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Meadows, South Australia: development through integration of local water resources

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Abstract

Meadows, on the outskirts of Adelaide, South Australia, does not have a reticulated water supply, and connection to the state's regional network is considered too costly, but it has its own sewerage system. A water resources management plan was prepared to demonstrate how integration of local water resources — rainwater, stormwater, and sewage effluent — can allow the town's population to grow from 800 to 2,400, the limit within the statutory town boundary. Due to the average rainfall being over 800 mm/a, rainwater tanks have been assessed to be adequate for all in-house uses, excluding toilet flushing. A combination of the reclaimed sewage effluent and harvested stormwater resources was found adequate for all non-potable uses including toilet flushing, household gardens and public open space. Class A quality reclaimed water is proposed for the reticulated non-potable supply. Seasonal balancing storage in dams was found feasible. The alternative of aquifer storage and recovery for stormwater is feasible subject to proving trials. Costs are estimated to be approximately the same as conventional servicing. The advantage of the holistic integrated urban water resource management approach is that the town will virtually generate sufficient additional water as it grows to meet its expansion requirements.

Keywords: Integrated urban water resource management; Rainwater tanks; Reclaimed water; Harvested stormwater; ASR

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1. Introduction

Meadows is a town with a population of 800, 30 km SE of Adelaide in South Australia (see Fig. 1), which has been constrained from developing to its full potential within its 131-ha statutory township boundary, principally because of the lack of a reticulated water supply. The existing properties obtain water from rainwater tanks for potable purposes and from groundwater, which is of variable quality and generally not suitable for in-house use. Connection to the SA Water regional distribution network is estimated at $4.2 million and considered prohibitive.

Located within the eastern Mt Lofty Ranges, the town is in the River Murray catchment with its run-off draining via Meadows Creek to the Finniss River and eventually to the River Murray. As this system is under stress due to excessive water use and the need for improved environmental flows, development policy restricts additional diversions of water for town supplies.

As a consequence, the District Council of Mt Barker commissioned Australian Groundwater Technologies (AGT) to undertake the preparation of a local water resources management plan (LWRMP) for Meadows. AGT engaged subconsultants Richard Clark & Associates (RCA) for surface water assessment and hydrologic modelling, and InterWater for water and wastewater engineering. The study team also included environmental management and town planning specialists.

The LWRMP addresses opportunities of using groundwater, surface water and wastewater resources to develop Meadows' water supply needs for the next 20 years in a sustainable, self-sufficient context. The plan is currently under consideration for adoption by Council (February 2005).

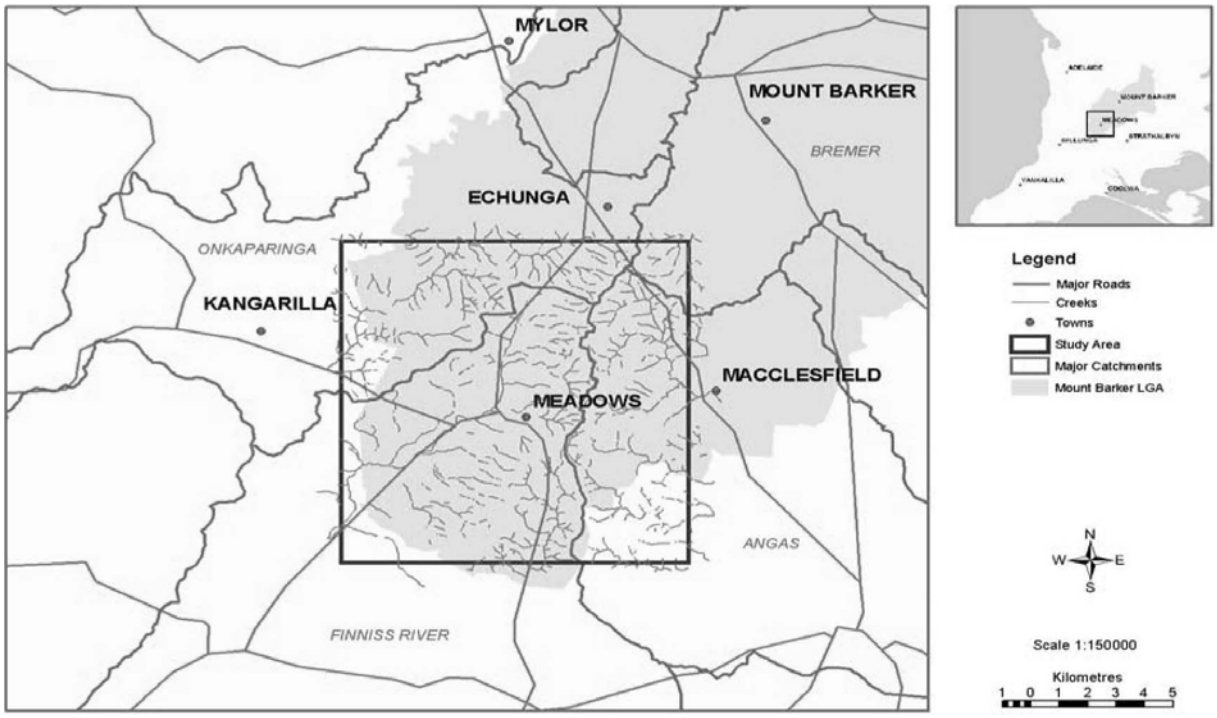

Fig. 1. Meadows locality plan [1].