

Appendix F

Master Plan Scenarios

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Appendix F Master Plan Scenarios

Five scenarios with different mixes of sourcing options were considered for analysis. They represent possible variations of the master plan and all have a number of common elements. Most of the options incorporated a variety of types of sources with one exception. In the last scenario, recycled wastewater from the LMWQCC was used to supply the whole of Canberra. Within each scenario, further testing of individual supply connections and alternatives were investigated to determine preferred supply and routing options for individual demands although it is recognised that more detailed investigations for each source will be required at a later date to optimise these. Lake Burley Griffin (under the jurisdiction of the National Capital Authority) is currently used to provide irrigation to public open spaces and other demands, such as the Australian National Botanic Gardens. However, only Territory controlled stormwater sources are considered in this report. The following scenarios were considered:

1.1 Scenario 1

Scenario 1 shown in Figure 1 involved a broad mix of stormwater, wastewater and ASTR sources with emphasis on maximising stormwater harvesting opportunities. Sources used included proposed stormwater ponds and the existing large lakes and ponds, Lake Ginninderra, Lake Tuggeranong and Gungahlin and Yerrabi Ponds. Identified opportunities for stormwater reuse such as Flemington Ponds and several sites in the southern areas of Canberra were utilised. This option would provide the greatest benefit to waterways within Canberra through minimisation of stormwater excess flows and pollutant loads and also a resilient system with a diversity of sources. Recycled wastewater was used to supply the Molonglo Valley development and South Canberra as there are not sufficient stormwater resources in these areas to supply demands, while the existing Fyshwick scheme (NCRWS) is retained.

