

Performance Story

Shepparton Irrigation Region Groundwater Management

Terry Hunter, August 2008

The Shepparton Irrigation Region (SIR) covers an area of about 500,000 ha of Northern Victoria and is extensively developed for irrigation (about 280,000 ha irrigated in 1989). Irrigation is predominately by gravity surface water, however groundwater is extracted from shallow (Upper Shepparton Formation) and deep (Calivil Formation and Renmark Group Deep Leads) groundwater systems.

In natural (undisturbed/pre-development) conditions regional groundwater levels are thought to have been 15m to 30m below surface and the Upper Shepparton Formation was generally not saturated. Infiltration from rain and flooding to groundwater would have been in balance with regional groundwater flows "down basin".

With irrigation development infiltration of water past the root zone increased and groundwater levels rose (an example of groundwater/surface water interaction) and from the 1930s onwards rising groundwater levels induced waterlogging and salinity problems for agriculture and the natural environment.

A response to this was to develop a community based Salinity Management Plan. This was endorsed by government in June 1990. Since then the Implementation Committee has developed a number of programs to encourage irrigators to undertake catchment works that are intended to improve irrigation management and efficiency. The strategy and programs (now part of the SIR Catchment Implementation Strategy) are specifically designed to:

- improve the efficiency of water use on farms;
- reduce the amount of water lost to the watertables or into the drainage network;
- protect the land and water resources from rising watertables; and
- protect the catchment and its downstream rivers from any adverse impact of irrigation.

One of the main mitigation strategies for high groundwater levels has been promotion of groundwater extraction from the Upper Shepparton Formation. This groundwater extraction is a form of water recycling because water in the Upper Shepparton Formation is principally irrigation drainage water.

The Shepparton Irrigation Region Water Supply Protection Area Groundwater Management Plan was established in 1999 to manage extraction from the Upper Shepparton Formation to support SIR Catchment Implementation Strategy objectives.

As a result of groundwater extraction and drought conditions groundwater levels have fallen significantly across the SIR in recent years. A drier climate and improved irrigation efficiency is likely to lead to further reductions in groundwater levels.

Issues:

The opportunity (and need) for recycling irrigation drainage water by extraction from the Upper Shepparton Formation is likely to decrease. Accordingly allocation, extraction arrangements and management should reflect the uncertainty and risk associated with extracting water from the Upper Shepparton Formation as a resource.

The Shepparton Irrigation Region Water Supply Protection Area Groundwater Management Plan may be of limited value for groundwater resource management because it does not have a Permissible Consumptive Volume (PCV) or mechanisms to control water usage on a seasonal basis. Also the variability of the Upper Shepparton Formation and lack of contiguous aquifers means it is not feasible to manage groundwater as a transferable and tradable resource in most areas of the SIR.

The current licensing arrangements under the Water Act do not reflect the "opportunistic" nature of water in the Upper Shepparton Formation. Unbundling of groundwater entitlements (and incorporation of these entitlements into Water Use Licenses) may provide an opportunity to implement more suitable management arrangements. Care will need to be taken to ensure any new management framework recognises that:

- Water in the Upper Shepparton Formation is principally irrigation drainage water; and
- Variability of the Upper Shepparton Formation and lack of contiguous aquifers means it is not feasible to manage groundwater as a transferable and tradable resource in most areas of the SIR.

Reduced infiltration to groundwater is likely to have some impact on Deep Lead groundwater system recharge volumes, however the management plans established for these groundwater systems have PCVs and mechanisms to control usage on a seasonal basis. These groundwater systems are also relatively homogenous and groundwater can be managed as a

transferable and tradable resource. Decreasing water quality in the Deep Lead groundwater systems due to salt loads in recharge water may pose a future risk to the resource.

SIR Catchment Implementation Strategy programs for management of risk from high groundwater levels will need to be reviewed in light of changing climate, infiltration and groundwater extraction conditions.

The Way Forward:

Groundwater resource managers and catchment managers are working together to develop strategies to deal with the changing environment in the SIR. The following conceptual approach has been developed and engagement with key stakeholders has already started.

1. Review the SIR total water balance in light of changing climatic conditions and improving irrigation efficiency
2. Reassess local, regional and basin salt management requirements
3. Assess SIR groundwater resource availability and management options
4. Develop salinity and resource management strategies in consultation with key stakeholders
5. Implement agreed management strategies with appropriate monitoring and adaptive management