeting was held on 30<sup>th</sup> September 1910 in the Institute Classroom to outline a proposal to dam the Angas. CA Bayer the Hydraulic Engineer explained to the people of the town and district the two alternatives proposed. One, being a dam capable of storing sixteen million gallons of selected water, costing twenty two thousand pounds. The other to store forty million gallons of ordinary flood waters costing seventeen thousand pounds.

To the second but cheaper plan it was proposed that, provided the retaining wall was constructed with it in view, extra height could be added later. This would increase the capacity to one hundred and eighty million gallons.

Users on the Plains would be assessed at the Town supply rate i.e. one pound per ten thousand gallons, any over that would be two shillings per thousand up to a million gallons.

Bayer said '*With the present population the supply would work out at about 100.3 gallons per head per day for the entire population, a supply which would thus allow very free use for irrigation as well as for domestic purposes. Ratepayers of four pound a year would thus have forty thousand gallons allowed them and so on. Compared with the cost of pumping by windmill, allowing for capital outlay, wear and tear, and incidentals the reservoir supply worked out to the consumer's advantage*'.

After lengthy discussion it was moved that a month should be allowed, in which people could look at the plans and consider the merits of both schemes, then another meeting called.



## RAILWAY

In 1910 whilst the debate for a rail line from Murray Bridge through Mulgundawa and Langhorne Creek to the Victor Harbour line was in progress the irrigation of the land near the Bremer was discussed

Because it was near the market, a rail line would benefit such a form of agriculture. Mr AJ Follett pointed out to the Murray Lands Railway Commission and Sedan select committee that in time the valley of the Bremer would have an irrigation scheme. It was, if irrigated, ideally suited to intense cultivation of crops. Mr V Cock also stated that the land was too valuable for sheep grazing and it was as good as that at Renmark for producing fruit.

They believed that a railway line would open it up for this form of endeavour.

## BORE WATER

Also at this time Watson Park at Milang was divided into smaller holdings. Mr Hill on one of these had put in 30 acres of lucerne which he irrigated from an artesian bore.

On the property of Mr AJ Follett at Langhorne Creek in 1910 the Ross brothers of Milang put in a six-inch bore one hundred and thirty seven feet deep. Water rose to within thirty feet of the surface and Mr Follett intended timbering a shaft to the water level. However a strong supply of water from '*surface springs*' at twenty feet meant that this was as deep as the shaft went. This supply of water flowing down the bore at the rate of several thousand gallons per day caused no rise in the level of the water in the bore. Clutterbuck's supplied a Blackstone seventeen horsepower oil engine and a three inch centrifugal pump which was able to deliver eighteen thousand gallons per hour. The complete outfit was installed by Mr Forrest. The bore was placed on a sandy rise around which was good soil. Mr Follett intends to gravitate the water onto a currant plot in one direction and a lucerne patch in the other.

At Lake Plains in 1913 several farmers planted potato crops. One farmer had two lots, one of twenty-two acres and the other of eight acres. Both were irrigated from bores using engines and pumps.

In 1917 east of Langhorne Creek Mr Duffield, on WH Williams land (known as Loser's and which had changed hands six times in six years because of a lack of water), struck water at ninety six feet. Water was also obtained, at sixty-five feet, on Mr Retallick's property a further mile east.

## FLOODGATES

After the drought in 1914 Mr Levi Hender of Montura decided to install floodgates on the Bremer to utilise flows of water for irrigation. His first two attempts were washed away.

However, learning from these he built the third much stronger and it was able to withstand the force of the water. Using channels he was able to direct the water to where it was needed for fruit growing.

## LOST WATER

In 1922 the cost of an acre foot of Murray River water used for irrigation was three pound. It was estimated that locally seven thousand acre-feet was lost from the Angas and twelve thousand from the Bremer that could be used for irrigation purposes.

## SALT WATER PROBLEMS IN MURRAY AGAIN

In 1930 the problem of salt water was again causing concern. A protest meeting was called by the Meningie District Council to agitate to keep the lower Murray and Lakes fresh.

This meeting was held at Strathalbyn in July and was attended by amongst others Sir Lancelot Stirling, Members of the Legislative Council J Cowan and HD Hudd, Members of Parliament for the Southern and Albert districts Hudd, Heggerton, Laffer and McMillan, Alan McFarlane, AP Bowman, KD Bowman, Keith Bowman, Keith Scarfe, George Hackett, EH Bakewell, FG Ayres. EL Goode, Roy Goode, RH Giles and J Grundy. People from Meningie, Milang, Goolwa, Narrung, Murray Bridge and Taillem Bend were also present. The Honourable T McCallum MLC was elected to chair the proceedings.

A great deal of talk took place about what was needed to be done to provide a good freshwater supply, why the conditions had altered to allow saltwater to encroach and how the government should go about achieving the aim desired.

The following resolution was adopted " *That the irrigation and conservation schemes in Victoria and New South Wales having deprived the lower River Murray and the lakes of the natural flow of water, the landowners request the government to take immediate action to preserve the riparian rights of the owners of land abutting the river and lakes; and that before any further expenditure is incurred in the locking and dealing with the waters of the river, the vital necessity be urged upon the Government of this State of constructing barrages as was the intention of surveyors and engineers in 1902, to conserve the fresh water in the lakes and river, and that an adequate supply of water be provided for that purpose*". Moved Landseer seconded Bowman.

A committee comprising of the following T McCallum, EH Bakewell, LH Landseer, G Hackett, A McFarlane, FG Ayres, KH Bowman and EB Rankine was appointed to take the resolution to the Government.

## HA FOLLETT SWAMP EXPERT

Mr HA Follett, of Langhorne Creek, was appointed by the Government as Agricultural Instructor for the irrigated swamps on the Murray in 1936.

Mr Follett attended Roseworthy Agricultural College where he was awarded a diploma of the first class with honours (gaining 90.3 percent) in agriculture, viticulture, oenology, fruit culture, veterinary science, wool classing, surveying, chemistry, bookkeeping, aviculture and dairying gaining. He was also awarded the gold medal for 1914 and won every prize open to him except one.

Since leaving Roseworthy he has farmed an irrigated block at Langhorne Creek that is considered to be a model one.

His practical knowledge would be a great asset in assisting with the problems of farming swamp areas.



## IRRIGATING THE PLAINS

As a result of a Public Meeting held at Langhorne Creek on October 11<sup>th</sup> 1940 a deputation met with the Commissioner of Public Works on 5<sup>th</sup> November. This deputation comprised of FJH Cleggett, HM Natt, GS Davidson, CA Whittlesea and LH Eichner and was introduced by HC Dunn Member of Parliament.

The purpose of the meeting was to request that the Angas and Bremer rivers be controlled so that the waters could be used for irrigation. The River Broughton scheme had been watched with interest and the local scheme was similar with one difference, whereas the Broughton was practically dry the Angas and Bremer had water in them.

The reason for looking into this scheme at the time was the serious drought, which was happening. In the first instance water from Lake Alexandrina was to be used, but if this proved too expensive then an alternative was to use water from the two rivers. Natural flooding occurred on both rivers during wet years. It was envisaged that an area of about one hundred square mile could be irrigated.

The proposed alternative to Lake water was three floodgates on the Bremer, one two miles above Langhorne Creek, one half a mile above Langhorne Creek and the third about five mile below costing a total of three and a half thousand pounds.

In regard to the Angas nothing had been planned but floodgates should be investigated. Whatever was decided on was thought to need about the same money as those on the Bremer bringing the total cost to seven thousand pounds.

The Minister said he was interested in the proposal and understood the subject of irrigation. However, a knowledge of it had taught him two things -- One being the value of irrigating land and the other that caution was needed before undertaking any scheme.

He also pointed out that the Government had in the past said that they could not undertake any scheme unless all landholders were agreeable and this was not forthcoming.

Besides this he did not believe that the Government would fund the scheme. But instead would set up a trust so that the farmers could either do it themselves or seek money elsewhere to do it. Thus the trust could set rates or charges on landholders similar to council rates to recoup the cost.

He would ask the Engineer in Chief to carry out investigations into the feasibility of the plan. This, because of other important works in hand, would probably take some time but when it was finished he would advise them through Mister Dunn.

## IRRIGATION SCHEME AT MILANG

In March 1943 a party of Government officials, at the request of the Premier, visited Milang to investigate the suitability of the area for irrigation. Those in the party were the chairman Mr McGilp, Hill and Melville from the Land Board, Hambidge the Surveyor General, Anderson the Engineer for Drainage and Stephens a soil expert from the Waite Research Institute.

This group was met at the Milang Institute by the Member of Parliament H Dunn and a large number of locals. After lunch they visited W Woodrow's garden to see what could be grown with lake water. Then the party and about twenty locals made a tour of the district. They travelled along the Nine Mile track to Cross's corner then to Nurragi and on to Wurralee and returning to Milang to inspect the properties of EH Burgess and Mr McInnes.



From there they went along the Strathalbyn road to McLean's corner and onto L Davidson's where they took levels.

At Angas Plains they went around Mr Matheson's property before continuing to the Lake road and back to Milang.

Despite the group being very impressed with the soil, level ground and the fact that there were none of the difficulties present that have been encountered at other schemes along the Murray theirs was only a preliminary investigation. Once they had presented the report, which would be favourable, much more work would need to be done before anything concrete happened.

The work, which included soil testing, level taking and surveying, could not be expected to proceed at once because of the shortage of manpower within the Government.

The Premier Mr Playford in May 1943 inspected the twelve thousand acres of land proposed for an irrigation scheme. This was to the north east of Milang and east of the Strathalbyn road including the Angas and Bremer rivers and about five miles fronting Lake Alexandrina.

He was accompanied by the Superintendent of the Irrigation Branch AC Gordon, the Chairman of the District Council of Strathalbyn and Member of Parliament HC Dunn and the Irrigation Development Committee.

The construction of the barrages had made it possible to consider such a scheme and the water would come from the lake. This water would require a lift of not more than fifty feet and as the land was relatively flat could be put to good use.

The Premier believed that the area irrigated would be suitable for dairying and raising fat lambs. In 1951 an irrigation scheme using water from Lake Alexandrina to water the country from Strathalbyn to Finniss and Milang to Langhorne Creek was still being talked about. Although it would be one of the cheapest schemes to initiate, it would require very little clearing of land and be very close to the main market. Nothing had eventuated. Blame for this inaction was variously put on Parliamentarians and the leading citizens of the district.

One of the suggestions of using the area was to plant over five thousand acres of grapes for wine production was not looked upon as the most beneficial use of the resources. It was felt that a better use would be food production, to supply the world market, which because of the recently ended world war was in short supply.

## IRRIGATION RESEARCH

The Milang Irrigation Centre was established in 1953 to demonstrate the potential of the country near the lake for pasture irrigation. Studies were made into which was the more effective way to grow lucerne, flood or spray irrigation and the effect of this lucerne as a stock feed. As well the costs and problems of farmers establishing irrigation schemes were investigated.

In 1954 the Milang Agricultural Bureau held, as part of its Annual Field day, a tour of the research centre. The Chief Irrigation Officer, J Cook and assistants Langsford and Lines, who explained the various research being carried out, showed them over the facility. The party looked at such things as selection of types of plants and the watering regimes necessary for the best results.

It was realised, after several years, that there was a lack of knowledge regarding other pasture species and irrigation. Therefore trials were undertaken looking at ways of selecting the most productive grasses and clovers in an effort to improve grazing management, fertiliser use and the best use of the extra feed produced.



A spokesman for the Department of Agriculture, Mr Judd said that 31 grasses and clovers were being trialled. Trials were also being undertaken into whether nitrogen as a fertiliser would lift production.

Information gained from this research was hoped to show the most profitable application rate of water, how pasture production could be increased with the application of fertilisers and the correct species to choose for summer production.

Three trials, each with a different spray regime and fertiliser application rate was to be tried. The outcome was to find the species that had the best dry matter yield, best botanical composition and most effective root zone for the best watering rate and fertiliser application.

All this was being carried out by an Irrigation Research Officer, Field Assistant and two farm hands financed by a Commonwealth Extension Services grant of five thousand four hundred pound per annum to the South Australian Department of Agriculture.

## WATER SCHEME FOR STRATHALBYN AND DISTRICT

Councillor Stacey reported to the Strathalbyn District Council meeting of 6<sup>th</sup> January 1958 on a scheme of supplying water to Strathalbyn and district. He originally thought that the greatest need was between Strathalbyn and Callington but now realised that the need was wider.

The entire district, except the Langhorne Creek- Angas Plains area, which had ample water from the sub artesian basin, would benefit. Up to ninety percent of the landholders would make use of water provided.

