

Ass # 041

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MINISTER FOR ENVIRONMENT

STATEMENT THAT A PROPOSAL MAY BE IMPLEMENTED (PURSUANT TO THE PROVISIONS OF THE ENVIRONMENTAL PROTECTION ACT 1986)

GNANGARA MOUND GROUNDWATER RESOURCES

Water Authority of Western Australia

Stage 1 of the Pinjar Groundwater Scheme may be implemented, subject to the following conditions:

1. The Water Authority adhering to the proposal as assessed by the Environmental Protection Authority and fulfilment of the management commitments it has made. (copy of commitments attached)
2. Decisions affecting the management of groundwater resources of the Gnamagara Mound should be based on the concept of sustainable yield of resources and maintenance of ecological systems in accordance with the objectives of the State Conservation Strategy.
3. The Water Authority of WA shall manage public and private groundwater abstraction from the Gnamagara Mound in accordance with water quality and level criteria for wetlands determined by the Environmental Protection Authority. The criteria, which are specified in Appendix 1, shall be reviewed and varied from time to time by the Environmental Protection Authority to ensure that the social values and the ecological values of the wetlands are maintained.
4. The basis for management decisions and the criteria specified for conservation of the environment and of the groundwater resource of the Gnamagara Mound shall be subject to regular review by the Water Authority in conjunction with the State Planning Commission and the Department of Conservation and Land Management, to the satisfaction of the Environmental Protection Authority.

5. Management plans for the land managed by the Department of Conservation and Land Management (existing and proposed) on the Gnangara Mound shall include protection of native vegetation and wetlands as principle objectives for management. These management plans, as far as they relate to State Forest 65, shall clearly reflect the priority purpose for State Forest 65, ie, water production. Management objectives for the wetlands shall be consistent with the water levels specified by the Environmental Protection Authority.
6. The pine plantations in State Forest 65 shall be managed by the Department of Conservation and Land Management with the objective of achieving and maintaining their water use at a level that is no more than that of pre-existing native vegetation. This should be based on an average basal area within the pine plantations of approximately 11 square metres per ha.
7. The State Planning Commission and Department of Conservation and Land Management shall initiate the consolidation into managed conservation reserves, those wetlands and other native vegetation areas on the Gnangara Mound identified by the Environmental Protection Authority as having conservation value. For wetlands within the public estate, priority shall be for those which fall into:
  - . Category 1 (Wetlands of exceptionally high natural and/or human use attributes);
  - . Category 2 (Wetlands with relatively intact natural systems); and
  - . Category 3 (Wetlands which have been highly modified but which are considered to play important roles in their urban and/or rural settings),

of the Environmental Protection Authority's Draft Guidelines for Wetland Conservation in the Perth Metropolitan Area.
8. Where areas of high conservation value occur on private property, means for protecting and ensuring their management shall be initiated by the Department of Conservation and Land Management and State Planning Commission.
9. The private water allocation quotas proposed in the Environmental Review and Management Programme shall be reviewed and revised if necessary, to ensure that they meet the water levels for wetlands specified by the Environmental Protection Authority.
10. The current approach of the Water Authority in widely publishing the limits on groundwater availability for the Gnangara Mound be continued. These figures shall be updated and published annually with emphasis on those areas of high conflict for the use of the resource so that limits to growth and development can be clearly seen by all interested parties.
11. The Water Authority shall actively encourage further reduction in public water demand through its Water Conservation Strategy.

