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Coleambally Irrigation Co-operative Limited

Submission to the Productivity Commission

Study into Water Use and the Environment: The Role of Market Mechanisms

January 2006

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EXECUTIVE SUMMARY

CICL wishes the Commission well in its study into the role of market mechanisms.

CICL is concerned with the viability of agriculture in the evolving water reform environment that sees Government monopolies demanding exorbitant dividends from irrigation farmers that are battling other nations' treasuries via agricultural subsidies. CICL suggests that if this is the direction Government intends to pursue, then at the very least the Government monopoly should become contestable.

CICL has been disappointed in the past by the quotation by eminent scientists and politicians of dated data that has little relevance to today's practices and outcomes. CICL has also been disappointed by the inappropriate use of performance measures to push water reform in certain directions by these same people. We look forward to the Commission's definitions of the 'economic meaning' of water use efficiency and 'more productive uses of water' and for these definitions to be more widely understood by politicians, commentators and stakeholders in water reform.

The data presented in this submission clearly demonstrates very significant improvement in key environmental indicators/externalities in our region, including water tables, water quality and water use efficiency at both the farm level and bulk water distribution level.

The data presented also demonstrates the very substantial investment by the Coleambally community in Land and Water Management Plan (LWMP) initiatives which have been developed after extensive consultation between Government agencies and the community. As of the 30th June 2005 $8.2M of Government incentive payments have been matched by $54M of community funds in delivering real on-ground works targeting long-term sustainability outcomes.

CICL is also investing heavily in cutting edge technologies and improving overall water distribution efficiency and maximizing water availability to our customers. To date CICL has invested in the order of $9M on such initiatives.

CICL is involved in a number of research projects with CSIRO, CRC's and other agencies including *Market Based Incentives for managing salinity and waterlogging in irrigation areas*. In terms of this project it was generally found that the market was too immature to be progressed at this stage. Information in relation to this has been forwarded separately.

CICL has also implemented such mechanisms as crop area offsets to manage leakage of surface water to the watertable.

1.0 BACKGROUND

Coleambally Irrigation District is located 650km southwest of Sydney in the Riverina. Coleambally was constructed for the purpose of irrigated agriculture with construction commencing in the late 1950s and the town officially being opened in 1968. The area now has a population of approximately 1200 people.

The irrigation area was constructed to make use of water diverted westward as a result of the Snowy Mountains Hydro-Electric Scheme. It covers an area of 79,000 ha of intensive irrigation, 42,000 ha irrigation/dry land farms and 297,000 ha Outfall District stations delivering water supply to 452 farms in total. Water is diverted to the area from the Murrumbidgee River at Gogelderie Weir. Coleambally Irrigation has a bulk licence of 621,516 ML of surface water and 8,080 ML of groundwater entitlement, which is used for the irrigation area.

Drainage water flows via Yanco and Billabong Creeks before entering the Murray River. Much of the drainage water is reused downstream of Coleambally by Outfall District properties.

Irrigation water is used for crops such as rice, wheat, barley, oats, canola, soybeans, maize, sunflowers, lucerne, grapes, prunes and pastures for sheep and cattle.

The location of the Coleambally township and Coleambally Irrigation Co-operative Limited's (CICL) administrative regions are shown in Figures 1.1 and 1.2.

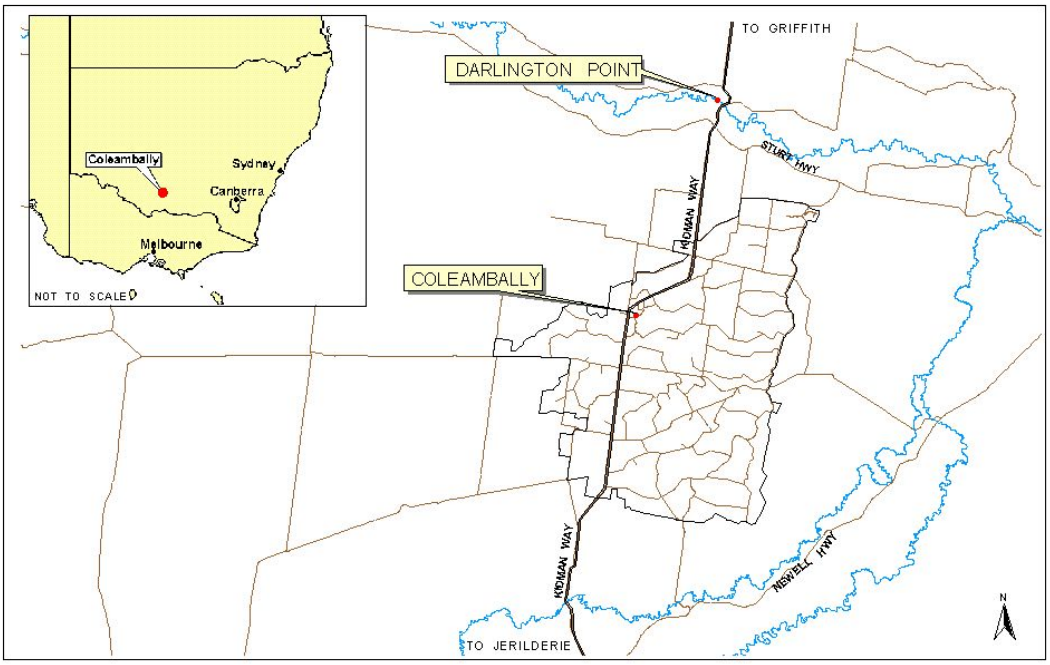


Figure 1.1 Location of Coleambally township

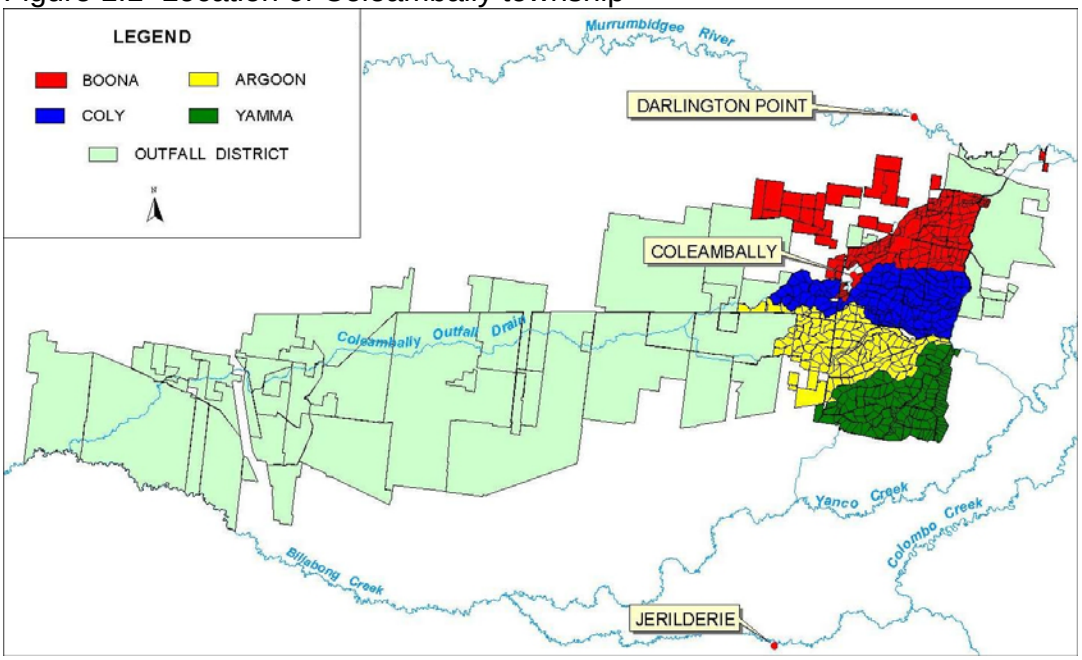


Figure 1.2 CICL operational area showing regions

CICL is required to distribute water to its customers within its operational area in a sustainable manner. The environmental and economic sustainability of the area is to be achieved through the implementation of Land and Water Management Plans. These Plans are specific to the three Irrigation Areas that comprise the Coleambally Irrigation District, i.e. Coleambally Irrigation Area, Outfall District and Kerarbury.

1.1 Privatisation

The National Competition Council's – National Competition Payments – Third Tranche Assessment Framework states in relation to irrigation scheme management that (P 8.12).

> "*Jurisdictions endorsed the principle that constituents be given a greater degree of responsibility for the management of irrigation areas citing, as example, the potential devolution of operational responsibility subject to the establishment of an appropriate regulatory framework.*
>
> *In conducting the third tranche assessment, the Council will look for all impediments to devolution to have been removed and local management arrangements identified in the second tranche assessment to have been implemented……..*"

In terms of NSW, the Irrigation Areas were privatised. The Coleambally community has taken what has been effectively rundown State owned irrigation assets and is systematically refurbishing these assets in line with our expectations of achieving long-term sustainability, without leaving a legacy cost for future generations.

1.2 Impact of Past Legislation

For your information I have shown below an extract of NSW Government Gazette No.31 dated 5 April, 1963 that relates to 'large area' Coleambally farms (average size 220ha):

> *The lands within each holding shall not be used to plant an area of fruit trees or vines in excess of 1 acre.*

This gazettal significantly constrained more intensive irrigation developments in the Coleambally Irrigation Area, particularly in relation to Governments' current view and the mantra of increased trade seeing water move to so-called 'high value crops'. Effectively Government has tightly controlled such an outcome in relation to our Irrigation Area. My understanding is that the above Gazettal was effectively rescinded with deregulation in 1993-94. However this 'favoured status' provided to other areas allowed the critical mass of horticultural crops to develop and then spawn the value adding secondary industries in those areas. As you would appreciate, it then becomes much more difficult for industries to relocate to more efficient growing areas. As such the Coleambally area has been significantly disadvantaged by the above mentioned Government gazettal i.e. the large area farms of the Coleambally were restricted from entering a market whereby their economy of scale could provide a market advantage.

On a related matter I find it useful in looking at the relative efficiency of the various irrigation schemes; for example the ratio of land served per kilometre of supply channel. In the case of our Co-operative this is in the order of 200 hectares of land served per kilometre of delivery channel as compared to approximately 70ha/km for Goulburn Murray, 67ha/km for Rochester and 138ha/km for the Burdekin River Irrigation Area. I suspect it was for this and farm scale reasons that Government sought to make the CIA less competitive in attracting alternative crops to the District.

1.3 Cropping Data for the Coleambally Irrigation District

Table 1.1 provides a snapshot of the crops grown in CICL's operational area in 2004/05. It must be remembered that this was a year with only 41% allocation for General Security Water.

Table 1.1 Irrigated crop areas within CICL's operational area

	CIA (ha)	Kerarbury (ha)	Outfall District (ha)	Total District (ha)	Proportion of total irrigated crop area (%)
WHEAT	18450.7	983	853	20286.7	29.60%
RICE	6985	368	789	8142	11.88%
PASTURE	8870.7	1417	2577	12864.7	18.77%
BARLEY	5281.4	490	60	5831.4	8.51%
OATS	2637.6	270	265.3	3172.9	4.63%
CANOLA	2441.4	100	140	2681.4	3.91%
TRITICALE	1991.6	12	40	2043.6	2.98%
CORN	1964.5	1706	0	3670.5	5.36%
FALLOW	1891	0	44	1935	2.82%
SUMMER PASTURE	1565.9	0	2	1567.9	2.29%
SOYBEANS	1285.2	50	160	1495.2	2.18%
SORGHUM	988	0	13	1001	1.46%
WINTER PASTURE	591.6	200	0	791.6	1.16%
LUCERNE	556.5	0	60	616.5	0.90%
SUNFLOWER	295	170	0	465	0.68%
MILLET	272	75	52	399	0.58%
MAIZE	152.5	0	0	152.5	0.22%
FOREST	137	0	0	137	0.20%
FABA BEANS	98	174	0	272	0.40%
GRAPES	78	40	0	118	0.17%
LUPINS	63.7	0	0	63.7	0.09%
OTHER	61	0	0	61	0.09%
PRUNES	58	80	0	138	0.20%
OLIVES	49	0	0	49	0.07%
STOCK - DAMS	38.5	2	18	58.5	0.09%
POTATOES	28.3	0	0	28.3	0.04%
PEAS	25	0	0	25	0.04%
AZUKI BEANS	22	0	0	22	0.03%
FODDER	12	0	100	112	0.16%
ONIONS	11	0	0	11	0.02%
PUMPKINS	10.5	0	0	10.5	0.02%
CLOVER	6.5	0	170	176.5	0.26%
GREEN MANURE	3.4	0	0	3.4	0.00%
TOMATOES	3.2	110	0	113.2	0.17%
LAB LAB	3	0	0	3	0.00%
LATHURAS	3	0	0	3	0.00%
MISCELLANEOUS	3	0	0	3	0.00%
NOT DEFINED	0	0	0	0	0.00%
Total	**56934.7**	**6247**	**5343.3**	**68525**	**100**

