CRC for Water Sensitive Cities

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CRC Project B2.4: Hydrology and nutrient transport processes in groundwater/ surface water systems

Groundwater Control and Supply

for Sustainable Urban Development

Introduction

Urban development in low lying land has two primary water related management issues:

1. Providing a water source in over-allocated areas earmarked for urban development.

2. The massive cost and volume of imported fill to raise the site

This project aims to provide a water source through aquifer storage and recovery (ASR) of subsurface drainage water. Groundwater mounding between subsurface drains will also be assessed to estimate fill for infrastructure protection.

Groundwater Mounding

Groundwater mounding between subsurface drains is being measured at two urban sites in Perth, Western Australia.

To date, groundwater mounding of approximately 0.5 to 0.8m has been measured between subsurface drains that are located ~80m apart in road verges. Figure 1 shows one project site and Figure 2 shows the subsurface drainage concept. Monitoring will continue until late 2016.

Monitoring results will be used to predict groundwater mounding between subsurface drains in urban developments. This will in turn be used to estimate fill requirements for infrastructure protection and to minimise unnecessary use of the resource.

Subsurface Drain Quantity and Quality

Subsurface drain quantity and quality is being measured at the two urban sites. The results will be used to assess the feasibility of using subsurface drainage water for ASR.

Preliminary flow monitoring shows ASR of subsurface drainage water can provide several times a development's own public open space irrigation need (Figure 2). The surplus could be on-sold to other water users or to supplement wetlands in drier months.

Quality sampling indicates subsurface drain water has elevated nutrients and iron, which will need to be treated prior to injection. The project will assess treatment options to determine whether ASR is environmentally, economically and operationally feasible.

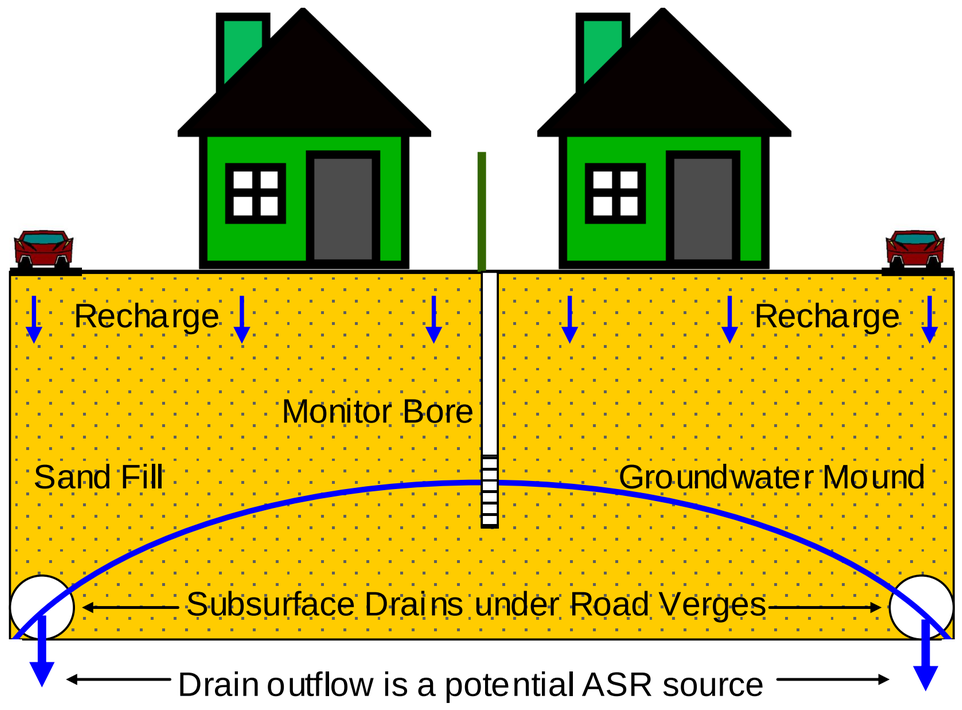
Figure 1: Monitoring Locations at Project Site

Rain Gauge and Backyard Bore

Installing Bore

Subsurface Outlet

Figure 2: Subsurface Drainage Concept



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