



Government of **Western Australia**
Department of **Water**

Gnangara

groundwater areas allocation plan

Statement of response

Looking after all our water needs

November 2009

Department of Water

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Statement of response – Gnangara groundwater areas allocation plan

This statement is the Department of Water's response to the comments received on the *Gnangara groundwater areas water management plan – allocation: draft for public comment* (Department of Water 2008).

Summary

The draft plan was open for a three-month public comment period, from 19 March to 30 May 2008. Letters inviting comment on the draft plan were sent to:

- local members of parliament and council (42)
- local government authorities (18)
- other government departments (16)
- industry associations, industry representatives, land conservation district committees, tourism groups and environmental groups (67)

An invitation to comment was advertised each month during the three-month public comment period in the following newspapers:

- *The West Australian*
- *The Wanneroo Times*
- *The Joondalup Times*
- *The Western Suburbs Weekly*
- *The Eastern Suburbs Reporter*
- *The Guardian Express*
- *The Midland-Kalamunda Reporter*
- *The North Coast Times*
- *The Post*
- *The Stirling Times*
- *The Independent Express*
- *The Bullsbrook Bindoon Gingin Advocate*
- *The Hills Gazette*
- *The Perth Voice.*

An invitation to comment was also advertised in the Gnangara Sustainability Strategy e-bulletin.

We received 18 submissions during the draft plan comment period from a range of interest groups (Table 1). We appreciate the effort put into all of the submissions that we received and have considered the comments from them when finalising the plan. This statement responds to the comments and summarises how we have addressed them in the final plan.

Table 1 Interest groupings of respondents to the draft plan

Interest group	No. of submissions
Agriculture and irrigation	1
Conservation and environment	2
Individual	5
Local government	1
Mining and industry	3
Other state government	4
Public water supply	1
Other	1
Total	18

A list of the respondents and their associated interest group is given at the end of this report (see Table 10). It is important to note that respondents representing a specific interest group may also have commented on other areas of interest.

Comments received and the department's responses

The following tables summarise and group the main issues raised in submissions and how we have responded to them (Table 2 to Table 9). We have grouped the comments by the type of water related issue raised by the public submissions.

Text in italics in the tables refers to the location of information in the final plan.

We have grouped comments and responses as follows:

- allocating water
- assessing groundwater resources
- managing water resources
- land use and water resource management
- managing water in the environment
- managing licensing and compliance
- public water supply.

Most respondents requested that the department provide more detail on the supporting information used to make allocation decisions. Allocation plans are designed to provide the allocation and management framework for water use in a particular area.

The department has published supporting information separately. For more information please see our website: <www.water.wa.gov.au/allocationplanning>

Gnangara groundwater>. This avoids repetition, the potential for misinterpreting information, and the need to update the plan if the supporting information is updated.

Some respondents made comments on specific urban development proposals. It is not within the scope of the statement of response to address specific development comments or queries. Respondents with specific project related comments should contact the Swan Avon regional office to discuss their project.

A list of the respondents and their associated interest group is given at the end of this report (Table 10). It is important to note that respondents representing a specific interest group may also have commented on other areas of interest.

Table 2 General comments on the draft plan

Comment	Department of Water response
<p>Support for the plan</p> <p>Just over a third of respondents expressed their support for the plan in the following main areas:</p> <ul style="list-style-type: none"> • working with the Water Corporation to increase their water efficiency and conservation measures to achieve their abstraction targets • aligning the plan with the goals of the Gnangara Sustainability Strategy (GSS) • our commitment to environmental sustainability by acting now to reduce abstraction and restricting access to the confined aquifers • protecting drinking water quality • our commitment to monitoring, including our environmental monitoring program, annual reporting on the condition of the resource and groundwater investigations and research. 	<p>We value the support that stakeholders have expressed for the plan.</p>
<p>Community involvement</p> <p>Four respondents commented on community involvement.</p> <p>Three of these appreciated the opportunity to provide comment on the plan and would like to remain actively involved in the planning process.</p> <p>One respondent said that they have been consulted extensively and now want to see action from the department on the condition of the Gnangara Mound.</p>	<p>We will continue to work with stakeholders through the next phase of planning for Gnangara.</p> <p>We will also ensure information is publicly available and engage with the community on major issues and concerns.</p> <p>See also in the plan, <i>Section 2.9 – Community input into allocation planning</i>.</p>

Comment	Department of Water response
<p>Other plans</p> <p>One respondent sought clarification of the relationship of this plan to other planning activities for Gnangara.</p>	<p>See <i>Section 1.3 – Where does this plan fit in?</i></p>
<p>Suggested edits</p> <p>Five respondents suggested over eighty editorial changes to the plan. The relevance of some of the appendices was also questioned.</p> <p>Specific comments are detailed below.</p>	<p>We have updated text and tables throughout the plan. We have also reviewed the appendices and made changes where appropriate.</p>
<p>Definitions</p>	
<p>Four respondents sought clarification on terminology or made suggested changes to definitions.</p>	<p>We have checked the definitions and clarified where appropriate. We use a standard glossary for all allocation plans.</p>
<p>Time frames and timelines for the plan</p>	
<p>Two respondents commented on timelines and time frames in the plan.</p>	
<p>Both suggested a definite review date for the plan, and sought clarification of timelines for other documents shown in Figure 2.</p>	<p>We have removed Figure 2. <i>Section 1.3</i> contains the time frames and timelines relevant to this plan.</p>
<p>One respondent suggested a 2009 time frame for completing research and investigation (Action 19) and finalising an adaptive management framework (Action 20).</p>	<p>Research and investigation is ongoing (now <i>Action 2</i>). See <i>Table 16</i> in <i>Section 7.4 – Future planning</i>, for the work we have committed to completing for the 2012 plan.</p> <p>We have committed to implement an integrated annual management review and response framework for the Gnangara system by 2009 (now <i>Action 7</i>).</p>
<p>Questions</p>	
<p>1 The <i>Water availability and use</i> chapter forms the basis of the plan. However, it is unclear if some parts represent a repetition of section 2.4 (use of water). Is it discussing future use under this plan or does it refer to entitlements either existing or proposed?</p>	<p>We have reviewed the structure of the plan and made appropriate changes to minimise repetition and clarify meaning.</p> <p>Please see <i>Section 2.7 – Existing allocation and use of groundwater</i> and <i>Chapter 4 – Water allocation</i>.</p>

