



Environmental  
Protection  
Authority

Gnangara Mound Groundwater Resources [Including Groundwater  
Resource Allocation, East Gnangara City of Swan] – inquiry under  
section 46 of the *Environmental Protection Act 1986* to amend  
Ministerial statement 819

Department of Water and Environmental Regulation

Report 1805  
March 2026

## Inquiry under section 46 of the *Environmental Protection Act 1986*

The Minister for Environment has requested that the Environmental Protection Authority (EPA) inquire into and report on the question of whether the implementation conditions (of Ministerial statement 819) relating to the Gnangara Mound Groundwater Resources [including Groundwater Resource Allocation, East Gnangara City of Swan] should be changed as requested by the proponent.

Section 46(6) of the *Environmental Protection Act 1986* requires the EPA to prepare a report that includes:

- (a) a recommendation on whether or not the implementation conditions to which the inquiry relates, or any of them, should be amended
- (b) any other recommendations that it thinks appropriate.

The following is the EPA's report to the Minister pursuant to s. 46(6) of the *Environmental Protection Act 1986*.



**Darren Walsh**  
**Chair**

20 March 2026

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# 1 Proposal

The Gnangara Mound Groundwater Resources [including Groundwater Resource Allocation, East Gnangara City of Swan] proposal (the proposal) is for the management of groundwater abstraction for public and private water supply from the Gnangara Mound, with provision for environmental water requirements (water level criteria). The Gnangara groundwater system covers an area of approximately 228,379 hectares (ha) of the Swan Coastal Plain, from Derbarl Yerrigan (Swan River) to the south, the Moore River and Gingin Brook to the north, the Darling Scarp to the east, and the Indian Ocean to the west; and consists of three main aquifers, the Superficial, Leederville and Yarragadee. The proponent for the proposal is the Department of Water and Environmental Regulation.

The Environmental Protection Authority (EPA) assessed the original proposal at the level of Environment Review and Management Programme and published its report in August 1987 (EPA Report 295). The then Minister for Environment approved the proposal for implementation on 8 March 1988, subject to the implementation conditions of Ministerial statement (MS) 21.

The proposal has been subject to multiple inquiries under section 46 of the *Environmental Protection Act 1986*. The most recent in 2009, with MS 819 issued in December of the same year. A summary of the proposal history is provided in Appendix D.

In applying the *Statement of environmental principles, factors, objectives and aims of EIA* (EPA 2023) the environmental factor considered in the assessment of the original proposal is now represented by inland waters.

## New information since the last inquiry

Since the last inquiry under section 46 (EPA Report 1324), the proponent has undertaken several studies and investigations to improve the knowledge and understanding of the Gnangara groundwater system including:

- the Perth regional confined aquifer capacity study
- shallow groundwater system investigations at ten wetlands across the Gnangara groundwater system prioritised for their ecological significance
- studies of causes of water level declines at Loch McNess and Lake Nowergup
- major updates to the Perth regional aquifer modelling system
- long term monitoring of significant wetlands and other groundwater dependent ecosystems (GDEs) where criteria are set under MS 819 and preceding statements for the proposal.

### *Gnangara groundwater allocation plan 2022*

The results from the abovementioned studies and investigations have informed the development of the proponent's Gnangara groundwater allocation plan, which was released in June 2022. The Gnangara groundwater allocation plan, developed following extensive stakeholder consultation, sets out measures required to

rebalance groundwater abstraction with the decline in rainfall and recharge that is projected under climate change (DWER 2022a). The plan outlines strategies to reduce overall annual groundwater use from Gnangara by 54 gigalitres, or about 19 per cent.

Relevant to MS 819 and this section 46 inquiry, the plan aims to maintain or increase groundwater levels in important locations and reduce the rate of groundwater decline in other locations to avoid further impacts to the health of GDEs. The plan also described the scientific approach and methods for the proposed changes to the water level criteria at some of the relevant sites in MS 819.

## 2 Requested amendments to the conditions

In November 2021, the proponent requested changes to condition 1 (implementation) and condition 2 (proponent commitments) of MS 819 in order to update the water level criteria and requested the conditions be updated in line with the current condition framework.

The conditions of MS 819 relate to how the proponent manages the allocation of groundwater resources to ensure the environment is sufficiently protected from over-abstraction. The proponent commitments include water level criteria for 30 representative GDE wetland and bushland sites across the Gnangara groundwater system.

With a reduction in Perth's average rainfall since the 1970s and an increase in reliance on groundwater resources to satisfy public and self-supply demands, water levels across large parts of the Gnangara groundwater system have substantially declined. Compliance reporting indicates that since the early 2000s, many representative sites are below the water level criteria set in MS 819. The proponent advised that by the end of summer 2016, groundwater levels were the lowest on record with 18 of the 30 representative sites being in non-compliance with their respective water level criteria.

More recently, in 2021-22 and 2022-23, 14 out of 30 representative sites were in non-compliance with water level criteria set in MS 819. Despite actions by the proponent to distribute groundwater abstraction away from ecologically sensitive sites, reduce private licensed entitlements, and implement the new garden bore sprinkler roster in 2022, the number of non-compliant sites increased in 2023-24 to 16 out of 30 sites. The increased rate of non-compliance in 2023-24 is likely attributable to one of the driest years recorded in Perth, where recorded rainfall was well below the long term (75-year) and short-term (10-year) averages (DWER 2025a).

The compliance report from 2024-25 indicate improved compliance, with 14 out of 30 sites being in non-compliance with water level criteria, which is likely to be attributable to higher rainfall recorded in 2024-25 than in 2023-24 (DWER 2026). A summary of the proponent's management actions in response to the water level criteria was provided along with research initiatives.

Implementation of the 2022 Gnangara groundwater allocation plan will see a reduction in annual groundwater abstraction. Modelling undertaken by the proponent indicated that this would result in a stabilisation or rise in groundwater levels at many of the representative sites even under a drying climate scenario. However, modelling also indicated that despite seeing a stabilisation or improvement to current water levels, meeting the criteria of MS 819 at all representative sites would not be possible. Therefore, the proponent considers it necessary to revise water level targets that are achievable under a drier climate and reduced abstraction scenario.

To reflect this, the proponent's request to amend included changes to water level criteria (now referred to as water level thresholds) at 16 sites and the removal of one

site (Pinjar North PM9). Changes to water level thresholds are proposed to take effect from 2028 once the outcome of abstraction reductions actions as outlined in the Gnangara groundwater allocation plan are realised, except for at Lake Nowergup, where the revised threshold is proposed to come into effect immediately.

The proponent expects that implementation of the revised water level thresholds will help improve the condition of many GDEs that are currently experiencing significant stress, and halt further deterioration of ecological values at other sites. However, the EPA notes that there remains a risk of non-compliance at some criteria sites, particularly given the declining trends in rainfall, groundwater recharge and the storage capacity of the Superficial aquifer. The EPA has provided other advice about reporting on non-compliances that may be realised in the future.

In February 2022, the then Minister for Environment requested that the EPA inquire into and report on the question of whether the implementation conditions relating to the proposal should be changed as requested by the proponent.

This report satisfies the requirements of the EPA's inquiry.

### 3 Inquiry into amending the conditions

The EPA has discretion as to how it conducts this inquiry. In determining the extent and nature of this inquiry, the EPA had regard to information such as:

- the currency of its original assessment (EPA Report 295)
- subsequent s. 46 inquiries (EPA Reports 817, 1155, 1324)
- the currency of the assessment of the East Gnangara proposal (EPA Report 904)
- Ministerial statements 21, 438, 496, 687, 819
- information provided by the proponent
- Gnangara groundwater allocation plan (DWER 2022a)
- Gnangara groundwater allocation plan – methods (DWER 2022b)
- Gnangara groundwater allocation plan – statement of response (DWER 2022c)
- the independent peer review of the 2030 proposed revised water thresholds, undertaken by the Centre for Ecosystem Management, School of Science, Edith Cowan University (Kavazos et al. 2020)
- additional independent review of revised threshold levels on Lake Nowergup wetland and bushland values (Froend Bowen and Associates 2025)
- the independent peer review of Part B of the Gnangara groundwater allocation plan – methods, undertaken by CSIRO and their advice on adaptive management and future revisions to the water level thresholds in a changing climate (CSIRO 2024)
- triennial compliance assessment report July 2021 – June 2024 (DWER 2025a)
- annual compliance assessment report July 2024 – June 2025 (DWER 2026)
- any new information regarding the potential impacts of the proposal on the environment.

The EPA did not seek public comment on the s. 46 inquiry, noting the extensive public consultation undertaken by the proponent in developing the 2022 *Gnangara groundwater allocation plan*, which had considerations for the revised water level thresholds. The proponent opened public submissions on the draft allocation plan from November 2021 to February 2022, and published its response to submissions in the *Gnangara groundwater allocation plan: statement of response* (DWER 2022c).

#### EPA procedures

In conducting this inquiry, the EPA has considered and given due regard to relevant current and former policy documents. Until 1 January 2026, the EPA followed the procedures in the *Environmental Impact Assessment (Part IV Divisions 1 and 2) Administrative Procedures 2024* (State of Western Australia 2024) and the *Environmental Impact Assessment (Part IV Divisions 1 and 2) Procedures Manual* (EPA 2024). From 1 January 2026, the EPA has had regard to the *Environmental Impact Assessment Practice Guide Assessment of Proposals in Western Australia under Part IV of the Environmental Protection Act 1986*, which replaced the abovementioned Administrative Procedures and Procedures Manual.

## 4 Inquiry findings

The EPA considered that inland waters is the key environmental factor relevant to the section 46 inquiry into the amendments to the conditions.

Noting the age of the most recent statement (MS 819) being published in 2009, and that it retains conditions and commitments from the original statement from 1988, the EPA considers it appropriate to recommend that all conditions, procedures and proponent commitments of MS 819 be replaced by a new contemporary Ministerial statement and conditions. The inquiry findings and recommendations have therefore been discussed in this context. Appendix A summarises the EPA's inquiry findings for each condition and commitment in MS 819 and provides a recommendation as to whether the condition should be deleted or replaced.

### 4.1 Inland Waters

The EPA environmental objective for the inland waters environmental factor is to *maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected* (EPA 2018).

#### Assessment of the requested amendments to conditions

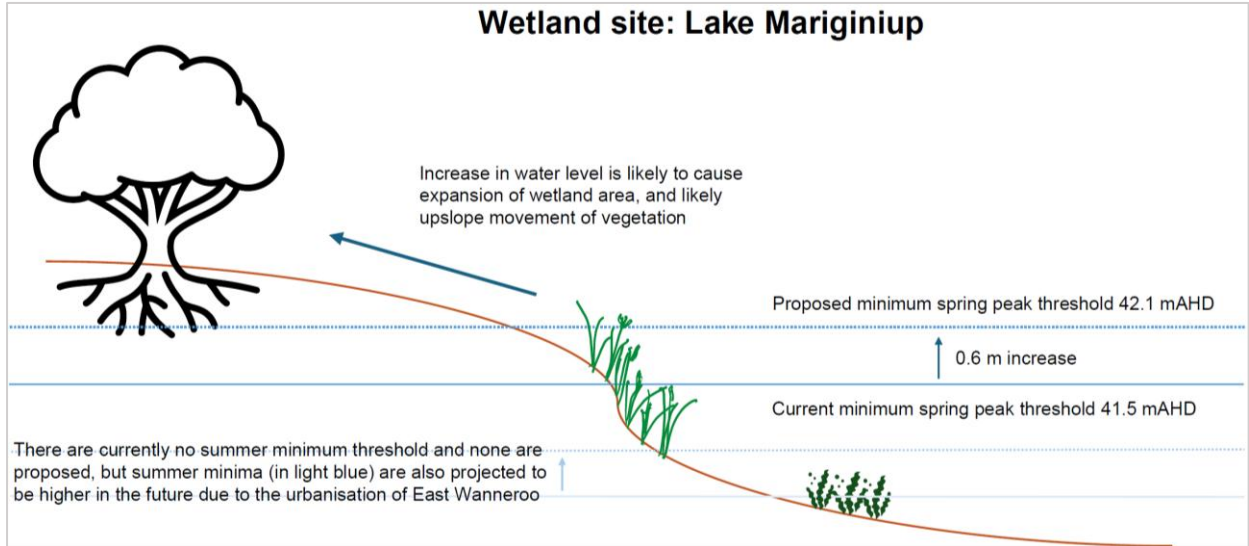
The EPA understands that the planned measures to rebalance groundwater abstraction from the Gnangara groundwater system aim to, in part, maintain or increase groundwater levels to avoid damage to environmental health. The proponent has proposed changes to water level thresholds at 16 representative GDE sites comprising wetland and bushland areas, including:

- a decrease to the minimum water level threshold at 11 sites
  - Note: a decrease means that the new water level threshold is proposed at a depth that is deeper from ground level than the current Ministerial criteria (see Figures 2 and 3)
- an increase to the minimum water level threshold at four sites
  - Note: an increase means that the new water level threshold is proposed at a depth that is shallower from ground level than the current Ministerial criteria (see Figure 1)
- an amendment to the minimum water level threshold at Egerton Seepage as the current monitoring bore requires replacing due to accessibility issues
- removing preferred minimum summer and/or preferred spring peak water level thresholds from all sites.

