



MINISTER FOR THE ENVIRONMENT;
LABOUR RELATIONS

Statement No.

000496

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

**GROUNDWATER RESOURCE ALLOCATION, EAST GNANGARA
SHIRE OF SWAN**

Proposal: The abstraction of groundwater for public and private water supply from the East Gnangara Mound, with provision for environmental water requirements, as documented in schedule 1 of this statement.

Proponent: Water and Rivers Commission

Proponent Address: 3 Plain Street, EAST PERTH WA 6004

Assessment Number: 932

Report of the Environmental Protection Authority: Bulletin 904

The proposal to which the above report of the Environmental Protection Authority relates may be implemented subject to the following conditions and procedures:

1 Implementation

- 1-1 Subject to these conditions and procedures, the proponent shall implement the proposal as documented in schedule 1 of this statement.
- 1-2 Where the proponent seeks to change any aspect of the proposal as documented in schedule 1 of this statement in any way that the Minister for the Environment determines, on advice of the Environmental Protection Authority, is substantial, the proponent shall refer the matter to the Environmental Protection Authority.
- 1-3 Where the proponent seeks to change any aspect of the proposal as documented in schedule 1 of this statement in any way that the Minister for the Environment determines, on advice of the Environmental Protection Authority, is not substantial, those changes may be effected.

Published on

17 FEB 1999

2 Proponent Commitments

- 2-1 The proponent shall implement the consolidated environmental management commitments documented in schedule 2 of this statement.
- 2-2 The proponent shall implement subsequent environmental management commitments which the proponent makes as part of the fulfilment of conditions and procedures in this statement.

3 Proponent

- 3-1 The proponent for the time being nominated by the Minister for the Environment under section 38(6) or (7) of the Environmental Protection Act 1986 is responsible for the implementation of the proposal until such time as the Minister for the Environment has exercised the Minister's power under section 38(7) of the Act to revoke the nomination of that proponent and nominate another person in respect of the proposal.
- 3-2 Any request for the exercise of that power of the Minister referred to in condition 3-1 shall be accompanied by a copy of this statement endorsed with an undertaking by the proposed replacement proponent to carry out the proposal in accordance with the conditions and procedures set out in the statement.
- 3-3 The proponent shall notify the Department of Environmental Protection of any change of proponent contact name and address within 30 days of such change.

4 Commencement

- 4-1 The proponent shall provide evidence to the Minister for the Environment within five years of the date of this statement that the proposal has been substantially commenced.
- 4-2 Where the proposal has not been substantially commenced within five years of the date of this statement, the approval to implement the proposal as granted in this statement shall lapse and be void. The Minister for the Environment will determine any question as to whether the proposal has been substantially commenced.
- 4-3 The proponent shall make application to the Minister for the Environment for any extension of approval for the substantial commencement of the proposal beyond five years from the date of this statement at least six months prior to the expiration of the five year period referred to in conditions 4-1 and 4-2.
- 4-4 Where the proponent demonstrates to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority that the environmental parameters of the proposal have not changed significantly, then the Minister may grant an extension not exceeding five years for the substantial commencement of the proposal.

5 Compliance Auditing

- 5-1 The proponent shall submit periodic Performance and Compliance Reports, in accordance with an audit program prepared in consultation between the proponent and the Department of Environmental Protection.

5-2 Unless otherwise specified, the Chief Executive Officer of the Department of Environmental Protection is responsible for assessing compliance with the conditions, procedures and commitments contained in this statement and for issuing formal clearances.

5-3 Where compliance with any condition, procedure or commitment is in dispute, the matter will be determined by the Minister for the Environment.

CHERYL EDWARDES (Mrs) MLA
MINISTER FOR THE ENVIRONMENT

17 FEB 1999

Schedule 1

The Proposal

The proposal is to allocate groundwater for abstraction from the eastern side of the Gngangara Mound to the Water Corporation and other uses, while allowing for provision of groundwater to the environment. Abstraction will provide for urban development in the north-east corridor in addition to supplementing the Perth metropolitan water supply, and groundwater for private users.

Table 1. Key environmental criteria for terrestrial vegetation, wetlands and seepages in East Gngangara study area.

