

Perth Water Users

Second Submission to ERA Water Price Inquiry 5 May 2005

In this submission Perth Water Users (PWU) do not want to repeat points made in our September 2004 submission available on the ERA website, so any reader of this current paper should be acquainted with the concise 3 page submission we made in September 2004. The contents of this second submission will comprise some material to augment two of the three points made in September 2004 and following that three issues will be discussed, dam catchment region rainfall, Perth groundwater and then environmental impacts from the Kwinana Desalination Plant (KDP).

[1] At the end of our first point on page 2 in September 2004 headlined;

Wellington Dam Reverse Osmosis proposal of Agritech

we stated, "There may be other sources of slightly saline river and stream drainage from the Darling Ranges that could be treated in this way."

There is now new published data to add scale to our September 2004 statement.

At the 1st National Salinity Engineering Conference, 9–12 November 2004, held at Burswood, a paper (Ref 1) reviewed stream salinity in South West Western Australia. The (Ref 1) Abstract commences (PWU bold), "**On average, about 4700 GL of water flows out of the rivers of the south-west into the ocean each year. Of that, 44% is fresh, 10% is now marginal, 21% is brackish, 20% is moderately saline and the rest has even higher salinity.**"

PWU notes that the figure of 4700GL is over 100 times the production of the proposed KDP. However this figure includes outflows from Moore River to Pallinup east of Albany. Ref 1 notes that the Avon, Murray and Collie have combined average flows of just over 680GL per year and lists average salinity. The PWU point is that while the Government is planning to desalinate seawater at the KDP, fifteen times the output of the KDP is wasting to the sea every year in rivers near Perth at an average salinity only 13% of seawater and much at an elevation that would facilitate vastly cheaper gravity powered desalination.

[2] On the first page of our September 2004 submission we stated under point 2; "Forest and scrub regrowth has degraded Perth catchments to a point where only 6% of rain falling ends up as stream flow into dams." PWU notes now in Ref 2 page 30 graphic that 2004 stream inflows to Perth catchment dams look to be about 80GL which is less than 3% of the 2800GL of catchment rain May to October, not the 6% we had previously accepted. The 2800GL figure is arrived at by a column of rain total 82cm falling from May to October over the 3500 square kilometre catchments. A reservation is noted here that while we are not 100% convinced of the homogeneity of the Water Corporations (WC) stream flow data history we are accepting the data for now.

The graphic of catchment rainfall plotted against stream flows Fig 1 below shows that stream flows since 1996 have fallen off considerably as a proportion of rainfall. This trend is rendering our dam catchments increasingly inefficient and makes it imperative to begin catchment thinning across the entire catchment area forthwith. There should be no more timewasting with the 12 year trial at Wungong on just 3.8% of total catchment area.

Figure 1

Perth dam catchments rainfall proxy 1980 to 2004 May to October (average of Mundaring, Karnet and Dwellingup) plotted against stream inflows in GL.