Councillor Stacey believed that to try and get such a scheme in place it needed a greater effort than he could provide. He therefore thought that the best course of action would be to try and work through the Murray Valley Development League. This would need delegates from the Strathalbyn district to join the League to try and convince the Minister of Works that Strathalbyn was more deserving than other parts of South Australia. He also suggested that the best candidates as delegates were Councillor W Eckert, Mr MK Phillips and Mr AC Weston.

In February Mr Stacey met with officers of the Mines Department who expressed surprise that more use was not being made of the almost unlimited supplies of fresh water from Lake Alexandrina at Milang. They believed that a supply could be drawn from that source at a low cost.

Later in February councillor Stacey outlined his plans to pump water from the Department of Agriculture Irrigation farm near Milang the eight or ten miles to the Strathalbyn Racecourse. Here it would be connected to the Strathalbyn town supply and pumped to the reservoir. From there it could be reticulated all over the plains between Strathalbyn and Lake Alexandrina. It was believed that thirty or forty farmers along the pipeline would be assured a constant supply of water.

His scheme has the full support of Mr WW Jenkins the local Member of Parliament. He has arranged for a deputation to meet with the Minister Mr McIntosh.

By 1961 this was still being discussed, as the headlines of an article in the Southern Argus put it '*Strathalbyn and District Water Supply – Local Committee still plugging away*'. This committee consisted of C Stacey, P Ball, John Jenkins, MK Philips, N Perry and C Roberts.

To them the solution to the water problem was simple, a pipeline from Lake Alexandrina.

Politicians saw two options, one a dam on the Angas, the other a branch line from the Murray Bridge to Onkaparinga River pipeline.



Local member Mr W Jenkins said, in February 1962, that the scheme that was recommended, and was soon to be submitted for approval to Parliament, was to receive water from the Murray Bridge to Onkaparinga River pipeline.

But despite this recommendation the option of Lake Alexandrina water from Milang was taken.

In August 1963 all the pipes had been purchased and a small camp had been constructed at Strathalbyn for the workers. Mains laying had commenced in early June with eight and a half miles of three and four inch and half a mile of twelve inch already completed. Sites for tanks had been located. Of the total cost of three hundred and seventy nine thousand five hundred pound, one hundred and thirty six thousand five hundred and twenty four pound had been spent.

The scheme was officially opened on the 29<sup>th</sup> April 1965.

## BORE DRILLING

The 31<sup>st</sup> July 1958 'Southern Argus' featured the following article entitled Water is Life, Water is Wealth. Modern Drillers operate in the district.

*'During the past year or two residents in our district have complained about the lack of water for stock and irrigation purposes. It is well known that right throughout the South and Lakes Districts, there are large quantities of underground water of fair average quality.*

*Of considerable interest to water seekers is the arrival in the district of a new and efficient rotary boring plant, of American design, which has been working successfully for a number of years in WA. The advent of this equipment is welcome news indeed for those who have had to wait indefinitely for bores for the urgent needs of stock and irrigation, as well as for domestic use.*

*To the mechanically minded the lay-out and design of this rotary drill is of particular interest.*

*Robustly built as a complete mobile unit, the working head is raised and lowered hydraulically as also is the rotary mechanism for exerting the downward thrust of many tons on the drills, making quick work of even the hardest formations. The upward thrust with suitable leverage can exert pressure of several hundred tons.*

*Powered by an engine with a V8 Mercury normal gearbox, the drive is through a top speed transfer case. A range of eight speeds is therefore available for the rotary action and also for the bailing and winch, giving ample selection for any operation under any conditions. Quiet in operation, the quietness belies the speed and efficiency with which the clean, accurate 6 inch diameter holes are bored.*

*On the business side of things Modern Drillers are continuing their West Australian practice of discounting non productive and multiple holes drilled on the same property when drilled at the one time. Also those in residential areas who require limited supplies of water for domestic use and for the garden, can now have their own bore supply for a minimum of cost under a similar arrangement.*

*Another feature worthy of mention is the constant testing of water for salinity as the bore progresses. Advantage can thus be taken of the best available water at any level without the often, unnecessary and expensive deepening of the bore only to find greater salinity at a greater depth.*

*To Modern Drillers we offer our best wishes and may good success attend their operations, and as the water flows as a result of their labours, may it mean greater production, wealth and convenience to all in this district'.*

## PROBLEMS (see also sections on Water Use and Angas Bremer Water Management and Grape Growers and Irrigators minutes)

At the February 1962 meeting of the Langhorne Creek Grape Growers it was moved that enquiries should be made to the Department of Agriculture in regard to the 'salty water' that had come down the Bremer during the last winter.

This was still an issue in 1963 when the president suggested a public meeting at which someone from the Mines Department could talk on the 'salt and contents' of the Bremer.

Upstream in the Bremer catchment, property owners, through whose land the Mount Barker Creek ran, complained in October 1963 that due to pollution stock would not drink the water. It was also believed to be unfit to use for irrigation of potatoes and lucerne. The source of the pollution was not stated, however the Central Board of Health and eighty medical students from the University of Adelaide were to collect samples for analysis.

Contamination of the river was again discussed at a meeting of the Grape Growers in 1965. Len Potts passed on discussions he had had with a Mines Department member regarding what they were planning to do.

In 1967 MW Edson, a councillor on the Mount Barker District council, brought up the subject of local creeks being polluted. He said this was caused by two factories in the area, Jacobs and the Tannery, discharging liquid waste into them. He said ' *I don't know whether stock would attempt to drink from the creeks, but the odour is sickening*'.

In 1967 a dam at the Mount Barker Tannery which was used to hold waste burst and emptied its contents into the nearby creek.

Lack of water in the Bremer, not pollution of the water was the main issue in 1968. There had been thirteen months where no water was available for irrigation from the Bremer. This had been overcome to a large degree by pumping water from the sub artesian basin and an estimated eighty percent of the grape growing district was watered in this way.

Even though this 'emergency watering' was considered satisfactory the president Len Potts could foresee further problems. The major one was a depletion of the underground basin with the resultant loss of water quality. This needed to be closely monitored he said.

## PUMPING FROM THE LAKE

In mid 1962 Mr L Yelland of Point Sturt had a channel dug from Lake Alexandrina into one of his lakeside paddocks. At the end of this channel he placed a corrugated iron tank (in the channel) from which he pumped water. Pumping of water was done by an electric motor and this was spray used to spray irrigate several acres of lucerne.

## MONITORING THE BASIN

In August 1966 in reply to a question he asked in parliament, local member WP McAnaney received the following answer from the Honourable JD Corcoran ' *The Minister of Mines reports further progress in hydrological investigation of the Milang district was delayed pending clarification of the staff and financial position of the department in the new financial year. The drilling of four, two to*



*three hundred feet deep boreholes is planned for the coming months. These will be to determine the stratigraphic thickness of the aquifers at a number of localities and pump tests will be carried out to obtain figures on the aquifer characteristics, that is maximum draw off capacity and safe field. These bores will be used for long-term observation of water level behaviour.*

Mr WP McAnaney, local Member of Parliament asked the following question in the house in late 1967. *' In the Milang area because of the salt content in the water, bores used for agricultural purposes cant be used to water stock. Farmers in the area explain this by saying that the new water scheme has brought about many disused bores with the result that salt water has entered the basin. Can the Minister of Agriculture ask the Minister of Mines whether the farmer's explanation is correct and what action can be taken to seal bores?'*

The Honourable GA Bywaters – *' Yes. Detailed field survey needed to be undertaken. While it is hoped to carry out a preliminary survey in a week or so pressure of work makes it difficult to forecast when detailed survey will occur.'*

The preliminary survey had begun by the end of November because it was mentioned in the Langhorne Creek news, in the Southern Argus for 30 November that the Mines Department were carrying out a survey of the basin. Again in the 11 April 1968 Langhorne Creek news, in the same paper it was reported that the Mines Department men are still at work drilling.

In May, Mr McAnaney in a letter to the Southern Argus supplied the information that two bores had been finished one as a pump test bore and the other as an observation well.

It was estimated that 5 bores would be sunk. The long term program was to assess the reserves of the basin. As well as this a short term project would also be undertaken to assess the rapid deterioration of the basin in quality and quantity of water.

In the Southern Argus edition for 12 September 1968 an article headed '*Langhorne Creek Water Basin – Warning to Pumpers*' had the following from WP McAnaney *' I have been informed that a preliminary progress report on the test drills in the artesian basin in the Langhorne Creek area indicates that the area is being severely over pumped and the depletion of the aquifer is already evident. Work has not progressed far enough to arrive at a quantitative conclusion.'*

In February 1969 Hansard records that Mr WP McAnaney asked the following regarding the Langhorne Creek basin *'Has the Premier a reply from the Minister of Mines to my recent question about the present activities of the Mines Department in the Langhorne Creek basin and the possibility of the area being proclaimed under the Water Preservation Act?'*

The Honourable RS Hall – *' The Mines Department investigations have been temporarily suspended because of staff losses, and no further work is possible until late March. Several bores have been sunk and pump testing to determine the aquifer potential is planned. Consideration is being given to the need to proclaim the Underground Waters Preservation Act and a preliminary report on the geology of the basin is being prepared.'*

## POLLUTION

In November 1969 Mr McAnaney asked the following in regard to the Bremer River

*' Has the Premier received from the Minister of Mines a reply to my question about the possible pollution of the Bremer River from copper mining operations at Kanmantoo.'*



The Honourable DN Brookman – *'The details of the proposed mining operations at Kanmantoo have not yet been submitted. However it can be taken for granted that pollution of the Bremer River or any other stream would not be contemplated by the company or permitted by the Department.'*

On the 15<sup>th</sup> of July 1970 Mr WP McAnaney asked the following question, in the House of Assembly, regarding what was happening with the investigations into the basin. *'Although there has been considerable investigation in recent years of the Langhorne Creek and Milang basin it has only been on a limited scale. Will the Minister of Mines ascertain what progress has been made and whether action will be taken here similar to that taken in the Virginia basin?'*

He received the following answer from the Honourable Premier Mr DA Dunstan on the 29<sup>th</sup> of July, *'Investigation of the Milang Langhorne Creek basin this year has been severely restricted due to lack of geological staff. One bore hole has been drilled and two pump tests carried out. Periodic readings of water levels in a number of observation bores are being taken, but no proper analysis of data so far obtained has been made. Additional resignations in the last month have made it impossible to programme further work in this area in the immediate future, but it may be possible to reassign staff to the area following completion of the present phase of technical investigation on the Northern Adelaide Plains.'*

The Minister of Development and Mines in November 1973 announced that funds had been allocated to the Department of Mines to drill two further groundwater observation bores in the Milang/Langhorne Creek irrigation area. In fact one was already almost complete and the other should be completed by about the 30<sup>th</sup> of November.

They were being drilled by the Department's cable tool drilling rig.

They will be about one hundred and thirty feet deep and have casings inserted that will be pressure cemented to prevent the saline upper water from leaking into the lower aquifer.

Interested landholders and drillers were invited to attend a lecture by the Department of Mines drilling branch. At this, staff will answer any questions that people may have.

The Minister also said he would be interested to hear from anyone who had attempted artificial recharge.

The Strathalbyn District Council's Local Board of Health Inspector reported to them on the condition of the waters of the Bremer. Council resolved that *'The Minister of Environment and Conservation be advised of the Local Boards concern at the increasing level of pollution in the River Bremer which is threatening grape growing in the district of Langhorne Creek and request that the matter of pollution be investigated and treated as a matter of urgency.'*

Eric Hender, Secretary of the Langhorne Creek Grapegrowers wrote to the Southern Argus in March 1974 in response to the above. *'Dear Sir, The people who live along the River Bremer have for some time expressed concern at the increasing levels of pollution in the river water. It is interesting to note the Strathalbyn District Council action recorded and published in the Southern Argus of March 21<sup>st</sup> following the Health Inspector's report.'*

*Landowners have noticed a continued deterioration in the quality of the water during the past winter and which at present is unsuitable for stock and plant life in the upper Bremer region.*

*A protest meeting is being organised so that the situation can be rectified before the coming winter.*

The meeting took place in the Woodchester Hall in April attended by about ninety landholders and addressed by KJ Harris of the Mines Department He informed them that it could take up to ten years to rectify the problem created by the Brukunga Pyrites Mine. He had been studying the Bremer for about two years and *'painted a grim picture'*. The dam at the mine he estimated to hold twenty



seven and a half million gallons of water is slowly becoming more and more acidic. At present this water is being circulated between two impoundments to prevent it entering Scotts Creek. Some of the proposals being considered to solve the problem included dilution of the acid for safe release or piping the creek around the Brukunga Mines. Minister of Mines Hopgood stated that thirty thousand dollars had already been spent on a study of the Bremer cleanup.

