

Environmental Management of Groundwater Abstraction from the Jandakot Groundwater Mound – 2002/03 Annual Compliance Report

Water and Rivers Commission

**Report by the Environmental Protection Authority
under section 48(1a) of the *Environmental Protection Act 1986***

**Environmental Protection Authority
Perth, Western Australia
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1. Introduction and background

Groundwater abstraction from the Jandakot Mound for public water supply is subject to environmental conditions issued in Statement 253 by the Minister for the Environment on 29 April 1992. The current nominated proponent is the Water and Rivers Commission (WRC).

The EPA has delegated responsibility under section 20 of the *Environmental Protection Act* to audit compliance by the WRC with the environmental conditions applying to groundwater abstraction from the Jandakot Mound and also the Gngangara Mound. This delegation was gazetted on 26 September 2003.

This report provides the advice of the Environmental Protection Authority (EPA) to the Minister for the Environment in relation to compliance with environmental conditions.

The WRC submitted the July 2002 - June 2003 Annual Compliance Report for the Jandakot Mound to the EPA on 2 February 2004. This report is available on the Commission's website (www.wrc.wa.gov.au)

The 2002/03 Annual Compliance Report has been reviewed by an independent consultant to the EPA. The report of the auditor is provided in Appendix 3.

Following a request from the WRC because of concerns about consistent transgressions of some environmental conditions applying to the Jandakot Mound and the Gngangara Mound, the Minister for the Environment asked the EPA in 2001 to review and advise on changes to the existing environmental conditions under section 46 of the *Environmental Protection Act 1986*. The EPA agreed in 2001 to this section 46 being approached in two stages, with the first review dealing with some specific conditions where available information may provide sufficient basis for considering changes to criteria and the second stage review providing a more comprehensive review of environmental conditions applying to both groundwater mounds.

2. Compliance with environmental conditions

Section 48(1) of the *Environmental Protection Act 1986* provides for monitoring of implementation of a proposal for the purposes of determining whether the environmental conditions related to the proposal are being complied with. The EPA has an obligation under section 48(1a) to report non-compliance to the Minister.

The EPA has undertaken this compliance audit in two parts. The first was to appoint an independent consultant to review and report to the EPA on the WRC's Compliance Report. The WRC was then given an opportunity to respond to the auditor's report. This response is provided in Appendix 4. The second part was for the EPA to consider the auditor's report and WRC response, and to prepare this report to the Minister on issues associated with the WRC's Compliance Report.

WRC 2002/03 Annual Compliance Report

The WRC has acknowledged that there has been non-compliance with some environmental conditions applying to management of groundwater abstraction from the Jandakot Mound. The 2002/03 Annual Report provides the following summary information:

“There were six bores with non-compliance with environmental criteria including water levels in four wetlands, one bore for criteria vegetation and one rare flora monitoring bore. Consistent with previous years, vegetation monitoring indicated no significant risk to changes to wetland species on the Jandakot Mound during the reporting period 2002-2003.” (WRC 2004, p 3)

While there were six bores (including four which reflect wetland water levels) where criteria were breached, there were a further 26 bores where the criteria was not breached. In five of the six non-compliant bores, the water level fell below the lowest acceptable level (absolute minimum level) defined in the environmental conditions during 2002/03.

Table 1: Summary of non-compliances with Ministerial Conditions- Jandakot Groundwater Mound

Location	Absolute (A) or Preferred (P) minimum level	Relevant criteria (mAHD)	Minimum level (mAHD)	Predicted 2004 Non-compliance
1. North Lake	A	12.7	12.36	Yes
2. Lake Forrestdale	A	21.1	20.91	Yes
3. Shirley Balla Swamp	Summer drying	Water until end January	Dry in December	Yes
4. Beenyup Road Swamp	A	23.6	23.53	Yes
5. JM45 (vegetation)	A	23.52	23.42	Yes
6. JM29 (rare flora)	A	23.3	23.22	No
MINISTERIAL STATEMENT 253:				
P-2	To ensure that groundwater abstraction satisfies the environmental criteria presented in this PER.			

This summary also indicates that non-compliance is expected to continue in five of the bores during 2003/04.

Audit of Compliance Report

The auditor has provided the following summary advice in relation to his examination of the WRC's 2002/03 Annual Compliance report:

“The Report fails to address some important matters specifically called for in the conditions, such as estimating private water use and assessing whether the environmental criteria are effectively meeting the environmental objectives. The proponent should be asked to complete the missing parts of the report.

There is detailed reporting of monitoring the water levels in wells and wetlands near and on the mound. This has shown that in six cases the minimum levels were not maintained and so there is non-compliance with the environmental criteria set for

abstracting water from the mound. Some of these water level non-compliances have been predicted in advance and some have recurred over a number of years.

Non-compliance is a serious offence under the Act. Where future non-compliance can be predicted, the prediction should trigger action to ensure the non-compliance is avoided.

Actions taken by the proponent in the face of predicted and actual non-compliance to date to avoid the non-compliance or return to a state of compliance have been too slow and too ineffective.” (Malcolm 2004, p 1)

The EPA’s Auditor has confirmed the non-compliance as documented by the WRC, but has also identified a number of additional items in Statement 196 where there has been either non-compliance or where the action or response of the WRC is considered inadequate by the Auditor. These are highlighted in Appendix 1.

The Auditor’s report has then suggested actions on each item of non-compliance to enable the WRC to achieve compliance with all environmental conditions and proponent commitments. These are presented in Table 1 of Appendix 2, and are considered by the EPA below.

EPA’s Advice on compliance

It is clear from the WRC’s Annual Compliance Report and also the Auditor’s report that there have been instances of non-compliance with environmental conditions during the period July 2002 – June 2003. These have been documented in both reports.

The Auditor’s report contains a number of recommendations to facilitate future compliance by the WRC. These are summarised below (from Table 1 Appendix 2), along with the EPA’s recommendation in relation to each action suggested by the Auditor.

Table 2: Recommendations of the Auditor and EPA to address non-compliances

	Issue	Auditor’s Recommended action	EPA Recommendation
1	Scheme abstraction in Airport subarea slightly exceeded the quota. [M-3-2]	Set action level below quota to trigger closer monitoring to ensure the quota is not exceeded.	Agree with Auditor’s recommended action
2	Report does not record rainfall data, though this affects recharge and volumes abstracted.	Report should include annual rainfall data for Jandakot Airport	Agree with Auditor’s recommended action
3	Management actions in response to predicted and actual breaches of minimum water levels have been ineffective. S46 Review won’t provide new ones till 05/06 summer.	Develop interim new, more effective management options, to be used on 04/05 summer when there is a breach of Preferred Minima, to ensure no subsequent non-compliance.	Agree with Auditor’s recommended action, to be included in 2004 section 46 review
4	There are no quantitative criteria set for monitoring vegetation, habitat or fauna.	Develop quantitative criteria for the required status of vegetation, habitat and fauna in the s46 review.	Disagree. This may be desirable and proposed in the S46 review, but should not be stipulated at this time

	Issue	Auditor's Recommended action	EPA Recommendation
5	The Report fails to address several of the matters required under condition M-4-2.	Provide the omitted information.	Agree with Auditor's recommended action, but not to delay this report
6	Breaches of water level criteria have been reported annually, instead of "immediately" as required.	Change reporting practices to ensure breaches and predicted breaches are reported immediately.	Agree with Auditor, for prompt notification of non-compliances
7	No action on commitment to develop a communication strategy to influence private abstraction.	Complete development of the strategy by 30 June 2004.	Agree with Auditor's recommended action, to be included in 2004 section 46 review
8	Existing knowledge of private use is based on a 1998/99 survey.	Repeat the survey in 2004/05.	Agree with Auditor, for up-to-date information on groundwater use to be available
9	No action on commitment for intensive compliance monitoring of private licences.	Intensive compliance monitoring of Banjup subarea in summer of 2004/05.	Agree with Auditor (See 8 above) and include portions of Airport, Wright and Success sub-areas in proximity to breach sites
10	No action on commitment to introduce water efficiency measures.	Metering of water use as part of the above monitoring, as a pilot study for wider use of metering.	Agree with Auditor, that metering requirements should be applied to licences greater than 5 000kL per annum

(Shading indicates non-compliance)

In its response to the Auditor's report (Appendix 4) the WRC has indicated that, while it agrees that some action should be taken in relation to the above points, it considers that the Auditor's recommendations in a number of instances may not achieve the desired environmental outcome and that other options should be examined either immediately or through the section 46 that has been initiated.

The WRC has also highlighted the observation that, in general, there "is no significant risk to changes in vegetation species on the Mound" although some "areas have had a decline in vegetation health and invasion of weeds (some of which may be attributed to groundwater levels)" (WRC Response, p. 1-2).

In several instances the WRC has indicated in its response (Issues 1 and 3) that it will not necessarily take action to resolve future non-compliance, but will consider the consequences of non-compliance when determining what action it will take. While the EPA appreciates that compliance may mean constraints to water allocations or licences and impose increased management requirements, this is precisely what the conditions and commitments envisage. The EPA provides more comment on some of the implications of this when it discusses private allocations below.

3. Other Advice

In previous advice on progress of the Section 46 to the Minister for the Environment the EPA has identified a number of matters that are relevant to non-compliance, many of which are also noted in the Auditor's report. These matters are:

- On-going breaches of criteria and action taken by WRC to address these breaches
- Progress on the Section 46 initiated by the WRC in 2001

- Allocation and private licence decisions under circumstances of non-compliance

These are discussed below.

On-going breaches

The WRC has advised the EPA over the past three years of actual and predicted breaches of criteria as part of its reporting on the progress of the Section 46 review. The Annual Compliance Report identifies six instances of non-compliance during 2002-2003. That report notes that, during 2002/03, there were “two more non-compliances than the predicted four on the Jandakot Mound.... . However, given the presumptions of urban development that have not yet taken place, together with the dry climate run being experienced, the groundwater system could be considered as performing better than anticipated” (WRC 2003, p 48).

These statements need to be considered in the light of a long period of continuous breaches. There have been breaches since 1997-98, and some even earlier (since 1993/94), as acknowledged by the WRC and illustrated in Figures 2 and 3 of the auditor’s report. Further, the Annual Compliance Report indicates that there is expected to be breach of criteria at five sites during 2003/04.

The Auditor has pointed to the seriousness of non-compliance. The WRC is required to consider environmental, economic and social issues when making allocation decisions. However, it is also required to fully comply with legal requirements attached to environmental approvals.

Progress toward resolving the appropriateness of criteria established under environmental conditions has been distracted by consequences of the recent period of poor dam inflows and declining groundwater levels.

The EPA considers that deferring immediate action to achieve compliance is no longer legally nor environmentally acceptable.

Progress on the Section 46 Review

The EPA noted in its advice to the Minister on the WRC’s 2003 Progress Report that it continued to express increasing concern about the environmental consequences of continuing high levels of public and private water abstraction on the Jandakot and Ngarara Mounds, particularly the latter.

The EPA made the following comment to the Minister in that advice:

“The 2003 Progress Report indicates that the first stage of the Section 46 review of the Environmental Conditions is planned to be submitted to the EPA in late 2004 with a more comprehensive Stage 2 proposal for modification of Environmental Conditions to the EPA in early 2005. While the EPA has previously accepted this timing, the on-going extent of breaches of the current Environmental Conditions has caused the EPA to recommend that the Section 46 review should be submitted as soon as possible, preferably in the first half of 2004. While encouraging earlier progress on the Section 46 review, this should not be interpreted as indicating that the EPA will necessarily support changes to the existing criteria or conditions. Clearly any proposed changes

will need to be clearly supported by documentation and demonstrate that nominated environmental values will have improved protection and enhanced management.”

The EPA understands that the section 46 review addressing all of the issues could not be prepared before early 2005, largely because some of the significant scientific investigations to support changed criteria have yet to be completed. However, the WRC is working towards submitting a first stage section 46 review that will address some of the criteria sites.

Completion of the Section 46 has already taken longer than desirable and should be a specific priority for the WRC. A detailed timetable which addresses non-compliance should be agreed with the Minister as soon as possible.

Allocation and private licence decisions under circumstances of non-compliance

Private use of water from the Jandakot Mound is covered by a combination of licences (industrial and irrigation use) and unlicensed uses (domestic and stock purposes). The WRC has a policy of not requiring metering for private licence water entitlements of less than 500,000 m³ per year. There are no private licences within the Jandakot Groundwater Area with an entitlement that require metering. The WRC is presently reviewing its metering policy. The EPA is of the view that all licenced private users with allocations greater than 5 000 kilolitres per annum should install meters to ensure compliance with licence conditions.

Given the comments made by the WRC about the implications of “urban development that have not yet taken place, together with the dry climate run being experienced” and the on-going increase in breaches, the question of what is the current level of sustainable abstraction from the Jandakot Mound needs to be addressed urgently. This is a task that is clearly the responsibility of the WRC and should be carried out so that it can contribute to the Section 46 review.

The Water Corporation has taken account of the recent period of low rainfall by de-rating its dams to reflect the significant reduction of inflows. However, a similar approach has not been undertaken by the WRC for all allocations on the Gnangara and Jandakot Mounds. The current annual allocation decision for public groundwater abstraction based on groundwater levels provides some capacity for fine-tuning but is largely constrained by dam storage levels and predicted total water demand from the Integrated Water Supply Scheme. Private use appears to have largely been unchanged, despite efforts of the WRC to achieve voluntary reductions. The EPA has previously expressed concern about the focus on public water abstraction, while private abstraction has not been effectively managed. Unlike the Gnangara Mound, public abstraction is not the major user on the Jandakot Mound. In 2002/03, the public abstraction quota from the superficial aquifer within the Jandakot Groundwater Area was 5.13 GL whereas the private abstraction allocation was 11.29 GL.

The Auditor’s report points to an instance (Airport sub-area) where actual use was in excess of the 2002-03 quota. This highlights the need for accurate information related to groundwater use. The auditor’s report makes four recommendations (1, 8, 9 and 10) which are relevant to this. The EPA supports:

- setting an action level below the quota to trigger closer monitoring to ensure the quota is not exceeded;
- up-to-date information on groundwater use being available, especially in and near areas in proximity to breach sites; and
- metering requirements being applied to licences in excess of 5 000 kilolitres per annum.

4. Conclusion

There have been a number of breaches of compliance by the WRC with some of the requirements of Statement 253. These particularly relate to compliance with environmental criteria specified in the Statement.

The WRC has exercised considerable discretion for some time about whether and how it complies with the environmental conditions and proponent commitments in Statement 253. The EPA cannot ignore any breach of the *Environmental Protection Act*, which is a consequence of this approach. Clearly the extent of the recent significant reduction in rainfall over the past decade and longer was not foreseen and there has been a substantial decline in recharge to the Jandakot Mound, but the response to this reduction and also other factors such as less urban development on the periphery of the Mound has been inadequate.

The EPA considers that deferring immediate action to achieve compliance is no longer legally nor environmentally acceptable.

In several instances, the EPA has recommended that the WRC address non-compliance through the forthcoming section 46 review. The EPA recommends that a detailed timetable for the section 46 be agreed with the Minister as soon as possible.

Given the likely influence of climatic variability on groundwater levels, it will be important for water allocation regimes to provide for and reflect the changing availability of water, possibly at an annual frequency.