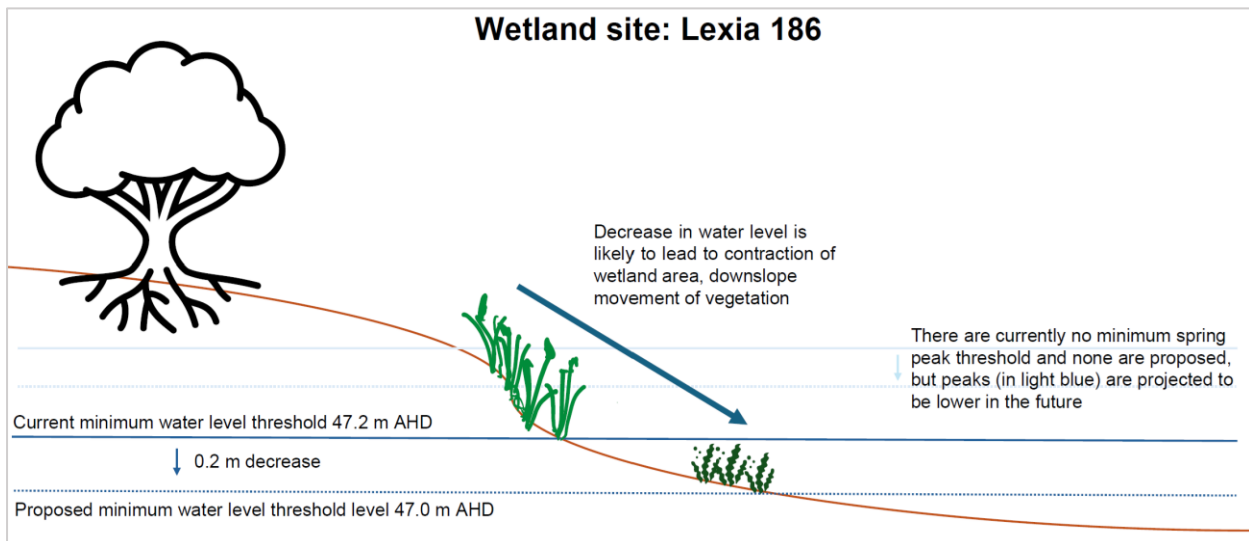
A summary of the proponent's proposed changes to the water level thresholds can be found in Appendix F of the Gnangara groundwater allocation plan (DWER 2022a).

Minimum spring peak thresholds are proposed for Lake Mariginiup and Melaleuca Park 78. The spring peak threshold is the level that needs to be attained when water levels are at their highest ('peak') in the year following the winter wet period

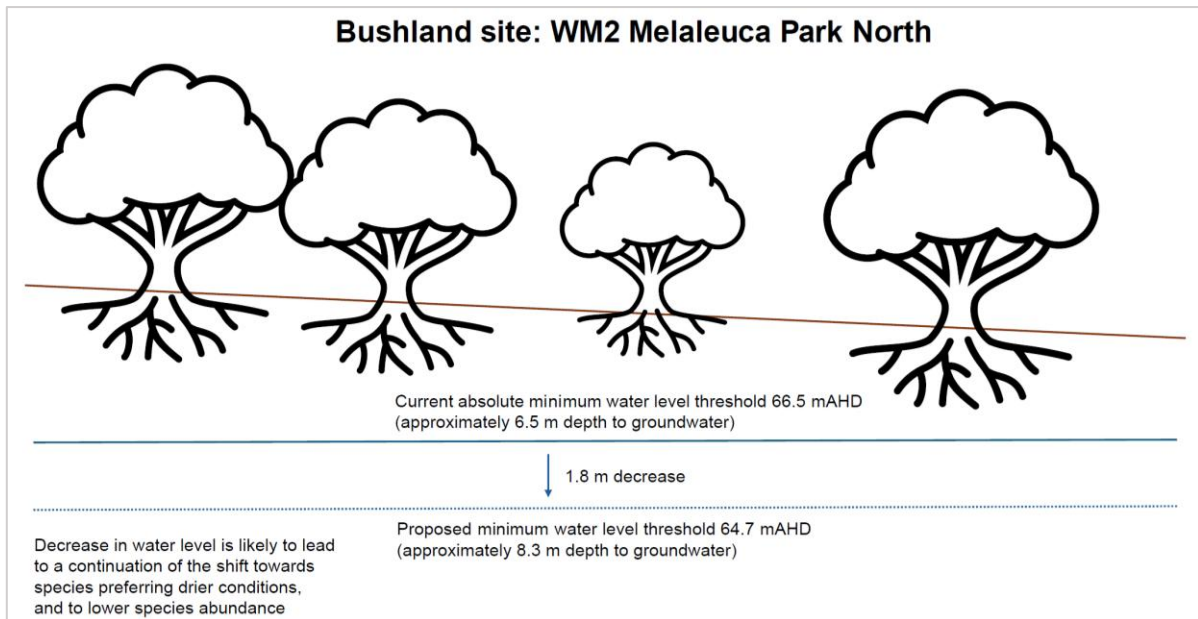
(see Figure 1). Absolute minimum thresholds are proposed for the other sites, whereby the threshold is the lowest point water levels should fall to in the year after the summer dry period if ecological values are to be maintained (see Figures 2 and 3).



**Figure 1. Diagrammatic representation of an increase to minimum water level threshold.**



**Figure 2. Diagrammatic representation of a decrease to minimum water level threshold at a wetland site.**



**Figure 3. Diagrammatic representation of a decrease to minimum water level threshold at a bushland site.**

### *Proposed decreases to minimum water level thresholds*

Representative GDEs at the 11 sites where minimum water level thresholds are proposed to be decreased are currently experiencing varying levels of water stress and terrestrialisation. Terrestrialisation means that GDEs are becoming less dependent on groundwater, causing a shift in the structure and composition of the vegetation community. This may ultimately result in loss of species and ecological values associated with GDEs.

Long-term monitoring indicates that water levels at these sites have not met the water level criteria specified in MS 819. Sites WM2 Melaleuca Park and WM8 Melaleuca Park have been in non-compliance with existing water level criteria since 2019, and the remaining nine sites have been in non-compliance since the early 2000s.

The EPA notes that in 2024-25, there was an improvement in the number of compliant sites compared with records from 2023-24 (DWER 2026). Sites where water levels increased in 2024-25 are expected to continue improving with the implementation of planned abstraction reductions, as set out in the Gnangara groundwater allocation plan (DWER 2022a). Water level criteria at these sites that reported improvement in 2024-25 are not proposed to be amended.

The EPA notes that the proponent's groundwater modelling compared a 'no intervention' scenario with other various scenarios of reduced groundwater abstraction volumes. The 'no intervention' scenario is where the volume of groundwater abstraction remains unchanged from existing abstraction rates. All scenarios assumed a drying climate to reflect the declining rainfall trends over the past two decades and the resulting recharge to groundwater across the Gnangara groundwater system (DWER 2022b).

Under the ‘no intervention’ scenario, water levels were predicted to decline across most of the Gnangara groundwater system except in areas likely to be influenced by land use changes, namely urbanisation in the East Wanneroo area. Modelling of scenarios where groundwater abstraction is reduced indicated improvements to water levels across a broad area, although climate still drove declines in the central eastern and northern parts of the Gnangara groundwater system (DWER 2022b). The EPA notes that modelled projections show that even with large reductions to groundwater abstraction, these representative sites are likely to remain in non-compliance with water level criteria specified in MS 819. As such, the proponent proposes to decrease the minimum water level thresholds at 11 sites.

For these 11 sites, the proponent has identified management objectives to either maintain and/or improve the ecological health of GDEs, or to manage the rate of decline in water levels to support GDEs.

#### Maintain or improve the ecological health of GDEs

The proponent considers that the ecological health of GDEs at seven representative sites will either be maintained or improved despite the decreases to the minimum water level thresholds being proposed.

The EPA notes that although the proposed minimum thresholds are lower than those specified in MS 819, they remain above the water levels recorded at the representative sites in 2024 (Table 1). The EPA notes that by reducing groundwater abstraction, water levels are expected to rise from those recorded in 2024. This is likely to improve or maintain the ecological health of these representative GDEs, rather than contributing to further decline.

While permanent water still occurs at Loch McNess, Lake Yonderup, Lake Nowergup and Pipidinny Swamp, declining water levels have altered the distribution of aquatic and wetland vegetation, leading to changes in lake nutrient levels at some sites, and impacts to drought refuge for birds and habitat for native bush rat (*Rattus fuscipes*), rakali (*Hydromys chrysogaster*) and aquatic macroinvertebrate communities.

Managing water levels to the proposed lower minimum thresholds at Loch McNess, Lake Yonderup and Pipidinny Swamp is likely to sustain deeper permanent water than current levels. This is likely to improve the existing condition of fringing vegetation and wetland habitat that support vertebrate fauna and macroinvertebrate communities. Improvements in the distribution of fringing vegetation is also likely to maintain a buffer against nutrient enrichment and acidification.

**Table 1. Current and proposed post-2028 minimum water level thresholds to maintain or improve ecological health of GDEs at representative sites**

Site W – wetland site B – bushland site	Management objective	Current water level threshold (mAHD)	2024 summer minimum recorded water levels (mAHD)	Proposed water level threshold (mAHD) post-2028
Loch McNess (W)	Improve	6.95	<5.5	6.2
Lake Yonderup (W)	Improve	5.9	<5.4	5.7
Lake Nowergup (W)	Improve	16.8	15.1 (minimum) 15.6 (peak)	15.1

Lake Wilgarup (W)	Improve	4.5	2.73	3.2
Pipidinny Swamp (W)	Improve	1.6	0.3	1.1
Lexia 186 (W)	Maintain	47.2	46.6	47
MM59B Whiteman Park East (B)	Improve	36.3	35.5	36.2

Despite efforts to artificially maintain Lake Nowergup since 1989, the historical decline of approximately 0.8 m in water depth has been substantial and it is unlikely that the previous deep-water feature will return. The EPA notes that the proponent currently supplements the lake to maintain a minimum water level above 15.1 mAHD, which has mitigated acidification and continues to provide habitat for fish and diving birds. Managing water levels to the proposed lower minimum threshold of 15.1 mAHD is likely to maintain this current water regime (Froend Bowen and Associates 2025). The EPA considers that changing the water level threshold at Lake Nowergup ahead of the implementation of groundwater abstraction reductions in 2028 is appropriate and should ensure that the ecological health of the lake is maintained and further declines avoided.

Surface waters at Lake Wilgarup have not been observed since 1998, which has led to local extinction of sedges and aquatic species (Kavazos et al. 2020). It is understood that managing water levels to the proposed lower minimum threshold will not restore surface water. However, the proponent considers that soil moisture is likely to increase with the proposed changes to abstraction, reducing the risk of acidification and increasing the likelihood that sediment processes will be maintained.