Location	Monitoring Well	EWR (minimum water level metres AHD)	EWP (minimum water level metres AHD)	EWP < EWR (metres)
Vegetation				
Melaleuca Park	WM6	58.8	58.3	0.5
Melaleuca Park	WM8	65	64.8	0.2
Melaleuca Park	NR6C	58.5	58.5	-
Melaleuca Park	WM2	67	66.5	0.5
Melaleuca Park	NR11C	55	55	-
Whiteman Park	MM49B	24.7	24.7	-
Whiteman Park	MM53	33.3	33.3	-
Whiteman Park	MM55B	29.5	29.5	-
Whiteman Park	MM18	38.6	38.6	-
Whiteman Park	MM59B	36.3	36.3	-
Vegetation Corridor	MM12	43	42	1.0
Vegetation Corridor	L30C	47.5	47.2	0.3
Vegetation Corridor	L110C	57	55.7	1.3
Vegetation Corridor	L220C	52.5	52.2	0.3
		EWR^a		
Wetlands		Minimum	Absolute minimum	
Melaleuca Park 78	GNM13	5.5m below ground	5.8m below ground	
Melaleuca Park 173	GNM14	0.1m above ground	0.1m above ground	
Lexia 186	GNM15	0.8m below ground	1.1m below ground	
Lexia 86	GNM16	1.0m below ground	1.3m below ground	
Lexia 94	GNM17A	1.5m below ground	1.8m below ground	
		EWR	EWP	
Seepages				
Edgecombe	B10	14.35 ^b	b	
Egerton	B25	39.29 ^c	39.29 ^c	

Key:

EWR = Environmental Water Requirements.

EWP = Environmental Water Provisions.

- a - Interim EWRs and absolute minimum water levels have been determined for these wetlands. EWPs will be provided following investigation of stratigraphy and water regimes, and reported in the triennial review.
- b - Recommendation for management only. The seepage is outside the zone of influence of the proposal; final water levels are expected to be affected by factors unrelated to groundwater abstraction for public water supply.
- c - Access to land required before monitoring can be conducted.

Locations of East Gngangara study area and abovementioned wells, wetlands and vegetation are shown in Figures 1, 2 and 3 (attached).