Table 3 Comments on allocating water

Comment	Department of Water response
<p>Allocation limits</p> <p>Three respondents commented on allocation limits. The main concerns raised were:</p> <ul style="list-style-type: none"> i. allocation limits are a blunt tool and as resources approach full allocation other methods are required ii. that the over-allocated status of the resource was likely to continue, so defining allocation limits is worthless iii. capping of abstraction is not sufficient and more conservative limits should be applied. 	<p>Allocation limits are one of the management tools we use to limit the amount of water that can be abstracted.</p> <ul style="list-style-type: none"> i. We agree that we need to use a range of other methods to manage resources that approach full allocation or are over allocated. We are already doing this and it is outlined in <i>Chapter 5 – Allocation and licensing policies</i> and <i>Section 7.1.1 – Management triggers and responses</i>. ii. Our aim is to reduce abstraction to recover over-allocated resources. By reducing allocation limits (see <i>Chapter 4 – Water allocation</i>), we have categorised some resources as over-allocated to initiate recovery. Also see Table 5 of this document for our responses on recovering over-allocated systems. iii. We have committed to reviewing allocation limits if new information becomes available during the life of this plan. We will also review and update allocation limits using the latest information for the 2012 plan.
<p>Allocation limits and water availability tables</p> <p>Four respondents commented on the tables in the plan.</p> <p>Eight comments stated that the calculations didn't add up, were confusing, incorrect and/or inconsistent with the text.</p> <p>Four respondents requested that estimated unlicensed water use be included in the tables.</p> <p>One respondent requested a description of water use from each subarea and aquifer, and for what purpose.</p>	<p>We have restructured the <i>Water availability and use</i> chapter from the draft plan. The allocation limit tables are now in <i>Section 4.3 – Water availability</i>.</p> <p>The figures for licensed entitlements and water availability are a snapshot at a particular date and will vary in the future, as licensing and recouping of water is an ongoing activity.</p> <p>We have updated and reviewed the figures and tables throughout the plan.</p> <p>Tables presented in <i>Section 4.3 – Water availability</i> now have totals.</p> <p>The tables refer to licensed use only. This means that water availability for the Gnangara plan is for the licensed components of use only. This level of detail is outside the scope of an allocation plan.</p>

Comment	Department of Water response
<p>One respondent suggested presenting the availability tables as maps.</p>	<p>We have presented this information spatially in other allocation plans. However, as there are very few resources in the Gnangara plan area that have water available for new licences, we did not include availability maps in the final plan. Also, as water availability constantly changes, the maps could be out-of-date-once the plan is released.</p>
<p>Allocation limit methodology</p> <p>One-third of respondents commented on the method used to determine allocation limits. Eight comments related to how the following information was considered when we set the allocation limits, including:</p> <ul style="list-style-type: none"> i. water generated from a change in land use (e.g. pines, urbanisation) ii. unlicensed abstraction iii. climate <p>One respondent sought clarification on what impact the Southern Seawater Desalination Plant will have on allocation limits.</p> <p>Five comments were made regarding the method of determining confined aquifer limits.</p>	<p><i>Section 4.5 – Methodology used to set allocation limits</i> summarises how we determined the allocation limits. For more information on the supporting technical reports that were used in setting the allocation limits see our website: <www.water.wa.gov.au/allocationplanning> Gnangara groundwater></p> <ul style="list-style-type: none"> i. We considered future changes in land use on a regional and subarea scale when we reviewed the allocation limits in 2007. We will review allocation limits if aquifer monitoring identifies an increase in groundwater recharge and recovery of aquifer storage (<i>Table 15</i>). ii. We have clarified the text in <i>Section 4.5.1– Superficial aquifer</i>. We took unlicensed use (garden bores) into account as part of the water balance and deducted this estimated volume before setting allocation limits for the Superficial aquifer. We will review this approach for future allocation limit reviews. iii. We used a medium-term, dry climate (1976–2004) for the PRAMS modelling that supported our allocation limit decisions for the Superficial aquifer. See <i>PRAMS scenario modelling for water management of the Gnangara Groundwater Mound</i> (Vogwill et al., 2008). <p>The Southern Seawater Desalination Plant will assist the Water Corporation to reduce their abstraction from the Gnangara system to a more sustainable level (average target of 120 GL/yr) (see <i>Section 5.4.2 – Allocation post-2012</i>). This will not result in changes to allocation limits for any subareas.</p> <p>We have revised the text summarising the methodology (see <i>Section 4.5.3 – Leederville and Yarragadee aquifers</i>).</p>

Comment	Department of Water response
<p>We also received comments suggesting that we should consider the following approaches when making allocation decisions:</p> <ul style="list-style-type: none"> • a similar allocation approach for all water users like the VGAR that is currently used for the IWSS • future climate sequences, including 'wet' periods • allowing for increased unlicensed water use. 	<p>We will consider these suggestions when reviewing our allocation decisions, including the allocation limits, for the 2012 Gnangara allocation plan. See the following sections in the plan for information on future planning:</p> <ul style="list-style-type: none"> • <i>Section 1.3 – Where does this plan fit in?</i> • <i>Section 5.4.2 – Allocation from 2012 (for the IWSS)</i> • <i>Section 7.4 – Future planning.</i>
<p>Priorities for water allocation</p> <p>Half of the respondents commented on priorities for water allocation. One suggested that water be shared between sectors for overall benefit, while the majority of submissions suggested that water should be allocated on a hierarchical basis relative to their interests.</p>	<p>The department sets the total amount of water available for consumptive use once in situ needs are considered and sets licence conditions to manage efficiency and impacts of use. We do not normally specify in allocation plans what purpose the water is, or should be used for, apart from water we reserve for public drinking water supply.</p> <p>The draft <i>Gnangara Sustainability Strategy</i> (Government of Western Australia 2009a) has recommended land and water management options for the use of groundwater from the Gnangara system. We will incorporate the final recommendations from the GSS into the 2012 plan.</p> <p>The GSS recognises that public water supply is the highest value social and economic use of the water from the Gnangara groundwater system. Consistent with this direction, water reserved for future public water supply prior to this plan is still a priority. However, hydrogeological studies are necessary to confirm that the volume we have set aside is still available.</p> <p>As stated in the plan, there is limited water available for new entitlements. For this plan the department will continue to assess licence applications according to the first-in, first-served approach.</p> <p>We have committed to investigate an alternative approach to allocating water for the 2012 plan (see <i>Table 16</i>).</p>
<p>Questions</p>	
<p>1 Why is unlicensed abstraction not included in the percentage distribution of water use by category table? This would make total water use more clear.</p>	<p><i>Table 2</i> includes unlicensed abstraction – it was classified as 'domestic garden bores'. We have clarified this in the final plan.</p>

Comment	Department of Water response
2 How does general agriculture differ from pastures? Does pasture relate to irrigated pastures or stock watering or both?	See <i>Appendix D</i> for the water use sub-categories and categories that the department uses.
3 With regard to the water available in the Yarragadee aquifer in the Swan groundwater area being – 50 000 kL, why not reduce the volume reserved for future public water supply and balance the resource?	We have removed the ‘Reserved for future public water supply’ numbers from <i>Tables 6 to Table 9</i> as they indicate the indicative amount we have set aside and these volumes may not necessarily be available (see <i>Policy 2.1</i>). Before releasing water from the reserve the amount available needs to first be quantified.