Lexia 186 has undergone a shift from being a seasonally waterlogged basin to a predominately dry site, with loss of aquatic species and shift in composition of native vegetation. Nevertheless, high native species richness has been recorded at the site and now provides important habitat for terrestrial fauna (Kavazos et al. 2020). The proponent considers that managing water levels at the proposed lower threshold will ensure the high species richness of native vegetation that currently exists at the site will be maintained.

Despite not achieving the current threshold levels, groundwater levels at MM59B Whiteman Park East have remained relatively stable, with the Banksia woodland community at the site not exhibiting symptoms of water stress. The proposed lower minimum threshold should ensure that groundwater occurs within 5 metres of the surface, which is substantially higher than the water table under the current abstraction regime (Kavazos et al. 2020).

#### Manage the rate of decline in water levels to support GDEs

The proponent acknowledges that terrestrialisation is occurring at wetland site Melaleuca Park 173, and at three bushland sites, WM1 Pinjar, WM2 Melaleuca Park North, and WM8 Melaleuca Park (Table 2). The EPA understands that managing water levels to the proposed lower minimum thresholds is not likely to halt terrestrialisation or reinstate previous ecological values. However, the proponent proposes to manage the decline of water levels at a rate that limits decline in the health of fringing and wetland vegetation at the wetland site and avoids significant impacts to habitat values of Banksia woodland communities at bushland sites.

Melaleuca Park 173 has shifted from a permanently inundated wetland to a seasonally inundated dampland, leading to a loss of aquatic fauna and the local extinction of black-stripe minnow (*Galaxiella nigrostriata*) which is listed as endangered under the *Biodiversity and Conservation Act 2016* and the *Environment Protection and Biodiversity Conservation Act 2000* (Kavazos et al. 2020). However, the wetland retains high native vegetation species richness.

The EPA notes that the proposed reduction in abstraction is likely to reduce, but not fully arrest, further water level declines at the wetland site. The EPA acknowledges that managing water levels to the proposed lower threshold is unlikely to reinstate the aquatic macroinvertebrate communities previously observed and further declines of ecological values associated with the presence of surface water are likely. However, the revised lower threshold should ensure the site will remain as a seasonally inundated sumpland and this is likely to be frequent enough to maintain fringing and wetland vegetation at a similar state to present and continue to support the current range of habitats present at the site (Kavazos et al. 2020).

**Table 2. Current and proposed post-2028 minimum water level thresholds to manage the rate of decline in water level to support GDEs at representative sites**

Site W – wetland site B – bushland site	Current water level threshold (mAHD)	2024 summer minimum recorded water levels (mAHD)	Proposed water level threshold (mAHD) post-2028
Melaleuca Park 173 (W)	50.2	48.5	49
WM1 Pinjar (B)	55.7	54.6	53.7
WM2 Melaleuca Park North (B)	66.5	66.1	64.7
WM8 Melaleuca Park (B)	64.8	64.6	63.7

At the bushland sites, water level records show that these sites have remained relatively stable since 2017; however, remain below the water level criteria set in MS 819. While the understorey at the sites is dominated by dryland species, including *Acacia* species and *Xanthorrhoea preissii*, the *Banksia* woodland communities appear to be in good condition (Kavazos et al. 2020). The proposed lower threshold should ensure groundwater levels are maintained at between six to seven metres below the surface, which is within the range accessible to phreatophytic vegetation. It is therefore likely that the *Banksia* woodland communities will persist but may become less dependent on groundwater as terrestrialisation continues.

The EPA notes that managing water levels to the proposed lower thresholds in Table 2 will be an improvement to historical water levels and should be sufficient to manage the decline in the health of wetland and phreatophytic vegetation at these four representative sites.

#### *Proposed increases to minimum water level thresholds*

Due to increased recharge as a result of changes in land use from agriculture to urban development, groundwater levels near East Wanneroo are expected to increase. Water levels at Lake Goollelal, Lake Joondalup, and Lake Mariginiup are likely to reach levels higher than the water level criteria specified in MS 819.

Accordingly, minimum water level thresholds are proposed to be increased at these sites (see Table 3).

**Table 3. Current and proposed post-2028 minimum water level thresholds and associated site management objectives for GDEs at representative wetland sites**

Wetland site	Management objective	Current water level threshold (mAHD)	2024 summer minimum recorded water levels (mAHD)	Proposed water level threshold (mAHD) post-2028
Lake Goollelal	Maintain	26	26.6	26.4
Lake Joondalup	Maintain	15.8	16.8	16.2
Lake Mariginiup	Improve	41.5 (spring minimum peak)	41.5	42.1 (spring minimum peak)
Melaleuca Park 78	Manage	65.1	65.3 (minimum) 65.7 (peak)	65.5 (minimum peak)

The EPA notes that managing water levels to the proposed new thresholds at the three wetland sites should see the ecological health of these lakes maintained at, or improved from, their current condition (Kavazos et al. 2020). An increase in water levels, however, may result in the expansion of wetland vegetation into dryland areas. Where this happens in areas of expanding urbanisation, upland vegetation may experience ‘squeezing’, whereby existing vegetation is prevented or limited from migrating and colonising further upslope due to surrounding development. The EPA notes that high water levels resulting from land use change such as urbanisation will be managed by other controls, such as controlled groundwater levels in drainage schemes, and relevant district water management strategies.

In addition to the East Wanneroo lakes, the proponent proposes to increase the minimum water level threshold at Melaleuca Park 78 and considers that this should enable declines in groundwater levels to be managed in order to limit the decline in the health of wetland vegetation. The proposed higher threshold is predicted to be achievable under a dry future climate scenario and should alleviate water stress on *Melaleuca preissiana* (Kavazos et al. 2020). The EPA notes that reduction in abstraction is expected to reduce, but not fully arrest, further declines in water levels at this site, and progressive encroachment of dryland vegetation species into the wetland is likely to occur (DWER 2022b).

In addition to the proposed changes set out in Table 3, the minimum water level threshold at Egerton Seepage is proposed to be increased from 39.29 mAHD to 39.8 mAHD. This is due to bore accessibility issues and the need to replace bore B25 with bore B25A. The proposed new threshold for Egerton Seepage at B25A is the equivalent summer minimum criterion at bore B25 relative to Australian Height Datum (DWER 2022a). As such, no change to ecological health outcomes is expected as a result of the revised water level.

#### *Removal of monitoring site Pinjar North (PM9)*

The proponent requested to remove Pinjar North (PM9) from the monitoring framework. The EPA is advised that monitoring of PM9 ceased in 2016 due to safety concerns regarding bore access as a result of a nearby rifle range. The actual

groundwater levels at this site are therefore unknown, however, previous monitoring indicates that groundwater levels at this site continuously declined from 1980 until 2016.

Groundwater modelling predicts that further declines are likely to have occurred at this site, and water levels are expected to be greater than 12 metres below the surface (Kavazos et al. 2020). As vegetation at PM9 comprises Banksia woodlands, the woodlands are no longer likely to be groundwater dependent having adapted to the lowering of the water table. The EPA accepts the proposed removal of PM9 from the monitoring framework and recommends that the contemporary conditions that replace the conditions and proponent commitments of MS 819 reflect this change.

#### *Conclusion of key factor assessment*

Based on the above assessment, the EPA considers it acceptable to decrease or increase the water level thresholds as proposed by the proponent to align them with the modelled projected changes. The EPA is confident that the proposed new water level thresholds developed by the proponent are based on robust analysis of ongoing and long-term monitoring data, and improved knowledge and understanding of the hydrogeology of representative wetland sites across the Gnangara groundwater system. The EPA also notes the major updates to the groundwater modelling system has taken into account, information about climate trends.

The EPA considers that key environmental values supported by, or dependent on, inland waters can be protected by requiring the proponent to achieve the new water level thresholds, and therefore, has recommended this outcome to be subject to implementation conditions. With implementation of the recommended conditions, the EPA considers that existing groundwater regimes at the representative sites is likely to be improved or maintained, such that the ecological values of these sites are protected, and the outcome of the proposal is consistent with the EPA's objective for inland waters.

Further, the EPA understands that water level thresholds will be reviewed in terms of meeting the outcomes and objectives of the Gnangara groundwater allocation plan (DWER 2022a), including any changes to climate trends and with consideration for future climate projections.

## **4.2 Implementation timing of proposed new thresholds**

The Gnangara groundwater allocation plan (DWER 2022a) sets out abstraction reduction measures to be implemented in phases, with all measures being fully implemented by 2028. The EPA recognises that the proponent has implemented changes to the domestic garden bore sprinkler roster in September 2022 and has reduced the volume of groundwater abstraction in Yanchep for public water supply in 2024-25 (DWER 2024). The remaining reductions in groundwater abstraction across all sectors will occur from 2028, to allow self-supply licensees time to adjust and for Water Corporation to bring new replacement water sources online (e.g. Alkimos Seawater Desalination Plant).

Accordingly, the proponent has requested the proposed new water level thresholds, excluding Lake Nowergup, to come into effect from 2028. The EPA considers this request appropriate, given the phased implementation approach of the Gnangara groundwater allocation plan.

Based on the above, the EPA recommends minimum water level thresholds as per MS 819 to continue to apply from when the contemporary Ministerial statement is issued to 30 June 2028, except for at Lake Nowergup where the proposed new water level threshold should apply immediately (condition B1-1(1)(a)). The proposed new water level thresholds at the remaining representative sites are recommended to apply from 1 July 2028 onwards (condition B1-1(1)(b)).

The EPA has also provided other advice (section 5) in relation to new water supply options.

### 4.3 Other conditions

Ministerial statement 819 contains other conditions not related to the key environmental factors discussed above and conditions that are no longer relevant or are outdated. The EPA's recommendations regarding these other conditions and its recommendations regarding other proposed new conditions are summarised in Appendix A.

## 5 Other advice

The EPA may, if it sees fit, include other information, advice or recommendations relevant to the environment in its assessment reports, even if that information has not been taken into account by the EPA in its assessment of a proposal.

The EPA provides the following information for consideration by the Minister:

### New water supply options to further ease pressure on Gnangara

Despite strategies and actions to achieve general stabilisation and a small improvement in compliance with the water level thresholds, there is still a risk that the proponent may remain in non-compliance at some criteria sites. This is particularly the case given downward trends in rainfall, groundwater recharge and storage capacity of the superficial aquifer (DWER 2024).

To ease further pressure on the Gnangara groundwater resource, the EPA considers it would be prudent for Government to continue progressing with the planning and investigation of new water supply options, such as managed aquifer recharge for non-potable supply. This is consistent with the actions in the Gnangara groundwater allocation plan (DWER 2022a).

The EPA recommends that details of progress and investigations in relation to new source developments, including for managed aquifer recharge be set out in the next Gnangara groundwater allocation plan progress report.

### Management of pines regrowth and recharge

The EPA acknowledges the Minister for Environment's decision in December 2023 to cease pine harvesting within the Gnangara-Moore River State Forest (State Forest 65). It is noted that this may have implications for achieving groundwater site management objectives as set out in the Gnangara groundwater allocation plan (DWER 2022a), as these objectives were determined based on abstraction reduction, appropriate pine plantation management, and urbanisation occurring at the northern extent of the Gnangara Mound.

The Gnangara groundwater allocation plan progress report (DWER 2024) shows that despite early reductions in abstraction from the Yanchep Superficial aquifer bores, groundwater levels in this area have fallen, with the end-of-summer water levels at Loch McNess in April/May 2024 being lowest on record.

The EPA highlights the need for inter-agency collaboration to develop a management strategy for State Forest 65, and for Government to ensure there is sufficient resourcing of agencies to manage areas of dense pine wildlings, while balancing the objectives of supporting habitat and food resources of Carnaby's cockatoo (*Zanda latirostris*) for the long term and maximise recharge to the Gnangara groundwater resources.