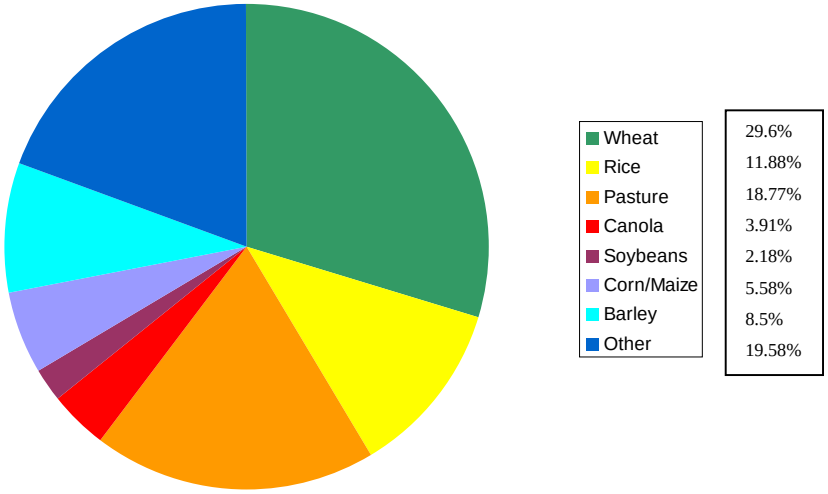


Figure 1.3 Proportions of total irrigated area sown to various crops within CICL's operational area

Table 1.2 Comparison of major land uses in CICL's operational area in the past eight years

	Rice		Soybeans		Corn		Wheat		Pastures		Canola	
	Area (ha)	Proportion of delivery (%)	Area (ha)	Proportion of delivery (%)	Area (ha)	Proportion of delivery (%)	Area (ha)	Proportion of delivery (%)	Area (ha)	Proportion of delivery (%)	Area (ha)	Proportion of delivery (%)
2004/05	8142	43.98	1495	2.24	3671	7.19	20287	18.80	12865	10.80	2681	1.27
2003/04	12597	55.8	1938	3.5	3545	5.7	21192	14.98	12131	7.5	1763	0.7
2002/03	11395	46	1788	1	4788	9.3	21346	20.4	10183	7.4	2095	1.7
2001/02	27493	67.5	3297	3.4	3808	4.2	21103	9.2	11581	6.1	2191	0.6
2000/01	30440	73.9	4551	5.9	4074	5.7	14276	4.6	11998	4.7	2153	0.4
1999/00	24138	77.7	2185	3.9	1178	3.1	12649	6.1	7485	4.4	2152	0.7
1998/99	24491	73.8	4339	5.7	1059	1.3	13963	1.7	13879	8.1	2184	1.7
1997/98	24624	70.4	4998	7.5	1678	2.4	14943	7.4	9964	6.1	2053	0.4

In comparison to 1999/00 the area of crops other than rice was 30,497 ha and has doubled in 2003/04 and 2004/05 to over 60,000ha. Whilst the area of rice crop has reduced by two thirds from 24,138ha in 1999/00 to 8,142ha in 2004/05.

You may recall recent media attention associated with an ABARE report that flagged huge increases in areas under rice. This report was further promoted by luminaries such as Professor Cullen. The fact that this report was reporting data current to 2001 appeared to be lost. The irrigation environment has undergone considerable change as a result of water reform since 2001 and the impact of 4 years of drought. This makes the 2001 data as espoused by Professor Cullen

and others dangerously misleading. Our communities expect and deserve better. I offer the following facts on rice area to demonstrate my point.

CROP YEAR	TOTAL HECTARES HARVESTED
C1993	122,902
C1994	132,656
C1995	129,235
C1996	149,719
C1997	165,701
C1998	140,190
C1999	150,826
C2000	131,843
C2001	184,470
C2002	147,268
C2003	38,356
C2004	64,735

Average hectares for the past 5 crops (C2000 - C2004) = 113,334
Average hectares for the 5 years prior to this (C1995 - C1999) = 147,134
Therefore there was a reduction of 23%.

If you compare 5 year trends leaving out the drought years there has been a slight increase i.e.
Average hectares for C1993 - C1997 = 140,043
Average hectares for C1998 - C2002 = 150,919
Therefore a 7.8% increase. However the big crop of C2001 really needs to be discounted as it skews the results. This crop was an aberration because there was a huge amount of 'off allocation water (or supplementary water)' available that year, i.e. was before the off-allocation rules changed. It was also a large crop to counter the cash flow impact of the previous year's relatively smaller crop which coincided with low allocations at the critical plant decision time. Wheat prices in 2001 were also depressed and drove decisions to increase rice areas. Paddy price also played a role in increased rice plantings. In 1999 paddy rice prices were $233/tonne and in 2000 price was $251. Fundamentally rice is generally a profitable crop to grow. This size crop will never be grown again. These are hard figures and vary considerably from those presented. The aberrant 2001 figure skewed ABARE's results. One needs to be careful to analyse the data in the first instance. The Irrigation Corporations in NSW are required to provide detailed environmental reporting each year. As part of this reporting a wide variety of data are systematically captured and presented. See Figure 2.1 overleaf to gauge rice performance in the Coleambally Irrigation District (CID) since 1985/86. This is significantly at odds with data presented by Professor Cullen and others who also suggested a 19% increase in rice water use over the last 5 years. In terms of the CID this is clearly unsupported by the facts. What does become apparent is that the water use efficiency is continuing to improve. Perhaps this is an aspect that could be examined more closely in Commission's study.

In guiding Government policy development, much more care needs to be given to data capture and analysis. I suggest that industry should be engaged to assist in reviewing relevant data such that its relevance and rigor is secured.

2.0 FARM MANAGEMENT DECISIONS

Water Use Efficiency programs exist in most irrigation areas across Australia. In terms of the Coleambally District this is done through such initiatives as the Land and Water Management Plans (LWMP's as discussed in Section 3.2) and industry led initiatives such as the Rice Environmental Champions Program. These initiatives also involve the development and implementation of Best Management Practice (BMP) with a view to continual improvement.

The improvement in key environmental indicators is very encouraging and indicates that these programs are very successful in improving awareness and irrigation practices. (Refer to Section 3)

Figure 2.1 provides an indication of productivity increase per megalitre of applied water.

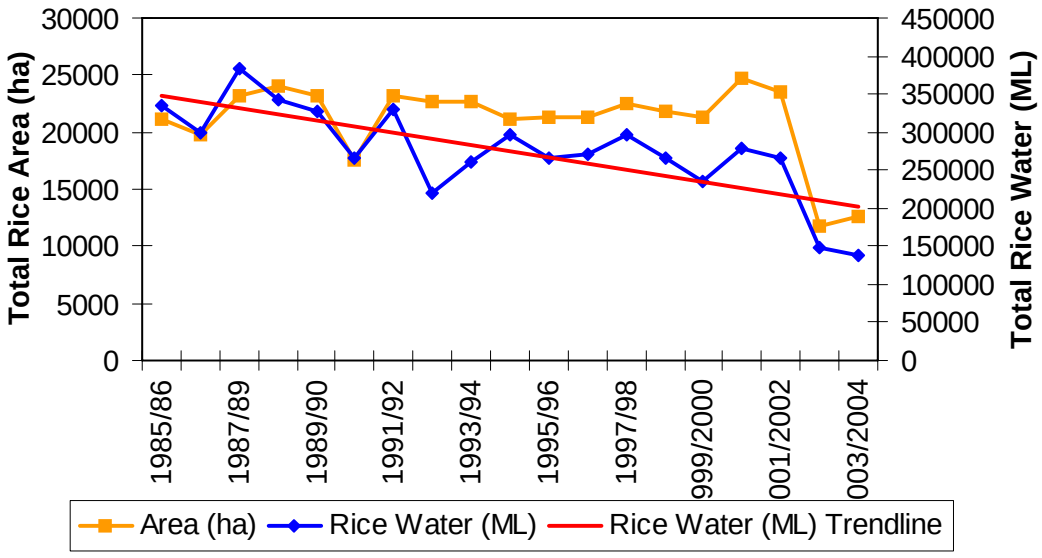


Figure 2.1

2.1 Incentives

The incentives program associated with the LWMP has been a success however cash-flow issues associated with the drought have been a limiting factor. As of the 30th June 2005 landholders had invested approximately $54M in achieving LWMP related on-farm works. Government has contributed a further $8.2M as incentive payments (a 6.6 to 1 investment ratio).

Moving from gravity flood irrigation systems to pressurised irrigation systems such as low pressure overhead irrigation systems does involve considerable expense, for example an incentive payment of $17K whilst useful is a small contribution to a total capital outlay of around $180K. The uptake of incentives in the Coleambally District shows a direct link between the size of the incentive against the total cost of the project – as you would expect i.e. an increase in incentive payments would translate to an increase in uptake rate.

A number of studies are ongoing across Australia to determine the relevant merits of changing on-farm irrigation systems. Well managed trials that facilitate an accurate comparison of irrigation technologies are rare. The outcomes to date of such trials are not as clear as one would expect. Take for example a trial in the sugar industry being undertaken on the Atherton Tablelands in Far North Queensland involving a comparison of conventional furrow irrigation against, furrow irrigation using surge valve technology, overhead low pressure irrigation and a combination of overhead low pressure (OLP) irrigation and conventional furrow irrigation. The production results are shown below in Table 2.1.

Table 2.1

Treatment	Cane Yield (tones cane/ha)	Mill ccs**	Sugar Yield (tones sugar/ha)	Irrigation (ML/ha)
Conventional Furrow	130	12.78	16.59	*8
Partial OLP	116	13.63	15.77	*6
Surge Furrow	115	12.68	14.54	4.3
Continuous OLP	119	13.13	15.67	4.6

* Includes estimated tail water losses of 30 per cent
** Commercial content of sugar

The economic analysis of the above is expected to be completed within the next few months, however early indications are that the cost of changing to an overhead low pressure irrigation system are not supported unless there is a range of other factors such as environmental or social considerations e.g. rising water tables (using irrigation techniques not suited to the soil type) and a desire to no longer get up in the middle of the night to start syphons (life style choice)

etc. As such this appears to support the need for incentive payments to drive change if it is to be widely adopted.

2.2 Level Playing Field with Agriculture

The Government has continued to withdraw subsidy support for agricultural production on the basis that they can't compete with the subsidies provided by other nations as a result of the relative size of our economy. Australia rightly argues for the removal of all trade restrictive barriers, such as subsidies, on the basis that Australian farmers are amongst the most efficient in the world. Whilst this may be true, subsidies exist at various levels.

With many of our competitors in world agricultural markets the price of water is often met in varying degrees by respective Governments. In New South Wales we have State Water currently making a submission to IPART requesting a move to 'Upper Bound' pricing as defined within the 1994 CoAG Agreement. State Water's table of increased costs is shown as Attachment A. These charges slate all costs to irrigators and recognize no other beneficiaries whilst providing a very substantial dividend to Government.

Whilst other nations obfuscate the WTO on agricultural subsidies we have Governments in Australia withdrawing anything that could be considered a subsidy to the extent that very substantial windfall gains are passed to government by farmers through water charges. It is little wonder that many farmers feel that they have been cut adrift by their own government. Australian farmers are competing against other nations' Treasuries.

Whilst the economic drivers in Australia may be 'text book perfect' the rest of the world understands the text but makes their decision based on what is best for their nation and farmers. More often than not this is at odds with economic theory and open markets.

Farmers are now very much more aware of the impact of conversion rates between currencies and outlooks on world commodity prices. These are being increasingly factored into crop planting decisions – although the continued expansion of grape plantings is a little hard to fathom, not withstanding public comments by the likes of Professor Cullen encouraging such planting decisions. Wine grapes are in a serious state of over production unless new market opportunities are found.

3.0 WATER RELATED EXTERNALITIES

The irrigator members within the Coleambally Irrigation District accept they have a key role to play in achieving *National Water Initiative* and *Living Murray* targets as they relate to river and aquifer systems. However for these targets to be achieved it requires the investment of both the Government and communities to be maximized and for rural communities' contribution to wider community expectations to be duly recognised.

CICL and our community know they have a key role to play in ensuring the long-term sustainability of our community and the long-term health of the river systems. Improved environmental outcomes are but one part of a more comprehensive plan. The Coleambally community of approximately 400 farming families have been making a very large contribution to positive environmental, economic and social outcomes in line with the thrust of the National Water Initiative, without being a load on Taxpayers, Treasury or Government (State and Federal). The following information provides hard data to support this claim.