Table 4 Comments on assessing groundwater resources

Comment	Department of Water response
<p>Hydrogeology and investigations</p> <p>Six respondents made sixteen comments on hydrogeology and investigations used to inform the draft plan.</p> <p>Four respondents sought further information on topics such as pressure heads, reduction in heads by subarea, sources of recharge and a more scientific hydrogeological cross-section of the Mound.</p> <p>Three respondents expressed different opinions as to the cause of groundwater level decline.</p> <p>One respondent claimed that pressure heads in the confined aquifers have stabilised, and that the information on the cone of depression in the Yarragadee was inaccurate.</p> <p>We also received comments relating to the ground sinking under a dwelling and watertable levels north of the planning boundary.</p>	<p>For further information on hydrogeology, refer to Davidson (1995) and the Gnangara allocation planning page on the department’s website for technical information that supports this plan: <www.water.wa.gov.au/allocationplanning> Gnangara groundwater></p> <p>We recognise that the causes of groundwater level decline include both reduction in rainfall and abstraction. We are undertaking investigation and research work which will help us quantify the causes for the 2012 plan.</p> <p>We disagree that the pressure heads in the confined aquifer have stabilised. The cone of depression is still expanding at the northern extremity of the Gnangara system, for example, at artesian Yarragadee monitoring bore AM9. We have corrected the text in <i>Section 2.2.3 – Current condition</i>.</p> <p>These are outside the scope of this water allocation plan.</p>

Comment	Department of Water response
<p>Analysis and modelling techniques</p> <p>One respondent questioned the appropriateness of the techniques that we used to analyse groundwater level data and to model the water balance, including:</p> <ul style="list-style-type: none"> • Cumulative deviation from the mean (CDFM) • Hydrograph trend analysis method • Vertical flux model (VFM) • Perth Regional Aquifer Model System (PRAMS) 	<p>We used the best supporting technical information available at the time to make allocation limit decisions.</p> <p>Please see our website: <www.water.wa.gov.au/allocationplanning> Gnangara groundwater> for the latest detailed information on the information and techniques used. We have published more reports since the draft plan was released.</p> <p>We agree that some of these techniques are complex and we have committed to continue to develop and refine them. We will also develop new tools including local area models where appropriate (see <i>Tables 13 and 16</i> in the plan).</p>
<p>Water balance</p> <p>Two respondents commented on the water balance information that the department used to make allocation decisions, including a request that more water balance information be included in the plan.</p>	<p>See the Gnangara groundwater page on the department’s website for technical information that supports this plan, in particular <i>PRAMS scenario modelling for water management of the Gnangara Mound</i> (Vogwill et al., 2008).</p>
<p>Questions</p>	
<p>1 What does ‘Superficial formations’ mean?</p>	<p>These are geological formations that form part of the Gnangara Mound Superficial aquifer. We have updated the text in <i>Section 2.2.2 – Connectivity of aquifers – groundwater recharge and discharge</i> to be clearer.</p>
<p>2 Has rainfall been higher in the northern part of the Mound and less in the south?</p>	<p>Average rainfall is similar across the Mound (see <i>Figures 3 and 4</i> in the plan).</p>
<p>3 Should the plan mention land subsidence as a public issue?</p>	<p>This is outside the scope of the water allocation plan. It has not been raised as an issue through the GSS.</p>
<p>4 How does the surficial aquifer differ from the Superficial aquifer?</p>	<p>The surficial aquifer refers to any shallow aquifer comprised of unnamed sediments. For the Gnangara system it is the deposits overlying the fractured rock east of the Darling Scarp. We have removed reference to the surficial aquifer in the final plan as there is currently no recorded abstraction from this aquifer.</p>
<p>5 Are we accurate in attributing declining water levels to declining rainfall in the way that we have in the plan?</p>	<p>Our analysis, including the CDFM technique, demonstrates that declining rainfall is a major factor in declining groundwater levels.</p> <p>This is supported by the GSS which states that the decline in rainfall is the main contributor to the decrease in storage of the Gnangara groundwater system.</p>

<p>6 How are the Leederville and Yarragadee aquifers recharged? One respondent presented an opposing view that there is no recharge to the confined aquifers and therefore water levels will continue to fall and that they will eventually be completely depleted.</p>	<p>Recent investigation drilling in the northern Gnangara Mound has demonstrated that there is connection between the Superficial aquifer and the directly underlying Leederville and Yarragadee aquifers. Hydrograph analysis clearly shows that there is induced leakage from the Superficial aquifer into the confined aquifers. However, as the cones of depression in the potentiometric head in the confined aquifers are continuing to expand, groundwater storage (elastic storage) is being progressively depleted. The confined aquifers will not eventually be depleted as we have restricted abstraction from the confined aquifers in the Perth region.</p>
<p>7 What was the base case modelled in PRAMS and used for the determination of allocation limits?</p>	<p>The results from the PRAMS model were part of a range of hydrogeological information we used to set allocation limits. See our comments on analysis and modelling techniques above or Vogwill et al., (2008) for information on the base case. This publication is available on our website at: <www.water.wa.gov.au> Publications>.</p>
<p>8 PRAMS model estimated that a reduction of 19% in rainfall will cause some 27% reduction in recharge, but is this true?</p>	<p>The predictions of the VFM and PRAMS are the best estimates that can be made with current data. It is normal to expect the reduction recharge to be greater than the reduction in rainfall as there will be losses from the system, including evaporation.</p>
<p>9 Should we be estimating sustainable yields on the basis of discharge rather than recharge?</p>	<p>We also consider other hydrogeological factors apart from recharge when estimating yields, including:</p> <ul style="list-style-type: none"> • the amount of discharge that can be captured without unacceptable environmental impacts • the extent to which storage can be depleted.
<p>10 Doesn't groundwater flow north, south east and west, rather than all towards the coast?</p>	<p>Yes. We have revised and updated the text in <i>Section 2.2 – Hydrogeology</i>. Also see <i>Section 2.1.2 – Connectivity of aquifers – groundwater recharge and discharge</i> for new wording.</p>
<p>11 Does thickness refer to the thickness of the aquifer or the depth to the bottom of the aquifer?</p>	<p>This refers to the thickness of the aquifer.</p>