5. Recommendations

The EPA submits the following recommendations to the Minister for the Environment:

1. That the Minister notes this report on compliance by the Water and Rivers Commission with environmental conditions and proponent commitments set out in Statement 253.
2. That the Minister notes that the EPA has found that the Water and Rivers Commission has not complied with a number of environmental conditions and proponent commitments set out in Statement 253
3. That the Minister considers the recommendations of the EPA in Table 2 in this report on those matters of non-compliance.
4. That the WRC submit a detailed timetable for the section 46 review addressing non-compliance and that this timetable be agreed with the Minister as soon as possible

Appendix 1

**Ministerial Statement No. 253
Jandakot Groundwater Scheme, Stage 2**

**Environmental Conditions Compliance Table
(from Malcolm, 2004)**

A. Ministerial Conditions

Code	Description	Responsibility	Compliance assessment/ Mitigation actions [Shading highlight = non compliance]	Auditor Comments [Italic highlight = Response inadequate]
M-1	In implementing the proposal, the proponent shall fulfil the commitments (which are not inconsistent with the conditions or procedures contained in this statement) made in the Public Environmental Review and included as Appendix 1 in Environmental Protection Authority Bulletin 587.	WRC and Utility	Refer to conditions and commitments below.	OK
M-2	Subject to these conditions, the manner of detailed implementation of the proposal shall conform in substance with that set out in any designs, specifications, plans or other technical material submitted by the proponent to the Environmental Protection Authority with the proposal. Where, in the course of that detailed implementation, the proponent seeks to change those designs, specifications, plans or other technical material in any way that the Minister for the Environment determines on the advice of the Environmental Protection Authority, is not substantial, those changes may be effected.	WRC and Utility	Condition met and ongoing.	<i>There is an ongoing requirement to do something if the occasion arises. The compliance report needs to answer the question "Were any changes sought or approved during the reporting period?"</i>
M-3-1	Prior to 1 December each year, the proponent shall determine anticipated public water supply abstraction limits and shall advise the Environmental Protection Authority of those limits, the period to which the limits apply and details of the actual and anticipated environmental effects of abstraction.	WRC	Abstraction limits have been determined and EPA have been notified. (Section 46 report)	<i>When were the limits determined and when was EPA notified?</i>
M-3-2	The proponent shall operate within the limits and the period specified in condition 3-1.	WRC (Utility via licence conditions)	Annual abstraction was exceeded in 1 subarea (Airport) by a small volume (50 Megalitres). This is not a reportable breach as it remains below 115% of the approved bore quota.	<i>Given the reported non-compliance in well JM45, more detail is warranted. It may not be "reportable" but surely it is still a breach?</i>
M-3-3	The proponent shall inform the Environmental Protection Authority immediately of any proposed change to the anticipated abstraction limit and period. Changes made after 1 December each year shall be to the satisfaction of the Environmental Protection Authority.	WRC	Condition met- refer to Appendix 3.	<i>Appendix 3 shows that a change was proposed. There is no evidence provided that the EPA was informed (immediately or otherwise) or that it was satisfied with the change.</i>

Code	Description	Responsibility	Compliance assessment/ Mitigation actions [Shading highlight = non compliance]	Auditor Comments [Italic highlight = Response inadequate]
M-4-1	Prior to commissioning the borefield, the proponent shall prepare a detailed environmental monitoring plan, to the satisfaction of the Minister for the Environment on advice of the Environmental Protection Authority and the Department of Conservation and Land Management. This monitoring plan shall include, but not be limited to monitoring the following: 1. vegetation; 2. fauna; 3. habitat; and 4. groundwater levels.		Cleared (conditional) by the submission of the 1992 EMP.	OK
M-4-2	The proponent shall submit brief annual and more detailed triennial reports addressing, but not limited to the following: (1) the quantity of water abstracted for public use and estimated quantity for private use; (2) environmental monitoring results; (3) compliance with the environmental criteria and the commitments; (4) compliance with the environmental objectives; (5) a review of the effectiveness of the criteria in meeting the environmental objectives; and (6) any proposed changes to management, monitoring or mitigation of wetland impacts. to the satisfaction of the Environmental Protection Authority.	WRC	Condition met by the preparation of this report to EPA.	<i>This Report does not comply with several of the listed requirements.</i> (1) <i>There is no estimate of the quantity for private use</i> (2) <i>OK</i> (3) <i>OK, except for inadequacies listed here.</i> (4) <i>There is no reporting against "environmental objectives".</i> (5) <i>There is no review of the effectiveness of the criteria in meeting the objectives.</i> (6) <i>The Audit Report highlights that the Report is inadequate in its proposals for change to management.</i> Since the Report is to be to the satisfaction of the EPA it is recommended that the EPA require it to be modified to rectify the inadequacies before expressing its "satisfaction" with the Report.
M-4-3	The proponent shall submit the reports required by condition 4-2 to the Environmental Protection Authority and shall make them publicly available. The annual reports shall be submitted by 1 December and the triennial reports by 1 March, following commencement of the operation of the scheme.	WRC	Reports are publicly available from the Commissions library and copies sent to key stakeholders (eg Water Corporation). Extension to submission of Annual report from 1 December to 30 January was given by the EPA (Attachment 6)	OK Report should also be made available on internet.
M-4-4	The proponent shall report any breach or anticipated breach of the environmental criteria or environmental objectives to the Environmental Protection Authority immediately.	WRC	Condition met - refer to Appendix 7.	<i>Appendix 7 shows that breaches and anticipated breaches were reported, but this appears to have occurred annually, not "immediately".</i>

Code	Description	Responsibility	Compliance assessment/ Mitigation actions [Shading highlight = non compliance]	Auditor Comments [Italic highlight = Response inadequate]
M-4-5	If impacts are detected which are deemed to be unacceptable by the Environmental Protection Authority, the proponent shall modify subarea water allocations and abstraction strategies for the Jandakot Public Water Supply Area to the satisfaction of the Environmental Protection Authority.	WRC	A precautionary management approach is taken where groundwater level forecasts are made monthly to determine potential breaches and pre-emptive action is taken.	<i>A precautionary management approach is to be expected. The question to be answered is "What action has been taken in this reporting period?"</i>
M-5-1	<p>Prior to commissioning the borefield, the proponent shall prepare a plan to mitigate losses of wetland area and wetland function that are likely to occur as a consequence of the development and operation of the borefield, based initially on the anticipated impacts associated with the likely future landuse/abstraction scenario for the area, to the satisfaction of the Minister for the Environment on advice of the Environmental Protection Authority. This plan shall include but not necessarily be limited to:</p> <ol style="list-style-type: none"> (1) a description of the processes used for identifying the likely wetland impacts; (2) the identification of individual wetlands that will be affected, quantification of the likely changes in water level expected to occur, and the likely impacts of these changes on the areas and functions of the wetlands; (3) identification of wetlands that are likely to be dry on December 1 each year as a result of abstraction (i.e. the area of free water is less than 1 000 square metres or less than 20 percent of the wetland area); (4) the existing importance of the areas that will be affected (e.g. rare and endangered flora and fauna present, number of breeding waterbird species); (5) a strategy to mitigate losses of wetland area and functions, including details of compensatory action. This should include details of the strategy to mitigate against impacts on Twin Bartram and Solomon Road Swamps, using all reasonable and practicable means; (6) a commitment to modify the plan to the satisfaction of the Environmental Protection Authority, based on the results of future environmental impact monitoring; and (7) a commitment to modify the plan to the satisfaction of the Environmental Protection Authority, if impacts are detected which are deemed to be unacceptable by the Environmental Protection Authority. 	WRC – partial delegation to Utility via allocation licence.	Commitment met by the submission of the 1992 EMP.	<i>The requirements of items (6) and (7) are ongoing. It is likely that the mitigation plan's ongoing implementation has been absorbed into the EMP. If so, this response should direct the reader to where the relevant part of the EMP's implementation has been reported (see comment on M-6-2 below).</i>

Code	Description	Responsibility	Compliance assessment/ Mitigation actions [Shading highlight = non compliance]	Auditor Comments [Italic highlight = Response inadequate]
M-5-2	The plan required by condition 5-1 shall be made available for public comment.	Cleared	Condition met - public comments were invited on the EMP.	OK
M-5-3	Subsequent to conditions 5-1 and 5-2, the proponent shall commence implementation of the approved wetland management plan within two years of commissioning the borefield, to the satisfaction of the Environmental Protection Authority	WRC	Ongoing commitment. This report details the implementation for the current review period.	<i>Response inadequate. See comment on M-6-2 below.</i>
M-6-1	Prior to the commissioning of the borefield, the proponent shall prepare a comprehensive environmental management program to the satisfaction of the Minister for the Environment on advice of the Environmental Protection Authority. This program shall reflect the anticipated future landuse/abstraction scenario for the area and shall include, but not necessarily be limited to: (1) an environmental monitoring plan as required by condition 4; and (2) a wetland management plan as required by condition 5.	Cleared (conditional) in EMP	Commitment met by submission of the EMP.	OK Should read "Condition met...".
M-6-2	The proponent shall implement the comprehensive environmental management program required by condition 6-1, to the satisfaction of the Environmental Protection Authority.	WRC (with delegation to the Utility).	Ongoing commitment. This report details the implementation for the current review period.	<i>The EMP has many elements and commitments. A separate table reporting on implementation of the EMP is needed for effective, transparent auditing.</i>
M-7-1	At least six months prior to decommissioning the borefield, the proponent shall prepare a decommissioning and rehabilitation plan, to the satisfaction of the Environmental Protection Authority.	Utility	Not relevant at this time.	OK
M-7-2	The proponent shall implement the decommissioning and rehabilitation plan required by condition 7-1, to the satisfaction of the Environmental Protection Authority.	Utility	Not relevant at this time.	OK
M-8	No transfer of ownership, control or management of the project which would give rise to a need for the replacement of the proponent shall take place until the Minister for the Environment has advised the proponent that approval has been given for the nomination of a replacement proponent. Any request for the exercise of that power of the Minister shall be accompanied by a copy of this statement endorsed with an undertaking by the proposed replacement proponent to carry out the project in accordance with the conditions and procedures set out in the statement.	WRC/Utility. See Reallocation Schedule for amended conditions	Was undertaken with split of Water Authority.	<i>WRC as the current nominated proponent is still required to comply with this condition. Presumably "No action in this reporting period." Is the appropriate response.</i> It may be that with the recent insertion of s38(6a) of the EP Act this condition is no longer needed. That matter should be addressed in the section 46 Review.

Code	Description	Responsibility	Compliance assessment/ Mitigation actions [Shading highlight = non compliance]	Auditor Comments [Italic highlight = Response inadequate]
M-9	If the proponent has not substantially commenced the project within five years of the date of this statement, then the approval to implement the proposal as granted in this statement shall lapse and be void. The Minister for the Environment shall determine any question as to whether the project has been substantially commenced. Any application to extend the period of five years referred to in this condition shall be made before the expiration of that period, to the Minister for the Environment by way of a request for a change in the condition under Section 46 of the Environmental Protection Act. (On expiration of the five year period, further consideration of the proposal can only occur following a new referral to the Environmental Protection Authority.)	WRC/Utility	Not relevant. Proposal has been implemented	OK

B. Proponent Commitments

Code	Description	Responsibility	Compliance assessment/ Mitigation actions [Shading highlight = non compliance]	Auditor Comments [Italic highlight = Response inadequate]
P-1	To prepare a Management and Monitoring Program, satisfactory to the EPA, prior to commissioning of the Stage 2 Scheme.	WRC	Commitment met by submission of the EMP.	OK
P-2	To ensure that groundwater abstraction satisfies the environmental criteria presented in this PER. To mitigate impacts associated with construction of the Stage 2 Scheme by the Water Authority.	WRC (delegation to Utility via allocation licence)	Refer Table 1. Environmental criteria have been breached on several occasions. Mitigation action includes promoting general public awareness of need to reduce water consumption during drought. Water use efficiency initiatives including WaterWise on the Farm, metering, and development of water conservation plans as part of licensing, are expected to improve water resource management in sensitive areas over time. Environmental criteria are currently being reviewed under S.46 of the EP Act.	<i>The commitment refers to mitigation of construction impacts, and has presumably now been met. The mitigation reported relates to other commitments.</i>
P-3	Clearing of vegetation at bore sites will be restricted to the area of the enclosure (approximately 25 metres square) in non-urban areas, and the immediate area of the bore head in the case of bores located in public open space in urban areas.	Utility (completed)	Not relevant. Proposal has been implemented.	<i>There will be an ongoing requirement to maintain the cleared areas, and under the EP Act, as recently amended, this would be "clearing", and may require a clearing permit.</i>
P-4	Where practical, the collector main will be located within existing road reserves.	Utility (completed)	Not relevant. Proposal has been implemented.	OK
P-5	On Crown Land, top-soil from the collector main trench will be separately stripped, stock-piled and re-spread on completion of pipe laying.	Utility (completed)	Not relevant. Proposal has been implemented.	OK
P-6	On private land, the collector main route will be left in a state agreed to by the land owner/occupier.	Utility (completed)	Not relevant. Proposal has been implemented.	OK
P-7	Where feasible, bore site compounds will be used for the storage of materials and for contractors' facilities, in preference to the establishment of separate short-term sites.		Not relevant. Proposal has been implemented.	OK
P-8	Where temporary construction sites are established, the area will be returned either to its original state, in the case of Crown Land, or to a state agreed to by the land owner/occupier.	Utility (completed)	Not relevant. Proposal has been implemented.	OK
P-9	All work on extensions to and modifications of the Jandakot Treatment Plant will be undertaken on existing cleared areas within the boundary of the Plant site, and	Utility (completed)	Not relevant. Proposal has been implemented.	This is an ongoing commitment for which the Utility continues to be responsible.