Maximum annual allocations for the regulated section of the Murrumbidgee River since 1983 are shown in Figure 3.1. Since 1994/95 there has been a continual downward trend in allocations. Reduced allocations over the past eight years have adversely affected landholders capabilities to invest in on-farm works targeting water use efficiency. However even within this operating environment I believe their level of investment is admirable (Refer to Section 3.2). CICL has committed to a works program to maximize the availability of water to our customers by improving water distribution efficiency. (Refer to TCC, Section 3.1)

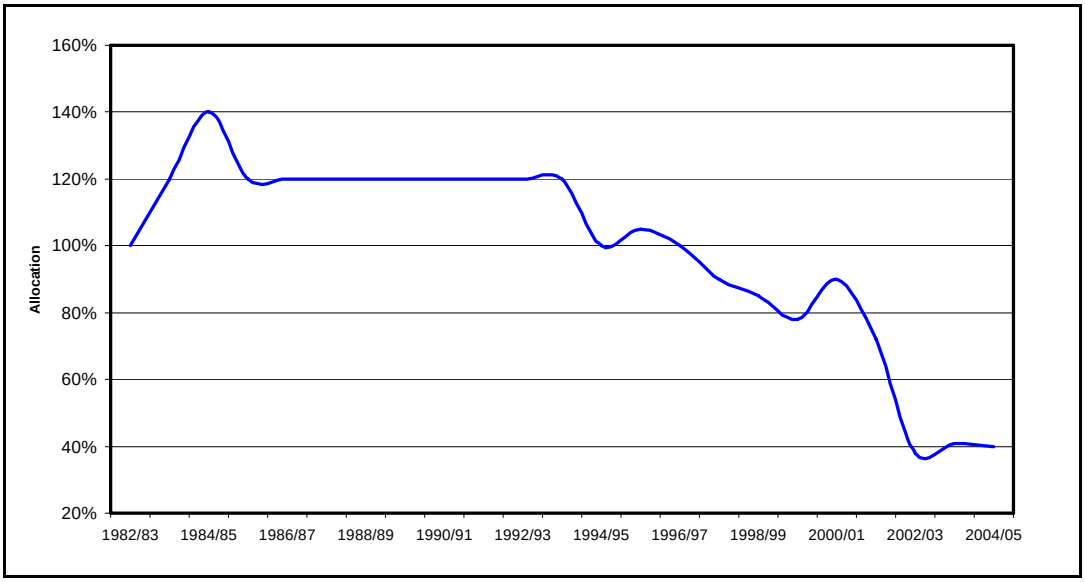


Figure 3.1 Annual general security allocations since 1982/83

However it should be noted that the operational environment has changed significantly in recent years, for example:

- Carryover provisions were not allowed up to 99/2000. Carryover provisions only came in after this date.
- Fixed requirements were a lot less up to 99/2000. During 01/02 and 02/03 we experienced high system losses and consequently higher losses are being set aside in the resource assessment e.g. river losses.
- Similarly minimum inflows have been significantly impacted in 01/02 and 02/03 i.e. provision for minimum inflow is significantly less now than in 99/2000.
- Snowy Hydro release patterns have changed since 99/2000 in relation to dam levels. Whilst Snowy Hydro are required to release a prescribed amount each year it doesn't matter too much (other than the timing of deliverability i.e. pre or post February) as to whether the water is in Blowering Dam or one of Snowy Hydro's upper storages.
- Environmental Flow Provisions have not changed significantly with the Murrumbidgee Water Sharing Plan. A change to end of system flows at Balranald from 125ML/day to 200-300ML/day occurred in the mid 90's. The Water Sharing Plan does however make allowance for an additional 25GL as an Environmental Contingency and an allowance for a further increase in End of System Flows is foreshadowed from 2008.

3.1 Investment at the Business Level to Improve Water Distribution Efficiency and Maximise Productive Capacity

Total Channel Control (TCC)

CICL has to date invested approximately $9M over three years in TCC technology and is looking at a similar level of investment over the next three years to complete the coverage of the entire Coleambally Irrigation Area.

TCC involves the installation of automatic control gates, communication networks and advanced control and management software to existing open channel infrastructure that delivers reduced water loss through channel escapes as a result of precision volumetric measurement and remote monitoring and operation systems.

TCC has also provided the capacity to capture real time data on a wide range of water quality parameters such as EC, turbidity, pH, temperature etc; hence enabling timely responses to issues which may emerge.

As part of our TCC program we are replacing on-farm dethridge wheels for metering water use. Dethridge wheels are well known to be inaccurate at both low and high flows. These programs are being implemented at great cost to our shareholders, but are seen as being essential in managing our water entitlement i.e. if you can't measure it (accurately), you can't manage it.

TCC also allows 2 hour water ordering which means farmers only take and use what the crop needs as against 24 hour ordering with changes to orders only made once every 24 hours i.e. may only need water for 18 hours but must take it for 24 hours.

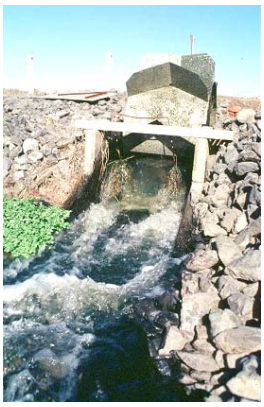


Figure 3.2 Dethridge Wheel

Figure 3.3 FlumeGate

Bulk Metering of Diversions

In additional CICL has installed an accusonic meter at our offtake from the Murrumbidgee River and at an additional location on our Main Canal. Accusonic meters are recognised as the world's best technology for metering large flows, and once again come at significant cost to our shareholders ($200K approximately).

Channel Seepage

CICL is continuing to invest in investigations into channel seepage losses. We also have an annual budget allocation for clay lining works where seepage losses are identified as an opportunity to create water savings.

CICL was disappointed with the release of the final *Pratt Report* which we considered misleading. Unfortunately the findings of this report appear to have become assumed as 'fact', particularly in the political arena. A report titled, "*Channel seepage assessment with EC/EM and thermal imaging techniques*," was presented at the recent ANCID Conference in Mildura by Willem Vlotman from the consulting engineering firm *SKM*. The report outlines the findings to date of channel seepage studies in the Coleambally Main Canal. The full report is available on ANCID's web site, with an extract shown below.

Pratt Water (2004) distinguished water losses and savings both in the on-farm and near-farm zones and claimed that for the Coleambally Irrigation Area (CIA) the combined savings could amount to as much as 53,000 ML from near-farm losses (although evaporation losses are hard to recover, nor is it cost effective) and 120,000 ML/yr from on-farm losses (Table 1). Losses from farms include channel seepage and deep percolation below the rootzone, while adoption of modern/new irrigation technologies such as Centre Pivot, Linear Move and Drip Irrigation, and savings from reducing rice growing area, accounted for the other potential savings. Near-farm losses comprise leakage, seepage and evaporation

from the channels in CIA, but also include losses from above-ground storages (CICL has none) *and overbank flows, escapes and end of system flows in the Pratt Water Study.*

Table 1 Accounted losses and water savings in the on-farm and near farm zones

	*Accounted and identified for water savings ML/yr in the **on-farm** zone*	
Component of the system	*Previous estimates*	*Revised assessment (Pratt Water 2004)*
Seepage	*10,000*	*10,000*
Deep percolation	*35,000*	*35,000*
Irrigation technology conversion		*45,000*
Rice savings		*30,000*
Total	*45,000*	*120,000*
	*Accounted and identified for water savings ML/yr in the **near-farm** zone*	
Seepage	*15,000*	*38,000*
Evaporation	*15,000*	*15,000*
Total	*30,000*	*53,000*

The 2004 assessment of the Pratt Water Study (Table 1) is based on work by Khan et al. 2004, who based their findings on primarily the annual environmental reports of the CICL combined with local knowledge and detailed groundwater studies in the CICL area. Hence, although it might be intimated from Pratt Water reporting that new assessments meant additional measurements, this was not the case (Khan et al. 2004).

It is interesting to note that the Pratt Water Study concluded that of the three components of channel losses; leakage, seepage and evaporation, seepage is by far the greatest. This is probably based on subjective opinions, as it is difficult to distinguish between leakage and seepage.

The report goes on to conclude that, '*seasonal leakage and seepage loss of 2000 – 2600 ML/season is tentatively determined. Note that these are considerably lower than the Pratt study would suggest.'* This investigation is ongoing with final results expected within the next few months.

I was concerned that unaccounted for water losses through publication in the final *Pratt Report* turned into seepage losses that could be translated into water savings. Unaccounted for water could be due to a range of factors such as inaccurate metering on-farm, inaccurate metering at our river diversion point, theft and seepage, leakage and evaporation. CICL has taken the necessary steps to address metering accuracy matters as mentioned above and a security officer is employed from time to time to carry out unannounced night time

inspections. Over the last two years the security officer has not uncovered any significant water theft incidents.

Metering of Stock and Tank-fill Offtakes

Tradionally all stock and tank-fill offtakes have been unmetered. However in an effort to better define CICL's system losses all diversions from the system will be metered. A program to install approx 350 meters (on all stock and tank-fill offtakes) has commenced and is expected to be completed within the next 6 months and is expected to cost in the order of $150K.

3.2 Environmental Externalities Driven by Investment at the Farm Level

The Coleambally Land & Water Management Plan (LWMP) was developed by the local community in response to concerns about rising watertables in the late 1980's and early 1990's. The thirty-year LWMP commenced in July 1999 with a cost-sharing commitment from the community of 86% and Government 14% of the total cost of $119m.

The objectives of the LWMP were focused on ensuring that the CIA remains viable and sustainable:

- Maintain productivity and profitability and social well being;
- Control net recharge to the groundwater so that the area of land affected by salinity does not exceed more than 15% of the total land area;
- Control downstream effects of water quality by monitoring drainage from farms via the drainage system and taking corrective actions as may be necessary;
- Manage salt loads in accordance with the Murray Darling Basin, Commission Salinity and Drainage Strategy;
- Control the external effects of groundwater flow from the CIA, and
- Address the decline in natural resource habitat in the region.

The main tools proposed to achieve the above objectives were:

- EM31 surveys
- Whole Farm Planning
- Rice growing on suitable soils
- Perennial vegetation
- Landforming,
- Net Recharge management, and
- On-farm recycle systems and water storages.

Prior to irrigated agriculture, watertables were about 20 m below the surface. With the introduction of irrigation the area with shallow watertables (less than 2m from the surface) was predicted to rise to 50,000 hectares by 2013 and 60,000 hectares by 2023 if no further action was taken. It was predicted that at least 25% of the land area would be salt affected by 2023.

EM31 surveying has almost been completed for the whole CIA. This provides an excellent tool for guiding appropriate land use on farms. Whole Farm Planning and the installation of recycle systems and on-farm storages are progressing steadily though a little behind the original targets. This is largely due to the current run of dry seasonal conditions and low water allocations and the subsequent impact on farm cash-flows. I believe Coleambally is the only irrigation area in Australia (and possibly the world) where extensive EM31 coverage is available.

The Coleambally community has just completed a five-year review of its Land and Water Management Plan. The community recognises the need to manage net recharge in order to ensure the long term prosperity of the region. Some hard decisions have been made by the community and these combined with some innovative measures should help to ensure that watertables can be contained even with a return to high rainfall seasons.

A Review Committee, in conjunction with the community, developed a number of new recommendations for the revised LWMP which had a strong emphasis on managing net recharge to the watertable and improving the local biodiversity of the region. These are outlined below.

Soil salinity

It is no secret that salt is the greatest enemy of irrigation areas. Salt contained in irrigation water can induce primary salinisation of the rootzone while salt that moves up from the groundwater into the rootzone is termed secondary salinisation. Secondary salinisation poses the greatest threat to the CIA.

The only way to control secondary salinisation in the CIA is to keep watertables below the rootzone. Primary salinisation can then be managed by utilising a small portion of irrigation water to leach salt down past the rootzone.

Net recharge management

The way to keep watertables below the root zone is to control net recharge to the watertable. Although the original LWMP had a strong emphasis on controlling net recharge, it became evident during the review that some more simple and practical methods are required for each landholder to take responsibility for the net recharge on each farm.

