MINISTER FOR THE ENVIRONMENT AND HERITAGE

Review of Environmental Conditions on Management of the Gnangara and Jandakot Mounds – Public Water Supply Allocation 2002/03

This is the second review of proposed annual allocations for public water supply from the Gnangara and Jandakot Mounds considered by the EPA. Although it is being undertaken notionally under the Section 46 review of environmental conditions applying to the Gnangara and Jandakot Mounds, it is more part of a compliance review. The Water and Rivers Commission (WRC) has responsibility for the environmental conditions and achievement of the environmental criteria set by the Minister for the Environment in 1992, 1995 and 1998.

The WRC has prepared a report to the EPA which (i) advises of the intended groundwater allocation for 2002/03 to the Water Corporation, (ii) describes implementation of the management initiatives put in place during the 2001/02 summer and outcomes, and (iii) describes the proposals for management of the resource and expected performance over the forthcoming summer, including expected outcomes. The report also describes the individual projects proposed as part of the overall review of environmental conditions, to the extent that they have been scoped at this time. A copy of the WRC report is attached for your information.

Following negotiations with the Water Corporation, the WRC has sought the endorsement of the EPA to the allocation of 167 GL of groundwater for public water supply for 2002/03, together with the suite of mitigation actions proposed in the report.

The EPA has been advised that the Board of the Water and Rivers Commission considered and agreed on 8 November 2002 to this public water supply allocation, subject to several conditions:

1. Water Corporation works with the Commission to develop an agreed program for accelerated source development to relieve pressure on Gnangara Mound as soon as possible (this is also a condition of the recent approval for an additional 15 GL/yr of water from the Yarragadee Formation and is ongoing).
2. Receipt and approval by the Commission of a Water Corporation report on its proposal to extract six GL from the Lexia wellfield during 2002/03.
3. Approval by the Water and Rivers Commission of a recently received report on environmental water provisions associated with the recently constructed West Mirrabooka wellfield.
4. Approval of a strategy to reduce Water Corporation groundwater abstractions in key risk areas in future years in accordance with a set of surface water storage "trigger levels".
5. Implementation of a range of mitigation strategies as summarised below:

   Public Water Supply
   - Continued imposition of Stage 4 water restrictions with the potential to move to Stage 6 restrictions if Stage 4 ineffective in reducing demands to acceptable levels.
   - Accelerate the Water Corporation source development program to relieve demand on existing groundwater assets as soon as possible.
   - Implement an agreed public water supply groundwater abstraction reduction strategy based on potential surface water storage scenarios over next three years.
   - Contribute to the Yanchep Caves emergency recovery strategy.
   - Pursue per capita public water use target of 155 kL/yr.

   Private water supply
   - Continue pursuit of the suite of private abstraction management initiatives proposed in the Stage 1 report to the EPA (Water and Rivers Commission 2001) and approaches developed since that time.
   - Implement recommendations of equity issues report (Welker Environmental Consultancy 2002) to reduce non-essential low-value groundwater abstractions in sensitive areas.
   - Consider purchase of private allocations on temporary or permanent basis in key risk areas to reduce abstraction levels.

   Environmental management
   - Continue wetland supplementation as proposed for Lake Jandabup and review arrangements for Lake Nowergup and Coogee Springs).
   - Review overall arrangements and examine potential for further supplementation in other areas.
   - Contribute to Yanchep Caves Strategy to artificially supplement water levels in caves.

- Review groundwater and environmental monitoring systems and implement recommended improvements.

Other

- Public communication strategy to ensure community is aware of potential for widespread and significant environmental impacts to be experienced in the study areas, irrespective of the levels of abstraction undertaken.
- Improved management (thinning and clearing programs) of pines on the Gnangara Mound to maximise groundwater recharge in key risk areas.
- Pursue the inclusion of water as a primary consideration in planning for Gnangara Park.
- Pursue the potential for wastewater to be treated and used for Aquifer Storage and Recovery in critical areas.

This letter provides the EPA's advice on the proposed allocation by the WRC, which was considered by the EPA at its meeting on 21 November.

There is an increasing trend of progressively lower levels being recorded in wetlands and the groundwater over a larger portion of the Gnangara Mound. Groundwater levels over much of the Gnangara Mound in September 2002 were lower than at the end of 2001 winter and these sites were also at their lowest recorded levels.

The recent Water Forums and Water Symposium have highlighted the need to provide for basic health requirements while acknowledging the need to reduce overall per capita consumption and to protect the range of water dependent ecosystems and other environmental, social, cultural and economic values dependant on or related to the water resource.

