



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

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Protecting public drinking water source areas in Western Australia

June 2016

Securing Western Australia's water future

Strategic policy

Protecting public drinking water source
areas in Western Australia

June 2016

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June 2016

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ISSN [ISSN] (online)

ISBN 978-1-925174-85-4 (online)

The recommended reference for this publication is: Department of Water 2016 *Protecting public drinking water source areas in Western Australia*, Strategic Policy, Government of Western Australia, Perth.

Acknowledgements

This document has been prepared by the Water source protection planning branch of the Water and land use division of the Department of Water.

The Department of Water would like to thank the following for their contribution to this publication: Kathryn Buehrig (author), Stephen Watson and Nigel Mantle (program management).

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Contents

1	Introduction.....	1
1.1	What is the purpose of this policy?.....	2
1.2	Where does this policy apply?.....	3
2	Policy statements	4
3	Implementing this policy	5
3.1	Legislation.....	5
3.2	Integrated land use planning and public drinking water source area protection program	5
3.3	Determining and proclaiming PDWSAs.....	6
3.4	Assigning priority areas and protection zones	7
3.4.1	Priority areas.....	7
3.4.2	Protection zones.....	8
3.5	Drinking water source protection reports	8
3.6	Recognising PDWSAs in planning documents	9
3.7	Appropriate land uses and activities within PDWSAs	10
3.8	Working with our stakeholders	10
3.8.1	Advisory Committee for the Purity of Water	10
3.8.2	Department of Agriculture and Food.....	10
3.8.3	Department of Environment Regulation	10
3.8.4	Department of Health.....	11
3.8.5	Department of Housing.....	11
3.8.6	Department of Mines and Petroleum	11
3.8.7	Department of Parks and Wildlife	11
3.8.8	Department of Planning/Western Australian Planning Commission	12
3.8.9	Environmental Protection Authority.....	12
3.8.10	Land owners and operators	12
3.8.11	Local government	12
3.8.12	Water service providers	13
3.9	Our policies, strategies and guidance	13
4	Key concepts.....	14
4.1.1	Safe, good quality drinking water is important to all Western Australians.....	14
4.1.2	Primacy of drinking water.....	14
4.1.3	<i>Australian drinking water guidelines</i>	14
4.1.4	Risk assessment in PDWSAs.....	15
4.1.5	Increased development increases risks to drinking water quality and public health	15
4.1.6	'An ounce of prevention is worth a pound of cure'	16
4.1.7	Land planning and water factors.....	16
5	Reviewing this policy	18
	Appendices.....	19
	Shortened forms	23
	References	24

Appendices

Appendix A — Public drinking water source areas in Western Australia.....	19
Appendix B — Finding the location of public drinking water source areas	20

Appendix C — List of useful water quality protection notes20
Appendix D — Example of a groundwater PDWSA.....21
Appendix E — Example of a surface water PDWSA22

1 Introduction

Safe, good quality drinking water is essential for all Western Australians. Drinking water for cities and towns across Western Australia comes from surface water and groundwater sources, and some comes from seawater desalination, groundwater replenishment and water recycling. The surface and groundwater sources are called 'public drinking water source areas' (PDWSAs), and include the catchments of surface water sources (such as dams and reservoirs), the recharge areas of unconfined groundwater sources (superficial bores) and confined groundwater sources (confined and/or 'artesian' bores). There are currently more than 120 proclaimed PDWSAs in Western Australia, all covered by a protection report.

For more than a century, our PDWSAs have provided reliable and safe drinking water to consumers in Western Australia. In recent times, the volume of water available from some of these sources has reduced due to our drying climate and growing population. However, in general, they still provide valuable, lower cost, good quality sources of drinking water that are required to help meet the water needs of a growing population, alongside water conservation, water recycling and desalination.

PDWSAs are important for the ongoing growth and development of Western Australia. Without reliable sources of drinking water, development cannot occur, so PDWSAs require ongoing protection from water quality contamination risks. Land use intensification introduces increased risks of contamination which can have a negative impact on water quality and public health. If we don't protect PDWSAs, we will become reliant on more costly treatment and monitoring programs. That outcome would be less effective and cost more than a combination of PDWSA protection and lower levels of treatment.

As Perth and the state's regional areas are developed, our PDWSAs need to continue to be protected to the maximum extent practical, consistent with the *Australian drinking water guidelines* (ADWG; NHMRC & NRMCC 2011).

The first and most significant protection provided in a modern drinking water system is protection of the source i.e. the PDWSA. Protecting PDWSAs supports growth and development by:

- applying preventive measures to decrease risks to water quality and public health
- integrating land use planning with best practice drinking water source protection
- enabling lower cost water treatment and supply
- preventing the loss of PDWSAs due to declining water quality
- reducing the need to find alternative drinking water sources
- reducing the resources required for water quality monitoring, testing and reporting in the mitigation of contaminated PDWSAs
- protecting the sole supplies of drinking water to Western Australian towns.

The Department of Water is responsible for managing and protecting PDWSAs. We aim to strengthen the protection of water in PDWSAs for their ongoing use, and for long-term public health benefits. We prepare and implement legislation, policy, plans and guidance to inform our stakeholders on management measures that apply in PDWSAs. These management measures aim to secure a reliable, safe, good quality, lower cost drinking water to consumers, to protect public health, now and in the future.

1.1 What is the purpose of this policy?

This policy updates and replaces *Public drinking water resource policy* (Department of Environment 2005). It describes how PDWSAs are managed in Western Australia. It does not introduce new requirements, but provides for the continued implementation of Western Australia's existing integrated land use planning and PDWSA protection program. The Department of Water's advice to planning authorities and other stakeholders about PDWSAs is based on this policy.

