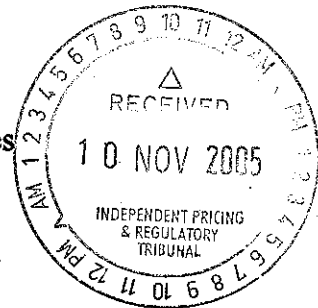


PEEL VALLEY WATER USERS ASSOCIATION INC.
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5th November 2005

Independent Pricing and Regulatory Tribunal of New South Wales
PO Box Q290
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SYDNEY NSW 2000



Submission to IPART-Bulk Water Prices from 2006/07

STOP! The Bulk Water Pricing Process and its participants need to halt the process and take a reality check and a deep breath (The community would be a lot better off if some of the participants held their breath for at least ½ an hour)

None of the States dams or the Government agencies or corporations associated with them were built on the premise of full cost recovery from water users, let alone a return of 6% or more on assets.

The cost spiral is out of control with State Water Corporation (SWC) and the Department of Natural Resources (DNR) **selectively** using the Inter Government Agreement (IGA) on the 2004 National Water Initiative (NWI) and the 1995 COAG agreement on water reform to push their case for full cost recovery.

What is full cost recovery?

The Department of Land and Water Conservation (DIPNR) the predecessor of SWC and DNR in its submission to IPART in April 2001 lists the Total Bulk Water costs for the 2003/04 water year on page 25 of that document as:

| Total Cost (\$) | Full Cost Recovery (user share) |
|-----------------|---------------------------------|
| \$104,421,000 | \$69,020,000 |

Dipnr's replacements SWC and DNR in their submissions to IPART September 2005 lists total Bulk water costs for 2006 / 07 as:

| Total Cost (\$) | Full Cost Recovery (user share) |
|--------------------------------|---------------------------------|
| SWC (page9) 89,873,000 | 67,841,000 |
| DNR (page25) <u>55,269,000</u> | <u>46,986,000</u> |
| Total \$145,142,000 | \$114,827,000 |

That is if you believe that the SWC and DNR's current costs listed in their submissions are genuine then the total cost for bulk water has risen by \$40,721,000 or 39% over three years and the cost to the Water Users (irrigators and towns water supplies) has risen by a massive \$45,807,000 or 66% over the same 3 year period compared to the national rate of inflation over the same period of something less the 8%. **Who has their snouts in the trough!**

In essence it would appear the breakup of DIPNR by the NSW Government into SWC and DNR has caused a massive blow out in the costs of Bulk Water Services. In reality it is more likely that these two NSW Government institutions have found bigger and more devious ways to interpret the IGA, NWI and COAG agreements to milk NSW Country dry and ruin what used to be vibrant rural economies.

Unfortunately the escalation of these costs attributed by this NSW Government Corporation and Agency cannot be recouped from the water users on a valley basis. The milking cows of the Peel Valley, North Coast and South Coast are drying up and worse still they are suffering from the terminal disease Black Mastitis.

For SWC to increase the Peel's General Security charges from \$14.42 / ML in 2005/06 to a massive \$90.95 / ML in 2008/09 whilst the Murrumbidgee's costs rise from a low \$3.93 ML in 2005/06 to \$4.87 ML in 2008/09 is quite frankly unbelievable. DNR's charges will of course be added to these costs. What sort of message does this send? It looks like we will all be moving south to Mexico.

Uniform Statewide Bulk Water Pricing should be introduced by IPART in **THIS** pricing determination. It is the only fair and reasonable method of distributing the costs of Bulk Water Services amongst the community, after of course, IPART has sorted out the genuine costs from the ambit claims put forward by both SWC and DNR.

Apart from raising the obvious issue of the totally unreasonable and escalating costs of SWC and DNR and the inability of the Peel Valleys Water Users, both General Security and Town Water Supply to pay for these hikes in bulk water charges, the Peel Valley Water Users Association would like to take this opportunity to raise other issues that should be taken into account by IPART in its Pricing Determination.

1. PEEL VALLEY GENERAL SECURITY - Reliability of supply

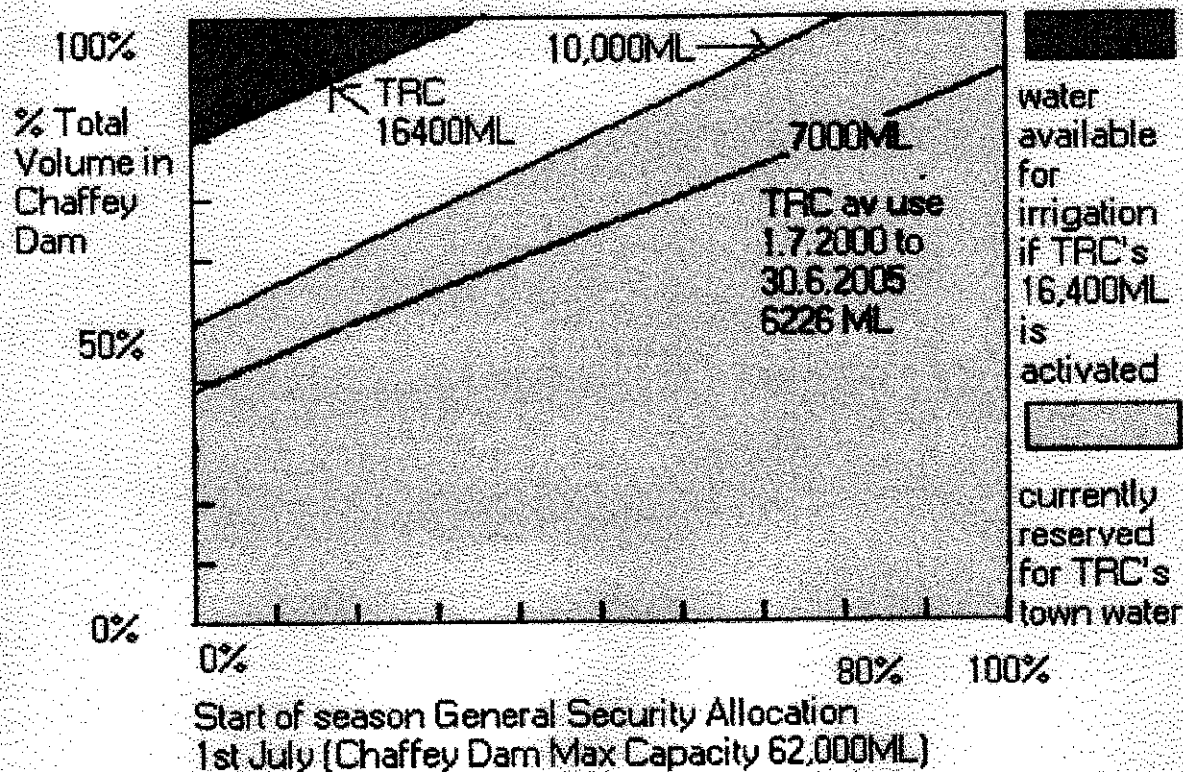
The start of season allocation (1st July) for the General Security Users of the Peel Valley is listed below:

| Year | Start of Season allocation | Dam Capacity |
|-------|----------------------------|--------------|
| 01/02 | 80% | 100% |
| 02/03 | 60% | 80% |
| 03/04 | Zero | 33% |
| 04/05 | Zero | 46% |
| 05/06 | Zero | 43% |

What sort of irrigation industry can survive and be successful with three consecutive years with no access to irrigation water at the start of the water year when Chaffey Dam has, compared to other Dams in the region, been quite full. Chaffey is too small to cater for the requirements of Tamworth Regional Council and also support an irrigation industry. Chaffey Dam needs to be enlarged as soon as possible. Preferably yesterday.

The impact of Tamworth Regional Councils (TRC) access to water from Chaffey Dam on the General Security Water Users Access is clearly demonstrated in Figure 1.

Impact on the Peel Valley Irrigation Industry of Tamworth Regional Councils water requirements on the resources of Chaffey Dam.



Should TRC require its full entitlement, general security entitlement holders will receive no access to irrigation water until the Dam is 80% and then will only receive 35% of entitlement when Chaffey Dam is full. Clearly the Dam is currently to all intents and purposes basically reserved for Town Water supplies.

Whilst the Peel Valley Water Users Association is aware that SWC in its submission to IPART has determined that the impact of TRC on the reserves of Chaffey is so great that to reduce the cross subsidy between General Security Users and High Security Users the High security charge should be 13.46 times higher than for General Security Users which would cause TRC's costs for Bulk Water to rise dramatically and unreasonably. Whilst TRC has the facility to increase its water rates to the Town

folk and may be able to pass on its direct costs for about 50% of its annual water usage to the alternative sewerage effluent reuse users, the impact on TRC's financial outlook will still be significant.

Given that Chaffey Dam was built for the purposes of irrigation, flood mitigation and to augment Tamworth's water supply, not for the purposes of full cost recovery supporting innumerable bureaucratic backsides, the Peel Valley Water Users Association would propose that TRC's contribution to Bulk Water charges remain about where they are, and the General Security charges be reduced by the 13.46 ratio given that to all intents and purposes we are in effect largely Unregulated water users.

2. RETURN ON ASSETS – UPPER BOND PRICE RECOVERY (rate of return on capital)

The justification in moving to upper bound pricing is unreasonable. The inter Governmental Agreement on the 2004 National Water Initiative (NWI) indicates in clause 66V(b) that the NWI seeks *"continued movement towards upper bound pricing for all rural systems, where practical."*

This NWI statement needs to be questioned. The NWI states that it is built on the work and intentions of the 1994 COAG agreement on water reform. The 1994 paper is the strategic framework document that formed the basis for the 1995 COAG agreement on water reform. The 1994 strategic framework document identifies cost recovery for rural water and irrigation schemes as
(Clause 3.4 1994 COAG)

"In the case of many existing rural water and irrigation schemes application of the full cost definition will need to take account of operational and maintenance costs, any river delivery costs, the refurbishment costs of supply and reticulation assets, including headwork's and the extent to which investments were intended to meet social as well as economic objectives."

There is no mention of returns on capital of rural water infrastructure or in regard of cost recovery in the 1994 document. However the current State Water submission builds a rate of return on capital into the construction of the regulatory asset base (RAB).

This appears to be a policy decision by State Waters shareholders namely NSW treasury. This policy decision needs to be debated and the impacts assessed. Both NWI and the original 1994 COAG agreement stress the need to avoid monopoly pricing. Any treasury insertion of increased pricing needs serious scrutiny in the light of these concerns over monopoly pricing.

Both documents acknowledge that in many instances full recovery will not be possible due to previous 'legacy' policy decisions being made without consideration of possible future cost recovery or returns on capital.

The Peel system is a prime example of legacy decisions making full cost recovery impossible. The Peel's cost structures are extremely high due to the awkward size (too small for dedicated irrigation, too large for dedicated town water) of the Chaffey storage.

Page 9 of State Water Corporations current submission calculates a return on assets of \$20,199,000 dollars per annum across NSW, these are new costs driven by upper bound cost recovery.