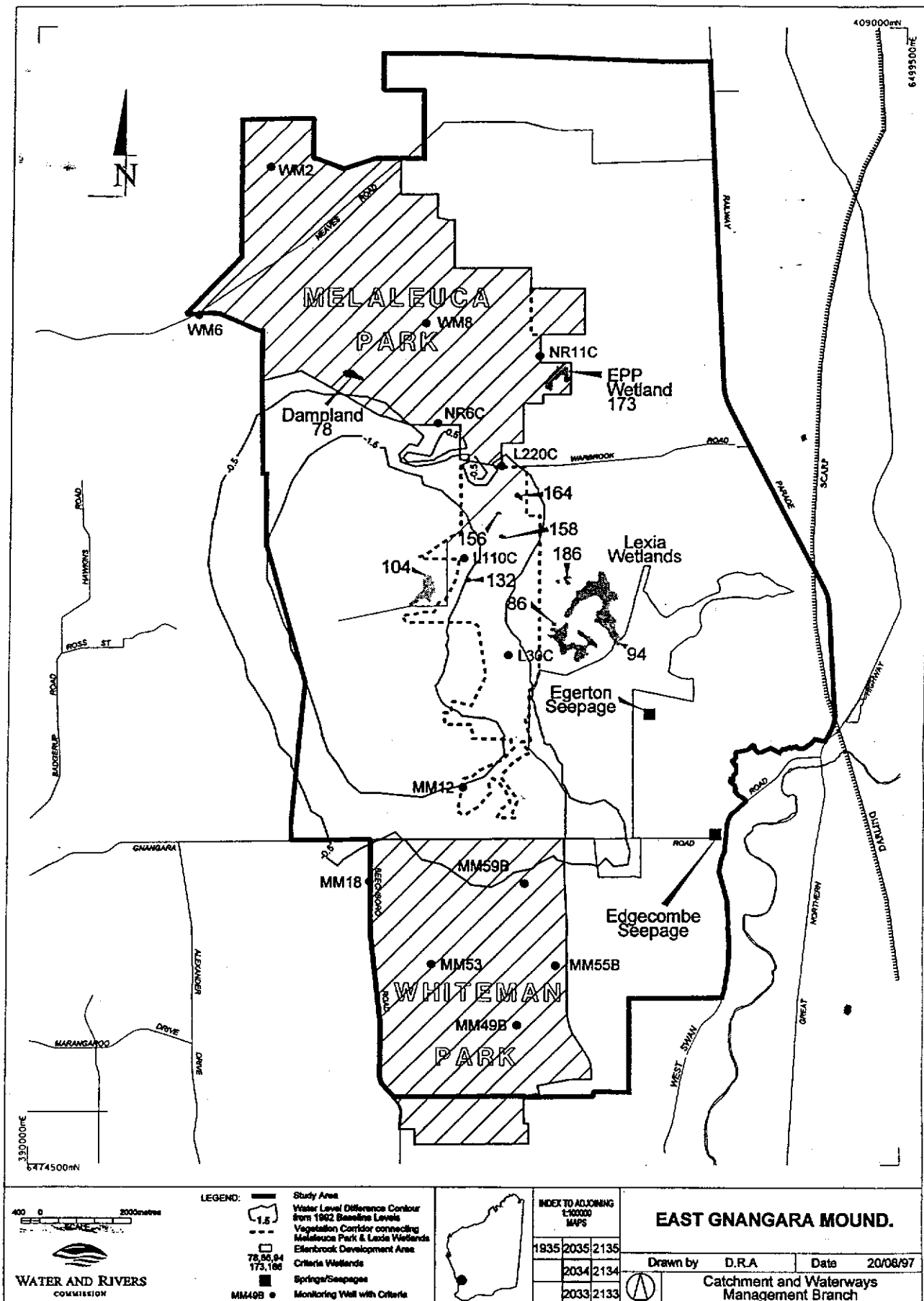


Figure 1. Location of monitoring wells, wetlands and seepages in the East Gungahra study area (Source: WRC 1998).