The policy:

- continues to implement government's long-standing commitment to the protection of PDWSAs
- describes how and why PDWSAs are protected
- explains the existing integrated land use planning and PDWSA protection program, and the planning mechanisms used to protect PDWSAs
- explains the Department of Water's role in managing PDWSAs, the roles of other agencies, and demonstrates our stakeholder engagement process
- informs the community about the role they have in protecting PDWSAs
- delivers clarity, consistency and equity for land use planning decision-making in PDWSAs
- is implemented by state planning policies (in particular no. 2.2: *Gnangara groundwater protection policy*, 2.3: *Jandakot groundwater protection policy*, 2.7: *Public drinking water source policy* and 2.9: *Water resources*).

This policy implements the following documents:

- National water quality management strategy no. 6: *Australian drinking water guidelines* (ADWG; NHMRC & NRMCC 2011)
- *State water quality management strategy*
- Government's responses to three parliamentary committee inquiries:
 - Select committee on metropolitan development and groundwater supplies (1994)
 - Standing committee on ecologically sustainable development in relation to the quality of Perth's water supply (2000)

- Standing committee on public administration's report – Recreation activities within PDWSAs (2010)
- an independent review of Western Australia's drinking water source protection program by Marsden Jacobs (2014).

1.2 Where does this policy apply?

This policy applies to PDWSAs in Western Australia (Appendix A), proclaimed as catchment areas, water reserves or underground water pollution control areas under the *Metropolitan Water Supply, Sewerage, and Drainage Act 1909* or the *Country Areas Water Supply Act 1947*. Proclamation follows the completion of a drinking water source protection report (see 3.5).

For a list of proclaimed PDWSAs, refer to our Water quality protection note no. 75: *Proclaimed public drinking water source areas* (see Appendix C for how to find this). This list is regularly updated as new sources are proclaimed, and sources that are no longer required are abolished. For an interactive map of PDWSAs in Western Australia, see our *Geographic Data Atlas* (see Appendix B for how to find this).

Private household drinking water sources are not proclaimed as PDWSAs but this policy provides useful guidance for their protection. The Department of Health also provides information about the safe use of rainwater and bore water as private drinking water sources (www.health.wa.gov.au).

Bitumen catchments and some emergency public drinking water sources that supply public drinking water are not proclaimed as PDWSAs, hence they are not covered by this policy, but their protection should be guided by its content.

Remote Aboriginal community drinking water supplies which are managed by the Department of Housing, and mine sites which are managed by mining companies, are not subject to this policy, but we recommend that their protection is guided by its content.

The Department of Water will consider extending the application of PDWSA proclamations to remote Aboriginal communities and bitumen catchments in the near future. Should these sources be proclaimed, then this policy will apply.

2 Policy statements

1. All Western Australians have a right to safe, reliable, good quality drinking water now and in the future (see 4.1.1).
2. Protecting PDWSAs is the first step towards achieving quality drinking water, and is the most critical step for protecting public health. It allows preventive measures to be applied; avoiding contamination risks and lowering costs of risk management options and treatment (see 4.1.6).
3. The Department of Water will protect PDWSAs by:
 - promoting the primacy of water quality to protect public health (see 4.1.2)
 - implementing, and amending as appropriate, legislation (see 3.1) and policies
 - determining PDWSA boundaries (see 3.3), and assigning priority areas and protection zones within them (see 3.4)
 - undertaking a drinking water quality risk assessment in accordance with the ADWG (see 4.1.3), and preparing, reviewing and implementing (or endorsing) a drinking water source protection report for each PDWSA (see 3.5)
 - providing expert advice on land use planning matters in PDWSAs in accordance with Water quality protection note (WQPN) no. 25: *Land use compatibility tables for PDWSAs* and the Western Australian Planning Commission's (WAPC's) state planning policies relevant to PDWSAs.
4. Public drinking water sources are managed via an integrated land use planning and PDWSA protection program (see 3.2), underpinned by the following:
 - The Western Australian Government's endorsement of the ADWG (see 4.1.3).
 - Residual risks from land use intensification can be mitigated to some extent, but the maximum risks cannot. Land use intensification in a PDWSA will increase the risk to drinking water quality and public health (see 4.1.5).
 - PDWSA boundaries, their priority areas and protection zones need to be recognised in planning documents (as per State planning policy no. 2.7: *Public drinking water source policy*) so that they can be considered when making decisions about land use (see 3.6).
 - WQPN no. 25: *Land use compatibility tables for PDWSAs* outlines appropriate land uses and activities within PDWSAs and their priority areas, and should be referred to when making decisions about land use (see 3.7).
 - The housing and employment needs of a growing population may sometimes mean that government, through the WAPC, is required to make strategic-level planning decisions (subsequently confirmed through region and local scheme amendments) in some parts of a PDWSA that results in land use intensification (e.g. rezoning land from rural to urban). Contemporary land and water factors (see 4.1.7) should be considered when making these decisions.

3 Implementing this policy

3.1 Legislation

The Department of Water will prepare, review, amend and implement legislation for the protection of PDWSAs. Current legislation includes:

- *Country Areas Water Supply Act 1947*
- *Metropolitan Water Supply, Sewerage, and Drainage Act 1909*
- *Water Agencies (Powers) Act 1984*
- *Water Services Act 2012*
- *Rights in Water and Irrigation Act 1914.*

The Metropolitan Water Supply, Sewerage, and Drainage By-laws 1981 and the Country Areas Water Supply By-laws 1957 support the protection of PDWSAs and will be periodically reviewed and enhanced. A review of these by-laws is occurring with the aim of creating consistent, modern by-laws across the state.

The Western Australian Government is currently working to reform legislation and policy to deliver new water resources management and water services legislation that is flexible, progressive and capable of managing water today and in the future. The reform presents contemporary approaches to water resources management and water services legislation, which will support Western Australia's growth and development, even in a changing climate.

This policy will be reviewed as required, to reflect any legislative changes.

3.2 Integrated land use planning and public drinking water source area protection program

Western Australia has an integrated land use planning and PDWSA protection program. This program implements the findings of three parliamentary committee inquiries (1994, 2000 and 2010, see References) and the ADWG (see 4.1.3). Each of these documents identifies source protection as the critical component for delivering safe, good quality drinking water to protect public health.