A number of strategies have been endorsed by the community to contain net recharge in the CIA:

- Reclassify marginal rice ground over two years using soil sodicity testing
- Rice area & total farm water use linked to net recharge for each farm
- Rice area & total farm water use linked to the area of CIA watertable less than 2m

- Cropping offset ratios that alleviate the need to reduce rice area. Landholders have been given the option to maintain current rice allowable area and not be affected by the CIA-wide rice area reductions due in July 2007, via the adoption of rice area offsets (net recharge ratios). These offsets, as calculated by CSIRO, are based on the leakage (recharge) of 1 ha of rice to be equivalent to and balanced by 1 ha of perennial species (e.g. Lucerne or other perennial pasture; agro-forestry; native vegetation; Old Man Saltbush) or 2 ha of annual species (e.g. winter crop sown into rice stubble), or a combination thereof.

  For example, a 230 ha rice-based farm with a current rice allowable area of 69 ha, can completely avoid a 11 ha rice allowable area reduction to 58 ha (25% of farm area) by planting or providing evidence of 11 ha of perennial species or 22 ha of winter crop sown into rice stubble or a combination of both. This process ensures that rice area is linked to Net Recharge Management. It is expected that this tool will generally result in the lowering of seasonal water-table levels throughout the CIA.
- Watertable target of the CIA area less than 2m reduced from 40,000 ha to 10,000 ha
- Full-time net recharge management officer to be employed
- New financial incentive for activities that reduce net recharge
- New financial incentive for change of landuse that will lead to significant reductions in net recharge.

Further research has explored the idea of using 'cropping' offset ratios to manage net recharge. The research showed that different ratios are required for different watertable depths ranging from 0.5ha of lucerne to balance the recharge from 1ha of rice with a watertable depth of 2m to 2.5ha of lucerne where the watertable depth is 3m.

The community decided that rice area should be reduced from 30% to 25% of farm area if there are not sufficient actions taken to offset the recharge caused by growing rice. One of the actions can be to utilise the *Swagman Farm Model* (developed by CSIRO with considerable funding from CICL) to demonstrate that net recharge for the farm is within acceptable limits. Another way is to use plants to draw out the groundwater. 'Offset ratios' have been established for this purpose. The ratio for perennial plants is 1:1 and annual crop sown into rice stubble 2:1.

If there is more than 10,000 ha of the CIA with watertables less than 2m from the surface, the rice area reduces to 21% of farm area unless sufficient 'offset works' have been undertaken to further constrain net recharge. I anticipate that the suite of Net Recharge Management Strategies will ensure that such a situation does not eventuate.

Biodiversity

A strong emphasis has been placed in the revised LWMP on the importance of maintaining and enhancing the local biodiversity. The Coleambally district is extremely fortunate to have some large areas of native vegetation remaining. Although many of these patches are not on farms, they can be complemented by protecting and enhancing what is present on farms. Areas of native vegetation on farms managed for conservation can be counted as part of an offset ratio for rice growing as outlined above.

A CIA Landscape Report and a CIA Landscape Strategy has been developed for the LWMP review. The emphasis is to help willing landholders and to encourage those who could be tempted with some expertise and financial assistance to increase the biodiversity on their farms. These reports, including CICL's Annual Environment Report are available on our web site www.colyirr.com.au .

The revised LWMP contains new initiatives for biodiversity which include the:

- employment of a full-time biodiversity officer;
- establishment of financial incentives for biodiversity works; and
- targets for protection, enhancement and replanting of locally native vegetation.

The LWMP is being implemented by CICL and is delivering real and measurable positive environmental outcomes. It soundly places the Irrigation District on a path of continual improvement and long term sustainability.

In addition, CICL took part in a pilot scheme with the MDBC in developing and implementing Farm Management Plans that target long term sustainability of the individual farming enterprises and put it within the context of basin wide environmental outcomes. These are now encapsulated within our community's LWMP.

I trust you agree that the achievements shown in Table 3.1 are extremely positive, particularly given the hardship faced by individual farming enterprises during the current drought.

Table 3.1 Progress against milestones during 2003/04 and 2004/05

Milestones	Targets under the contract	Completed 03/04	Completed 04/05	Total
Net Recharge Management (soil, water, crop and groundwater relationship)	NRM implemented on 20 farms	6	3	9
Whole Farm Plans	70 farms meet LWMP criteria	45	29	74
EM- 31 surveying	Additional 10,000 ha is surveyed	Survey 5,873 ha Map 7,044 ha Drill 2,095 ha	Survey 3,442 ha Map 4,349 ha Drill 1,217 ha	Survey 9,315 ha Map 11,393 ha Drill 3,312 ha
Pressurised Irrigation	Pressurised irrigation systems are installed on 8 farms	7	9	16
Water Quality	Install recycling systems on 50 farms	45	19	59
	Install storage on 5 farms	4	5	9
Landholder Awareness, Education and capacity building	Conduct annual landholder survey	Completed	Completed	100%
Biodiversity	Conduct annual survey and 5 yearly benchmarking surveys during 2003-04	Completed	Completed	Reports publicly available
	Publish the handbook.		Completed	100%

As of the 30th June 2005 landholders had invested approximately $54M in achieving LWMP related on-farm works. Government has contributed a further $8.2M as incentive payments. It is apparent that the existing programs are making huge steps forward in our district. At a 6.6 to 1 investment ratio I believe the landholders in the CIA are leading the way in maximising Government incentive payments to bring about real positive on-ground change as is demonstrated in following sections.

3.3 Water Quality Externalities - Pesticides in Drainage Water

Surface water samples are taken in accordance with CICL's Environmental Protection Licence. These water samples are analysed for a variety of different pesticides throughout the year. All analyses are carried out at a NATA approved laboratory. In addition to the drainage monitoring points identified in the licence, CICL monitors two supply sites for chemical exceedances. Table 3.2 is a summary of all pesticide analysis carried out in 2004/05. There were no

exceedances of the Environmental Guideline, Notification Level or Action Level in 2004/05.

Table 3.2 2004/05 pesticide analysis summary (µg/L)

PESTICIDE	CCS	CE 160-2	CCD	CODA	CODD	DC 800A
2,4-D	No Samples Exceeded Detection Limits in 2004/05					
Atrazine	No Samples Exceeded Detection Limits in 2004/05					
Chlorpyrifos	No Samples Exceeded Detection Limits in 2004/05					
Diazinon	No Samples Exceeded Detection Limits in 2004/05					
Diuron	No Samples Exceeded Detection Limits in 2004/05					
Endosulfan I	No Samples Exceeded Detection Limits in 2004/05					
Malathion	No Samples Exceeded Detection Limits in 2004/05					
Metolachlor	No Samples Exceeded Detection Limits in 2004/05					
Molinate	No Samples Exceeded Detection Limits in 2004/05					
Simazine	No Samples Exceeded Detection Limits in 2004/05					
Thiobencarb	No Samples Exceeded Detection Limits in 2004/05					
Trifluralin	No Samples Exceeded Detection Limits in 2004/05					
Endosulphate	No Samples Exceeded Detection Limits in 2004/05					
Endosulfan II	No Samples Exceeded Detection Limits in 2004/05					

In addition to the above, the Environmental Protection Licence makes specific provision for a Rice Chemical Management Program (RCMP).

The 2004 RCMP took place over a 12-week period between 5 October and 20 December 2004.

During the 2004 RCMP samples were taken once a week from 22 sites within and around the CIA as shown in Figure 3.4.

All samples were analysed at a National Association of Testing Authorities (NATA) approved laboratory using gas chromatography, testing for the presence of molinate. The main aim of this program is to ensure that CIA landholders are abiding by the 21-day rice chemical withholding period that CICL has adopted for the area.

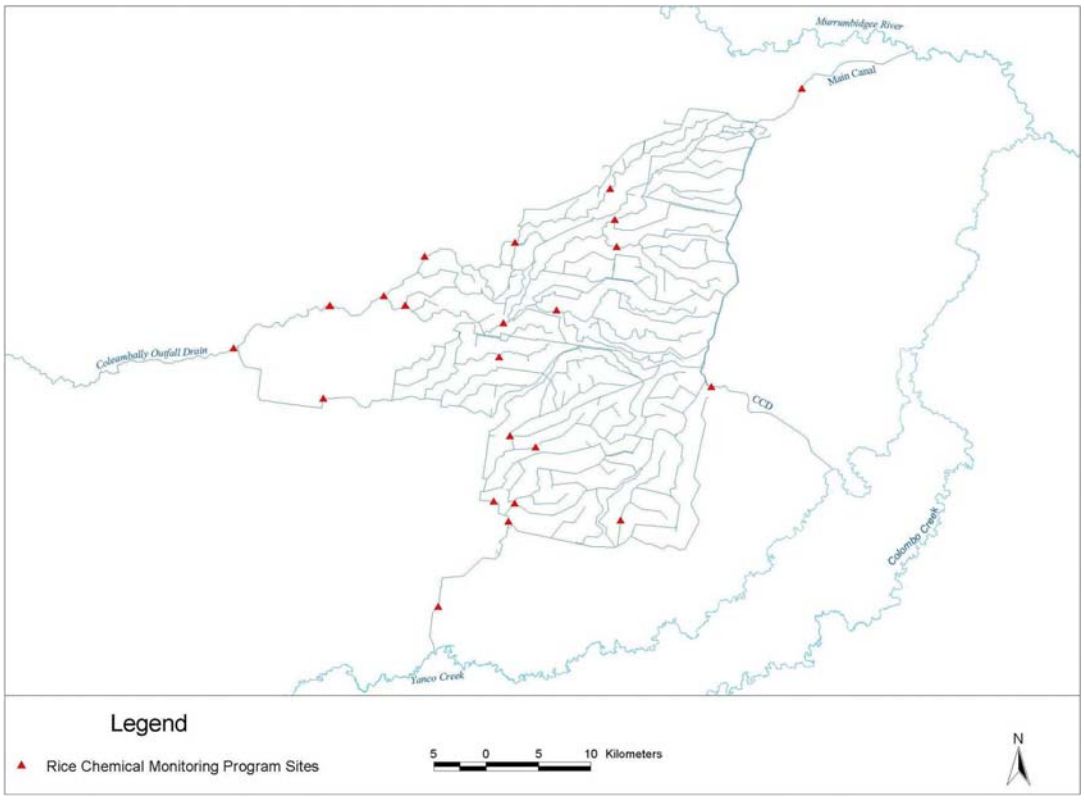


Figure 3.4 Monitoring sites of the Rice Chemical Management Program

As well as the three sites specified in the licence, 19 other sites within the irrigation area are monitored for rice chemical management purposes.

In total, 227 samples were taken from the specified sites for analysis. Some sites were not taken in some weeks due to a lack of flow. DEC sets the limits for molinate concentration in irrigation drainage water at three levels; the Environment Guideline, the Notification Level and the Action Level. For molinate these guidelines are currently as follows: Environmental Guideline – 2.5µg/L, Notification Level – 3.4µg/L and Action Level - 14µg/L. Table 3.3 shows a summary of molinate results from 1995 to 2004. This data has also been graphically represented in Figure 3.5, to show the steady improvement that has taken place since the program started in 1995 in relation to the guidelines set by DEC. The results shown indicate the proportion of detections of chemical relative to the DEC limits that applied in the season in question. The results from the monitoring program are not shown for 2002 due to a number of problems encountered with discrepancies between *Elisa Kit* results and the analysis of samples by the Environmental Management Laboratory in Melbourne. After 9 weeks of conflicting results it was established that the samples analysed by DIPNR were being contaminated by Aluminium foil sealing the sample bottles.

Table 3.3 Molinate sample summary 1995 to 2004

	1995	1996	1997	1998	1999	2000	2001	2003	2004
Below Environmental Guideline	31%	47%	48%	63%	79%	70%	78%	85%	93%
Exceeding Environmental Guideline	17%	27%	30%	29%	13%	21%	17%	15%	5%
Exceeding Notification Level	16%	12%	13%	5%	4%	7%	4%	0%	1%
Exceeding Action Level	36%	14%	9%	4%	4%	2%	1%	0.4%	0%

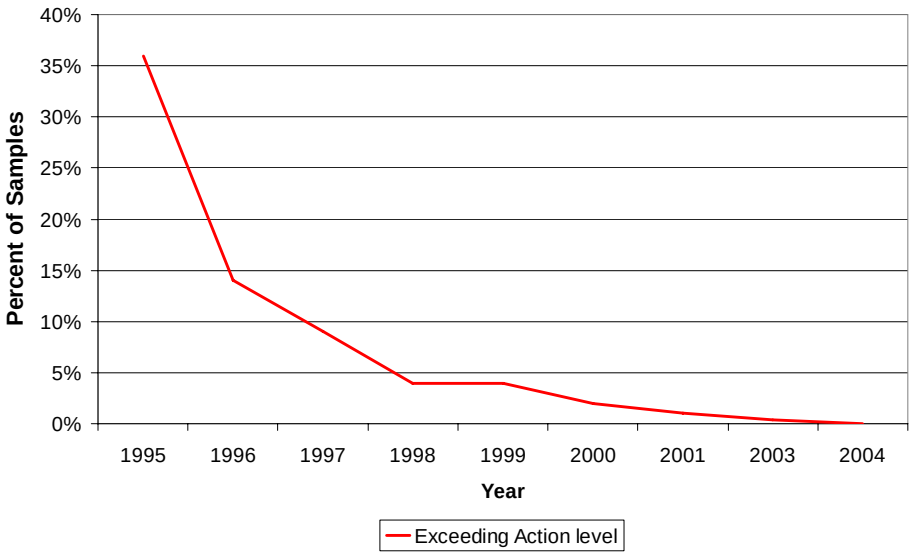


Figure 3.5 Molinate sample summary 1995 to 2004

The two discharge sites of CODA, DC800A are closely monitored for chemical returning back to the river system during the RCMP. Figure 3.6 shows the performance of the CODA site since the program began in 1995. The data shows that in 2004 the molinate concentrations at CODA were the lowest overall since 1995. Figure 3.7 shows the levels of molinate at DC800A; indicating that overall molinate levels at DC800A were the lowest since recording began.

