



# Rockingham-Stakehill groundwater management plan: Evaluation statement 2008–2011

This statement evaluates the extent to which the objectives of the *Rockingham-Stakehill groundwater management plan* were met since its release in November 2008.

Evaluation statements are part of the Department of Water's adaptive management process and allow us to continually review and improve management of water resources.

## 1 Allocation status

### 1.1 Changes in allocation status

This section presents a list of the resources in the plan area where the water availability changed (*Table 1*).

We changed the allocation limits in the plan area in December 2009 for the Confined Leederville aquifer. In the plan this resource was originally combined across both the Rockingham and Stakehill groundwater areas, with an annual allocation limit of 0.82 GL/yr and was identified as over-allocated (123%; see *Table 2*).

This resource was split into two separate resources, by groundwater area, to facilitate licensing and manage the impacts of abstraction in concentrated areas:

- 1 Rockingham Confined Leederville, with an annual allocation limit of 0.495 GL/yr (currently 93% allocated)
- 2 Stakehill Confined Leederville with an annual allocation limit of 0.325 GL/yr (currently 113% allocated).

This change is in line with meeting the plan objectives and forms part of delivering Action 1.





For a full list of up to date water availability in all resources contact the Kwinana–Peel Regional office, in Mandurah or see our water register, <[www.water.wa.gov.au/ags/WaterRegister](http://www.water.wa.gov.au/ags/WaterRegister)>.

Table 1 Resources that changed allocation status since the plan release

Groundwater area	Resource		Allocation limit GL/yr	Licensable component of allocation limit GL/yr	Licensed entitlements GL/yr				Allocation status for licensing	
	Subarea	Aquifer			2008	2009	2010	2011	2008	2011
Rockingham	Churcher West	Superficial-Rockingham Sand	1.85	1.51	1.24	1.24	0.97	0.97	Limited availability	Water Available
	Cooloongup	Superficial-Rockingham Sand	0.27	0.27	0.17	0.36	0.36	0.36	Water Available	Over-allocated
	Karnup West	Superficial-Rockingham Sand	1.20	0.83	0.10	0.11	0.54	0.66	Water Available	Limited availability
Stakehill	Churcher East	Superficial-Rockingham Sand	3.67	3.52	3.82	3.70	3.57	2.84	Over-allocated	Limited availability
	Karnup East	Superficial-Rockingham Sand	1.64	1.54	1.75	1.70	1.48	1.33	Over-allocated	Limited availability
	Outridge	Superficial	2.46	2.25	2.12	2.05	2.37	2.23	Limited availability	Fully allocated

Notes: Licensed entitlement statistics were collected on 4 July 2008, 2 July 2009, 12 July 2010 and 1 June 2011.

Status of water available for licensing against the licensable component/s of the allocation limit:

	Water available: 0-<70% of resource allocated		Fully allocated: 100% allocated
	Limited availability: 70-<100% allocated		Over-allocated: >100% allocated

## 1.2 Over-allocated resources

Over-allocated resources are those where the total of licensed entitlements exceed the licensable component of allocation limit for that resource. Of the 15 groundwater resources in the plan area two are currently over-allocated (as at 1 June 2011; *Table 2*).

During the 2008-2011 reporting period we restored two resources back to within their allocation limits for licensing. The resources were the Superficial-Rockingham sand aquifer in:

- Churcher East subarea: decrease in licensed volume of 105% in 2009 to 81% in 2011
- Karnup East subarea: decrease in licensed volume of 110% in 2009 to 86% in 2011

This was achieved by recouping unused entitlements through carrying out water use surveys, compliance, and enforcement of licenses in these subareas. We are continuing to recoup water in the remaining two over-allocated resources to return them to full allocation (*Table 2*).

*Table 2 Over-allocated resources for 1 June 2011*

Groundwater area	Subarea	Aquifer	% allocated				Comments
			2008	2009	2010	2011	
Rockingham	Cooloongup	Superficial-Rockingham Sand	63	135	133	130	A temporary short-term licence was issued for the recovery of contaminated water for environmental purposes. Once this water is no longer required the resource will return to below the allocation limit.
	Rockingham Confined	Leederville	124	108	104*	93	The split of the resource and the spatial distribution of the draw points mean that only the Stakehill Confined Leederville resource is over allocated. We are progressively reducing over allocation by recouping.
Stakehill	Stakehill Confined	Leederville				113	

\* Complete separation of all licences into the new resources was only achieved in late 2010, as all licences were reviewed and assessed prior to changing the resource on the licence.