Peel Valley Usage Entitlement Figures

Annual entitlement HS 17277MLmGS 30,878 ML

Average annual usage 14675 ML HS / GS combined figure

Average annual usage less 1 standard deviation 12,925 ML HS / GS combined figure

The increased annual cost of seeking a rate of return on capital in the Peel system

| 2006 / 2007 | 2007 / 2008 | 2008 / 2009 | 2009 / 2010 | 2010 / 2011 |
|-------------|-------------|-------------|-------------|-------------|
| \$331,000 | \$417,000 | \$587,000 | \$809,000 | \$933,000 |

Each year an average of 14675 ML of HS and GS water is used. The average cost of seeking a rate of return on capital in the Peel will be –
2006-07 \$331,000 raised as a rate of return on capital equates to an increase of \$22.56 per ML attributable to seeking a rate of return on capital, averaged across HS and GS water.

3. COST SHARING RATIO'S

All of the Cost Sharing ratio's for the various product codes of both SWC and DNR need to be reviewed by IPART and 'on the ground experts.' The following examples are just a few which could be put forward to demonstrate the unfair and unreasonable burden being placed on Water Users by the current cost sharing ratios.

State Water Corporation

| <u>Code</u> | <u>Description</u> | <u>Valley</u> | <u>% to User</u> | <u>Total Cost</u> |
|-------------|----------------------------|---------------|------------------|-------------------|
| 11736 | Public Liability Insurance | Peel | 100 | \$41,600 |

The Public Liability in the Peel is principally to cover the possibility of an accident at Chaffey Dam by a recreational user or tourist or visitor to the Dam. Who is the beneficiary? NOT the water user. Why should we be charged nearly \$1.00 ML of entitlement for this Public Liability Insurance? The benefactors are the people and the Government should pay 100%, NOT the water users. Alternatively close the Dams and headworks to the public. Imagine the outcry!

| <u>Code</u> | <u>Description</u> | <u>Valley</u> | <u>% to User</u> | <u>Total Cost</u> |
|-------------|---------------------------------------|---------------|------------------|-------------------|
| 12150 | Water Quality Data Collection-Chaffey | Peel | 100 | \$141,300 |

The water users are neither impactor or beneficiary. The General Security Peel Valley Water User gets so little access to the resources of Chaffey Dam that the quality of the water is of little concern especially when it is remembered that about two thirds of the water used in the Peel is extracted downstream of the TRC sewerage treatment works.

The Water Quality Data Collection at Chaffey is largely for Blue Green Algae alerts with the beneficiaries being the recreational users or adjacent land-holders. The user share should be zero and the NSW Government's share 100%.

Department of Natural Resources

Water Modeling and Impact Assessment. (Ref. Page 21 DNR Submission)
\$7,184,970

The share is unspecified but is highly likely to be close to 100% If the Peel's IQQM is any guide to the usefulness of the IQQM Model for water monitoring and impact assessment then the cost attributed to the water user should approach zero. The Peel is a simple system, when it rains irrigation water is not used and when the weather turns dry irrigation is used to meet the crops water requirements. The IQQM modelers have used two irrigator behavior models for the Peel, both of which are WRONG.

They are

(a) Area irrigated increases as water availability increases (water availability allocation improves as rainfall increases) i.e. area planted for irrigation increases as rainfall increases.

(b) Area planted for irrigation increases as rainfall decreases.

NOTE These two concepts of irrigator behavior in the Peel Valley are 180 degrees apart and diametrically oppose each other and both are wrong.

In the Peel Valley, water use increases as rainfall decreases in order to meet the crops water requirement. Water use per Ha increases as rainfall decreases NOT the area planted for irrigation.

To demonstrate the highly inaccurate data that can be generated by the Peel IQQM which the water users basically pay 100% of the costs, the Peel Valley Water Users refer IPART to the 2005/06 'Peel Water Allocation Plan, Page 5.'

..... when general security allocations are less than 35% of entitlement, which the IQQM predicts will be about 18% of years.....

That is the IQQM for the Peel predicts that the General Security Allocation will be less than 35% for only about 18% of water years.

In practice since 1990 / 91 to 2005 / 06 using the current method of water allocation, the Peel would have had less than 35% allocation for 7 of the 16 years or 44% of the time including 5 years of zero start of season allocation. So much for the IQQM!!!

Why should the water users pay for this process? The information it generates is inaccurate, misleading and reeks of incompetence.

4. 2005 / 06 IPART SUBMISSION

The Peel Valley Water Users has taken this opportunity to resubmit our 2005 / 06 submission on water pricing which is still more than relevant to the 2006 / 07 IPART determination.

Once again the Peel Valley Water Users Association thanks IPART for its assistance to the Peel Valley and for giving us the opportunity to participate in the process.

Yours faithfully

Laurie Pengelly
Representing the Peel Valley Water Users Association Inc.

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12th December 2004

Independent Pricing and Regulatory Tribunal of New South Wales
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Submission to IPART – Bulk Water Prices from 2005/06

Dear Sirs,

The Peel Valley Water Users Association is most concerned that the Department of Infrastructure Planning and Natural Resources (DIPNR) has not made its submission on bulk water pricing to IPART available to the public for comment if indeed it has got around to making a submission at all. The Peel Valley Water Users Association would put to IPART that the bulk water pricing process for 2005/06 be suspended until DIPNR's submission is made available as we fail to see how IPART can make a pricing determination without knowing what is in DIPNR's wish list and basing its determination only on State Water's submission.

The Peel Valley Water Users Association is also most concerned at the rate at which the goal posts for full cost recovery are disappearing over the horizon. Many valleys thought they were at full cost recovery for the 2001/02 IPART Determination. They thought wrong!!! Full cost recovery is still not in sight. We have State Water's Corporatisation! It's 6% return on its Regulatory Asset Base! DIPNR's as yet unknown costs and how soon before the Catchment Management Authorities have their snouts in the trough. **IPART needs to remember that the irrigation industries and the town water supplies were not built on the premise of full cost recovery.** and in many cases full cost recovery on a valley basis can only lead to the destruction of the industry. What would happen if Corporatisation; a 6% return on RAB and full cost recovery was applied to State Schools, Public Hospitals, and the Metropolitan Rail Network. We would have an illiterate society, low life expectancy and no one could afford to go to work in Sydney. This would solve the old age problem and decentralization issues all in one hit.

Our association would however like to take this opportunity to raise the following issues which we consider need to be addressed in IPART's determination for bulk water prices from 2005/06.

UNIFORM STATE WIDE BULK WATER PRICING

The Namoi-Peel Customer Services meeting held on 26th May 2004 action No. 0405.02 *Write to IPART indicating that the Namoi-Peel CSC is in favour of statewide bulk water pricing even if accounts are separate.* This action was taken by the committee as it was felt that the price of bulk water in the Northern and smaller valleys was rising at a rate which would significantly impact on the economic viability of these irrigation areas due to circumstances and history beyond the control

of the individual valleys concerned. This sentiment is confirmed by analysis of State Water's submission for bulk water pricing from 2005/06. State Water's submission puts forward

- State Water proposes that the ratio of entitlement revenue to usage revenue be standardized across the state at 60:40. This will have the impact of reducing charges in times of low allocation. The major beneficiary of this proposal will be the southern valleys which currently have a high ratio of fixed costs.
- Appendix 5. IPART user share for each sub product is uniform across the state.
- Regulatory Asset Base. The RAB figure of \$300 million at 1 July will be split between government and water users on the basis of past contributions to State Water's asset base. Allocation of 65% of opening RAB to government and 35% to water users reflects the current ratio of capital annuities between government and customers. These proportions will change over time, in line with investments made by government under current cost sharing arrangement and customer revenue.

All three dot points are uniform state wide apportionment of water charges which have the potential for a massive impact on a valley basis as clearly demonstrated by the situation in the Peel Valley. If it suits the government to apply these costs uniformly across the state without apportioning them accurately with justification on a valley basis then logically uniform state wide bulk water charges should apply.

The Peel Valley Water Users Association has made the following assessment of the likely costs if valley based water charges were replaced by a single statewide charge.

The assessment was based on

- (a) The long-term average annual diversions at 1993/94 levels of development, which effectively equates to the Murray Darling Basin Cap.
- (b) Bulk water at full cost recovery for the regulated system at 2003/04. Reference Table 4.5 page 24. Submission by DLWC to IPART on Bulk Water Pricing 2001/02 – 2003/04. It is recognized that this data is not current but is the best available given that DIPNR has not made its submission to IPART. The numbers may change but the principle remains the same. It is also recognized that the revenue wishing to be recovered in this table is high and included many costs that were questioned by the NSW Irrigators Council and many other water users organizations and that the resultant bulk water assessment made by the PVWUA will be on the high side and is therefore conservative in terms of its impact.
- (c) The North Coast, Hunter and South Coast were not included in the assessment as our association was unable to source the long-term average diversions for these valleys. It is likely however that the impact of these valleys, which should also be included in the proposed statewide charge, would be fairly low. We therefore consider that the result of our analysis is a fairly good representation of the likely cost of bulk water on a state-wide basis.

METHOD

- (i) Regulated System, Entitlement, Long term average use
Total Entitlement 6312GL
Long term average use 5103GL
Which equates to 80.85% utilization of entitlement
- (ii) Bulk Water Full Cost Recovery Revenue 2003/04
Regulated \$48.44 million
- (iii) Based on a long term average use of 80% and a \$2.00 entitlement charge
Entitlement @ \$2.00 – 6312 x 2.00 = \$12.62 million
Usage at 80% 5103 x 7.00 = \$35.72 million
\$48.34 million

RESULT

An entitlement charge of \$2.00 and a usage charge of \$7.00 at 80% LTAU will recoup in full the DLWC's proposed revenue of 2003/04.

IMPACT

With reference to the Regulated Water Price schedule for the 2004/05 water year at a total state wide bulk water charge of \$9.00 per ML the Murrumbidgee at \$5.01/ML is the Valley most seriously affected followed by the Murray at \$6.55/ML. All the other valleys are likely to be beneficiaries of this proposed statewide charge following the completion of this IPART determination and State Water would have a stable funding base without severe economic hardship being placed on valley based irrigation industries in low allocation, low income years.

POINTS TO NOTE

1. A \$2.00 entitlement charge was chosen to reduce growth in water use. A low entitlement charge would not have the same incentive to

- (a) use the water or
(b) sell the water

as would a high entitlement charge of say \$6.94ML, which is the 2004/05 entitlement charge for the Namoi. i.e. growth is slowed down and would leave entitlement available for use or temporary transfer in drought or low allocation years for the active water users. NOTE. More water is able to be accessed in dry or low rainfall years without breaching the MDBC Cap.

- Low entitlement charge is beneficial for the entire industry whilst still maintaining State Water's revenue base as long-term average state wide use is high at 80% utilization of entitlement.

2. The Murrumbidgee and Murray Valleys, which are impacted on by a uniform state wide price of about \$9.00 would have difficulty demonstrating economic hardship at this level of pricing given that the current water charges in the Namoi and Peel Valleys for the 2004/05 water year is over \$15.00 per ML.

3. The usage charge of \$7.00 ML or thereabouts is a charge, which cannot be claimed to incur significant socio economic hardship when it is coupled with only a \$2.00 entitlement charge. It will take some off the bottom line but should not send irrigation farmers broke.

4. DIPNR and State Water accountability should be maintained on a valley basis and scrutinized by the local Customer Services Committee. The industry should be in a position to be able to closely watch and monitor all of the DIPNR / State Water costs.