Table 5 *Comments on managing water resources*

Comment	Department of Water response
<p>Vision</p> <p>Two respondents commented that the plan should have a clear vision and clarify the outcome in reducing the trend of declining groundwater levels caused by groundwater abstraction as opposed to rainfall and other factors.</p>	<p>The Gnangara Sustainability Strategy will set the directions for the Gnangara system, which we will incorporate into the 2012 plan.</p>
<p>Principles of the plan</p> <p>Four respondents commented on the principles of the plan.</p> <p>Three of these respondents sought clarification on the term ‘mimic a natural rate of decline’, commenting it would be hard to estimate, may not be natural and is not well defined.</p> <p>One respondent commented that the principles should include biodiversity, environmental and social values.</p>	<p>We have replaced the principles with a position (<i>Section 1.1.1 – Department of Water’s position</i>) to reflect the goals of the GSS.</p>
<p>Objectives</p> <p>We received seven comments from two respondents. These included:</p> <ul style="list-style-type: none"> i. rewording of objectives ii. linking objective 1 to outcomes to improve performance measurement iii. linking objective 2 to efficiency targets in the State Water Plan iv. for objective 3 – how we would measure it, concern over use of the term ‘direct’, and clarification on precedence of use and climate impacts v. linking objective 5 with principle 3 vi. adding an objective to comply with the requirements of the National Water Initiative. vii. linking actions to objectives and principles. 	<ul style="list-style-type: none"> i. We have added ‘recharge <i>from rainfall</i>’ for objective 1, but have made no other changes. Our wording is deliberate and we have used wording consistent with department terminology. ii. We have now specified strategies that we will use to meet particular objectives (see new <i>Section 3.2 – Strategies to meet objectives</i>). We have also reworked the tables in <i>Section 7.1 – Implementing the plan</i> to clarify how we will link outcomes to improve performance. iii. We will develop more specific objectives for the 2012 plan which will be informed by the GSS and the draft <i>Perth-Peel Regional Water Plan</i> (Department of Water, 2009a) (see <i>Section 3.1</i>). iv. We agree that it will be difficult to measure ‘the direct impacts of abstraction on groundwater-dependent ecosystems’. We have committed to environmental monitoring and investigations to enable us to do this (<i>Tables 13 and 16</i>). We have used the term ‘direct’ to be clear about what we can achieve. We are aiming to manage total abstraction (objective 1) and protect important sites (objective 3).

Comment	Department of Water response
	<p>v. We have removed principle 3. However objective 5 takes variability into account.</p> <p>vi. We disagree. We are working towards implementing many aspects of water reform. The evaluation statement (see <i>Section 7.2 – Evaluating the success of this plan</i>) will include performance against NWI criteria where relevant.</p> <p>vii. Actions were linked to objectives in the draft plan (<i>Table 13</i>). We have revised the actions from the draft plan and have moved some actions into <i>Table 12</i>. We have added <i>Table 14</i> which shows our performance indicators against the objectives of the plan.</p>
<p>Water quality management</p> <p>Five respondents commented on water quality:</p> <ol style="list-style-type: none"> the need to protect water quality for the environment as well as for drinking and self-supply purposes request to include a discussion on water quality for each aquifer define how relevant water source protection plans / policy will guide licensing decisions clarification on where underground water pollution control areas (UWCPA) are the taste of tap water. 	<p>We have revised the structure of the plan and included new sections on water quality: <i>Section 2.3 – Water quality</i> and <i>Section 2.4 – Water quality protection</i>.</p> <ol style="list-style-type: none"> We agree that we need to protect water quality for the environment, where it is directly affected by abstraction. We have included a brief summary of important water quality parameters in section 2.3. Our environmental monitoring program (<i>Appendix H</i>) includes water quality and we have committed to continue to research water quality of the Mound (<i>Table 16</i>). See <i>Section 2.3 – Water quality</i> See <i>Section 2.4 – Water quality protection</i>. We have added the UWCPA to the public drinking water source areas map (<i>Figure 6</i>). See Note in <i>Section 2.4.2 – Protection of water quality in public drinking water source areas</i>.
<p>Subarea boundaries</p> <p>Four respondents commented on subarea boundaries:</p> <ul style="list-style-type: none"> current boundaries are not based on hydrogeological features wetland suites are a good basis for boundary definition boundaries should be finalised as soon as possible as they are integral to land and water management and decision making no information was made available regarding the change in planning boundaries for the Gingin subarea. 	<p>We have added <i>Section 4.2 – Subareas</i> and have added <i>Action 9</i> to review the groundwater area and subarea boundaries. We will consider information including hydrogeology, ecological features, land use and the GSS zones in our review.</p> <p>We split the Gingin subareas in January 2008 and disseminated information as part of the draft Gnangara plan in February 2008. We will manage water use for any property within the plan boundary (<i>Figure 1</i>) according to this plan. Landowners or developers with specific queries regarding the impacts on their operations should</p>

Comment	Department of Water response
	contact the Swan Avon Regional office.
<p>Monitoring</p> <p>Two respondents made three comments on the department's groundwater monitoring program.</p> <p>Both respondents suggested more frequent and extensive monitoring, and increased availability of the results to the community.</p>	<p>We have added a monitoring chapter for the final plan, see <i>Section 6.2 – Groundwater level monitoring</i>. We are currently reviewing our monitoring program. See <i>Actions 1, 19 and 20</i> relating to monitoring, assessment and releasing results. A monthly summary of groundwater levels on the Gnangara groundwater level graph can also be found on our website at: <www.water.wa.gov.au> You can also access our monitoring data under: <www.water.wa.gov.au> Tools & Data > Monitoring and Data>.</p>
<p>Adaptive management (Management review and response)</p> <p>Two respondents commented on adaptive management (or how we will change our management based on the ecological condition of the resource).</p> <p>One respondent expressed concern that adaptive management may be difficult to meet given that it measures impacts against a reference system based on 'before and after control impacts'.</p> <p>Water Corporation commented that they had adapted their abstraction patterns to minimise impacts on areas of sensitive groundwater-dependent ecosystems.</p>	<p>We have removed this reference to 'adaptive management' in the final plan and have replaced it with 'management review and response'.</p> <p>Objective 5 is to adapt our management based on the results of monitoring programs and the condition of the resource. See <i>Chapter 7</i> for the detail on how we will do this.</p> <p>The Department of Water and Water Corporation set the abstraction pattern for the integrated water supply scheme (IWSS) annually to minimise environmental impacts of abstraction (see <i>Section 5.4 – Allocations for the Integrated Water Supply Scheme</i>).</p>
<p>Unlicensed water use</p> <p>One third of respondents commented on unlicensed water use (from domestic garden bores).</p> <p>The main topics raised were:</p> <ol style="list-style-type: none"> i. the accuracy of the estimated of the number of bores and average consumption (respondents had differing views on whether we had under- or over-estimated garden bore use) ii. the need to better identify location and actual use for more accurate modelling, including a register of bores be kept by the Water Corporation or Department of Water iii. declining water levels in the Superficial aquifer under Perth iv. the impact of bores near sensitive 	<ol style="list-style-type: none"> i. The information in <i>Section 2.7 – Existing allocation and use of groundwater</i> provides an overview and indicates the relative volume of water abstracted by garden bores. ii. We agree that we need to better identify the number of bores and estimated groundwater use from each bore. We are currently undertaking a study on domestic garden bore water use and distribution, partially funded by the Australian Government under the Water Smart Australia – Water for the Future program. (See <i>Section 7.4 – Actions for future planning</i> on how we will undertake research on estimating unlicensed water use).