Urbanisation of the east Yanchep area should have consideration for the requirements of the *State Planning Policy 2.9 Water* (WAPC 2025), including updated policy requirements to consider water-related issues associated with climate change and cumulative impacts, and establishing wetland buffers, so that environmental values of water are protected (WAPC 2025).

### Additional monitoring methods

It is recommended that the proponent investigate opportunities to deploy additional monitoring methods, such as a remote sensing or eDNA technology, to detect changes in environmental assets and surrounding landscape in response to changing groundwater levels. The investigations should consider whether additional monitoring technologies would add value to the current Gnangara monitoring program and complement any component of current biodiversity monitoring.

Investigations should also guide the establishment of an early warning system to assist in the advanced development of strategies to prevent water level threshold exceedances and support adaptive, sustainable water resource management. The EPA considers that it is reasonable to request an update on the outcome of these investigations at the next Gnangara groundwater allocation plan progress report. Recommended contemporary condition B1-4 requires the proponent to commence investigations on other monitoring technologies.

## 6 Conclusions and recommendations

The EPA considers it appropriate to contemporise and replace all conditions of Ministerial statement 819 with those discussed in this report and outlined in Appendix B. The assessment of each implementation condition and proponent commitment of Ministerial statement 819 is provided in Appendix A.

### Conclusions

In relation to the environmental factors, and considering the information provided by the proponent and relevant EPA policies and guidelines, the EPA concludes that:

- there are no amendments to the proposal associated with the request to amend the conditions
- there is no significant new or additional information that changes the conclusions reached by the EPA under any of the relevant environmental factors since the proposal was assessed by the EPA in Reports 295, 817, 904, 1155, and 1324
- no new significant environmental factors have arisen since the EPA's original assessment of the proposal
- the proponent has developed the proposed new water level thresholds based on improved and contemporary understanding of the Gnangara groundwater system, informed by ongoing and long-term monitoring, new hydrogeological studies, and updates to the Perth Regional Aquifer Modelling System (PRAMS)
- the imposition of the attached recommended conditions (Appendix B), which includes the new water level thresholds, is likely to ensure the protection of key environmental values across the Gnangara Mound and meet the EPA's objective for inland waters.

### Recommendations

Having inquired into this matter, the EPA submits the following recommendations to the Minister for Environment under s. 46 of the EP Act:

1. It is appropriate to amend Ministerial statement 819 in its entirety by replacing it with a new Ministerial statement containing implementation conditions under the new condition framework, while retaining the environmental requirements.
2. After complying with s. 46(8) of the EP Act, the Minister may issue a statement of decision to replace conditions statement Ministerial statement 819 in the manner provided for in the attached recommended statement (Appendix B).

## Appendix A: Assessment of proposed amendments to implementation conditions of Ministerial statement 819

**Table 1: Gnangara Mound Groundwater Resources [including Groundwater Resource Allocation, East Gnangara] – Section 46 assessment and evaluation of proposed amendment to conditions of Ministerial Statement 819**

Ministerial condition 819	Assessment and evaluation of proposed amendment
<p><b>1 Implementation</b></p> <p>1-1 The proponent shall implement the proposals as documented in “Section 46 Review of Environmental Conditions on Management of the Gnangara and Jandakot Mounds – Stage 1 Proposal for Changes to Conditions” (August 2004), as modified and documented in Environmental Protection Authority Bulletin 1155, which revised the Environmental Review and Management Programme (1986), published in Environmental Protection Authority Bulletin 295 as Appendix D; and which were consolidated in May 1996 and reported on in Environmental Protection Authority Bulletin 817, as revised in November 1996, and also revised in the Public Environmental Review (1997), published in Environmental Protection Authority Bulletin 904 as Appendix 3.</p>	<p><u>Replace condition 1 with the introduction to the new Ministerial statement</u></p> <p>Under the new condition framework, the introduction of the new Ministerial statement (MS) states that the proposal must now be implemented in accordance with the implementation conditions and procedures of that Statement.</p> <p>The conditions, procedures, and proponent commitments of MS 819 for the proposal is expressly deleted and replaced with conditions and procedures under the new conditions framework.</p> <p>The new Statement lists preceding report and MS numbers.</p>
<p><b>2 Proponent Commitments</b></p> <p>2-1 The proponent shall implement the environmental management commitments, as revised in May 2009, and documented in schedule 1 of this statement, to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority.</p>	<p><u>Delete condition 2</u></p> <p>Condition 2 relates to proponent commitments that are documented in Schedule 1 of MS 819.</p> <p>The EPA has reviewed each proponent commitment and considers that they:</p> <ul style="list-style-type: none"> <li>• can be addressed in the proposed Gnangara groundwater monitoring and management plan (GMMP) required under contemporary condition B1-2</li> <li>• are no longer relevant, or</li> <li>• relate to matters that can be managed under other legislation.</li> </ul> <p>The EPA considers that all proponent commitments can be deleted. For full details of this assessment see Table 2 of Appendix A.</p>

Ministerial condition 819	Assessment and evaluation of proposed amendment
<p><b>3 Proponent Nomination and Contact Details</b></p> <p>3-1 The proponent for the time being nominated by the Minister for the Environment under section 38(6) or (7) of the <i>Environmental Protection Act 1986</i> is responsible for the implementation of the proposals 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 as the proponent for the proposals.</p> <p>3-2 If the proponent wishes to relinquish the nomination, the proponent shall apply for the transfer of proponent and provide a letter with a copy of this statement endorsed by the proposed replacement proponent that the proposals will be carried out in accordance with this statement. Contact details and appropriate documentation on the capability of the proposed replacement proponent to carry out the proposals shall also be provided.</p> <p>3-3 The nominated proponent shall notify the Chief Executive Officer of the Department of Environment and Conservation of any change of contact name and address within 60 days of such change.</p>	<p><u>Delete conditions 3-1 and 3-2</u></p> <p>Conditions 3-1 and 3-2 are no longer relevant for inclusion within the Statement and are deleted.</p> <p><u>Replace condition 3-3 with contemporary condition D4 (Contact Details)</u></p> <p>Contemporary condition D4 requires the proponent to notify the CEO of any changes to their contact details. The intent of condition 3-3 is retained.</p>
<p><b>4 Compliance Audit and Performance Review</b></p> <p>4-1 The proponent shall prepare an audit program and submit compliance reports to the Chief Executive Officer of the Department of Environment and Conservation which address:</p> <ol style="list-style-type: none"> <li>1. evidence of compliance with the conditions and commitments; and</li> <li>2. the performance of the environmental management plans and programs.</li> </ol> <p>4-2 The proponent shall submit a performance review report by 1 December each year and more detailed reports by 1 February every three years, to the requirements of the Chief Executive Officer of the Department of Environment and Conservation, which address:</p> <ol style="list-style-type: none"> <li>1. compliance with the conditions;</li> <li>2. the achievement of environmental objectives set for the proposal;</li> </ol>	<p><u>Replace condition 4-1, 4-2 and 4-3 with contemporary condition D2 (Compliance Reporting)</u></p> <p>Contemporary condition D2 requires the proponent to prepare annual compliance assessment reports which must include details of:</p> <ul style="list-style-type: none"> <li>• compliance against the implementation conditions</li> <li>• monitoring results</li> <li>• corrective, remedial or preventative measures undertaken.</li> </ul> <p>Contemporary condition D2 also requires the proponent to publish the compliance assessment report on its website.</p> <p>The intent of conditions 4-1 to 4-3 is retained.</p> <p><u>Delete requirement for triennial performance review reports under condition 4-2, add contemporary condition B1-2 (Gnangara GMMP), and D3 (Environmental Performance Reporting)</u></p> <p>The requirement for the proponent to prepare performance review reports and provide updates on proposed environmental management every three years is no longer required as:</p>

Ministerial condition 819	Assessment and evaluation of proposed amendment
<p>3. stakeholder and community consultation about environmental performance and the outcomes of that consultation, including a report of any on-going concerns being expressed; and</p> <p>4. proposed environmental management over the next three years to comply with conditions and environmental objectives set for the proposal.</p> <p>4-3 The proponent shall make the reports required by condition 4-2 publicly available, to the requirements of the Chief Executive Officer of the Department of Environment and Conservation.</p> <p>4-4 The proponent shall report any breach of the environmental criteria set out in Tables 1 and 2 or environmental objectives to the Chief Executive Officer of the Department of Environment and Conservation immediately it becomes evident to the proponent.</p>	<ul style="list-style-type: none"> <li>the information required to be contained within the three-yearly performance review reports are required by annual compliance assessment reports under contemporary condition D2, or by Environmental Performance Reports required under contemporary condition D3 on a five-yearly basis</li> <li>the Gngangara GMMP, required under contemporary condition B1-2, specifies the environmental management measures to be implemented.</li> </ul> <p>The intent of condition 4-2 is retained.</p> <p><u>Replace condition 4-4 with contemporary condition D1 (Non-compliance)</u></p> <p>Contemporary condition D1 requires the proponent to report, investigate and rectify all potential non-compliances. The intent of condition 4-4 is retained.</p>
<p><b>5 Management of the Water Resource</b></p> <p>5-1 The proponent shall base decisions affecting the management of groundwater resources of the Gngangara Mound on the concept of sustainable yield of resources and maintenance of ecological systems in accordance with the objectives of the State Conservation Strategy (1987).</p> <p>5-2 The proponent shall subject to review, every three years, the basis for groundwater management decisions, including groundwater allocations and licences, and the criteria specified for conservation of the environment and the groundwater resource of the Gngangara Mound, to the requirements of the Environmental Protection Authority on advice of the Department of Environment and Conservation.</p>	<p><u>Replace condition 5 with contemporary condition B1 (Inland Waters) and contemporary condition D3 (Environmental Performance Reporting)</u></p> <p>Condition 5-1 is deleted as reference to the State Conservation Strategy is outdated. The EPA notes that resources of the Gngangara groundwater system are now managed through the Gngangara groundwater allocation plan (DWER 2022a), implemented by the proponent.</p> <p>In regard to protecting the environmental values of the Gngangara groundwater system, this is retained through contemporary condition B1 (Inland Waters), which requires the proponent to achieve the proposal environmental outcome.</p> <p>The Gngangara GMMP, required under contemporary condition B1-2, includes provisions for monitoring against the environmental outcome. The framework requires the proponent to review groundwater management measures against monitoring results and adjust these measures (including abstraction and licenses) as required.</p> <p>Contemporary condition D3 requires the proponent to prepare and submit an Environmental Performance Report, which must include</p>

Ministerial condition 819	Assessment and evaluation of proposed amendment
	<p>proposed adaptive management and continuous improvement strategies.</p> <p>The intent of condition 5-2 is retained.</p>
<p><b>6 Groundwater Allocation</b></p> <p>6-1 The proponent shall ensure that the allocation of water to public and private users and the operation of the Pinjar Stages 1, 2 and 3, Wanneroo, Mirrabooka and Lexia Groundwater Schemes comply with environmental water provisions.</p>	<p><u>Replace condition 6 with contemporary condition B1 (Inland Waters)</u></p> <p>Contemporary condition B1 specifies the environmental outcome to be achieved with the implementation of the proposal, which includes water level thresholds for wetlands and other GDEs within the Pinjar, Wanneroo, Mirrabooka, and Lexia groundwater areas.</p> <p>The intent of condition 6-1 is retained.</p>
<p><b>7 Groundwater-dependent Ecosystems</b></p> <p>7-1 The proponent shall ensure that the integrity of all groundwater-dependent ecosystem located on the Gnangara Mound that may be impacted as a result of groundwater abstraction are protected, to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority and the Department of Environment and Conservation.</p>	<p><u>Replace condition 7 with contemporary condition B1 (Inland Waters)</u></p> <p>Contemporary condition B1 specifies the environmental outcome to be achieved with the implementation of the proposal, that is, to maintain the ecosystem health of GDEs located on the Gnangara groundwater system that may be impacted by groundwater abstraction.</p> <p>The intent of condition 7 is retained.</p>
<p><b>8 Groundwater Availability</b></p> <p>8-1 The proponent shall widely publish by the end of October each year the limits on groundwater availability for the Gnangara Mound.</p> <p>8-2 The proponent shall update annually the figures published according to the requirements of condition 8-1, with emphasis on those areas of high allocation relative to sustainable yield of the groundwater resource so that limits to use and development can be clearly seen by all interested parties. The updated figures shall also be widely published.</p>	<p><u>Delete condition 8</u></p> <p>The Gnangara groundwater allocation plan (DWER 2022a) sets out the requirement for the proponent to publish progress reports every two years, to provide an update on the implementation of the allocation plan, including groundwater level trends and licensing statistics.</p> <p>The requirement under condition 8 is no longer required for inclusion within the Statement.</p>
<p><b>9 Water Conservation</b></p> <p>9-1 The proponent shall actively encourage further reduction in public and private water demand in accordance with the State Water Strategy (2003) and other water conservation initiatives.</p>	<p><u>Replace condition 9 with contemporary condition B1-2 (Gnangara GMMP)</u></p> <p>The EPA notes that the proponent currently implements water use efficiency and education programs in line with the Waterwise Perth Action Plan 2 – Kep Katitjin – Gabi Kaadadjan (DWER 2022d).</p> <p>The Gnangara GMMP, required under contemporary condition B1-2, includes provisions for this work to continue. It also includes provisions for the proponent to work with commercial nursery and tree</p>