Code	Description	Responsibility	Compliance assessment/ Mitigation actions [Shading highlight = non compliance]	Auditor Comments [Italic highlight = Response inadequate]
P-10	All workers involved in project construction in natural areas will be instructed on environmental protection procedures before work proceeds.	Utility (completed)	Not relevant. Proposal has been implemented.	OK
P-11	<p>In the event that monitoring indicates that there will be significant impacts of a nature not predicted in this evaluation or a breach of the specified criteria, then the Water Authority must undertake one or more of the following:</p> <p>(1) demonstrate to the satisfaction of the EPA that the breach of criterion is not a result of groundwater abstraction; or</p> <p>(2) satisfy the EPA that the breach of criterion is transient and not of permanent significance; or</p> <p>(3) take the relevant action as specified in Section 7 of the EPA Bulletin:</p> <p>(a) modify pumping from any bore where such changes can have a measurable effect (say raise water levels 1 centimetre or more), except in extenuating circumstances such as where significant economic hardship would occur, or CALM declare that the low water levels would be beneficial</p> <p>(b) in the case of a wetland, artificially maintain the "action minima" water level (see Table 7.5); and</p> <p>(c) implement a short-term detailed monitoring program to establish the condition of agreed species in the affected area.</p>	WRC	<p>Wellfield abstraction has been modified to limit environmental impact. Besides water use efficiency initiatives underway, further urbanisation of some areas will reduce abstraction over time and possibly raise water levels in some wetlands.</p> <p>DEP will be advised immediately if results of ongoing biological monitoring indicate that adverse impacts have occurred.</p> <p>Section 46 Review is currently being undertaken with respect to this.</p>	<i>Given the ongoing breaches, the modification of abstraction has not been sufficient. It is not possible to justify present non-compliance by referring to future urbanization that may or may not occur and over which the proponent has no control.</i>
P-12	To modify the chlorine withdrawal system to a liquid process prior to commissioning of the Stage 2 line of bores.	Utility	Not relevant. Proposal has been implemented.	OK
P-13	<p>To operate the treatment plant with established buffer zones so that:</p> <p>The personal risk hazard of fatality associated with chlorine release is less than one in a million in any year; and</p>	Utility	Responsibility of Water Corporation.	OK
P-14	Hydrogen sulphide levels attributable to plant operation will be below noticeable levels of 5 parts per billion	Utility	Responsibility of Water Corporation.	OK

Code	Description	Responsibility	Compliance assessment/ Mitigation actions [Shading highlight = non compliance]	Auditor Comments [Italic highlight = Response inadequate]
P-15	Regularly reviewing the bulk allocations for private abstraction, as part of the total water abstraction allocation for the Jandakot PWSA, with regard to the sustainable yield of the superficial aquifer, including consideration of the environmental impacts of that abstraction.	WRC	Water use survey conducted in 1999 which indicated that total water use was below licensed allocations in all subareas. Recommendations of survey are being progressively implemented. Application of the PRAMS model will assist in assessment of environmental impact and sustainable yield for the Jandakot Mound.	<i>The commitment refers to "allocations" not "use". It asks the question "are the allocations sustainable?" – a relevant question given the non-compliances. It would seem fair for the same criteria to apply in the determination of public and private allocations, and in the issuing of quotas or licences within those allocations.</i>
P-16	Restricting the issuing of licences for private water abstraction to the limits set by the bulk allocations for both the Jandakot PWSA in its entirety and the licensing subareas.	WRC	Commitment met.	Table 3
P-17	Investigating and implementing efficient mechanisms for groundwater allocation.	WRC	Being addressed in ongoing Statewide planning and policy development and initiatives recommended in State Water Strategy (eg. metering of use).	<i>Given the non-compliance problems in Jandakot and Gnamagara implementation of this Strategy may need to be fast-tracked.</i>
P-18	Conduct pump tests on Stage 2 bores and liaise with nearby private users of groundwater prior to commissioning to assess the impact of Stage 2 bores on private bores.	Completed	Commitment met.	OK
P-19	To protect the groundwater resource by active participation in: The development of Environmental Protection Policies to protect groundwater;	WRC/Utility	Commitment met. Groundwater EPP developed in 1998.	<i>Ongoing. There will be other EPPs relevant to the protection of groundwater.</i>
P-20	The review of Regional Plans proposed by the Department of Planning and Infrastructure, Local Government Town Planning Schemes, and re-zoning and development applications; and	WRC	Commitment met. WRC continues to provide advice to Department of Planning and Infrastructure on planning and development proposals affecting the Jandakot Mound.	<i>If feasible, the number of occasions on which advice was given in the reporting period should be given.</i>
P-21	Review of development submissions to EPA.	WRC	WRC provides advice on development proposals to the EPA upon request.	<i>If feasible, the number of occasions on which advice was given in the reporting period should be given.</i>
P-22	To work with the Department of Planning and Infrastructure to prepare an integrated Landuse and Water Management Strategy for the Jandakot Mound.	Cleared	Condition cleared.	OK
P-23	To actively pursue programs in both supply and demand management. This includes ongoing public information programs and, where appropriate, regulation for design changes and regular reviews of pricing to conserve water. Improvements in the Authority's supply system will also be pursued.	WRC/Utility	Commitment met and part of WRC ongoing business.	<i>Need to outline how the commitment was met during the reporting period.</i>

Code	Description	Responsibility	Compliance assessment/ Mitigation actions [Shading highlight = non compliance]	Auditor Comments [Italic highlight = Response inadequate]
P-24	To actively participate in integrated management of the Jandakot catchment.	WRC/Utility	Commitment ongoing.	<i>Need to outline how the commitment was met during the reporting period.</i>
P-25	To review the management criteria and strategies, with the agreement of the EPA, as knowledge of the Jandakot environment and its interaction with groundwater improves.	WRC	The Section 46 Review is currently being undertaken in this regard. Evaluation of the interaction between climate, abstraction and water levels is continuing and a study to determine interaction between the Leederville and superficial aquifer has commenced.	OK
P-26	To review opportunities for reducing the radius of the buffer zone required around the treatment plant to achieve acceptable personal risk and hydrogen sulphide levels	Utility	Responsibility of Water Corporation.	
P-27	To monitor water levels in groundwater monitoring bores and North, Bibra, Yangebup, Kogolup, Thomsons, Forrestdale Lakes. The Spectacles and Twin Bartram Swamp as well as some other small wetlands.	Utility	Commitment met (Table 5) and ongoing.	Good. Brief, but sufficient.
P-28	To monitor vegetation transects on a triennial basis to establish significant changes in the condition, floristics or structure of vegetation communities.	WRC	Detailed in triennial reports.	OK
P-29	To continue to fund the research projects 10.6.3 listed in Appendix 2 of the EPA Bulletin for the duration of the studies.	Cleared	Condition cleared.	OK
P-30	To use aerial photographs on a triennial basis to detect habitat shifts in North, Bibra, Yangebup, Kogolup, Thomsons and Forrestdale Lakes.	WRC	Detailed in triennial reports.	OK
P-31	To develop a fauna monitoring program, prior to the commissioning of the Stage 2 Scheme, which will focus on: - waterbird species diversity and breeding success, and - number of families of aquatic invertebrate and at infrequent intervals, species richness.	WRC	Commitment met. Program implemented.	OK
P-32	To hold meetings at least annually with a Jandakot Consultative Committee which will be established in consultation with the EPA. This Committee will be informed on the scheme's operation and will provide feed-back to the Water Authority.	WRC	Commitment met. Meetings held with the Jandakot Water Management Community Consultative Committee in December 2002 and September 2003. Meeting held with the Beeliam Community Group in April 2003.	Good. Brief, but sufficient.

Code	Description	Responsibility	Compliance assessment/ Mitigation actions [Shading highlight = non compliance]	Auditor Comments [Italic highlight = Response inadequate]
P-33	To continue to monitor community response as reported by the media and maintain the current practice of public accessibility of Water Authority officers. Upon request and adequate notice, officers will address community groups on issues associated with groundwater management.	WRC	Commitment met. Commission addressed various community groups including the Jandakot Water Management Community Consultative Committee and Beeliar Community Group.	Good. Brief, but sufficient.
P-34	After the commissioning of the Stage 2 Scheme, written reports to the EPA will consist of: (1) annual reports addressing compliance with the environmental protection criteria, and (2) triennial reports including, in addition to a review of compliance with the criteria, an evaluation of the effectiveness of the criteria in meeting the environmental protection objectives.	WRC	Commitment met with this report.	OK
P-35	To advise the EPA immediately upon becoming aware that specific environmental protection criteria might be breached. Details of the actions taken to avoid such a breach of criteria or, in the event of a breach occurring, its consequences, will be reported to the EPA at the earliest feasible date.	WRC	Condition met. Similar to Ministerial Condition M-4-4. The Commission advises the EPA annually (eg. Section 46 report) on predicted summer breaches and resource management measures actions taken.	<i>The commitment requires that the EPA be notified "immediately" and "at the earliest feasible date". In fact notification in Appendix 7 of the Report has occurred annually, long after the proponent has become aware of some non-compliances.</i>
P-36	Undertake a study of Banganup Lake, in conjunction with CALM and the University of WA to establish management criteria and consider the effectiveness of artificial maintenance of water levels.	WRC/Utility	Cleared in 1993 triennial report.	OK
P-37	Undertake a study of Twin Bartram Swamp to consider the feasibility and effectiveness of artificial maintenance of water levels.	WRC/Utility	Cleared in 1993 triennial report.	OK

Shading highlights non-compliance

Appendix 2

References

Malcolm J (2004). Audit of Compliance Report - Environmental Management of Groundwater Abstraction from the Jandakot Groundwater Mound

Water and Rivers Commission (2004). Environmental Management of Groundwater Abstraction from the Jandakot Groundwater Mound - Annual Compliance Report to the Environmental Protection Authority. July 2002 – June 2003

Water and Rivers Commission (2003). Progress Report 2003 – Section 46 Review of Environmental Conditions on Management of the Gnangara and Jandakot Mounds

Appendix 3

**Malcolm J (2004). Audit of Compliance Report - Environmental Management of
Groundwater Abstraction from the Jandakot Groundwater Mound**

JIM MALCOLM
Environmental Consultant



- Environmental Law Policy
- Impact Assessment
- Waste Management
- Zero Waste
- Compliance

Jandakot Compliance Audit

**Audit of Compliance Report for
2002/03**

**Environmental Management of
Groundwater Abstraction from
the Jandakot Groundwater
Mound**

**Jim Malcolm
Environmental Consultant**

Audit of Annual Compliance Report for 2002-03

Environmental Management of Groundwater Abstraction from the Jandakot Groundwater Mound

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Audit of Annual Compliance Report for 2002-03

Environmental Management of Groundwater Abstraction from the Jandakot Groundwater Mound

Summary

The taking of groundwater from the Jandakot Groundwater Mound, in the southern suburbs of Perth is subject to a Ministerial approval under Part IV of the *Environmental Protection Act 1986* (the Act). That approval is subject to a number of environmental management conditions. The purpose of those conditions is to ensure that the environment is protected as implementation of the proposal proceeds.

The Department of Environment¹ submitted to the Environmental Protection Authority in January 2004 its report for 2002-03 on compliance with the conditions (the Report), and this document presents an audit of that compliance report, including an assessment of the significance of instances of non-compliance.

The Report fails to address some important matters specifically called for in the conditions, such as estimating private water use and assessing whether the environmental criteria are effectively meeting the environmental objectives. The proponent should be asked to complete the missing parts of the report.

There is detailed reporting of monitoring the water levels in wells and wetlands near and on the mound. This has shown that in six cases the minimum levels were not maintained and so there is non-compliance with the environmental criteria set for abstracting water from the mound. Some of these water level non-compliances have been predicted in advance and some have recurred over a number of years.

Non-compliance is a serious offence under the Act. Where future non-compliance can be predicted, the prediction should trigger action to ensure the non-compliance is avoided.

Actions taken by the proponent in the face of predicted and actual non-compliance to date to avoid the non-compliance or return to a state of compliance have been slow and ineffective.

Table 1 summarises the issues identified and recommended actions. Note that not all recommended actions relate to actual non-compliances.

¹ The nominated proponent is the Water and Rivers Commission, which is currently being incorporated into a new Department of Environment.



Table 1 – Issues identified in the audit and recommended actions

No.	Issue	Recommended action
1	Scheme abstraction in Airport subarea slightly exceeded the quota.	Set action level below quota to trigger closer monitoring to ensure the quota is not exceeded.
2	Report does not record rainfall data, though this affects recharge and volumes abstracted.	Report should include annual rainfall data for Jandakot Airport
3	Management actions in response to predicted and actual breaches of minimum water levels have been ineffective. S46 Review won't provide new ones till 05/06 summer.	Develop interim new, more effective management options, to be used on 04/05 summer when there is a breach of Preferred Minima, to ensure no subsequent non-compliance.
4	There are no quantitative criteria set for monitoring vegetation, habitat or fauna.	Develop quantitative criteria for the required status of vegetation, habitat and fauna in the s46 review.
5	The Report fails to address several of the matters required under condition M-4-2.	Provide the omitted information.
6	Breaches of water level criteria have been reported annually, instead of "immediately" as required.	Change reporting practices to ensure breaches and predicted breaches are reported immediately.
7	No action on commitment to develop a communication strategy to influence private abstraction.	Complete development of the strategy by 30 June 2004.
8	Existing knowledge of private use is based on a 1998/99 survey.	Repeat the survey in 2004/05.
9	No action on commitment for intensive compliance monitoring of private licences.	Intensive compliance monitoring of Banjup subarea in summer of 2004/05.
10	No action on commitment to introduce water efficiency measures.	Metering of water use as part of the above monitoring, as a pilot study for wider use of metering.

Shading indicates non-compliance.



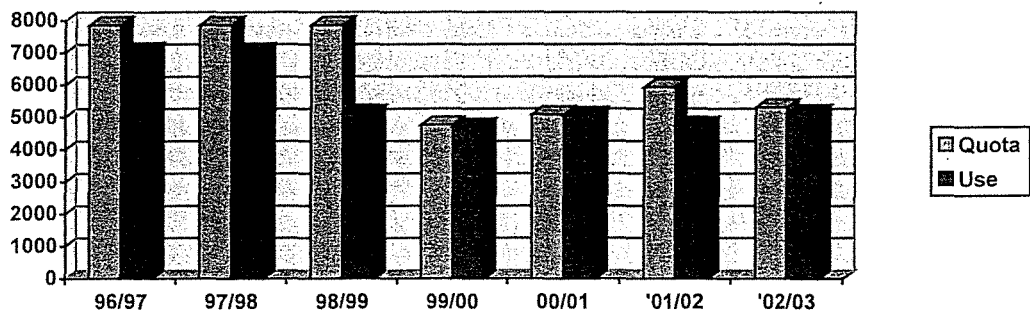
1. Water Allocation and Water Use

The terminology used in the report is confusing. There is an overall “Total Subarea Allocation Limit”. The share of this for public abstraction is termed a “Licensed Allocation Limit”. The share of this for public abstraction is termed a “Licensed Allocation”. Then each year an annual quota is set, and actual use is measured against the quota.

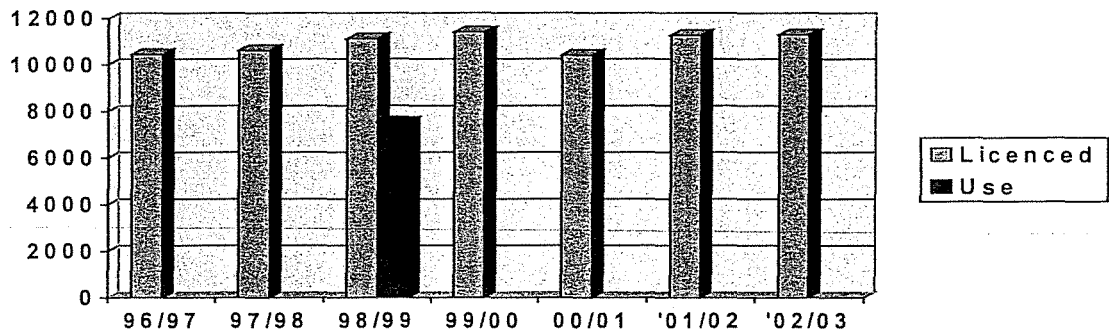
For private abstraction the share of the “Total Subarea Allocation Limit” is termed “Private Use Quota”, and the total of the licences actually issued is called “Private Use Allocation”. Figure 1 shows the quotas, allocations and licences since 1996/97.