Since it was first applied to the Jandakot groundwater protection area in 1995, the integrated land use planning and PDWSA protection program has been applied to more than 120 PDWSAs in Western Australia.

Entities with key roles and responsibilities for implementing this program are:

- Department of Water
- WAPC and the Department of Planning
- water service providers such as the Water Corporation, that are licensed by the Economic Regulation Authority to provide drinking water to consumers

- local governments, through their planning schemes
- other state government agencies (Department of Health, Department of Parks and Wildlife, Department of Environment Regulation, Environmental Protection Authority, Department of Sport and Recreation, Department of Mines and Petroleum)
- Advisory Committee for the Purity of Water (see 3.8.1).

Section 3.8 provides more information about how we work with our stakeholders.

A key strength of this integrated program is that it allows water quality and public health risks to be considered at the first stage in the drinking water supply system – catchment protection. This allows contamination risks to be prevented, minimised or managed rather than relying on treatment and monitoring to provide safe drinking water (see 4.1.6).

Another strength of this program is that it can respond to changing land planning and water factors (see 4.1.7), climate change and the development of new sources of water (i.e. seawater desalination and water recycling) that can supplement traditional sources.

This integrated program relies upon two key elements. The first is the development of a drinking water source protection report (see 3.5), and the second is the implementation of that report through land use planning authorities and controls (see 3.6).

3.3 Determining and proclaiming PDWSAs

The Department of Water will determine PDWSA boundaries and ensure they are proclaimed under relevant legislation (*Metropolitan Water Supply, Sewerage, and Drainage Act 1909* or the *Country Areas Water Supply Act 1947*) to allow by-laws to be applied that protect water quality. PDWSA boundaries will generally reflect:

- the catchment area for surface water sources
- all or part of the recharge area for unconfined groundwater sources
- the area immediately surrounding bores for confined groundwater sources (e.g. at least the bore compound).

In determining PDWSA boundaries for groundwater sources, we consider:

- the hydrogeology of the aquifer (i.e. unconfined, semi-confined or confined; groundwater flow, bore capture zones)
- the depth of the aquifer
- the bore construction standard.

See Appendix D for an example of a groundwater PDWSA and Appendix E for an example of a surface water PDWSA.

The Department of Water will also arrange the abolition of PDWSAs that are no longer required to supply drinking water to remove drinking water protection constraints. This will allow them to be used for increased recreation, tourism and customary activities, or other development.

We will consult proclamations and abolitions with our stakeholders, and boundaries will be identified in drinking water source protection reports (see 3.5).

3.4 Assigning priority areas and protection zones

After determining a PDWSA boundary (see 3.3), priority areas and protection zones need to be assigned within them to maximise the protection of water quality and public health. Priority areas and protection zones help guide land use planning to avoid, minimise or manage water quality contamination risks within PDWSAs. The Department of Water assigns priority areas and protection zones via drinking water source protection reports (see 3.5). There are more than 120 of these reports covering PDWSAs across the state.

3.4.1 Priority areas

Within each PDWSA, up to three different priority areas can be defined to guide land use planning. The purpose of priority areas is to maximise the protection of water quality in a PDWSA, while recognising existing, approved development and land use zoning.

Priority 1 (P1) areas are generally located over land under government ownership, such as state forests. The objective in P1 areas is to avoid unnecessary water quality contamination risks.

Priority 2 (P2) areas are located on land zoned rural, such as farm land and rural-residential lots. The objective in P2 areas is to minimise water quality contamination risks.

Priority 3 (P3) areas are located on land zoned urban, commercial and light industrial. The objective in P3 areas is to manage water quality contamination risks.

We will assign priority areas based on the:

- strategic value of the drinking water source
- vulnerability of the PDWSA to contamination risks
- current zoning in relevant planning documents
- current and approved land uses
- land ownership (tenure).

P1, P2 and P3 areas implement land zoning decisions made by the WAPC and local governments. They are assigned based on the land planning and water factors that exist at the time (see 4.1.7). Our WQPN no. 25: *Land use compatibility tables for public drinking water source areas* gives further details about how priority areas are assigned, and what land uses and activities are appropriate within each priority area.

Priority areas can change over time, because land planning and water factors change. These changes are normally captured in strategic-level planning documents prepared or approved by the WAPC. Priority areas may need to be updated so they remain contemporary, and reflect WAPC decisions. The Department of Water will undertake these updates via drinking water source protection reports (see 3.5).

Priority 1 (P1) or priority 2 (P2) to priority 3 (P3)

In specific instances, some areas that were previously P1 or P2 may change to P3 as a result of strategic-level planning assessments undertaken by the WAPC. In these areas, the Department of Water recommends additional requirements to protect drinking water quality and public health. Please refer to our WQPN no. 25: *Land use compatibility tables for public drinking water source areas* for these special requirements. WAPC's state planning policies for PDWSA protection provide further advice.

3.4.2 Protection zones

Protection zones are defined in the immediate vicinity of drinking water extraction points, as these areas are the most vulnerable to contamination. There are two types of protection zones:

- wellhead protection zones (WHPZs) defined for groundwater sources
- reservoir protection zones (RPZs) defined for surface water sources.

WHPZs are generally circular with a 500 m radius around each drinking water production bore in P1 areas and a 300 m radius around each drinking water production bore in P2 and P3 areas, in recognition of existing development. Other sizes and shapes can be applied to WHPZs if data supports that outcome.

RPZs are defined in the Metropolitan Water Supply, Sewerage, and Drainage By-laws 1981, and generally extend to 2 kilometres from the top water level of any reservoir, back into the defined PDWSA. They do not extend outside the PDWSA. RPZ are also applied as policy in country areas. Public access to RPZs is prohibited in legislation for the protection of water quality and public health.

Land use decisions in protection zones should largely be guided by recommendations related to the underlying priority area. However, the Metropolitan Water Supply, Sewerage, and Drainage By-laws 1981 can prohibit or restrict specific activities within protection zones. Best practice management measures need to be implemented to minimise contamination risks in these protection zones.