12. The Water Authority of WA should initiate a scheme whereby costs associated with the environmental management of the Gngangara Mound be identified as such and borne by the users of the water resource.
13. The Water Authority shall continue to review and develop methods to improve monitoring and control of all public and private bores, for the purpose of managing the water resource.
14. The Water Authority, State Planning Commission and Environmental Protection Authority shall develop Environmental and/or Planning Policies for the Gngangara Mound which minimise the impact of land use activities (especially those that have a high water use or are likely to cause pollution to groundwater) on groundwater and wetlands, and provide protection of the water resource and conservation of wetlands and upland vegetation.
15. The Minister for Planning shall ensure that the local authorities located on the Gngangara Mound incorporate in their statutory Town Planning Schemes, policies, zones and such other mechanisms as appropriate and in accordance with Policies instituted under condition 14; with the objectives of:
  - . protection of the groundwater resource of the Gngangara Mound; and
  - . conservation of wetlands, including any suitable buffer areas.
16. In principle, Stages 2 and 3 of the Pinjar Scheme are environmentally acceptable but the Water Authority shall revise these stages in the light of the Environmental Protection Authority's Report and Recommendations and shall refer these and other stages to the Authority for further consideration.
17. The staged development of groundwater schemes, which permit the matching of growth in demand with supply and the tailoring of schemes to minimise environmental impact, is an environmentally acceptable approach and shall be applied to future groundwater schemes.
18. The Water Authority shall undertake the following specific areas of research and monitoring, in addition to those proposed in the existing monitoring programme and commitments in the Environmental Review and Management Programme:
  - . clarify the relationship between groundwater level and wetland water quality; and
  - . improve understanding of the conservation value of wetlands on the Gngangara Mound, especially those for which information on their value is limited;to the satisfaction of the Environmental Protection Authority.
19. The Water Authority shall submit brief annual and more detailed triennial reports on environmental monitoring and management of the Gngangara Mound to the Environmental Protection Authority.
20. As the many issues in relation to the Gngangara Mound cannot be considered by any single agency, policy direction, broad planning and management on the Gngangara Mound should be undertaken as follows:

- . A Policy Coordinating Group, be established with responsibility to Cabinet for formulation of policy directions, including representatives from:

Department of the Premier and Cabinet (Chair)  
Water Authority of WA  
State Planning Commission  
Environmental Protection Authority.

- . A Technical Advisory Group, be established to provide specific planning and management advice to the Policy Coordinating Group, including representatives from:

Water Authority of WA  
Western Australian Water Resource Council  
State Planning Commission  
Department of Conservation and Land Management  
Department of the Premier and Cabinet  
Environmental Protection Authority  
Department of Agriculture  
City of Wanneroo  
Shire of Gingin

- . The Wanneroo Groundwater Advisory Committee continue, and other such Committees as appropriate be established, to provide advice to the Water Authority on management of private abstraction of groundwater.

Barry Hodge, MLA  
MINISTER FOR ENVIRONMENT

8 MAR 1988

MANAGEMENT COMMITMENTS MADE BY THE WATER AUTHORITY OF WA  
FOR THE PINJAR GROUNDWATER SCHEME AND THE WATER RESOURCE  
OF THE GNANGARA MOUND

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The Water Authority will develop, within 12 months, a model to allow the local effects of the Pinjar Scheme to be better defined, monitored and managed.

Private abstraction in the Wanneroo Groundwater Area north of Flynn Drive will not exceed 15 million cubic metres per year unless further monitoring and modelling shows the impact on water table levels to be acceptable.

The unconfined and confined aquifers will be developed concurrently to provide some capacity for managing water table declines under severe drought conditions.

#### LAYOUT OF SCHEMES FOR PUBLIC WATER SUPPLY

The layouts of the proposed Lexia, Yeal and Barragoon Schemes will be further assessed as part of detailed investigation prior to selection of the preferred strategies for management of the groundwater resource.

#### ABSTRACTION STRATEGIES FOR PUBLIC WATER SUPPLY SCHEMES

Groundwater levels will be monitored using the existing network of over 900 monitoring points in conjunction with measurements from the production wells. The abstraction strategy will be reviewed, and if necessary, modified taking into account the results of monitoring and the need to maintain the resource to meet public, private and environmental needs. The Water Authority will not exceed the quota or substantially modify the abstraction strategy from the scheme without prior Environmental Protection Authority approval.

#### MANAGEMENT OF PRIVATE WATER USE

The Water Authority will manage private abstraction within the Wanneroo Groundwater Area, so as not to exceed the private groundwater abstraction quota. This quota will be reviewed as part of the annual reporting procedure for the Environmental Protection Authority. Provision will be made for the Wanneroo Groundwater Advisory Committee to have appropriate public representation from the entire Wanneroo Groundwater Area.