Comment	Department of Water response
<p>groundwater-dependent ecosystems, including a suggestion for volumetric charges for bores near environmentally sensitive areas</p> <p>v. the inequality of two-day restrictions for scheme water use and three-day restrictions for bore water use.</p>	<p>iii. We agree that groundwater levels have declined in the Perth metropolitan area. The department has committed to work across government to reduce unlicensed abstraction (<i>Action 10</i>).</p> <p>iv. The department and the GSS support the use of garden bores in suitable areas as they:</p> <ul style="list-style-type: none"> - distribute impacts across a broader area - provide a substitute for scheme water use - recycle local recharge when used efficiently. <p>We are developing a state-wide policy on managing unlicensed groundwater use.</p> <p>v. Water restrictions are defined by the Minister for Water.</p> <p>The three-day restriction recognises that where garden bores are used instead of scheme water and the abstraction does not have an impact on environmental values, there is a net benefit.</p>
<p>Increasing recharge – urban development</p> <p>Four respondents commented on the potential for urban development to increase recharge.</p> <p>One respondent suggesting research into the benefits of land-use change (to urban) should be included in the plan.</p> <p>One respondent requested more detail on the research and investigation program, commenting that it should include examination of alternative scenarios for maximising groundwater recharge.</p> <p>Two respondents requested that we consider the potential positive impact that their developments may have on the Gnangara system when assessing their licence applications.</p>	<p>The draft GSS discusses options for increasing recharge, including land-use change. As part of modelling work for this plan and the GSS, we have examined different land-use options and their impacts on recharge.</p> <p>We will allocate water up to the allocation limits in this plan. In fully- or over-allocated areas, developers should contact the Swan Avon Regional office to discuss their water needs and alternative sources.</p> <p>Where proponents can demonstrate that:</p> <ul style="list-style-type: none"> • recharge will increase in addition to standard water sensitive urban design techniques through innovative and careful design • the proposed development will have a net positive effect on the water balance • we may agree to allocate a portion of that water depending on the water balance objective for that area. <p>We would require local monitoring of the aquifer post-development before we consider any</p>

Comment	Department of Water response
<p>Increasing recharge – managed aquifer recharge</p> <p>Three respondents commented on the potential to recharge aquifers with other water, including treated wastewater.</p> <p>One respondent was in favour of the approach and commented that wastewater was being wasted by being pumped out to the ocean.</p> <p>Water Corporation indicated that they have demonstrated the technical feasibility of aquifer storage and recovery and are currently working on projects.</p> <p>One respondent commented that there may be other options than adding treated wastewater – for example, changing land uses, land management practices, redirecting stormwater.</p>	<p>additional water entitlements.</p> <p>We acknowledge the potential of managed aquifer recharge as a source option. The GSS discusses this further and will inform the 2012 plan.</p>
<p>Recovering over-allocated systems</p> <p>We received five comments from two respondents on recovering over-allocated systems, with the following suggestions:</p> <ul style="list-style-type: none"> i. Reduce all entitlements in over-allocated areas (with priority given to those containing environmentally-sensitive areas) ii. Make changes to Table 11 – Management triggers and responses and Table 12 – Actions for implementing the plan, relating to reissuing recouped water and linking with metering and compliance iii. Add a management action to reduce licensed and unlicensed allocations and use to the new allocation limits. 	<ul style="list-style-type: none"> i. For the 2012 allocation plan, we intend to modify entitlements to represent a share of available water on a periodic basis. The mechanism to achieve this will depend on the status of proposed changes to legislation. ii. We have reviewed (and revised where appropriate) the tables in <i>Section 7 – Implementing and evaluating the plan</i>. <i>Table 14</i> contains performance indicators relating to recovery of over-allocated systems, metering and compliance. iii. The plan contains actions (<i>Table 13</i>) relating to the IWSS allocation, reducing garden bore use and working with local government to implement water conservation plans. The department will also review efficiency measures as part of the licence assessment process and may set measures as a licence conditions (see <i>Policy group 5 – Efficiency</i>). iv. Through this plan we will recoup unused entitlements and assess whether licensed use complies with licensed entitlements (<i>Tables 14 and 15</i>). v. Actions for future planning include policy development for recovering over-allocated systems, and incorporating the outcomes of the GSS into future plans (see <i>Table 16</i>).

Comment	Department of Water response
Questions	
1 What about unlicensed abstraction from the Superficial and the surficial aquifers?	We have removed reference to the surficial aquifer as there is currently no recorded abstraction from this aquifer. See <i>Section 5.1.3 – Exemptions</i> for abstraction that does not require a licence in the Superficial aquifer.
2 In the table showing the environmental monitoring program, does a blank indicate that no monitoring occurs at that site?	We have revised the structure and updated the table summarising our environmental monitoring program (<i>Appendix H</i>).
3 Re: 'annual assessment'. Annual or twice-annual assessment?	We have committed to complete an annual groundwater resource assessment report (<i>Action 1</i>).
4 How are changes in the control or reference sites measured against the monitored sites? Given the lack of reference sites across the Mound this will prove very difficult to implement.	<p>There are no 'true' reference sites on the Gnangara Mound as most groundwater-dependent ecosystems have experienced some impacts.</p> <p>We are installing monitoring infrastructure at groundwater-dependent ecosystem sites in areas thought to be outside the zone of impact as part of the shallow groundwater systems investigation (<i>Table 16</i>).</p> <p>We will compare groundwater-dependent ecosystems with varying degrees of possible impact due to abstraction as part of the annual ecological monitoring program.</p>
5 What are the desired goals and outcomes from an adaptive management framework? If it is to see the groundwater levels in all aquifers rise then what management activities and actions need to be undertaken?	<p>Our broad goals are stated in the objectives (<i>Section 3.1 – Objectives</i>). Objective 1 is to reduce the total volume of water abstracted from the Gnangara system towards a level that better reflects the current recharge from rainfall.</p> <p>We recognise that if a drying climate continues, it is unlikely that groundwater levels will rise, even if abstraction is reduced.</p> <p>The management actions and activities that we will do to meet our objectives are outlined in <i>Section 7.1 – Implementing the plan</i>.</p>
6 It is understood that treated wastewater from the proposed Alkimos Wastewater Treatment Plant may be used for direct aquifer recharge. Can this be used for irrigation water in the summer when needed and aquifer recharge in the winter?	We are currently developing a state-wide policy on managing water that may become available through managed aquifer recharge.

Table 6 Comments on land use and water resource management

Comment	Department of Water response
<p>Land use</p> <p>We received three comments from three respondents about land use, specifically:</p> <ul style="list-style-type: none"> • the future of pine plantations • the importance of horticulture. 	<p>The GSS addresses these issues.</p>
<p>Reference to GSS in the plan</p> <p>We received three comments from one respondent concerning references to the GSS. They commented that there needs to be an emphasis that the GSS relates to land use and water management, not solely water.</p>	<p>We have updated our references to the GSS in line with its current status (draft report released July, Government of Western Australia 2009a). We agree that the GSS considers land use management, and confirm that this plan and future allocation plans consider water allocation.</p>
<p>Questions</p>	
<p>1 What are the expected demands from the various sectors likely to be 5, 10 or 20 years from now?</p>	<p>Future demand will be considered through the department's <i>Perth-Peel regional water plan</i> which will be released later this year. The water allocation plan defines the limits of water availability, rather than aiming to meet all demand.</p> <p>See the <i>Gnangara Sustainability Strategy Situation Statement</i> (Government of Western Australia 2009b) for information on demand projections: <www.gnangara.water.wa.gov.au></p>
<p>2 What are the likely shifts in demand? For example much of the horticulture is being displaced in the outer suburbs of Perth resulting in lower water use from these regions.</p>	<p>See the draft GSS and <i>Perth-Peel regional water plan</i> when it is released.</p>
<p>3 Where is the new demand for horticultural activities likely to be?</p>	<p>This is outside the scope of this water allocation plan. For more information see the draft GSS.</p>
<p>4 What are the priorities – water for gardens and showers, or water for industrial activity or water for horticulture?</p>	<p>As discussed in 'Priorities for water allocation' in Table 3 of this document, we do not normally specify in allocation plans what purpose the water is used for. See the draft GSS for more information on water use priorities.</p>

