

Attachment 3

Water Supply Options for Melbourne

Background Information

Resulting from the Parliamentary Public Works Committee Report of 1968 titled "The Melbourne Metropolitan Water Supply Inquiry" the following works were authorised by Government.

1. Diversion of the Yarra Tributaries namely Armstrongs, McMahons , Starvation, Cement and Missippee Creeks.
2. Construction of Cardinia Reservoir
3. Construction of the Thomson Dam and associated tunnel to divert water to Upper Yarra Dam.
4. Construction of a diversion Weir on the Aberfeldy River at Donnelly Creek and tunnel to divert water from that source to Thomson Dam.
5. Construction of the Lower Yarra Scheme which resulted in the Sugarloaf Reservoir, Winneke Treatment Plant and Yering Gorge Pumping Station.
6. Construction of Watsons Creek Reservoir. This was to be filled via a tunnel connected to Sugarloaf Reservoir with the two storages operating as one.

With the exception of the diversion of the Missippee Creek, the Aberfeldy River and the construction of the Watson Creek storage and associated tunnel to Sugarloaf Reservoir all these works were implemented and completed by 1983.

At the time of the 1968 report the Aberfeldy River diversion at Donnelly Creek was considered to be capable of supplying approximately 90,000ML to the system in normal years. This required the construction of a diversion weir on the Aberfeldy River and a tunnel to Thomson Dam of about 4 kilometre length.

Today, commitments to maintain appropriate environmental flows in the river downstream of the diversion may be higher. Any diversion from the Aberfeldy could also impact on flows available to the Maffra/Macalister Irrigation District.

The land required for the construction of the proposed storage on Watson Creek, which was to have a capacity of some 350,000M, was purchased by the then MMBW. These works have not proceeded.

As a result of the water supply strategy prepared by the MMBW in the late 1970's into the future water needs of Melbourne (this was updated in the 1980's) it was determined that there was insufficient water available from the Yarra River to fill both Sugarloaf and Watsons Creek Reservoirs. A reduced capacity reservoir on Watsons Creek was therefore proposed of some 100,000ML. In normal years it was considered that there was sufficient water available from Maroondah Reservoir and the Yarra River at Yering Gorge to supply these storages. I believe Melbourne Water has retained the land required for this smaller storage.

The O'Shannassy River upstream of the reservoir has an annual average yield of approximately 100,000ML. In the early 1990's works were carried out on the dam wall with the placement of stabilising fill on the downstream embankment and construction of a spillway to bring the storage up to latest engineering design standards. These works also removed operational restraints that had been in place in respect to rise and fall of this storage since the floods of 1934. The restraints resulted in wasting of water from the dam to ensure its stability.

In 1993 the O'Shannassy Aqueduct was abandoned. This limited the ability to maximise utilisation of inflows into the reservoir to about 65000ML and hence annual flows above this amount are

wasted. In addition, the abandonment of this aqueduct also resulted in loss of the water resource available from Cement Creek. It had been diverted into the system in 1967 and its water was harvested utilising this aqueduct as the conveyance to Silvan Dam.

The combined loss in harvestable yields from these sources totals some 45000MI approximately.

The Tarago River system, which historically supplied much of the Mornington Peninsula, was abandoned some years ago and all supply to this region is now from Cardinia Reservoir. Cardinia is an off river storage filled from Silvan Dam which in turn is filled from the Upper Yarra/Thomson Systems.

The Tarago River is capable of supplying about 20,000MI; associated works to secure this water include a water treatment plant.

Included in the options to augment the supply of water to Melbourne in the water supply strategies referred to above were proposals to divert water from the Goulburn River System.

These were-

1. Diversion of the Big River, a tributary of the Goulburn upstream of Eildon Dam, into Upper Yarra Dam.
This entailed the construction of a diversion weir at the confluence of the Big River and Frenchman Creek and a tunnel through the divide, approximate length 14 kilometres, to the Walsh Creek arm of the Upper Yarra Dam.
2. Diversion of the Black River, a further tributary of the Goulburn upstream of Eildon Dam, into Thomson Dam. The details of this I believe to be similar in respect to construction requirements as referred to in the Big River Diversion option above.