Our WQPN no. 25: *Land use compatibility tables for public drinking water source areas* provides more information about protection zones.

3.5 Drinking water source protection reports

The Department of Water will develop (or assist in developing and endorse where appropriate), implement and review drinking water source protection reports for every PDWSA in Western Australia. These reports implement element 2 (Assessment of

the drinking water supply system) and element 3 (Preventive measures for drinking water quality management) of the ADWG. There are four types of drinking water source protection report:

- *Drinking water source protection assessments* contain water quality data and background information about a current or proposed PDWSA and an assessment of water quality contamination risks (see 4.1.4) based on the ADWG. The boundary is included, and in some cases, priority areas and protection zones may be proposed. Assessments are subject to limited stakeholder involvement.
- *Drinking water source protection plans* build upon and update an assessment. They recommend management strategies to address the water quality contamination risks. Plans include a risk assessment, water quality data, the boundary, assign priority areas and protection zones (see 3.4) and are publicly consulted.
- *Drinking water source protection reviews* assess the implementation status of a drinking water source protection plan or assessment and advise on any changes since its publication. They include water quality data, boundary and priority areas, and provide an updated drinking water quality risk assessment (see 4.1.4) based on the ADWG. Recommendations are consolidated and updated to address water quality contamination risks. Key stakeholder consultation is undertaken as part of a review.
- *Land use and water management strategies* are similar to a drinking water source protection plan, but they are prepared by the WAPC with assistance from the Department of Water. They are prepared at a strategic planning level e.g. *Middle Helena land use and water management strategy* (WAPC 2010) and *Gnangara land use and water management strategy* (WAPC 2001). Strategies are publicly consulted.

We aim to review drinking water source protection reports every seven years or as the need arises.

Each of these reports is based on planning advice and decisions, and considers current land planning and water factors (see 4.1.7). They are required to support the integrated land use planning and PDWSA protection program (see 3.2).

3.6 Recognising PDWSAs in planning documents

PDWSA boundaries and their priority areas and protection zones need to be recognised in planning documents so that they can be considered when making decisions about land use, rezoning and subdivision, in accordance with State planning policy no. 2.7: *Public drinking water source policy*. This recognition should apply to all levels of planning documents, such as strategies, structure plans and local planning schemes.

This approach is supported by the WAPC's state planning policies 2.2 (Gnangara), 2.3 (Jandakot), 2.7 (rest of state) and 2.9 (water resources).

3.7 Appropriate land uses and activities within PDWSAs

The Department of Water's WQPN no. 25: *Land use compatibility tables for public drinking water source areas* (as amended) outlines appropriate land uses and activities within each priority area (P1, P2 and P3) in PDWSAs. The Department of Water will update this note from time-to-time as appropriate. Major updates will be publicly consulted.

Land use planning decision makers, landowners and anyone wanting to develop land within PDWSAs should refer to WQPN no. 25, but further specialist advice will be provided as required. You can contact us at drinkingwater@water.wa.gov.au or by calling (08) 6364 7600 and asking for the Water source protection planning branch.

3.8 Working with our stakeholders

3.8.1 Advisory Committee for the Purity of Water

The Advisory committee for the purity of water (ACPOW), established in 1925, is a multi-agency, non-statutory committee chaired by the Department of Health. It comprises representatives from government and water service providers that have a role and responsibility in protecting and supplying public drinking water sources.

ACPOW provides advice to the ministers for water and health on protecting, managing and monitoring drinking water quality, and fosters inter-agency cooperation on such matters.

ACPOW established a sub-committee in 2005 charged with the responsibility of water source protection, chaired by the Department of Water. This reflects the significance placed on the protection of public drinking water sources. The Department of Water works with ACPOW and its sub-committees on drinking water quality issues to implement the ADWG. We will help coordinate and prepare a drinking water source annual report to ACPOW from the source protection sub-committee.

3.8.2 Department of Agriculture and Food

The Department of Water will work with the Department of Agriculture and Food on key water-related projects, such as the Water for Food initiative. We will also work together on best management practices to avoid, reduce, mitigate or manage drinking water contamination risks on rural land.

3.8.3 Department of Environment Regulation

The Department of Environment Regulation is responsible for administering the *Environmental Protection Act 1986*, including works approvals and licensing, compliance and response, enforcement and other major environmental initiatives within Western Australia. The Department of Water expects that the Department of

Environment Regulation will continue to seek our expert advice on PDWSA issues, and factor this into any regulatory decision-making.

The Department of Water will continue to work with Department of Environment Regulation when developing drinking water source protection reports (see 3.5) and any other documents that address PDWSAs (see 3.9).

3.8.4 Department of Health

The Department of Health's mission is to improve, promote and protect the health of Western Australians. Its services include health protection through the provision public health services. Via the *Health Act 1911*, it administers statutory processes to protect and maintain safe drinking water. The Department of Health is responsible for:

- recognising our drinking water source protection reports (see 3.5) in memoranda of understanding (MoUs) with licensed water service providers
- providing expert advice about and approvals for the use of pesticides in PDWSAs.

The Department of Water will:

- refer public health matters in PDWSAs to the Department of Health
- invite the Department of Health to comment on our policies, reports and guidance documents applicable to PDWSAs.

3.8.5 Department of Housing

The Department of Housing (or engaged regional service providers) manage housing in remote Aboriginal communities. The Department of Water will continue to work with the Department of Housing or its service providers by providing advice on the protection of drinking water sources in these communities.

3.8.6 Department of Mines and Petroleum

The Department of Water and the Department of Mines and Petroleum have established administrative agreements concerning the assessment and regulation of mining activities under the *Mining Act 1978*, the *Petroleum and Geothermal Energy Resources Act 1967* and the *Petroleum pipelines Act 1969* within or relevant to PDWSAs. This will ensure that mining, petroleum and energy projects will address water quality and public health aspects of drinking water source protection.

3.8.7 Department of Parks and Wildlife

The Department of Water will work with the Department of Parks and Wildlife when national parks, state forest and conservation reserves are within PDWSAs. We will consult with and seek comments from the Department of Parks and Wildlife when preparing drinking water source protection reports (see 3.5) affecting land that it manages.