Following a review of modelling carried out by the Water Corporation to predict changes in groundwater levels arising from a range of water allocations (135 GL, 150 GL and 167GL), the WRC and Water Corporation agree that there is little difference in the predicted reductions of groundwater levels. It appears from the modelling that even a significant reduction from the Gnangara Mound from the 167 GL requested by the Water Corporation will not lead to environmental improvement in the short-term. This is primarily due to a number of factors, including the very low groundwater levels recorded at the end of winter 2002. Rainfall was lower than average, leading to diminished recharge, on top of generally low groundwater levels prior to winter rains this year. In addition, the WRC advises that the design and operation of the bores are intended to reduce impacts on sensitive areas on the Gnangara Mound. This is explained in more detail in section 6.2.2 of the WRC report.

An important consideration for the EPA is the clear desire to reduce groundwater abstraction from the Gnangara Mound as quickly as possible. Two aspects give the EPA some optimism in relation to this matter. The Water Corporation has been

continuing to invest in a range of new water supply sources, and these will progressively be available to the Integrated Water Supply Scheme within the next three years. Included within the proposed allocation for 2002/03 is an additional 15.2 GL of groundwater capacity that has been constructed since the 2001 annual progress report. This is available from new Yarragadee bores in the Gwelup Scheme and the West Mirrabooka superficial bores (Mirrabooka Scheme).

In addition, the Water Corporation and WRC are working towards an agreed set a supply rules relating to groundwater abstraction and surface water levels. This is explained in section 8 of the WRC report, where there is an emphasis on a groundwater recovery strategy.

Despite the new investments in sources by the Water Corporation, there is no assurance that this level of groundwater allocation (167 GL) will not be required next year (2003/04). In fact, Table 16 in the WRC report suggests that there is a one third probability of the need for 165 GL to be drawn next year. Without significant above average rainfall next winter, this abstraction combined with low groundwater levels would almost certainly cause areas on the Gnangara and Jandakot Mounds to experience severe stress and further decline.

Of course another key part of the Water Corporation's groundwater recovery strategy is increased groundwater recharge. This raises the EPAs ongoing concern about the effect of the pine plantations on recharge. This was mentioned in the EPA letter last year and remains a major issue, despite the Wesbeam LVL Agreement signed this year.

In 1987, an environmental condition was applied to the development of further groundwater schemes on the Gnangara Mound by the then Water Authority, in recognition of the adverse affect of pines on groundwater recharge and levels. The wording of the 1987 condition is:

> "The pine plantations in State Forest 65 should be managed with the objective of achieving and maintaining their water use at a level that is no more than that of the pre-existing native vegetation. This should be based on progressively moving towards an average basal area within the pine plantation of approximately 11 square metres per hectare."

While there is some question about the appropriateness of the 11 square metres per hectare basal area criteria in the condition, the intent of the condition remains and has even greater relevance today. While the condition is still current, it does not apply to the Department of Conservation and Land Management (CLM) (which agreed to the requirement at the time) nor to the Forest Products Commission (which now owns the pines). To overcome this problem, a Memorandum of Understanding was agreed between the Department of Conservation and Land Management and WRC in 1999. Although there has been some progress in reducing the density of pines in some areas on the Gnangara Mound, the Wesbeam LVL Agreement is now a potential impediment to the timely removal of and

improved management of pines in areas which are critical to the protection of significant environmental values (such as Yanchep National Park and its threatened ecological communities) and groundwater recharge on the Mound.

Declining groundwater levels across the Gnangara Mound has lead to increasing concern about the environmental values of the Mound. This has been brought into sharpest focus in the caves of Yanchep National Park, where water levels are below those required to support the threatened ecological communities found in the root mats of Tuarts. These communities are now being artificially maintained, but there is concern that there may have been loss of some species. The EPA commends the efforts of CLM, WRC and Water Corporation to protect the Yanchep communities. Other areas on the Gnangara and Jandakot Mounds, including a number of wetlands and also areas of native vegetation, are also experiencing increasing decline in health including tree death.

In view of the importance of these issues, CLM made a submission to the WRC on the intended allocation for 2002/03, emphasising the need to protect Threatened Ecological Communities at Yanchep and on the eastern margin of the Gnangara Mound (WRC Report Appendix 7). The WRC has indicated that it's management approach is not inconsistent with that suggested of CLM.

