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MDBC

Dear Dr McLeod,

I am writing to you with the authority of the Groundwater Technical Reference Group (GTRG) to submit their response and recommendations to the *Review of the Operation of the Cap (Draft)*. The GTRG is an expert reference group set up by the Murray-Darling Basin Commission to provide Basin-wide perspective and advice on groundwater issues. The integration of groundwater and surface water management has been identified by the GTRG as an issue that must be addressed if sustainable management of the total water resource is to be achieved.

Existing MDBC Groundwater Policy

The MDBC has responsibilities to manage the surface waters of River Murray. The MDBC responsibilities relating to the management of groundwater are reflected through policies on natural resource management, and the objectives of the Basin Sustainability Program (BSP - which directs Strategic Investigation and Education funding). The BSP objectives of most direct relevance to groundwater are:

- Ensuring the sustainable use of groundwater resources (Irrigation and Dryland Sub-programs)
- Protecting groundwater quality (Irrigation and Dryland Sub-programs)
- Maintaining key ecological processes (Irrigation and Dryland Sub-programs)
- Maintaining and enhancing the sustainable productive capacity of the land resource base by slowing or reversing rising groundwater tables (Dryland Sub-program)
- Improving the quality of the water in streams, rivers and groundwater for environmental, consumptive and recreational uses including by implementing appropriate flow regimes (Riverine Environment Sub-program)

The Dryland, Irrigation, and Riverine Environment Sub-program Strategic Plans all identify the development of an integrated policy for the planning and managing the sustainable use of surface and groundwater resources as a key priority.

Benefits of Integrating Groundwater Management with the Cap

Were the correct management tools available, natural interactions between surface and ground water resources clearly indicate the advantages of a single policy for total water resource management. The GTRG considers the most pressing of these interactions to be the

groundwater base-flow contribution to surface flows, and how these are effected by groundwater management.

Potential developments of groundwater management that may effect the Cap are:

- groundwater trade and impacts on the Cap through trade potential with surface water and decreased base-flow contributions to rivers;
- over-allocation of the total water resource resulting from independent allocations of groundwater and surface water (partially constructed of base flows of groundwater origin); and
- water quality impacts of groundwater contributions to surface water flows.

MDBC investments in surface water management (including BSP investments and activities such as the *Sustainable Rivers Audit*, Environmental Flows and the *Basin Salinity Management Strategy*) cannot currently take full account of groundwater and surface water interactions. Improved knowledge of these interactions would enable improved predictions on related issues such as the continuity of base-flows and terrestrial ecosystem groundwater requirements (which are currently effected by independent management of groundwater).

Issues Limiting Integration of Groundwater with the Cap

Difficulties of integration are based on origin of the Cap as a surface water (as distinct from total water resource) management tool. Not only are the management timeframes for groundwater vastly different from those for which the Cap was designed, but the surface water management axiom of promoting water efficiency is not consistent across groundwater resources.

Groundwater resources fall into the four management types identified in Figure 1 (see following page). Water efficiency is a priority for areas where usage exceeds sustainable yield of an aquifer, whilst the conflicting priority of increasing water usage exists for those aquifers where usage is well below recharge rates (maximal potential for salinity and/or waterlogging).

Allocation and usage relationships across the four types recognise that the groundwater users manage usage while the State can control the allocation. This management philosophy has been recognised in the MDBC *Salinity and Drainage Strategy*, and will be reflected through the *Basin Salinity Management Strategy* (due for public release in early 2001). The existing Cap does not provide for such variable management requirements.

Figure 1 illustrates that total groundwater recharge is comprised of sustainable yield and environmental provisions. The four major types of ecosystems defining groundwater environmental provisions are: terrestrial vegetation, base-flow, aquifer and cave ecosystems, and wetlands (Hatton T and Evans R, *Dependence of ecosystems on groundwater and its significance to Australia*; LWRRDC, 1998). Sustainable yield can therefore not be determined without a clear understanding of base-flow requirements of the river system, and how these are being effected by current groundwater usage.

There is currently very poor understanding of groundwater contributions to river base flows, and the river water quality impacts of these contributions. The GTRG has identified the need for initial estimates of this kind as a high priority for both surface water and groundwater management, and is currently seeking funding for this work through the MDBC.

Outside the large alluvial abstraction areas where metered production bores are monitored by inspectors, knowledge of how much groundwater is being diverted within the MDB (and how

this effects base-flows) is also largely unknown. The National Land and Water Resources Audit (NLWRA) has some macro-scale information based indicating that about 1% of groundwater usage that is currently metered. Each of the jurisdictions is preparing water compliance implementation policies to provide a framework into how this essential knowledge will be managed.