PEEL VALLEY - GENERAL SECURITY ACCESS AND RELIABILITY OF SUPPLY

On the basis that there is a strong westerly wind blowing and IPART does not take up the option of uniform state wide bulk water pricing the Peel valley Water Users Association will take this opportunity to reinforce with IPART the difficult position continually being faced by the General Security Users of the Peel Valley as shown in the table below.

| Water Year | Capacity of Chaffey Dam | Gen. Sec. Start of Season Allocation |
|------------|-------------------------|--------------------------------------|
| 2001/02 | 100% | 80% |
| 2002/03 | 80% | 60% |
| 2003/04 | 33% | 0% |
| 2004/05 | 46% | 0% |

As can be seen Chaffey Dam over the last 4 seasons has had an average capacity of 65% at the start of the water year but the General Security water users have received only an average of 35% allocation with two years having a start of season allocation of zero. No other Dam in the state with this capacity of water in the dam has such a poor reliability of supply to its General Security entitlement holders.

This situation was recognized by IPART in its determination of bulk water prices on the 1st October 2001 when IPART compared the worst case scenario for all the other General Security users against the best case scenario for the General Security users of the Peel and determined on page 45 of its determination that *"The very small allocations made to low security users in the Peel Valley result in a clear disparity between the effective prices paid by low and high security users in that valley. This disparity is of a magnitude significantly greater than in any other valley. The tribunal is of the view that the current disparity in the Peel Valley is so great that some correction is required for this Determination. Therefore, whilst usage charges and high security entitlement charges in the Peel Valley will rise by 15per cent (real) for each of the next three years, the low security entitlement charge will remain at the 2000/01 level in real terms for the period of this Determination."*

This assessment by IPART is strongly supported by State Water Corporations Pricing submissions to IPART October 2004 page 35 where State Water using a completely different methodology to IPART came to the same conclusion as IPART that the General Security users of the Peel Valley are severely impacted on by the large volume of High Security Entitlement required to be serviced from Chaffey Dam. State Water has recommended that the High Security to General Security Entitlement Price Ratio be increased from its current level of 1.7 to a massive 13.46. Table 4 of State Water's Submission clearly demonstrates the parlous position of the Peel's General Securities users compared to the General Security users in all of the other river valleys.

The Peel Valley Water Users Association would like to draw IPART's attention to the following information, which is relevant to the Peel Valley which may help it in its determination for setting bulk water pricing for the Peel Valley.

Chaffey Dam

Chaffey Dam was to be built in two stages. Stage 1 has been in operation since 1980 and stage 2 is unlikely to ever be built, as Governments are loath to aggravate the Green lobby.

Stage 1 was built for the following purposes listed in order of priority.

Priority 1.

To ensure that Tamworth City had a secure water supply for its 35,000 population, Tamworth City Council contributed a relatively small amount to the construction of the Dam. \$2.88 million out of a total cost of \$31 million, about half of Tamworth City Council's contribution was by way of a public works grant, hence the ratepayers of Tamworth actually contributed about \$1.5 million of ratepayers funds over a period of years.

For this contribution, Tamworth City received a High Security allocation of 16,400ML, which effectively means that their full entitlement will be available in all but extreme drought years. In contrast, the General Security Users at Tamworth City Council's current usage receive 80% start of season allocation when Chaffey is spilling and have NO access to water when the Dam is less than 50% capacity. *WHO is the beneficiary of Chaffey Dam?*

Priority 2.

Flood Mitigation largely to protect Tamworth City from flooding. For example, Chaffey Dam reduced the maximum flood height at Tamworth, which occurred on 20th November 2000 by about 1.0 meter (estimated by the DLWC's Barwon Region Senior Assets Engineer). The Peel peaked at Tamworth at 6.8 meters, 7.8 meters would have been likely to have breached the levy protecting the City centre.

In contrast the irrigation farmers of the Valley were inundated with floodwater as 46,000ML per day raced down the valley. Once your farm is underwater it is not all that relevant how deep it is. In my case it cost \$13,000 to rebuild and repair my pump

site. I know of others whose costs exceeded \$20,000. *WHO is the beneficiary of Chaffey Dam?*

Priority 3.

Irrigation and recreation. Both these pursuits were really after thoughts for stage 1 and were to be catered for in stage 2 of the Dam. The Dam is however used extensively for rest and recreation and of course supports what was once a viable irrigation industry. Again *WHO is the beneficiary of Chaffey Dam?*

NOTE The cost sharing ratios developed by IPART attributed to the head works of the states major dams which are principally used for irrigation are NOT applicable to Chaffey Dam and should not be costed against the irrigators of the Peel as the major beneficiaries of the Dam are clearly the people of Tamworth and the bulk of the cost attributed to Chaffey Dam are clearly those of the Tax payer (NSW Government) and of course Tamworth City Council which has a secure water supply and to all intents and purposes dominates and dictates the use of Chaffey Dam.

Impactor Pays

It is interesting to note that IPART has decided to use the Impactor Pays approach to attribute costs against the water user.

The following scenario is a variation of the impactor pays approach, which IPART should consider. That is water use and its impact on the riverine environment.

The impact of the water users of the Peel Valley on the end of stream flow of the Peel into the Namoi at Carroll Gap over the period of normal years is about 6% and drops to only 2% if large flood events are taken into account.

Professor Cullen from the Australian National Universities Centre for Fresh Water Research has indicated that irrigation diversions of less than 30% impact over the end of stream flow is acceptable socio economic / environmental outcome.

When it is remembered that long term average diversion in the Murray Darling Basin impacts on the Murray's river discharge to sea by about 80%, the Peel's impact of 2 – 6% is negligible and all costs and product codes attributed to the environment in the Peel should have their cost sharing ratio brought back in line with the Peel's real impact on the environment.

These cost sharing ratios were determined by IPART as a "best guess". This best guess, which may be applicable to the larger irrigation river systems, clearly is inappropriately high for the Peel.

REGULATORY ASSETT BASE

State Water has apportioned its regulatory asset base to each valley in table 2 page 28 of its submission to IPART. This table clearly demonstrates the inequalities in the system and clearly supports a uniform state-wide price structure. This is particularly

evident when entitlement and long term average use is added to the table as shown below.

| Valley | RAB at 1.7.04 \$M | Revenue Generation for 2005/06 \$M ^F | Entitlement GL | Long term Av Use % |
|---------------|----------------------|--|-------------------|-----------------------|
| Border rivers | 2.8 | 0.2 | 266 | 79 |
| Gwydir | 60.5 | 1.2 | 537 | 58 |
| Namoi | 62.2 | 1.0 | 264 | 90 |
| Peel | 13.4 | 0.3 | 48 | 31 |
| Macquarie | 39.7 | 1.3 | 689 | 56 |
| Lachlan | 30.2 | 1.1 | 671 | 46 |
| Murrumbidgee | 48.7 | 2.1 | 2400 | 80 |
| Murray | 16.1 | 0.8 | 2248 | 86 |
| Hunter | 20.1 | 1.0 | 200 | 64 |
| Minor coastal | 6.9 | 0.4 | 23 | 30 |

Compare for example the potential revenue raising capability of the Namoi and the Murrumbidgee. The RAB's are \$M62.2 and \$M48.7 respectively. To achieve the same rate of return on the RAB the Namoi Valleys water price at 90% usage would need to be ten times higher than that of the Murrumbidgee at 80% of usage.

To compare the Peel with the Murray which has a similar RAB of \$M13.4 and \$M16.1. To achieve the same rate of return on RAB the Peel's Water pricing would be over 100 times higher than that in the Murray.

So much for National Competition Policy and level playing fields. The RAB's allocated to each valley by State Water are a result of circumstances beyond the control of the Valley and are largely a quirk of fate and bear no relationship to the Valleys ability to pay. Clearly the RAB apportionment by State Water dictates that uniform state wide Bulk Water pricing is a much fairer and equitable system for bulk water pricing in NSW.

WATER USERS CAPACITY TO PAY

State Water in its submission on this subject item 3.7.2 page 41 states

- The cost of water as an input to production is generally only a small percentage of total input costs as shown in the socio-economic study by NSW Agriculture in 2001. There is no reason to believe the validity of that study has changed since it was completed.

On the contrary there is every reason to question the validity of the Economic Assessment of Water Charges in the Peel Valley. The report when it was issued contained serious errors, which was the subject of a submission to IPART on the 15th May 2001 (appendix 1). Some of these errors were the subject of a presentation by Jason Crean at IPART's Bulk Water Pricing public workshop held in Armidale on the 29th June 2001. In summary, the areas used in roads 22 and 23, over estimated the actual areas by 40 and 21 per cent respectively. The Department concluded that these findings were to be treated with caution as further ground truthing of the data was

desirable but may involve significant time in doing so, consequently under a base case situation irrigation farms in these noad's of the Peel would appear more marginal to start with. This would make them more vulnerable to any significant change in production costs (like an increase in water prices) or a fall in income (like a drop in commodity prices.) The impact of proposed price increases would be more significant in these circumstances.

This report has now been used inappropriately by IPART and State Water, however the Peel Valley Water Users Association considers that with more work, this report can be made a useful benchmark tool and consider that IPART should direct that the works be completed to the satisfaction of the Namoi-Peel Customer Service Committee.

To assist in this process, the Peel Valley Water Users Association has assessed the Peel Valleys irrigation water requirements as a function of rainfall. The complete report is tabled in appendix 2 and summarized below.

This investigation of the Peel Valleys irrigation water usage was conducted to assist IPART's deliberation into water pricing in the Peel Valley and to help refine DIPNR's Intergrated Quality and Quantity Model (IQQM) for the Peel Valley.

The analysis of on farm water usage under intensive irrigation in the Peel Valley demonstrated a strong linear relationship between irrigation water usage and rainfall. The consumption of water per Ha varied from 2ML per ha in the wet years (850mm) up to 8ML per ha in drought (400mm) averaging around 4.5ML per ha in average rainfall years. Unfortunately average rainfall conditions don't occur all that often with the climate varying considerably from drought to flood and back again over a ten year period.

The raw data with respect to water use and in particular area irrigated used to calibrate the IQQM contains inaccuracies, which result in the information generated from the model with respect to these two variables being highly inaccurate. This data in the IQQM shows virtually no correlation with rainfall whereas in practice water use in the Peel Valley in terms of ML per Ha has a very strong relationship with rainfall. When it rains we don't irrigate and when it doesn't rain the pumps work over time. Note. There is no effective on farm storage in the Peel Valley to cause an aberration in this relationship. DIPNR's computer modelers are currently in the process of reassessing irrigator behaviour and other input variables in order to improve the model.

The Peel Valley Water Users Association would once again like to thank IPART for giving our Association the opportunity to participate in the IPART process and also to **thank IPART for listening to and acting on some of our concerns raised in past IPART determinations.**

Yours faithfully

Laurie Pengelly
Representing the Peel Valley Water Users Association

APPENDIX 1

1

Rosebank
Wallamore Road
TAMWORTH NSW 2340

15th May 2001

Independent Pricing & Regulatory Tribunal
PO Box Q290
QVB Post Office
SYDNEY NSW 1230

Submission to IPART – Bulk Water Pricing 2001/02 – 2003/04

**SUBJECT: A Critique by the Peel Valley Water Users Association of the NSW
Agricultures Economic Assessment of Water Charges in the Peel Valley.**

This economic assessment of bulk water pricing by the NSW Agriculture was started under contract to the DLWC around about Christmas 1999 and had to be completed in early 2000 in readiness for the DLWC's 2000 triennial (subsequently abandoned) bulk water pricing submission. The report had too short a time frame for completion, which placed the NSW Agriculture in an untenable position. The Peel Valley Water Users Association has had a lot of help, assistance and advice from many officers of NSW Agriculture and is with reluctance that we critique this report and are only doing so as we believe that our livelihood as irrigators of the Peel Valley is in jeopardy.