Table 7 Comments on managing water in the environment

Comment	Department of Water response
<p>Ecosystem health</p> <p>We received three comments from one respondent regarding the deterioration of ecosystem health, the value of ecosystems in the plan area and the need to apply the precautionary principle to protect these groundwater-dependent ecosystems.</p>	<p>We recognise that the health of groundwater-dependent ecosystems is at risk because groundwater levels are declining. Through the plan, we are aiming to reduce total abstraction on the Mound. We have made allocation limit decisions based on the best information available at the time. We are undertaking research and investigation to better understand the impact of abstraction on groundwater levels. We are also undertaking work to better understand groundwater level decline and to develop a framework for determining ecological water requirements in the context of a drying climate and ecosystem health (<i>Table 16</i>).</p> <p>We recognise the value of groundwater-dependent ecosystems and have set environmental water provisions to protect groundwater-dependent ecosystems on the Gnangara Mound (see <i>Section 6.1 – Environmental monitoring</i>). We have also developed policy to minimise direct impacts from abstraction near wetlands (see <i>Policy group 4 – Environmental policies</i>).</p>
<p>Ministerial criteria and environmental commitments</p> <p>We received five comments from two respondents on our environmental commitments.</p> <p>One respondent commented on the importance of complying with Ministerial criteria and that well defined goals and outcomes must be identified for each site where wetland site management is required.</p>	<p>While we aim to meet all commitments under Ministerial Statement 687, declining rainfall and the time taken to commission alternative sources has meant that in recent years we have not been able to meet all water level commitments.</p> <p>See the Gnangara planning page on our website for the report of our application to the EPA to review Ministerial criteria: www.water.wa.gov.au/allocationplanning Gnangara groundwater>. This report provides the most recent update of ecological condition in relation to pre-determined management objectives at wetland sites.</p>

Comment	Department of Water response
<p>A second respondent stated that there needs to be a clear way forward to develop environmental water provisions in the context of a drying climate for realistic Ministerial criteria. They also advised that they had provided comment to the EPA regarding our application to review the current sites under Ministerial Statement 687.</p>	<p>We are currently undertaking a number of research projects (see <i>Table 16</i>) so that we can develop clearer, climate-relative management goals for important groundwater-dependent ecosystems on the Mound.</p>
<p>Environmentally sensitive areas</p> <p>Two respondents commented on the statement that ‘buffer zones will restrict bores from operating close to important wetlands’ in the summary of the draft plan.</p> <p>One respondent requested more detail on buffer zones and one respondent questioned what criteria is being used to decide which are the ‘important wetlands’ and what will happen to those not classified as important?.</p>	<p>We have removed this reference to buffer zones and replaced it with ‘high impact zones’.</p> <p>As discussed in the draft plan, we assess licence applications in accordance with policy relating to abstraction in environmentally sensitive areas (see <i>Policy group 4 – Environmental policies</i>).</p> <p>For this plan, important wetlands are those wetlands where we have Ministerial criteria (see <i>Section 6.1</i>).</p> <p>The GSS has identified significant wetlands on the Mound. It also recognises that some wetlands are predicted to dry out due to climate change despite land and water management interventions and management should centre on transition to a terrestrial ecosystem.</p> <p>As part of the environmental investigations work for the 2012 plan (<i>Table 16</i>), we will review the status and classification of wetlands and the recommendations of the GSS.</p>
<p>Aboriginal heritage, cultural and social values</p> <p>The Department of Indigenous Affairs commented on Aboriginal heritage, reaffirming the value of water to Aboriginal peoples.</p> <p>They also provided further information about Aboriginal sites across the Mound and highlighted how actions arising from licensed activities may breach the <i>Aboriginal Heritage Act 1972</i>.</p>	<p>We have updated <i>Section 2.5.2 – Cultural and social values of the Gnangara groundwater system</i>.</p> <p>We are aware that we are we are legally required to comply with all statutory requirements related to the <i>Native Title Act 1993</i> and the <i>Aboriginal Heritage Act 1972</i>, and have developed guidelines to ensure that all reasonable measures are undertaken under these acts.</p> <p>We also consider registered sites in our licensing processes under Schedule 1, Division 2, section 7(2) of the <i>Rights in Water and Irrigation Act 1914</i>.</p> <p>Water users are responsible for ensuring their land use and actions comply with these Acts.</p>

Comment	Department of Water response
A second respondent commented that the plan only deals with in situ social values and we did not discuss the social values of irrigated gardens, parks and recreation areas.	We agree. Our definition of social values includes in situ values only. The GSS discusses the importance of social values associated with water use, including irrigated public open space.
Questions	
1 It could be argued that many wetlands on the Swan Coastal Plain are in significant decline. What is the definition of 'significant decline'?	'Significant decline' means that groundwater and surface water levels at the wetland are approaching levels which significantly threaten the original ecological values of the wetland. For further information on predicted ecological change and decline at wetlands on the Mound see Froend et al. (2004). The plan states that when environmental monitoring indicates that the ecological health of wetlands and other groundwater-dependent ecosystems are in significant decline, remedial action may be taken. The GSS has identified significant wetlands on the Mound and discusses current and alternative remediation strategies.
2 What year was Ministerial statement 687 released?	Statement No. 687 was published on 31 August 2005.

Table 8 Comments on managing licensing and compliance

Comment	Department of Water response
Policy – general Three respondents commented on general licensing policy: i. the validity of the <i>General Principles and Policy for Groundwater Licensing in WA</i> (1990) as a licensing tool ii. the 'use it or lose it' principle encourages inefficient water use iii. the absence of a stated policy for assessing licence applications in public drinking water source protection areas.	i. We agree that we need to review this policy and we included it as a policy action for future planning in the draft plan (<i>Table 16</i> in the final plan). ii. We disagree. There is a misconception that if water users waste their water to show they "use it", they won't "lose it". <i>Statewide policy no 11 – Management of unused licensed water entitlements</i> (Water and Rivers Commission, 2003a) requires water users to demonstrate actual use according to their licence to retain their allocation. Where licensees can demonstrate water efficiency savings, they may trade that component of their entitlement (see <i>Policy group 8</i>). iii. We have updated the text and referred to applicable policies for public drinking water source protection areas. See <i>Section 2.4.2 – Protection of water quality in public drinking water source areas</i> .