Engineer for Water and Sewage RC Williams said the Bremer had a complicated catchment, acid came down the Scotts Creek, organic waste came down Mount Barker Creek and highly saline water down the Bremer. Analysis had shown cadmium, zinc, copper, arsenic, aluminium and mercury but not in levels for concern. He told the meeting ' *If there was any concern about heavy metal levels, it would have been brought to your attention.*

Those present then chose a committee comprising Don Brown, Ron Donohue, Bob Chapman (from the top end of the Bremer) Malcolm Cleggett, Len Potts, Ken Follett (from Langhorne Creek) Leon Bartholomaeus and D Clements (representing bottom end) with Eric Hender as Minute Secretary.

They will next meet at Callington where a chairman will be elected.

At this meeting they will consider amongst other things—court action against those responsible for polluting Scotts and Mount Barker creeks and the Bremer and a direct approach to the government for the long promised Kanmantoo to Strathalbyn pipeline. In addition they will discuss the acidity of the water, the deaths of all trout and burn off of reeds, refusal of sheep to drink the water because of detergents and dyes.

By June a headline in the Southern Argus read ' *Bremer Pollution Almost Solved* '. The article said that at a recent meeting involving Mines, Engineering and Water Supply, Nairne Pyrites, Australian Mineral Development Laboratories and the local committee, plans that would end the pollution of the Bremer River were talked about. The first stage costing two hundred thousand dollars would involve collecting of all water from all seepage points, including Days Creek, and pump it away from the area. To ensure supplies are available to landowners in summer water will be collected above the mine and through a diversion bypass it.

D Clements of the Eastern Hills Watershed Anti Pollution Committee said scientists from E and WS and AMDEL had formulated a three stage plan which should receive financing by late June. The second stage was evaporation ponds, of which cost estimates were currently being prepared. To ensure that they were able to achieve their aims a trial would also need to be run.

The third stage was plantings on the mullock heaps to prevent contamination being washed downstream.

Mr Clements said that the Pyrites company had accepted responsibility and were ready to assist with any remedial action.

A second public meeting at Woodchester would take testimonials and written evidence of stock losses and property damage by landowners on the Bremer in order to get priority for allocation of any monies.

In August a sludge deposit with a heavy metal content was left in the vineyards at Langhorne Creek. This came from the ponds at Brukunga, where there was an area of about one hundred acres that was up to eighteen inches deep of acid mine waters.

Departments of Mines and Agriculture, Engineering and Water Supply and AMDEL were asked to determine if it would be detrimental to the vines by the Eastern Hills Watershed Anti Pollution Committee.



A meeting of all those interested was held at K and L Potts vineyard on Saturday 24<sup>th</sup> August to inspect the deposit.

In the 5<sup>th</sup> of June 1975 issue of the Southern Argus under the headline '*Bremer River a Soup*' the following description was given '*Take raw effluent from Lobethal via Harrogate Ponds mix well with surplus dyes and other chemicals from the Woollen Mills. The latter having a bearing on the final colour. Sometimes its red sometimes its blue. On Monday this week it was a delicate milky green. To this already poisonous mixture add an equal obnoxious portion of acid from the Pyrites Mine sediment dam at Brukunga.*

*Now take the taste from two bacon and smallgoods factories. Your mixture will be taking on that subtle odour of putrefication. However there is still more to come. You must include the waste from a tannery and a large dry cleaning factory.*

*If this sounds difficult to obtain just drive your car to the Bremer at Callington and let down a bucket into the murky water of the Bremer River, it is already mixed and waiting.*

*Whether this combination appeals to you or not it is the main water supply for stock along the river. It waters the vineyards and eventually ends up in Lake Alexandrina. It has a PH so high it is equal to weedicide. Not only is it killing stock and destroying vegetation along its banks and annihilating the fish but it is also being piped to the homes of Strathalbyn.*

A deputation of Bremer Valley landowners called on Minister Corcoran to enquire as to what the government was doing to rectify the pollution problems in the Bremer. He was sympathetic with their concerns, but could not see anything being done in the near future because of finance problems. He did, however, say that he would get a report from the E and WS and get back to the deputation with an answer within a week.

The next Public Meeting was scheduled for the 30<sup>th</sup> June 1975, to be held at the Woodchester Hall. Those calling the meeting strongly urged residents of Strathalbyn to attend as the pollution of the Bremer eventually would affect Lake Alexandrina and thus their water supply.

The Public Meeting at which the deputation reported on their meeting with Minister of Works Corcoran was '*packed out*'. Those present included Member for Murray, Wardle, Eastern Hills Anti Pollution Committee representative Cleggett, Mobilong Council representative Paech, several members of Strathalbyn Corporation plus Mayor elect Garwood, representatives of Milang and Callington Progress Associations, President of Strathalbyn Development and Tourism Association, Ron Critchley, UF and G Strathalbyn, Stewart Roper of Department of Environment and Conservation as well as Terry McAnaney, Liberal Movement candidate for Heysen.

The chairman of the deputation who visited Minister Corcoran outlined the points that had been discussed with him. He also said that the Minister considered the conservation had been '*sketchy*'. The chairman had received a letter from Minister Corcoran that read '*I understand you have made enquiries from the E and WS as to what I have asked them to undertake following the deputation which you had introduced into my office on 28 May. I have requested the Director and Engineer in Chief to investigate the claims by the Department and the state of the Bremer. As a result of the representation I have asked him to press ahead as soon as possible with the multi objective study necessary in order to supply to the funds for work. In addition I have asked him for a timetable for the project, showing the proposed time for study reference to the Public Works Standing Committee and desired construction program in order that I might advise the residents of the area through you as promised.*



The chairman of the Callington Progress Association said he had been told that a temporary pipeline to supply water to Callington would be built. Landholders pointed out the urgency of tackling the problem as there had already been stock losses and a fish kill caused by the water.

At a meeting attended by forty Callington residents and addressed by Kimber of the E and WS the promise of a reticulated water scheme for Callington and through to Strathalbyn was made. When it eventuated was entirely dependant on the residents.

Despite the concerns of polluted Bremer water, almond and grape growers at Langhorne Creek, still irrigated with it when the first flow for the year made its way downstream in July 1975.

Still nothing seems to have been done by July 1976 as a public meeting held at Strathalbyn, attended by residents of Callington, Bletchley, Hartley, Woodchester, Langhorne Creek, Milang and Strathalbyn they were told that no provision had been made in the 1976/77 budget estimates for funding to provide an adequate water supply.

Opinion at the meeting was that the buck was being passed. The State government said it could not do anything until the Federal government provided funds. Whereas the Federal government said it had not done anything because the State government had not provided reports from relevant departments.

Meanwhile farmers were complaining about the quality of the water. One said his dog had become violently ill shortly after drinking it. Another, who farmed property at the junction of the Dawesly and Mount Barker creeks said he had lost a lucrative deal to sell sheep to the Middle East because after drinking the polluted water they got scours and the stock agents acting for the buyers refused to accept the stock. (He was to sell six hundred wethers at eight dollars fifty a head).

Tests had shown that the PH was 4.2 when it was normally 7.

In April 1977 the relevant Minister, who had responsibility, was told by the opposition and locals to quit stalling and do something. The problem had been brought to the attention of the Government by WP McAnaney in 1973 and still nothing had been done except talk.

## REHABILITATION OF BRUKUNGA MINE SITE

One hundred and fifty thousand dollars was allocated in April 1975 to alleviating the problems at the Brukunga Pyrites Mine.

Members of the Eastern Hills Anti Pollution Committee met with representatives of the Mines Department, AMDEL and E & WS at the mine to have explained what was being undertaken.

Measures included the bypassing of the site by uncontaminated water in Days and two unnamed creeks, the water, of high acidity, in the benches will be contained by a layer of clay undersealed by plastic covered with soil and sown to grass. As well shrubs will be planted on the mullock heaps. A pilot treatment plant was set up to treat the water in Brukunga's '*death lake*', the tailings dam at the mine site.

But by August 1978, Member for Murray in the South Australian parliament was calling for the cleanup programme to be accelerated.

In January 1979 Mr Wotton said he had received no answers from the government on his questions regarding the cleanup of the Bremer River and the Brukunga mine site.



## INFORMATION REGARDING UNDERGROUND WATER

At the annual general meeting of the Bremer/Angas Irrigators Association held at the Langhorne Creek school on Thursday 8<sup>th</sup> June Mr Waterhouse a geologist with the E and WS was guest speaker. He spoke on the Water Resources Act which was to come into effect on the 1<sup>st</sup> July 1976. This act will restrict the drilling for water to licensed drillers and that will only be able to be undertaken with a permit. The permits were to be free and were only being introduced to protect the quantity and quality of water in the basin.

Each area, according to Waterhouse, would have a council of twelve members comprising local irrigators, Member of Parliament and local government representatives to act in an advisory capacity '*to preserve surface and underground water*'.

Following this talk a film entitled '*The Water Below*' explaining the composition of the water basin and its relation to the surface area was screened.

A further meeting of the Association was to be held in three months. All irrigators and '*underwater tappers*' were urged to attend.

Waterhouse spoke to local irrigators again in September 1977 on the fall in water levels and increase in salinity within the basin. He said geologists from the Mines Department had been undertaking a study, since 1969, to establish how much water could be safely pumped from the basin.

This study had shown that twenty five thousand cubic metres a year was at present being extracted but only twelve thousand cubic metres being '*put in*' every year. Replacement came from five thousand five hundred from the Angas and Bremer Rivers, three thousand from Lake Alexandrina and three thousand five hundred from both the east and west sides of the basin. The balance is leaking down from the upper aquifer to the confined aquifer.

He also said that Tritium, a by product of hydrogen fallout, which had been present in Lake Alexandrina water for twelve years was now present in basin water close to the lake.

He was of the opinion that the water had reached a static level. Recharging was taking place, but with some salty water. He said the problem was how to prevent this salty water from entering the confined aquifer.

By 1979 Waterhouse said that this increasing salinity was still causing concern. The causes were the pollution of the Bremer and leakage from constructed wells. Water quality was rarely better than fourteen hundred milligrams per litre and several kilometres away from the river could be as high as ten thousand milligrams per litre.

## TOWN WATER SUPPLY FOR LANGHORNE CREEK

In February 1979, District Clerk of the Strathalbyn District Council, Vern Cotton said that about thirty five properties at Langhorne Creek would receive reticulated water. Water would come from a bore near the Langhorne Creek Emergency Fire Service shed. The scheme was made possible by a thirteen thousand dollar State Unemployment Relief scheme grant to which the council had added twenty three thousand dollars.





## WATER RELEASE FROM MINE RETENTION DAM

In May 1979 an agreement was said to have been reached between members of the Eastern Hills Watershed Anti Pollution Committee and the Engineering and Water Supply department to allow acid water to be released, at times of high river flow, from the Brukunga Mine site. Property owners would receive prior warning so that appropriate action could be taken.

## "SECRET" REPORT ON WATER QUALITY IN BREMER

In November 1979 a report that was undertaken between 1973 and 1975 on the quality of the water in Bremer was made public.

Samples at fifteen selected sites to monitor salinity, pH, heavy metals, nutrients and bacteria levels had been carried out on the Western Flat, Mount Barker Creek, Dawesly Creek and Bremer as part of the Monarto 'satellite city' study.

This showed that the Bremer was subjected to heavy bacteria and organic pollution runoff in its catchment. Main sources of this pollution were the Bird in Hand Sewage Treatment Works, Mount Barker Common Effluent lagoons and waste from Jacobs and George Chapman's factories.

## BASIN RECHARGE

A study into the potential of artificially recharging the underground basin was to be done by the Department of Mines and Energy. The Deputy Premier Roger Goldsworthy said that thirty four thousand dollars had been made available to investigate if it was feasible to do this in the Angas Bremer irrigation area in May 1980.

## TOUR OF SITES BY ANGAS BREMER COMMITTEE

The government appointed Angas Bremer Water Resources Advisory Committee toured various industries in and around Mount Barker in July 1980. The committee was established by the Minister of Water Resources P Arnold to investigate and study problems in the basin in the Langhorne Creek/Milang area.

The committee visited the Tannery, Jacob's and the neutralisation plant at the disused pyrites mine. The committee comprised officers from the Engineering and Water Supply, Mines, Environment and Agriculture departments and seven residents of the area.

The chairman Mr A Davidson said ' *The overriding question facing the committee is whether the basin is worth saving from an agricultural point of view. On past and present usage of the water and its declining quality, it will be of little value in another twenty-five years unless some management controls are adopted.*



## END OF ACIDITY IN BREMER

In September 1980 the Deputy Premier and Minister for Mines and Energy Mr ER Goldsworthy pressed the button to start the Brukunga Neutralization Plant. This was expected to end the acid from the Pyrites mine polluting the waters of the Bremer.