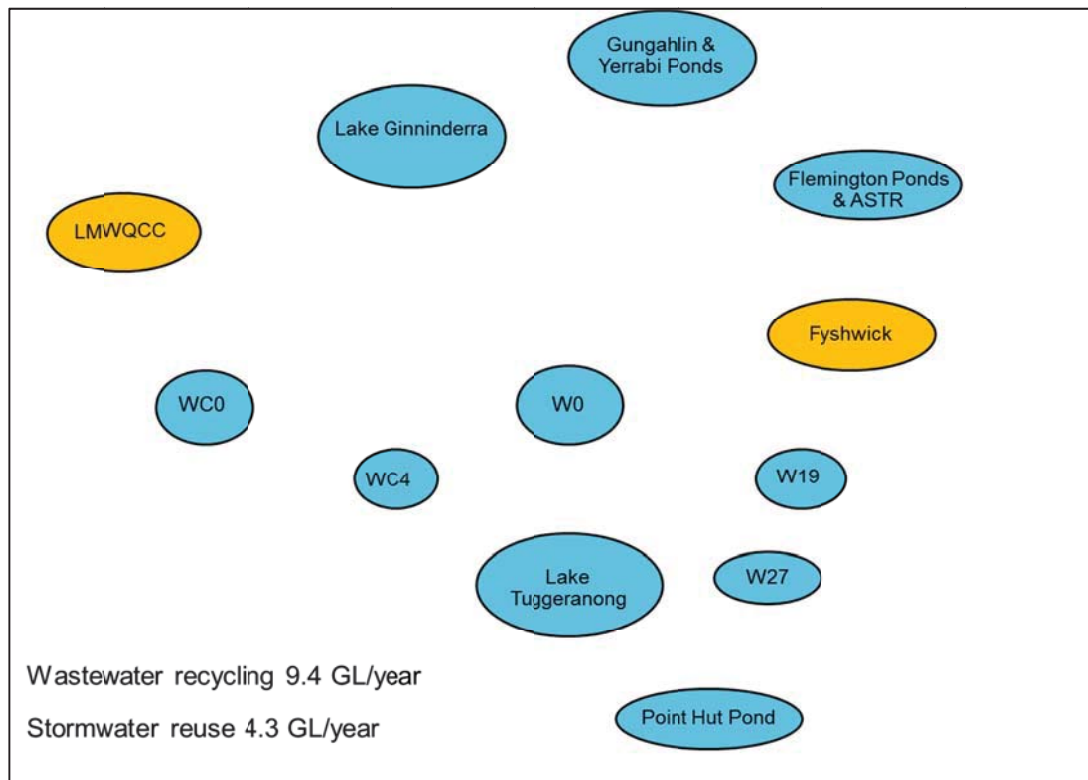


Figure 1 Scenario 1

1.2 Scenario 2

In Scenario 2, see Figure 2, recycled wastewater from LMWQCC was extended south to meet demands in the Tuggeranong area and replaced Lake Tuggeranong and the smaller ponds in the area to understand whether wastewater recycling may be more cost effective for these areas. The results suggest that this does not improve the cost effectiveness of the overall system and that the marginal local cost of supply from LMWQCC to these areas is higher than the local alternatives. Lake Tuggeranong has the potential to provide a large and cost effective reuse scheme in its own right and is sufficiently isolated from any practical alternatives that it provides the best opportunity to service Tuggeranong, Kambah, Woden Valley and surrounding areas. The smaller stormwater ponds through the southern areas of Canberra can optionally be adopted with some being more costs effective and others less cost effective than relying on either Lake Tuggeranong or LMWQCC.

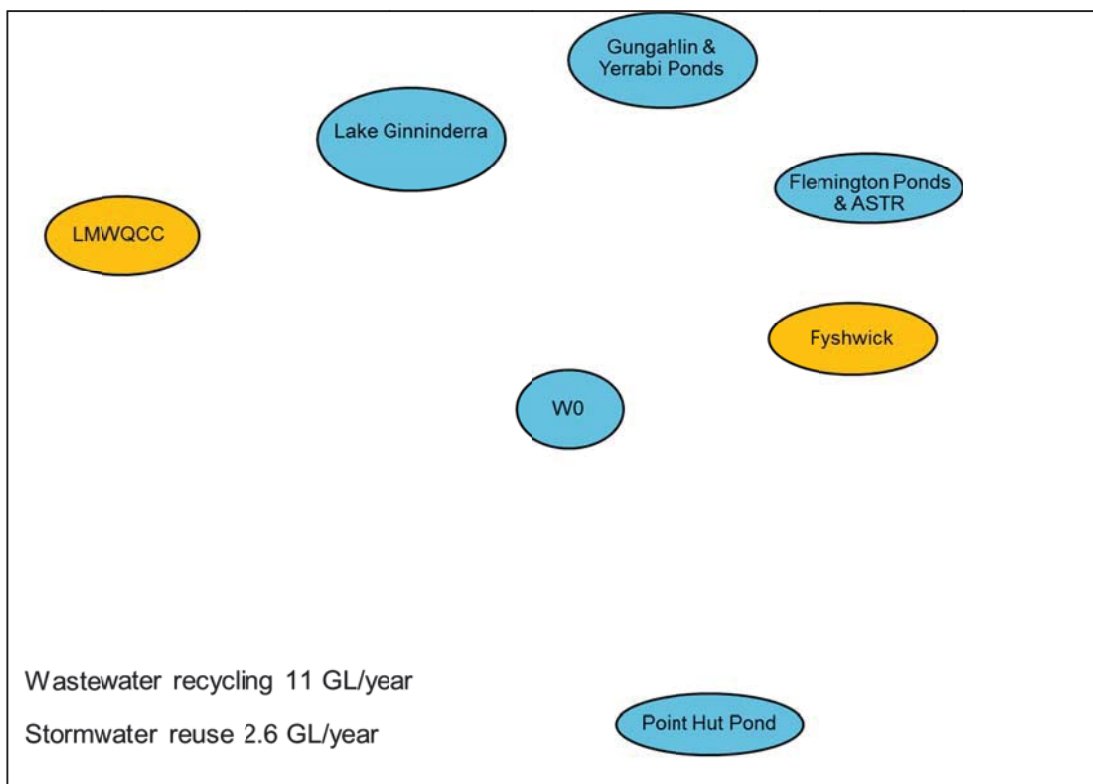


Figure 2 Scenario 2

1.3 Scenario 3

Scenario 3, see Figure 3, builds on the first scenario with the LMWQCC servicing South Canberra and connected through to the NCRWS as suggested in previous studies, while Lake Tuggeranong and other smaller stormwater ponds are used to service Tuggeranong and other areas as appropriate. The connection through South Canberra would allow LMWQCC to either replace or supplement flows from Fyshwick to the NCWRS. The scenario assumes it will be replaced. It is clear from this scenario that LMWQCC can provide recycled wastewater at a lower unit cost than Fyshwick even allowing for the longer reticulation systems needed. While this may change if Fyshwick were to be upgraded to allow recycled wastewater to be supplied at a lower cost, the present findings appear to confirm the recommendations of previous studies to provide a connection from LMWQCC to the NCWRS and this Scenario provides a more cost effective outcome than either of the first two scenarios.