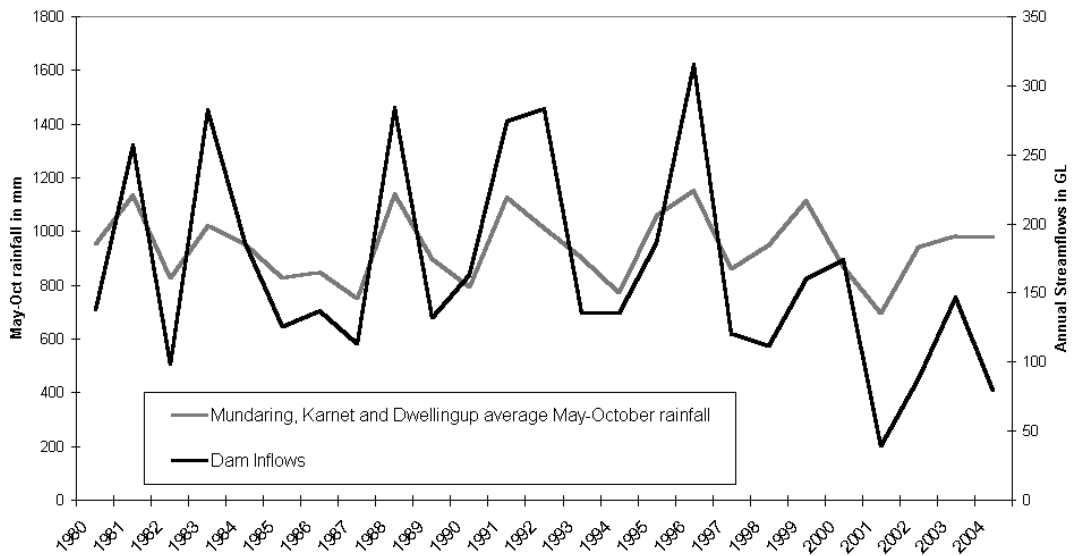
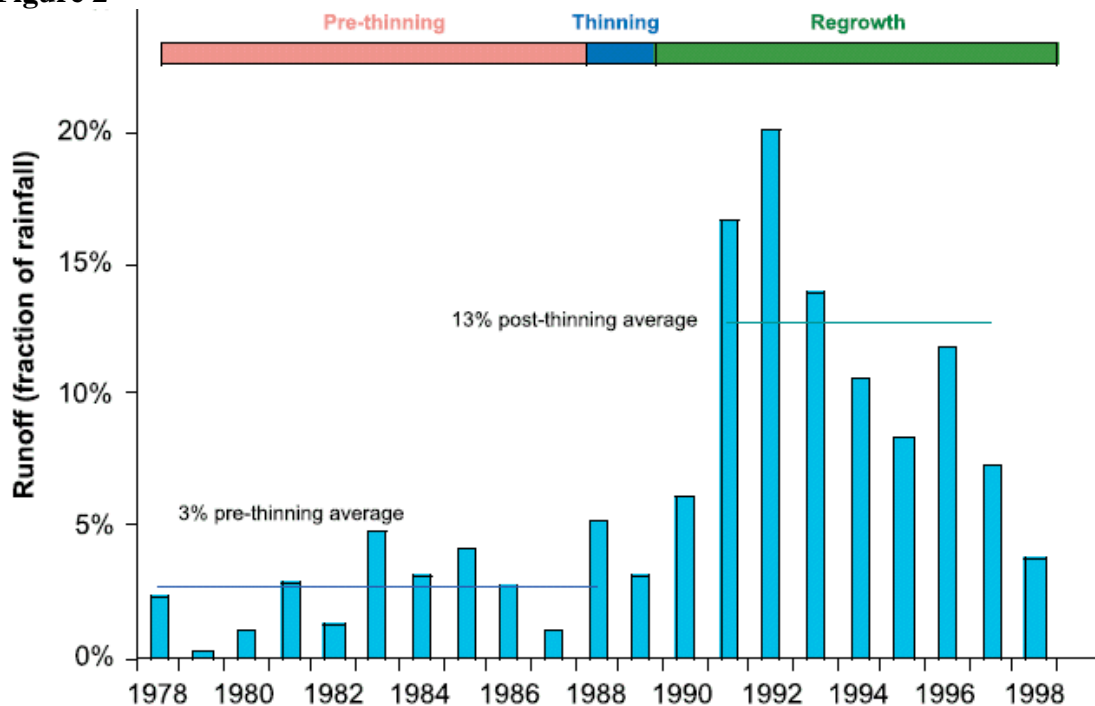


Figure 2 below is from page 28 in the book version of Ref 2 (Section 4 of online version) and demonstrates the considerable increase in stream flows that were generated in the Higgins catchment north of Dwellingup. It is obvious from this graphic that catchment management must be a constant process rotating from place to place. Note the drastic fall off in efficiency in the years from 1991 to 1998. It is interesting to speculate that if catchment management only caused an increase from the 3% inflows in 2004 to say 8%, then inflows from the 2800GL of rainfall would have been 224GL. It is crystal clear that there need be no water crisis !!

Figure 2



[3] The widely promulgated slogans of “our drying climate” and “independent of rainfall” have pervaded Government statements on Perth water issues for years now. What does rainfall data from our catchment regions show ?