Ministerial condition 819	Assessment and evaluation of proposed amendment
	<p>farming sector, local governments, and DPIRD, to improve their water efficiency in preparation of the abstraction reductions to be implemented in 2028 under the Gngangara groundwater allocation plan.</p> <p>The intent of condition 9 is retained.</p>
<p><b>10 Research and Monitoring</b></p> <p>10-1 The proponent shall participate in and undertake research and monitoring on the Gngangara Mound which includes:</p> <ol style="list-style-type: none"> <li>1. clarification of the relationship between groundwater level and rainfall under conditions of declining long-term rainfall;</li> <li>2. improvement in the understanding of the relationship between groundwater levels and vegetation, including plantations;</li> <li>3. improvement in the understanding of the relationship between groundwater level and abstraction from unconfined and confined aquifers of the Gngangara Mound;</li> <li>4. clarification of the relationship between groundwater level and wetland water levels and wetland water quality;</li> <li>5. improvement in the understanding of the relationship between groundwater level and water levels in the Yanchep caves; and</li> <li>6. improvement in the understanding of the conservation value of wetlands and other groundwater-dependent ecosystem on the Gngangara Mound,</li> </ol> <p>to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority and the Department of Environment and Conservation.</p>	<p><u>Replace condition 10 with contemporary conditions B1-3. Add new contemporary conditions B1-4, B1-5 and B1-6.</u></p> <p>Condition 10 is replaced with contemporary condition B1-3, which requires the proponent to undertake and participate in research that will contribute to the scientific knowledge and understanding of the relationship between the Gngangara groundwater system and rainfall, vegetation (including plantations), and abstraction.</p> <p>Contemporary condition B1-4 is added, requiring the proponent to investigate other technologies that could be used to monitor GDEs.</p> <p>Contemporary conditions B1-5 and B1-6 require the proponent to incorporate their findings and learnings into the Gngangara GMMP and make them publicly available.</p>
<p><b>Procedures</b></p> <ol style="list-style-type: none"> <li>1. Where a condition states "to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority", the Environmental Protection Authority will prepare the written notice to the proponent.</li> <li>2. The Environmental Protection Authority may seek advice from other agencies or organisations, as required, in order to provide its advice.</li> </ol>	<p><u>Delete procedures</u></p> <p>Procedures are deleted, as it is no longer relevant for inclusion within the Statement. The EPA now follows the <i>Environmental Impact Assessment (Part IV Divisions 1 and 2) Administrative Procedures 2021</i>, gazetted on 22 October 2021.</p>

Ministerial condition 819	Assessment and evaluation of proposed amendment
<p>3. Where a condition lists advisory bodies, it is expected that the proponent will obtain the advice of those listed as part of its compliance reporting to the Chief Executive Officer of the Department of Environment and Conservation.</p>	
<p><b>Notes</b></p> <ol style="list-style-type: none"> <li>1. The Minister for the Environment will determine any dispute between the proponent and the Environmental Protection Authority over the fulfilment of the requirements of the conditions.</li> <li>2. The conditions and commitments of statement no. 437 for which the Water Corporation is primarily responsible have not been reviewed during the section 46 consideration which has lead to the amended conditions of this statement.</li> </ol>	<p><u>Delete notes</u> Notes are deleted, as it is no longer relevant for inclusion within the Statement.</p>

**Table 2: Gnangara Mound Groundwater Resources [including Groundwater Resource Allocation, East Gnangara] – Section 46 assessment of proposed changes to proponent commitments of Ministerial Statement 819**

Topic	Proponent commitment	Assessment and evaluation of proposed amendment
1 Gnangara Mound allocations	Manage public and private groundwater abstraction to meet objectives and Environmental Water Provision (EWP) criteria presented in Tables 1 and 2 (attached).	<p><u>Replace commitment 1 with contemporary condition B1 (Inland Waters)</u></p> <p>Contemporary condition B1 requires the proposal to be implemented so that the integrity of representative GDEs across the Gnangara groundwater system are protected and maintained. To achieve this environmental outcome, the proponent is required to achieve site-specific water threshold levels.</p> <p>The proposed management measures, monitoring program, and adaptive management and review framework are specified in the Gnangara GMMP, which is required under contemporary condition B1-2.</p> <p>The intent of commitment 1 is retained.</p>
2 Management objectives and criteria	Management objectives and criteria and water allocation limits will be regularly reviewed and amended as information becomes available to provide for ongoing adaptive management.	<p><u>Replace commitment 2 with contemporary condition B1-2 (Gnangara GMMP)</u></p> <p>The Gnangara GMMP, required under contemporary condition B1-2, includes provisions for monitoring, review, and adaptive management.</p> <p>The intent of commitment 2 is retained.</p>
3 Yanchep caves	Continue to develop catchment strategies to minimise change in hydrological regime within the caves of Yanchep National Park. Monitor water levels and cave fauna.	<p><u>Replace commitment 3 with contemporary condition B1-2 (Gnangara GMMP)</u></p> <p>The EPA notes that significant decline in cave water levels has led to the drying of the Aquatic Root Mat Community in Caves of the Swan Coastal Plain threatened ecological community. It is acknowledged that efforts in the early 2000s to prevent further decline of water levels by supplementation into the caves were unsuccessful.</p> <p>The EPA is advised that access into the caves is now limited due to safety concerns as a result of drying, and efforts of supplementation and fauna cave monitoring have ceased.</p> <p>The Gnangara GMMP, required under contemporary condition B1-2, specifies that public water supply from the bores west of Yanchep National Park will be stepped down during the pre-2028 phase of the Gnangara groundwater allocation plan. It also specifies that the proponent will work</p>

Topic	Proponent commitment	Assessment and evaluation of proposed amendment
		collaboratively with DBCA and the Water Corporation in reducing impact on dependent values within Yanchep National Park. The intent of commitment 3 is retained.
4 Strategic drainage plans	Prepare strategic drainage plans for the study area including options for the management of high water levels in Lakes Joondalup, Goollelal, Mariginiup and Jandabup.	<u>Delete proponent commitment 4</u> The EPA notes that this commitment is associated with land use planning and development, and acknowledges that the proponent carries out this role as part of its core business. Commitment 4 is not directly relevant to the implementation of the proposal and is therefore deleted.
5 Research and investigation program	<ol style="list-style-type: none"> <li>1. Prepare a research and investigation program for submission to the EPA for review and subsequent finalisation of the program to the satisfaction of the EPA. The research and investigation program will be prepared with the objective of improving understanding of: <ul style="list-style-type: none"> <li>• groundwater-environmental relationships on the Swan Coastal Plain;</li> <li>• the associated management requirements; and</li> <li>• potential management techniques;</li> </ul> and will incorporate all relevant aspects of research and investigation work currently committed to under Ministerial Statements 438 and 496. </li> <li>2. Implement the research and investigation program to the satisfaction of the EPA.</li> <li>3. Review and revise the program every six years (coinciding with triennial reports), to the satisfaction of the EPA.</li> </ol>	<u>Delete proponent commitment 5</u> This commitment was completed in 2005 and can be deleted. However, the EPA acknowledges the importance of improving the understanding of the Gngangara groundwater system under a changing climate. Contemporary conditions B1-3 and B1-4 are added, requiring the proponent to undertake and participate in research that will contribute to the scientific knowledge and understanding of the relationship between the Gngangara groundwater system and rainfall, vegetation (including plantations), and abstraction; and investigate other technologies that could be used to monitor GDEs. Contemporary condition B1-5 requires the proponent to incorporate the findings and learnings from the research and investigations into the Gngangara GMMP. The intent of commitment 5 is retained.
6 Environmental monitoring program	1. Prepare an environmental monitoring program for submission to the EPA for	<u>Replace commitment 6 with contemporary condition B1-2 (Gngangara GMMP)</u>

Topic	Proponent commitment	Assessment and evaluation of proposed amendment
	<p>review and subsequent finalisation of the program to the satisfaction of the EPA. The monitoring program will include:</p> <ul style="list-style-type: none"> <li>• monitoring of groundwater levels in all relevant aquifer systems;</li> <li>• relevant wetland water levels and water quality;</li> <li>• condition of vegetation and fauna associated with groundwater dependent ecosystems; and</li> <li>• cave water levels.</li> </ul> <p>2. Implement the approved environmental monitoring plan to the satisfaction of the EPA.</p> <p>3. Review and revise the program every six years (coinciding with triennial reports), to the satisfaction of the EPA.</p>	<p>The Gnangara GMMP, required under contemporary condition B1-2, includes provisions to monitor groundwater and surface water (where relevant) levels, groundwater pressure in the Leederville and Yarragadee aquifers, and biological parameters.</p> <p>The Gnangara GMMP will be subject to an adaptive management and review framework. The six-yearly schedule for review under commitment 6(3) is therefore no longer required.</p> <p>The intent of commitment 6 is retained.</p>
7 Development advice	Continue to provide advice to the City of Wanneroo, the Department for Planning, DEC and other relevant agencies on the impact of land use on groundwater resources.	<p><u>Delete proponent commitment 7</u></p> <p>This commitment is deleted as it is not specifically relevant to the implementation of the proposal. The EPA acknowledges that the proponent continues to provide advice on the impacts of land use development on water resources across the state as part of its core business.</p>
8 Gnangara interagency technical advisory group	Convene and provide ongoing executive support for an inter-agency technical advisory group for water resources planning and management issues on the Gnangara Mound. The group will consider planning and management issues in the context of recommendations of the Select Committee on Metropolitan Development and Groundwater Supplies.	<p><u>Delete proponent commitment 8</u></p> <p>The EPA is advised that this commitment refers to the 1994 report by the Select Committee on Metropolitan Development and Groundwater Supplies. The intent of this commitment is to ensure inter-agency collaboration on water resource planning and management. The EPA acknowledges that the proponent undertakes this as part of its core business.</p> <p>Whilst the intent of this commitment is relevant for the state, it is outdated and not specifically related to the implementation of the proposal and is therefore deleted.</p>