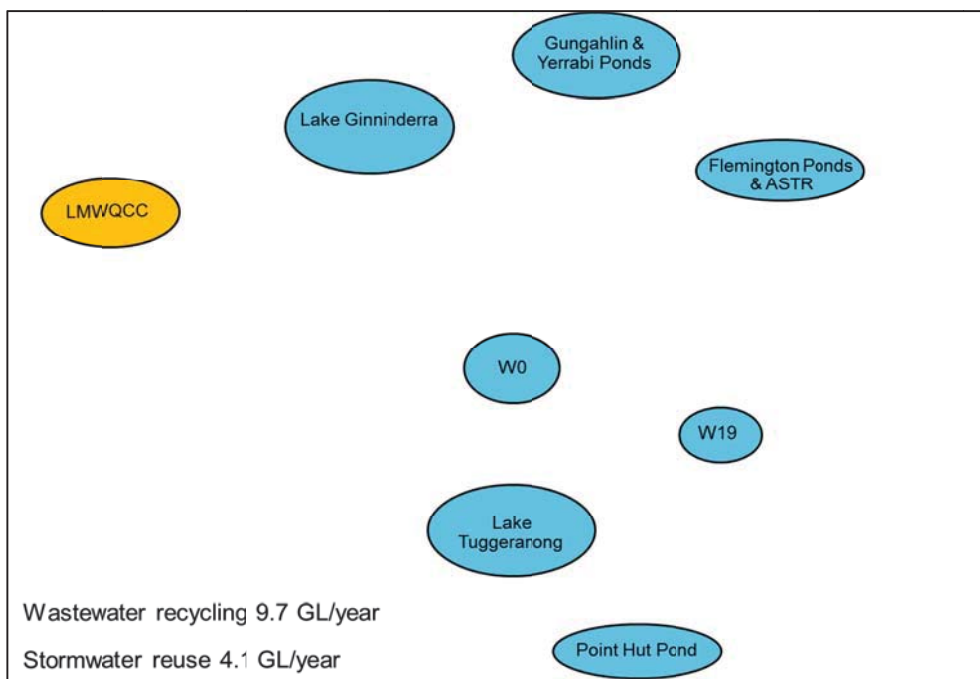


Figure 3 Scenario 3

1.4 Scenario 4

An alternative strategy was considered that was similar to Scenario 3 for the areas south of Lake Burley Griffin while Lake Ginninderra was connected to the NCWRS to service demands throughout North Canberra and LMWQCC and Lake Tuggeranong serviced the South Canberra area similar fashion to Scenario 3, see Figure 4. This proved to be quite a cost effective strategy. However, the total yield for this strategy and its flexibility was somewhat limited as the capacity of Lake Ginninderra was not sufficient to service all demands of the NCWRS and the developments of Kenny and Throsby in the north-east.