Figure 3 (Graph A) shows trends from 1876 to 2004 and it can be seen that our rainfall in the late 19C was on a par with recent trends while the period from before WWI to 1960’s could be seen as a period of abnormally high rainfall.

GRAPH A Perth and water supply regions 5 year average rainfall trends 1876 to 2004

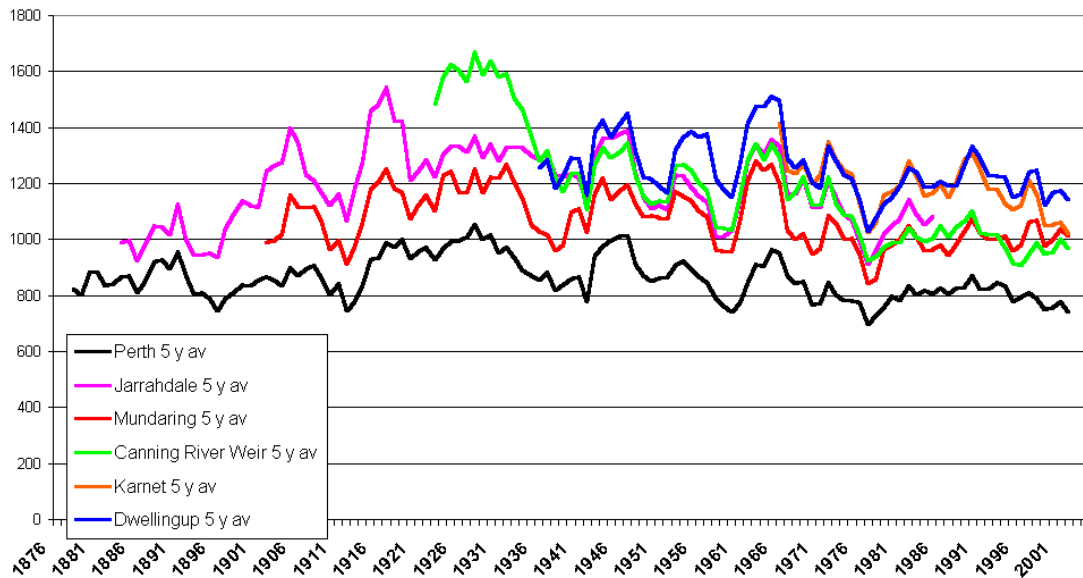
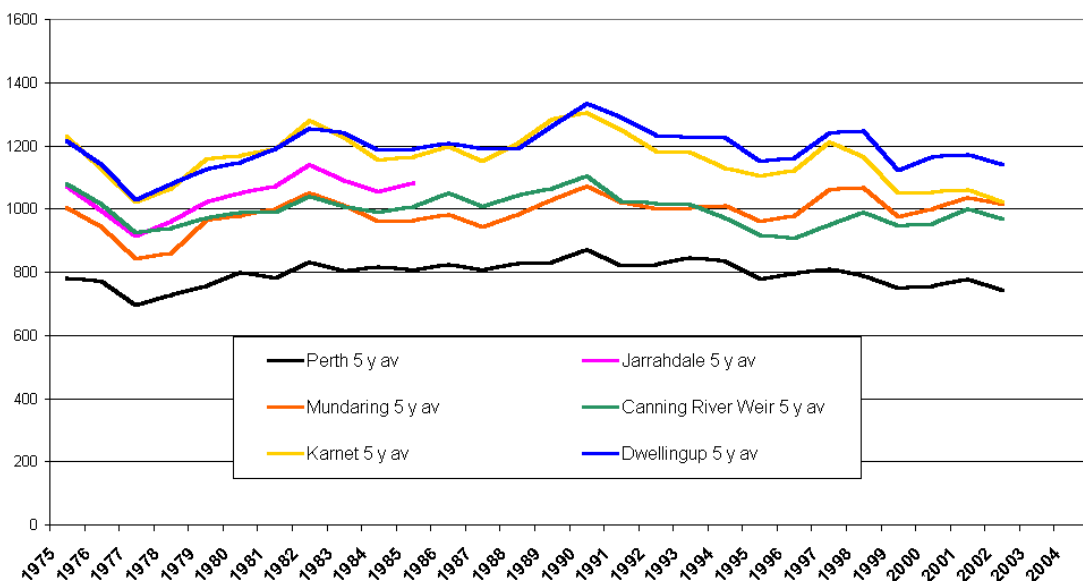