Well here we go:-

To read the first few pages of the NSW Agriculture "Economic Assessment of Water Charges in the Peel Valley" and the conclusion, as most people do, the reader would think that the irrigators lot in the Peel Valley was one of Milk and Honey with just a tad less honey with bulk water pricing at full cost recovery.

Page 6 "*Irrigation supplies from the Peel River are very secure compared to other Northern Valleys. Under current levels of development, irrigators can expect to receive their full allocations in 92 years out of 100. Simulated announced allocations for the Peel Valley, using historical climatic information from 1891 to 1998, yielded an average announced allocation of 94 per cent.*"

Page 7. "*The alluvium in the Peel is typically between 10 to 20 metres thick with a porosity of 10%. Therefore, under each hectare of river flat there would be 10 to 20 ML of stored groundwater. There is a close connection between river levels, rainfall and groundwater levels. However, in times of drought, groundwater reserves are a more reliable source of irrigation water.*"

Page 25 "*The results indicate that the proposed price increases are unlikely to pose major viability issues for most irrigation farms in the Peel Valley. They will however add to the general picture of declining terms of trade common to many broad acre agricultural industries. This implies that in the longer term, farmers in the Peel Valley will need to*"

continue to improve the productivity and efficiency of their production systems to remain viable or gain other income beyond the operation of the farm.

The assessment of the Water Resources of the Peel Valley is misleading in the Extreme. The regulated surface water users of the Peel River have the lowest security of supply of all of the regulated systems in the Barwon region. Chaffey Dam has as its primary commitment, the supply of town water to the City of Tamworth. At Tamworth City's current usage the allocation at the start of the irrigation season with the Dam at spill is 80%. When the Dam is 50% or less the allocation is zero. The average start of season allocation for the 1990's was 50%. The regulated water user of the Peel Valley has the lowest security of supply of ALL of the states regulated systems. As Tamworth City increases its usage of Chaffey the security of supply will decrease even further.

The ground water system of the Peel alluvium is shallow, it recharges rapidly in wet seasons and discharges rapidly during drought years. There are strong linkages between surface and ground water in the Peel and transmission losses from the surface water exceed 30% in drought years. The ground water resources of the Peel, like many zones in the Namoi are grossly over allocated. The Peel ground water is extremely unreliable in drought years and for the NSW Agriculture to even suggest that ground water could be used to off set the use of expensive regulated water from Chaffey Dam defies comprehension.

To confirm this assessment of the bulk water resources of the Peel Valley, the Peel Valley Water Users Association strongly recommend that IPART consults with the Resource Manager. That is the Regional Director of the Barwon Region on 02 6764 5900.

The Peel Valley Water Users Association list the following "dot" points for IPART's examination.

COMMENTS ON NSW AGRICULTURE'S "ECONOMIC ASSESSMENT OF WATER CHARGES IN THE PEEL VALLEY"

- This report was NOT provided to the Namoi-Peel CSC and its comments were therefore NOT incorporated into the report as claimed in IPART'S Report No 7, 2000 page 19. This is a *serious integrity* issue for all water users, but should be of particular concern to all Customer Service Committees.
- The NSW Ag. Dept is currently working on a revision of the report and reassessing its assumptions – particularly those of irrigated area and gross margins.
- The representative farms are hypothetical NOT actual farms and are not cross referenced to actual farms.
- Three of the four "representative" farms are unrepresentative of the valley and represent only the largest 20% of Licence holders.
- Peel regulated usage and reliability data incorrect. Peel has the lowest reliability of supply of all the northern regulated rivers NOT the best.

- Ground water details are also wrong, in dry times the ground water depletes rapidly and is an unreliable source of water and is well over allocated – with respect to sustainable yield.
- The conjunctive licence conversion for the Peel was calculated by the Namoi Ground Water Management Committee using a start of season allocation of 50% resulting in a conversion rate of 3.0ML per Ha. The highest rate of conversion in the Namoi system. This high conversion rate had the consensus of this committee, which included among others the EPA and National Conservation Council.
- There are no other crop options in the Peel, which have a higher gross margin than Lucerne. The chances of finding one is slim as all avenues to find a crop / enterprise to be a third industry along side Lucerne and Dairying was exhaustively examined over nearly a year in 1998 by a combined effort with NSW Agriculture and Peel Valley Water Users Association “Emerging Opportunities in Agriculture 9th October 1998” (Copy provided for Ipart’s information). This information is provided to IPART to demonstrate that the irrigators of the Peel Valley have got off their butts and tried to find alternate enterprises, as it was quite apparent even in 1998 that in the fullness of time that the NSW Government’s Bulk Water Pricing Policy was and now is going to have severe socio economic impacts.
- Irrigated areas of cutting Lucerne too large.
- Volume of water used per season too low.
- Usage charge ONLY was factored into the gross margins
- The hypothetical representative farms production and costing is related to the actual DLWC recorded water use in 1997/98, which was an average season but with unusual rainfall patterns in that of five cuts it would have been likely that only three cuts would have been watered – There is significant room for error when hypothetical not actual farms are correlated with actual water usage.
- Cross checking with the Hay maker project on water use can be used as a guide only as the acres of cutting Lucerne monitored in the Haymaker project were only relatively small sections of the actual farm acreage sown to irrigated Lucerne. Because of the likely variation in irrigated area of the farm, the yield obtained and the impact of water pricing – the effective price of water should have been used to calculate the “gross margins per ha” to reduce this error effect.
- Despite all of these deficiencies, the report demonstrates a reduction in Net farm income of 11% ranging to 27% and a reduction in operating returns of 16% to 109% across the four representative farms.
- “Major viability” has been reassessed by the Ag Dept and defined as sending the irrigator broke. This was also not spelt out in the report.

- IPART and DLWC have selectively quoted from this document in a manner, which can only be described as mischievous and lacking integrity. As I explained at the Sydney CSC meeting of 9/4/01, the DLWC submission is dishonest.

Each of the above points are important and can be expanded if necessary but for the purpose of this exercise only Irrigated area and Water Usage will be further detailed as the accuracy of these two factors have a major impact on the accuracy of the economic analysis.

1. Irrigated Area

The Peel Valley Water Users Association contends that the area's listed "as irrigated" for the hypothetical farms are unrepresentative. They are too large relative to entitlement. They are too large relative to the actual areas of irrigation in the Peel and the whole irrigated area is according to the NSW Ag study sown to Lucerne.

Most farms in the Peel have an irrigation area something less than half of their entitlement divided by 6ML/Ha. (Area to volume conversion rate for the Peel regulated system) because of the Peels low reliability of access to entitlement.

| Node | Base Allocation | Peel Valleys Theoretic Irrigated Area $\frac{1}{2}$ Base Allocation. 6 | NSW Ag Irrigated Area Ha |
|------|-----------------|--|--------------------------|
| 20 | 253 | 21 | 37 |
| 21 | 126 | 10.6 | 24 |
| 22 | 314 | 26 | 34 |
| 23 | 417 | 35 | 50 |

The areas of irrigated area in node 21 could be a little greater than that listed above, (10.5) as the water licence is quite small but it is inconceivable that the zone which appears to have an average licence of 126ML has 24 Ha of irrigated area i.e. it appears that all farms in the zone are developed beyond their Licence entitlement at 6 ML/Ha.

At the General meeting of the Peel Irrigation Council held on Tuesday the 1st May to discuss the current DLWC pricing submission in the presence of Robert Marsh representing the DLWC Pricing unit.

There were 41 Lucerne haymakers out of a total attendance of 90

| <u>No & % of Lucerne Haymakers</u> | <u>Area of Cutting Lucerne</u> |
|--|--------------------------------|
| 3 or 7% cut | >40 Ha (100ac) |
| 5 or 12% cut | 28-40Ha (70ac-100ac) |
| 9 or 22% cut | 20-28Ha (50ac - 70ac) |
| 24 or 59% cut | <20 Ha |

Compare these results with NSW Agriculture's report

| <u>Area of Cutting Lucerne</u> | <u>Survey Results</u> | <u>NSW Ag Representative Farm</u> |
|--------------------------------|-----------------------|-----------------------------------|
| >40 | 7% | 25% |
| 28-40 | 12% | 50% |
| 20-28 | 22% | 25% |
| <24 | 59% | NIL |

i.e. the areas listed as irrigated for the representative farms are NOT representative of the 41 haymakers present at the meeting.

The area listed as "*irrigated*" by the "representative farms" is translated in the report into 100% cutting Lucerne in the financial analysis. This translation is NOT justified as an irrigator who is a dedicated Lucerne grower (one whose major enterprise is Lucerne) would have no more than 75% of the irrigated area sown to Lucerne.

Why? – (a) because good agronomic practice for disease control requires a break crop and fallow

(b) Lucerne fixes nitrogen in the soil and economics dictate that a crop, which uses Nitrogen, should be grown to maximise the economic benefit of growing Lucerne.

(c) Whilst Lucerne can be grown back to back research in the 70's early 80's in the USA identified water soluble toxins, found mainly in the leaf of the Lucerne plant, that inhibit germination and establishment of seeding Lucerne. This term is called **allelopathy**. It was identified as an additional factor in the failure of Lucerne sown back into old Lucerne country. Many farmers describe it as Lucerne sick soil.

All of these factors add up to support the Peel Valley Water Users Associations claim that the NSW Ag's reports areas sown to irrigated Lucerne are too large and therefore the representative farm gross incomes are far too high.

2. Water Usage.

The water usage tabled in NSW Ag's report of 2.7ML per Ha for two of the representative farms is far too low and the usage of 3.7ML/Ha for the other two farms is on the low side but could be applicable depending on the season and rainfall pattern if the number of cuts was restricted to five. Many Lucerne growers especially those with higher annual yields make 6 – 7 cuts and therefore would require additional water.

To support the Peel Valley Water Users claim that the water use figures are too low the following information is offered.

- (i) A survey of irrigators in the Peel Valley demonstrated that most Lucerne growers used 1.0 – 1.3 ML per Ha per cut. It was recognised that on occasions depending on the rainfall pattern some cuts required little or no irrigation water.
- (ii) North West Magazine, April 9, 2001 "Lucerne grower benefits in being water wise." Tamworth Lucerne grower Bryce Wythes has made this provisional comparison for this season to date

Hand shift uses 1.25ML/Ha per cut and produces 2.92T/ML
 Travelling Irrigator uses 1.0ML/Ha per cut and produces 2.8T/ML
 Sub surface uses 0.93ML/Ha per cut and produces 3.93T/ML

- (iii) Lucerne in Farming Enterprises March 2001 (Publication by NSW Agriculture, Queensland Dept. of Primary Industries and CRC for Tropical Plant Protection)
 Irrigated Hay Making – Inglewood /Texas by Phillip Burrill DPI Warwick.