Figure 1 – Quotas, allocations and licences for abstraction from the Jandakot Groundwater Mound

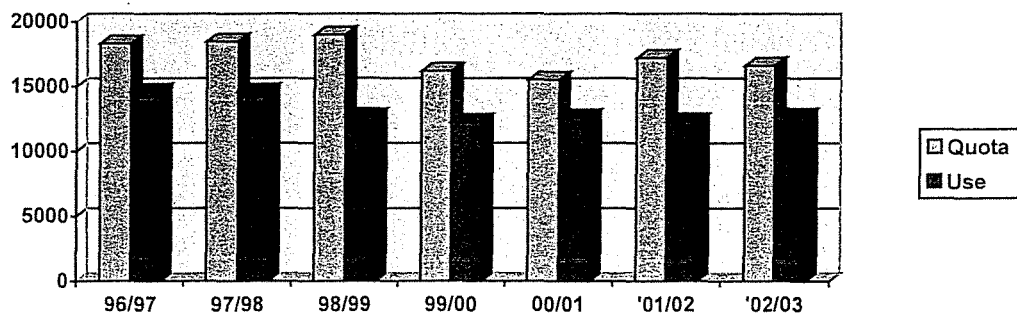
Public Scheme abstraction



Private abstraction



Total abstraction (Assuming 98/99 private use applies for other years)



1.1 Public abstraction

In the Airport subarea, where the Quota for 2002-03 had been agreed between the Water Corporation and the (then) Water and Rivers Commission, and approved by the EPA at 1,550 ML, the actual abstraction was 1,600 ML a breach of the licensed amount by about 3%.

In reporting this breach, the Report claims “This minor excess is not considered to be an issue of concern.”. No evidence is provided to justify that assertion.

The system of setting quotas is scientifically accountable and credible and subject to third-party confirmation. That being the case, the limits should be taken seriously and there should be early warning systems in place for ensuring that they are never breached. The off-hand dismissal of the breach devalues the quota-setting process.

In this particular instance there is further ground for concern. There was a breach of the groundwater level criterion in well JM45 near the public scheme abstraction wells in the Airport subarea. The Report makes no connection between these two events, but they could be related.

It is recommended that the proponent be required to set action levels (slightly below the Quota volumes) for each Scheme abstraction well to trigger closer monitoring and ensure Quotas are not exceeded.

1.2 Private abstraction

The Ministerial conditions do not require that the amount of water abstracted for private use be measured. Rather, the Report is to address the estimated quantity of water abstracted for private use (Condition M-4-2). The Report contains no such estimate. This deficiency must be rectified.

According to the last triennial report “For larger allocations, over 500 ML/year, the licensees are generally required to install water meters and report annually on the water use as a standard condition of holding a water licence”. The proponent has advised (Appendix 3) that there are no such licences in the Jandakot area. It is recommended below that a trial of metering be introduced in the Banjup subarea. The “over 500ML” cut off for requiring metering and reporting as a condition of licence should also be reviewed.

The Report mentions a 1999 survey of private use that indicated actual use was below the licensed allocation (see Figure 1). It appears that the proponent is assuming that this continues to be the case, however, there is no attempt to document or justify that assumption.

It would seem much more likely that private use is related to rainfall, and for this, as well as an indicator of recharge it would be useful for the Report to provide rainfall data for the Jandakot Airport (in addition to providing the required estimate of private use).



It is recommended that the annual and triennial reports should include annual rainfall data for Jandakot Airport.

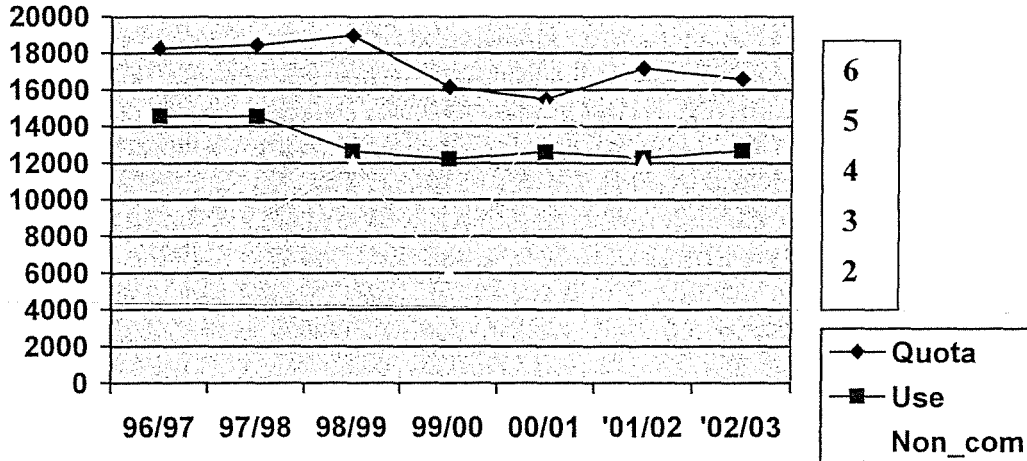
1.3 Management of abstraction

Despite the non-compliance in the Airport subarea the management of abstraction is potentially much more effective for the public scheme than for private users.

Within the licensed allocation of 7,850 ML (33.6% of the total allocation) the quota is determined annually. According to the Report “These annual quotas reflect the environmental and production constraints on the wellfields and take year-to-year fluctuations in water levels into consideration.” Figure 1 shows that since 1999/2000 these annual quotas have been well below the 7,850 ML figure set in 1995/96.

For private users, within the Private use quota of 15,489 ML licences appear to be issued on demand up to the quota. The proponent is committed to refusing licence applications where the resulting allocations would exacerbate criteria breaches, but the Report advises that no such applications were received (and hence none refused). According to the triennial report the private quota was increased in the last triennium in five subareas. Three of these subareas had water level non-compliance problems in 2002/03.

Figure 2 – Abstraction and water-level non-compliance



It appears clear from Figure 2 that the number of non-compliances has been trending up in recent years. Over the same period the total quota has trended down slightly, but, assuming the private use quantity from the 1998/99 survey applied for the other years graphed, the total use has at best remained the same, and may have actually slightly increased over the last four years, while the number of non-compliances trebled.



The management approach for private users adopted by the proponent was to develop a commitment to 18 water resource management initiatives which were put forward in the 2001 Section 46 Stage 1 Report. The Compliance Report provides a progress report on the implementation of these commitments (see Appendix 2 for details).

There has been no action on at least seven of these initiatives, in some cases due to “lack of resources”. The most significant action has been the use of regulations to ban daytime domestic sprinklers and the progress in finalising an improved computer model of the mound to review “sustainable private allocation limits”.

There have been ongoing breaches of the environmental criteria, as noted in the next section. From these ongoing problems of non-compliance it is clear that the present system for managing abstraction (the 18 initiatives and limiting scheme abstraction) has not been effective in responding to changed circumstances so as to maintain the set environmental criteria. Despite this, the Report does not propose any changes, appearing to wait for the new PRAMS model, the completion of the s46 Review and “more resources”.

The Stage 2 section 46 Review is due for completion by late 2004/early 2005. This would mean that any implementation of its management initiatives would be delayed until the 2005/06 summer. Some interim management options need to be identified for the 2004/05 summer.

It is recommended that the proponent develop interim new, more effective management options, to be used in the 2004/05 summer when there is a breach of Preferred Minima, to ensure no subsequent non-compliance.



2. Compliance with the environmental criteria

Ministerial condition M-4-1 requires the preparation of a detailed environmental monitoring plan to monitor at least

- Vegetation;
- Fauna;
- Habitat; and
- Groundwater levels.

Under M-6-1 the environmental monitoring plan is incorporated in the environmental management plan (EMP), and M-6-2 requires that it be implemented to the satisfaction of the EPA. These conditions are supplemented by the proponent's commitments P-1 to develop the monitoring and management plan, and P-27 to P-31 to monitor water levels, vegetation, habitat and fauna.

The EMP establishes specific criteria for the water levels in 10 wetlands and 28 bores. In most cases there is a Preferred Minimum and an Absolute Minimum water level specified, the intent being that only breaches of the Absolute Minimum levels amount to non-compliance. However, for some wetlands there are additional criteria such as "not to dry before the end of January" or "must be above preferred minimum 4 in every 6 years".

The Report advises that there was non-compliance during the reporting year in four wetlands and two bores. Of itself this is a concern. That concern is heightened because this is part of an ongoing pattern of non-compliance that appears to be getting worse.

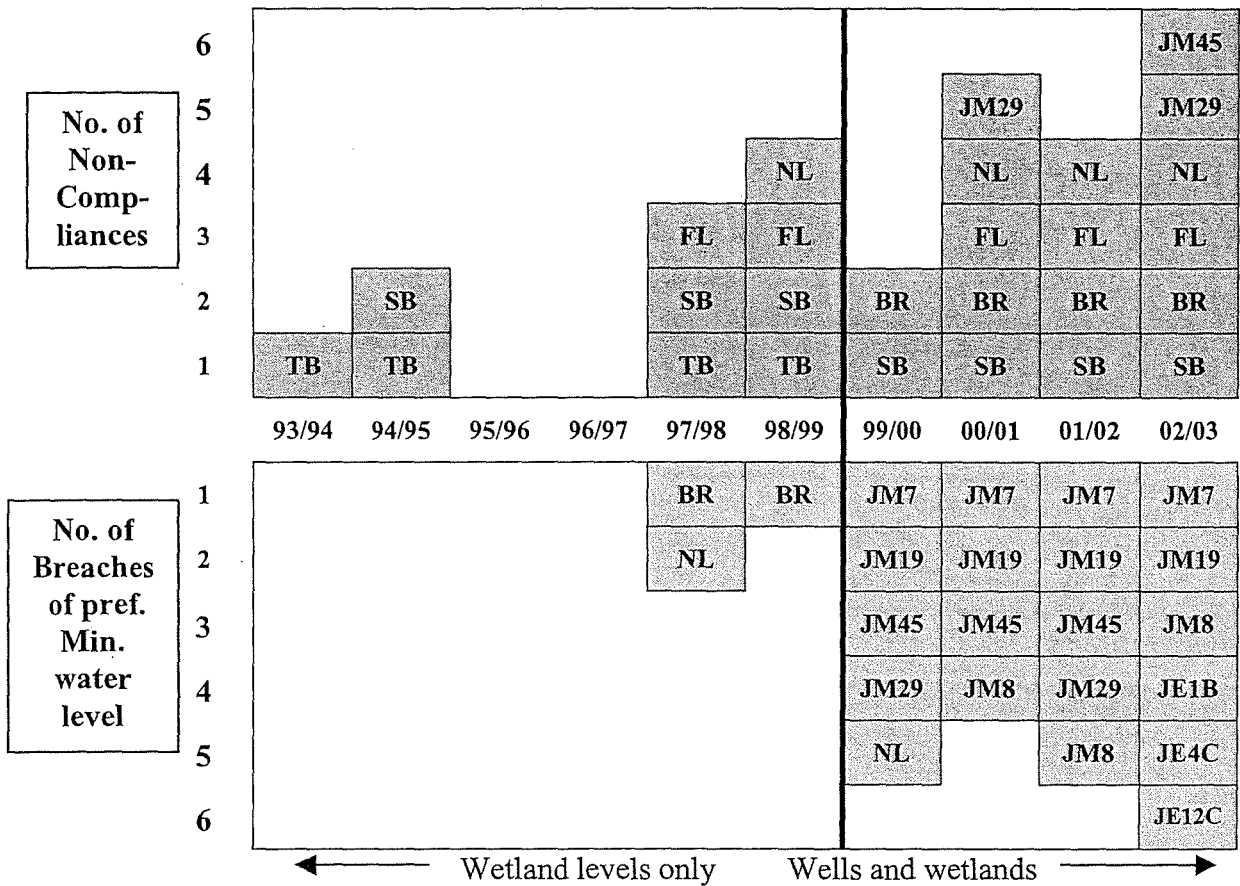
There have been water level breaches in Shirley Balla Swamp every year since 1997/98 (six years), in Forrestdale Lake every year since then except 1999/2000 (five years), and in North Lake in 1998/99, 2000/01, 2001/02 and 2002/03. In Beenyup Road Swamp the Preferred Minimum level has been breached every year since 1997/98, meaning that the '4 years in 6' criterion has been breached for the last four years.

Figure 3 is intended to show this pattern of breaches and non-compliance. In a number of cases it appears that a breach of the Preferred Minimum was an early warning for non-compliance in later years. Figure 3 also clearly shows how the number of instances of non-compliance and breach of Preferred Minimum has increased in recent years.

One likely reason for setting Preferred Minimum water levels was that they should act as triggers for the initiation of management actions to stop the situation developing into one of non-compliance. It is not clear from the Report that this is how they have been used, and Figure 3 suggests that whatever management actions have been taken have not been effective in avoiding non-compliance.



Figure 3. Reported breaches of preferred and absolute minimum water levels



TB = Twin Bartram Swamp, SB = Shirley Balla Swamp, FL = Forrestdale Lake, BR = Beenyup Road Swamp, NL = North Lake.

The Report does not provide any information on the status of habitat or fauna, though there are qualitative assessments of vegetation. There is no reference to quantitative criteria and it appears that the EPM does not define any. The qualitative assessments have been provided by an external consultant, however, it would be preferable if there were more objective criteria for the required status of the environment in terms of vegetation, fauna and habitat.

It is recommended that, as part of the section 46 review, quantitative criteria be developed to specify the required status of vegetation, fauna and habitat.



3. Meeting the environmental conditions and commitments

The purpose of the Compliance Report is to demonstrate publicly that the proponent has complied with the environmental conditions and commitments. The key part of the Report that does this is the Compliance Audit Table, a detailed table listing all the conditions and commitments and briefly stating how they have been complied with.

Appendix 1 presents the proponent's Compliance Audit Table (from Appendix 4 of the Compliance Report), with some comments on the adequacy of the responses and the degree of compliance.

Sometimes the ongoing implementation of a proposal gives rise to additional initiatives, undertakings or commitments that must be reported on. One such matter with this proposal is a series of 18 private abstraction management initiatives. These initiatives were committed to by the proponent in the 2001 Section 46 Stage 1 Report.

Appendix 2 presents the proponent's table reporting on the implementation of these initiatives (from Appendix 5 of the Compliance Report). As noted below, implementation of the elements of the Environmental Management Plan and compliance with the environmental objectives should be similarly reported on.

3.1 Non-compliance on the evidence presented

The audit of the tables identified six instances of non-compliance with the requirements of the relevant condition or commitment², based on the information presented in the Report (see Table 2).

3.1.1 Incomplete Report

Ministerial condition M-4-2 spells out the required content of the compliance report. The Report submitted does not address some of the required elements and so does not comply with M-4-2. The missing elements are

- No estimate of the quantity of water abstracted for private use;
- No reporting against the "environmental objectives"; and
- No review of the effectiveness of the environmental criteria in meeting the environmental objectives.

In addition, this audit has identified that the "proposed changes to management, monitoring or mitigation of wetland impacts" are inadequate.

² Actually the conditions are subdivided into "auditable elements". For example, condition 4 has five auditable elements. Two of these were satisfactory, one had insufficient information and two were non-compliant. M refers to a Ministerial condition, P to a commitment by the proponent and I to one of the 18 management initiatives committed to in the context of the section 46 review, Stage 1.