## MOUNT BARKER CREEK

People living along the Mount Barker Creek were expressing anger and disappointment at the deteriorating condition of the Mount Barker Creek in November 1980. It was felt that it was so heavily polluted that it appeared to be dying and therefore could no longer support life.

The State government initiated action in May 1981 that was expected to lead to a significant improvement in water quality in the Mount Barker creek. In addition the Mount Barker Tannery and The Jacobs Smallgoods factory planned to carry out clean up measures.

## BUCK PASSING

A release of acid water into the Bremer in September 1981 turned the water in the creek a thick blue green colour, filled the water holes with sludge and killed fish. Farmers in the Hartley and Langhorne Creek area were irate at the way government departments blamed each other as to who was responsible.

As a result the Engineering and Water Supply department undertook to limit the amount of acid water that reached the Bremer.

## BREMER "SEWER" OF THE HILLS

Don Brown, in March 1981, president of the Callington Water Reticulation Committee said that the Bremer, a major source of water for stock and irrigation, because of waste from the Mount Barker and Lobethal drainage schemes, effluent from Mount Barker tannery and meat works, was a sewer. He also said that most causes of this pollution were located in the electorate of the Minister of Environment and Planning, David Wotton.

## WARNING OF ACID RELEASE

The Langhorne Creek Post Office was to become the central point for information on release of acid water into the Bremer from the Brukunga Mine. This was announced in November 1982 following several months of negotiation between landholders and the Engineering and Water Supply department. ( An announcement had been made in May 1979 that an agreement had been reached between the Anti Pollution group and the E and WS to allow such releases)

People who live along the course of the Bremer and use its waters for irrigation would have a notice advising of expected releases placed in the Langhorne Creek Post Office. Postmistress Gillard said



that anyone who had not come into the post office and seen the note would be telephoned and made aware of it. She also said that last year there had been three releases but so far this year because of dry conditions there had been none.

## LANGHORNE CREEK IRRIGATION SCHEMES

In 1992 four Langhorne Creek farmers, Barry Borman, John Laurie, Doug and John Collins commissioned a privately owned water scheme to provide supplies to a vineyard, market garden, lawn turf business and lucerne farm. Water would be pumped through ten kilometres of three hundred and seventy five millimetre PVC pipe from Lake Alexandrina, delivering between twenty and one hundred and sixty litres per second as required. The system, operated by a programmable logic controller, consists of four single stage centrifugal pumps near Lake Alexandrina. The PLC is able to switch these pumps on or off at the turn of a tap or gate valve on the farm ten kilometres away.

The private company that operates the scheme was formed by the four with shares allocated on the percentage of water used by each. The variable costs such as maintenance and power are determined from each enterprises meter readings of water usage.

The Premier Dean Brown opened the largest, privately funded, irrigation scheme in Australia on the 4<sup>th</sup> of October 1995. Forty participants funded the \$2,600,000 scheme to take water from Lake Alexandrina to Langhorne Creek. Water is lifted twenty-seven metres and pumped through thirty-five kilometres of pipeline. It is capable of pumping one point seven million litres of water per hour and will service fifty-two outlets. The water received at these outlets will be used for grapes, almonds, potatoes, lucerne, dairy, horticulture, stock and domestic needs ranging from four thousand four hundred litres per hour to one hundred and thirty two thousand litres per hour with a guaranteed minimum pressure.

Since these two schemes began there has been many more implemented.

## Angas Bremer Water Management

### HISTORY

From when settlers began taking up land in the Angas Bremer area until the present time bores have been put in to supply water. Farmers have had them drilled as the need for water arises. However, there have been instances when there were large numbers drilled in a short period of time. Two examples of this are

1 : In the late 1800's when Lake Alexandrina, due to a drought and coupled with water extraction from the Murray upstream for irrigation became salt and therefore an alternative supply was needed to be found by local farmers.

2 : In the 1950's when the provision of a State run power supply was provided locally enabling electric operated pumps to be installed on bores.

Records of the Department of Water, Land and Biodiversity Conservation show that they have knowledge of seven hundred and ninety eight drill holes in the Angas Bremer Prescribed Wells Area. This number was arrived at when landholders were surveyed about the number of bores that



they had on their properties. Because this was only done within the last twenty or so years the number that has actually been put down is probably far greater. Water from these bores are/were used for stock, irrigation and domestic purposes.

## PROBLEMS WITH BREMER WATER

In the late 1960's the Langhorne Creek Grape Growers started to question the quality of the water coming down the Bremer, which was having a detrimental effect on their vines.

Pollution from several sources -- Mount Barker Tannery, Jacobs Factory and the Pyrites Mine at Brukunga – were all contributing to this.

However, pollution from upstream was not a new phenomenon. In the 1870's and 1880's the Bletchley correspondent to the Southern Argus frequently made comments such as ' *The creek is very foul, the slush and muck of Mount Barker finds their way down this creek, the smell of which is anything but enjoyable*' and ' *Bremer came down, usual slush, mud and stink*'. At another time he knew there had been rain in the hills because ' *the usual quantities of incense in solution*' came down the creek.

In addition to the polluted water in the 1960's there had been long periods when very little run off or flooding had occurred from the Bremer. Low rainfall, increased numbers of dams in the catchment, and land clearing to increase pasture were all thought to have contributed to this.

Therefore the grape growers needed to make use of water from the underground basin because what little water was coming down the Bremer was unfit for them to use.

## SOLUTION FOR POLLUTED WATER BECOMES A PROBLEM

Grape growers began supplementing the watering of vines with pumping from the underground basin. This source of water was already being used for lucerne, potatoes and other crops. It was not very long before a change in both the quantity and quality of water was being noticed. One of the reasons that watering from bores was needed to be done – little water coming down the Bremer – also meant that there was very little recharge of the basin occurring.

## RECTIFYING THE PROBLEM

In 1979 the South Australian Government through the Minister for Water Resources appointed members to an Angas Bremer Water Resources Advisory Committee. The first meeting was held in the council chambers at Strathalbyn on the 29<sup>th</sup> of January 1980. There were local members and representatives from the Engineering and Water Supply, Mines, Environment and Agriculture Departments with Angas Davidson as chairman. The other members were WRP Boucaut, P Brooke-Smith, M Cleggett, D Clements, B Hauesler, A McCord, R McDonald, C Marriott, ML Potts, KC Tai, with VR Curd as secretary and Miss CG Ireland as assistant secretary.

This committee lasted for about a year before a new one was appointed.



The second committee consisted of Alan Birchmore, Chris Marriott, Joe Cleggett, Dennis Parker, Geoff Warren, Len Potts, Mac Cleggett, Rob Giles, Ken Follett and David Thorpe as community representatives with Zac Zebernacer, Brian Harris, Vic Curd and Julie Cann from government departments and Ray McDonald as chair.

The Angas Bremer had been proclaimed with licences issued for 29600 MegaLitres of water per year. However the new committee realised that this needed to be examined as it was well over the sustainable level of 6000 MegaLitres per year.

Doctor Kerri Muller in her paper 'A Partnership Approach to Environmental Stewardship in Langhorne Creek, SA.' explains the reason for formation of the committee thus ' *The Angas Bremer Water Resources Committee was formed in the late 1970's as a statutory Body pursuant to the Water Resources Act 1976. This committee included local irrigators and specialists from Government agencies amongst its membership and was responsible for the development and delivery of policies to coordinate management of the Angas Bremer Proclaimed Wells Area (ABPWA), a groundwater resource that had been developed beyond its sustainable limit when it was proclaimed in 1981. In 1981, the annual usage of groundwater in the ABPWA was four times the annual rate of recharge from flows down the Angas and Bremer Rivers. This excessive water use led to the formation of cones of depression in the high quality groundwater lens, drawing in saltier groundwater from the margins and causing a decline in the quality of the prescribed resource.*

To ascertain the amount of water actually being used by irrigators, meters were supplied, to be fitted to bores. From the monitoring of these meters it was found that the 1981 usage of underground water was four times the recharge from flows down the Angas and Bremer Rivers.

In an attempt to recharge water into the underground basin specific bores were allocated for this purpose. Recharge bores on properties owned by Ray McDonald, Ron Nurse, Rob Giles, Trevor McLean, and Metala with the Department of Mines managing one at the Bridge Reserve, Langhorne Creek directed water down into the aquifer.

Any one with a recharge bore had fifty percent of the amount that had been put down the bore added to their licence for that year. This, if not used, could be carried over for three years, unless a further recharge was done then it would be fifty percent of that amount.

## PERCEIVED LICENCE PROBLEMS

David Le Brun secretary of Langhorne Creek Grapegrowers said in April 1982 that the 25 to 30 growers had been issued restricted licences for basin water. They believed they were being discriminated against because other users, such as those growing lucerne, almonds, and potatoes had a full licence with no restrictions. Grape growers were only permitted to take water when there was a sufficient flow or when the flow in the Bremer was not adequate. (see Grape Growers minutes)

## NEW COMMITTEE

In 1983 the Water Resources Minister, Jack Slater announced that twelve people had been appointed to the Angas Bremer Water Advisory Committee. They were Chairman RR McDonald of



Strathalbyn, M Cobb of the Mines and Energy department, P Kopoli of the Environment and Planning department, SD Moore of the Department of Agriculture, G McIntosh of Engineering and Water Supply department, D Thorpe of Kangarilla, I Cleggett, R Giles, CM Marriot, D Parker, L Potts and GD Warren of Langhorne Creek. These members have experience and expertise in environment and planning, water resource management, hydrogeology, agricultural science, well drilling, horticulture, viticulture and all forms of irrigation.

Minister Slater said 'every effort has been made to ensure that the advisory committee has the widest range of knowledge and experience. I am confident the committee will continue to provide valuable advice to the SA Water Resources Council'.

## REVIEW

In 1985 a review of licences issued for the ABPWA was undertaken. As a result it was decided that a reduction of fifteen percent in the allocated amount of water needed to be made. To achieve this the highest annual monitored water use in the three year period 1983/84/85 was to constitute the new allocation to licensees.

Problems arose in this method of allocation. Some irrigators had not used water from bores during the designated years and as a result their licences were not re issued. Others had not carried out the amount of irrigation that they would normally expect to do and their licences were below what was needed. Therefore, an appeal process was set up whereby irrigators could plead their cases for increased allocations.

In 1987 the Minister of Water Resources, Don Hopgood said that underground water licences in the Angas Bremer proclaimed area will not be extended beyond June 30. This was the beginning of measures to rectify the salinity problems being experienced. Some irrigators had sought an extension until September, however the Minister said under the Water Resources Act he was not able to do this.

The new licences, which were to take effect from July 1<sup>st</sup> 1987, would be based on highest annual water usage over the three year period 1984/85, 1985/86 and 1986/87. Added to this may be additional amounts requested through individual submissions from licensees.

The committee said that this was the first step in trying to find a solution to the salinity problem. This and other steps that the committee were planning had been outlined to irrigators at a public meeting held in April. The plan, when outlined at the meeting, was not welcomed by all irrigators. Some thought that the wrong group was being asked to make cuts. Two irrigators suggested that the big users should be made to become more efficient not hit the 'little people'.

Chairman Ray McDonald said that even though consumption will not be reduced there will be no further increase in amounts extracted.

Further recommendations from the committee will be forwarded to the Minister for approval before they will be implemented.

Minister Hopgood hoped that the final management plan to control the deteriorating underground water will be completed by late 1987.



## UNDERGROUND WATER FOR MURRAY WATER

The reduction in the amount of water extracted from the basin was only partly successful. To further reduce the use of this resource the committee began negotiations with the South Australian government to swap basin water allocation for River Murray water.

## MANAGEMENT PLAN

It was early 1988 when the Water Resources Minister announced that he had approved a five year management plan for the basin.

When he released the plan, Minister Hopgood said that the problem with the basin was that irrigators pumping exceeded natural replenishment.

In conjunction with the reduction of the amount of water extracted from the basin an opportunity was offered to irrigators to swap allocations from this source to River Murray water licenses.

Some irrigators were also artificially recharging the basin with river water through bores on their property. This, the Minister said, was an example of self-help.

## MURRAY WATER

An agreement was reached allowing a three year period in which groundwater allocations could be swapped for River Murray water. The total amount of water available to be swapped with underground water was 15000 MegaLitres.

Initially irrigators were slow to accept this offer. A couple of reasons contributed to this such as the costs of setting up privately funded pipelines from Lake Alexandrina and the poor returns on the types of crops grown – lucerne and potatoes.

At the time lucerne accounted for about eighty two percent of the water used from the basin.