3.8.8 Department of Planning/Western Australian Planning Commission

It is the Department of Water's responsibility to provide advice to the WAPC for consideration in their decision-making process for land use planning in PDWSAs. We do this by providing expert advice on water source protection issues, compatibility of proposed land uses and activities and recommended development approval conditions.

The WAPC recognises PDWSAs in its strategic-level planning documents and gives them due consideration when making decisions about rezoning, subdivision and development.

3.8.9 Environmental Protection Authority

The Environmental Protection Authority has statutory obligations under the *Environmental Protection Act 1986* to conduct environmental impact assessments, initiate measures to protect the environment from environmental harm and pollution and to provide advice on environmental matters. The Office of the Environmental Protection Authority supports the Department of Environment Regulation to achieve this.

The Department of Water and the Office of the Environmental Protection Authority have an established memorandum of understanding (MoU) concerning the assessment of significant resources, industrial and infrastructure proposals under Part IV of the *Environmental Protection Act 1986*. This ensures that PDWSAs are considered in the assessment of proposals.

The Department of Water expects that the Office of the Environmental Protection Authority will continue to collaborate with us on PDWSA issues, and consider our advice when making recommendations on development within PDWSAs. The Department of Water will continue to consult with the Office of the Environmental Protection Authority where applicable on the development of drinking water source protection reports (see 3.5) and any policy, strategy and guidance documents (see 3.9).

3.8.10 Land owners and operators

The Department of Water will consult landowners and operators within PDWSAs when we write a drinking water source protection review. All comments received on our documents will be considered.

We will work with landowners and operators to assist them in implementing best management practices to protect drinking water quality and public health. Our water quality protection note series, available on our website, provides this type of information.

3.8.11 Local government

The Department of Water will assist local governments in their decision-making role for land use planning in PDWSAs by providing informed advice on water quality

protection issues, compatibility of proposed land uses and activities within PDWSAs and recommended development approval conditions.

We expect that local governments will continue to recognise PDWSAs within their planning schemes. We expect that advice received from the Department of Water on land use planning applications will be incorporated, and that PDWSAs are given due regard when making decisions.

The Department of Water will invite comments from relevant local governments when preparing drinking water source protection reports (see 3.5).

3.8.12 Water service providers

Under legislation, the Department of Water has delegated responsibility to the Water Corporation for catchment surveillance, by-law enforcement and prosecution in PDWSAs that are operated by the Water Corporation. The Water Corporation provides updates on any issues in these PDWSAs once a month through the ACPOW sub-committee and through the annual delegation report to the Department of Water.

The Department of Water has two MoUs with the Water Corporation; one for drinking water source protection and the other for management of department-owned land.

The Water Corporation is the major water service provider for Western Australia, but the Department of Water also works with other water service providers to assist in the protection of drinking water quality.

3.9 Our policies, strategies and guidance

We will ensure that the Department of Water's policies, strategies and guidance documents align to manage PDWSAs for the protection of water quality and public health.

We will periodically review and update our policies, strategies and guidance documents to inform our stakeholders, including:

- this policy
- Operational policy no. 13: *Recreation in public drinking water source areas on Crown land*
- WQPN no. 25: *Land use compatibility tables for public drinking water source areas*
- other notes in the WQPN series
- other Department of Water policies, reports, guidelines, information sheets and brochures.

4 Key concepts

This section outlines concepts that underpin this policy. These key concepts need to be understood to be able to interpret this policy.

4.1.1 Safe, good quality drinking water is important to all Western Australians

The Department of Water will strive to achieve the ongoing supply of reliable, safe, good quality, lower cost drinking water to consumers across Western Australia through the protection of PDWSAs. This requires a multi-agency approach and stakeholder input to achieve this.

4.1.2 Primacy of drinking water

The Department of Water will promote the primacy of water quality when managing PDWSAs to protect public health.

Recommendation 3 of the 2000 Parliamentary review states 'the protection of water quality to meet public health objectives have primacy in the planning of integrated catchment management'. The submissions that the Standing Committee on Public Administration received for the 2010 Parliamentary inquiry 'overwhelmingly reveal[ed] that the general public have a fundamental concern for the primacy of drinking water and its source protection'.

4.1.3 Australian drinking water guidelines

The Western Australian Government has endorsed the 2004 version of the ADWG, which outline a 'catchment to consumer' approach to achieve safe drinking water supplies. It outlines a preventive, risk-based, multiple-barrier approach to protect PDWSAs. Traditional barriers include:

1. protecting catchments and source water
2. water storage and detention
3. treatment including disinfection
4. monitoring the quality of water supplies
5. protecting the water distribution system
6. maintenance of the water distribution system.

Stage 1 is critical in protecting water quality because only this stage allows risks to be avoided (e.g. by rejecting high-risk land uses).

Barriers against contamination are used at each stage in the above drinking water supply system. These multiple barriers are important because failure of one barrier can be compensated by others later on. This helps address the over-reliance on engineered measures (such as treatment) to make water safe to drink, and properly recognises the range of consequences from consuming contaminated drinking water.

There are 12 elements in the ADWG. The Department of Water addresses catchment protection and management mainly via the following elements:

1. Commitment to drinking water quality management.
2. Assessment of the drinking water supply system.
3. Preventive measures for drinking water quality management.
8. Community involvement and awareness.

Remaining elements are addressed by other stakeholders (see 3.8).

4.1.4 Risk assessment in PDWSAs

Contaminated drinking water can result in illness, hospitalisation and death – even in developed countries like Australia. The Department of Water takes a rigorous approach to managing these risks, ensuring there is consistency with the ADWG.

Within all three priority areas (i.e. P1, P2 and P3 (see 3.4.1)), the maximum protection of water quality and public health relies upon best practice – risk assessment, land use management and technology.