“Most producers grow from 16-40 Ha, with several up to 60 ha plus. Yields average 20T/Ha/year with 6-7 cuts / year. Irrigation Water Usage on Lucerne is approximately 10ML / Ha / Year with side roll or centre pivot irrigation equipment being the main systems in use.

- (iv) **Sharing the Water Resources on Unregulated Rivers** _ Dept of Land and Water Conservation 2000
 Draft Conversion Rates – Climate Zone 3 – Tamworth – Narrabri

| | Theoretical Average Irrigation Water Requirements | Return Cards 20 th percentile | Metered Usage Regulated System | Namoi Water User Survey | Draft Conversion Rate |
|--------------------|---|--|--------------------------------|-------------------------|-----------------------|
| Lucerne ML/Ha/Year | 11.0 | 5.0 | 4.5 to 6.0 | 5.0 – 7.0 | 6.5 |

The draft conversion rate of 6.5ML/Ha was agreed to by the Namoi Unregulated River Management Committee in its deliberations on the area to volume conversion in the unregulated system of the Namoi-Peel system. The 6.5 ML/Ha conversion for Lucerne producers was supported by consensus of the committee which included as members the **Dept of Land & Water** – who in the past have grossly over allocated the water resources of the Regulated and Ground Water systems and were NOT about to over allocate the Unregulated system by allowing excessive crop water conversion rates.

The **Environment Protection Authority**, which along with the other agencies is charged with the responsibility of ensuring that the NSW Government Water Quality and River flow objectives are met.

The **Nature Conservation Council** whose interest as IPART is fully aware is the provision for as much water as possible being used for environmental purposes.

All of the above points support the view of the Peel Valley Water Users Association that the water use figures used by NSW Agriculture are too low and therefore the financial impacts of full cost recovery in their economic assessment are significantly under estimated.

In closing IPART would be aware that the Peel Valley Water Users association has given the NSW Agriculture considerable encouragement over the past 9 months or so to re-assess the criteria that they have used. Following a meeting on Thursday 4th May 2001 with representatives of NSW Agriculture and the PVWUA, the Dept. agreed to re-assess the “irrigated areas” of the representative farms. The faxed results of the NSW Agriculture re-assessment are shown in the attachment (Jason Crean) which concludes on page 3.

"The conclusion of this work is that the original estimated irrigated areas used in the study for Nodes 20 and 21 closely reflect actual areas. The areas used for Nodes 22 and 23 over estimate actual areas by 40 and 21 per cent, respectively. These findings be treated with caution as further ground truthing of the data is desirable. This would help confirm the proportion of lucerne grown on the irrigable area, the presence and types of other crops and the water source. This could probably only be obtained either through on-farm visits or telephone contact but may involve significant time in doing so.

On the basis of previous work, a reduction in the areas of lucerne in Nodes 22 and 23 (presuming that the over estimated proportion is not generally being used by other profitable crops) would lower overall net farm income. Consequently, under a base case situation, irrigation farms in these nodes of the Peel would appear more marginal to start with. This would make them more vulnerable to any significant change in production costs (like an increase in water prices) or a fall in income (like a drop in commodity prices). The impact of proposed price increases would be more significant in these circumstances."

It is clear from all of the above that the assertion of the Peel Valley Water Users Association that NSW Agriculture's "Economic Assessment of Water Charges in the Peel Valley" in its current form is not worth the paper that it is written on is the correct assessment of this report.

However, the Peel Valley Water Users Association considers that with more work, this report can be made a useful benchmark tool and consider that IPART should direct that the works be completed to the satisfaction of the Namoi - Peel Customer Service Committee.

The Peel Valley Water Users Association request that **IPART suspend the current bulk water price hearings** as the quality of information contained in NSW Agriculture "Economic Assessment of Water Charges in the Peel Valley" does not allow the DLWC to make any reasonable **Impact Assessment** of their bulk water pricing submission as required by the IPART process.

Thankyou, for allowing us once again, to participate in the IPART process. Should you have any concerns with this assessment please do not hesitate to contact the undersigned on 02 6760 7152.

Yours faithfully



Laurie Pengelly
Representing the Peel valley Water Users Association

APPENDIX 2

PEEL VALLEY WATER USERS ASSOCIATION INC.

Rosebank Wallamore Road TAMWORTH NSW 2340 Ph/Fax 02 67607152

REPORT

PEEL VALLEY IRRIGATION WATER REQUIREMENTS AS A FUNCTION OF RAINFALL

SYNOPSIS

This investigation of the Peel Valleys irrigation water usage was conducted to assist the Independent Pricing and Regulatory Tribunal's (IPART) deliberation into water pricing in the Peel Valley and to help refine the Department of Land and Water Conservations, Integrated Quality and Quantity Model (IQQM) for the Peel Valley.

The analysis of on farm water usage under intensive irrigation in the Peel Valley demonstrated a strong linear relationship between irrigation water usage and rainfall. The consumption of water per Ha varied from 2ML per ha in the wet years (850mm) up to 8ML per ha in drought (400mm) averaging around 4.5ML per ha in average rainfall years. Unfortunately average rainfall conditions don't occur all that often with the climate varying considerably from drought to flood and back again over a ten year period.

The raw data with respect to water use and in particular area irrigated used to calibrate the IQQM contains inaccuracies, which result in the information generated from the model with respect to these two variables being highly inaccurate. This data in the IQQM shows virtually no correlation with rainfall whereas in practice water use in the Peel Valley in terms of ML per Ha has a very strong relationship with rainfall. When it rains we don't irrigate and when it doesn't rain the pumps work over time. Note. There is no effective on farm storage in the Peel Valley to cause an aberration in this relationship.

INTRODUCTION

During the last round of the IPART process, NSW Agriculture was commissioned to do an "economic assessment of water charges in the Peel Valley". This assessment was critiqued by the Peel Valley Water Users Association in its submission to the IPART process in 2000. One of the main concerns, but not the only one was the irrigation water usage, which was used in the report to assess the economic impact of proposed changes to bulk water prices in the Peel Valley. The gut feeling of most irrigators was that as a ball part figure they used about a ML per Ha per cut or about 5ML per season. It was recognised though that some cuts and some seasons required less irrigation due to rainfall but in drought more water was required.

During 2001/2002 the Dept. of Land and Water Conservation started the public consultation process on the Peel Valleys IQQM model and the sub committee was formed to progress this issue. The committee did not progress as the Dept. modellers time was largely being consumed by the water sharing plans of the major regulated river systems. Limited data was available but the Peel Valley Water Users were concerned by again relatively low irrigation water usage from 2.5 to 4.5 ML per ha coupled with extremely large swings in the area under irrigation ranging from as low as 850 ha in high rainfall years to over 3000 ha in the dry years. This wide range in area under irrigation did not seem valid given that most of the irrigation farms in the Peel Valley require considerable infrastructure to be in place (pump stations and underground mains) to apply water to the irrigation farms. It is recognised that in drought years a small percentage of farmers will drag their pumps out of the shed and increase their irrigation in dry years conversely others who use a fair percentage of their entitlement year in year out would reduce their area under irrigation due to reduced allocations and higher levels of evapotranspiration. It was felt that the area under irrigation would remain fairly constant, and that the apparent increase in area under irrigation was due to the card system, which was used to record water usage and crop areas irrigated.

In order to clarify and quantify these issues the Peel Valley Water Users Association asked its members for accurate records of irrigation water usage, on-farm rainfall and area irrigated. Surprisingly, very few irrigators had kept records of these three variables over any reasonable length of time. Whilst many irrigators could tell you what they used last week or last year, few had detailed records of these three variables over any reasonable length of time. Fortunately one set of data was available extending over the seasons 91/92 to 99/00. Daily water use, rainfall, area irrigated was available for a 55 ha irrigation block on the property "Rosebank" 10 Kms downstream from Tamworth City in section 2 of the Peel River. It turns out by coincidence that "Rosebank" is situated relatively close to Tamworth City's weather station (about 4 kms) and is about midway down the Peel system which flows roughly in a north-westerly direction from Nundle to Carrol Gap with rainfall decreasing as the river goes further west. The annual median rainfall above Chaffey Dam is around 900mm decreasing to 580mm at the confluence with the Namoi. January is the wettest month of the year with May the driest.

Rosebank has been laser levelled and set up in 30 metre wide bays for border check surface irrigation with tail water return systems whereas the majority of the irrigators in the Peel Valley use some form of spray system with hand shift spray lines being the most commonly used method of irrigation.

It was recognised that because of the limited data available from one property and the different method of irrigation, that the results obtained from this property need to be assessed, to ensure that the results obtained are valid for the entire Peel Valley. To access the suitability of this data, regression analysis was employed to compare the on-farm data, with the overall general bulk water use of the Peel Valley, as a function of rainfall.

RESULTS

The data used in the regression analysis is summarised in the table below

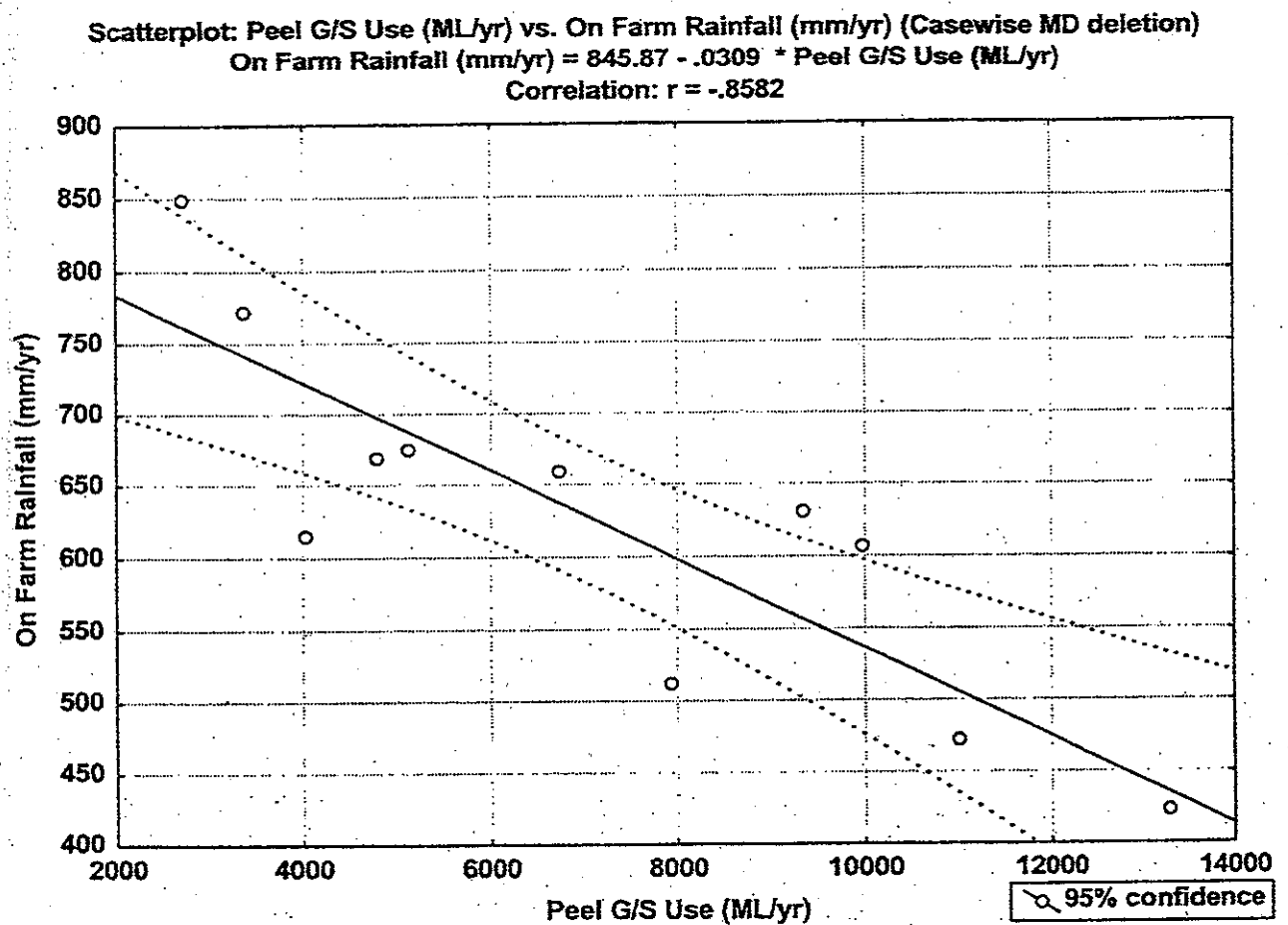
| | Farm Water Use (ML/ha) | On Farm Rainfall (mm/yr) | Peel G/S Use ML/yr |
|---------|---------------------------|-----------------------------|-----------------------|
| 1991/92 | 7.8 | 512 | 7930 |
| 1992/93 | 4.8 | 607 | 9973 |
| 1993/94 | 5.1 | 631 | 9348 |
| 1994/95 | 7.1 | 423 | 13272 |
| 1995/96 | 3.7 | 615 | 4025 |
| 1996/97 | 2.5 | 772 | 3368 |
| 1997/98 | 3.7 | 659 | 6738 |
| 1998/99 | 1.7 | 849 | 2720 |
| 1999/00 | 3.0 | 669 | 4789 |
| 2000/01 | 5.2 | 675 | 5120 |
| 2001/02 | 7.2 | 472 | 11000 |