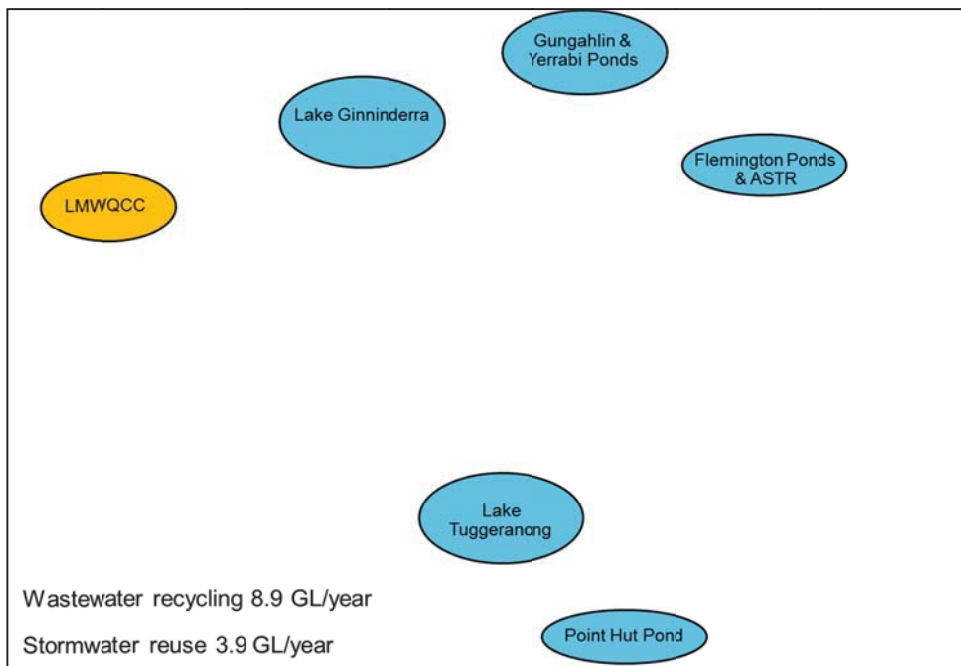


Figure 4 Scenario 4

1.5 Scenario 5

Lastly, consideration was given to the potential to supply recycled wastewater to the whole of Canberra from LMWQCC. The benefit of this would be a simplified and centralised system. However, while the total costs are comparable, it appears that this actually does not provide an optimal solution in terms of cost effectiveness for the utility. The system would also not provide any benefits to waterways within Canberra and depends on a single source, reducing its flexibility and resilience. It appears from this scenario that an integrated solution including a range of potential sources can provide a more cost effective outcome that will also have greater resilience and a broader range of environmental benefits.

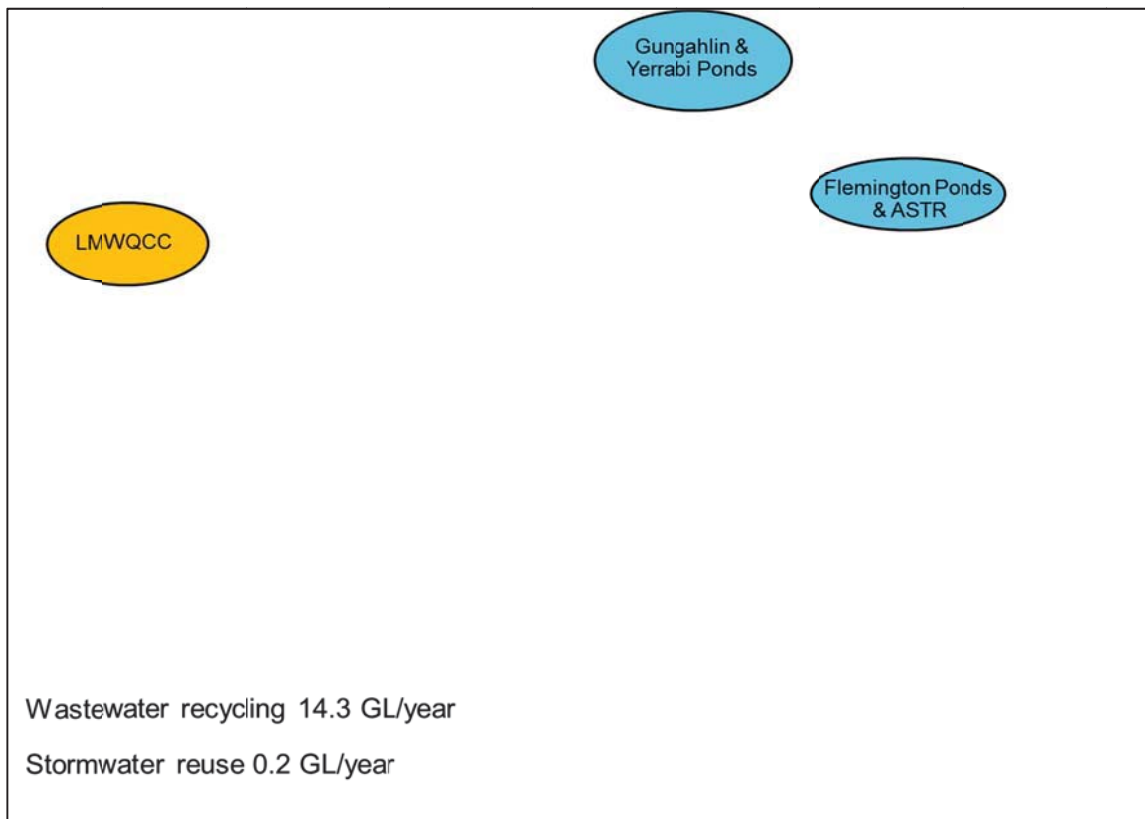


Figure 5 Scenario 5

The differences in reductions in stormwater excess and wastewater discharges as well as scenario costs are summarised in Appendix G.