Figure 4 (Graph B) shows trends from 1975 to 2004 and PWU is saying that our policymakers are panicking about the very minor decline in rainfall post 1990 which is no more significant than the slight increase in rain from 1975 to 1990.

GRAPH B Perth and water supply regions 5 year smoothed rainfall 1975 to 2004

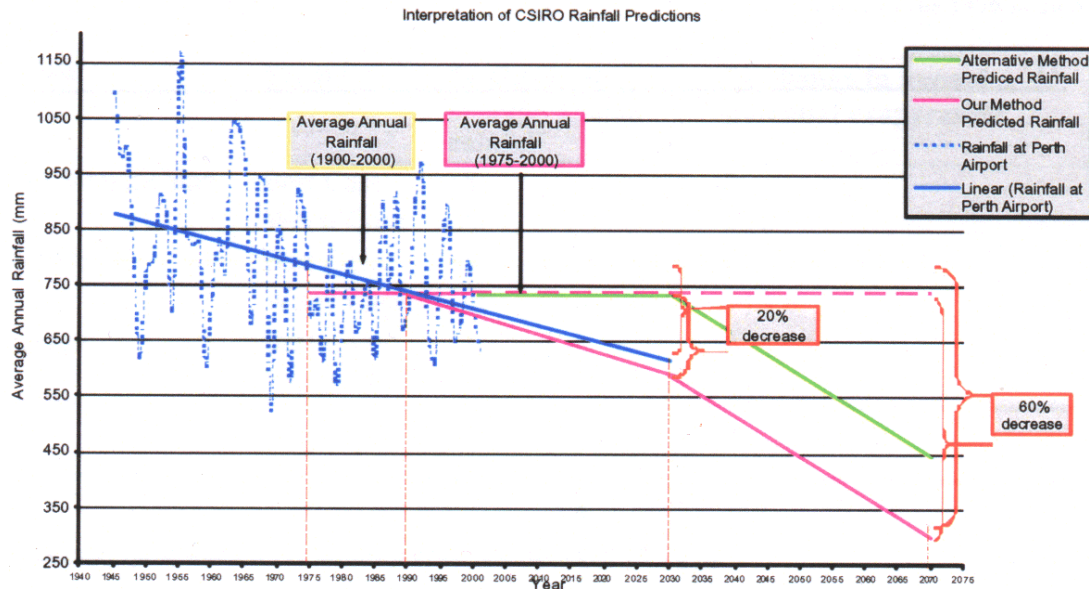


PWU believes that the widely promulgated notion of “our drying climate” owes much to exaggerated predictions of the future by CSIRO climate modelers. An

example of which is shown in Figure 5 titled “**Interpretation of CSIRO Rainfall Predictions**”, taken from page 35 of Ref 3 which portrays Perth Airport rainfall with a linear trend prominently displayed to predict Perth Airport annual rainfall will fall to circa 300mm by 2075 from current average of around 750mm.

It is obviously very dangerous for taxpayers if such wildly speculative diagrams are shown to non-scientific policymakers.

Figure 5



[4] Gnangara Mound groundwater supplies just over half of Perth supply at present and the WC is under some pressure from the EPA to cut this back

Natural recharge of the Gnangara mound has been degraded by a pine plantation and UWA experts (see Ref 3 page 173) calculate that replacing the pines by a mix of urban areas and native vegetation could increase recharge by **130GL per year**.

World pine log prices have fallen and PWU suspects that with incremental water now priced at KDP costs meaning we would have to invest circa a \$Billion in future KDP clones (and run them) to replace the water lost by the pines; the Gnangara pines can have no net present value. The best outcome for water prices would be if the pines were felled and sold at world prices forthwith, say within five years. This should reduce EPA concerns about over pumping. The Gnangara Mound covers 2140 square km and with typical May to October rain of 60cm there would be 1200GL per year falling on the mound of which near 50% could be available for recharge.