As chance would have it, the period 1991/92 to 2001/02 is reasonably representative of the climate range that occurs in the Tamworth district. There were the drought years of 1994/95, the high rainfall years of 1996/97 and 1998/99 coupled with the floods of the winter of 1998 and again in November 2000. The average on farm rainfall for the period was 625mm, which compares reasonably well to the long-term average of Tamworth of 673mm. A detailed analysis of the rainfall patterns of Tamworth district can be provided by the CD-ROM weather forecasting package Rainman. (QLD Dept. of Primary Industries, 1999).

ON FARM RAINFALL versus PEEL VALLEY GENERAL SECURITY WATER USE

A scatter plot of the regression analysis showing the 95% confidence limit of the on farm rainfall at Rosebank compared with the overall general security water use is shown in figure 1.

Fig 1

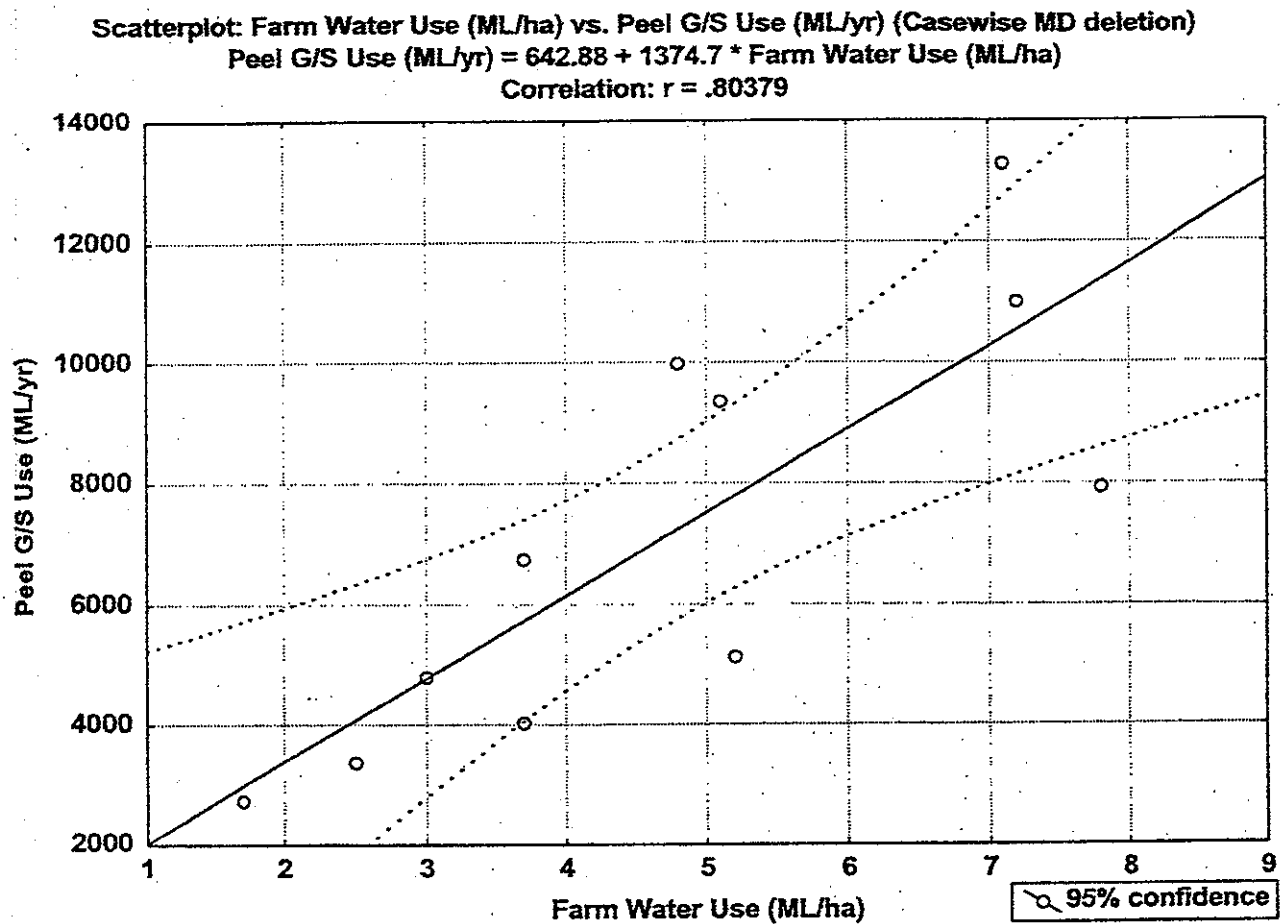


As can be seen there is a strong linear relationship between the on farm rainfall and general security water use with a high correlation coefficient of $r = .8582$ and $p = .001$ (marked correlations are significant at p less than .0500) These results clearly indicate that the rainfall patterns at Rosebank are characteristic of the rainfall patterns of the Peel Valley with general security water use increasing as rainfall decreases.

ON FARM WATER USE versus GENERAL SECURITY WATER USE

A scatter plot of the regression analysis showing the 95% confidence limit of the on farm water use compared with over all general security water use is shown in figure 2.

Fig 2



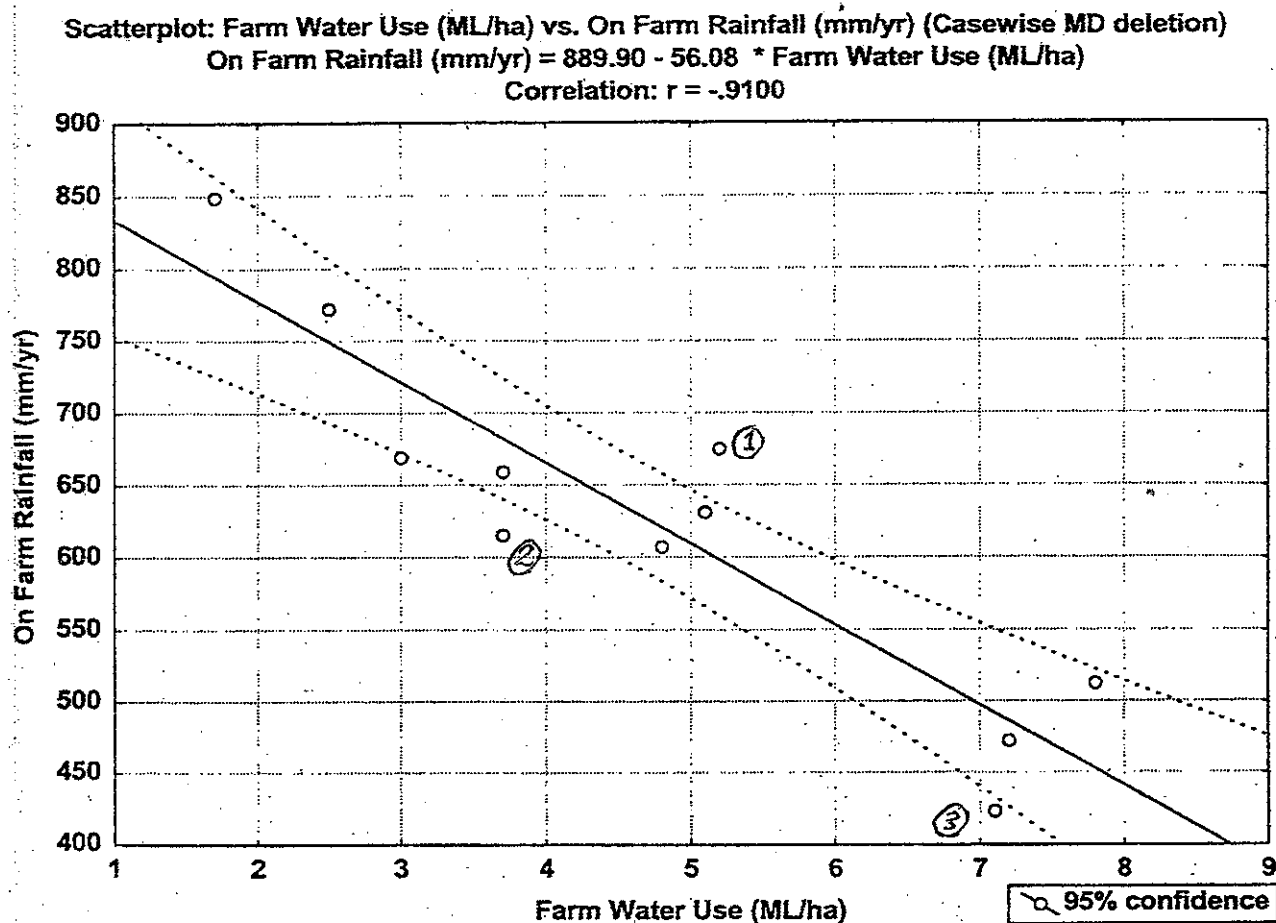
Again there is a strong linear relationship between on farm water use (ML per ha) and general security water use. The correlation coefficient is again reasonably high with $r = .8038$ and $p = .003$. Again these results indicate that the on farm water use on Rosebank gives a good representation of water use in the valley as a whole with general security water use increasing lineally as water use per ha on Rosebank increases.