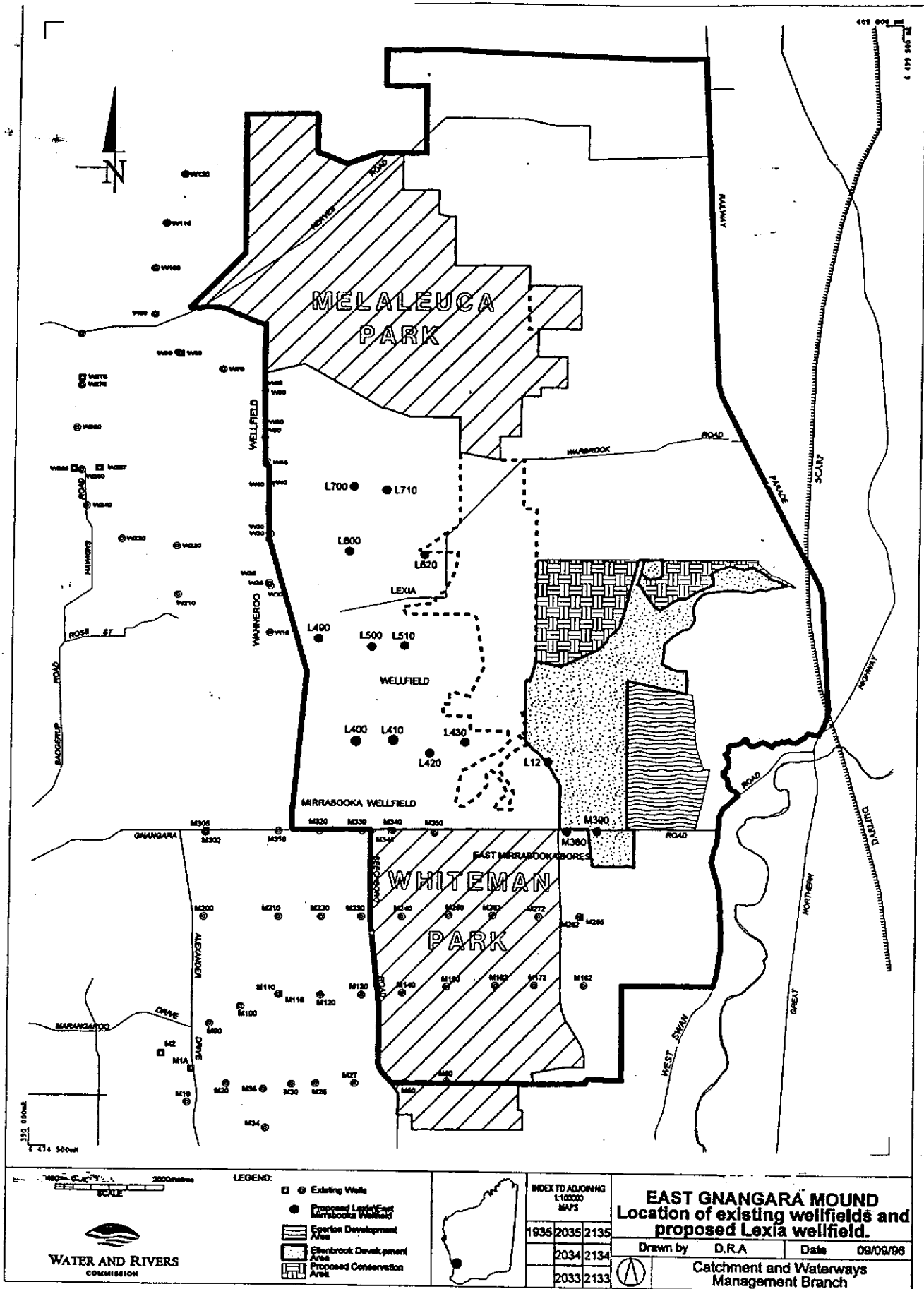


Figure 2. Location of production wells for the proposed Lexia wellfield (Source: WRC 1997).

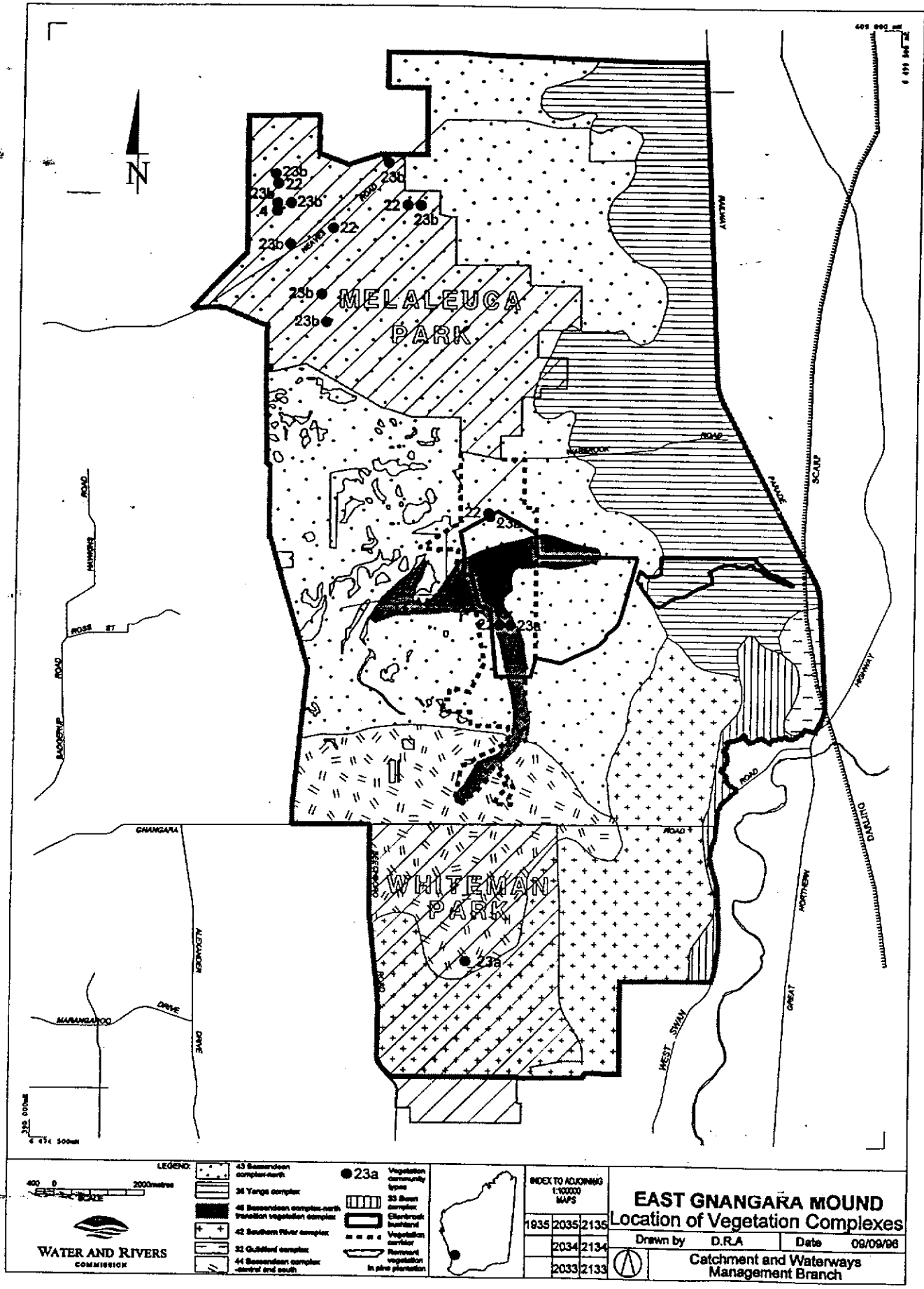


Figure 3. Vegetation complexes in the East Gungahra study area (Source: WRC 1997).