Quite apart from the removal of pines there may be cheap engineering opportunities to increase recharge, such as impeding runoff in water courses.

[5] Our last point addresses the issue of possible understatement of environmental impacts for the KDP.

(i) The issue of energy consumption is very real because the KDP would add about 6% extra load to Western Power’s already shaky grid. Refs 6 and the EPA reply ref 4 and then ref 7 and EPA reply 5, go through various coal and fired electricity generating options with WC preferring gas fired generation because of the reduced carbon emissions. However this misses the point that there is a gas shortage in Perth and until that is eased any advantage WC wants to claim by using gas will simply prevent another Western Power customer from using gas and being able to claim lower carbon emissions. Simply a

case of load shifting. In recent months public statements have been made in the media that the KDP will be powered by renewable energy, probably meaning a wind turbine farm near Geraldton. Although PWU can state that Water Corporation plans are so ill formed on this subject that several emails asking for information over a few weeks have all gone unanswered. If wind generation is used with attendant huge taxpayer funded subsidies, then unless Water Corporation intend shutting down the KDP when wind does not blow, base load capacity is still needed in place and there is a cost to having idle capacity built and maintained for periods when wind is too light.

- (ii) **The issue of brine discharges to Cockburn Sound** at near twice the salinity of seawater has attracted adverse public comment by several experts including UWA Centre for Water Research Professors Imberger and Pattiaratchi. Both expressed concern on ABC Radio in August 2004 that brine being heavier than seawater would accumulate to some extent in deep areas of the Sound which would increase stratification and possibly lower dissolved oxygen levels with adverse implications for bottom dwelling biota. (Transcripts can be supplied) In their 2002 and 2003 reports to the EPA (refs 6 & 7), WC claimed that there was no problem to worry about and the EPA said they could “manage” the issue. In early April 2005 WC was due to address the Cockburn Sound Management Council (CSMC) a Government appointed body, on the subject of KDP impacts on the Sound. Despite this proposed talk simply being one arm of Government talking to another, the talk had to be cancelled, so PWU can only assume that WC is having to reassess its earlier position that it knew how to “manage” the brine discharge impacts. More information is awaited. So we find that after the Government rushed to approve the KDP, serious scientific issues are still being addressed no doubt with the prospect of increased costs to comply with environmental guidelines.

Warwick Hughes,
Perth Water Users 6 May, 2005

http://au.geocities.com/perth_water/
http://au.geocities.com/perth_water/july04.html
<http://www.warwickhughes.com/water/>
<http://www.warwickhughes.com/water/quest.html>
http://www.geocities.com/agritech_wa/wellro.html

References :

[1] 2004; X. M. Mayer, J. K. Ruprecht, P. M. Muirden and M. A. Bari, "A review of stream salinity in the south-west of Western Australia" , 1st National Salinity Engineering Conference 9–12 November 2004 Perth, Western Australia Affiliation: Department of Environment, 3 Plain St, East Perth 6004

[2] Water Corporation online publication, "Wungong Catchment Environment and Water Management Project", found at;
http://www.watercorporation.com.au/environment/environment_wungong_publications.cfm

[3] 2002. Western Australia's Water Supply, A Holistic Study, University of Western Australia, Centre for Water Research.

[4] EPA Bulletin Report 1070 available in full from the EPA website:
http://www.epa.wa.gov.au/docs/1799_B1137.pdf

[5] EPA Bulletin Report 1137). available in full from the EPA website:
http://www.epa.wa.gov.au/docs/1500_B1070.pdf

Refs 6 and 7 are Water Corporation Environmental Impact Assessment Documents and can be found at;
http://www.watercorporation.com.au/water/water_sources_desalination_docs.cfm

[6] The Sep 2002 30 GL/annum proposal. The EPA reply is ref 4

[7] The expansion to 45 GL Section 46 review February 2004 EPA reply is ref 5