#### COOPERATIVE LAND MANAGEMENT

The Water Authority will liaise with the Department of Conservation and Land Management so that plans for thinning, control burning and future management of pine plantations recognise the effect of plantation management on the groundwater resource.

The Water Authority will provide advice during preparation of management plans for conservation areas and recreational activities to ensure protection of water quality.

The Water Authority will continue to liaise with the State Planning Commission to ensure that appropriate consideration is given to water resource management when land planning issues are being considered.

The Water Authority will continue to liaise with the Departments of Conservation and Environment, and Conservation and Land Management to assist them in developing guidelines for water level changes which take into account the need for environmental conservation.

The Water Authority will continue to liaise with the Mines Department and the Department of Conservation and Environment to ensure that consideration is given to water resource management when mining applications are evaluated.

The Water Authority will take account of future land management in the area of the proposed Yeal Nature Reserve extension when planning future groundwater management in the area, by liaison with the Department of Conservation and Land Management.

#### DEMAND MANAGEMENT

The Water Authority will prepare a demand management strategy.

#### ON-GOING REVIEW

Monitoring of water levels will be used to assess the effectiveness of management strategies which will be reviewed as appropriate.

#### MONITORING

The programme of groundwater investigations and vegetation monitoring will continue, forming the basis for the monitoring to be undertaken in connection with existing and future developments on the Gngangara Mound area generally and the Pinjar Scheme in particular.

#### PROPOSED WATER MONITORING

Regular monitoring of groundwater levels will be carried out within the Pinjar area. This will include observation bores at the site of proposed production wells to monitor the local drawdown effects and selected lakes and swamps. These lakes will include Lake Carabooda, Nowergup, Neerabup, Pinjar, Adams, Maringiniup, Jandabup and Loch McNess. Water level monitoring from over 900 other existing stations will continue. The existing regional groundwater quality monitoring programme will continue. The quality of water produced by the Pinjar Scheme will be monitored frequently to ensure that the water meets potable standards.

The need for specific water monitoring data in conjunction with vegetation and fauna monitoring, will be evaluated in consultation with the Departments of Conservation and Environment, and Conservation and Land Management.

#### PROPOSED VEGETATION MONITORING

The Water Authority will prepare an appropriate vegetation monitoring programme in consultation with the Departments of Conservation and Land Management, and Conservation and Environment.

#### PINE PLANTATION MONITORING

The Water Authority will liaise with the Department of Conservation and Land Management regarding future monitoring of the basal area of pine plantations in State Forest No 65.

## PROPOSED FAUNA MONITORING

The existing wetland invertebrate monitoring programme will continue and be expanded to include Lake Goollelal and Loch McNess. The Water Authority will continue to support this programme.

The Water Authority will continue to liaise with and provide support to the Western Australian Water Resources Council's Groundwater Management Project study team.

The Water Authority will continue to take into account the advice of the Groundwater Advisory Committees as an important contribution to the management of the resource.

## REPORTING AND ASSESSMENT

The results of the management and monitoring programmes will be reported regularly for review by the Environmental Protection Authority and the programmes modified where appropriate. Reporting on the existing Wanneroo and Mirrabooka Schemes will continue in the established format with brief annual reports complimented by comprehensive triennial reviews for submission to the Environmental Protection Authority.

## PINJAR DEVELOPMENTS

The existing reporting to the Environmental Protection Authority will be extended to cover the proposed Pinjar Scheme, together with a review of private groundwater usage in the area.

A brief annual report will be submitted to the Environmental Protection Authority. It will contain:

- . a review of operations and productions volumes;
- . a summary of well, lake level and water quality monitoring;
- . brief reviews of the vegetation and fauna monitoring programme; and
- . an overview of any other developments which may be significant to the operation of the scheme, have potential environmental effects or may be of relevance to management of the groundwater resource.