Because of factors such as a poor markets and an outbreak of lucerne flea it was not economically viable to pipe water large distances to grow it. (Although Ray McDonald had done so with a six inch pipe from the lake to Angas Plains for potato and lucerne growing in the late 1970's)

By the late 1980's a changeover to grapes being the dominant crop was taking place. Doctor Muller's excellent paper explains that in 1981 three thousand four hundred hectares were under irrigation with one thousand seven hundred of these being lucerne but by 2001 the area under irrigation had increased to six thousand eight hundred hectares with only four hundred and seventy one being lucerne. Driving this change was significant increases in the price being received by the grower for grapes.

Another reason for this change was that larger companies were showing interest in the Langhorne Creek area for growing grapes. Rosemount, one of the first to do so, had bought land many kilometres from Lake Alexandrina and constructed a pipeline to provide the water for it.

Construction of another pipeline, funded by ten or twelve properties owners, for the provision of water to their land in some instances up to twelve kilometres from the lake was constructed. The effect this had was that it showed it was not only possible to bring water 10 to 15 kilometres from Lake Alexandrina but also it was cost effective for grape growing.



## TAKE UP OF OFFER

Therefore the offer of a transfer of basin allocation to River Murray water became attractive to all licensees and towards the end of the three year period, a 'mini rush' on, so much so that more water than was available in the initial offer was sought. This meant that a further 6000 MegaLitres was needed. The amount of River Murray water needed for those seeking licences was 21000 Mega Litres.

## REDUCTION OF BASIN WATER USE

This had the desired effect of reducing the amount of water extracted from the basin. Muller shows that the amount of groundwater used decreased to 1500 MegaLitres in 2001 from 26600 in 1981. This reduction of 95% in the groundwater extracted meant that groundwater pressures were able to recover.

## SUCCESSFUL REDUCTION IN WATER USE OVERALL

Correspondingly the total amount of water used by irrigators had also decreased from 26600 MegaLitres in 1985 to 17500 MegaLitres in 2001. This was despite the fact that the total irrigated area had increased from 3400 hectares in 1985 to 6800 in 2001. As well as a decrease in the total amount of water used there has also been a decrease in the amount provided to each hectare for growing a crop.

In 1981, 7.8 MegaLitres per hectare was used - whereas by 2001 Only 2.1 MegaLitres per hectare was used.

These figures convert to a rainfall of 780 mm per year per hectare compared to 260 mm per year per hectare.

The way in which water is delivered to the crop, sprinklers to drip and the change from water 'hungry' crops like lucerne has also contributed to this reduction. The amount of irrigated lucerne had reduced from 1700 hectares in 1985 to 471 hectares in 2001.

## CHANGE IN COMMITTEE'S ROLE

The Water Resources Act of 1997 saw the Angas Bremer Water Resources Committee (ABWRC) being superseded with the formation of the River Murray Catchment Water Management Board. The ABWRC no longer had a role to develop or implement the Water Allocation Plan for the Angas Bremer Prescribed Wells Area or any statutory powers to bring any plans into practice.

The irrigation community felt that they still wanted a role in policy development and so the Angas Bremer Water Management Committee Inc, a publicly elected, voluntary community group was formed.

A partnership between the RMCWMB and the ABWMC supported by the Goolwa to Wellington Local Action Planning Board, was formed. The ABWMC consists of eight local irrigators as well as staff from the Department of Water Land and Biodiversity Conservation, RMCWMB and the GWLAPB. In this way development and implementation of the Water Allocation Plan for the ABPWA remains under the local irrigation communities ownership. Members of the community who understand local issues are able to develop policies, within the community.





## Floods and other events on the Angas River

( SA G C R = South Australian Colonial Gazette and Register, TD = Turvey Diaries, not designated = Southern Argus)

- 1844 – around 18 July, Angas flooded. Davenport of Macclesfield writing to his father says ' *The water in the creeks rose three or four feet higher than it has known to do before* ' it washed away fences, gardens and log bridges. Result of unusually heavy rains in the area.
- 1860 – 1 December, Angas Plains farmers are looking into irrigating their land. (SA G CR)  
2 December, Strathalbyn farmers, who had creeks on their land, were considering irrigation.
- 1861-- 9 February, At Strathalbyn, Mr Gollan proposed that where farmers were in dispute because of the stopping or diverting of the waters of the Angas at Blackwood they should refer the problem to arbitrators appointed by each side.  
14 May, Angas rose twelve feet above its normal height, carrying away trees, logs, bridges and fences. One footbridge consisting of a twenty five foot tree and thirty inches in diameter was washed one hundred and fifty yards. It was thought to be the largest flood for eight years. Opinion was that in 1852 the river had not risen so high, but because the channel had since been washed deeper a much larger quantity of water had come down.
- 1866 – 14 July, Heavy rains last Thursday. ' *The Angas which is usually clear and rather unpretending river soon became a muddy torrent and in many places overran its banks* '.  
14 July, ' *On Sunday morning there was another heavy fall near Macclesfield, and the tributaries of the Angas rising rapidly, caused it again to overflow* '.  
18 August, At Strathalbyn after a ' *torrent of rain* ' the Angas washed away two or three log footbridges, but the main bridges remained. The aborigines who had camped on the island near the Telegraph Station had to ' *decamp at short notice* '.  
The Angas had flooded near Milang. The view from Tod's Hill presented an unbroken sheet of water. At the ford to the north of Milang A Pavy almost drowned in the strongly flowing three to four foot deep water.  
22 October, Miss Jane Jeffries under the guidance of Mr Ashwin broke a bottle of champagne and christened the bridge over the Angas at Belvidere. There was a crowd of six to seven hundred people present.
- 1867 – 24 August, A bridge crossed the Angas at J McLean's property.  
21 September, Heavy rain at Strathalbyn on Sunday, frequent showers on Monday and the Angas became a ' *torrent* '  
28 September, The Angas flooded for the second time in September when it rose ' *very high on Wednesday* '.  
5 October, A gale on Sunday evening, which blew over trees, caused the Angas to "swell"  
30 November, The North Parade Bridge, which had been rendered unusable for some time by heavy floods, was reopened.
- 1869 – 13 February, rain made a 'perceptible difference in quantity of water in Angas'.  
27 November, The Angas as a result of rainy wintry weather rose higher than it had been all year.



- 1870 – 29 January, Angas flooded at Strathalbyn after rain.  
9 April, after thunderstorm on Friday, River Angas 'rose very considerably'.
- 1872 – 26 July, The Angas, because of heavy and continuous rain reached the highest it had been so far in the year. The amount of rain should have pleased the farmers.  
23 August, Mr Anderson (Civil Engineer) surveying river at Strathalbyn to determine possibility of a dam " *to throw back a splendid sheet of water through the town*"
- 1873 – 21 February, The Angas rose to within one or two inches of its winter height after a fall of one inch of rain.
- 1874 – 27 August, Flood on the Angas  
3 September, Angas in flood, 'highest ever', Within thirty inches of St Andrew's bridge.  
1 October, 'Rivers and creeks' of the district once again flooded.  
29 October, Bridge at Bagley's ford near Milang. Necessary survey done by Mr Hull a Government Surveyor. Parliament voted 1050 pounds for work.
- 1875 – 13 May, Heavy rains in the district and the Angas was described as '*swollen considerably*'.
- 1877 – 22 January, At Angas Plains the bridge on Lake side was completed but the lower part of the Angas was dry.  
8 March, Rains on February 28<sup>th</sup> at Angas Plains had '*brought down creeks, filled tanks and left the land ploughable*'.  
27 September, Angas at Strathalbyn was the highest it had ever been.
- 1880 – 16 September, Angas flooded, higher than in 1877.
- 1884 – 13 March, A thunderstorm caused the Angas to flood.
- 1886 – 29 July, Dam on Angas at Mr Matthew Rankine's estate. Massive concrete wall 70 ft long 16ft at base tapering to 4ft at top . Opening 20ft wide by 8ft deep in which iron sluice gate can be fitted . Discharges ½ million gallons/minute . Floods 700 acres.
- 1887 – 4 August, Due to heavy rain the Angas flooded and was the highest it had been for 10 years. Many square miles of low lying country on the plains is either covered with water or in a swampy condition.
- 1889 – 3 January, What was described as a medium flood occurred at Strathalbyn, However between Strathalbyn and Milang there was more rain and roads and fences were damaged.
- 1890 – 17 July, At Milang the low lying ground adjacent to the Angas at Rankine's, McLean's and at Watson Park was flooded when the Angas came down a '*banker*'. In fact the whole of the Angas and Lake Plains were wet.
- 1893 – 1 June, Three inches in seventy two hours caused widespread flooding of the Angas.



28 September, article re May floods "*as a matter of fact the Angas has been more or less flooded ever since then*" Friday it rained and river flooded again

1895 – 5 December, Heavy thunderstorms caused Angas to rise.

1897 – 2 September, Heavy rains and the Angas rose to the highest flood level for a couple of years. '*Many places where formerly swamp waters were generally to be seen all year, but for several recent years have been dry, have been filled.*

1900 – 24 May, The Angas came down a banker for a few hours Wednesday  
23 August, The overflow of Angas floodwaters to east of Milang covered a large area of the paddocks near its mouth.

1901 – 20 June, best for 10 years. '*The Angas ran a big stream all through Sunday and Monday and at midnight on Sunday the water topped the record of a decade prior.*

1902 – 18 December, A succession of heavy storms on Wednesday caused the Angas to come down a banker.

1903 – 16 April, Torrents of rain on Good Friday and the Angas rose to flood level.  
24 September, A downpour of rain and the Angas rose to its highest for 10 years.  
'*Considering how much the channels have been widened and deepened it is questionable that past records were not beaten.*  
22 October, Sir Lancelot Stirling will release Rainbow Trout into the Angas. He had done this some years previously, but at the wrong time of the year and they did not survive.

1904 – 28 April, Three creeks joining the Angas in Strathalbyn ran bankers. The stream in front of the Argus office rose several feet in a few minutes.

1906 – 29 March, At Strathalbyn the dam near the footbridge, even though it was not completed, had withstood the floods well. This was suspected to be because of the good quality of cement used in its construction.

2 August, Winter flood level of the Angas running for 10 days, longest period during which flood heights has been maintained for many years. Because of continued rain in the hills, and the springs flowing heavily, high levels were expected to be maintained for several more days.

13 September, The Angas continues to run at flood level because rain has fallen almost every day last week. An immense amount of water was pouring into the Lake.

1908 – 3 September, The Angas ran at its highest level for the year caused by rain on Thursday. Some damage was caused in parts by the flood waters.

1909 – 20 May, Four inches of rain fell in four days, the Angas reached its highest level since 1901.  
17 June, Rain on Saturday and Sunday and the Angas rose to the highest for 10 or 12 years. The water mark of 1903 was bettered by a foot or so.



- 24 June, The Angas continued at higher level than usual after reasonable rains last week. The river continuing at a high level also suggested that the springs in the hills had risen.  
29 July, Angas rose to almost the height it had been earlier this month.
- 1910 – 10 March, The Angas rose to normal flood level.  
28 July, The Angas after heavy rains attained high flood level.
- 1913 – 20 February, Flood on Angas last Thursday.
- 1914 – 22 January, In his Jottings column in the Southern Argus, JW Elliot writes '*I don't think I have ever known the Angas to be so low as at present Or perhaps I should say so low for so long and certainly never have there been so many stagnant pools. Wells which have hitherto been inexhaustible are showing signs of failure, springs by the score have ceased to flow*'.  
20 February, Again JW Elliot writes that the Angas has never been so low.
- 1915 – 27 April, Mr Alex Caldwell remembers a Murray Cod being caught in the Gas Works pool over twenty years ago and cod and mulloway in a pool on Mr Baird's property at Angas Plains on several occasions.  
24 June, Heavy rains and Angas rose rapidly to one of the highest markings ever recorded.  
12 August, Angas flooded to high levels from rains last Thursday and Friday.  
16 September, The Angas overflowed its banks last night (13<sup>th</sup> September) making twelve floods this season.  
23 September, Showers brought Angas up to flood level again. This time it was reported as the twentieth time a flood had occurred for the year.  
According to JW Elliot between July 1<sup>st</sup> and October 1<sup>st</sup> '*twenty rises to the dignity of flood has occurred and in several places the bed of the stream has been altered appreciably*'.
- 1916 – 26 July, At Angas Plains the Angas overflowed its banks.  
17 August, Angas rose to flood level on several separate occasions.
- 1917—21 June, Heavy rains and the Angas came down in a heavier flood than had been recorded so far that season. It also overflowed its banks at Angas Plains  
26 July, River Angas overflowed its banks on Friday night and maintained flood level flows for three and a half hours. It was considered the largest flood for twenty six years and the flood waters of the Angas and Bremer came within half a mile of each other. Some damage was done to fences and roads.  
23 August, At Angas Plains another heavy flood was experienced on the Angas.
- 1919 – 18 September, Angas rose to flood level.
- 1920 – 22 July, Angas nearly dry.
- 1923 – 6<sup>th</sup> June, Flood out this morning (TD)  
11<sup>th</sup> June, A big flood out today (TD)



14 June, Near Strathalbyn some of the smaller creeks that feed into the Angas reached record flood levels on Monday and Tuesday. At Sweet Home the residence of Mr FJ Thring water reached the highest ever in '*white man's recollection*'. Rushmore creek also established what is believed to be a record level.