Comment	Department of Water response
<p>Two respondents questioned the statement that ‘security of supply for existing users was assured’. One respondent commented that this appeared to contradict objective 1 – ‘To reduce the total volume of water abstracted from the Gnangara system towards a level that better reflects the current recharge.’</p> <p>One respondent stated that security of access to water for licence holders is required under the National Water Initiative, not security of volumes.</p> <p>One respondent commented the plan does not provide enough certainty for the future.</p>	<p>We have clarified this statement in the final plan (<i>How are we managing the Gnangara groundwater areas?</i> section in the <i>Summary</i>). Security of existing licences (including volumes) is assured for the life of this plan provided licensees use the water in accordance with the terms and conditions on the current licence.</p> <p>This decision does not contradict objective 1, as we are also aiming to reduce unlicensed abstraction and abstraction for public water supply.</p> <p>We will review this decision for the 2012, in line with the state water resource management and reform program, the direction of the <i>Perth-Peel Regional Water Plan</i> and the final outcomes of the GSS.</p> <p>This plan sets out whether water is available (<i>Section 4.3 – Water availability</i>) and the way we will manage water abstraction (<i>Chapter 5 – Allocation and licensing policies</i>).</p> <p>The plan doesn’t provide certainty that water will be available for water users seeking new or additional groundwater entitlements. However, the plan enables water users wishing to access water in fully or over-allocated to purchase water through trading (see <i>Policy group 8 – Trading</i>).</p>
<p>Allocating water</p> <p>Five respondents commented on policy relating to allocating water.</p> <p>One respondent commented that the plan appears to have two objectives – one for the IWSS to use the confined aquifers in preference to the Superficial aquifer, and the second for private abstraction to use the Superficial aquifer in preference to the confined aquifers.</p> <p>One respondent commented on the validity of the allocation limits for the confined aquifers if the plan supersedes the policy on accessing the Leederville and Yarragadee aquifers in Perth. One respondent suggested changes to the wording of the text.</p>	<p>As per <i>Policy 1.1</i> the department will allocate water for new private entitlements from the Superficial aquifer in preference to the confined aquifers.</p> <p>We are working with the Water Corporation to investigate opportunities for, and the possible effects of, increasing the proportion of water abstracted from the confined aquifers relative to that abstracted from the Superficial aquifer if it will reduce environmental impacts.</p> <p><i>Accessing the Leederville and Yarragadee aquifers in Perth</i> (Department of Water 2006) is still valid. We have reworded <i>Policy 1.1.3</i> to refer to this policy.</p>

<p>Two respondents commented on their inability to secure a water entitlement for a housing estate and dust suppression purposes respectively. One respondent request that more water be made available for particular subareas for development.</p>	<p>As per <i>Policy 1.2</i>, the department only allocate water up to the allocation limit. We will refuse applications for licences in fully or over-allocated resources.</p> <p>Developers should contact the Swan Avon Regional office to discuss water needs and options such as alternative sources and trading.</p>
<p>Licence conditions</p> <p>One respondent made two comments on licensing conditions in environmentally sensitive areas, recommending that entitlements be reviewed annually and be subject to metering.</p> <p>The respondent also commented that all licensed entitlements should be subject to mandatory water efficiency standards, such as sub-surface irrigation and soil amendment for water retention.</p>	<p>For the 2012 allocation plan, we will aim to modify entitlements to represent a share of available water on a periodic basis. The mechanism to achieve this will depend on the status of proposed changes to legislation.</p> <p>We currently undertake metering in accordance with <i>Strategic Policy 5.03 – Metering the take of water</i> (Department of Water 2009b). See <i>Section 5.2 – Policies for water take and use</i>.</p> <p>The department supports best practice in irrigation and soil management. As part of the licensing process, we review efficiencies proposed in each application (see <i>Policy group 5</i>).</p>
<p>Water use efficiency</p> <p>Seven respondents commented on water use efficiency.</p> <p>Two respondents commented on efficiency incentives, including:</p> <ul style="list-style-type: none"> i. charging for water ii. accurate metering iii. opportunity to on-sell surplus water derived through water efficiency measures. <p>Four respondents commented on specific water use efficiency measures for proposed developments.</p> <p>Two respondents commented on Waterwise rebates.</p>	<ul style="list-style-type: none"> i. The Economic Regulatory Authority is reviewing fees and charges for water management and is including the Gnangara system as a case study. ii. We agree that accurate metering is important to assess water use and the potential for water efficiency savings (see response under ‘metering’ below). iii. The plan does allow for trading of water savings through efficient irrigation (see <i>Policy group 8 – Trading</i>). <p>The department supports water use efficiency measures in new developments. However, in fully- and over-allocated areas, we will not issue new licences, even if the proposed water use is efficient. Developers should contact the Swan Avon regional office to discuss alternative sources and trading.</p> <p>Waterwise rebates for unlicensed garden bores ceased on 30 June 2009. See the department’s website <www.water.wa.gov.au> for further information.</p>
<p>Metering</p> <p>Two respondents commented on metering and expressed support for our metering</p>	<p>We agree that metering of actual water use is important for our allocation decisions.</p>

<p>program.</p> <p>One respondent suggested that all licensed and unlicensed bores be metered.</p> <p>One respondent suggested more detail on the implementation of the monitoring program.</p>	<p>We have revised the text on metering and have moved some of the management actions into the policy table 12 in <i>Section 5.2 – Policies for water take and use</i>. Since the draft plan was released, we have finalised <i>Strategic policy 5.03 – Metering the taking of water</i> (Department of Water, 2009b).</p> <p>Currently, it is not practical to meter all bores. We are focusing our metering program on high risk areas.</p> <p>The information on the implementation of the metering program (now <i>Section 5.3.2 – Metering</i>) is intended to provide a summary only.</p>
<p>Compliance and enforcement</p> <p>Two respondents commented on compliance and enforcement. Both commented that the department should take a more active role of managing the water resources through compliance of licensees.</p> <p>One commented that metering has shown that few licensees comply with their conditions.</p> <p>One of the respondent suggested adding a trigger and response for non-compliance.</p>	<p>Compliance and enforcement is part of our licensing role.</p> <p><i>Table 15 – Performance indicators against objectives</i> details how we will meet our objectives. Two of the performance indicators for the department relate to assessing actual use against the entitlement volume and compliance with licence conditions.</p>
<p>Trading</p> <p>Two respondents commented on trading.</p> <p>One respondent queried why the plan did not discuss the value of water in a water market and did not propose water trading.</p> <p>One respondent commented that allowing people to purchase water in an area where allocations need to be reduced could be costly, as once people have paid for water they will seek compensation if it is subsequently withdrawn.</p>	<p>It is outside the scope of this allocation plan to discuss the value of water. The department does not have a register of trade values.</p> <p>Trading is occurring within the plan area. We have added text to clarify that trading can be established once resources are fully-allocated according to current state-wide policy (see <i>Section 5.2 – Policies for water take and use</i>).</p> <p>We agree that there is the risk of compensation if we need to reduce entitlements in the future. We will aim to minimise this risk in the 2012 allocation plan. We also intend to modify entitlements to represent a share of available water on a periodic basis.</p>
<p>Questions</p>	
<p>1 How will compliance be enforced?</p>	<p>The Swan Avon Region licensing program will continue to monitor compliance with licence conditions. They will determine and implement the appropriate levels of enforcement where non-compliance is found.</p>
<p>2 'The Leederville and Yarragadee aquifers are over-allocated; therefore no further water is available except in circumstances where providing access to water will</p>	<p>This principle applies to all aquifers. In extenuating circumstances, we consider that there will be fewer impacts abstracting from the confined aquifers than the Superficial aquifer.</p>