A comprehensive triennial review of the Pinjar Scheme will also be submitted, covering similar topics to the annual reports but in more detail, with the emphasis on any important changes in the resource and the implications for any alterations required to future management. Management strategies will be reviewed and modified as appropriate.

## FUTURE DEVELOPMENTS

The Water Authority will provide appropriate environmental documentation to enable the Environmental Protection Authority to assess future groundwater developments on the Gngara Mound.

## APPROACH

For nominated wetlands, two water levels are specified in Table 1:

- . the preferred minimum summer level, which reflects the level that would ensure maintenance of the social and environmental values of the wetland; and
- . the minimum water level, below which the social and environmental values of the wetland would be significantly threatened.

In addition, the maximum sequence of months that the wetland water levels are below the preferred minimum summer level in any 12 month period is also specified, beyond which the social and environmental values of the wetland would be significantly threatened.

Protection of the social and environmental values of wetland also requires that existing regimes of water quality and quantity, within normal climatic variation, are maintained for Category 1 and Category 2 wetlands.

## MANAGEMENT RESPONSE

Management responsibility for the water resources of the State rests with the Water Authority of WA, which has as a primary objective "to conserve, assess and efficiently manage the State's water resources for the continuing benefit of the community" (Water Authority of WA Corporate Plan 1987-1992).

To ensure protection of the social and environmental values of nominated wetlands in Table 1, the following management response shall apply:

- . should the water level decline below the preferred minimum summer water level, public and/or private groundwater abstraction should cease unless positive action is instituted to minimise the extent of the decline.
- . should the water level decline below this preferred minimum summer water level for a period of one month or such other period as specified or to the defined minimum water level the Water Authority of WA shall take appropriate remedial action, which may include the cessation of public and/or private groundwater abstraction, to ensure that the minimum water level and sequence of months criteria are complied with; and
- . the Water Authority should investigate means of maintaining water regimes and levels in wetlands whereby social and environmental values of the wetlands are maintained or enhanced.



Table 1. Criteria for Specific Wetlands on the Ghangara Mound.

WETLAND NAME	*CATEGORY	LAND STATUS	SYSTEM SIX	PREDICTED WATER LEVEL CHANGE OF AQUIFER UNDER PREFERRED LAND USE SCENARIO OF ERMP	RECOMMENDATION	COMMENTS	ACREEMENT OF RECOMMENDATION WITH ERMP	PREFERRED MINIMUM SUMMER WATER LEVEL TO MAINTAIN CURRENT VALUES (M AHD)	NUMBER OF CONSECUTIVE MONTHS BELOW PREFERRED MINIMUM SUMMER WATER LEVEL ALLOWED IN ANY 12 MONTH PERIOD	MINIMUM WATER LEVEL (M AHD)
Loch McVess	1	NPNC	M3	<-0.5	no change to existing regime of water quality and quantity, within normal climatic variation	for hydrol/geol reasons actual change expected to be close to 0 m	disagrees	7.0	#	6.90
Joodalup	1	NPNC	M7	<-0.5	" " "	for hydrol/geol reasons actual level expected to be close to 0 m	disagrees	16.7	4	16.45
Twin Swamps	2	NPNC	M17	0	" " "	outside predicted area of influence	agrees	n/a	n/a	n/a
Ellen Brook	2	NPNC	M17	0	" " "	outside predicted area of influence	agrees	n/a	n/a	n/a
Vonderup	2	NPNC	M3	<-0.5	" " "	for hydrol/geol reasons actual change expected to be close to 0 m	disagrees	5.3	#	5.15
Melaleuca Fk Wetlands	2	NPNC	M9	0 to +0.5	" " "	-	agrees	n/a	n/a	n/a
Jandabup	2	NPNC/ freehold	M8	<-0.5	" " "	management strategy in place	disagrees	44.3	3	44.00
Yeal Swamp	2	CALM	C13	< 0.5	" " "	not affected by Pinjar Scheme; later schemes impinge	disagrees	n/a	n/a	n/a
Bindiar	2	CALM	C13	<-0.5	" " "	not affected by Pinjar Scheme; later schemes impinge	disagrees	n/a	n/a	n/a
Nowergup	2	NPNC	M6	<-0.5	no change to existing regime of water quality and quantity, within normal climatic variation	for hydrol/geol reasons actual change expected to be close to 0 m	disagrees	16.5	3	16.30
Pipidinny	3	freehold	M3	<-0.5	predicted change is acceptable	-	agrees	n/a	n/a	n/a
Goollelal	3	SPC	M7	0	predicted change is acceptable	outside predicted area of influence	agrees	26.4	2	26.25
Ghangara	3	LGA	M8	+0.5	predicted change is acceptable	predicted rise would reflect changed forest management	agrees	41.4	3	41.30
Wilgarup	3	NPNC	M3	<-0.5	acceptable subject to advice from NPNC	subject to needs of Yanchep National Park	agrees	n/a	n/a	n/a
Beoraddy	4	freehold	M3	<0.5	predicted change is acceptable	-	agrees	n/a	n/a	n/a
Coogee Springs	4	freehold	M3	<0.5	water permanency should be maintained	intent is to maintain landscape and historical values	disagrees	n/a	n/a	n/a
Neerabup	4	freehold		<-0.5	predicted change is acceptable	affected by historical land use, landscape	agrees	n/a	n/a	n/a
Lake Adams	4	freehold/ LGA	M8	-0.5 to -1.0	predicted drawdown is acceptable	wetland could be further modified	agrees	n/a	n/a	n/a