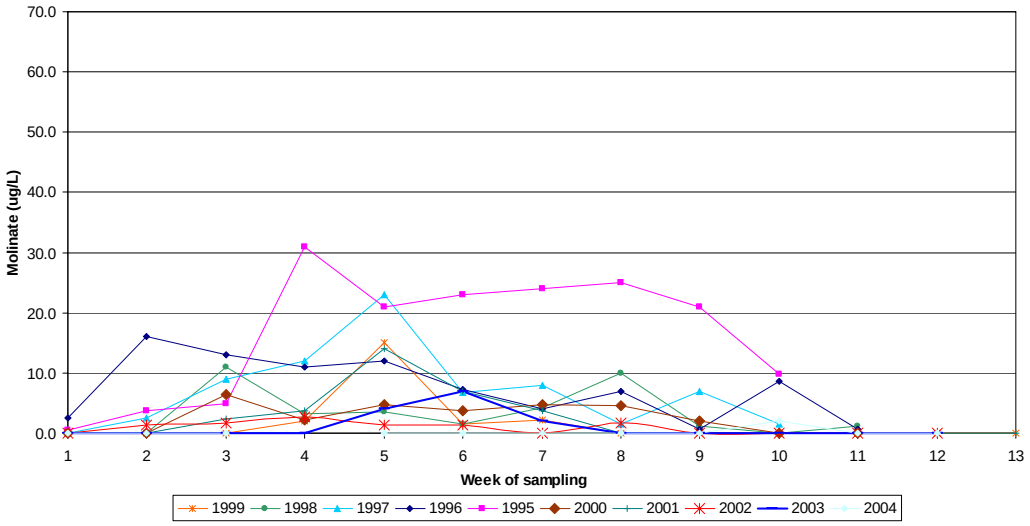


Figure 3.6 CODA molinate concentrations, 1995 to 2004

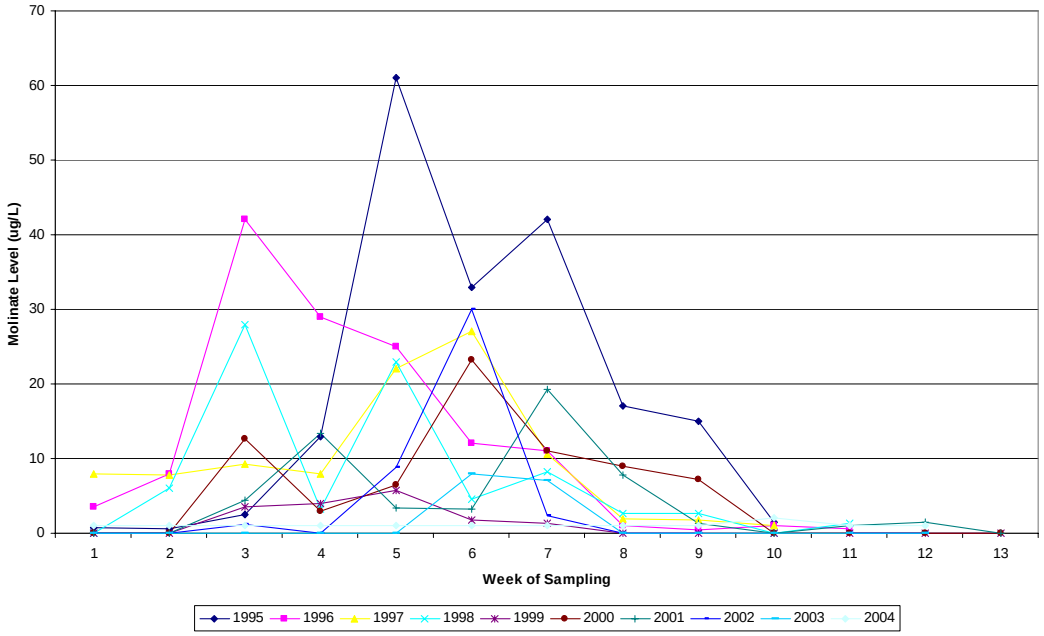


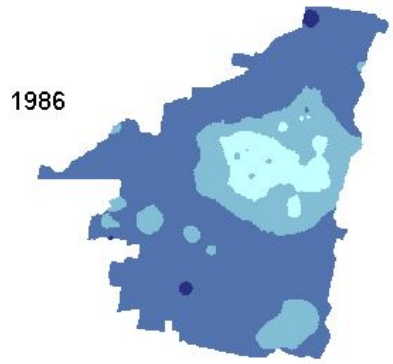
Figure 3.7 DC800A molinate concentrations, 1995 to 2004

I trust you agree that since privatisation, and together with the Coleamablly Irrigation community, significant achievements have been made.

3.4 Groundwater Externalities - Aquifers

CICL carries out extensive analysis of the potential impact of irrigation activities on aquifer systems and soil salinisation.

Figures 3.8 and 3.9 are contour maps of the piezometric levels in the Coleambally Irrigation Area (CIA) for August/September over the years 1986 to 2005. These maps were produced using the inverse distance weighted method of interpolation. This method of interpolation requires input in the form of x and y coordinates for location and a z coordinate for the groundwater piezometric level. An output grid cell size of 100 metres was used. The number of neighbours sampled was 12 and a power of two was used as the exponent of distance.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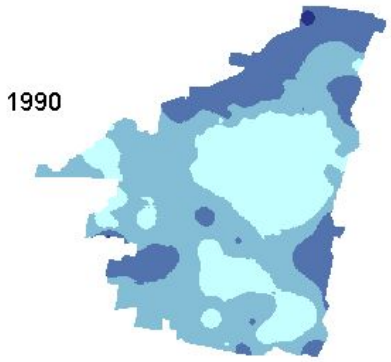
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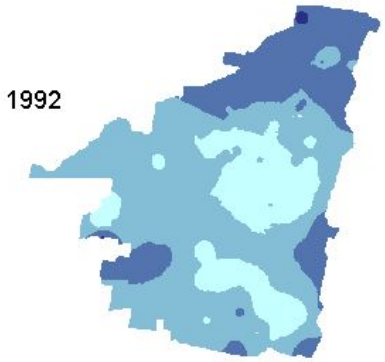
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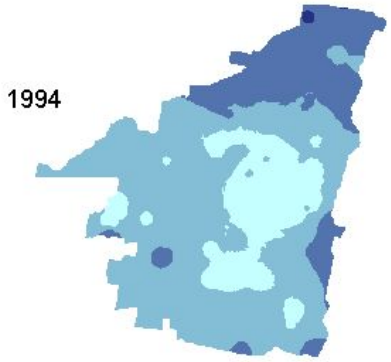
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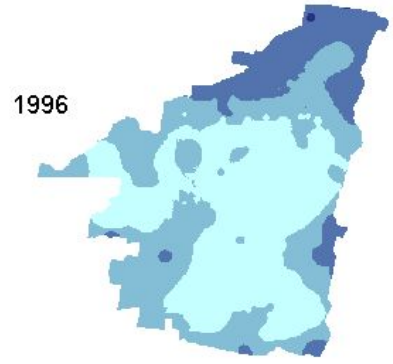
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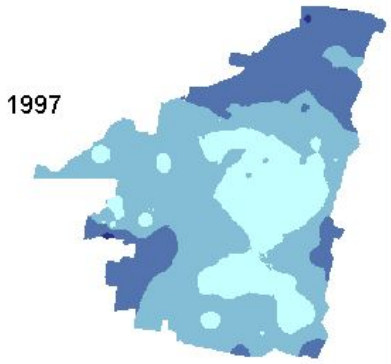
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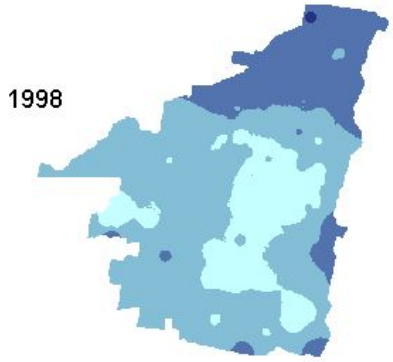
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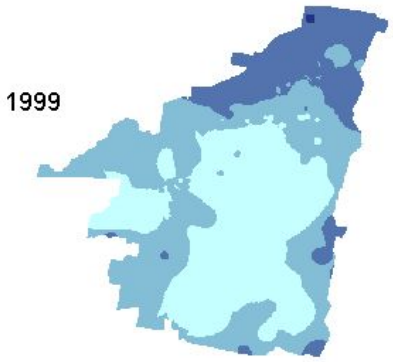
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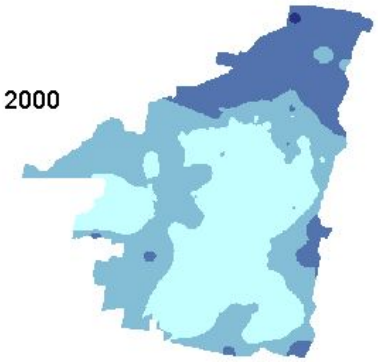
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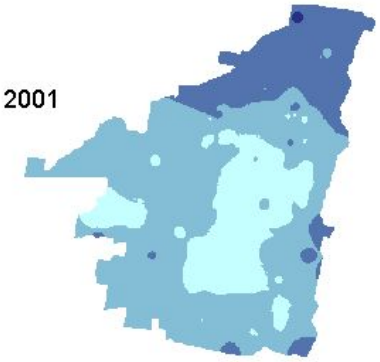
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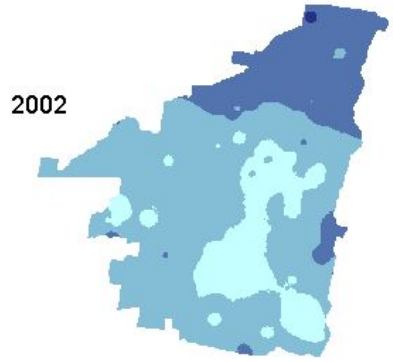
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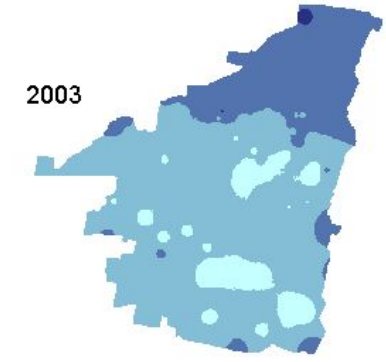
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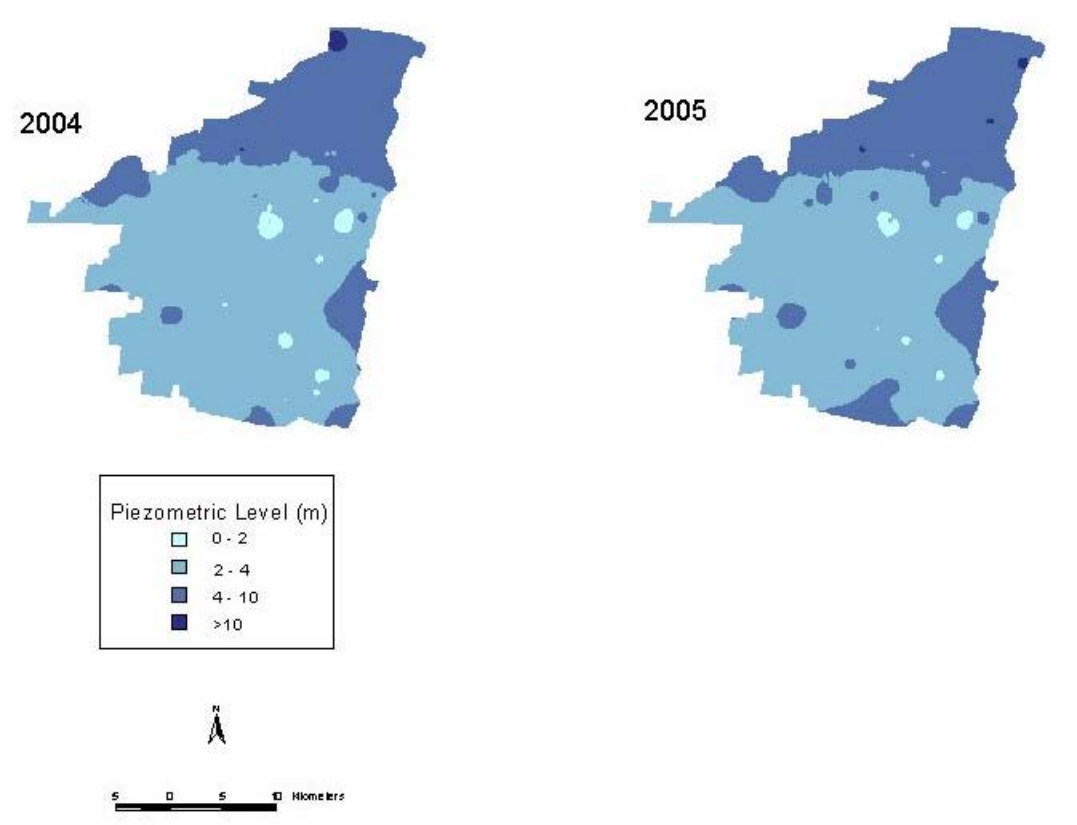
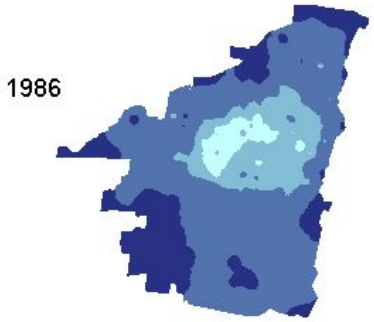