The volume of water available from either of these options was considered to be of the order of 80,000-100,000MI.

Comments

I have alluded above to a number of sources of water available to Melbourne (at least equivalent in total volume to that currently proposed 75,000MI), from south of the divide which I believe should be harnessed before embarking on taking water from the Goulburn.

If water must be taken from north of the divide the realistic options are the diversion of the Big or Black Rivers. Either of these can supply at least the amount proposed with the obvious advantage that it puts the water into the upper end of the supply system to Melbourne, that is Upper Yarra Dam. From this storage the water can gravitate to the downstream distribution system without pumping. It has the further advantage of long term storage of the water and hence minimal treatment of the water is required to meet potable water standards.

These options also have the added advantage of minimal environmental impact as the works would be located in forest with the only disturbance being at the diversion and outlet ends of the works; there would be no requirement for compulsory acquisition of freehold land or interference with private enterprises. The greatest advantage to my view, in this accepted time of global warming, is they do not require the use of energy, no creation of Greenhouse gases to further pollute the environment.

The works currently proposed divert water from the Goulburn River downstream of Eildon Dam into Sugarloaf Reservoir. It entails construction of some form of diversion works on the river at Killingworth with a low lift, high volume pumping station to store water in large tanks at the site.

The water is then to be pumped with a high lift, high volume pumping station to transfer the water to Sugarloaf via the proposed pipeline. So we have two long-term energy consuming facilities. Added to this, is the further pumping required to take the water from the Sugarloaf Reservoir to the Winneke Treatment Plant before distribution via the Clearwater Reservoir to Melbourne. Further, all water from Sugarloaf Reservoir is fully treated to meet potable water standards. This entails clarification and filtration.

A further disadvantage of the proposal is it places the water at a low level in the supply system. That is – the level of Sugarloaf and the Clearwater Reservoir is at 178 AHD hence it commands a very limited part of the overall water supply system without further pumping, whereas Upper Yarra Dam is at 366.4AHD and commands the whole system.

In essence, both the Big and Black River diversion options put the water into Upper Yarra Dam.

Apparently the diversion of the Black River is not considered by current management a viable option as the Thomson Tunnel, which is used to transfer water from the Thomson Dam to the Upper Yarra Dam, is deemed to be a weak point in the system. If this is correct one must wonder about the security of supply to Melbourne in respect to existing water utilised from this source.

It should be noted that following completion of construction of the Thomson works a maintenance manual for this tunnel was prepared and adopted by MMBW management. This specifies that a full inspection of the tunnel must be carried out at a minimal interval of 5 years. I believe that the last inspection was carried in 1990, some 18 years ago.

A further option, not previously contemplated in regard supply of water to Melbourne, which must be considered in conjunction with the above, is the construction of a storage reservoir on the Macalister River upstream of Glenmaggie Reservoir.

The streamflow of this river, that is located east of the Aberfeldy River, has its waters impounded at that storage. In years of average and above rainfall it is an underutilised resource with significant volumes of water being wasted to the sea as occurred in 2007.

Glenmaggie Reservoir has a storage capacity of only 190,000 MI and is an irrigation storage supplying the Maffra/Macalister Irrigation District.

In addition to water being supplied to irrigators from Glenmaggie, water is also released from Thomson Dam for their use.

A second storage upstream of Glenmaggie would capture excess streamflow and reduce waste. It would be operated in unison with Glenmaggie making more resource available to irrigators. It would give them increased security of supply and reduce the volume of water required to be released from Thomson Dam for irrigation purposes making it available for Metropolitan use.

Whilst this, on its own, may be insufficient to meet ongoing growth in demand to satisfy Metropolitan water requirements it must be included as an option in the decision making process.

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