provide a public benefit.' About 90% of the Superficial aquifer subareas are also over-allocated so why should this not be a universal principle of over-allocated subareas?	
3 Should the price of water reflect the scarcity of water i.e. in years when groundwater allocation is above the 120 GL target and water efficiency and conservation measures are increased?	This is outside the scope of a water allocation plan. The price of water is determined by the government, informed by the Economic Regulatory Authority.

Table 9 Comments on public water supply

Comment	Department of Water response
<p>Accessing water from public water supply reserves</p> <p>One respondent commented on accessing water reserved for public water supply and the requirement for source development plans. They commented that the state has committed to integrated resource planning and we should follow those principles.</p>	<p>We are moving towards the model set out in the State Water Resource Management and Reform Program.</p>
<p>Variable groundwater abstraction rule (VGAR)</p> <p>One third of respondents commented on the variable groundwater abstraction rule.</p> <p>Some respondents commented that the 120 GL/yr target was not acceptable and that there should be additional conditions to make sure it is adhered to, relating to:</p> <ul style="list-style-type: none"> • reduction in subsequent year's allocation following years where target is exceeded • reducing private abstraction as an offset • further Integrated Water Supply Scheme restrictions. <p>The Water Corporation commented that they support the ongoing application of conjunctive operation. The main issues raised were:</p> <ol style="list-style-type: none"> risk of affecting the security of supply to the IWSS the proposed groundwater entitlement 	<p>We have revised <i>Section 5.4 – Allocations for the Integrated Water Supply Scheme</i> and made the following changes:</p> <ul style="list-style-type: none"> • moved the information that was in the draft plan under 'Determination of allocation in years past' to <i>Appendix G</i>. • renamed 'New rules for determination of annual allocation' to <i>Section 5.4.1 – Allocation 2008–2012</i>. • added <i>Section 5.4.2 – Allocation from 2012</i>. <p>The GSS recognises public water supply as the highest value use. We believe the target of 120 GL/yr is reasonable until 2012, when we will review the allocation (see <i>Section 5.4.2 – Allocation from 2012</i>). This approach is consistent with the GSS recommendation.</p> <ol style="list-style-type: none"> The revised VGAR has been agreed by the Department of Water and Water Corporation (see <i>Section 5.4.1 – Allocation 2008–2012</i>). The permitted abstraction will be negotiated each year according to the VGAR. The groundwater entitlement for the IWSS is

Comment	Department of Water response
<p>under the revised VGAR</p> <p>iii. recognition that they have demonstrated commitment to deliver sustainable use, including a reduction in abstraction from the Superficial aquifer</p> <p>iv. the public benefit justifies the abstraction of the last seven years.</p>	<p>an administrative tool the department uses to manage the variable allocation.</p> <p>iii. We recognise that Water Corporation has reduced abstraction from the Superficial aquifer.</p> <p>iv. We also recognise that abstraction from the Gnangara system for public water supply has a public benefit. However, past abstraction has not been sustainable which means total abstraction needs to be reduced. This is consistent with the directions of the GSS.</p>
<p>Water restrictions</p> <p>In response to Action 9 in the draft plan, one respondent commented that permanent sprinkler bans in summer must have a higher profile.</p>	<p>The Minister for Water is responsible for determining the level of water restrictions. We will continue to provide advice (see <i>Section 5.4.1</i> and <i>Action 15</i>).</p>
<p>Future water sources</p> <p>Water Corporation made two comments relating to Table 10 in the draft plan, stating that it is inappropriate to link specific projects (e.g. Logue Brook and Southern Seawater Desalination Plant) to actions in the plan as the timing is influenced by some factors that are outside the control of the corporation.</p>	<p>We have removed Table 10 from the draft plan (on the timing of contingency and major sources) and reached agreement with the Water Corporation on a revised strategy.</p> <p>We agree that this information should be incorporated into relevant Water Corporation plans and strategies (see <i>Section 5.4.1</i>).</p>
<p>Questions</p>	
<p>1 Where will the IWSS obtain their water sources when demand is increasing for potable water?</p>	<p>The Water Corporation is considering the development of alternative water source options for the future. See the Water Forever page on the Water Corporation website for further information: < www.thinking50.com.au ></p>
<p>2 What is the policy in regard to provision of water for the IWSS in the future?</p>	<p>See <i>Policy group 2 – Public water supply reserves</i> in <i>Table 12</i>, <i>Section 5.2 – Policies for water take and use</i> and <i>Section 5.4.2 – Allocation from 2012</i>.</p>
<p>3 When referring to water reserved for short-term future water supply, what period of time is this?</p>	<p>The short-term reserve is reviewed annually to allow for administrative flexibility for us to manage IWSS points of abstraction.</p>
<p>4 Page 51, paragraph 2: Considering the other information provided in this section, should not this be 145 GL instead of 165 GL? The proposed reduction from 165 GL to 145 GL per year maximum allocation is supported</p>	<p>We have revised the text in <i>Section 5.4 – Allocations for the Integrated Water Supply Scheme</i> (see also responses to VGAR comments above).</p> <p>The maximum allocation is 145 GL/yr except where specific criteria are met.</p>

Where to next?

We have carefully considered submissions to finalise the *Gnangara groundwater areas allocation plan*. The final plan will come into force once it is endorsed by the Minister for Water.

For more information on how the plan will be implemented and reviewed and how it will meet its commitments, please see Chapter 3 (objectives and strategies), Chapter 6 (monitoring) and Chapter 7 (implementation, evaluation and review).

List of respondents

Table 10 Interest groups and respondents in each group

Interest group	Respondents
Agriculture and irrigation	Australian Water Resources Pty Ltd – Kimberley Water
Conservation and environment	Conservation Council of Western Australia CSIRO
Individual	Five individuals
Local government	City of Wanneroo
Mining and industry	Banksia Grove JDA Consultant Hydrologists Urban Development Institute
Other state government	Department of Agriculture and Food Department of Environment and Conservation Department of Indigenous Affairs
Public water supply	Water Corporation
Other	Swan Valley Planning Committee Landcorp

Further information

The plan and its supporting documents are available from the department's website: <www.water.wa.gov.au/allocationplanning> go to Gnangara groundwater.

For further information please email <gnangara.planning@water.wa.gov.au> or contact:

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