Figure 3.8 Depth to piezometric level (5-12m)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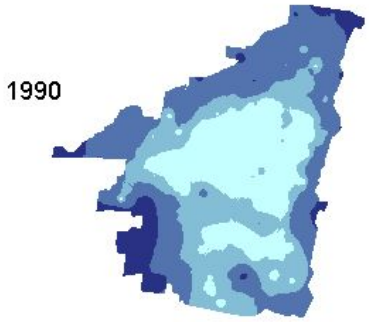
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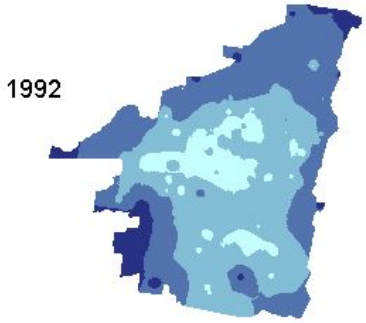
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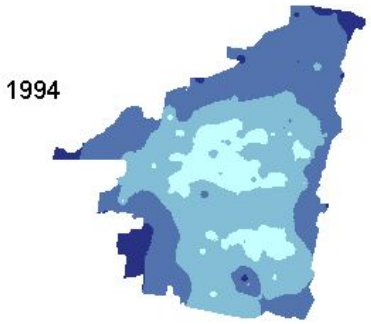
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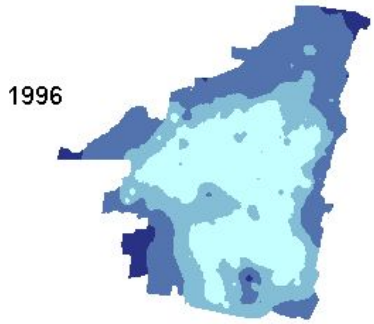
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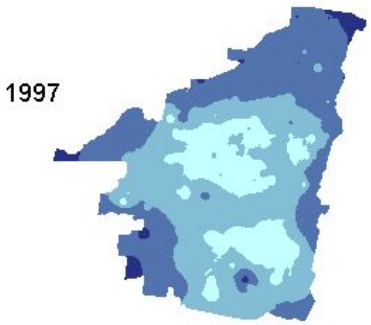
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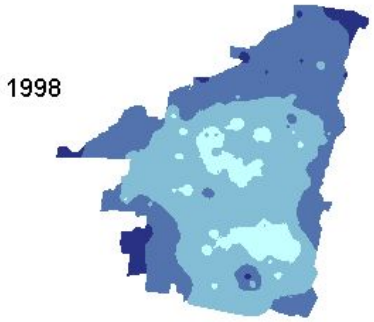
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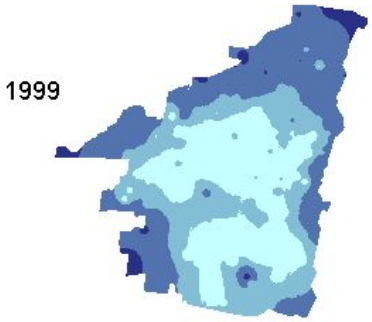
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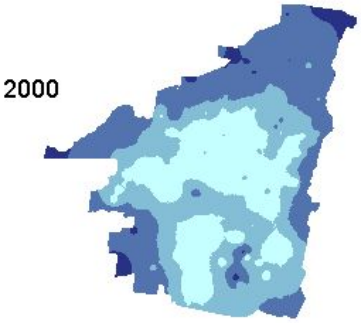
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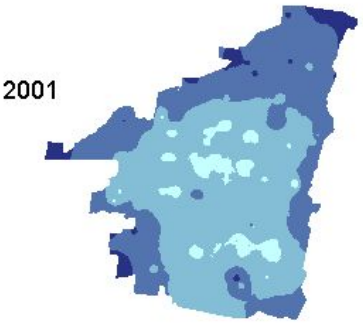
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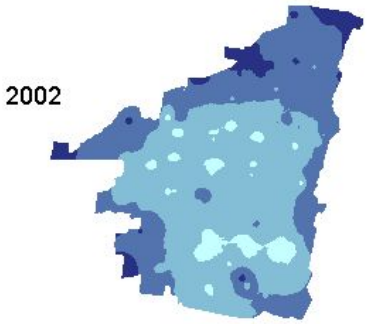
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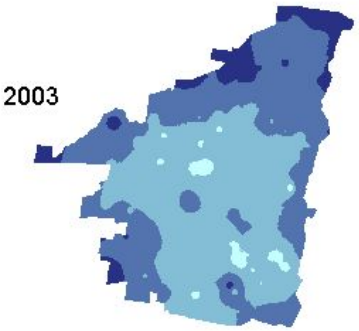
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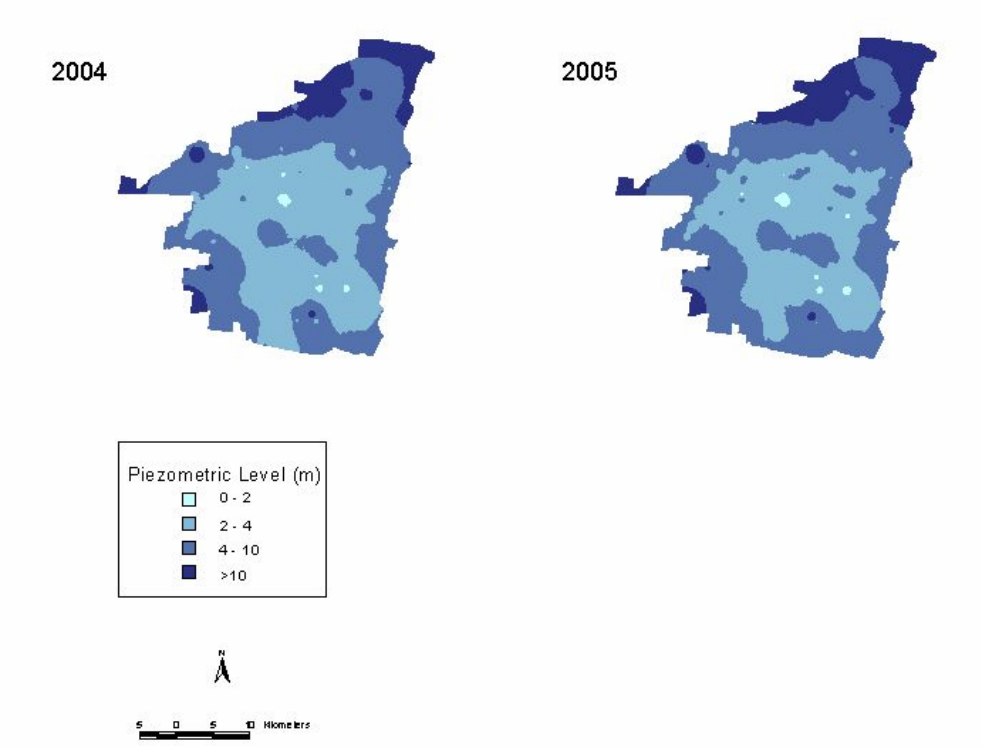

Figure 3.9 Depth to piezometric level (12-35m)

These figures along with the following tables show that there has been a continual decline in piezometric levels of both aquifers from 2002. This trend is related to drought conditions, reduced irrigation intensities and improved water distribution efficiency and improved on-farm practices. Table 3.3 and 3.4 show the areas of the CIA with watertables in various piezometric ranges. The most significant change over the past four years is the decline in area with piezometric levels between 0 and 2 meters and the subsequent increase area with piezometric levels between 4 and 10 meters. This trend is seen in both the upper and lower Shepparton aquifers.

Table 3.3 Areas of the CIA with piezometric level in various ranges (5-12m)

Piezometric level range (m)								
Area (thousands of ha), proportion of CIA in brackets (%)								
Year	**0 to 2**		**2 to 4**		**4 to 10**		**> 10**	
1986	7.6	(8)	20.6	(22)	66.9	(70)	0.5	(1)
1987	9.4	(10)	22.8	(24)	63	(66)	0.4	(0)
1990	30.1	(32)	44.5	(47)	20.7	(22)	0.3	(0)
1992	19.1	(20)	53.2	(56)	23.1	(24)	0.2	(0)
1994	18.1	(19)	57	(60)	20.3	(21)	0.2	(0)
1996	44	(46)	35.9	(38)	15.5	(16)	0.1	(0)
1997	22.2	(23)	49.5	(52)	23.8	(25)	0.2	(0)
1998	19.1	(20)	55.1	(58)	21.2	(22)	0.1	(0)
1999	39.2	(41)	39.3	(41)	17	(18)	0.1	(0)
2000	38.9	(41)	37.5	(39)	19.1	(20)	0.1	(0)
2001	20.9	(22)	55.5	(58)	19.3	(20)	0.2	(0)
2002	17.1	(18)	57.8	(60)	20.8	(22)	0.2	(0)
2003	9.1	(9)	62.2	(65)	24.2	(25)	0.3	(0)
2004	1.5	(2)	64.0	(67)	29.9	(31)	0.4	(0)
2005	0.9	(1)	58.4	(61)	36.3	(38)	0.2	(0)

Table 3.4 Areas of the CIA with piezometric level in various ranges (12-35m)

Piezometric level range (m)								
Area (thousands of ha), proportion of CIA in brackets (%)								
Year	**0 to 2**		**2 to 4**		**4 to 10**		**> 10**	
1986	4.1	(4)	13.9	(15)	56.4	(59)	21.1	(22)
1987	5	(5)	15.5	(16)	57.6	(60)	17.5	(18)
1990	25.8	(27)	26.6	(28)	35.6	(37)	7.6	(8)
1992	10.5	(11)	40.8	(43)	38.4	(40)	5.9	(6)
1994	12.6	(13)	40.6	(42)	38.1	(40)	4.4	(5)
1996	34.1	(36)	26	(27)	32	(33)	3.5	(4)
1997	17.3	(18)	40	(42)	35.9	(38)	2.4	(2)
1998	8.7	(9)	45.4	(47)	37.4	(39)	4.2	(4)
1999	30.7	(32)	28.4	(30)	33.5	(35)	3.0	(3)
2000	26.8	(28)	31.3	(33)	34.4	(36)	3.1	(3)
2001	5.4	(6)	49.4	(52)	37.2	(39)	3.9	(4)
2002	4.8	(5)	50	(52)	35.8	(37)	5.3	(6)
2003	1.8	(2)	46.2	(48)	40.0	(42)	7.8	(8)
2004	0.4	(0)	41.2	(43)	43.8	(46)	10.4	(11)
2005	0.5	(1)	35.1	(37)	47.1	(49)	13.1	(14)

Hydrographs of watertables in the CIA have been created from the piezometric levels. Geometric means from each data set have been used to produce the hydrographs. When the data is examined, most sets show a skewed distribution. For this reason, the geometric mean is believed to be a more appropriate descriptor of the datasets then the arithmetic mean.