## 2 New allocation issues

One new allocation issue was identified in the plan area (*Table 3*).

*Table 3 New allocation issue that was raised during evaluation period*

New allocation issue	Our response
<b>Urban development</b>	<p>The plan identified urbanisation as a future issue for the area. However, the transfer of water from agricultural use (as areas are urbanised) is either not keeping pace or not providing enough water for urban developments.</p> <p>Development is continuing in the plan area and will require significant quantities of water from resources that are at, or nearing their allocation limits. Therefore developers need to consult with the department early in the proposal stage to identify alternative water source options and opportunities for water trading.</p>

## 3 Implementation actions

We committed to completing the following actions identified in the plan by the 2010-2011 reporting period (*Table 4*). Action 7 is met each year an evaluation statement is released. Action 6 will be addressed in the next evaluation statement.

*Table 4 Summary of progress towards actions for implementing the plan*

	Action	Status	Evaluation
1	Review the location of bores and draw points and identify which aquifer they are drawing from.	Partially met	The locations of bores and aquifer draw points were updated to reflect changes in resource boundaries resulting from the plan. This action will continue through licence renewals until we are satisfied all licences in the plan area were reviewed.
2	Update current acid sulfate soils (ASS) risk map through review of existing information in the Rockingham–Stakehill area.	Not met	The current ASS risk map is suitable for the implementation of this plan. We will assess the impacts of ASS through the licensing process in consultation with Department of Environment and Conservation. We will reconsider whether we need to update the ASS risk maps in 2011-2012.
3	Undertake domestic garden-bore surveys to account for unlicensed use.	Met	Research Solutions, on behalf of the department, conducted surveys covering bore users across the metropolitan area, including the Rockingham local government authority, to improve information about the incidence and distribution of garden bores. We undertook a garden bore trial to refine estimates of garden bore use to better inform the next allocation limit review.
4	Finalise the drilling investigation reports for Lake Thompson bore series.	Not met	We are currently in the process of finalising these reports.

	<b>Action</b>	<b>Status</b>	<b>Evaluation</b>
5	Review current groundwater monitoring program, including an appropriate monitoring program for groundwater dependent ecosystems and improving existing regional monitoring.	Partially met	We reviewed the statewide monitoring program and are in the process of updating our information systems and regional monitoring programs as a result. We are also developing guidelines for designing monitoring programs to allow for a clearer and targeted approach to monitoring across the state.
8	Determine ecological water requirements for groundwater-dependent ecosystems and review allocation limits.	In progress	Investigations into ecological water requirements across the Kwinana–Peel region area are progressing. The Rockingham-Stakehill area is yet to be initiated. A timeline for completion of this work is yet to be established.
<b>Score:</b>		3.5/7	
<b>Rating:</b>		<b>Adequate</b>	

## 4 Plan performance

We rated the performance of the plan and its implementation by reviewing the performance indicators and assessing the extent to which plan objectives (Section 5.2 of the plan) were met (*Table 5*).

*Table 5 Objectives and their status*

	<b>Objectives</b>	<b>Status</b>	<b>Evaluation</b>
<i>Unconfined aquifers (Superficial and Rockingham Sands aquifers)</i>			
1	Prevent further water level declines in the unconfined aquifers	Met	Groundwater levels in the superficial and Rockingham Sands aquifers continued to stabilise since the plan's release ( $\pm$ seasonal variation).
2	Minimise degradation of water quality from seawater intrusion and acid sulfate soils	Met	There is no evidence from licensees of changes in water quality. It should be noted that no water quality monitoring is carried out by the department in the plan area.
3	Protect high ecological values of wetlands	Not met	No monitoring of groundwater-dependent ecosystems is carried out in the plan area. However stable groundwater levels in the unconfined aquifers indicate that wetland water levels should be sufficient to maintain a low level of risk to ecological values.