Table 2 - Instances of non-compliance in the compliance tables

No.	Requirement	Response	Auditor's comment
M4-2	<p>Submit brief annual and more detailed triennial reports addressing, but not limited to the following:</p> <ul style="list-style-type: none"> (1) the quantity of water abstracted for public use and estimated quantity for private use; (2) environmental monitoring results; (3) compliance with the environmental criteria and the commitments; (4) compliance with the environmental objectives; (5) a review of the effectiveness of the criteria in meeting the environmental objectives; and (6) any proposed changes to management, monitoring or mitigation of wetland impacts. <p>To the satisfaction of the Environmental Protection Authority.</p>	Condition met by the preparation of this report to EPA.	<p>This Report does not comply with several of the listed requirements.</p> <ul style="list-style-type: none"> (1) There is no estimate of the quantity for private use (2) OK (3) OK, except for inadequacies listed here. (4) There is no reporting against "environmental objectives". (5) There is no review of the effectiveness of the criteria in meeting the objectives. (6) The Audit Report highlights that the Report is inadequate in its proposals for change to management. <p>Since the Report is to be to the satisfaction of the EPA it is recommended that the EPA require it to be modified to rectify the inadequacies before expressing its "satisfaction" with the Report.</p>
M4-4	Report any breach or anticipated breach of the environmental criteria or environmental objectives to the EPA immediately.	Condition met- refer to Appendix 7.	Appendix 7 shows that breaches and anticipated breaches were reported, but this appears to have occurred annually, not "immediately".



No.	Requirement	Response	Auditor's comment
P35	Advise the EPA immediately upon becoming aware that specific environmental protection criteria might be breached. Details of the actions taken to avoid such a breach of criteria or, in the event of a breach occurring, its consequences, will be reported to the EPA at the earliest feasible date.	Condition met. Similar to Ministerial Condition M-4-4. The Commission advises the EPA annually (eg. Section 46 report) on predicted summer breaches and resource management measures actions taken.	The commitment requires that the EPA be notified "immediately" and "at the earliest feasible date". In fact notification in Appendix 7 of the Report has occurred annually, long after the proponent has become aware of some non-compliances.
I6	Development of a long term communication strategy to provide ongoing advice and education	No new action from last compliance report due to lack of resources. A proposal is still being considered to communicate more information about the Commission, its charter, and what is required and expected of licensees.	Commitment refers to developing the strategy, not implementing it. That would require fewer resources and should have been done.
I11	Enforcement of licence allocations and conditions	No new action although area was recently surveyed for compliance. Survey found that some licensees were under- utilising their water allocation. Besides lack of suitable resources to do so, no action has been taken to recover this unused volume because of the view that to this might provide incentive for over- watering. Also, by not being used, this component of the water allocation is contributing to environmental maintenance. An updated Commission policy on Operating Strategies now provides the option of requiring such strategies in environmentally sensitive areas (ie. not just for large allocations).	There should be compliance monitoring of licensees adjacent to non-compliant wetlands and bores.
I15	Intensive compliance monitoring in targeted areas	See initiative 11.	This does not duplicate 11, it relates to the medium and long term (1-2 years). Since the initiatives were committed to in 2001, there should have been action on this initiative in the reporting year.



Under M-4-2 the Report is to be “to the satisfaction of” the EPA. The omissions are significant and need to be addressed.

It is recommended that the EPA require that the omissions be rectified before expressing itself satisfied with the Report.

3.1.2 Delayed notification of breaches

M-4-4 requires that any breach or anticipated breach of the environmental criteria or environmental objectives is to be reported to the EPA immediately. Commitment P-35 goes a step further, stating that, in addition to this immediate notification, details of action taken to avoid the breach or its consequences will be reported to the EPA “at the earliest feasible date.

The response claims that this has been met by it’s letter to the EPA copied in Appendix 7 of the Report. In fact, this is an annual compilation report of breaches for both Jandakot and Gnangara. This letter, dated 29 July 2003, advises the EPA that Shirley Balla Swamp has been dry since 3 December 2001, and that the minimum levels for Beenyup Road Swamp, Forrestdale Lake and North Lake were breached on 30 April 2003, 25 February 2003 and 15 April 2003, respectively. This is clearly not immediate notification.

Further, the letter provides no details of action taken to avoid the breaches, but advises that the Section 46 2003 Progress Report, due in November 2003 will provide “a summary of the management actions taken”. This does not appear to be reporting to the EPA “at the earliest feasible date”.

It is important that the EPA, which is publicly accountable for auditing compliance with the Ministerial conditions and ensuring the environment is protected, is promptly informed about breaches and management actions taken.

It is recommended that the proponent be required to change its reporting practices to comply with the requirement for immediate notification of anticipated or actual breaches.

If, however, there are genuine problems with complying with the requirement, and the EPA agrees that annual reporting is adequate, a relaxation of the requirement could be considered as part of the section 46 review.

3.1.3 No action on communication strategy

The sixth management initiative is for the development of a long-term communications strategy to provide ongoing advice and education (to private abstracters). The Report advises that there has been “No new action from last compliance report due to lack of resources.”

While the initiative does not specify a time by which the strategy is to be developed it is reasonable to assume that it should occur as soon as reasonably possible. It is one of

a number of “Medium and Long-Term (1-2 years and more)” initiatives, and it is likely that the implementation of the strategy would be a long term activity.

The development of the strategy needs to proceed more quickly if it is to have an impact on private groundwater use. Developing the strategy is not a resource-intensive activity, and it should have been done.

It is recommended that the EPA require that the development of the strategy commence forthwith, to be completed by the end of the current reporting year.

3.1.4 Inadequate enforcement of private abstraction licences

Three of the 18 management initiatives relate to the enforcement of private abstraction licences.

I-5 “Licence compliance surveys and enforcement” is listed as a medium-term “Co-operative Management Initiative. Clearly surveys of compliance could be seen as such, but enforcement is not. There has been no action under this initiative.

The report under I-11 refers to the 1999 survey of private use, describing it as “recent” and highlighting its finding that some licensees were under-utilising their allocation. There is no adequate discussion of the representativeness of the 1999 survey or the currency of its results. Abstraction is likely to be highly seasonal, and the level of awareness of the need to conserve water has changed so there is good reason for repeating the survey in the near future.

It is recommended that the survey of private water use be repeated in the 2004-05 reporting period.

I-11 is an initiative for “Enforcement of licence allocations and conditions”. It is under this initiative that the Report has responded to compliance for all three enforcement-related initiatives. There is no reported enforcement action. Given the ongoing breaches of environmental criteria this is not adequate. Action is recommended under I15, below.

I15 is an initiative for “Intensive compliance monitoring in targeted areas”. Again, no action is reported. Clearly the ongoing non-compliance and near non-compliance with environmental criteria in Shirley Balla Swamp, Beenyup Road Swamp and well JM29 suggests that the Banjup subarea would be an appropriate one to target for such intensive compliance monitoring.

It is recommended that there be intensive compliance monitoring in the Banjup subarea at least during the summer of 2004-05.

The wording of the initiative does not so specify, but would seem to be essential that such monitoring involve metering of use. Given the thrust of I-13 of promoting water use efficiency measures and the specific consideration of metering in the State Water Strategy, it would be opportune for metering to be introduced in the Banjup subarea as a pilot study.



It is recommended that the intensive compliance monitoring in the Banjup area involve metering of licensed water abstraction, and that this act as a pilot study for wider introduction of metering of private use from the Jandakot and Gnangara mounds.

3.2 Incomplete or inadequate responses

The audit of the tables identified 19 responses that were incomplete or inadequate. In at least four cases this meant that it was not possible to determine whether or not the requirement had been complied with.

These deficiencies were administrative rather than substantive. For example, it was not possible to determine whether the process for approving changes to the proposal under M-2 had been followed. The response asserted that it had, but no evidence was offered to support this.

It is recommended that these deficiencies be rectified when the omissions from the Report are being rectified.

This criticism of inadequate responses is not a criticism of the brief reporting format that has been adopted. Indeed, the responses to P-27, P-32 and P-33 show brief responses can be entirely adequate for demonstrating compliance.



4. Significance of the compliance results

Compliance with the Ministerial conditions is a statutory requirement and failure to comply is a Tier 1 offence under the Environmental Protection Act 1986. Consequently, a failure to comply with any of the conditions is a significant matter. However, the purpose of the conditions is to protect the environment. How significant are the identified non-compliances in their effect on the environment?

The Report fails to provide an assessment of compliance with the environmental objectives or a review of the effectiveness of the environmental criteria in meeting the environmental objectives. This makes it exceedingly difficult to assess the effect of the non-compliances on the environment.

In some instances there may be a requirement for the maintenance of a certain water level in a lake or wetland for visual amenity purposes but, in general, the water level criteria that have been set are intended to protect vegetation, habitat and fauna on, in and near the wetlands.

There are no set quantitative criteria for the required minimum status of vegetation. An expert study by Loomes et al (2003), quoted in the Report, has concluded that, so far, there is “no significant risk” of changes to vegetation species, though there has been a decline in condition of some wetland dependant shrub and tree species and an increase in weediness at several wetlands.

The Report made no mention of the status of fauna or habitat, and again there are no set quantitative criteria for the required minimum status. The Triennial Report for 1999-2002 quotes Bamford (2001) finding that there was a decline in water bird breeding that seemed to be related to spring water levels dropping too rapidly. The Triennial Report did not regard this decline as “significant”.

A falling water level could mean that too much water is being taken, and that allocations should be cut back. Abstraction monitoring by the Water Corporation and the 1999 survey of private bore owners have shown that use is below the allocation. Nevertheless there have been significant non-compliances with the minimum water levels.

If abstraction of amounts well below the allocation can lead to non-compliances, it would follow that the method of setting allocations appears to be flawed.



Appendix 1 – Compliance Audit Table - with Auditor's Comments

A. Ministerial Conditions (Ministerial Statement No.196- Environmental conditions Jandakot Groundwater Scheme, Stage 2)

Code	Description	Responsibility	Compliance assessment/ Mitigation actions [Red highlight = non compliance]	Auditor Comments [Blue highlight = Response inadequate]
M-1	In implementing the proposal, the proponent shall fulfil the commitments (which are not inconsistent with the conditions or procedures contained in this statement) made in the Public Environmental Review and included as Appendix 1 in Environmental Protection Authority Bulletin 587.	WRC and Utility	Refer to conditions and commitments below.	OK
M-2	Subject to these conditions, the manner of detailed implementation of the proposal shall conform in substance with that set out in any designs, specifications, plans or other technical material submitted by the proponent to the Environmental Protection Authority with the proposal. Where, in the course of that detailed implementation, the proponent seeks to change those designs, specifications, plans or other technical material in any way that the Minister for the Environment determines on the advice of the Environmental Protection Authority, is not substantial, those changes may be effected.	WRC and Utility	Condition met and ongoing.	There is an ongoing requirement to do something if the occasion arises. The compliance report needs to answer the question "Were any changes sought or approved during the reporting period?"
M-3-1	Prior to 1 December each year, the proponent shall determine anticipated public water supply abstraction limits and shall advise the Environmental Protection Authority of those limits, the period to which the limits apply and details of the actual and anticipated environmental effects of abstraction.	WRC	Abstraction limits have been determined and EPA have been notified.(Section 46 report)	When were the limits determined and when was EPA notified?



Code	Description	Responsibility	Compliance assessment/ Mitigation actions [Red highlight = non compliance]	Auditor Comments [Blue highlight = Response inadequate]
M-3-2	The proponent shall operate within the limits and the period specified in condition 3-1.	WRC (Utility via licence conditions)	Annual abstraction was exceeded in 1 subarea (Airport) by a small volume (50 Megalitres). This is not a reportable breach as it remains below 115% of the approved bore quota.	Given the reported non-compliance in well JM45, more detail is warranted. It may not be "reportable" but surely it is still a breach?
M-3-3	The proponent shall inform the Environmental Protection Authority immediately of any proposed change to the anticipated abstraction limit and period. Changes made after 1 December each year shall be to the satisfaction of the Environmental Protection Authority.	WRC	Condition met- refer to Appendix 3.	Appendix 3 shows that a change was proposed. There is no evidence provided that the EPA was informed (immediately or otherwise) or that it was satisfied with the change.
M-4-1	Prior to commissioning the borefield, the proponent shall prepare a detailed environmental monitoring plan, to the satisfaction of the Minister for the Environment on advice of the Environmental Protection Authority and the Department of Conservation and Land Management. This monitoring plan shall include, but not be limited to monitoring the following: vegetation; fauna; habitat; and groundwater levels.		Cleared (conditional) by the submission of the 1992 EMP.	OK



Code	Description	Responsibility	Compliance assessment/ Mitigation actions [Red highlight = non compliance]	Auditor Comments [Blue highlight = Response inadequate]
M-4-2	The proponent shall submit brief annual and more detailed triennial reports addressing, but not limited to the following: (1) the quantity of water abstracted for public use and estimated quantity for private use; (2) environmental monitoring results; (3) compliance with the environmental criteria and the commitments; (4) compliance with the environmental objectives; (5) a review of the effectiveness of the criteria in meeting the environmental objectives; and (6) any proposed changes to management, monitoring or mitigation of wetland impacts. to the satisfaction of the Environmental Protection Authority.	WRC	Condition met by the preparation of this report to EPA.	This Report does not comply with several of the listed requirements. (7) There is no estimate of the quantity for private use (8) OK (9) OK, except for inadequacies listed here. (10) There is no reporting against “environmental objectives”. (11) There is no review of the effectiveness of the criteria in meeting the objectives. (12) The Audit Report highlights that the Report is inadequate in its proposals for change to management. Since the Report is to be to the satisfaction of the EPA it is recommended that the EPA require it to be modified to rectify the inadequacies before expressing its “satisfaction” with the Report.
M-4-3	The proponent shall submit the reports required by condition 4-2 to the Environmental Protection Authority and shall make them publicly available. The annual reports shall be submitted by 1 December and the triennial reports by 1 March, following commencement of the operation of the scheme.	WRC	Reports are publicly available from the Commissions library and copies sent to key stakeholders (eg Water Corporation). Extension to submission of Annual report from 1 December to 30 January was given by the EPA (Attachment 6)	OK Report should also be made available on internet.
M-4-4	The proponent shall report any breach or anticipated breach of the environmental criteria or environmental objectives to the Environmental Protection Authority immediately.	WRC	Condition met- refer to Appendix 7.	Appendix 7 shows that breaches and anticipated breaches were reported, but this appears to have occurred annually, not “immediately”.
M-4-5	If impacts are detected which are deemed to be unacceptable by the Environmental Protection Authority, the proponent shall modify subarea water allocations and abstraction strategies for the Jandakot Public Water Supply Area to the satisfaction of the Environmental Protection Authority.	WRC	A precautionary management approach is taken where groundwater level forecasts are made monthly to determine potential breaches and pre-emptive action is taken.	A precautionary management approach is to be expected. The question to be answered is “What action has been taken in this reporting period?”.



Code	Description	Responsibility	Compliance assessment/ Mitigation actions [Red highlight = non compliance]	Auditor Comments [Blue highlight = Response inadequate]
M-5-1	<p>Prior to commissioning the borefield, the proponent shall prepare a plan to mitigate losses of wetland area and wetland function that are likely to occur as a consequence of the development and operation of the borefield, based initially on the anticipated impacts associated with the likely future landuse/abstraction scenario for the area, to the satisfaction of the Minister for the Environment on advice of the Environmental Protection Authority. This plan shall include but not necessarily be limited to:</p> <p>(1) a description of the processes used for identifying the likely wetland impacts;</p> <p>(2) the identification of individual wetlands that will be affected, quantification of the likely changes in water level expected to occur, and the likely impacts of these changes on the areas and functions of the wetlands;</p> <p>(3) identification of wetlands that are likely to be dry on December 1 each year as a result of abstraction (i.e. the area of free water is less than 1 000 square metres or less than 20 percent of the wetland area);</p> <p>(4) the existing importance of the areas that will be affected (e.g. rare and endangered flora and fauna present, number of breeding waterbird species);</p> <p>(5) a strategy to mitigate losses of wetland area and functions, including details of compensatory action. This should include details of the strategy to mitigate against impacts on Twin Bartram and Solomon Road Swamps, using all reasonable and practicable means;</p> <p>(6) a commitment to modify the plan to the satisfaction of the Environmental Protection Authority, based on the results of future environmental impact monitoring; and</p> <p>(7) a commitment to modify the plan to the satisfaction of the Environmental Protection Authority, if impacts are detected which are deemed to be unacceptable by the Environmental Protection Authority.</p>	WRC – partial delegation to Utility via allocation licence.	Commitment met by the submission of the 1992 EMP.	The requirements of items (6) and (7) are ongoing. It is likely that the mitigation plan's ongoing implementation has been absorbed into the EMP. If so, this response should direct the reader to where the relevant part of the EMP's implementation has been reported (see comment on M-6-2 below).