In relation to the proposed allocation of 167 GL to the Water Corporation, it seems to the EPA that there are very limited options available. On the one hand, to require a significant reduction in the proposed allocation would result in increased water restrictions (i.e. outside sprinkler bans) and would not lead to improved environmental conditions (according to Water Corporation modelling referred to in the WRC report). On the other hand, agreement to the 167 GL would possibly avoid increased restrictions this summer (unless the water saving target is not met) but would require accepting the significant environmental risk to portions of the Gnangara Mound.

Although the EPA remains very concerned about the environmental consequences, it concurs with the position of the Water and Rivers Commission in allocating 167 GL from the Gnangara and Jandakot Mounds in 2002/03 to the Water Corporation.

In taking such a position, the EPA is also aware that this allocation is predicted to lead to a total of 18 breaches in environmental conditions applying to groundwater management on the Gnangara and Jandakot Mounds. These are described in section 7 of the WRC report. This represents a 50 per cent increase over the 12 breaches recorded in 2001/02. Four sites (Lake Nowergup, Lake Wilgarup, Beenyup Road Swamp and Lake Joondalup) are predicted to experience a severe or significant to severe threat to their environmental values. Each of these sites is more likely to be subject to effects from private abstraction than public abstraction, and clearly climatic influences also play a part. The WRC has made commitments in relation to mitigating the effects on these and other sites.

The WRC report advises that "a severe response (threat) indicates the potential for a 'threshold response' with high tree mortality rates". It also advises that, in relation to upland vegetation, "the vegetation now indicating slight stress would be severely stressed at the end of summer. The long-term recovery potential of the vegetation under these high stress conditions is a concern, rather than the short-term outlook." In general, there continues to be the threat of more general dramatic decline in environmental health of vegetation in the even of particularly severe climatic conditions this summer. The level of stress evident in vegetation has increased over more of the Gnangara Mound.

This matter was also highlighted by the Peer Review Panel established as part of the current section 46 process for reviewing environmental criteria on the Gnangara and Jandakot Mounds. The Panel advised the WRC and EPA that there is a need for a risk assessment for the coming summer. They have expressed concern about the likelihood of severe weather conditions conducive to tree deaths, the extent of area most likely to be affected by such conditions, ability for systems to recover from such impacts, whether it is possible to identify areas of greatest vulnerability and the extent to which these site have environmental values which are represented elsewhere. The Panel has suggested that management strategies should be devised in advance to mitigate the range of expected impacts.

The EPA encourages the WRC, with the participation of the Water Corporation and CLM, to develop such management strategies and responses, particularly for areas which are most vulnerable to significant threat. The EPA is aware that the WRC is also preparing a communication strategy for this summer to inform the community about the increased risk to the environment of the Mounds.

In its advice last year, the EPA expressed concern about the reliance on managing public water supply abstractions where private abstraction may be having an equal or more substantial influence on wetland or groundwater levels. The EPA also indicated that, in the event that cooperative initiates do not achieve required outcomes, moves towards more structural initiatives to protect the environmental values might be required. This remains an issue for the EPA, particularly in the light of the severity of the predicted breaches. In addition, the WRC report indicates that there was very limited support from licenced private bores users for voluntary reduced abstraction, and any water saving has not been determined by the WRC. The EPA appreciates that this is a difficult matter for the WRC to deal with, but reaffirms its view that actions which will lead to improved protection of significant environmental values need to be taken now in relation to private abstraction.

In summary, the EPA agrees to the proposed allocation by WRC of 167 GL for 2002/03, and points out that a substantially smaller allocation is not predicted to achieve significantly different environmental outcomes or greater compliance with conditions. Both the Water Corporation and WRC are planning to substantially reduce public abstraction from the Gnangara Mound as soon as possible. This is to

be encouraged but the timing will be determined primarily by climate. The response of private bore owners to voluntary initiatives promoted by WRC is poor and not surprising. Although this is a complex issue, it will continue to present significant compliance difficulties for WRC unless initiatives achieve real water savings for significant, threatened portions of the environment. Supplementation of critical wetlands by the WRC is having varying success. In the longer term, the Water Corporation's intentions to investigate wastewater reuse and aquifer recharge should provide major environmental benefits. These programmes should be discussed further with the EPA, particularly in relation to actions and timeframes.

The need to review the implications of all abstraction from the Mounds is clearly important. The section 46 process currently underway for the Gnangara and Jandakot Mounds will address this in part, but a much broader approach may be required. The WRC will be discussing this with the EPA early next year

I will provide a copy of this advice to the WRC and also the Water Corporation.

Bernard Bowen
CHAIRMAN

16 December 2002