It is important to understand how risks are determined to appreciate the impact of development in a PDWSA. The table below shows how different risk levels are determined from an understanding of both the consequence and the probability (likelihood) of a decision to increase hazards. An understanding of this relationship will also prevent the common misinterpretation that probability equals risk. For example, just because a drinking water contamination incident has not occurred for many years (probability), that does not mean that the risks associated with land use intensification have reduced and that more development should be supported (because the consequence may still be major or catastrophic).

Consequence→	Insignificant	Minor	Moderate	Major	Catastrophic
Likelihood ↓	Risk ↓				
Almost certain	moderate	high	very high	very high	very high
Likely	moderate	high	high	very high	very high
Possible	low	moderate	high	very high	very high
Unlikely	low	low	moderate	high	very high
Rare	low	low	moderate	high	high

For more information on risk assessment, refer to our WQPN no. 77: *Risk assessment in PDWSAs* (see References).

4.1.5 Increased development increases risks to drinking water quality and public health

Increased development in a PDWSA will increase the risk to water quality and public health. For example, urban areas pose a greater risk of water quality contamination than rural areas, and rural areas pose a greater risk of contamination than naturally forested areas. This is an inevitable consequence of more chemical, biological and physical hazards being introduced due to more people, buildings, vehicles and rubbish associated with land use intensification.

4.1.6 'An ounce of prevention is worth a pound of cure'

The 1994 parliamentary committee noted that the saying 'an ounce of prevention is worth a pound of cure' was true for protecting drinking water sources. Water quality contamination risks should be avoided rather than being dealt with later in the drinking water supply system, when the only response available could be to increase treatment. The committee also noted that reliance on treatment only to make drinking water safe was a second-best option, compared to a combination of source protection and treatment.

It is noted that groundwater replenishment is being developed in Western Australia as an alternative source of water to augment traditional sources of drinking water from PDWSAs. This is part of a diversity of supply that also includes desalination. Groundwater replenishment requires multiple barriers of treatment for wastewater obtained from municipal sewage treatment plants. The water is produced at a significantly higher cost than water drawn from conventional PDWSAs. It also requires ongoing monitoring to ensure it meets required water quality criteria prior to recharge into aquifers for later abstraction for drinking water.

All three parliamentary committee reviews have advocated the protection of water sources rather than relying only on remedial water treatment or costly cleanup of contaminated sources that is often required in other parts of the world. After meeting with water managers from interstate and around the world, the 2010 parliamentary committee found that Western Australia is fortunate not to have the significant drinking water contamination legacy challenges facing many other areas.

4.1.7 Land planning and water factors

Current land planning and water factors need to be considered together when making decisions about land use within PDWSAs. This ensures decisions properly consider the protection of water quality and public health, and that land planning and water factors may have changed over time.

Land planning factors include:

- accessibility to transport infrastructure like roads and railways
- availability of services like power, water and gas
- the condition of the land, for example high-value vegetation in comparison to cleared land
- the state's need to provide land for housing and employment
- major agricultural (i.e. Water for Food), mining or energy-related projects
- proximity to land already zoned urban.

Water factors include:

- the strategic importance of the water source
- quality of the water source
- quantity of the water source

- availability of alternative water sources
- a potential shift from superficial to confined aquifers via water trading or allocation licensing
- a drying climate.

Land planning and water factors assessments should be considered via strategic-level processes, and documented in planning instruments prepared or approved by the WAPC. Strategic-level planning assessments that consider land planning and water factors are vitally important because they allow development risks to be avoided, mitigated or managed. The Department of Water will continue to provide advice to WAPC on the water factors, including protecting drinking water quality and public health. The role of the WAPC is to weigh up the land planning and water factors to decide on an appropriate balance for land in PDWSAs for the net long-term public benefit, or an alternative water source may need to be secured.