**Proponent's Consolidated Environmental Management
Commitments**

February 1999

**GROUNDWATER RESOURCE ALLOCATION
EAST GNANGARA, SHIRE OF SWAN (932)**

Water and Rivers Commission

**GROUNDWATER RESOURCE ALLOCATION, EAST GNANGARA, SHIRE OF SWAN - ENVIRONMENTAL
MANAGEMENT COMMITMENTS (ASSESSMENT NO. 932) - FEBRUARY 1999**

Commit- ment number	Commitment (What)	Objective (Why)	Action (How/ Where)	Timing (When)	Whose advice (to Whom)	Measurement/ Compliance criteria
1.	Manage public & private groundwater abstraction to meet objectives and EWRPs*.	As per column 3 of table A	As per column 4 in table A (& columns 2&3 in table B).	Ongoing particularly summer / autumn	DEP	Annual/ Triennial reports & as necessary
2.	Prepare annual & triennial reports.	Report on compliance, impacts, review abstraction & criteria etc	Review abstraction, monitoring etc.	annually, triennially	DEP	Annual/ Triennial reports
3.	Investigate water regimes and stratigraphy in Lexia wetlands, and wetland 173 and dampland 78 in Melaleuca Park.	To identify if perched, degree of dependence on groundwater, and to confirm EWRs*	By a drilling and monitoring programme.	In first 3 years following project approval	DEP	First triennial report
4.	Conduct research on EWRs*.	Improve knowledge	provide support to research projects, conduct investigations.	- ongoing - major vegetation project will finish end 1999	DEP	Triennial reports
5.	Review EWRPs*.	Adaptive management - incorporate new knowledge.	By monitoring / research.	Six yearly or more frequently as necessary	DEP	Triennial reports & as necessary
6.	Implement monitoring programme.	Feedback to EWRPs*	water level, vegetation, invertebrate and frog monitoring as outlined 6.1-6.17 in attached document "Commitments (932)".	monthly, yearly, triennially & ongoing.	DEP	Annual & Triennial reports & as necessary.

7.	Determine pine management regime for SF65.	Optimise water and timber production / development of Gnangara Park while minimising environmental impacts.	Develop a MOU with CALM which includes pine harvesting over 20 years and Gnangara Park establishment.	June 1999	DEP	MOU and monitoring results in annual reports
8.	Provide advice on impacts of landuse on groundwater resources.	Assist protection / management groundwater resources.	Provide advice as required.	Ongoing	Other agencies, especially Shire of Swan and MFP.	-
9.	Determine EWP*s for new, appropriately located, wells in the vegetation corridor.	To assist groundwater resource management and to be in compliance with EWP*s for new wells.	Collect and review monitoring data.	In first 3 years following project approval	DEP	Triennial report
10.	Chair Consultative Committee for the Gnangara Mound.	To exchange information/advice with stakeholders.	Conduct meetings at local shire.	Annually	Local government, relevant agencies, conservation and community groups	Meeting minutes and brief documentation in triennial reports.
11.	Production wells close to phreatophytic vegetation to be appropriately phased in by the Water Corporation.	To allow vegetation to adapt and minimise impacts of groundwater drawdown.	Include requirement in licence conditions.	When groundwater licence for Lexia wells provided.	Water Corporation DEP	Licence conditions. Annual reports by Water Corporation.
12.	Require the Water Corporation to develop and implement a wetland mitigation strategy for any loss of values in 132, 156, 158, 164 and 104.	Compensate for any loss of wetland values.	Assist with determining an appropriate wetland mitigation strategy and include requirement in licence conditions.	Develop strategy prior to commissioning of Lexia wellfield and implement actions as necessary to avoid or compensate loss of values as impacts become apparent	Water Corporation CALM DEP	Licence conditions