Topic	Proponent commitment	Assessment and evaluation of proposed amendment
9 Community consultation	Continue to chair and provide support for the Gnangara Consultative Committee as an ongoing forum for information exchange and advice.	<p><u>Delete commitment 9, and add contemporary conditions D2 (Compliance Reporting) and D5 (Public Availability of Data)</u></p> <p>The EPA is advised that the Gnangara Consultative Committee was formed in the early 1990s and continued until the GSS was initiated in 2007. The GSS was never implemented and was followed by other multi-agency land and planning exercises, which also remain unsolved, such as the Strategic Assessment of Perth and Peel Region (SAPPR) and Green Growth Plan. The committee was not reconvened at that time.</p> <p>The proponent has advised the EPA that due to the size, complexity, and number of interest groups across the Gnangara groundwater resource area, a single consultative committee to represent the range of stakeholders is not practical. The EPA agrees that this commitment is no longer appropriate and can be deleted.</p> <p>Information exchange will continue through recommended contemporary condition D2, which requires annual Compliance Assessment Reports to be published, and contemporary condition D5, which requires any validated environmental data, to be made publicly available for the remainder of the life of the proposal.</p>
10 Vegetation protection	Limit potential for tree deaths around production wells to 100 metres radius for normal (average) climate conditions and within 200 metres in extreme conditions.	<p><u>Replace commitment 10 with contemporary condition B1 (Inland Waters)</u></p> <p>Contemporary condition B1 specifies the environmental outcome to be achieved with the implementation of the proposal, that is, to maintain the ecosystem health of representative GDEs located on the Gnangara groundwater system.</p> <p>Contemporary condition B1-2 requires the implementation of the Gnangara GMMP, which requires the proponent to negotiate spatial distribution of abstraction with Water Corporation annually, based on the results of rainfall, water level monitoring and ecological monitoring.</p> <p>The specific spatial reference of the 100 metre radius is removed, however, the intent of this commitment to limit potential for tree deaths around production wells is retained.</p>
11 Lake Nowergup supplementation	Should EWPs in Lake Nowergup not be met by November 1, artificial supplementation will be used until the EWP is reached.	<p><u>Replace commitment 11 with contemporary condition B1-2 (Gnangara GMMP)</u></p>

Topic	Proponent commitment	Assessment and evaluation of proposed amendment
		<p>The EPA is advised that artificial supplementation is likely to be required at Lake Nowergup in the medium term to achieve the proposed water level threshold.</p> <p>Contemporary condition B1-2(1) requires the proponent to revise and update the Gnangara GMMP to the requirements of condition C2, which outlines that details of the artificial maintenance scheme at Lake Nowergup is needed. The intent of this commitment is retained.</p>
12 Reporting	Require the Water Corporation to submit yearly production plans as part of the operating strategy and to report on compliance with environmental commitments made in the operating strategy.	<p><u>Delete proponent commitment 12</u></p> <p>The Water Corporation fulfills this commitment by submitting their yearly production plans required by the water resource management operating strategy as part of the <i>Rights in Water and Irrigation Act 1914</i> licence conditions. It is no longer required for inclusion in the Statement.</p>
13 Vegetation protection	Establish additional monitoring wells in those areas where suitable wells do not exist to monitor groundwater levels under phreatophytic vegetation.	<p><u>Delete proponent commitment 13</u></p> <p>This commitment is completed and can be deleted. Fifteen terrestrial representative sites have been established to monitor water levels nearby representative phreatophytic vegetation.</p>
14 East Gnangara wetlands	Require the Water Corporation to implement its 2001 wetland mitigation strategy and subsequent approved revisions and report to the Department of Environment on implementation.	<p><u>Delete proponent commitment 14</u></p> <p>The EPA is advised that monitoring of the five wetlands expected to be impacted by the Lexia Groundwater Scheme indicated that groundwater levels had declined prior to any abstraction occurring. Noting this, the wetland mitigation strategy was not progressed. Instead, an offset strategy was proposed to be developed and finalised through the GSS. The GSS commenced in 2007 but did not progress, and subsequently an offset strategy has not been developed.</p> <p>The EPA is advised that:</p> <ul style="list-style-type: none"> <li>• abstraction from the Lexia Groundwater Scheme has never reached the full proposal. On average, the annual abstraction rate has been approximately one third of the full proposal, and further reductions in abstraction have been realised since 2011-12</li> <li>• since 2016, monitoring has indicated that water levels within the vicinity of the five wetlands are recovering</li> <li>• other impacts such as fire, reduced rainfall, self-supply abstraction and land use change have also affected each of the mitigation wetlands since 2001</li> </ul>

Topic	Proponent commitment	Assessment and evaluation of proposed amendment
		<ul style="list-style-type: none"> <li>• production from the Lexia Groundwater Scheme is proposed to be further reduced under the Gnangara groundwater allocation plan during the post-2028 phase</li> <li>• despite changes to ecological values of the mitigation wetlands, a recent review of geomorphic wetlands spatial dataset by the DBCA maintained the original boundaries, wetland type and management categories of all mitigation wetlands, suggesting that wetlands have not been 'lost'.</li> </ul> <p>The proponent contends that as the Lexia proposal was never implemented to its full capacity, the commitment to compensate for the loss of the wetlands has been accomplished by the management of abstraction volumes, and implementation of a mitigation strategy or offset strategy is not warranted.</p> <p>The EPA acknowledges that with further proposed reductions in abstraction volumes, it is likely that water levels will continue to recover at the five mitigation wetlands. The EPA agrees that offsets to compensate for these impacts to the five mitigation wetlands are not required. This commitment is deleted.</p>

### Abbreviations

DBCA = Department of Biodiversity, Conservation and Attractions  
 DPIRD = Department of Primary Industries and Regional Development  
 DEC = Department of Environment and Conservation  
 EPA = Environmental Protection Authority  
 EWPs = Environmental Water Provisions  
 FPC = Forest Products Commission  
 GL/yr = Gigalitre per year  
 GMMP = Groundwater monitoring and management plan  
 GSS = Gnangara Sustainability Strategy

## Appendix B: Recommended conditions

### STATEMENT TO AMEND THE IMPLEMENTATION CONDITIONS APPLYING TO A PROPOSAL (Section 46 of the *Environmental Protection Act 1986*)

GNANGARA MOUND GROUNDWATER RESOURCES [INCLUDING  
GROUNDWATER RESOURCE ALLOCATION, EAST GNANGARA CITY OF SWAN]

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

**Proponent:** Department of Water and Environmental Regulation  
Australian Business Number 28 420 443 065

**Proponent address:** 8 Davidson Terrace  
Joondalup WA 6027

**Assessment number:** 2325

**Report of the Environmental Protection Authority:** 1805

**Preceding Reports relating to this Proposal:** 295, 817, 904, 1155, 1324

**Preceding Statements relating to this Proposal:** 21, 438, 496, 687, 819

**Introduction:** Pursuant to section 45 (8) as applied by section 46 (8) of the *Environmental Protection Act 1986*, an amendment to the implementation conditions has been agreed, and the proposal must now be implemented in accordance with the following implementation conditions and procedures.

The conditions, procedures and proponent commitments of Ministerial Statement 819 for the existing Gnangara Mound Groundwater Resources [Including Groundwater Resource Allocation, East Gnangara City of Swan] are deleted and replaced by the following implementation conditions and procedures:

#### Conditions and procedures

##### Part A: Proposal extent

##### Part B: Environmental outcomes, prescriptions and objectives

##### Part C: Environmental management plans and monitoring

##### Part D: Compliance and other conditions

## PART A: PROPOSAL EXTENT

### A1 Limitations and Extent of Proposal

A1-1 The proponent must ensure that the proposal is implemented within the following extent:

Proposal element	Location	Maximum extent
Physical element		
Proposal area	Figure 1	The Gnangara groundwater allocation plan area in Figure 1.

## PART B – ENVIRONMENTAL OUTCOMES, PRESCRIPTIONS AND OBJECTIVES

### B1 Inland Waters

B1-1 The proponent must ensure the implementation of the proposal achieves the following environmental outcome:

- (1) maintain the **ecosystem health** of **representative groundwater-dependent ecosystems**.

B1-2 The proponent must ensure implementation of the proposal achieves water levels consistent with the relevant minimum water level threshold:

- (1) described in Table 1 until 30 June 2028; and
- (2) described in Table 2 from 1 July 2028 for the life of the proposal.

**Table 1: Minimum water level threshold for the period until 30 June 2028**

Bushland sites	End of summer	
	Preferred minimum (mAHD)	Absolute minimum (mAHD)
MM16	-	38.8
MM18	-	38.6
MM53	-	33.3
MM55B	-	29.5
MM59B	-	36.3
MT3	-	43.0
NR6C	-	58.5
PM24	-	40.5
WM1	-	55.7
WM2	-	66.5
WM8	-	64.8
MM12 (G61610989)	-	42
L30C (G61611010)	-	47.2
L110C (G61611011)	-	55.7
L220C (G61611018)	-	52.2

**Table 1 (continued): Minimum water level threshold for the period until 30 June 2028**

Wetland sites		End of summer (mAHD)		Spring (mAHD)	
		Preferred minimum	Absolute minimum	Preferred Min. peak	Absolute Min. peak
Lake Goollelal	(Q6162517)	* 26.2	26		
Loch McNess	(Q6162564)		6.95		
Yonderup	(Q6162565)		5.9		
Lake Joondalup	(Q6162572 staff) (G61610661 bore)	* 16.2	15.8		
Mariginiup Lake	(Q6162577 staff) (peak levels recorded) (G61610685 bore)			* 42.1	41.5
Lake Jandabup Artificially maintained	(Q6162578)		44.3	* 44.7	44.2
Nowergup Lake Artificially maintained	(Q6162567)		15.1		
Wilgarup	(Q6162623 staff) (61618500 bore)	4.8	4.5	6.10	5.65
Pipidinny Swamp	(Q6162624)		1.6	2.7	2.4
Lexia 86	(GNM16) G61613215	* 47.3	47		
Lexia 186	(GNM15) G61613214	* 47.5	47.2		
Melaleuca Park (EPP) 173	(GNM14) Q6162628 staff bore G61613213		50.2		
Melaleuca Park (Dampland) 78	(GNM31) G61613231	* 65.4	65.1		
Egerton	61672233 bore		39.8		

\*water levels allowed between minimum and absolute minimum at a rate of 2 in 6 years to replicate natural drying cycles.

**Table 2: Minimum water level threshold for the period from 1 July 2028**

Site name	Site ID SG – surface gauge B – bore	Minimum water level threshold (mAHD)
<b>Wetland sites</b>		
Lake Goollelal	6162517 (SG)	26.4
Loch McNess	6162564 (SG)	6.2
Lake Yonderup	6162565 (SG)	5.7
Lake Joondalup	6162572 (SG) 61610661 (B)	16.2
Lake Mariginiup	6162577 (SG) 61610685 (B)	42.1 (minimum spring peak)
Lake Jandabup	6162578 (SG)	44.3
Lake Nowergup	6162567 (SG) 616145 (SG)	15.1
Lake Wilgarup	61618500 (B)	3.2
Pipidinny Swamp	6162624 (SG) 61611872 (B)	1.1
Lexia 86	61613215 (B)	47
Lexia 186	61613214 (B)	47
Egerton Seepage	61672233 (B)	39.8
Melaleuca Park 173	61613213 (B) 6162628 (SG)	49
Melaleuca Park 78	61613231 (B)	65.5 (minimum spring peak)
<b>Bushland sites</b>		
MM16 Whiteman Park West	61610835 (B)	38.8
MM18 Whiteman Park Central	61610918 (B)	38.6
MM53 Whiteman Park Central	61610493 (B)	33.3
MM55B Whiteman Park East	61610559 (B)	29.5
MM59B Whiteman Park East	61611025 (B)	36.2
MT3S East Wanneroo	61610745 (B)	43
NR6C Melaleuca Park	61610982 (B)	58.5
PM24 Lake Pinjar	61610697 (B)	40.5
MM12 Lexia	61610989 (B)	42

Site name	Site ID SG – surface gauge B – bore	Minimum water level threshold (mAHD)
L30C Lexia	61611010 (B)	47.2
L110C Lexia	61611011 (B)	55.7
L220C Melaleuca Park South	61611018 (B)	52.2
WM1 Pinjar	61610833 (B)	53.7
WM2 Melaleuca Park North	61610908 (B)	64.7
WM8 Melaleuca Park	61610983 (B)	63.7

*Gnangara groundwater monitoring and management plan (Environmental Management Plan)*

B1-3 The proponent must:

- (1) review, update and submit to the **CEO** the *Gnangara groundwater monitoring and management plan* (Revision 0, November 2022) (Environmental Management Plan) to satisfy the requirements of condition C2 and demonstrate how achievement of the inland waters environmental outcome in condition B1-1 will be monitored and substantiated;
- (2) submit the environmental management plan required by condition B1-3(1) by 1 July 2027; and
- (3) receive confirmation in writing from the **CEO** that the *Gnangara groundwater monitoring and management plan* (Environmental Management Plan) required by condition B1-3(1) satisfies the relevant requirements of conditions B1-3(1), B1-6 and C2.