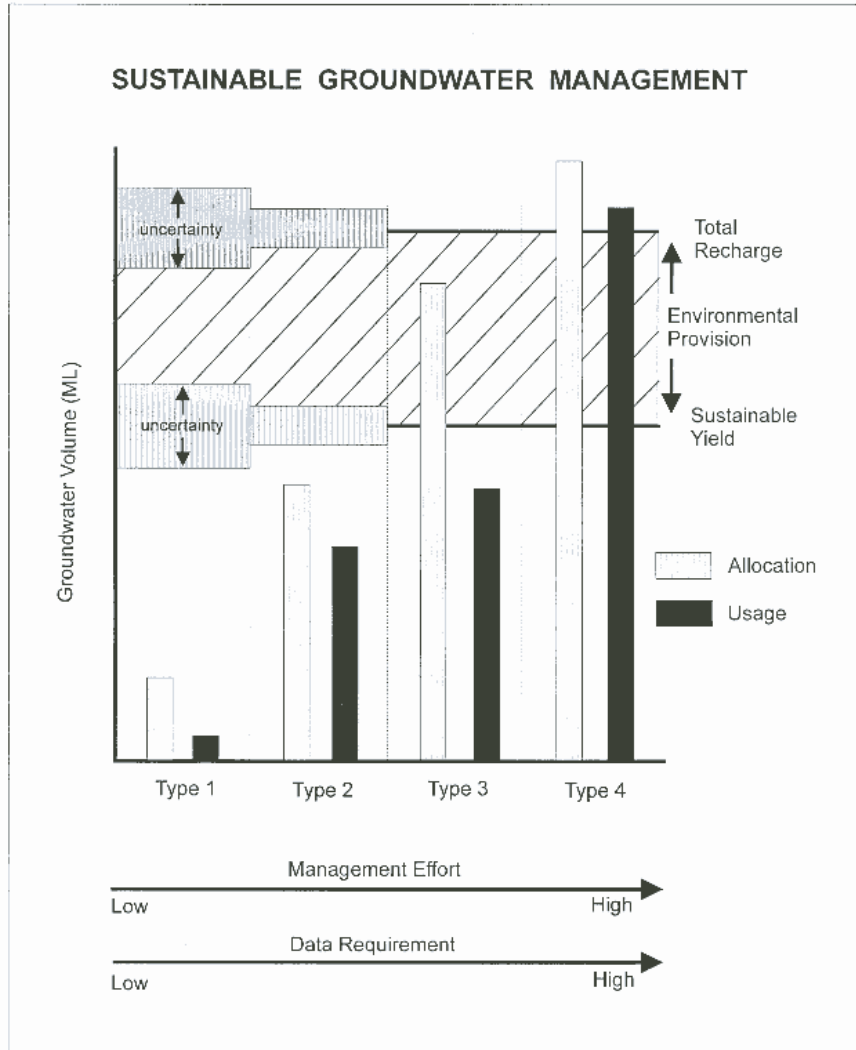


Figure 1: The four groundwater management types

Knowledge and monitoring of these fundamental links between surface water and groundwater are essential to an effective total resource management policy.

Major Contemporary Activities in Groundwater Management

The MDBC published an initial groundwater status report (1992). An update of this report is anticipated for release in 2002. These reports provide baseline data essential to sustainable groundwater management at a Basin scale.

Many Basin States are currently progressing towards management of groundwater allocation and usage through the concept of sustainable yields. The GTRG believes there is scope to develop the concept of sustainable yields through appropriate guidelines to streamline groundwater management the MDB in the spirit of the Cap, without undermining State management responsibilities of these resources.

This option relies on a consistent definition of sustainable yield being adopted across the Basin States and Australian Capital Territory (ACT). Alignment of the sustainable yield concept to the MDBC Charter requires further development of the definition agreed by the National Groundwater Committee (June 2000):

"The groundwater extraction regime, measured over a specified planning timeframe, that allows acceptable levels of stress and protects the higher value uses that have a dependency on the water."

The GTRG considers the definition needs to be placed in an operational framework with common methodologies and auditable outcomes developed. It is only through these actions that a commonality of sustainable resource management outcomes will be achieved (see 'Recommendations' below).

The NLWRA has some initial sustainable yield estimates (based on macro-scale information on usage) which could be developed into effective management tools through linkage with the surface water Cap.

Recommendations

The GTRG recommends that:

1. The MDBC adopt the policy of a Basin-wide approach to groundwater management. The adoption of this policy should be on the understanding that it will operate in conjunction with the surface water Cap under an over-arching policy on total water resource management.
2. The GTRG be directed to develop a Groundwater Management Strategy based on a sustainable yield system which gives effect to a Basin-wide approach to groundwater management. The following points would maximise the effectiveness of this strategy and are recommended for incorporation:
 - (i) Operationalise the 'sustainable yield' definition to recognise groundwater base flow contributions to rivers and the requirements of groundwater dependent ecosystems;
 - (ii) Sustainable yields should be up-dated on the jurisdictional management review cycles as knowledge on groundwater resources is improved; and
 - (iii) A system of auditable outcomes be developed so that the status and level of management of the MDB resources can be assessed.
3. Effective annual monitoring of groundwater diversion and recharge be reported by the MDB jurisdictions through processes already in place for surface water. This should be accomplished on the basis of each of the jurisdiction's compliance implementation policy. It should be noted that while large addition expenditure is not envisaged, the future

viability of the Cap may well be negatively impacted through ineffective and poorly informed groundwater management.

Comments or responses to this submission are welcomed by the GTRG, and may be forwarded through Imogen Fullagar (Executive Officer) at:

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Yours sincerely,



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