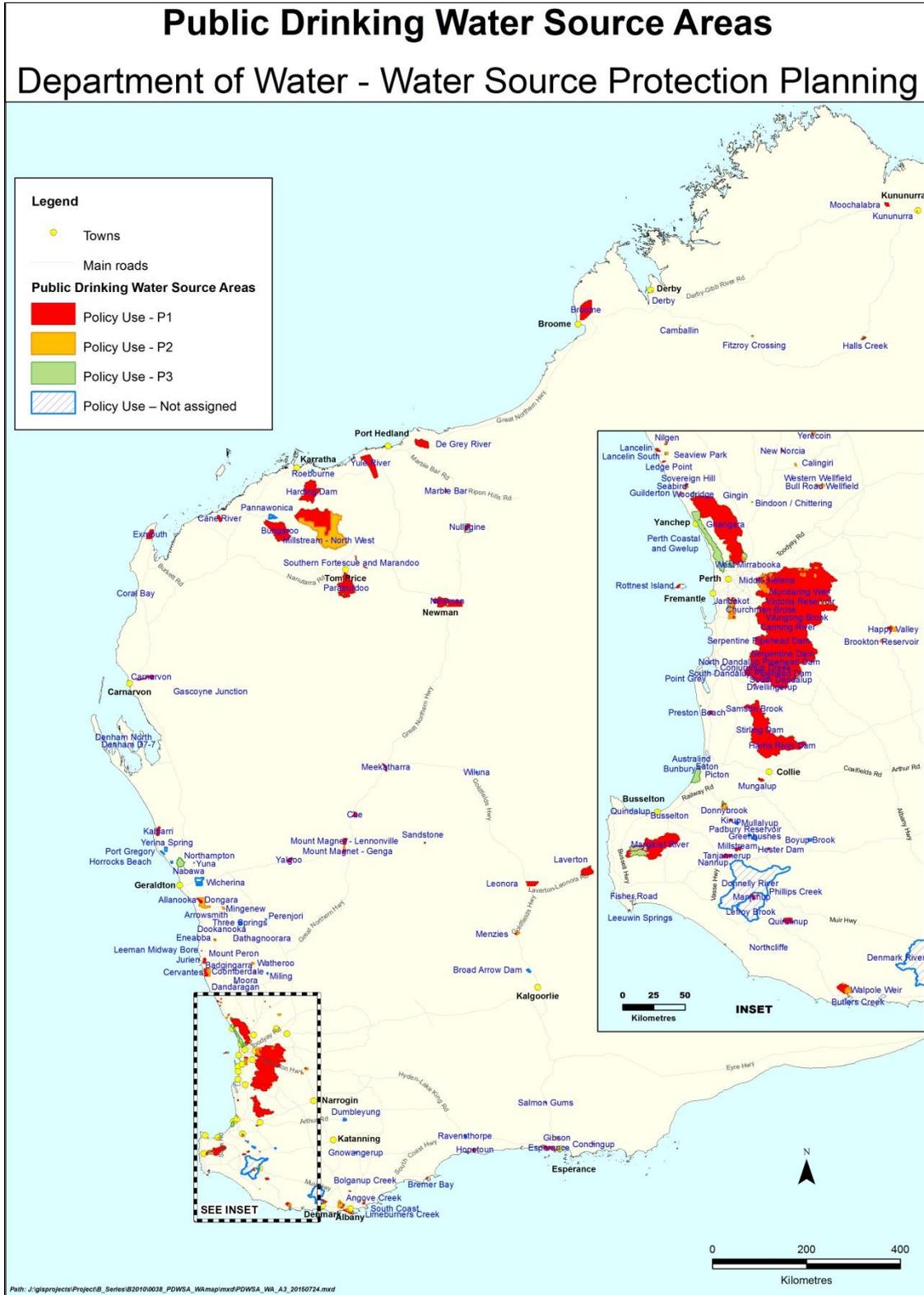
5 Reviewing this policy

This policy will be reviewed after five years, or as the need arises. As part of the review process, an evaluation of the effectiveness of this policy will be undertaken. Our review mechanisms will include:

- Water source protection planning branch regular team meetings and annual key performance indicators
- Department of Water annual reports
- ACPOW quarterly meetings
- ACPOW sub-committee monthly meetings and annual report provided to ACPOW
- The Water Corporation's annual delegation report to the Department of Water, addressing catchment surveillance, by-law enforcement and prosecution in PDWSAs.

Appendices

Appendix A – Public drinking water source areas in Western Australia



Appendix B – Finding the location of public drinking water source areas

The location of PDWSAs in Western Australia can be viewed on the Department of Water's Geographic Data Atlas, available at www.water.wa.gov.au > maps & data > maps. To load the PDWSA theme, click on the box next to 'public drinking water source area' and then zoom to your area of interest (the theme will not become visible until the scale reaches at least 1: 3 000 000). The search function can also be used to zoom directly to an area of interest by searching under the relevant local government, town or a specific address.

Alternatively, you can contact your nearest Department of Water regional office for assistance. Contact details are available at www.water.wa.gov.au.

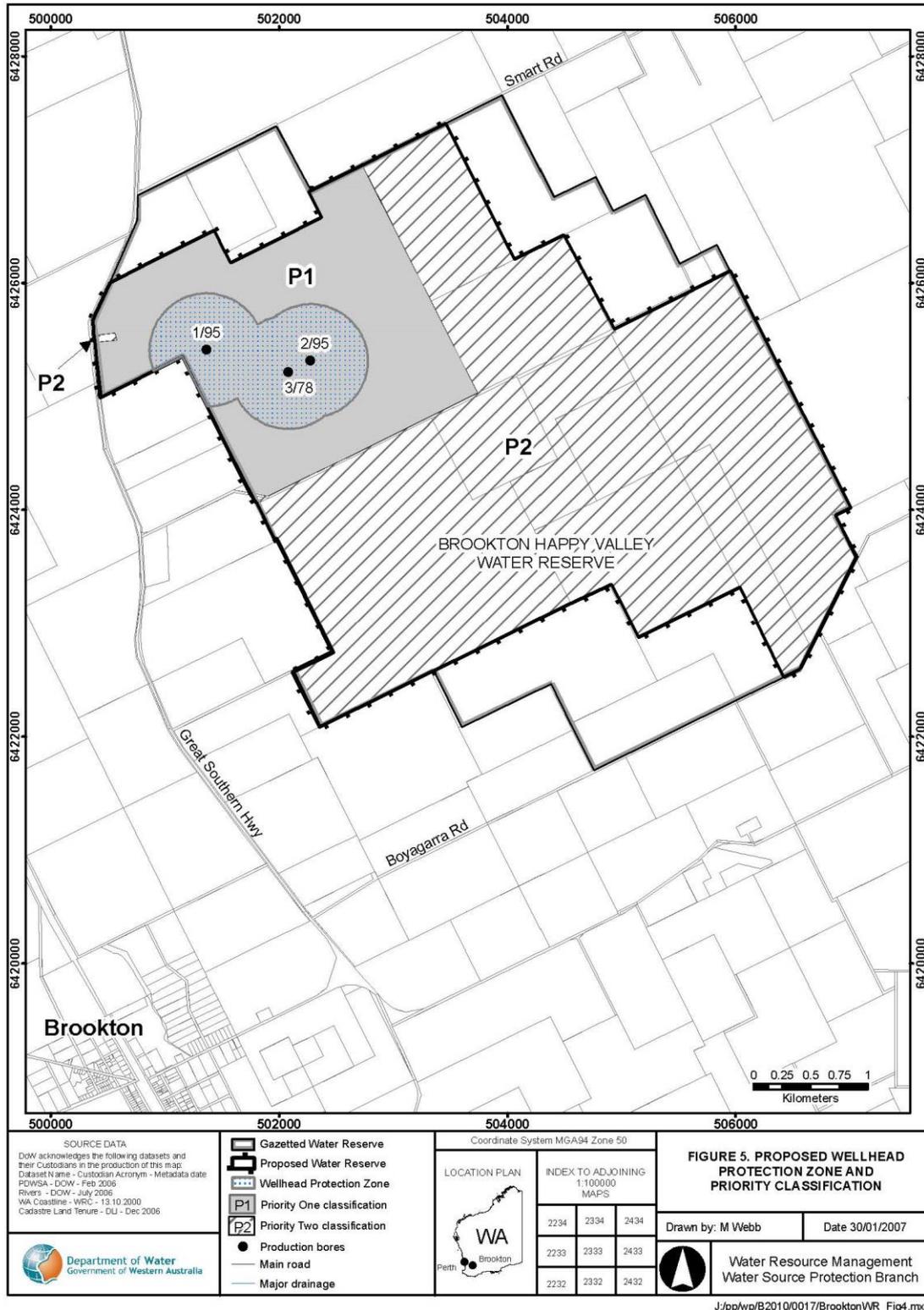
Appendix C – List of useful water quality protection notes