*Research and investigations*

B1-4 The proponent shall undertake and participate in research that will contribute to the scientific knowledge and understanding of the relationship between the groundwater levels of the **Gnangara groundwater system** and:

- (1) rainfall;
- (2) vegetation, including plantations; and
- (3) abstraction from the confined and unconfined aquifers.

B1-5 The proponent shall investigate whether other technologies, including but not limited to, remote sensing and eDNA, could be used to inform the:

- (1) **holistic impact assessment** required by condition D3-3(2); and
- (2) the development of an early warning system to support adaptive sustainable water resource management.

B1-6 The proponent shall incorporate the findings and learnings from the research and investigations required by conditions B1-4 and B1-5 into the *Gnangara groundwater monitoring and management plan* (Environmental Management Plan) required by condition B1-3(1), or its future revisions.

B1-7 The findings and learnings from the research and investigations required by conditions B1-4 and B1-5 are to be made publicly available in accordance with condition D5-1.

## PART C – ENVIRONMENTAL MANAGEMENT PLANS AND MONITORING

### C1 Environmental Management Plans: Conditions Relating to Approval, Implementation, Review and Publication

C1-1 Upon being required to submit an environmental management plan under Part B, and after receiving notice in writing from the **CEO** under condition B1-3(3), the proponent must:

- (1) implement the most recent version of the **confirmed** environmental management plan; and
- (2) continue to implement the **confirmed** environmental management plan referred to in condition C1-1(1), other than for any period which the **CEO** confirms by notice in writing that it has been demonstrated that the relevant requirements for the environmental management plan have been met, or are able to be met under another statutory decision-making process, in which case the implementation of the environmental management plan is no longer required for that period.

C1-2 The proponent:

- (1) may review and revise a **confirmed** environmental management plan provided it meets the relevant requirements of that environmental management plan, including any consultation that may be required when preparing the environmental management plan;
- (2) must review and revise a **confirmed** environmental management plan and ensure it meets the relevant requirements of that environmental management plan, including any consultation that may be required when preparing the environmental management plan, as and when directed by the **CEO**; and
- (3) must revise and submit to the **CEO** the **confirmed** environmental management plan if there is a material risk that the outcomes or objectives it is required to achieve will not be complied with, including but not limited to as a result of a change to the proposal.

C1-3 Despite condition C1-1, but subject to conditions C1-4 and C1-5, the proponent may implement minor revisions to an environmental management plan if the revisions will not result in new or increased **adverse impacts** to the environment or result in a risk to the achievement of the limits, outcomes or objectives which the environmental management plan is required to achieve.

C1-4 If the proponent is to implement minor revisions to an environmental management plan under condition C1-3, the proponent must provide the **CEO**

with the following at least twenty (20) business days before it implements the revisions:

- (1) the revised environmental management plan clearly showing the minor revisions;
- (2) an explanation of and justification for the minor revisions; and
- (3) an explanation of why the minor revisions will not result in new or increased **adverse impacts** to the environment or result in a risk to the achievement of the limits, outcomes or objectives which the environmental management plan is required to achieve.

C1-5 The proponent must cease to implement any revisions which the **CEO** notifies the proponent (at any time) in writing may not be implemented.

C1-6 **Confirmed** environmental management plans, and any revised environmental management plans under condition C1-4(1), must be published on the proponent's website and provided to the **CEO** in electronic form within twenty (20) business days of being implemented, or being required to be implemented (whichever is earlier).

## **C2 Environmental Management Plans: Conditions Relating to Monitoring and Adaptive Management for Outcomes Based Conditions**

C2-1 The environmental management plan required under condition B1-3(1) must contain provisions which enable the substantiation of whether the relevant outcomes of those conditions are met, and must include:

- (1) **threshold criteria** that provide a limit beyond which the environmental outcomes are not achieved;
- (2) details on how recorded data will be used to provide an early warning that **threshold criteria** are not likely to be met;
- (3) monitoring parameters, sites, control/reference sites, methodology, timing and frequencies which will be used to measure **threshold criteria**;
- (4) methodology for determining alternate monitoring sites as a contingency if proposed sites are not suitable in the future;
- (5) baseline data;
- (6) data collection and analysis methodologies;
- (7) adaptive management methodology;

(8) **contingency measures** which will be implemented if **threshold criteria** are not met; and

(9) reporting requirements.

C2-2 The environmental management plan required under condition B1-3(1) is also required to include:

(1) details of the artificial maintenance scheme at Lake Nowergup and Lake Jandabup; and

(2) details of monitoring and management to ensure groundwater dependent ecological values of Yanchep National Park, including water levels at the Yanchep caves, are improved.

C2-3 Failure to achieve an environmental outcome, or the exceedance of a **threshold criteria**, regardless of whether threshold **contingency measures** have been or are being implemented, represents a non-compliance with these conditions.

## PART D – COMPLIANCE, TIME LIMITS, AUDITS AND OTHER CONDITIONS

### D1 Non-compliance Reporting

D1-1 If the proponent becomes aware of a potential non-compliance, the proponent must:

- (1) report this to the **CEO** within seven (7) days;
- (2) investigate the cause;
- (3) investigate environmental impacts;
- (4) investigate **contingency measures** for implementation;
- (5) provide a report to the **CEO** within twenty-one (21) days of being aware of the potential non-compliance, detailing the measures required in conditions D1-1(1) to D1-1(4) above.

D1-2 Failure to comply with the requirements of a condition, or with the content of an environmental management plan required under a condition, constitutes a non-compliance with these conditions, regardless of whether the **contingency measures**, rectification or other measures in condition D1-1 above have been or are being implemented.

### D2 Compliance Reporting

D2-1 The proponent must provide an annual Compliance Assessment Report to the **CEO** by 1 December each year, for the period between 1 July to 30 June commencing in the preceding year for the purpose of determining whether the implementation conditions are being complied with.

D2-2 Each annual Compliance Assessment Report must be endorsed by the proponent's Chief Executive Officer, or a person approved by proponent's Chief Executive Officer to be delegated to sign on the Chief Executive Officer's behalf.

D2-3 Each annual Compliance Assessment Report must:

- (1) state whether each condition of this Statement has been complied with, including:
  - (a) exceedance of any proposal limits and extents;
  - (b) achievement of environmental outcomes;
  - (c) requirements to implement the content of environmental management plans;

- (d) monitoring requirements;
  - (e) requirements to implement adaptive management;
  - (f) a description of the investigations and research undertaken in accordance with conditions B1-4 and B1-5;
  - (g) how the investigations and research undertaken in accordance with conditions B1-4 and B1-5 will contribute to the scientific knowledge and understanding of the groundwater levels of the **Gnangara groundwater system**;
  - (h) whether and how the findings and learnings from the research and investigations required by conditions B1-4 and B1-5 have been incorporated into the *Gnangara groundwater monitoring and management plan* (Environmental Management Plan) required by condition B1-3(1); and
  - (i) reporting requirements;
- (2) include the results of any monitoring (inclusive of any raw data) that has been required under Part C in order to demonstrate that any outcomes or any objectives are being met;
  - (3) provide evidence to substantiate statements of compliance, or details of where there has been a non-compliance;
  - (4) include the corrective, remedial and preventative actions taken in response to any potential non-compliance, including whether likely **contingency measures** identified in D1-1(4) were implemented;
  - (5) be provided in a form suitable for publication on the proponent's website; and
  - (6) be prepared and published consistent with the latest version of the Compliance Assessment Plan required by condition D2-5 which the **CEO** has confirmed by notice in writing satisfies the relevant requirements of Part C and Part D.

D2-4 The proponent must prepare a Compliance Assessment Plan which is submitted to the **CEO** at least six (6) months prior to the first Compliance Assessment Report required by condition D2-1.

D2-5 The Compliance Assessment Plan must include:

- (1) what, when and how information will be collected and recorded to assess compliance;

- (2) the methods which will be used to assess compliance;
- (3) the methods which will be used to validate the adequacy of the compliance assessment to determine whether the implementation conditions are being complied with;
- (4) the retention of compliance assessments;
- (5) the table of contents of Compliance Assessment Reports, including audit tables; and
- (6) how and when Compliance Assessment Reports will be made publicly available, including usually being published on the proponent's website within sixty (60) days of being provided to the **CEO**.

### **D3 Environmental Performance Reporting**

D3-1 The proponent shall submit an Environmental Performance Report to the Environmental Protection Authority every five (5) years in electronic form suitable for on-line publication.

D3-2 The first Environmental Performance Report shall be submitted by 1 February following the expiry of the five-year period commencing from the date of this Statement being issued.

D3-3 Each Environmental Performance Report shall:

- (1) report on the state of **representative groundwater-dependent ecosystems**; and
- (2) include a **holistic impact assessment** of the state of groundwater dependent environmental values across the proposal area.

D3-4 The Environmental Performance Report must include:

- (1) a comparison of the environmental value identified in condition D3-3(1) at the end of the 5-year period; against the state of the environmental value at the beginning of the 5-year period;
- (2) a comparison of the environmental value identified in condition D3-3(1) at the end of the 5-year period; against the state of the environmental value identified in the first Environmental Performance Report submitted in accordance with condition D3-2;
- (3) the stakeholder and community consultation undertaken during the 5-year period about environmental performance, including the outcomes of that consultation, and any ongoing concerns being expressed;

- (4) the details of adaptive management strategies incorporated into the **confirmed** environmental management plan, based on the findings and learnings of research undertaken as required by condition B1-4, condition B1-5 and condition B1-6; and
- (5) the Environmental Performance Report may be in whole or part prepared in conjunction with other proponents where there are cumulative impacts from their proposals.

D3-5 Each Environmental Performance Report must be published on the proponent's website within twenty (20) business days of being provided to the Environmental Protection Authority.

#### **D4 Contact Details**

D4-1 The proponent must notify the **CEO** of any change of its name, physical address or postal address for the serving of notices or other correspondence within twenty-eight (28) days of such change. Where the proponent is a corporation or an association of persons, whether incorporated or not, the postal address is that of the principal place of business or of the principal office in the State.

#### **D5 Public Availability of Data**

D5-1 Subject to condition D5-2, within a reasonable time period approved by the **CEO** upon the issue of this Statement and for the remainder of the life of the proposal, the proponent must make publicly available, in a manner approved by the **CEO**, all validated environmental data collected before and after the date of this Statement relevant to the proposal (including sampling design, sampling methodologies, monitoring and other empirical data and derived information products (e.g. maps)), environmental management plans and reports relevant to the assessment of this proposal and implementation of this Statement.

D5-2 If:

- (1) any data referred to in condition D5-1 contains trade secrets; or
- (2) any data referred to in condition D5-1 contains particulars of confidential information (other than trade secrets) that has commercial value to a person that would be, or could reasonably be expected to be, destroyed or diminished if the confidential information were published,

the proponent may submit a request for approval from the **CEO** to not make this data publicly available and the **CEO** may agree to such a request if the **CEO** is satisfied that the data meets the above criteria.

D5-3 In making such a request the proponent must provide the **CEO** with an explanation and reasons why the data should not be made publicly available.

## **D6 Independent Audit**

- D6-1 The proponent must arrange for an independent audit of compliance with the conditions of this statement, including achievement of the environmental outcomes and/or the environmental objectives and/or environmental performance with the conditions of this statement, as and when directed by the **CEO**.
- D6-2 The independent audit must be carried out by a person with appropriate qualifications who is nominated or approved by the **CEO** to undertake the audit under condition D6-1.
- D6-3 The proponent must submit the independent audit report with the Compliance Assessment Report required by condition D2, or at any time as and when directed in writing by the **CEO**. The audit report is to be supported by credible evidence to substantiate its findings.
- D6-4 The independent audit report required by condition D6-1 is to be made publicly available in the same timeframe, manner and form as a Compliance Assessment Report, or as otherwise directed by the **CEO**.