12 July, Last week the Angas rose to the highest level it had been for many years. It was estimated that in the previous six weeks more water had flowed down the Angas than had done in twenty years.

16<sup>th</sup> July, The flood is out again this morning, higher than it has been this year (TD)

21<sup>st</sup> September, The flood up today, the highest it has been known to come (TD)

27 September, A terrific downpour in the hills near Macclesfield caused the largest flood on the Angas in the history of Strathalbyn.

30<sup>th</sup> September, The flood up again this evening (TD)

1925 – 7<sup>th</sup> February, The creek is down and the water coming over the top of our paddock (TD)

8<sup>th</sup> February, The water is out to the bank that Don made, within one foot in places (TD)

4<sup>th</sup> June, The flood is up to the new bank, soaking through in one place (TD)

15<sup>th</sup> August, The flood is high but not over bank yet (TD)

16<sup>th</sup> August, Flood very high, coming round the bank into the three corner paddock (TD)

17<sup>th</sup> August, Flood very high this morning. Water came over the bank in two or three places and about half a chain broke away (TD)

23<sup>rd</sup> August, The flood is down but hasn't come over the bank (TD)

1926 – 22<sup>nd</sup> May, Flood down more today (TD)

1939 – 21<sup>st</sup> August, Big flood (TD) 1939

27<sup>th</sup> August, Big flood down (TD)

29<sup>th</sup> August, Flood very high (TD)

30<sup>th</sup> August, Flood broken bank into Morgan's (TD)

31<sup>st</sup> August, Flood still (TD)

1942 – 3<sup>rd</sup> July, Flood coming down tonight (TD)

1<sup>st</sup> September, Flood is coming (TD)

16<sup>th</sup> September, Big flood coming (TD)

1946 – 30<sup>th</sup> June, Flood out on number 4 (TD)

17<sup>th</sup> July, Big flood down (TD)

1948 – 25<sup>th</sup> August, Flood coming through bank (TD)

26<sup>th</sup> August, Water running into Graham's (Warren) swamp (TD)

1951 – 19<sup>th</sup> July, Angas came down last weekend. Biggest since 1940

1953 – 20<sup>th</sup> August, Biggest flood on Angas for a while as a result of the weekend rain.

1956 – 17<sup>th</sup> June, Biggest flood for (about) 15 years, 230 acres under water (TD)

28<sup>th</sup> June, big flood down, water over Morgan's bank (TD)



## ANGAS BREMER PRELIMINARY LAND AND WATER MANAGEMENT PLAN

### module 1

- 6<sup>th</sup> July, Fairly big flood. 11<sup>th</sup> July nearly all water gone of flat, took about 10 days draining. (TD)
- 1959 – 17<sup>th</sup> August, Don went to help Ken working at flood. (TD)
- 1963 – 29 August, Angas came down in a bigger flood than it has for some time.
- 1964 – 9 January, George Bone drowned in Angas at Willyaroo.  
2 July, floodwaters washed away a nest of swans' eggs on the banks of the Angas at Strathalbyn.
- 1968 – 25 January, Dirty water washed into the Angas at Strathalbyn killing 100's of fish. Redfin between ½ to 3 pound and the odd brown trout.  
18 June, nice flood down the Angas, bigger than last weeks.  
15 August, Angas in flood for past week. It is the highest it has been for some years.
- 1969 – 13 February, Dawson Creek flooded.
- 1971 – 29 April, Angas ran strongly  
6 May, flood came down Angas.
- 1972 – 9<sup>th</sup> August, Let water into number 4. Fairly big flood down. (TD)  
11<sup>th</sup> August Had complete flooding. (TD)  
8<sup>th</sup> September, Small flood down. (TD)  
9<sup>th</sup> September, John Nicoll stopped water for a while. (TD)  
10<sup>th</sup> September, Continued flooding. Water running again. (TD)  
11<sup>th</sup> September, Let water down to bottom number 3 and number 1A. (TD)
- 1973 – 22<sup>nd</sup> March, Finished watering flood in WW. (TD)  
22<sup>nd</sup> May, Finished watering flood in WW. (TD)  
15<sup>th</sup> July, Some water down, shut weir. (TD)  
16<sup>th</sup> July, Opened flood gate. (TD)  
29<sup>th</sup> August, Opened flood gate and let water in about 6 am. (TD)  
31<sup>st</sup> August, Let water into bottom of number 2. (TD)  
1<sup>st</sup> September, Water covered nearly all of number 2 by evening. (TD)  
3<sup>rd</sup> September, Let water out of paddock through gate in number 1B. (TD)  
24<sup>th</sup> October, Started to flood calf paddock in Warrens. (TD)
- 1974 – around 3<sup>rd</sup> October, Angas ran a banker.
- 1975 – around 23<sup>rd</sup> October Angas carried large volume of water as a result of heavy rains caused by a tropical depression.
- 1977 – 15<sup>th</sup> January, Shifted calves out of flood (Warners?). Pulled log out of flood gate. (TD)  
5<sup>th</sup> February, Flood in Warrens. (TD)



- 24<sup>th</sup> July, Some flood water down. Blocked creek and opened gate to let water onto number 4. (TD)  
8<sup>th</sup> September, Ian started to water flood in 1A. (TD)  
12<sup>th</sup> September, Some water running into number 4. (TD)
- 1978 – 8<sup>th</sup> August, Big flood down. Came over road bank in places. (TD)  
9<sup>th</sup> August, Water came over bank along road in 6A and broke new bank near plantation. (TD)
- 1979 – 24<sup>th</sup> July, Water down in creek. Let some into number 4. (TD)  
26<sup>th</sup> July, Water covered number 4 and up to near top of bank in numbers 2 and 3. (TD)  
29<sup>th</sup> July, Let water down to south end of Number 3 and Number 1A. (TD)
- 1979 – 30<sup>th</sup> September, Started to flood in number 4. (TD)
- 1981 – 14<sup>th</sup> May, Flood for second time (TD)  
26<sup>th</sup> June, Flood came down Angas during night (TD)  
1<sup>st</sup> July, water from flood getting away quickly (TD)  
3<sup>rd</sup> July, Two floods came down quickly (TD)  
9<sup>th</sup> July, Due to heavy rain Angas is higher than it has been for some years.  
24<sup>th</sup> July, Small flood down (TD)  
8<sup>th</sup> August, Big flood came down (TD)  
9<sup>th</sup> August, Big flood (fairly) (TD)  
14<sup>th</sup> August, Another flood came down during night, 5 inches below sandbags. Biggest flood since 1941 (TD)  
20<sup>th</sup> August, Angas floods.  
21<sup>st</sup> August, Water coming down today (TD)  
28 September, Put boards in floodgates as some water running. (TD)  
31<sup>st</sup> September, Flood down (TD)
- 1982 – 19 March, started to flood irrigate WW. (TD)  
20 March, Continued with flood irrigation. (TD)
- 1983 – 15 October, Closed floodgate in creek. (TD)  
16 October, Some water down. Let it out in number 4.
- 1988 – 23 July, Fairly big flood down. (TD)  
13 September, Fair amount of water came down. (TD)
- 1991 – 29 August, Big flood down. (TD)
- 1992 – 1 September, Let water out on flat, did not put boards in river, took boards out of flood gate in bank.  
2 September, water covered all of number h two or three feet.  
3 September, Let water run into number 1 and south of number 2.  
5 September, Let water run into southern end of number 2.  
11 September, Let water run across road from south of number 2 flat to Warren's  
19 December, Very big flood down came over bank.



## Floods and other events on Bremer

(SA G C R = South Australian Colonial Gazette and Register, BRR = Belleville Rainfall Records, MRD = Metala Rainfall Diary, LPD = Len Potts Diary, Advertiser = Adelaide Advertiser, those not designated = Southern Argus)

1861 – 16 May, Kanmantoo, the River Bremer overflowed its banks, which it has not been known to do so for a number of years. (SA G C R)

17 May, Langhorne's Bridge, Bremer overflowed the banks and speedily made its way over all the flats. (SA G C R)

1862 – 15 February, Langhorne's Bridge, I regret the bridge here is in very shaky condition. A few days ago a person was crossing with his loaded dray, when the bridge groaned so that the driver thought it was giving way. (SA G C R)

7 March, Langhorne's Bridge, a public meeting regarding the bridge. A committee was formed and will attend the next meeting of the Board of Main Roads to petition for a new bridge. (SA G C R)

1867 – 5 October , flood on 25 September highest for many years

1870 – 29 January, Bremer, below bridge, at Langhorne's Creek, flooded.

25 June, Bremer flooded Callington mail detained.

20 August , 15<sup>th</sup> August , houses on west side not reached by waters , on east side low lying inundated . Below the bridge was like a sea. Several fences were washed away and there was some crop damage. Mr Fairweather, whose ground had been prepared for lucerne, will suffer to some extent.

29 October, floods rising to a great height at Langhorne Creek and carried away a quantity of mown hay – Mr J Borrett was a heavy sufferer.

1872 – 2 August, Bremer highest last week than so far this year at Hartley.

9 August, river high at Hartley after week of continual rain.

1873 – 21 February, Severe thunderstorms, water everywhere. Did good filling up tanks and waterholes, which were getting low.

1874 – 3 September, Bremer highest it has been for three years.

1 October, River and creeks once again flooded in the district.

1875 – 6 May, flood on 27 April at Bletchley, it is still raining.

13 May, Bremer "*swollen considerably*"





- 1877 – 28 February, rains brought down creeks at Angas Plains, filled the tanks and left land ploughable.  
5 April, Bletchley, Those acquainted with locality will be able to form some idea of the volume of water conveyed down the Bremer creek when I state that on the 24<sup>th</sup> of March the creek rose to within 1 foot of the footbridge at Edward's Crossing. I have not heard of any losses sustained on account of the late floods .  
2 August , freshet (flood) came down Bremer Creek last Saturday at Bletchley showing that rain had fallen further up in the hills.  
27 September , within 1 foot of footbridge at Edwards Crossing , Bletchley.
- 1878 -- 14 February , a little water in some of the holes in the creek turned to a nasty greenish colour , and will doubtless be found injurious to stock.  
14 March, Bremer brought down bank high at Bletchley.  
2 May , recent rains have swollen creek, three sisters Margaret , Alice and Kate Burley , children of publican , drowned in waterhole 3-400 yards from their home . Waterhole swollen from recent rains 16-18 feet deep.  
1 August, Bletchley, Copious rains have fallen. Bremer has at times been high indicating heavy rains have fallen in the hills. "*The creek is very foul, the slush and muck of Mount Barker find their way down this creek, the smell of which is anything but enjoyable.*"
- 1879 – 20 February, Drought at Bletchley, but Wild Dog Reserve has plenty of water.  
1 May, at Bletchley even though there is a drought the Bremer continues to run.  
10 July, Bremer at Bletchley bank high and floodwaters stink.
- 1880 – 4 March, Bletchley, Bremer came down usual slush and mud and stink. Creek at Woodchester '*highest for a while*':  
2 September, '*flood since last writing*', Bletchley correspondent.  
23 September, overflowed its banks, Bletchley. Large logs/trees brought down with it .Much damage .
- 1881 – 27 January; Bremer flooded again at Bletchley, with rubbish, sewage etcetera coming down with it.  
20 October, At Bletchley the creek rose considerably, must have been rain in hills. "*usual quantities of incense in solution*" were brought down.
- 1882 – 20 April, Continues dry "*I notice a phenomenon in the Bremer Creek. The waterholes have risen considerably and portions of the creek bed that have long been dry, have now water running over them – can some scientist, who understands about nature's laws explain the matter.*"  
31 August, Bremer highest of season and footbridges washed away at Bletchley.  
14 September, Meeting at Woodchester to discuss a bridge for Wild Dog Reserve at Bletchley. The reason being that heavy floods frequently come down. Blocks of stone weighing many hundredweights had been washed away.