13.	Require the Water Corporation to prepare operations plans (with environmental commitments to meet EWRPs*) for the Lexia and East Mirrabooka groundwater schemes.	To ensure that operation of the Water Corporation's groundwater schemes complies with Water & Rivers Commission environmental conditions / commitments on EWRPs*.	Include requirement for operations plan in licence conditions.	In 6 months following project approval and prior to commissioning of the Lexia wellfield	DEP	Licence conditions Operations Plan
14.	Map vegetation community types on the Gnangara Mound.	To assist future groundwater management and water supply planning.	Develop and undertake a vegetation mapping programme.	To be determined in development of mapping programme which will be submitted 3 months after approvals of the East Gnangara Plan obtained.	DEP	Mapping programme and maps
15.	Monitor water levels and vegetation in wetland 132.	To obtain information on drawdown impacts.	Monitor water levels monthly & vegetation transect in spring.	Establish monitoring prior to commissioning of wellfield and conduct for 3 years, then review.	DEP	Licence conditions Annual / Triennial reports.
16.	Liaise with Aboriginal community.	Provide an understanding of the proposal and how it relates to Aboriginal issues.	The proponent will consult directly with Swan Valley Nyungah Community.	In 6 months following project approval and prior to commissioning of Lexia wellfield	DEP	Meeting minutes & brief documentation in annual report.
17.	Carry out dieback survey.	To ensure the disease is not introduced into dieback-free areas.	Prepare and implement dieback management procedures.	Prior to and during commissioning of Lexia wellfield.	CALM	Annual report.

* - EWR and EWP denote Environmental Water Requirements and Environmental Water Provisions, respectively.

Table A: Environmental Criteria (932) - February 1999

WELL	LOCATION	Environmental Water Provisions (EWPs) Management Objective	Minimum water level (mAHD)	Absolute minimum water level (mAHD)
WM6	Melaleuca Park	Protect native vegetation from any further groundwater abstraction impacts	58.3	*
WM8	Melaleuca Park	Protect native vegetation from any further groundwater abstraction impacts	64.8	*
NR6C	Melaleuca Park	Protect native vegetation from any further groundwater abstraction impacts	58.5	*
WM2	Melaleuca Park	Protect native vegetation from any further groundwater abstraction impacts	66.5	*
NR11C	Melaleuca Park	Protect native vegetation from any further groundwater abstraction impacts	55	*
MM49B	Whiteman Park	Protect native vegetation from any further groundwater abstraction impacts	24.7	*
MM53	Whiteman Park	Protect native vegetation from any further groundwater abstraction impacts	33.3	*
MM55B	Whiteman Park	Protect native vegetation from any further groundwater abstraction impacts	29.5	*
MM18	Whiteman Park	Protect native vegetation from any further groundwater abstraction impacts	38.6	*
MM59B	Whiteman Park	Protect native vegetation from any significant groundwater abstraction impacts	36.3	*
MM12	Native vegetation corridor	Protect native vegetation but allow a slow change to a drier community structure	42	*
L30C	Native vegetation corridor	Protect native vegetation but allow a slow change to a drier community structure	47.2	*
L110C	Native vegetation corridor	Protect native vegetation but allow a slow change to a drier community structure	55.7	*
L220C	Native vegetation corridor	Protect native vegetation but allow a slow change to a drier community structure	52.2	*
GNM13	Dampland 78' - Melaleuca Park	Maintain existing areas of wetland vegetation	**	**
GNM14	EPP 173 - Melaleuca Park	<ul style="list-style-type: none"> • Maintain existing areas of wetland and stream • Maintain existing areas of wetland vegetation • Protect invertebrate communities dependent on the wetland and stream • Protect the fish, <i>Galaxiella nigrostrata</i> 	**	**
GNM15	Lexia wetland 186	<ul style="list-style-type: none"> • Protect current vegetation assemblages in and fringing the wetland • Protect any aquatic invertebrate fauna dependent on the wetland 	**	**
GNM16	Lexia wetland 86	<ul style="list-style-type: none"> • Protect current vegetation assemblages in and fringing the wetland • Protect any aquatic invertebrate fauna dependent on the wetland 	**	**
GNM17A	Lexia wetland 94	Protect current vegetation assemblages in the wetland	**	**
B10	Edgecombe seepage	Maintain a permanent flow of water in the seepage	14.35	**
B25	Egerton seepage	Maintain a permanent flow of water in the seepage	39.29	**

* not applicable ** to be determined *** Recommendation for management only **** Cannot be monitored until access to the land granted
 1 wetland reference numbers from Water and Rivers Commission Public Environmental Review document.