Figure 3.10 is a summary of the September depths for the entire CIA. In 2005, the downward trend in September piezometric levels for the lower and upper Shepparton aquifers continued. This trend commenced in 2002, corresponding to the onset of drought conditions, start of the TCC program and rolling out of the LWMP incentives program.

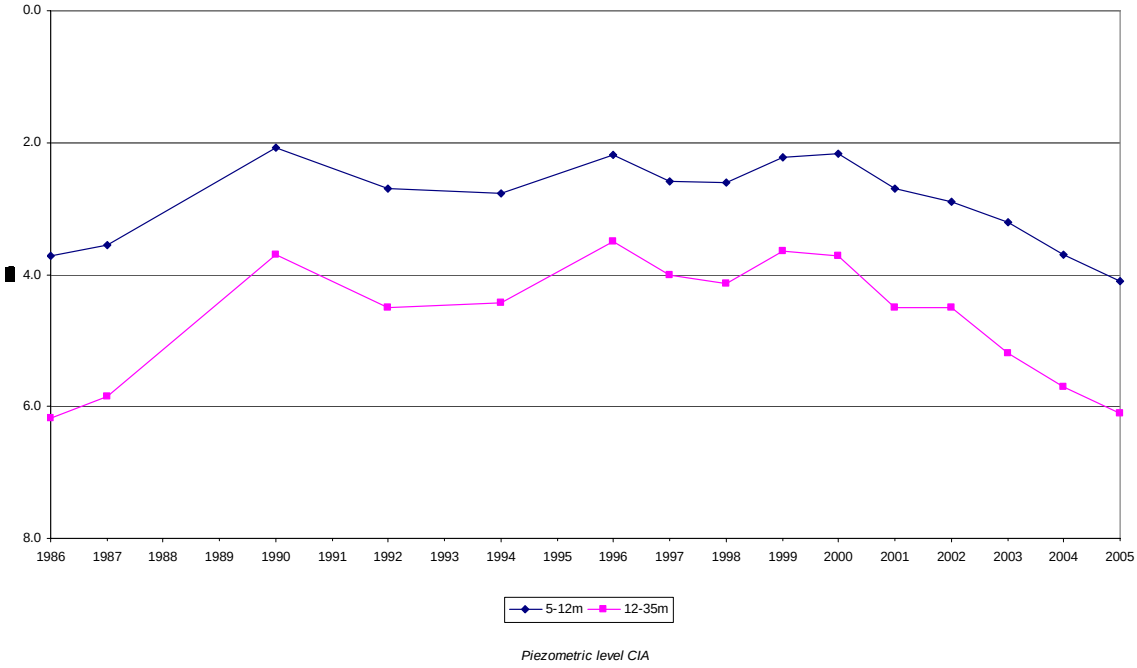

Figure 3.10 Piezometric level Coleambally Irrigation Area

3.5 Water Related Externalities Impacting Outfall District Customers

The Coleambally Outfall Drain (COD) is 162km in length and provides a drainage service to the top half of the Coleambally Irrigation Area. The Outfall Drain proper commences at the junction of DC400 and DC 500 and ends at its junction with Billabong Creek. COD largely follows the alignment of the deproclaimed *Eurolie Creek*.

Landholders along the drain have access to Class F 'opportunistic flow' (with no entitlement) and Class G (3,477 ML – based on 15ML per 1,000 hectares) Stock and Tank Fill Entitlement. The Class G water is measured as deliveries on-farm to 42 properties. CICL is expected to cover the conveyance losses in delivering this water from within its total 'loss allowance'.

The Coleambally Outfall District Water Users Association (CODWUA) was formed to assist facilitate discussions with Government over a wide range of service and entitlement related matters. CODWUA played a lead role in the lead up to privatisation in negotiations over conversions of pre-existing water rights.

Leading up to privatisation CICL's licensed loss allowance volume was reduced from 157,000 ML to a sliding scale between 111,000 ML to 130,000 ML depending on the volume of water to be delivered to customers. In reducing CICL's loss allowance Government effectively forced reform in how CICL operates its distribution and drainage infrastructure. CICL responded with investment in Total Channel Control technology which moves 'open channel' distribution performance close to closed system performance i.e. pipeline, with very significant reductions in channel escape losses. CICL's drainage system takes water from Channel escapes and farm drainage. Roughly 20% of historical flows in the drainage system emanated from uncontrolled escapes from the channel system with approximately 80% coming from farm drainage.

The impact of the current drought has in all probability fast tracked the emergence of issues that would have inevitably arisen in relation to supply of water to Outfall District customers.

In recent history many CODWUA members have had access to significant volumes of "Opportunistic Water" in the Outfall Drain i.e. up to approximately 90GL/annum. They hold an expectation that they are entitled to receive an average of approximately 30,000 ML/year based on their perception of a 'History of Use'. However the operational environment in which we now find ourselves has significantly changed with the introduction of the CAP for the Murray Darling Basin and the Governments' broader water reform agenda that has committed to history water allocation announcements of 120% and 130%.

Customers on the Outfall Drain did have the opportunity to acquire water allocation in the 1980's but did not believe this was necessary as they did not foresee that water distribution efficiency in the CIA could improve to the extent of vastly diminishing their 'opportunistic' source of water. Since the Outfall Drain is no longer a permanent running water course its effectiveness as a fence for sheep has been removed with the increased need for fencing by customers.

It is clear from the Government Water Reform Agenda that the concept of making specific water releases to a system that has high inherent water losses flies in the face of the intent of the *Living Murray*, *National Water Initiatives* and the broader community expectations of improving water use efficiency and returning water back to the main thread of the rivers. However there can be little doubt that CICL's customers on the Outfall Drain have been losers in the water reform process as it is reasonable to expect that opportunistic flows in the Outfall Drain will continue to diminish as further LWMP initiatives are implemented and CICL rolls out TCC over a larger area of the Irrigation District.

4 MARKET MECHANISMS

CICL and our shareholders are committed to a path of continual improvement and we are working closely with the other irrigation corporations in New South Wales to establish suitable mechanisms in terms of water trading. At CICL's AGM in November 2005 the members of the Co-operative voted to amend the Rules of the Co-operative to facilitate 4%/annum permanent trade out of CICL's bulk water licence. All necessary rule changes were endorsed by members.

CICL has adopted an Exit Fee approach for water that is transferred out of its licence with the methodology used to calculate the exit fee conforming to the guidelines set out in the document *'Principles for the Development of Access and Exit Fees'*. We understand the Murray Darling Basin Commission endorsed the principles at meeting 81 of the Commission, 14 September 2004.

Advice on the application of the MDBC's exit fee principles to the CICL business has been sought from the NSW Department of Infrastructure, Planning and Natural Resources, the National Water Commission, the NSW Independent Pricing and Regulatory Tribunal, the Productivity Commission, the MDBCand the MDBC's consultants – Hassall & Associates and Scrivco.

In developing an exit fee CICL has:

i. complied to the greatest possible extent with the MDBC principles;

ii. recovered only efficient costs by ensuring the prices in the exit fee reflect costs incurred by CICL in the delivery of the core service function – the delivery of water to customers in the CICL area of operations;

iii. adopted an initial one year interim exit fee, calculated using a set of holding assumptions for key forecasts of demand and costs, pending the availability of improved information for forecasting;

iv. sought to provide certainty to the market by reviewing the interim exit fee in 12 months with a view to moving to a 3 year review period;

v. limited cost recovery from the exit fee to those business costs that are currently priced into CICL's retail water charges. Business costs not recovered from retail water charges and not part of the exit fee include:

a) payments for bulk water which are recovered through a separate wholesale charge on customers;

b) funds received by CICL from government as a contributions to the cost of implementing the regional Land and Water Management Plan;

c) funds received by CICL from the NSW government under the deferred maintenance agreement on privatisation; and

d) funds available to CICL as at June 2005 from annual contributions by customers to the water supply asset maintenance/renewal reserve.

vi. excluded costs arising from non-core activities:

a) net cost associated with non-core activities: such as water auctions, marketing, commercial ventures and other transactions not related directly to water delivery services; and

b) business taxes and depreciation charges.

However I have concerns about the supposed openness of developing water markets. Take for example the transfer of large volumes of water from the Goulburn Murray (GM) to the Sunraysia district. Over 46,000 megalitres has moved from GM to Sunraysia and a further 26,000 megalitres is expected to move soon. Water is largely moving to almond production via a *Timbercorp* development. Could the *Timbercorp* development have been facilitated in the Goulburn Murray district if the same level of inducements had been provided? What becomes more interesting is how this water transfer will impact on existing water users downstream of the Barmah choke during periods of peak irrigation demand i.e. will the supplies to existing irrigators be restricted as a result of this transferred demand? This is not to mention the further drift from seasonal flow variations and extending related impacts over a longer reach of the river system. It is encouraging that the Commission is looking to better quantify what have to date been poorly understood third party impacts.

4.1 Temporary (Annual) Transfer of Water Allocation

There are no restrictions on temporary (annual) trade within, into or out of the CID. The data presented below provides an example of the way in which water trade has been largely meeting CoAG and NCC objectives since 1995/96.

Figure 4.1 shows the total volume of water transfers (i.e. in plus out) of CICL's operational area in the past eight years and their volumes, whereas Figure 4.2 shows the net transfer. Figures tend to suggest that in very low water allocation years there is a trend to sell water to maintain a cash flow as against choosing to grow reduced areas. It is reasonable to suggest that this is an economic

decision made by individuals in consideration of their cropping mix and scale of operation. It is a clear indication that farmers do understand their economic position and are best placed to make such hard but often necessary decisions.

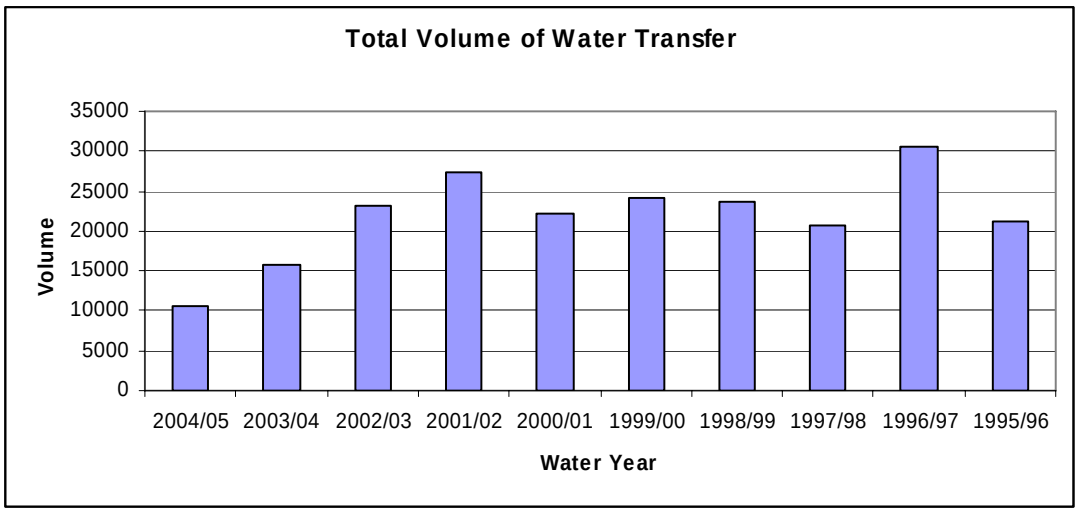

Figure 4.1 Total Volume of Water transfers in the CID

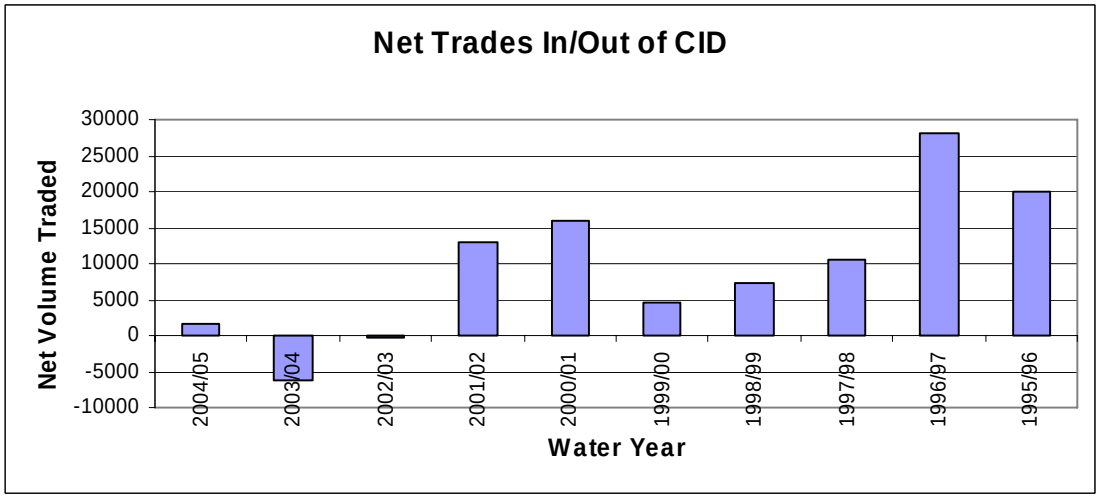

Figure 4.2 Net Volume of water transfers in/out of the CID

In addition to the temporary transfers into and out of the CID, temporary trade within the CID has ranged between 50,000 and 70,000 ML/year over the last three years. As can be seen by way of example with the CID, trade is very active within the Irrigation Corporations of New South Wales.