Code	Description	Responsibility	Compliance assessment/ Mitigation actions [Red highlight = non compliance]	Auditor Comments [Blue highlight = Response inadequate]
M-5-2	The plan required by condition 5-1 shall be made available for public comment.	Cleared	Condition met - public comments were invited on the EMP.	OK
M-5-3	Subsequent to conditions 5-1 and 5-2, the proponent shall commence implementation of the approved wetland management plan within two years of commissioning the borefield, to the satisfaction of the Environmental Protection Authority	WRC	Ongoing commitment. This report details the implementation for the current review period.	Response inadequate. See comment on M-6-2 below.
M-6-1	Prior to the commissioning of the borefield, the proponent shall prepare a comprehensive environmental management program to the satisfaction of the Minister for the Environment on advice of the Environmental Protection Authority. This program shall reflect the anticipated future landuse/abstraction scenario for the area and shall include, but not necessarily be limited to: (1) an environmental monitoring plan as required by condition 4; and (2) a wetland management plan as required by condition 5.	Cleared (conditional) in EMP	Commitment met by submission of the EMP.	OK Should read "Condition met...".
M-6-2	The proponent shall implement the comprehensive environmental management program required by condition 6-1, to the satisfaction of the Environmental Protection Authority.	WRC (with delegation to the Utility).	Ongoing commitment. This report details the implementation for the current review period.	The EMP has many elements and commitments. A separate table reporting on implementation of the EMP is needed for effective, transparent auditing.
M-7-1	At least six months prior to decommissioning the borefield, the proponent shall prepare a decommissioning and rehabilitation plan, to the satisfaction of the Environmental Protection Authority.	Utility	Not relevant at this time.	OK



Code	Description	Responsibility	Compliance assessment/ Mitigation actions [Red highlight = non compliance]	Auditor Comments [Blue highlight = Response inadequate]
M-7-2	The proponent shall implement the decommissioning and rehabilitation plan required by condition 7-1, to the satisfaction of the Environmental Protection Authority.	Utility	Not relevant at this time.	OK
M-8	No transfer of ownership, control or management of the project which would give rise to a need for the replacement of the proponent shall take place until the Minister for the Environment has advised the proponent that approval has been given for the nomination of a replacement proponent. Any request for the exercise of that power of the Minister shall be accompanied by a copy of this statement endorsed with an undertaking by the proposed replacement proponent to carry out the project in accordance with the conditions and procedures set out in the statement.	WRC/Utility. See Reallocation Schedule for amended conditions	Was undertaken with split of Water Authority.	WRC as the current nominated proponent is still required to comply with this condition. Presumably "No action in this reporting period." Is the appropriate response. It may be that with the recent insertion of s38(6a) of the EP Act this condition is no longer needed. That matter should be addressed in the section 46 Review.
M-9	If the proponent has not substantially commenced the project within five years of the date of this statement, then the approval to implement the proposal as granted in this statement shall lapse and be void. The Minister for the Environment shall determine any question as to whether the project has been substantially commenced. Any application to extend the period of five years referred to in this condition shall be made before the expiration of that period, to the Minister for the Environment by way of a request for a change in the condition under Section 46 of the Environmental Protection Act. (On expiration of the five year period, further consideration of the proposal can only occur following a new referral to the Environmental Protection Authority.)	WRC/Utility	Not relevant. Proposal has been implemented	OK



B. Proponent Commitments

Code	Description	Responsibility	Compliance assessm't/Mitigation actions [Red highlight = non compliance]	Auditor Comments [Blue highlight = Response deficient]
P-1	To prepare a Management and Monitoring Program, satisfactory to the EPA, prior to commissioning of the Stage 2 Scheme.	WRC	Commitment met by submission of the EMP.	OK
P-2	To ensure that groundwater abstraction satisfies the environmental criteria presented in this PER. To mitigate impacts associated with construction of the Stage 2 Scheme by the Water Authority.	WRC (delegation to Utility via allocation licence)	Refer Table 1. Environmental criteria have been breached on several occasions. Mitigation action includes promoting general public awareness of need to reduce water consumption during drought. Water use efficiency initiatives including WaterWise on the Farm, metering, and development of water conservation plans as part of licensing, are expected to improve water resource management in sensitive areas over time. Environmental criteria are currently being reviewed under S.46 of the EP Act.	The commitment refers to mitigation of construction impacts, and has presumably now been met. The mitigation reported relates to other commitments.
P-3	Clearing of vegetation at bore sites will be restricted to the area of the enclosure (approximately 25 metres square) in non-urban areas, and the immediate area of the bore head in the case of bores located in public open space in urban areas.	Utility (completed)	Not relevant. Proposal has been implemented.	There will be an ongoing requirement to maintain the cleared areas, and under the EP Act, as recently amended, this would be "clearing", and may require a clearing permit.
P-4	Where practical, the collector main will be located within existing road reserves.	Utility (completed)	Not relevant. Proposal has been implemented.	OK
P-5	On Crown Land, top-soil from the collector main trench will be separately stripped, stock-piled and re-spread on completion of pipe laying.	Utility (completed)	Not relevant. Proposal has been implemented.	OK
P-6	On private land, the collector main route will be left in a state agreed to by the land owner/occupier.	Utility (completed)	Not relevant. Proposal has been implemented.	OK



Code	Description	Responsibility	Compliance assessment/Mitigation actions [Red highlight = non compliance]	Auditor Comments [Blue highlight = Response deficient]
P-7	Where feasible, bore site compounds will be used for the storage of materials and for contractors' facilities, in preference to the establishment of separate short-term sites.		Not relevant. Proposal has been implemented.	OK
P-8	Where temporary construction sites are established, the area will be returned either to its original state, in the case of Crown Land, or to a state agreed to by the land owner/occupier.	Utility (completed)	Not relevant. Proposal has been implemented.	OK
P-9	All work on extensions to and modifications of the Jandakot Treatment Plant will be undertaken on existing cleared areas within the boundary of the Plant site, and	Utility (completed)	Not relevant. Proposal has been implemented.	This is an ongoing commitment for which the Utility continues to be responsible.
P-10	All workers involved in project construction in natural areas will be instructed on environmental protection procedures before work proceeds.	Utility (completed)	Not relevant. Proposal has been implemented.	OK



Code	Description	Responsibility	Compliance assessm't/Mitigation actions [Red highlight = non compliance]	Auditor Comments [Blue highlight = Response deficient]
P-11	<p>In the event that monitoring indicates that there will be significant impacts of a nature not predicted in this evaluation or a breach of the specified criteria, then the Water Authority must undertake one or more of the following:</p> <p>(1) demonstrate to the satisfaction of the EPA that the breach of criterion is not a result of groundwater abstraction; or</p> <p>(2) satisfy the EPA that the breach of criterion is transient and not of permanent significance; or</p> <p>(3) take the relevant action as specified in Section 7 of the EPA Bulletin:</p> <p style="padding-left: 20px;">(a) modify pumping from any bore where such changes can have a measurable effect (say raise water levels 1 centimetre or more), except in extenuating circumstances such as where significant economic hardship would occur, or CALM declare that the low water levels would be beneficial</p> <p style="padding-left: 20px;">(b) in the case of a wetland, artificially maintain the "action minima" water level (see Table 7.5); and</p> <p style="padding-left: 20px;">(c) implement a short-term detailed monitoring program to establish the condition of agreed species in the affected area.</p>	WRC	<p>Wellfield abstraction has been modified to limit environmental impact. Besides water use efficiency initiatives underway, further urbanisation of some areas will reduce abstraction over time and possibly raise water levels in some wetlands.</p> <p>DEP will be advised immediately if results of ongoing biological monitoring indicate that adverse impacts have occurred.</p> <p>Section 46 Review is currently being undertaken with respect to this.</p>	<p>Given the ongoing breaches, the modification of abstraction has not been sufficient. It is not possible to justify present non-compliance by referring to future urbanization that may or may not occur and over which the proponent has no control.</p>
P-12	To modify the chlorine withdrawal system to a liquid process prior to commissioning of the Stage 2 line of bores.	Utility	Not relevant. Proposal has been implemented.	OK
	To operate the treatment plant with established buffer zones.	Utility	Not relevant. Proposal has been implemented.	This is an ongoing commitment for which the Utility continues to be responsible.



Code	Description	Responsibility	Compliance assessm't/Mitigation actions [Red highlight = non compliance]	Auditor Comments [Blue highlight = Response deficient]
P-13	The personal risk hazard of fatality associated with chlorine release is less than one in a million in any year; and	Utility	Responsibility of Water Corporation.	OK
P-14	Hydrogen sulphide levels attributable to plant operation will be below noticeable levels of 5 parts per billion	Utility	Responsibility of Water Corporation.	OK
P-15	Regularly reviewing the bulk allocations for private abstraction, as part of the total water abstraction allocation for the Jandakot PWSA, with regard to the sustainable yield of the superficial aquifer, including consideration of the environmental impacts of that abstraction.	WRC	Water use survey conducted in 1999 which indicated that total water use was below licensed allocations in all subareas. Recommendations of survey are being progressively implemented. Application of the PRAMS model will assist in assessment of environmental impact and sustainable yield for the Jandakot Mound.	The commitment refers to “allocations” not “use”. It asks the question “are the allocations sustainable?” – a relevant question given the non-compliances. It would seem fair for the same criteria to apply in the determination of public and private allocations, and in the issuing of quotas or licences within those allocations.
P-16	Restricting the issuing of licences for private water abstraction to the limits set by the bulk allocations for both the Jandakot PWSA in its entirety and the licensing subareas.	WRC	Commitment met.	Table 3
P-17	Investigating and implementing efficient mechanisms for groundwater allocation.	WRC	Being addressed in ongoing Statewide planning and policy development and initiatives recommended in State Water Strategy (eg. metering of use).	Given the non-compliance problems in Jandakot and Gnangara implementation of this Strategy may need to be fast-tracked.
P-18	Conduct pump tests on Stage 2 bores and liaise with nearby private users of groundwater prior to commissioning to assess the impact of Stage 2 bores on private bores.	Completed	Commitment met.	OK
	To protect the groundwater resource by active participation in:			



Code	Description	Responsibility	Compliance assessm't/Mitigation actions [Red highlight = non compliance]	Auditor Comments [Blue highlight = Response deficient]
P-19	The development of Environmental Protection Policies to protect groundwater.	WRC/Utility	Commitment met. Groundwater EPP developed in 1998.	Ongoing. There will be other EPPs relevant to the protection of groundwater.
P-20	The review of Regional Plans proposed by the Department of Planning and Infrastructure, Local Government Town Planning Schemes, and re-zoning and development applications.	WRC	Commitment met. WRC continues to provide advice to Department of Planning and Infrastructure on planning and development proposals affecting the Jandakot Mound.	If feasible, the number of occasions on which advice was given in the reporting period should be given.
P-21	Review of development submissions to EPA.	WRC	WRC provides advice on development proposals to the EPA upon request.	If feasible, the number of occasions on which advice was given in the reporting period should be given.
P-22	To work with the Department of Planning and Infrastructure to prepare an integrated Landuse and Water Management Strategy for the Jandakot Mound.	Cleared	Condition cleared.	OK
P-23	To actively pursue programs in both supply and demand management. This includes ongoing public information programs and, where appropriate, regulation for design changes and regular reviews of pricing to conserve water. Improvements in the Authority's supply system will also be pursued.	WRC/Utility	Commitment met and part of WRC ongoing business.	Need to outline how the commitment was met during the reporting period.
P-24	To actively participate in integrated management of the Jandakot catchment.	WRC/Utility	Commitment ongoing.	Need to outline how the commitment was met during the reporting period.
P-25	To review the management criteria and strategies, with the agreement of the EPA, as knowledge of the Jandakot environment and its interaction with groundwater improves.	WRC	The Section 46 Review is currently being undertaken in this regard. Evaluation of the interaction between climate, abstraction and water levels is continuing and a study to determine interaction between the Leederville and superficial aquifer has commenced.	OK
P-27	To monitor water levels in groundwater monitoring bores and North, Bibra, Yangebup, Kogolup, Thomsons, Forrestdale Lakes. The Spectacles and Twin Bartram Swamp as well as some other small wetlands.	Utility	Commitment met (Table 5) and ongoing.	Good. Brief, but sufficient.



Code	Description	Responsibility	Compliance assessment/Mitigation actions [Red highlight = non compliance]	Auditor Comments [Blue highlight = Response deficient]
P-28	To monitor vegetation transects on a triennial basis to establish significant changes in the condition, floristics or structure of vegetation communities.	WRC	Detailed in triennial reports.	OK
P-29	To continue to fund the research projects 10.6.3 listed in Appendix 2 of the EPA Bulletin for the duration of the studies.	Cleared	Condition cleared.	OK
P-30	To use aerial photographs on a triennial basis to detect habitat shifts in North, Bibra, Yangebup, Kogolup, Thomsons and Forrestdale Lakes.	WRC	Detailed in triennial reports.	OK
P-31	To develop a fauna monitoring program, prior to the commissioning of the Stage 2 Scheme, which will focus on: - waterbird species diversity and breeding success, and - number of families of aquatic invertebrate and at infrequent intervals, species richness.	WRC	Commitment met. Program implemented.	OK
P-32	To hold meetings at least annually with a Jandakot Consultative Committee which will be established in consultation with the EPA. This Committee will be informed on the scheme's operation and will provide feed-back to the Water Authority.	WRC	Commitment met. Meetings held with the Jandakot Water Management Community Consultative Committee in December 2002 and September 2003. Meeting held with the Beeliar Community Group in April 2003.	Good. Brief, but sufficient.
P-33	To continue to monitor community response as reported by the media and maintain the current practice of public accessibility of Water Authority officers. Upon request and adequate notice, officers will address community groups on issues associated with groundwater management.	WRC	Commitment met. Commission addressed various community groups including the Jandakot Water Management Community Consultative Committee and Beeliar Community Group.	Good. Brief, but sufficient.