- WQPN no. 25: *Land use compatibility tables for public drinking water source areas*
- WQPN no. 36: *Protecting public drinking water source areas*
- WQPN no. 75: *Proclaimed public drinking water source areas*
- WQPN no. 76: *Land use planning in public drinking water source areas*
- WQPN no. 77: *Risk assessment in public drinking water source areas*

These and more WQPNs are available at www.water.wa.gov.au > publications search.

Appendix D – Example of a groundwater PDWSA

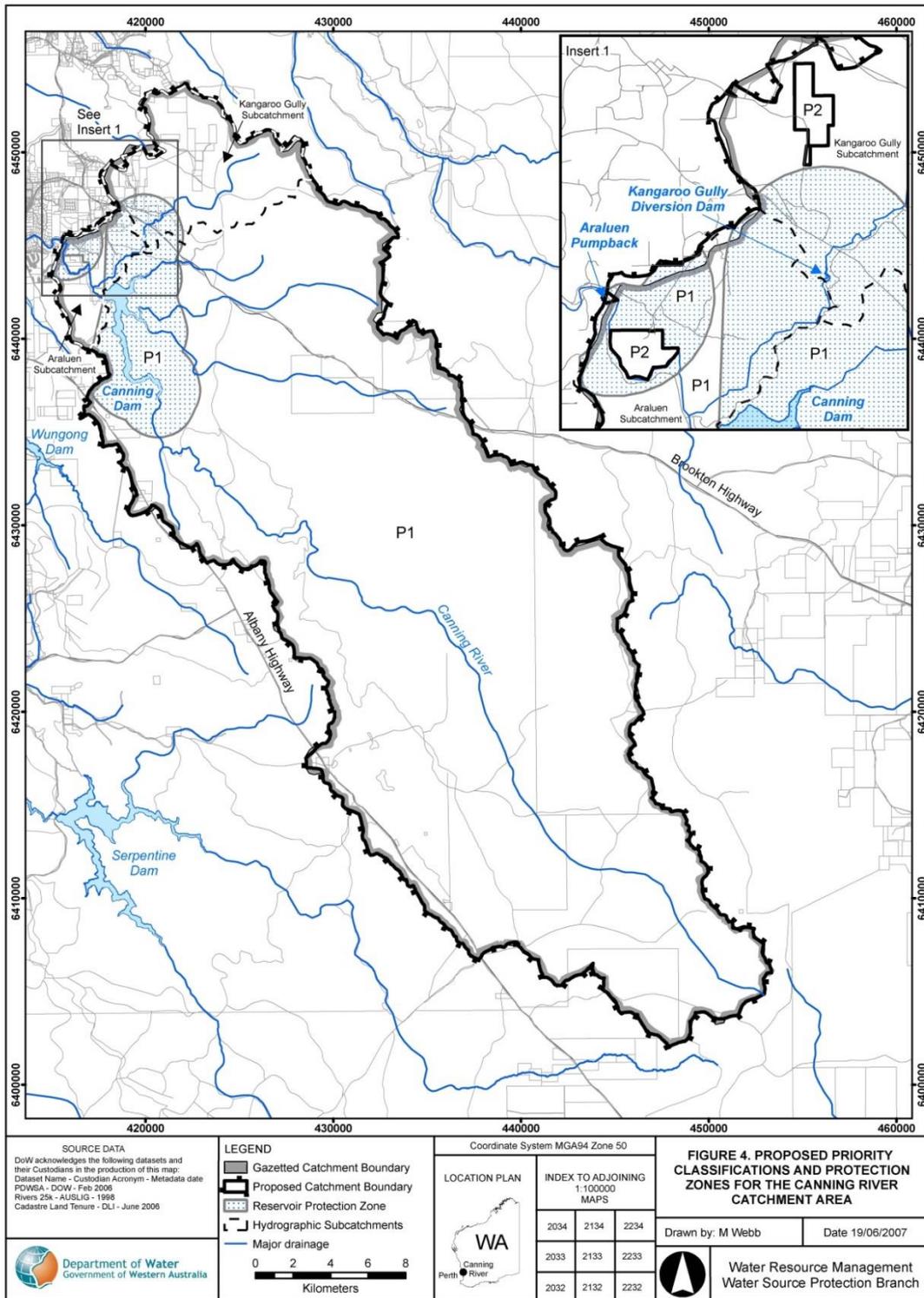
This figure shows Brookton Happy Valley Water Reserve, priority areas and wellhead protection zones. It is a groundwater source supplying drinking water to Brookton.



Extract from *Brookton Happy Valley Water Reserve drinking water source protection plan* (2008)

Appendix E – Example of a surface water PDWSA

This figure shows the Canning River Catchment Area, priority areas and reservoir protection zone. It is a surface water source providing drinking water to the Integrated Water Supply System.



Extract from *Canning River Catchment Area drinking water source protection plan (2007)*

Shortened forms

ACPOW	Advisory Committee for the Purity of Water
ADWG	<i>Australian drinking water guidelines</i>
MoU	memorandum of understanding
NHMRC	National Health and Medical Research Council
NRMMC	Natural Resource Management Ministerial Council
P1, P2, P3	priority 1, priority 2, priority 3
PDWSA	public drinking water source area
RPZ	reservoir protection zone
WAPC	Western Australian Planning Commission
WHPZ	wellhead protection zone
WQPN	water quality protection note

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