- 1883 – 12 April, Bremer flowed over ford at Bletchley.  
10 May, Bremer bank high, Bletchley  
28 June, Bletchley, Season good (like old fashioned season) Bremer has been unusually high at times. Floods last Friday sweeping all away.  
3 August, Bremer flooded by heavy rains on the 27<sup>th</sup> July. Road through Langhorne's Creek completely submerged with the water up to the axles of ordinary traps. It was higher than it has been since the flood of 1867. (MBC)  
9 August, Bletchley, the '*oldest inhabitant*' cannot remember the Bremer being higher than it was on the 27<sup>th</sup> July.
- 1884 – 13 March, Thunderstorms on Saturday night , Bremer and smaller creeks flooded.
- 1887 – 4 August, Article in Southern Argus reports that is has been very many years since the low lying country was either covered with water or in a very swampy condition. This was the result of heavy rains. The Bremer had flooded.
- 1889 – 3 January , A little above Callington 4 inches fell in less than 5 hours . Bremer and feeding creeks flooded .New Years Day a red letter day as largest flood ever. At Langhorne Creek a roaring noise like storm wind coming down creek about five thirty pm , within half an hour water had overflowed banks.
- 1889 – 3 Floods (LPD)
- 1890 – 4 Floods (LPD)
- 1891 – 1 October, A lack of rain at Langhorne Creek had the correspondent for the Southern Argus wishing for a reservoir '*some miles up the Bremer to contain sufficient (water) to irrigate numbers of small holdings*'.
- 1892 – 1 Flood (LPD)
- 1893 – 1 June  
28 September, biggest flood on record at Langhorne Creek. Bremer overflowed its banks on both sides. Two feet of water through school.
- 1893 – 3 Floods (LPD)
- 1894 – 2 Floods (LPD)  
1894 – Bremer came down a banker at Langhorne Creek on Thursday.
- 1897 – 2 September, Bremer rose to a higher level than had been noted for a couple of years. Many places where formerly swamp waters were generally to be seen all year , but for several years have been dry , have been filled.



1898 – 3 March, flood at Woodchester following a thunderstorm of two and a half inches in two and a half hours. Red Creek came down. Nineteen bullocks from Dalveen Estate were washed up to two miles down creek, one killed. Stein's bridge at Red Creek and Cross bridge at Woodchester washed away. Water was half a mile wide.

23 April, Heavy rains at Langhorne Creek, also in hills as Bremer came down very high on Tuesday, touched the bridge on the main road and overflowed beyond it. Flood within one foot of highest recorded here.

23 June, Bremer washed out several farmers on Tuesday night. The water touched the big bridge. It came within one foot of the record height. (At Langhorne Creek)

1900 – 15 February , Water becoming scarce here at Langhorne Creek where wells can not be brought into requisition . The creek is exceptionally dry .

1902 – 18 September , So far this year the Bremer has not been in heavy flood . Old residents can scarcely remember a year when so few freshets (floods) have swept by towards the Lakes.

4 December , The absence of floods down the river during winter has left the ground so dry that it is scarcely likely there will be the usual heavy growth of grapes for next season .

1903 – 16 April, slight rise in water level in the Bremer as a result of rains on Good Friday.

24 September, At Langhorne Creek the Bremer spread out into a big lake. All the houses on the flats being invaded by waters Highest attained for over 10 years. Considering how much the channel has been widened and deepened it is questionable that past records were not beaten.

1905 – 20 July, Langhorne Creek, Bremer flooded again. Fourth time for this season and a lot of land is under water . This is exceptional for so early in the season , August and September being the usual months for floods .

1906 – 6 September , Highest flood of season came down on Saturday night and overflowed some of the township blocks .

13 September , Bremer continues at flood level. An immense amount of water pouring into the lakes.

1908 – 3 September, Bremer ran a banker due to glorious downpour on Thursday, indeed the highest level for the year was attained.



- 1909 – 20 May, Bremer came down a banker on Sunday morning and soon all Bremerton was under water . A few inches more and it would have come over the western bank. Four inches of rain had fallen in four days  
17 June, Bremer has been high.  
24 June, Bremer continued at higher level than usual, showing the springs in the Hills have risen.  
29 July, On Tuesday the whole of the low lying flats were flooded, the oldest resident of Langhorne Creek stating all past records were easily beaten. Heavy rain is still falling.  
19 August, At Langhorne Creek small floods are common and scarcely a week passes without one or two coming over. Last week the Bremer came over twice and much of the low lying country was under water.  
26 August, flood number 15 up to this date. Flood number 14 came over 10 am Thursday and was still running out at 10 pm Friday. The high-water mark was reached at about midnight Thursday. During the afternoon temporary embankments were made around most houses in the town.
- 1910 – 10 March , Never before in the history of the Creek has a flood come down during the grape season . In the low parts the Bremer was out all Sunday, but on Sunday evening it came down a banker and floodwaters were out on both sides all Monday, the river is still keeping up . largest in history  
28 July, Bremer high in flood.  
4 August , Floodwaters have caused the collapse of the bridge over West Creek near Mr McAnaney's .  
15 September , Saturday a flood one of the highest of the season.
- 1912 – 19 September , Bremer overflowed its banks on Saturday night and all the vineyards are submerged for the first time in two years . It is a curious sight to see wild ducks, swans and other waterfowl swimming in vineyards  
26 September, Bremer overflowed again on Wednesday.
- 1913 – 20 February, Bremer , Rodwell and Red Creek , came down bankers at Woodchester from thunderstorms. *'Bremer overflowed its banks three mile north of Langhorne Creek and wrecked everything in its wake right down through the township and on to the Lake. It is biggest flood ever known and the damage done will run into thousands of pounds. Every settler from Mr C Woods to the Lake is a loser by fences, washouts and grass. Thousands of acres of dry feed and stubble has been swept away and in many cases the loose soil has also gone, whilst rubbish of all descriptions has been left behind in its place. Miles of fencing has been ruined and pigs, sheep and poultry drowned. In several houses the water went through in places two feet six inches deep. Mrs C Noles and children were awakened by rushing waters to find the house two feet deep in water, they took to the roof and remained there until rescued. The vineyards received a terrible flooding and it is impossible yet to estimate what damage is done in them. The heaviest losers are Messrs Natt, Cleggett, Binney, Follett, Potts, Cock, Wood, Dodd and Bray and the District Councils of Bremer and Brinkley'*



- 1914 – 22 January, JW Elliot in Southern Argus said, '*I don't know if I have ever known the Bremer to be so low as at present. Or perhaps I should say so low for so long and certainly never have there been so many stagnant pools. Wells which have hitherto been inexhaustible are showing signs of failure; springs by the score have ceased to flow.*'  
20 February, The Bremer has ceased to flow since December last, as a continuous water carrier, lots of dry patches now separating deep pools which are freely distributed along its windy bed on its way to Lake Alexandrina.  
5 March, Thunderstorms, but Bremer was not flooded. It filled waterholes and dams. The rain caused the submerging of miles of flat country and it is feared that grape crops would suffer badly, but the ground was so thirsty and sun so hot water disappeared.
- 1915 – 24 June, Southern Argus '*The Bremer ever a more torrential stream (than the Angas) did greater mischief and once again the townspeople of Langhorne Creek were a good deal inconvenienced.*'  
12 August, Bremer flooded to high levels from rain on Thursday and Friday last.  
16 September, Bremer overflowed last night (13<sup>th</sup> September)  
30 September, We have had 12 floods at Langhorne Creek this season.
- 1916 – 29 June, Langhorne Creek received the surplus of overflow from the Bremer  
20 July, Bremer overflowing its banks at Angas Plains.  
17 August, Bremer rose to flood level on several separate occasions.
- 1917 – 21 June, Bremer overflowed at Angas Plains.  
26 July, Bremer has been in flood at Langhorne Creek for 60 hours and dozens of houses have been flooded out. In front of the Hotel the road is covered to a depth of three or four feet. At Angas Plains the Bremer and Angas are three mile apart but floodwaters came to within a half a mile of each other. It is over fifty years since these waters met.  
23 August, Another flood at Angas Plains of Bremer.
- 1920 – 22 July, According to JW Elliott in Southern Argus, '*Bremer is dry.*'
- 1921 – 3 March, Red Creek came down a banker at Woodchester after 2.5 inches of rain.
- 1922 – 20 April, Article suggests 12000 acre feet of water is lost for irrigation down the Bremer every year. Murray water was three pounds per acre foot.  
20 July, Bremer rose to highest flood level of year on Monday morning.  
15 December, The Bremer, which has been dry for over nine months, started running through the town again Wednesday last.
- 1923 – 12 July, Bremer rose to a higher level than it has attained for many years and at Langhorne Creek miles of country became submerged for several days, doing immense good as well as causing inconvenience.  
27 September, The Bremer, which takes its rise in the Mount Barker watershed, rose to almost record height and flooded miles of the valley and plains. Near Langhorne Creek, several householders had to abandon their homes for a while. Altogether the extent of the downpour was unprecedented in this district.



- 1927 – August, Fair flood at Metala from rain in Hills.
- 1928 – October, Flood at Metala. (MRD)
- 1929 – 27 December, Heavy flood, 321 points of rain at Metala. (MRD)
- 1931 – Vineyards had benefited from above normal heavy flooding at Metala (no dates). (MRD)
- 1932 – 10 October, Langhorne Creek flooded. (Advertiser)  
Copious flooding at Metala (no dates). (MRD)
- 1933 – 7 September highest flood for several years at Langhorne Creek. September, Continuous flooding at Metala. (MRD)
- 1934 – Only one three quarter flood all year at Metala (no date). (MRD)
- 1935 – 19 September, Bremer burst its banks on Monday afternoon, and flooded streets, in places to a depth of two feet. The flood reached its peak about eight thirty Monday night.  
At Metala 3 floods for year (no dates). (MRD)
- 1937 – 25 August, The River Bremer flooded the vineyards when it overflowed its banks on Friday and again on Saturday.  
August, 2 half floods at Metala. (MRD)
- 1939 – Only one flood at Metala (no date). (MRD)
- 1940 – July, Two feet of water down Bremer for 6 days at Metala. (MRD)
- 1941 – January, Heaviest flood on Bremer ever at Metala. (MRD)
- 1942 – Vines received good waterings from floods this year at Metala (no dates). (MRD)
- 1943 – Sufficient water came down Bremer to ensure, with floodgates the vines getting a good drink at Metala (no date). (MRD)
- 1944 – A little water came down Bremer in July at Metala. (MRD)
- 1945 – Bremer flowed in August, September, October and November (LPD)
- 1946 – Vineyards flooded between July 16<sup>th</sup> and 18<sup>th</sup> at Metala. (MRD)  
Floods at Langhorne Creek in February and August. Bremer flowed in March, June, July, September and December. (LPD)



- 1947 – July 10<sup>th</sup>, good flood at Metala. (MRD)  
Flood at Langhorne Creek in September, river flowed in February, March, April, July, August, October, November and December. (LPD)
- 1948 – December, Thunderstorms brought down the Bremer and new vineyards were flooded at Metala. (MRD)  
Bremer flowed at Langhorne Creek in May, June, July, August, September, October, November and December. (LPD)
- 1949 – November, vineyards received a fair watering in early November at Metala. (MRD)  
Bremer flowed at Langhorne Creek in July, August, October and November. (LPD)
- 1950 – August, all vineyards had good watering at Metala. (MRD)  
Bremer flowed at Langhorne Creek in July, August, September, October and November. (LPD)
- 1951 – 17 July, People at Langhorne Creek battled knee deep in muddy floodwater from swollen Bremer River to save their homes. (Advertiser)  
18 July, Floods damaged homes but irrigated vines. (Advertiser)  
19 July, Bremer came down during last weekend. Biggest since 1940.  
30 August, Bremer flooded through Langhorne Creek last weekend. This was the fifth time in the last two months. The Bremer has hardly been below half full for *'weeks on end'*.  
Winter floods big and frequent at Metala (no dates). (MRD)  
Bremer flooded at Langhorne Creek in July and August and flowed in May, June, September, October and November. (LPD)
- 1952 – Bremer flowed at Langhorne Creek in May, June, July, August, September, October, November and December. (LPD)
- 1953 – 20 August, Bremer flooded after weekend rain.  
Vineyards have had good winter floodings at Metala (no dates). (MRD)  
Bremer flooded at Langhorne Creek in August and September and flowed in June, July, October, November and December. (LPD)
- 1954 – 1 March, Severe earthquake at Langhorne Creek, results in a strong flow from underground aquifer and this continued for over seven months. Flows in Bremer in March, April, May, June, July, August, September and October. (LPD)  
Very little water came down the Bremer. Only a few acres of the Paulo vineyard was flooded.
- 1955 – September 1, Langhorne Creek flooded out. Bremer burst its banks half mile upstream from town.  
Many winter floodings at Metala (no dates). (MRD)  
Bremer flooded in June and August and flowed in May, July, September and October at Langhorne Creek. (LPD)