Table 3: Abbreviations and definitions

Acronym or abbreviation	Definition or term
<b>Adverse impact/ adversely impacted</b>	Negative change that is neither trivial nor negligible that could result in a reduction in health, diversity or abundance of the receptor/s being impacted, or a reduction in environmental value. Adverse impacts can arise from direct or indirect impacts, or other impacts from the proposal.
<b>CEO</b>	The Chief Executive Officer of the Department of the Public Service of the State responsible for the administration of section 48 of the <i>Environmental Protection Act 1986</i> , or the <b>CEO's</b> delegate.
<b>Confirmed</b>	<p>In relation to a plan required to be made and submitted to the <b>CEO</b>, means, at the relevant time, the plan that the <b>CEO</b> confirmed, by notice in writing, meets the requirements of the relevant condition.</p> <p>In relation to a plan required to be implemented without the need to be first submitted to the <b>CEO</b>, means that plan until it is revised, and then means, at the relevant time, the plan that the <b>CEO</b> confirmed, by notice in writing, meets the requirements of the relevant condition.</p>
<b>Contingency measures</b>	Planned actions for implementation if it is identified that an environmental outcome, threshold criteria, or management target are likely to be, or are being, exceeded. Contingency measures include changes to operations or reductions in disturbance or <b>adverse impacts</b> to reduce impacts and must be decisive actions that will bring the impact to below any relevant threshold, management target and to ensure that the environmental outcome and/or objective can be met.
<b>Ecosystem health</b>	The ecosystem's ability to sustain vegetation, aquatic fauna and birdlife and the ecological processes that support them.
<b>Gnangara groundwater system</b>	The area of groundwater resource subject to the <i>Gnangara groundwater allocation plan</i> (Department of Water and Environmental Regulation, Water resource allocation and planning report, Report no. 76, June 2022), as spatially defined in Figure 1.
<b>Holistic impact assessment</b>	An assessment of the environmental effect of the proposal on the environment as a whole (as distinct from an assessment of the effect for each environmental value).
<b>Representative groundwater-dependent ecosystems</b>	Representative wetland or bushland sites on the <b>Gnangara groundwater system</b> that are at least partially dependent on groundwater for their existence and health, as depicted in Figure 12 of the <i>Gnangara groundwater allocation plan</i> (Department of Water and Environmental Regulation, Water resource allocation and planning report, Report no. 76, June 2022), excluding bushland site Pinjar North (PM9)

<b>mAHD</b>	Elevation in metres relative to the Australian Height Datum.
<b>Threshold criteria</b>	The indicators that have been selected to represent limits of impact beyond which the environmental outcome is not being met.

**Figures (attached)**

Figure 1 Gnangara Mound Groundwater Resources [Including Groundwater Resource Allocation, East Gnangara City of Swan] proposal area.

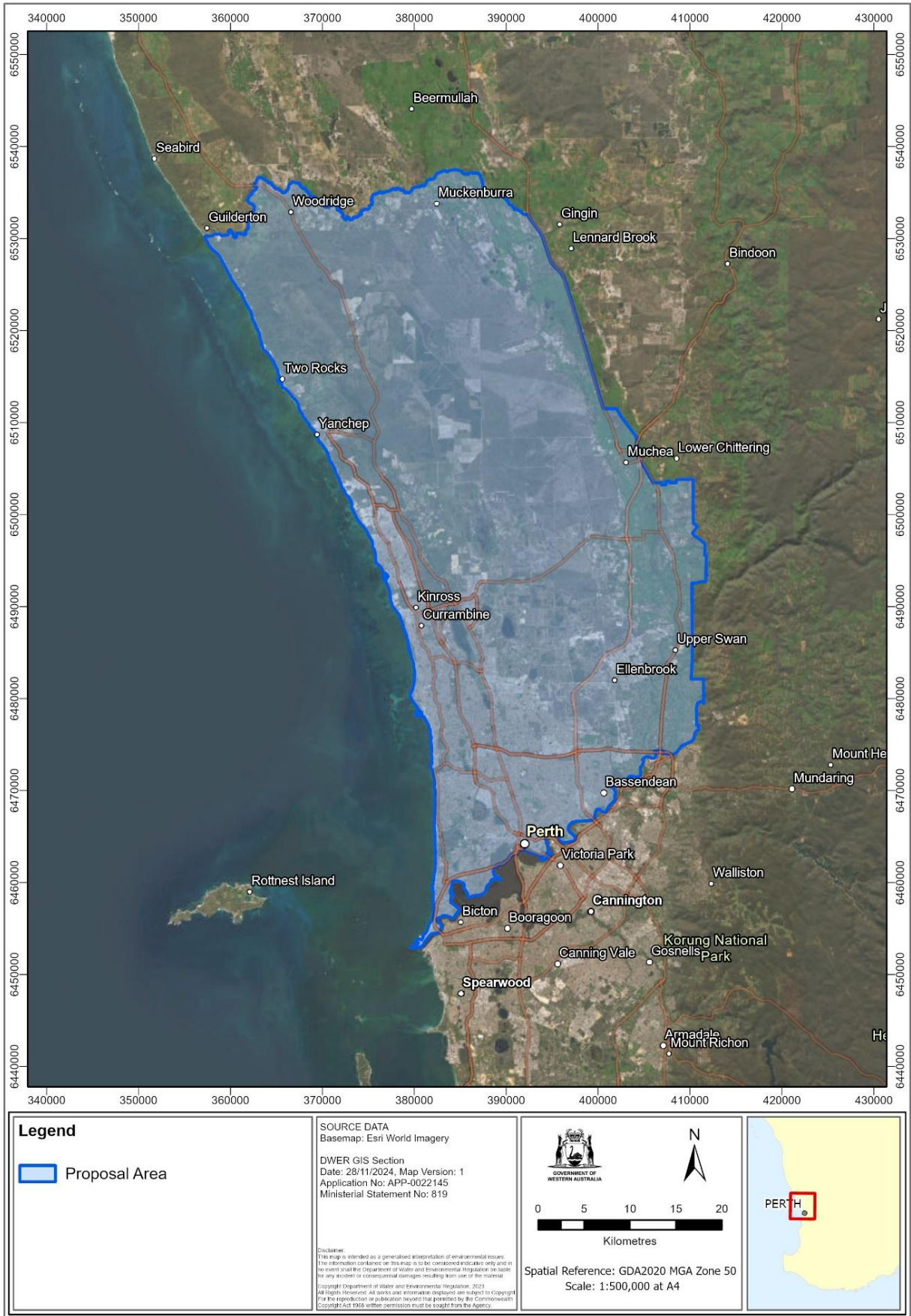


Figure 1: Proposal area

## **Schedule 1**

All co-ordinates are in metres, listed in Map Grid of Australia Zone 50 (MGA Zone 50), datum of Geocentric Datum of Australia 2020 (GDA2020).

Spatial data depicting the figures are held by the Department of Water and Environmental regulation in dataset titled Water Allocation Plans and Statements (DWER-086).

## Appendix C: Decision-making authorities

The decision-making authorities in the table below have been identified for the purposes of s. 45 as applied by s. 46(8) of the *Environmental Protection Act 1986*.

Decision-Making Authority	Legislation (and approval)
1 Minister for Water	<i>Water Agencies (Powers) Act 1984</i> - Part II, Division 1, section 9

## Appendix D: Proposal history

### *EPA Report 295: Ministerial statement 21 (March 1988)*

The EPA assessed the original proposal at the level of Environment Review and Management Programme and published its report in August 1987 (EPA Report 295). In this report, the EPA considered the likely biophysical impacts of groundwater abstraction on wetlands, uplands, and pine plantations across the Gnangara groundwater system.

The EPA concluded in EPA Report 295 that the proposal could be implemented while maintaining high environmental and social values of the Gnangara groundwater system. The EPA highlighted in its assessment that the management of the Gnangara groundwater system should be interactive and iterative, being modified as additional information is obtained, and under changing circumstances including climate change.

The then Minister for Environment approved the proposal for implementation, subject to the implementation conditions of Ministerial statement (MS) 21 on 8 March 1988. Environmental conditions of MS 21 included the requirement for the maintenance of minimum water levels at various sensitive areas (wetlands), which were managed through allocation of specific groundwater amounts.

With increasing understanding of the Gnangara groundwater system since the original approval, the EPA was requested to conduct inquiries under section 46 of the EP Act to amend the original implementation conditions.

### *EPA Report 817: Ministerial statements 437 and 438 (February 1997)*

The assessment in 1996 (EPA Report 817) adopted the concepts of environmental water requirements (EWRs) and environmental water provisions (EWPs) to manage groundwater allocation, rather than the allocation of specific groundwater amounts for abstraction. EWRs were established using a 'snapshot' approach, that is, to maintain the values of the representative GDEs as they were at the time of the assessment in 1996. The assessment in 1996 also acknowledged the importance of protecting GDEs other than wetlands, including phreatophytic vegetation and cave systems. The EPA concluded that the proposal to adopt alternative groundwater criteria to ensure maintenance of the ecological values of groundwater-dependent vegetation on the Gnangara Mound was consistent with the EPA's environmental objectives.

On 6 February 1997, MS 437 and 438 were issued to the Water Corporation and the Water and Rivers Commission, respectively, as joint proponents. Water level criteria were amended based on the concepts of EWRs and EWPs, and representative bushland GDEs were added to the monitoring framework.

### *EPA Report 904: Ministerial statement 496 (February 1999)*

Separate to the original proposal, the EPA assessed the proposal for the abstraction of groundwater from the eastern side of the Gnangara groundwater system for public

and private water uses (assessment published in EPA Report 904). The EPA considered the effects of groundwater drawdown could be managed to acceptable levels, particularly by ensuring that the rate of drawdown was progressively implemented to minimise impacts. The EPA concluded that the proposal could be managed to meet the EPA's objectives, provided that conditions were imposed. MS 496 was issued to the Water and Rivers Commission on 17 February 1999, which established representative sites and water level criteria within the East Gnangara area.

*EPA Report 1155: Ministerial statement 687 (September 2005)*

In 2004, the EPA acknowledged the increasing stress on GDEs resulting from groundwater abstraction, climate change and land use impacts. The EPA inquired into the conditions applying to the management of the Gnangara and Jandakot groundwater systems (assessment published in EPA Report 1155). The EPA concluded that some of the proposed changes to conditions and commitments could meet the EPA's objectives. The EPA accepted that values would not be further threatened by the deletion of three sites and also Coogee Springs. The EPA did not support changes to environmental criteria for Lake Nowergup. In addition, the EPA considered that conditions should be updated.

Following the inquiry, MS 687 relating to the Gnangara groundwater system was issued to the Water and Rivers Commission on 21 September 2005. Changes to the Gnangara conditions included amendments to some water level criteria and deletion of some representative sites from the monitoring framework, where it was recognised during the assessment that environmental values had been lost from these sites.

The assessment published in EPA Report 1155 also consolidated the Gnangara and East Gnangara proposals as outlined under MS 438 and 496. The Water Corporation's MS 437 related to the implementation of Stage 1 of the Pinjar groundwater scheme was not a part of the section 46 review and is still in effect.

*EPA Report 1324: Ministerial statement 819 (December 2009)*

The EPA's most recent assessment of the proposal, published on 4 May 2009 (EPA Report 1324) reviewed the water level criteria set out in MS 687 with consideration to declining annual rainfall and changes to land use and land management on the Gnangara groundwater system. The EPA agreed that seven of nine criteria sites could be removed from the implementation statement, as the proponent demonstrated that these sites had either lost their original environmental values or were predominately affected by climate variation and land use, rather than abstraction. Under MS 819, which was approved by the then Minister for Environment on 4 December 2009, water level criteria were set for 30 representative sites across the Gnangara groundwater system, comprising 14 wetland sites and 16 bushland (phreatophytic) sites.

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