4.2 CAP

As you would be aware, the CAP on the Murray-Darling Basin effectively set water extractive limits at 1994 levels. History of water use was not a factor in this decision. It could be argued that Coleambally community was disadvantaged at this stage as it had a high history of use but was effectively reduced at the same rate as that of other licence holders that may have been significantly under utilising their water entitlement.

Historically Coleambally irrigators used 95% (and up to 120% pre 1984) of their entitlement and as such CICL (the business) recouped the variable water charges against a usage of 95% of the licence volume. The introduction of the CAP saw an erosion of that number such that irrigators only had access to 85% of their pre-existing entitlement. The available entitlement was further eroded with the allocation of a further 3% for environmental flows.

The introduction of a 10% ,then 15% carryover, further reduced usage to cover carryover to next season. While there is little direct impact on CICL because of the use of the matrix to calculate the variable charge, this has had an impact on the local economy because of the associated loss of production – third party impact as a result of removing productive capacity.

4.3 Carryover Water

Carryover Water was developed as a product on the basis that it provided a mechanism to irrigators with the capacity to make a decision to plant a reduced crop in low allocation years to carryover water to the subsequent year to enjoy economies of scale in the following year i.e. increase flexibility. However this product has a range of pros and cons. These are largely outlined below.

Pros:

- Could be viewed as a more secure 'property right' for irrigators.
- Properties with higher water allocations per hectare will be able to take advantage of increased water prices by playing a tighter market.
- Moves to increase carryover will increase the incidence of dam spill events without the need for Government to spend money on acquiring water for the environment.
- Carryover after an initial adjustment period whereby some areas shift away from irrigated agriculture may lead to a more resilient irrigation core, more capable of coping with the vagaries of climatic conditions – areas of winners and losers.

Cons:

- A reduction in the volume of temporary transfer water could distort the temporary transfer market and be counter to the water reform agenda. Reduced supply will drive up the price of temporary transfer water. Greater capacity for 'Water Barons' to manipulate the market.
- Those properties with lower water allocations per hectare will be disadvantaged by needing to access higher priced temporary water. They will also possibly suffer reduced plantings and lower economic activity with potential flow-on effects to regional communities, environmentally, economically and socially.
- An increase in carryover will see the need to cover an increase in losses due to evaporation and seepage and loss of production capacity.
- Those irrigators that have traditionally used their full entitlement will be disadvantaged with a reduction in available temporary transfer water in lower allocation years.
- This has a compounding effect on full entitlement users as carryover water reduces the water available as part of the announced water allocation calculation for the valley.

Some suggest that water entitlement holders should be provided the option of carryover all of their water entitlement (less an allowance for seepage and evaporation). However this needs to be countered against the loss of water storage capacity and the effective loss of productive capacity associated with the carryover. This is not a simple debate and CICL is yet to be convinced that moving from 15% to 30% carryover would be a positive move particularly in terms of maximizing the economic value of the available water and storage and distribution infrastructure.

4.4 General Security / High security Water Relationship

During the 1990's the conversion of General Security to High Security Water was made at 0.8:1 on the basis of high security water being available at a minimum of 65% to ensure long term plantings – not to continue to maximise productive capacity, but to ensure trees remained alive. This was agreed through an extensive community consultation process. This fact seems to have been forgotten with High Security Water enjoying 95% availability in the Murrumbidgee Valley during the worst drought on record. This then has the impact of diminishing the reliability of General Security water. At no time was this very significant change discussed with stakeholders, as it would have been very likely that more entitlement holders would have taken the opportunity to convert General Security to High security. To further what was an unsustainable conversion rate the State Government has moved to 2 for 1, but no water has been converted under this regime. Also farms in the CID with restrictions on permanent plantings (as discussed in Section 1.2) couldn't justify to the then DLWC the reason for conversion to High Security.

5 MOVING FORWARD ON REFORM

In opening the recent ANCID Conference in Mildura the Federal Minister for Agriculture, Fisheries and Forestry, Minister McGauran said in relation to water reform initiatives that, "*Rural Communities should not be punished for past Government decision*s." Whilst I applaud the Minister's sentiment, rural communities remain to be convinced that this will be borne out by the facts as water reform has already significantly impacted adversely on many regional communities. For an example refer to section 3.5.

5.1 Economic Meaning of Water-Use Efficiency

It is encouraging to see that the Commission's Issues Paper has indicated that it *will be using an economic definition of water-use efficiency that incorporates how water resources are allocated and used to achieve the greatest overall net social benefit* in a broader context than just *physical water use efficiency*. To date we have been discouraged by the inappropriate use of gross margin analysis to draw a tenuous distinction between high and low value uses of water. Policy development needs to be careful in that it doesn't further exacerbate a boom-bust environment in the rural sector by the inappropriate use of indicators to promote specific agendas. Debate in this area appears to be somewhat jaundiced historically. We have noted the disparate views between the Productivity Commission and ABARE with extracts of a Commission report below.

> *….when debate or queries arise about the validity of the gross margin (GM) in decision analysis, then the GM is not the correct technique. Almost always, in such cases, what is needed is partial and whole farm budgeting, not simple GM analysis. Often GMs are asked to do far more than they were intended for or are equipped to do. Widespread misuse of the GM concept and technique has lead in some quarters to the gross margin earning the unflattering title 'the gross illusion'.(Makejham and Malcolm 1993, p.338)*

The Productivity Commission[1] went on to say, *there are three reasons why gross margins per megalitre are not a useful indicator of the benefits of water reform*:

- *Gross margins per megalitre are an average rather than a marginal measure of the productivity of water.*
- *When considering productivity, other inputs used by irrigators such as capital and labour also need to be included.*
- *Gross margins per megalitre usually do not capture the price volatility that can characterise agricultural commodity markets.*

In addition there is no account for risk the water user is prepared to accept in undertaking his or her business.

The Commission goes on to conclude that, *gross margins do not provide a sound basis for illustrating the net economic benefits of water trade across farming enterprises. The greatest economic return from the share of water allocated to irrigation will occur when irrigation water use is optimized in conjunction with other factors of production such as land, labour and capital.*
(Productivity Commission -Douglas R., Dwyer G., and Peterson D., Activity gross margins and water reform)

It would be encouraging indeed if the Commission's view as expressed above was to be more widely understood by politicians and the likes of Professor Cullen, in advancing water reform such that there is a more informed public debate. I also look forward to the independent opinion of the Commission of the impact of such water products as 'carryover'.

5.2 Definition of More Productive Uses of Water

Water 'moving' to date as outlined in 5.1 has largely revolved around the rhetoric of moving to *higher value use*'.

It is also possibly worthwhile providing you with a simple 'real' example of water moving to *high value uses*. The example used is the case of water moving to the entity that paid the most (market power) for water. With the demise of the tobacco industry in Far North Queensland many farmers in the Mareeba Dimbulah Irrigation Area moved to tea tree oil production. For three years they were achieving returns of up to $50/litre. Whilst not quite as profitable as tobacco production, it was eminently viable - no doubt a *high value use*.

A large corporation (established as a tax minimisation venture) with investors from southern states established in the area, purchased water and increased tea tree production by over 100%. The glut of tea tree oil on the market saw the price collapse to below $15/litre, or approximately $10/litre below cost of production. Needless to say that the corporation ultimately went into liquidation as willing investors dried up. Unfortunately they took many smaller tea tree farmers with them as the market became horribly skewed. Tea tree oil production is clawing its way back but still is achieving little more than cost of production. I suggest that this scenario could be replicated with aloe vera, some corporate timber arrangements (with tax minisation as the driver for development), some large areas of olive production, and some areas of grape production (look at grape production that has been dumped the last two years, with a growing volume expected this year). I trust that by way of example I have demonstrated how good intentions, with little knowledge of markets is extremely dangerous, especially when guiding Government policy development.

CICL is concerned that profitability does not appear to be considered in Governments' understanding of just what makes a 'high value' crop. Wine grapes are a classic example, yet 80% of growers remain unprofitable under the current production and marketing regime. It would be useful for politicians, academics and the wider community to gain a clear understanding of this seemingly very important term.

Permanent plantings such as grapes and tree crops lock growers in to the annual vagaries of market conditions and greatly reduce the flexibility of the grower to modify the cropping mix and subsequent cash-flow to respond to market conditions. It may well be that given the vagaries of markets and weather conditions that annual cropping systems should dominate irrigated agriculture to maximise production capacity in line with market signals. Farmers generally make cropping decisions based on their bottom line – notwithstanding advice by eminent scientists that promote high value use over that of profitability etc.

I look forward to the Commission defining *More Productive Uses of Water* and trust that once adequately defined it will be appropriately communicated to all stakeholders associated with Water Reform in the hope that they grasp the fundamentals. Hopefully this will also expose the deficiencies of the understanding and application of high value use as a economic, social and environmental indicator for water policy development.

5.3 Water for the Environment

Historically CICL has made investment in water saving initiatives (e.g. TCC) and kept the water savings that resulted for distribution to our customers. This assisted in a very limited fashion in mitigating the impacts of the drought. However CICL has now resolved to allow the Government to participate in such initiatives to do our part in meeting the 500GL target of the *Living Murray*.

To this end we are looking to sell a component of CICL's loss allowance to Government at fair market value with the revenue used to roll out TCC over the remainder of the CIA, line channels and change delivery systems.

Unfortunately CICL is the first entity outside of Government to move down this path in a substantive way and is meeting issues associated with tax and legislation. These matters are currently being worked through.

We are concerned over the lack of transparency in reporting on environmental water and the environmental criteria used to monitor change as a result of increased environmental flows.

Given the dearth of available information in this area it will be challenging for the Commission to carry out any sort of analysis. A serious analysis is required if irrigation communities are to have any faith in the process. At present there is considerable scepticism as 500GL for the Living Murray may well move to 1,000 or 1,500GL largely on the basis of a few collective scientists indicating it is 'a good thing'.

Attachment A

Table 10.7 below has been extracted from State Water's recent submission to the Independent Pricing and Regulatory Tribunal (IPART). It demonstrates the impact of proposed prices as a percentage of the previous year. In particular attention in drawn to 2006/07. In terms of the Murrumbidgee whilst General Security water entitlement holders can expect to have their prices decline by 5.1% General Security water entitlement holders within the Irrigation Corporations can expect to have their prices increase by approximately 35%.

HS = High Security Water
GS = General Security Water

TABLE 10.7 impacts of UNCONSTRAINED prices on customer bills

% change from previous year

	2006/07		2007/08		2008/09	
TOTAL BILL	**HS**	**GS**	**HS**	**GS**	**HS**	**GS**
Border Rivers	178.9%	112.2%	1.5%	1.5%	-5.4%	1.4%
Gwydir	265.5%	146.2%	1.9%	1.9%	-2.1%	4.5%
Namoi	144.1%	102.5%	3.4%	3.4%	-1.5%	5.3%
Peel	377.5%	102.0%	5.2%	5.2%	6.1%	18.5%
Macquarie	249.7%	117.0%	1.9%	1.9%	0.0%	6.9%
Lachlan	193.3%	58.5%	3.4%	3.4%	-0.1%	6.6%
Murrumbidgee	23.2%	-5.1%	1.6%	1.6%	2.5%	0.3%
Murray	84.4%	72.5%	6.0%	6.0%	5.1%	4.6%
North Coast	3979.2%	1196.7%	4.1%	4.1%	12.3%	-1.3%
Hunter	323.4%	132.6%	2.0%	2.0%	-1.8%	5.0%
South Coast	781.3%	484.3%	1.2%	1.2%	2.1%	-1.3%