Code	Description	Responsibility	Compliance assessm't/Mitigation actions [Red highlight = non compliance]	Auditor Comments [Blue highlight = Response deficient]
P-34	<p>After the commissioning of the Stage 2 Scheme, written reports to the EPA will consist of:</p> <p>(1) annual reports addressing compliance with the environmental protection criteria, and</p> <p>(2) triennial reports including, in addition to a review of compliance with the criteria, an evaluation of the effectiveness of the criteria in meeting the environmental protection objectives.</p>	WRC	Commitment met with this report.	OK
P-35	To advise the EPA immediately upon becoming aware that specific environmental protection criteria might be breached. Details of the actions taken to avoid such a breach of criteria or, in the event of a breach occurring, its consequences, will be reported to the EPA at the earliest feasible date.	WRC	Condition met. Similar to Ministerial Condition M-4-4. The Commission advises the EPA annually (eg. Section 46 report) on predicted summer breaches and resource management measures actions taken.	The commitment requires that the EPA be notified "immediately" and "at the earliest feasible date". In fact notification in Appendix 7 of the Report has occurred annually, long after the proponent has become aware of some non-compliances.
P-36	Undertake a study of Banganup Lake, in conjunction with CALM and the University of WA to establish management criteria and consider the effectiveness of artificial maintenance of water levels.	WRC/Utility	Cleared in 1993 triennial report.	OK
P-37	Undertake a study of Twin Bartram Swamp to consider the feasibility and effectiveness of artificial maintenance of water levels.	WRC/Utility	Cleared in 1993 triennial report.	OK



Appendix 2 – Progress on the 18 Private Abstraction Management Initiatives - with Auditor's Comments

CO-OPERATIVE MANAGEMENT INITIATIVES SHORT TERM (to June 2002)

Initiative	Action taken	Auditor's Comments
1. Direct mail letters and information to users requesting voluntary reductions in use	No action. Mail- out had been done during previous summer. Community was well aware of need to conserve water with the worsening drought.	Community may be aware, but repetition underlines the seriousness of the situation. Did EPA approve this change?
2. Property visits	Property visits were done as required with new and renewed licences. Previous year properties in close proximity to sensitive areas were surveyed to ensure that they complied with their licence conditions.	If feasible, the number of property visits in the reporting period should be given. Presumably results of survey already reported?
3. Work in partnership with LGAs to raise awareness of environmental constraints and modify landuse practices linked to private abstraction	Issues related to raising awareness of environmental constraints and modifying private groundwater use were discussed at the Jandakot Community Consultative Committee meeting in December 2002. Committee members include City of Armadale, City of Kwinana and City of Cockburn. The Commission is currently working with LGAs Statewide in response to the requirement of all Government agencies with licensed groundwater allocations to comply with daytime sprinkler bans.	OK
4. Work in partnership with the Irrigation Association of Australia and growers to reduce water use through provision of expert advice on water use efficiency.	The Commission is represented on the Executive Committee of the Irrigation Association of Australia, WA Branch. The Commission also has contributed funding to support the salary of the IAA's Industry Development Officer. This officer has provided a front- line contact with irrigators providing technical advice on water use efficiency (or referring them to an appropriate expert) and informing them of their responsibilities in regards Commission policy and regulations.	OK



**CO-OPERATIVE MANAGEMENT INITIATIVES
 MEDIUM and LONG- TERM (1-2 years and more)**

Initiative	Action taken	Auditor's Comments
5. Licence compliance surveys and enforcement	Refer to initiative 11 which also covers the intent of this initiative.	This is not a "Co-operative Management Initiative", it is "Structural".
6. Development of a long term communication strategy to provide ongoing advice and education	No new action from last compliance report due to lack of resources. A proposal is still being considered to communicate more information about the Commission, its charter, and what is required and expected of licensees.	Commitment refers to developing the strategy, not implementing it. That would require fewer resources and should have been done.
7. Industry group liaison	Meetings have been held with a range of industry and government groups at a variety of levels. This includes liaison with such groups as the Turf and Landscape Industry Association, Parks and Leisure Australia, WA Local Government Association, Irrigation Association of Australia, and the International Council for Local Environmental Initiatives. particularly in relation to development of the State Water Strategy and draft Water Conservation Strategy. Initiatives proposed in the State Water Strategy (eg. State Irrigation Review), will further strengthen liaison with industry groups.	OK
8. Investigate opportunities to modify local drainage design to minimise impact upon water table (Jandakot only)	Low levels in Thomsons Lake in November 2002 impacted on health of bird populations. Consideration was given to divert drainage water into Lake Thomson this winter but the Department of Conservation and Land Management, Water Corporation and Water and Rivers Commission decided against such action because water levels were higher (25cm) than last year and because water quality of water leaving Bartram Road buffer lake was unsuitable for release into wetlands. Currently, the drainage infrastructure is designed to allow only flood peaks to be diverted to Thomsons Lake. It is possible, however, with minor modification, to be able to divert non-flood peaks flows. The Water Corporation has committed to implementing the modification, if and when needed. agreed that Consultants appointed to prepare a water management strategy for the area subject to the Draft Jandakot Structure Plan	OK



STRUCTURAL MANAGEMENT INITIATIVES
SHORT TERM (to June 2002)

Initiative	Action taken	Auditor's Comments
9. Refusing applications for allocations in under-allocated subareas where analysis shows resulting allocations will exacerbate criteria breaches	No license applications were received that indicated granting allocations would exacerbate criteria breaches.	OK, though given ongoing breaches analysis should be re-examined.
10. Daytime sprinkler bans on domestic wells	Regulations remain in- force that ban the use of domestic wells (and scheme supply) for irrigation during prescribed hours. Currently garden sprinklers can not be used between 9:00 am and 6:00 pm.	OK
11. Enforcement of licence allocations and conditions	No new action although area was recently surveyed for compliance. Survey found that some licensees were under- utilising their water allocation. Besides lack of suitable resources to do so, no action has been taken to recover this unused volume because of the view that to this might provide incentive for over- watering. Also, by not being used, this component of the water allocation is contributing to environmental maintenance. An updated Commission policy on Operating Strategies now provides the option of requiring such strategies in environmentally sensitive areas (ie. not just for large allocations).	There should be compliance monitoring of licensees adjacent to non-compliant wetlands and bores.



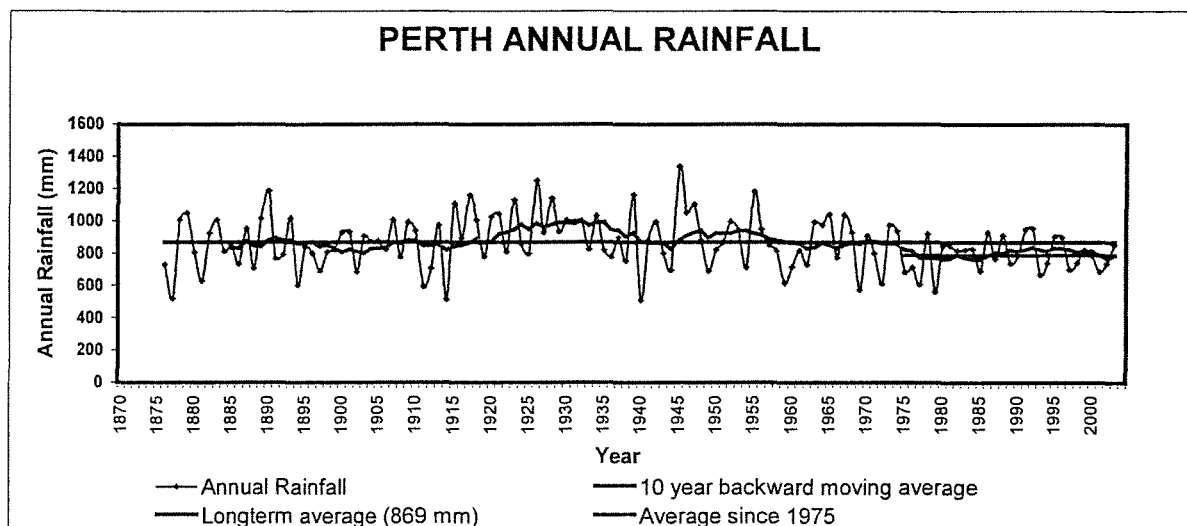
**STRUCTURAL MANAGEMENT INITIATIVES
 MEDIUM and LONG- TERM (1-2 years and more)**

Initiative	Action taken	Auditor's Comments
12. Directions to reduce use by imposing restrictions, applying capacity sharing and recognising relative beneficial use of water resource.	No new action. The Commission is still considering the viability of capacity sharing options. It is anticipated that initiatives proposed in the WA State Water Strategy (eg. Statewide Irrigation Review) will have input to issues such as capacity sharing and beneficial use of water resources.	What action on imposing restrictions?
13. Promoting and implementing water use efficiency measures through licence conditions in cooperation with AgWA	No new action. However, the Commission is currently reviewing the composition of existing license conditions, metering, and implementation of water conservation plans (State Water Strategy). These activities are expected to contribute to the implementation of water efficiency measures as part of licence condition.	A pilot study of metering in the Banjup subarea could be considered.
14. Model and review sustainable private allocation limits and reduce where required.	The PRAMS model has reached final development stage and application to the review of sustainable private allocation limits will progress in 2004.	OK
15. Intensive compliance monitoring in targeted areas	See initiative 11.	This does not duplicate 11, it relates to the medium and long term.
16. Intensive Management zones (wetlands)	No new action. This option is yet to be considered in any detail.	Should be given priority around non-compliant wetlands.
17. Land use zonings to limit water use (Planning Control Areas)	No new action. This option is yet to be considered in any detail.	OK
18. State Planning mechanisms (EPPs, SPPs)	State Planning Policies (i.e. The Peel-Harvey Coastal Plain Catchment, Jandakot Groundwater Protection Policy and the Draft SPP Public Drinking Water Source Policy) set out planning controls which may prohibit certain polluting landuses within the Jandakot Mound area. The policies ensure that landuse changes likely to cause environmental damage are referred to Local or/and State Government for approval. The benefit of this is that as well as restricting polluting landuses, it may also restrict large water users (ie turf farms, market gardens, nurseries, intensive agriculture, etc.). The policies are also guiding tools to also look at landuses which may impact on recharge of the aquifer and the quantity of water for abstraction.	OK, but such controls are only as good as their enforcement, which may be adequate for planning purposes but not for water conservation purposes. That is why effective action under initiatives 11 and 15 is needed.



Appendix 3 – Questions, Proponent’s Responses and Auditor’s Comments

1. What was rainfall for the years 1993/4 to 2002/03? How typical was the private use survey year, 98/99?



Perth Region- Annual Rainfall (mm)

Time	Perth Airport 009021	Jandakot 009172	Wanneroo 009105
1973	914.6	1013	887.3
1974	875.8		
1975	692.4	713.5	
1976	722		551.7
1977	615.1		498.2
1978	822.9	895.3	884
1979	569	620.2	679.2
1980	700.1	937.2	765.7
1981	791.4	1010.8	772.4
1982	664.8	875.6	790.2
1983	720.6	943.3	718.6
1984	748.2	1004.6	759.6
1985	620.2	917.3	620.6
1986	901	1148.1	868.4
1987	743.4		730.4
1988	914.4	1126.9	750.3
1989	674	790	708.5
1990	704.8	725.2	701.4
1991	903.8	962.1	956.7
1992	960		877.4
1993	666		767
1994	609		
1995	793.2		
1996	889.2	918.2	
1997	653	656.6	
1998	684.2	758.2	763.4
1999	793	954	859.4
2000	707	984.4	789.9
2001	623		718
2002	648.2	758	640.5
AVERAGE	744.1433333	891.0714286	752.45

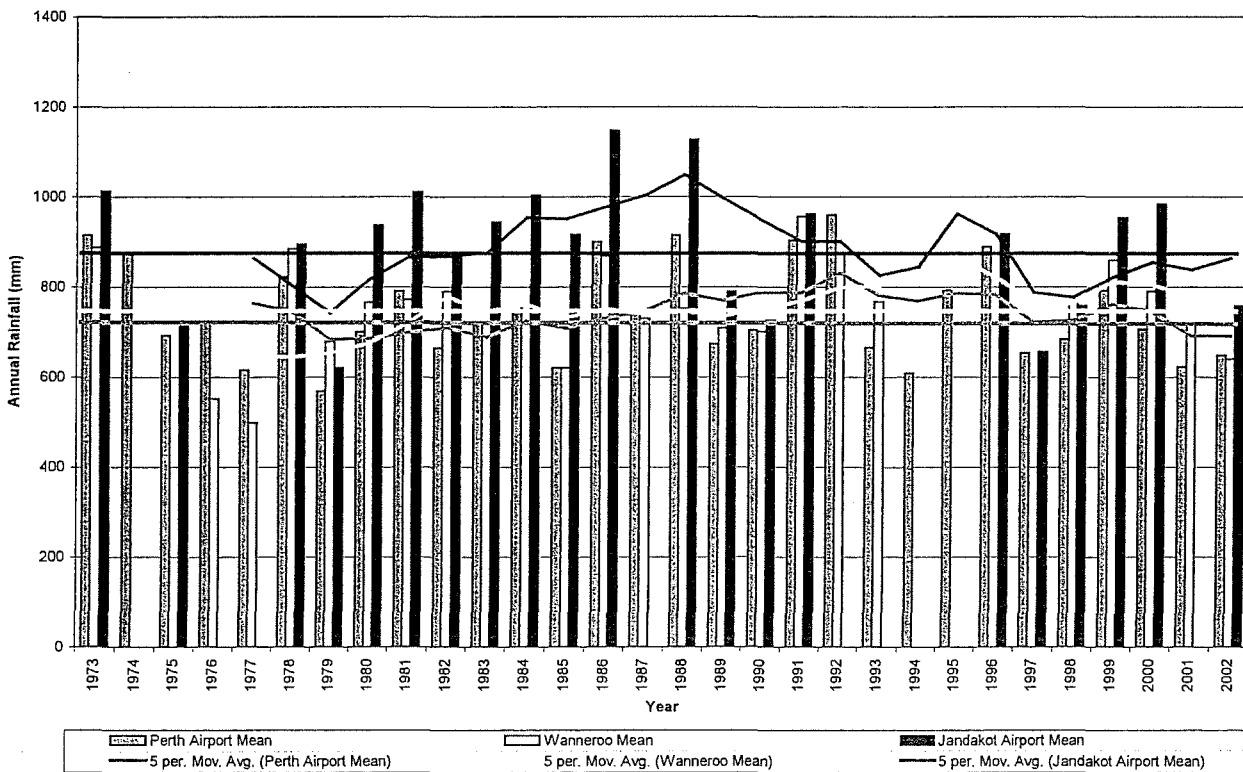


Auditor's comments

The long term rainfall data for Perth indicates that rainfall since 1975 has been considerably below the long-term average.

The data provided for Jandakot are incomplete, but it appears that (calendar) 1997 and 1998 were well below average rainfall ears while 1999 was well above average. What this means for the representativeness of the 1998/99 survey of private use is not clear. This underlines the need to repeat the survey, as recommended.

HISTORICAL ANNUAL RAINFALL FOR PERTH WANNEROO AND JANDAKOT
 Rainfall - Perth Airport (009021) Jandakot (009172) Wanneroo (009105)



2. What is the minimum threshold for a licence for industrial and other non-irrigation private uses?

Proponent's response

All industrial and irrigation use of water requires a licence. Historically all domestic stock use was also licensed, however this is no longer the practice. Unlicensed stock and domestic requirements are not included in usage statistics but are taken into consideration when establishing allocation limits and setting EWR's.

Auditor's comments

To evaluate the significance of the non-licensing of domestic and stock abstractions it is necessary to have some idea of the proportion of total abstractions that they represent. They are "taken into account" in setting allocation limits but it is not clear whether they are part of the "Private Use Quota", part of the environmental water requirement or some additional amount. The accounting system needs to be more transparent and clearly stated.