- 1956 – 13 winter floodings at Metala (no dates). (MRD)  
Bremer flooded at Langhorne Creek in June, July, August, September and flowed in April, May, October and November. (LPD)
- 1957 – Bremer flowed at Langhorne Creek in July, August, September and October. (LPD)
- 1958 – Vineyards were flooded at Metala (no date). (MRD)  
Bremer flooded at Langhorne Creek in August, September, October and flowed in May, June, July, and November. (LPD)
- 1959 – Bremer flowed at Langhorne Creek in August, September and October. (LPD)
- 1960 – Good winter floodings at Metala (no dates). (MRD)  
Bremer flooded at Langhorne Creek in May, June, September and flowed in April, July, August, October and November. (LPD)
- 1961 – The Bremer, which had been dry for some months, was running again (no date).  
The Bremer flowed at Langhorne Creek in June, July, August, September and October. (LPD)
- 1962 – A satisfactory 'creek' enabled vines to be watered at Metala (no date). (MRD)  
Bremer flowed at Langhorne Creek in June, July, August, September, October and November. (LPD)
- 1963 – 1 August, flood at Langhorne Creek one of the biggest experienced for some years.  
29 August, Flash flood at Langhorne Creek caused by heavy rain.  
31 October, Bremer came down a heavy flood as the result of rain in the Mount Barker area  
Bremer flooded at Langhorne Creek in July, August, September, October and flowed in April, May, June and November. (LPD)
- 1964 – 23 July, 'Dick Cleggett was walking near flooded Bremer about 10 days ago'.  
Bremer flooded at Langhorne Creek in July, November and flowed in June, August, September, October and November. (LPD)
- 1965 – Bremer flowed at Langhorne Creek in June, July, August and September. (LPD)
- 1966 – Bremer flowed in July, August, September, October and December at Langhorne Creek. (LPD)
- 1967 – Only one flow for year. Reached Natt's and dried up. (LPD)  
Southern Argus for 9<sup>th</sup> November stated that the Langhorne Creek area was experiencing the driest year on record and that the water had not flowed under the bridge for the first time in memory.





- 1968 – Bremer at Langhorne Creek about half full from rain.  
18 June, Bremer came down in flood  
15 August, Bremer flooded  
Bremer flooded at Langhorne Creek in June, August and flowed in January, May, July, September, October and November. (LPD)
- 1969 – 9 February, overflow to Cleggett's. Bremer flooded at Langhorne Creek in February and flowed in March, June, July, August, September and October. (LPD)  
13 February (edition date of Southern Argus) Bremer came down and on Monday there was still six inches of water over road by Collin's Store.
- 1970 – 10 April, Overflow to Marra's. (LPD)  
16 April, Bremer came down in flood after freak thunderstorm at Mount Barker – 5 inches in 90 minutes.  
26 August, overflow to bridge. (LPD)  
26 September, overflow to Natt's. (LPD)  
Bremer flowed in January, June, July, August, September and October. (LPD)
- 1971 – 27 April, Overflow to Marra's. (LPD)  
29 April, rain in hills expected to send small flood down the Bremer.  
4 May, Overflow to bridge. (LPD)  
6 May, flood coming down Bremer.  
14 August, Overflow to Natt's. (LPD)  
1 September, Overflow to bridge. (LPD)  
26 September, Overflow to Natt's. (LPD)  
Bremer flowed at Langhorne Creek in June, July and November and flooded in October. (LPD)
- 1972 – Bremer flowed at Langhorne Creek in February, July, August and September. (LPD).
- 1973 – 2 September, Bremer at Langhorne Creek overflowed up to Natt's and flowed in July, August and October. (LPD)  
6 September, Bremer flooded last Sunday. Water went up Mosquito Creek and Maurice Perrey was able to water between eighty and a hundred acres of his land.
- 1974 – 20 July, Overflow to Cleggett's. (LPD)  
26 July, Overflow to Bridge. (LPD)  
3 August, Overflow to Cleggett's. (LPD)  
8 August, flooding on Bremer at Langhorne Creek, second time in last fortnight. (Southern Argus issue date)  
3 October, Overflow to Clement's. (LPD)  
3 October, Bremer flooded (Southern Argus)  
Bremer flowed at Langhorne Creek in February, March, May, June, September and November. (LPD)



- 1975 – 21 August, two metre flow down Bremer. Smallest flow down Bremer ever. Besides this one only minor rises through the year.  
23 October, about, Large volume of water down Bremer as a result of heavy rain caused by a tropical depression. This spring flood is a continuance of a cycle of out of season floodings, which have plagued the Bremer flood plain over the past 12 years. Following upon only one summer flood from 1942 – 62 the district has experienced 7 untimely floods in last 12 years.  
29 October, Bremer overflowed upstream to DB Natt's and flowed in May, June, July, August, September and November at Langhorne Creek. (LPD)
- 1976 – 17 October, overflow upstream to bridge. (LPD)
- 1977 – Bremer flowed at Langhorne Creek in July and August. (LPD)
- 1978 – 6 July, overflow to Natt's for one hour. (LPD)  
7 August, Overflow to bridge. (LPD)  
8 August, Overflow to bridge. (LPD)  
12 August, Overflow to bridge. (LPD)  
Bremer flowed at Langhorne Creek in June, July, August, September and October. (LPD)
- 1979 – Wine grape growers received a timely flow down the Bremer in early September. Practically all 400 hectares were inundated.  
6 October, Overflow to Natt's for one hour. (LPD)  
10 October, Overflow up to Marra's. (LPD)  
12 October, Overflow up to Cleggett's. (LPD)  
Bremer flowed at Langhorne Creek in July, August, September, October and November. (LPD)
- 1980 – Bremer flowed at Langhorne Creek in June, July, August, October and December. (LPD)
- 1981 – 27 June, Overflowed to Pike's. (LPD)  
2 July, Overflowed to Natt's. (LPD)  
3 July, Overflowed to Clement's. (LPD)  
9 July, Bremer flooded at Langhorne Creek  
24 July, Overflowed to Natt's. (LPD)  
8 August, Overflowed to Natt's. (LPD)  
13 August, Langhorne Creek has biggest flood for years.  
14 August, overflowed to Clement's. (water flowed over east end of Howard's bridge). One of largest winter floods recorded. (LPD)  
14 August, biggest flood for many years. (BRR)  
15 August, Floods at Langhorne Creek, There has been 5 floods since June. Residents claim this is the worst one since 1956. (Advertiser)  
20 August, Bremer flooded.  
21 August, Overflowed to Pike's. (LPD)  
22 August, Overflowed to Scutching's. (LPD)  
31 August, Overflowed to Pike's. (LPD)



- 17 September, Killer acid in Bremer after biggest flood for many years.  
Bremer flowed at Langhorne Creek in June, July, August, September, October and November. (LPD)
- 1982 – River ran at Town bridge for about 18 days and did not get passed the Wine Vat Restaurant.  
Bremer flowed at Langhorne Creek in June and July. (LPD)  
- No water ran passed Langhorne Creek (township). (BRR)
- 1984 – 21 August, Overflow to Don Natt's. (LPD)  
25 August, Overflow to Cleggett's. (LPD)  
Bremer flowed at Langhorne Creek in July, August and September. (LPD)
- 1985 – Couple of floods (no date). (BRR)  
Bremer flowed at Langhorne Creek in June, July, August and September. (LPD)
- 1986 – Bremer flowed at Langhorne Creek in July, August, September, October and December. (LPD)
- 1987 – 24 June, Overflow to Natt's and Bremer flowed at Langhorne Creek in May, July, August, September, October and December. (LPD)
- 1988 – Bremer flowed at Langhorne Creek in May, June, July, August and September. (LPD)
- 1989 – Bremer flowed at Langhorne Creek in May, June, July, August, September, October, November and December. (LPD)
- 1990 – One good flood only in the vines (no date). (BRR)  
Bremer flooded at Langhorne Creek in August and flowed in June, July, August, September and October. (LPD)
- 1991 – 16 September, Overflow 1.5 kms upstream of bridge; Natt's flooded in September and October and flowed at Langhorne Creek in August. (LPD)  
- Two floods down the Bremer. (BRR)
- 1992 – 3 August flood at Langhorne Creek  
29 August, Record winter flood. (LPD)  
24 September, Second flood in two weeks washed out the Annual Gymkhana at Langhorne Creek  
1 October, Flood at Langhorne Creek for third time in less than three weeks, houses flooded.  
17 December, From midnight water overflowed at the Town bridge for sixty six hours until 6 pm on December 21. (LPD)  
19 December, Flood at 4 am was second largest ever recorded, water running out to the back of the cemetery. Only the January 1941 flood only superseded it. From August to December there were eleven floods. Ten of them being major floods coming onto Lloyd Jaensch's river flat at Hartley. (LPD)



Bremer flooded at Langhorne Creek in August, September, October, December and flowed in June, July and November. (LPD)

About six big floods in Langhorne Creek town, the last one December 18 –19<sup>th</sup> biggest since 1941 or possible just as big. (BRR)

1993 – 5 July, Overflowed to Natt's but no water through township of Langhorne Creek, Bremer flowed in January, May, June, July, August, September, October and November. (LPD)  
- July, a good flood and the only one came down the Bremer in July. (BRR)

1994 – Bremer flowed at Langhorne Creek in June, August, September and October. (LPD)

1995 – 23 July, Major winter flood with overflow to Clements Road. Water ran through town of Langhorne Creek and park. (LPD)  
31 July, Major flood, but smaller than 23 July, water again through Town and park. (LPD)  
Bremer flowed at Langhorne Creek in June and September. (LPD)  
- July, Bremer flooded twice. (BRR)

1996 – 4 August, Major flood with overflow to Clement's. Water covered Binney's vineyard. (LPD)  
30 September, Major flood, equal to largest spring flood on record (September 1992)  
Township inundated and Binney's completely inundated. (LPD)  
Bremer flowed at Langhorne Creek in January, June and July. (LPD)  
- 30 September, biggest flood down Bremer since 1992. (BRR)

1997 – 30 October, Creek full to just above Town bridge. 102 mm rain at Langhorne Creek in twenty four hours. Bremer also flowed at Langhorne Creek in July, August and September (LPD)  
- 30, 31<sup>st</sup> October, big rain 289 points, only one good flow in the Bremer. Big rains in the North of the State in February, greatest for 80-100 years. Heavy frosts in July (BRR)

1998 – 28 July, Water overflowed onto Frank Pott's Reserve. Bremer flowed at Langhorne Creek in July, August, September and October. (LPD)  
- No natural flooding, one man made flood– the Bremer only ran half a creek once. 2 heavy frosts in mid June (BRR)

1999 – Bremer only trickled down twice. 23<sup>rd</sup> April Adelaide had it's coldest April morning on record, heavy frosts (BRR)  
- Bremer flowed at Langhorne Creek in July, August and September. (LPD)

2000 – 22 February, Overflow onto Frank Pott's Reserve and 10 centimetres off full at Town bridge. (LPD)  
8 September, Water on Frank Pott's Reserve. (LPD)  
10 September, Water on Frank Pott's Reserve. (LPD)  
Bremer flowed at Langhorne Creek in June, July, August and October. (LPD)  
- Pushed two floods out into vines, but not much water down the Bremer. (BRR)



## ANGAS BREMER PRELIMINARY LAND AND WATER MANAGEMENT PLAN

### module 1

- 2001 – September 8<sup>th</sup> Creek (Bremer) overflowed to Natt's, water in township but not in Park.  
Bremer flowed 10 times from July to the end of October (LPD)  
- Sudden downpour on February 7<sup>th</sup>, heatwave 18<sup>th</sup>, 19<sup>th</sup> & 20<sup>th</sup> February, around and over 40°C, man made flood in July and one natural flood during the year (BRR)
- 2002 – Bremer flowed once only on July 10<sup>th</sup> to 11<sup>th</sup>. (LPD)  
- Driest summer on record, drought year only 940 points (235mm) for year (BRR)
- 2003 – August 24<sup>th</sup> Creek (Bremer) full at Frank Potts Reserve. Bremer flowed 10 times from June to October (LPD)  
- Above average rainfall for the year, a good cereal year, only one flood in the Bremer and part made floods. (BRR)
- 2004 - August 4<sup>th</sup> Full flood at noon, overflow up to Natt's, small flow through Park and Pasquin.  
August 5<sup>th</sup> Creek overflow to Bridge. Creek flowed 6 times from beginning of July to mid September (LPD)  
- Coolest January since 1992, Grapes late ripening, February 14<sup>th</sup> hottest day since record in 1939, 4 frosts during May, dry until July, Flood out in Langhorne Creek township, first in some years. 12<sup>th</sup> of October hottest October day for 17 year, 40°C in Murray Bridge (BRR)