From examination of the data in fig 1 & 2, it is reasonable to say that the rainfall and water use data from Rosebank can be used to access the impact of rainfall (or lack of it) on the water use per ha of irrigation farming practices of the Peel Valley.

ON FARM WATER USE verses ON FARM RAINFALL

A scatter plot of the regression analysis showing the 95% confidence limit of the on farm water use compared with on farm rainfall is shown in figure 3.

Fig 3



This graph clearly indicates a strong linear relationship between on farm rainfall to on farm water use. Correlation coefficient being quite high at .91 with $p < .001$. As expected irrigation usage in terms of ML per ha increases linearly as rainfall decreases. Roughly for each 100mm reduction of rainfall irrigation usage increases by 1.5ML per ha. This is a reasonable result as it would be expected that as rainfall decreases evapotranspiration rates would increase, coupled with irrigation inefficiencies would mean that more irrigation water would be required to be applied to compensate for the reduced water applied by rainfall.

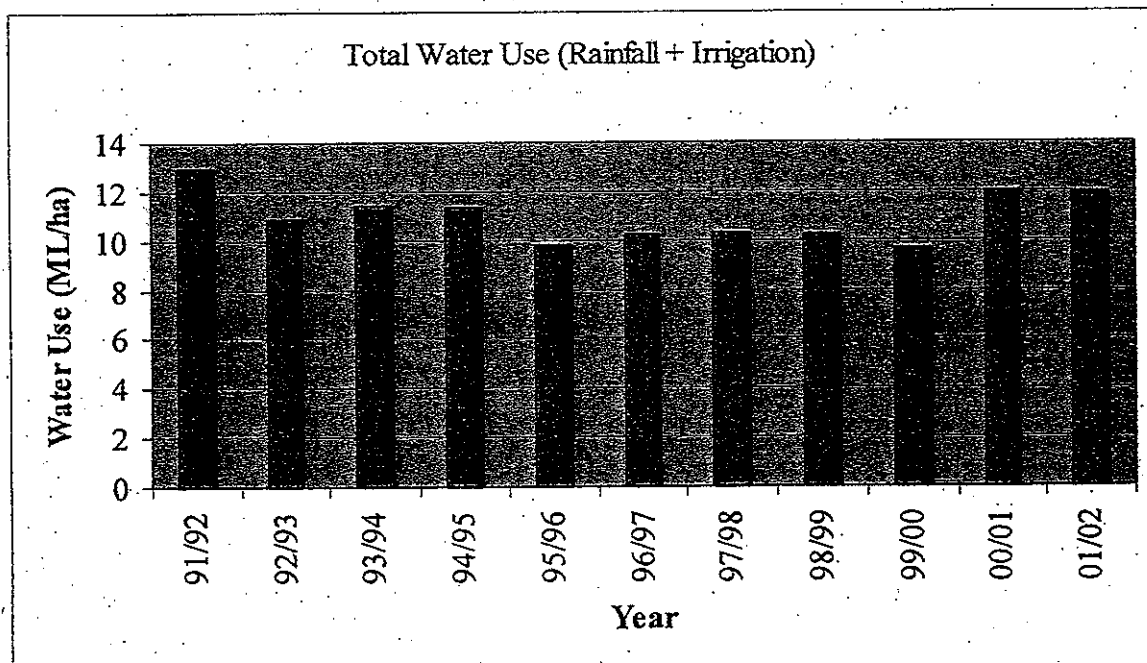
It is interesting to note that 3 points of the scatter plot fall just outside the 95% confidence level. The explanation for these anomalies are as follows:

- (1) Irrigation took place in the first week of March, 75mm of rain fell in the last half of March compared to the long term rainfall for March at 49mm therefore resulting in the high water usage relative to rainfall.
- (2) There was no access to irrigation water until December of that year resulting in low irrigation usage relative to rainfall for that year.
- (3) Water allocation for that year was 50% and has again resulted in low irrigation usage relative to rainfall but because of Rosebank's fairly large entitlement relative to area irrigated, this anomaly was not as large as it may have been.

TOTAL WATER SUPPLY ML per HA

This analysis was contributed by Dr Peter Hayman. (co-ordinator climate applications NSW Agriculture). The relationship between water use and irrigation is partly due to the higher evaporation in drier years, but mostly due to the fact that irrigation and rainfall are two sources of water supply. This shown in fig 4

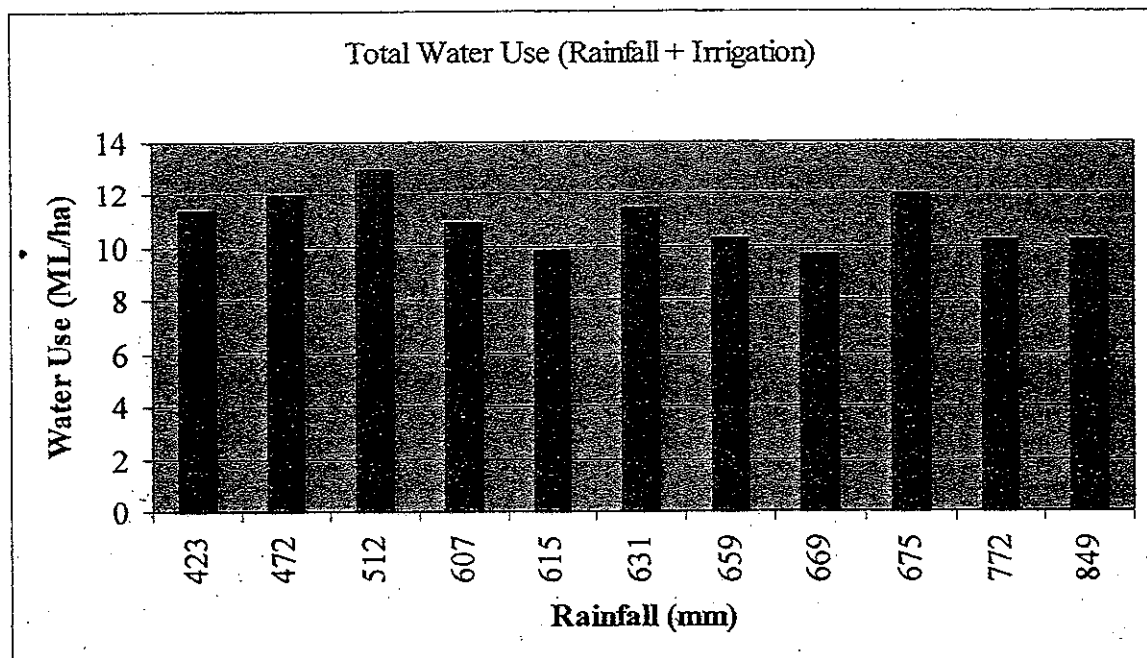
Fig 4



In this figure rainfall has been converted to ML per Ha (100mm = 1ML per Ha). The total water supply has ranged from just under 10 to just over 13ML per Ha. Irrigation is dominant in some years and rainfall in others.

It is interesting to rearrange the data in Fig 4 so that the total water supply in ML per Ha is shown in order of increasing rainfall as shown in fig 5.

Fig 5



This figure shows that in the average to high rainfall years total water use is around the 10 to 11 ML per Ha mark with irrigation usage in the drier years boosting total water usage to around the 12 to 13 ML per Ha mark.

NAMOI REGULATED RIVER MANAGEMENT COMMITTEE

This information was presented to the Namoi Regulated River Management Committee at meeting NO 23 held on 20th June 2002. It was presented to try to show the difficulty that the modellers developing the IQQM for the Peel and for that matter, for any other river model had in getting accurate water use data to put into their model. The Namoi Regulated River Management Committee had expressed concerns with the modelling and the data it generated. These concerns persisted right throughout the entire process for the development of the Namoi Water Sharing Plan. One is reminded of Justice Young in *Lawrence V Kempsey Shire Council BC9504607*

"One must be very careful with computer predictions. Usually they are the result of someone making assumptions and assessments of various vital factors and feeding these factors into the computer. Unless those assumptions and assessments are proved by evidence (or are conceded to be valid) the mere fact that a computer produced a prediction is of no evidentiary value whatsoever. It is clear law that an expert witnesses

evidence on matters of fact is in the same position as factual evidence of any other witness... That problem cannot be overcome merely by feeding into a computer and treating as evidence what the machine produces... Unless there is some factual evidence or satisfactory expert opinion evidence to support that sort of assumption, the result obtained from the computer has no evidential value."

WATER USAGE – ANECDOTAL DATA

- (i) A survey of irrigators in the Peel Valley (May 2001) demonstrated that most Lucerne growers used 1.0 – 1.3 ML per Ha per cut. It was recognised that on occasions depending on the rainfall pattern some cuts required little or no irrigation water.

- (ii) North West Magazine, April 9, 2001 "Lucerne grower benefits in being water wise." Tamworth Lucerne grower Bryce Wythes has made this provisional comparison for this season to date.

| | | |
|----------------------|------|---|
| Hand shift | uses | 1.25ML/Ha per cut and produces 2.92T/ML |
| Travelling Irrigator | uses | 1.0ML/Ha per cut and produces 2.8T/ML |
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Irrigated Hay Making – Inglewood / Texas by Phillip Burrill DPI Warwick.

"Most producers grow from 16-40 Ha, with several up to 60Ha plus. Yields average 20T/Ha /year with 6-7 cuts / year. Irrigation Water Usage on Lucerne is approximately 10ML / Ha / Year with side roll or centre pivot irrigation equipment being the main systems in use.

- (iv) Irrigation Australia 1991 Vol 6 No 2 – Haymaker – Irrigated Lucerne. Actual water use averaged 11 megalitres per hectare over the region, coming from 6 megalitres from irrigation, 3.5 from effective rainfall and 1.5 from the soil store. Deane Zimmerman, NSW Agriculture, Tamworth.

- (v) Sharing the Water Resources on Unregulated Rivers – Dept. of Land and Water conservation 2000
Draft Conversion Rates – Climate Zone 3 – Tamworth – Narrabri

| | Theoretical Average Irrigation Water Requirements | Return Cards 20 th percentile | Metered Usage Regulated System | Namoi Water User Survey | Draft Conversion Rate |
|--------------------|---|--|--------------------------------|-------------------------|-----------------------|
| Lucerne ML/Ha/Year | 11.0 | 5.0 | 4.5 to 6.0 | 5.0 – 7.0 | 6.5 |

The draft conversion rate of 6.5ML/Ha was agreed to by the Namoi Unregulated River Management Committee in its deliberations on the area to volume conversion in the unregulated system of the Namoi-Peel system. The 6.5 ML/Ha conversion for Lucerne producers was supported by consensus of the committee which included as members the

Dept. of Land and Conservation, NSW Agriculture, NSW Fisheries, Environmental Protection Authority, Nature Conservation Council, Regional Development, Local Government and community representatives.

AREA UNDER IRRIGATION

Peel Valley irrigation return cards for ordered water detail pumping requirements, type of crop to be watered and area of crop but do not enable the total area under irrigation to be determined. e.g. analysis of the card doesn't enable the analyst to decide if the area under irrigation has been partly watered, watered fully once twice or more. The cards are currently picked up on a monthly basis, but in years gone by were picked up quarterly and often irregularly, thereby making a determination of the area irrigated on any one farm even more difficult let alone determining the total area under irrigation in the Peel Valley with any degree of accuracy. A typical card layout is shown below with details of water ordered for both a wet and dry season.

