Sewage recycle

I would like to pass on some observations and facts to be considered when finalising your draft report into the National Water System as reported in "The Australian" on 11 February 2021 which highlighted the use of storm water and sewage water after recycling as additives to drinking water. What triggered my interest in this issue in October 2019 was the reported opposition by the NSW government to raising the wall of the Warragamba Dam to provide enough water for the burgeoning population of Sydney in times of drought. After the NSW Water Minister announced that the dam wall would not be raised there was a considerable outbreak of media articles about recycling. Subsequently, I saw an item on the TV news showing Sydney's Council sewage recycling plant (which no-one had heard of before) that had been built at great expense for commercial users only, but industries were not using it and instead kept using drinking water for commercial applications because of the prohibitive cost the Council was going to charge them as compared to the cost of drinking water from Warragamba.

I then made representations to some NSW Ministers with some suggestions that could make a contribution towards drought-proofing country towns both from a feasibility point of view. Canberra has been using recycled water for public (not domestic) use for some years now and that means there is more water left in the dams for drinking and other domestic purposes, so such a water management scheme is feasible for country towns. Many Media commentators at the time were also taking an interest water management and some were quite critical. One of the criticisms was that federal money is being given to Municipal Councils to do things that are not directly linked to "drought-proofing". If rural and country town councils were given money specifically for such recycling it would both help drought-proof the community's water supplies. The NSW Government at the time was looking at new dam proposals and I felt that recycling could be seen as making these new dams more efficient in dealing with future drought conditions. Having spent my early childhood in Tamworth NSW where we had the big drought in 1946 our family used "tank water" off the roof (when available) to minimise the use of the town water supply. Such tank water was boiled for making beverages or used in cooking and was considered safe. I don't know how safe for drinking would be recycled storm water collected from the street gutters given the potential for contamination from pesticides, hydrocarbons, animal faeces and dead animals etc.

There followed a TV segment at the time about using recycled sewage water as drinking water in drought affected towns like Tenterfield and the show's compere said that he was prepared to drink it. This issue originally came up in Canberra in when a big drought which started about 2006 reduced the water levels to almost disaster levels in the four dams (Googong, Corin, Cotter and Bendora) that serviced Canberra and Queanbeyan and surrounding areas. The ACT Government's initial response was to propose to turn our sewage into drinking water. At the time Australia was the leader in the world at producing large filters that could remove bacteria and most viruses from sewage water and it was proposed that these filters would be used. The idea was put out for public comment and a well respected public health doctor at the Canberra Hospital (Dr Collignon) specialising in infectious diseases came out against the idea because some virus pathogens could still go through the filter. I was working at the hospital pharmacy at the time and was mulling over this issue when I remembered in 1997 when I was doing a stint at the WHO in Geneva there was a big fuss in world health circles about the low sperm count that was being seen mainly in males in the Northern Hemisphere and was wondering if this had something to do with the drinking water. On checking, I

found out that many countries in the Northern Hemisphere, particularly in Western Europe, added recycled sewage water into their clean source of drinking water. In London for instance they draw much of their drinking water from a huge aquifer under London to which they add the purified sewage water. In 1964 when working at a London hospital one of the young trainee doctors there had done his initial training in Glasgow in Scotland and on one evening he told a group of us health professional colleagues how, as part of their public health training, the medical students were taken to a sewage treatment plant and taken through the process. They started at the top where all the faeces, urine, condoms and toilet paper etc were flowing into large tanks and from there it went from step to step until it was purified. When they reached that last stage the person who was conducting the tour stopped by a tap and poured some water into a paper cup and invited them to have a taste – that's how pure it was after the process. He told us he decided not to, with the sight of the initial inflow still in his mind to say nothing of the smell lingering in his nose. At that time I did not realise that such water was added to the normal supply, as in London. Also at the time, I was very impressed at how far more advanced was the UK over Australia in this matter. In 1964 Sydney's sewage used to flow into the sea out of pipes off some beach headlands, including Bondi where surfing could be a health hazard. One of my father's mates, a keen fisherman, used to cast his line into the Bondi outlet exit as did many others and it was a great fishing spot. Needless to say, my father politely refused to accept such fish from there when they were offered to him.

Meanwhile back to Canberra in the 2006 drought and the government review into recycling- It then occurred to me that filtration and other parts of the process would be unlikely to remove soluble chemical substances that would still remain dissolved in the water. There have been reports in recent times how police are testing the level of illicit drugs in sewage as a means of determining what people are taking and how much, so my theory in 2006 was right. I then realised that there was a possibility that oestrogens (female hormones) could be present in the recycled water because women excrete oestrogens into the sewage system when they are on the Pill, when they menstruate and particularly when they are pregnant. I then checked the public health standards prescribed in UK for several of the utilities there for providing drinking water in several towns, and sure enough they had limits set for levels of oestrogens in the drinking water. I immediately thought that this could be the reason for the lower sperm counts in the Northern Hemisphere, to say nothing of the potential increase in feminised men, if unsafe levels of oestrogens were occurring in the drinking water.

So I contributed these findings to the ACT review and they may have had some impact, together with other public health submissions from more qualified persons, because the government went ahead and used filters to purify sewage and then used it solely to water the grass on ovals and parks and for municipal applications in other public places and for industrial use where there was no chance of people accessing this water for drinking purposes. This prevented the use of drinking water for such municipal and industrial activities and kept the little water we had in the dams exclusively for drinking purposes and other domestic uses. To their credit, and despite the usual pushback from professional activists, they raised the height of the Cotter Dam wall to such a height that the water supply for Canberra would be adequate for years to come, droughts notwithstanding.

Hence I would suggest that for small towns like Tenterfield a network of separate pipes from the recycling facility be extended from just watering public ovals etc to be connected to individual homes for flushing toilets and possibly for watering home gardens. I can't see the sense in using drinking water for flushing toilets. This probably would not be feasible in large cities like Sydney

because of cost, but it could be cost-effective in rural towns. However, it would be feasible for municipal councils across a big city to introduce recycling plants and use the water as in Canberra for industrial and municipal purposes. Such plants would prove profitable, unlike the sea water recycling plants in Sydney and Melbourne, which are rarely used and are expensive to maintain.

Having witnessed many flooded rivers in my lifetime, I have often thought that it may be possible to utilise the flood waters as they overflow from the river into the surrounding land by directing the water into some form of storage facilities. This means such stored water could be used by farmers when the flood subsides.

Yours Sincerely

John Gregan