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title: # Use of detention storage and managed aquifer recharge to buffer water quality variability for drinking supplies

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Bank filtration has long been valued for water quality improvement and buffering of stream water quality changes that occurs in the aquifer between the stream and the water recovery well. The aquifer also plays a valuable role in producing drinking water supplies for a range of other managed aquifer recharge methods where source water is highly variable in quantity and quality, such as urban stormwater. In such systems some form of stormwater detention is required to allow time for recharge which occurs at a much slower rate than the rate of urban runoff during storm events. This detention storage also has the effect of mitigating some of the variability in quality, and in parallel with diffusive processes in aquifers can lead to a significant reduction in peak and mean concentrations of contaminants. The capability to monitor water in transit through the system can verify whether these "natural" treatment systems are effective and that residual risks are acceptable. Although aquifers are traditionally valued for their storage capabilities, it will become increasingly obvious in urban areas that both their treatment potential and their buffering capacity will be essential to establishing non-traditional water supplies. Public confidence with recycled water supplies also correlates closely with the natural processes that aquifers endow. These factors should create demand for better characterisation of urban aquifers to sustain water supplies in places where climate is drying and/or population is growing. This paper draws on several Australian case studies to illustrate these concepts and even puts a value on these treatment processes by comparing them with alternative engineered treatments that have the same effect.

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