Order card – eg Wet Year Pumping Details

| Starting Date | Finishing Date | Meter Reading | ML/day | Type of Crop(s) or Pasture to be watered | Area of each Crop or Pasture in Hectares |
|---------------------|----------------------|---------------|--------|--|--|
| 1 st Jan | | 950 | | | |
| | | | 0.5 | Lucerne | 25 |
| | 26 th Feb | 980 | | Pasture | 10 |
| | | | | | |

Order card – eg Drought Year Pumping Details

| Starting Date | Finishing Date | Meter Reading | ML/day | Type of Crop(s) or Pasture to be watered | Area of each Crop or Pasture in Hectares |
|---------------------|----------------------|---------------|--------|--|--|
| 1 st Jan | | 950 | | | |
| | | | | Lucerne | 100 |
| | 26 th Feb | 1050 | 2.0 | Pasture | 20 |
| | | | | | |

From this data what is the area that you would think is being irrigated from the information on these cards? The correct answer is 55Ha. Did you get it right? (In the wet year during the card pick up period it rained and the full irrigation area was not completely watered. In the drought year the area had been watered twice and had commenced the third watering during the card pick up period. Note several cards would be written out during the irrigation season to further complicate an assessment of the area under irrigation. (There are numerous versions and interpretations of how these cards could be filled in)

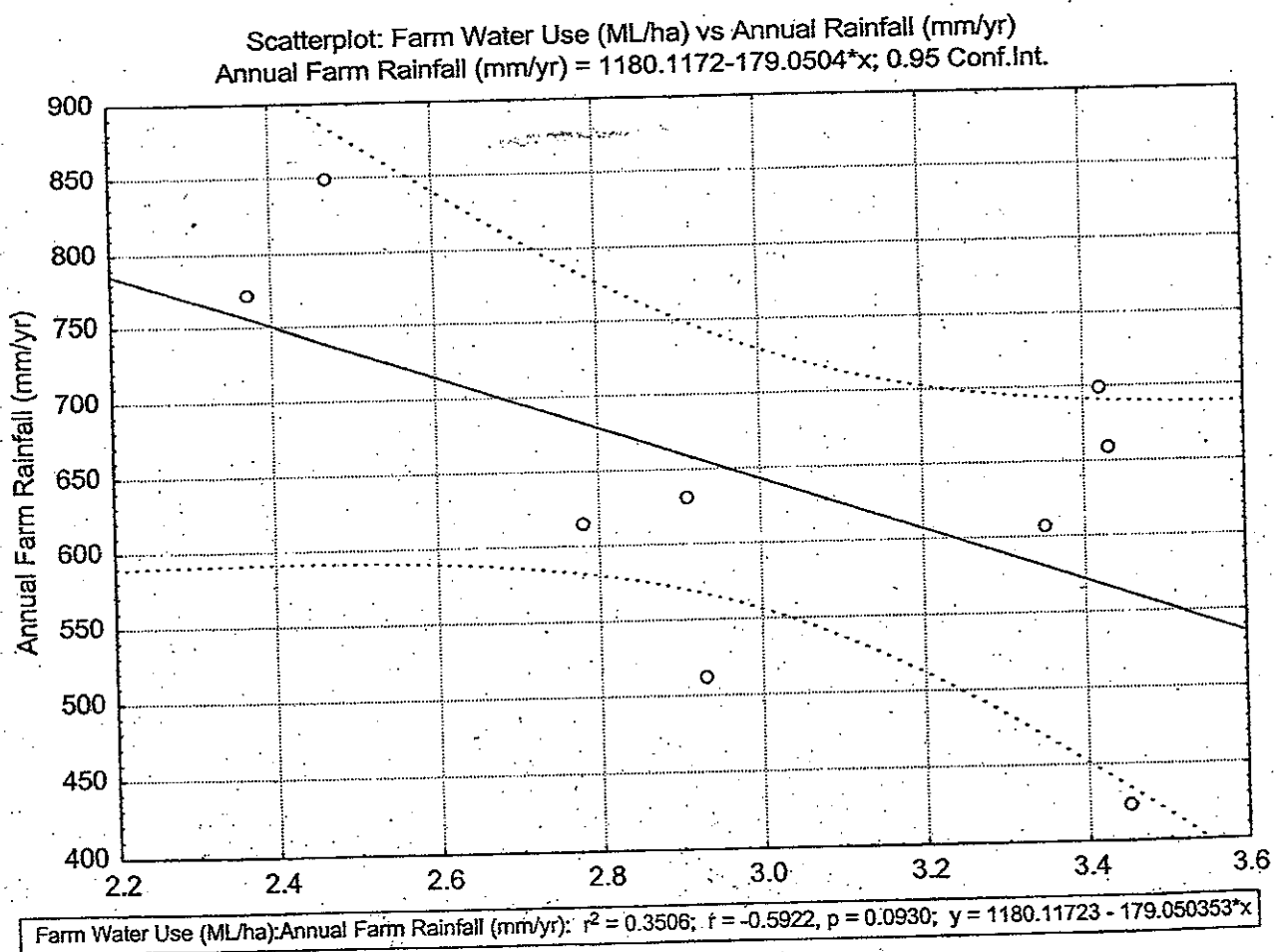
To try to use the Peel Valley's historic water use and area data as the basic input for the Peel Valleys IQQM means that the output of the IQQM has a high degree of inaccuracy and as such should only be used as a guide only or a rough rule of thumb. To use the Peel's IQQM for Cap management purposes such as those detailed in the State Water

Operations Management Plan (SWOMP) where irrigation usage is to be adjusted if the IQQM model predicts the 3% variation long term average trend is highly questionable as the input data in terms of water use and area under irrigation is at least one order of magnitude less accurate than the SWOMP criteria. To use the Peels IQQM in its current state of development for any other purposes is also highly questionable.

To further examine the reliability of the data in the IQQM for the Peel with respect to water use as a function of area irrigated, a regression analysis was carried out on the IQQM's recorded water use in ML per Ha as a function of rainfall. The data used in this regression analysis is summarised in the table below

| Water Year | On farm Rainfall Mm | Peel General Security Use ML Ex IQQM | Estimated area irrigated Ha Ex IQQM | Water Use ML/Ha Ex IQQM |
|------------|---------------------|--------------------------------------|-------------------------------------|-------------------------|
| 1991/92 | 512 | 8291 | 2830 | 2.9 |
| 1992/93 | 607 | 10069 | 3003 | 3.4 |
| 1993/94 | 631 | 9451 | 3245 | 2.9 |
| 1994/95 | 423 | 12985 | 3762 | 3.5 |
| 1995/96 | 615 | 4026 | 1466 | 2.7 |
| 1996/97 | 772 | 3367 | 1421 | 2.4 |
| 1997/98 | 659 | 7575 | 2066 | 3.4 |
| 1998/99 | 849 | 2815 | 1140 | 2.5 |
| 1999/00 | 669 | 5111 | 1496 | 3.4 |

Graphical representation of the regression analysis is shown in Figure 6



As can be seen from this figure the results are widely scattered. The 95% confidence limit is extremely wide. The correlation coefficient is low with $r = .59$ and $p = .0930$ (correlations are significant at $p < .0500$) **This means that the data used in the Peel IQQM model demonstrates a very poor correlation between rainfall and water use per hectare. This is exactly opposite to real life in the Peel Valley where there is a strong relationship between water use and rainfall as clearly demonstrated in Fig 1 & Fig 3.**

A summary of these regression analyses is summarised in the table below

| Regression run | r | r ² | p | Significance of Correlation |
|---|-----|----------------|-------|-----------------------------|
| Rainfall v on farm Water use Fig 3 | .91 | .83 | <.001 | Very high |
| Rainfall v Peel Valley General Security water use Fig 1 | .86 | .74 | .001 | High |
| Rainfall v IQQM water use Fig 6 | .59 | .35 | .093 | Very low |

The only conclusion that can be drawn from this is that the area irrigated data in the IQQM is inaccurate and that the results generated from the Peel IQQM can at the best be used as a rough guide only and are certainly not suitable for monitoring Cap compliance and should not be used for any purpose where a degree of accuracy is required. Accurate irrigated area data is historically not available and the ordered water card system is totally unsuitable for accessing this data.

IQQM CALIBRATION

The Peel model is run simulating conditions over the last 100 years or so. It looks at long term climatic conditions predicting inflows to Chaffey Dam, which was constructed in 1978 with irrigation water needs over the century calibrated on past practices. Reasonably reliable data on past practices is only available since the mid to late 1980's though the data recorded for this period is by no means accurate and was not collected for the purpose of IQQM type calibrations.

Errors in for example water use data are cumulative by the time the water use of all of the irrigators is totalled for the irrigation season. Similarly errors in the area irrigated are also cumulative, however when water use data is combined with area data to determine the water use in ML per Ha the error has a multiplier effect. The extent of this multiplier effect is not known but is significant. To demonstrate this impact the following basic example is put forward.

Raw material – Primary processing – yield – 82%
 Secondary processing – yield – 87%
 Tertiary processing – yield – 90%

Final yield from raw material to finished product = $.82 \times .87 \times .9 = 64\%$

That is the yield loss of each stage of processing looks reasonably good, but the final yield is quite low at 64%. **The same principle applies to errors in data put into complex modelling.**

This impact is clearly demonstrated previously in this report by the fact that accurate on farm data for water use and area irrigated had a statically strong correlation between water use and rainfall but the IQQM's less accurate data for these two variables resulted in a correlation between water use and rainfall which was not statistically significant.

Note. Aberrations in the data such as water use constrained years - eg 95/96 also add to the difficulty that the modellers have in gathering meaningful data to calibrate the IQQM which is further compounded by the fact that water use data is only available with any degree of reliability for the last 15 years or so - ie about 12% of the model run. The remaining 88% of the models water use data is extrapolated from this relatively inaccurate and limited data base.

CONCLUSION

Independent Pricing and Regulatory Tribunal (IPART)

In terms of water pricing it is quite clear from this analysis that irrigation water use in the Peel Valley varies considerably depending on rainfall or more correctly the lack of it. However a reasonable ball part figure to determine the impact of water pricing would be a water usage of around 4.5ML per Ha.

Integrated Quality and Quantity Model (IQQM)

It is quite clear from the data presented above that irrigation usage increases significantly in dry years. It is quite clear that the water usage per Ha increases significantly in these dry years not the area under irrigation as indicated by analysis by the return cards. The use of the IQQM model for determining water use patterns in the Peel and in particular MDBC compliance for the Peel and for that matter any other river valley must be questioned as the historical data relating to water use and in particular area under irrigation is highly unreliable. It may be the best available but it is clearly not good enough when the livelihoods of the communities in the Murray Darling Basin and the Peel Valley in particular are at stake.

The IQQM model for the Peel is still in its formative stage. It has not been subject to scrutiny by the Namoi regulated Management Committee or any other similar community consultative committee and the fact that the data used in the model shows a very poor correlation between rainfall and water use in the Peel Valley when in practice there is a very strong correlation between these two variables which can only mean that the Peels IQQM should not be used for an analysis requiring any degree of accuracy where water usage and irrigated area is being assessed in the Peel Valley.

Laurie Pengelly 14.5.03

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