Mariginup	4	VCL/ freehold	M8	-0.5 to -1.0	a smaller drawdown may be tolerable	current level reflects WGAC strategy	disagrees	40.9	1	40.85
Rodgerup	4	freehold	M8	+0.5	predicted change is acceptable	-	agrees	n/a	n/a	n/a
Little Rodgerup	4	freehold	M8	+0.5	predicted change is acceptable	-	agrees	n/a	n/a	n/a
Pinjar	4	freehold	M8	>-1.5	predicted change is acceptable	-	agrees	n/a	n/a	n/a
Lenzo Rd wetlands	5	freehold/ recreation		0	predicted change is acceptable	-	agrees	n/a	n/a	n/a
Dundarbar	5	freehold		0	no change predicted	is a result of current forest management & WGAC policy	agrees	n/a	n/a	n/a
Unnamed S.E. of Adams	5	freehold	M8	0	no change predicted	-	agrees	n/a	n/a	n/a
Snake Swamp	5	freehold	M8	0	no change predicted	-	agrees	n/a	n/a	n/a
Mindarie	5	freehold	M8	< 0.5	predicted change is acceptable	wetland value reduced by land use	agrees	n/a	n/a	n/a
Carabooda	5	freehold		<-0.5	seek to retain reduced wetland area	-	agrees	n/a	n/a	n/a
Little Mariginup	5	freehold	M8	-0.5 to 1.0	predicted change is acceptable	wetland values lost to land uses	agrees	n/a	n/a	n/a

KEY TO HEADINGS AND ABBREVIATIONS

\* Categories as defined in: Draft Guidelines for Wetland Conservation in the Perth Metropolitan Region. EPA 1986 (Bulletin 227).

1. Wetlands of exceptionally high natural and/or human use attributes.
2. Wetlands with relatively intact natural systems.
3. Wetlands which have been highly modified but which are considered to play important roles in their urban and/or rural settings.
4. Wetlands which have been significantly modified and/or which do not have clearly recognised roles in their urban or rural settings.
5. Wetlands with few remaining attributes and limited human attributes.

NPWCA = National Parks and Nature Conservation Authority  
CALM = Department of Conservation and Land Management  
SPC = State Planning Commission  
VCL = Vacant Crown land  
LGA = Local Government Authority

ZGNANTARLECM

Refers to area-specific recommendations in:

Conservation Reserves for Western Australia as recommended by the Environmental Protection Authority - 1983: The Darling System - System 6. Part II. EPA. 1983.

WGAC = Wanneroo Groundwater Advisory Committee

n/a = no level recommended because of limited information

# = to be determined by EPA

? = level not known