3. Did the survey estimate the use by those below the threshold?

Proponent's response

The groundwater use survey took in account existing licences and identified other water use, not currently licensed, that would require licensing. While all properties were inspected unlicensed domestic and stock watering was not considered in the survey results.

Auditor's comments

When the survey of private use is repeated, all private abstraction, including stock and domestic uses, should be surveyed, so there is a clear picture of total use, albeit at a single point in time.

4. Why is the abstraction from the Leederville aquifer reported in Triennial Report but not in the annual?

Proponent's response

Historically abstraction from the Leederville aquifer was never reported but it has since come to light that in certain areas of the Perth Region there may be some interaction between the Leederville and the superficial aquifers. Hence Leederville abstraction was reported in the previously triennial report.

Our latest understanding is that there is no hydrological connection between these two aquifers. As Leederville abstraction would have no impact on the Environmental Water Provisions no data was included.



The abstraction data could be made available if required.

Auditor's comments

The EPA needs to determine to its satisfaction whether or not there is a hydrogeological connection between the superficial aquifer and the Leederville aquifer that is of relevance to the environmental management of the Jandakot Mound, and whether or not abstraction from the Leederville aquifer should be reported.

5. What subareas relate to Stage 1 and Stage 2 of the Jandakot Scheme (i.e. NOT Stage 1 and 2 of the s46)?

Proponent's response

The subareas listed in the 2002-03 annual report relate to those that exist in the Jandakot Groundwater Area and hence relate to those contained in Stage 1 & 2. See table.

Jandakot GWA		
Subarea	Water Corporation Bore No	Stage
Forrestdale	J10	<i>Stage 1</i>
Banjiup	J20, J30, J40, J50, J60, J70, J45	<i>Stage 1</i>
Canning Vale	J90, J110, J120, J105	<i>Stage 1</i>
Airport	J130, J140, J150	<i>Stage 1</i>
	J320, J380, J390, J400, J410	<i>Stage 2</i>
Success	J210, J220, J230, J240, J250, J270, J360, J370	<i>Stage 2</i>

Auditor's comments

The Triennial Report reported Scheme abstraction in terms of Superficial aquifer Stage 1, Superficial aquifer Stage 2 and Leederville aquifer, but Private abstraction by subarea. The present Report takes the preferred approach of reporting both by subarea so the total abstraction from a subarea can be calculated and related to water-level changes in that subarea.

6. How does the Transferable Water Rights system provide for environmental water requirements?

Proponent's response

The Water and Rivers Commission 's Statewide Policy No 6 Transferable (Tradeable) Water Entitlements for WA makes provision for environmental impacts. Where significant environmental impacts are considered likely to occur as part of a trade, the Commission will either refuse the application or refer the matter to the



EPA for a separate assessment. A trade is not to result in unacceptable impacts, ecological or social.

In theory, if water had to be reduced near a environmentally sensitive wetland, the licensee could trade this water to someone else in a fully allocated subarea where this detrimental impact would not exist.

Allocation limits are set taking into consideration EWR and trading of water entitlements would not be allowed if the impacts were considered to be unacceptable. Any such refusal would be subject to the appeal and compensation provisions of the Rights in Water and Irrigation Act.

Auditor's comments

It is not clear that decisions about whether impacts are unacceptable are completely separate from any consideration of whether the resources are available to pay the required compensation.

7. What was the response to the draft policies on water licensing that was to be released for public comment in Feb 2003? Anything relevant to this report?

Proponent's response

A number of policies relating to the management and allocation of water resources have been released for comment from differing sources on and after February 2003. The policies and comments received are not considered relevant to the current Jandakot Compliance Report.

8. Since usage by private users of over 500ML/yr is metered and reported under licence conditions, why is this amount not reported, in aggregate, for the subareas or the Jandakot area as a whole?

Proponent's response

There are no private licence water entitlements greater than 500ML/yr within the Jandakot Groundwater Area. Therefore, there are no licences with a condition requiring the installation of a meter and subsequent reporting of use.

Auditor's comments

This underlines the need for the recommended trial of metering as part of the intensive compliance monitoring of the Banjup subarea.



Appendix 4

Water and Rivers Commission (2004). Response to Audit of Compliance report

**EPA AUDIT – ENVIRONMENTAL MANAGEMENT OF GROUNDWATER
ABSTRACTION FROM THE JANDAKOT MOUND 2002 –2003**

WRC RESPONSE TO THE EPA AUDIT REPORT OF 23 MARCH 2004

1. General Background

The WRC manages the groundwater resources of the Jandakot Mound primarily through controlling abstractions that might affect environmental values associated with groundwater dependent ecosystems over critical areas of the Mound. The means of controlling abstraction is through licensing required under the *Rights in Water and Irrigation Act 1914*. However, groundwater and associated wetland water levels are also influenced by climate, land use (particularly urbanisation and silvicultural activities) and by other activities such as artificial supplementation of wetlands. These other factors can have significantly more influence on groundwater levels than abstraction although WRC has no jurisdiction or control over them.

Over recent years, a number of environmental criteria for the Jandakot Mound have consistently not been met despite significant efforts by the WRC to reduce public abstraction in sensitive areas. These non-compliances have been largely in the form of groundwater and wetland levels falling below criteria set within the environmental conditions. Examination of the environmental condition associated with wetlands and areas of phreatophytic vegetation have shown varied impacts from water levels falling below criteria levels. This suggests that some of the criteria may be inadequate in representing an appropriate level of risk for environmental condition.

In response to these findings the WRC requested a review of the existing Ministerial conditions. This resulted in the Minister for the Environment's request to the EPA to "inquire into and advise on changes to the existing Ministerial conditions" and EPA endorsement of a two-stage approach to the review. The first stage (report due in August 2004) involves an initial investigation into the critical areas where non-compliances with environmental conditions have occurred and propose amendments to current conditions. The second stage (report due in early 2005) will provide all available information on environmental values, factors affecting groundwater levels and a proposed set of appropriate conditions that can be achieved via groundwater licensing.

Progress with the review has been affected by the post-2001 winter contingency study and a lack of resources. However some of the progress is limited by information, not resources. The WRC has agreed timeframes and information requirements with the EPA since the section 46 review commenced in 2001. Cutting short investigations to reset criteria may result in a poorer outcome than completing them. A two stage process was agreed in 2002 to allow studies to be completed. WRC can expedite Stage 1 and 2 reporting but the recommendations will then be incomplete and these may again need revision once the current investigations are complete.

Water levels are an indicator that the risk of environmental stress has been raised, not that environmental damage has taken place. It is important that both be measured. In fact environmental condition should be the primary monitor. It has been proposed to the EPA (January 2003, July 2003) that levels be used as a trigger for more investigations (as occurs for Cockburn Sound) and this will be considered further by the EPA in December 2004 when the Stage 2 report is submitted. It also proposed a multi-agency approach to protecting environmental values through improved land and water use planning is implemented to manage some of those factors beyond the control of WRC.

The WRC considers that it would be poor management if damage were to occur when levels were above the criteria (ie technically complying but wetlands area affected) because of a focus on a surrogate and not the environment itself. Loomes *et al.* (2003) concluded that there is no

WRC RESPONSE TO THE EPA AUDIT REPORT OF 23 MARCH 2004

significant risk to changes in vegetation species on the Mound, an observation that is missed in the EPA Services report but mentioned in the Auditor's report.

Some areas have had a decline in vegetation health and invasion of weeds (some of which may be attributed to groundwater levels) but spring 2003 levels were higher in all but one wetland as a result of an average rainfall year. This indicates the high degree of influence rainfall has on groundwater levels and also the Mound's ability to recover quickly in response to good rainfall.

The criteria and resulting groundwater allocations for the Jandakot Mound were set under a presumption of full urban development on the eastern flank of the Mound that was expected to increase recharge in that area. Considering development did not happen to this extent the groundwater system is considered to be performing better than anticipated, given the dry climate sequence experienced.

Predictions of condition of wetlands and areas of terrestrial vegetation of interest for 2003/04, based on expected wetland and groundwater level responses, indicate the changes to be 'not significant'. This is based on no significant change in distribution of phreatophytic species and no significant change in species distribution. Further information on these is contained in the Progress Report 2003.

Two bores breached by 7 and 10 cm in 2002/03 which was not predicted. Computer models are unable to be so precise so this is not unexpected. Also, despite a run of six dry to average rainfall years, 26 criteria bores did not breach which is encouraging.

However, the continued non-compliances with water level criteria are of concern to WRC and a range of actions to mitigate these effects continue to be investigated, trialed and implemented.

WRC suggest the EPA's final report also includes some of the positive changes to groundwater levels and ecosystem health on this Mound, for balance, when reporting to the Minister.

2. WRC Responses to Table 1: Recommended actions

Issue No.	Recommended Action	WRC Response
1. Scheme abstraction in Airport subarea ¹ .	Set action level below quota to trigger closer monitoring to ensure the quota is not exceeded	The WRC will require the Water Corporation to report any quotas likely to be exceeded before the event. The WRC will then examine the impact of the exceedance and direct the Corporation to take appropriate remedial action. This response will be reported to the EPA in the annual report. Any exceedances of quotas will be reported to the EPA as soon as practicable after the WRC is aware of them.
2. Rainfall data.	Report should include annual rainfall data for Jandakot airport	This information will be provided.
3. Management actions in response to non-compliances	Develop interim new, more effective management options, to be used on 04/05 summer	WRC now has 23 additional audit and compliance officers across the State. Their work will focus on private extraction, the main cause of non-compliances on the Jandakot Mound

¹ The public quota is 90% of the licensed allocation and public use is only 83% overall so it is not a breach of a licensed allocation. To put it into context, 50ML is the amount used by 30 – 40 private bores.

WRC RESPONSE TO THE EPA AUDIT REPORT OF 23 MARCH 2004

Issue No.	Recommended Action	WRC Response
ineffective.	when there is a breach of Preferred Minima, to ensure no subsequent non-compliance	<p>after climate.</p> <p>The PRAMS model is designed to provide a more quantitative understanding of how much impact the various factors influencing groundwater levels have both in terms of level and extent. This information will allow WRC to identify the most effective options it has available to help relieve pressure on the Mound.</p> <p>WRC will continue to develop options, under its jurisdiction, likely to have the greatest influence on reducing non-compliances.</p>
4. No quantitative criteria set by EPA for monitoring vegetation, habitat or fauna.	Develop quantitative criteria for the required status of vegetation, habitat and fauna in the s46 review	WRC will investigate what quantitative criteria can be set as part of the Stage 2 report for the section 46 review.
5. M-4-2 - omitted information.	Provide the omitted information	<p>WRC will provide information on quantity of water abstracted for private use.</p> <p>Reporting against environmental objectives is in the Triennial report and annual progress reports (last one submitted in December 2003). As the annual report covers the period to June 2003 the December 2003 progress report should provide the information required. WRC proposes the annual report be amended to refer to section 4 of the 2003 Progress Report – Review of 2002/03 performance and outcomes so that it meets the condition.</p> <p>As noted in the auditor’s report, there is a lack of quantitative criteria set for the required minimum status of vegetation, habitat and fauna. To date, WRC has relied on semi-quantitative surveys conducted by recognised experts and their opinions to determine impact on environmental condition and objectives. This has, to date, met the requirement of the condition. If the EPA now requires amendments to the condition, the WRC requests guidance on what those amended requirements might be.</p>
6. Non-compliances reported annually rather than immediately.	Change reporting practices to ensure breaches and predicted breaches are reported immediately	<p>WRC monitors quarterly and will submit quarterly monitoring reports specifically to the EPA if there are any non-compliances.</p> <p>These quarterly monitoring data are also presented on the WRC website for public scrutiny.</p>

WRC RESPONSE TO THE EPA AUDIT REPORT OF 23 MARCH 2004

Issue No.	Recommended Action	WRC Response
		<p>Feasible management actions tend to be long term because of the long response time between action and water level change. Therefore, WRC proposes maintaining the current regime of reporting management actions in annual, triennial and section 46 reports as they are unlikely to change on a quarterly basis.</p>
<p>7. No action on communication strategy to influence private abstraction.</p>	<p>Complete development for the strategy by 30 June 2004</p>	<p>WRC is currently developing a communication strategy as part of its <i>Private Use Strategy</i> in the Stage 1 report for the section 46 review. This will be submitted as part of that report.</p>
<p>8. Existing knowledge of private use based on 1998/99 survey.</p>	<p>Repeat the survey in 2004/05</p>	<p>Although there are some merits in obtaining current private water use statistics in Jandakot, the value of this information in achieving environmental benefit needs consideration. The previous survey determined that there was more underutilisation of allocations than overallocation. There is no environmental gain in taking back unused allocations as in a sense the unused water is already going to the environment (ie. not being drawn from the aquifer). A detailed study of the likely impact of private abstraction on environmentally sensitive areas may be of more value than intensive water use surveys. Use of the updated PRAMS computer model is likely to be beneficial in assessing such impact. In areas where modelling suggests detrimental impact, ground truthing by select surveys of private use may be required.</p> <p>Discussions with the EPA on surveys versus other approaches (eg. PRAMS modelling) in the management of private abstraction is proposed.</p>
<p>9. No action on commitment for intensive compliance monitoring of private licences.</p>	<p>Intensive monitoring of Banjup sub-area in summer of 2004/05</p>	<p>Banjup sub-area covers Airport, Wright and Success. Wright and Success areas have no non-compliances so it is unclear why they have been included.</p> <p>WRC proposes discussions with the EPA regarding merits of an intensive monitoring program. If demonstrated, WRC will include the Banjup sub-area in its compliance monitoring program of private licences scheduled for 2004/05.</p>
<p>10. No action on commitment to introduce water efficiency</p>	<p>Metering of water use as part of the above monitoring, as a pilot study for wider use of</p>	<p>WRC is supporting Waterwise on the Farm programs (to encourage more efficient water use by growers) on the Gnangara Mound area. It is also developing a policy on water conservation</p>

WRC RESPONSE TO THE EPA AUDIT REPORT OF 23 MARCH 2004

Issue No.	Recommended Action	WRC Response
measures.	metering	<p>plans with the requirement for licensees to introduce such plans as part of their licence requirements. More details on these will be provided in the <i>Private Use Strategy</i> for Jandakot and Gnangara Mounds, being developed as part of the Stage 1 report for the section 46 review.</p> <p>WRC is currently developing a policy on the Measurement of Water Use (metering). Metering is an indirect tool for obtaining water efficiency as it indicates the amount of water a licensee uses, not the degree of efficiency they have achieved. Metering is being targeted in key areas where private use is likely to be having the greatest impact on sensitive environments such as Carabooda, to achieve optimal return on effort.</p>
N/A	Twin Bartram Swamp's location be shown and the date of the compliance report be changed to 2004.	Agreed.
N/A	De-rating of the Mounds has not been done, unlike surface water in the hills.	<p>The current public licence quota is 90% of Water Corp's licensed allocation and use was only 83% in 2002/03 (Appendix 2, Table 2-2 of the annual compliance report). Private allocation was 66% of their licensed allocation and use estimated to be 48% (Appendix 2, Table 2-2 of the annual compliance report). WRC are proposing to revise the Allocation Limits for both Mounds as part of a more extensive groundwater plan in 2005/06. This was part of the package of timelines and deliverables negotiated in January and July 2003 with the EPA.</p>

Shading indicates non-compliance.