Objectives	Status	Evaluation
<i>Confined aquifers (Leederville and Yarragadee aquifers)</i>		
4 Minimise use and reduce long term impacts to confined aquifers	Not met	The pressure heads in the Leederville and Yarragadee aquifers are continuing to decline on a regional scale. Locally, we reduced the level of over-allocation in the Leederville aquifer (Table 2) and in the Superficial-Rockingham Sand aquifer in Churcher East and Karnup East subareas. The temporary over-allocation of the Superficial-Rockingham Sand aquifer still meets this objective. No water is taken from the Yarragadee aquifer in the Rockingham groundwater area.
<b>Score:</b>	2/4	
<b>Rating:</b>	<b>Adequate</b>	

## 5 Evaluation of the management approach set out in plan

The implementation of revised allocation limits and policies under the plan resulted in half of the plan's objectives being met. Importantly, water levels in the superficial aquifers remained stable since the plan was released, demonstrating that licensing up to the allocation limits resulted in sustainable abstraction levels.

Licensed entitlements were recouped across all resources. Over allocation was reduced in the Leederville resource and there were no licences issued from the Yarragadee aquifer. This minimised additional effects on the confined aquifers. However, pressure heads continue to decline, highlighting the impacts of regional abstraction influences outside the plan area. A regional approach to managing the confined aquifers will be considered to address this as part of planning for Jandakot, Perth South and Serpentine groundwater areas and updating the Gnangara groundwater areas.

The most notable changes were a recovery of two resources to below the allocation limit in:

- Churcher East, superficial aquifer (decrease in licensed volume from 105% in 2009 to 81% in 2011).
- Karnup East, superficial aquifer (decrease in licensed volume from 110% in 2009 to 86% in 2011).

Demand for water increased substantially in the following resources since 2008:

- Karnup West, superficial aquifer (increase in licensed volume of 14% in 2009 to 80% in 2011).
- Warnbro, superficial aquifer (increase in licensed volume from 20% in 2009 to 60% in 2011).

We observed through data collected by licensees that there was no significant change to water quality in the superficial aquifer. At this stage licensee reporting is the only (and most efficient) mechanism employed for monitoring changes in water quality across the plan area.

## 6 Response to this evaluation

We identified through this evaluation that the *Rockingham–Stakehill groundwater management plan* is suitable to be in place until the next evaluation. The plan is not scheduled for replacement, as the current management approach is meeting the plan’s objectives. The need to replace the plan will continue to be considered each year through the evaluation process.

### 6.1 Work required to improve the plan's performance

We identified work required to improve our implementation of this plan. We will:

- Continue to recoup unused water entitlements in over-allocated resources to recover them to within the allocation limit.
- Encourage land developers to consult with us early so that water supply expectations are realistic and can be met by available water using the existing allocation limits or an appropriate alternative water supply option.
- Provide land developers with guidance on how to effectively align the requirements of the *Better Urban Water Management framework, 2008*<sup>1</sup> with the department’s water licensing and other water management processes.
- Review and update our monitoring program in line with the objectives of the plan.
- Apply appropriate management of groundwater abstraction and use in areas with acid sulphate soils in line with Department of Environment and Conservation guidelines.<sup>2</sup>

### 6.2 Work required for next plan

There are particular components of the plan that will require consideration when the plan is replaced. They are:

- Establish ecological water requirements in the plan area.
- Review allocation limits using updated modelling, long-term regional water level monitoring and climatic influences in the confined aquifers.
- Update the objectives and performance indicators to better facilitate adaptive management.

#### Rating system

Rating	Description
Good	70 to 100% of performance indicators, objectives and/or actions met
Adequate	40 to 70% of performance indicators, objectives and/or actions met
Poor	Less than 40% of performance indicators, objectives and/or actions met

<sup>1</sup> Western Australian Planning Commission 2008, *Better Urban Water Management framework*, Government of Western Australia, Perth

<sup>2</sup> See *Treatment and management of soils and water in acid sulfate soil landscapes*, Department of Environment and Conservation, 2011 < [www.dec.wa.gov.au](http://www.dec.wa.gov.au) > Management and Protection > Land > Acid Sulfate Soils