Table B: Interim Environmental Water Requirements - October 1998 (932)

Wetland	Interim Environmental Water Requirement ¹	
	Minimum	Absolute minimum
Lexia wetland 1 (94)	1.5m below ground (45.8 mAHD - well GNM 17A)	1.8m below ground (45.5 mAHD - well GNM 17A)
Lexia wetland 2 (86)	1m below ground (47.3 mAHD - well GNM 16)	1.3m below ground (47 mAHD - well GNM 16)
Lexia wetland 3 (186)	0.8m below ground (47.5 mAHD - well GNM 15)	1.1m below ground (47.2 mAHD - well GNM 15)
EPP wetland 173	0.1m above ground (in western sector)	
Dampland 78	5.5m below ground (65.4 mAHD - well GNM 13)	5.8m below ground (65.1 mAHD - well GNM 13)

1. Note that these Environmental Water Requirements are by necessity, interim, due to a range of difficulties in establishing appropriate criteria taking into account "perching" of water levels and accurate survey information. Final criteria monitoring points are still to be established in some wetlands.

Commitments (932) - February 1999

1. The proponent will manage public and private groundwater abstraction to meet the water regime management objectives and Environmental Water Provisions (EWPs) summarised in Table A. The proponent will also manage abstraction to meet the interim EWRs in Table B. As these EWRs are interim, they will be reviewed in the first triennial report to the EPA and updated as appropriate.
2. The proponent will report on the management and monitoring of the Eastern Gngangara Mound to the EPA as a part of the reporting in place for the Gngangara Mound. Triennial reports will include information on the operation of groundwater schemes by the Water Corporation and private groundwater use, compliance with EWPs and environmental conditions and outline any environmental impacts. Annual reports will provide information on compliance with environmental conditions.
3. The proponent will investigate stratigraphy and water regimes in the Lexia wetlands, EPP wetland 173 in Melaleuca Park and Melaleuca Park dampland 78. For those showing characteristics of perching, the importance of groundwater to wetland water levels will be established and EWRs updated for the first triennial report to the EPA. EWPs will also be determined at this time.
4. The proponent will support further research and investigations into the EWRs of wetlands, vegetation and seepage areas as defined in Section 16.5 of the PER document.
5. EWPs will be reviewed every six years in triennial reports or more frequently if necessary. Feedback, through the monitoring programme, of any unexpected impacts of groundwater abstraction will be used to update EWPs and water allocations if necessary. Any update will involve consultation with the EPA and incorporate public involvement.
6. The proponent will, after receiving environmental approvals, implement and undertake the following monitoring programme to the satisfaction of the EPA and report results in annual and triennial reports to the EPA:
 - 6.1 Continue monitoring the network of wells on the East Gngangara Mound, at the frequency of 1 - 3 monthly depending on the well.
 - 6.2 Monitor water levels in terrestrial vegetation monitoring wells with EWPs monthly.
 - 6.3 Develop three new terrestrial vegetation transects on the East Gngangara Mound: one in Melaleuca Park and two in the Ellenbrook bushland near the Lexia wetlands. The transects will be monitored every three years.
 - 6.4 On a shared cost basis with the Whiteman Park Board of Management, recommence monitoring the terrestrial vegetation transect established in 1991 by WAWA in Whiteman Park.
 - 6.5 Continue monitoring the terrestrial vegetation transect in Melaleuca Park established in 1966, on a triennial basis.
 - 6.6 At each of the terrestrial vegetation transects, select a range of species which provide an indication of vegetation composition. The indicator species will be monitored in Spring every three years to assess any change towards a drier community. Parameters that will be assessed are; age (size), class distribution, vigour and recruitment.
 - 6.7 Calculate a similarity index for each transect at each monitoring period with the aim of summarising spatial and temporal changes in vegetation composition.
 - 6.8 For each terrestrial vegetation transect on the Eastern Gngangara Mound determine an 'acceptable' rate of change in vegetation composition. Rates of change will be measured using indicator species and similarity indices.

- 6.9** Monitor water levels once a month in wetlands and/or in nearby monitoring wells for the following wetlands:
- Lexia wetland 94;
 - Lexia wetland 186;
 - Lexia wetland 86;
 - Melaleuca Park Dampland 78;
 - EPP wetland 173; and
 - Lake Yakine.
- 6.10** Develop vegetation transects in each of the wetlands listed in Commitment 6.9 (with the exception of Lake Yakine). Monitoring will be undertaken yearly in Spring for the first three years then reviewed in the first triennial report.
- 6.11** Conduct baseline monitoring on aquatic invertebrates, frogs and water quality in the Lexia wetlands. Findings will be published in the first annual report.
- 6.12** Monitor aquatic invertebrate fauna, frogs and water quality in the wetlands listed in Commitment 6.9 which contain open water, annually in Spring.
- 6.13** Map wetland habitats along a regional transect in Melaleuca Park in Spring using large scale aerial photography every year for the first three years, then every three years.
- 6.14** Monitor water levels in the Egerton and Edgecombe seepages and upstream of the seepages on a monthly basis (once access is granted).
- 6.15** As long as access is granted, conduct baseline monitoring of aquatic invertebrate fauna and water quality in the Egerton seepage. Results will be provided in the first triennial report.
- 6.16** Monitor aquatic invertebrate fauna and water quality in the Egerton and Edgecombe seepages annually in Spring (once access is granted).
- 6.17** Monitor water levels in wells with EWP's more frequently than once a month where necessary to determine compliance with provisions.
- 7.** The proponent will consult with CALM to endeavour to develop a Memorandum of Understanding (MOU) on pine management regimes in State Forest 65 which recognises the dual use of forests and optimises water and timber production, while minimising environmental impacts. The MOU will include agreements associated with the removal of the pine plantation over the next 20 years and the proposed establishment of Gngangara Park. In the process of developing the MOU, further modelling studies will investigate the impact of the various scenarios of pine removal on water tables. This will include consideration of how the 'extra water' could be 'allocated' between consumptive and ecosystem protection uses.
- 8.** The proponent will provide advice on the impact of land-uses on groundwater resources of the Gngangara Mound to relevant agencies.
- 9.** The proponent will determine EWP's for new wells in the native vegetation corridor which have been installed at more appropriate places to replace wells MM12, L30C, L110C and L220C once sufficient monitoring data is available from the new wells.
- 10.** The proponent will continue to chair and provide support for a Consultative Committee as a forum of information exchange and to provide advice to the Water and Rivers Commission in relation to management of water on the Gngangara Mound. A reduced number of members representing each of the East Gngangara and Gngangara Committees will be combined to form one Consultative Committee for the Gngangara Mound.
- 11.** The proponent will require the Water Corporation, through licence conditions, to phase in the production wells closest to phreatophytic vegetation to allow the vegetation to adapt slowly to the drawdown and minimise the overall impacts of drawdown.

12. The proponent will require the Water Corporation to develop and implement a mitigation strategy to:

- identify actions to minimise loss of values, prior to development,
- monitor wetlands to determine whether loss of values has occurred, on an ongoing basis, and
- compensate for any loss of values in the event of adverse impacts becoming apparent

for the conservation category wetlands 132, 156, 158 and 164 and the *Melaleuca raphiophylla* wetland (104) in the pine plantation, on the advice of the WRC and the DEP.

13. The proponent will within six months of receiving environmental approval, require the Water Corporation, through their licence conditions to update their operations plan to include the Lexia and East Mirrabooka groundwater schemes. This will include environmental management of the schemes including details of how abstraction will be managed to meet EWPs. As part of the operating strategy the Water Corporation will be required to submit yearly production plans.

14. To assist with future groundwater management and water supply planning the proponent will map vegetation communities on the Gngangara Mound. This will be done through the following process in consultation with the Department of Environmental Protection.

- 1 Determine the procedures required to undertake mapping of vegetation communities on the Mound;
- 2 Use the procedures to develop a programme for mapping communities; and
- 3 Undertake mapping to the satisfaction of the Department of Environmental Protection.

15. The proponent will monitor water levels monthly and establish a vegetation transect in wetland 132 in the vegetation corridor. The vegetation transect will be monitored in Spring of the first three years to gain information on the impacts of drawdown on the vegetation. The monitoring will then be reviewed in the first triennial report. The monitoring will be undertaken to gain information on early indicators of drawdown impacts.

16. The proponent will liaise directly with the Swan Valley Nyungah Community regarding the proposal.

17. The proponent will survey the occurrence of dieback disease at monitoring sites and prepare and implement dieback management procedures to prevent its spread by accessing these sites. Management procedures will be determined in conjunction with CALM.