GOVERNMENT OF WESTERN AUSTRALIA

DANDARAGAN WATER RESERVE

WATER SOURCE PROTECTION PLAN

Dandaragan Town Water Supply

WATER RESOURCE PROTECTION SERIES

WATER AND RIVERS COMMISSION REPORT WRP 10

1999

WATER AND RIVERS COMMISSION

WATER AND RIVERS COMMISSION
HYATT CENTRE
3 PLAIN STREET
EAST PERTH
WESTERN AUSTRALIA 6004

TELEPHONE (08) 9278 0300
FACSIMILE (08) 9278 0301
WEBSITE: http://www.wrc.wa.gov.au

Cover Photograph: The Dandaragan Wellfield

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Water and Rivers Commission
Policy and Planning Division

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Acknowledgments

Contribution	Personnel	Title	Organisation
Supervision	Ross Sheridan	Program Manager/Protection Planning	Water and Rivers Commission
Report Preparation	Lidia Boniecka	Environmental Engineer	Water and Rivers Commission
Report Preparation	Sandra Franz	Environmental Officer	Water and Rivers Commission
Drafting	Dianne Abbott	Drafting Assistant	Water and Rivers Commission
Drafting	Nigel Atkinson	Drafting Contractor	McErry Digital Mapping Pty Ltd

For more information contact:

Program Manager, Protection Planning
Water Quality Protection Branch
Water and Rivers Commission
3 Plain Street
EAST PERTH WA 6004

Telephone: (08) 9278 0300
Facsimile: (08) 9278 0585

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Foreword

Water source protection plans

Water Source Protection Plans establish the level of protection required within Water Reserves. The plans identify sources of contamination that should be investigated and set out programs for management of the resource. Water Source Protection Plans are developed in consultation with affected landowners and industry groups and relevant government agencies.

Proclaiming Water Reserves under the *Country Areas Water Supply Act 1947*, protects the quality of water sources in country Western Australia. The Act's by-laws enable the Water and Rivers Commission to control potentially polluting activities, to regulate land use, inspect premises and to take steps to prevent or clean up pollution.

The Water and Rivers Commission aims to work pro-actively with planning agencies to incorporate water protection in the land planning process. Decisions on land use zoning and subdivision applications have a significant impact on the protection of water sources. The Commission supports the amendment of Town Planning Schemes and Development Strategies that reflect land use compatible with Water Source Protection Plans.

This Water Source Protection Plan provides a basis for establishing compatible land uses within the Water Reserve at Dandaragan and is a mechanism for practical implementation of the Commission's protection strategies. Local government decision-makers, State planning authorities and operational staff are encouraged to recognise this document as a basis for ensuring the long term protection of this groundwater resource for generations to come.

Water quality protection framework

The Water and Rivers Commission is responsible for managing and protecting Western Australia's water resources. The Commission has developed policies for the protection of public drinking water source areas that include three levels of priority classification of lands within Priority Drinking Water Source Areas (PDWSAs).

Priority 1 (P1) source protection areas are defined to ensure that there is no degradation of the water source. P1 areas are declared over land where the provision of the highest quality public drinking water is the prime beneficial land use. P1 areas would typically include land under Crown ownership. P1 areas are managed in accordance with the principle of risk avoidance and so land development is generally not permitted.

Priority 2 (P2) source protection areas are defined to ensure that there is no increased risk of pollution to the water source. P2 areas are declared over land where low intensity development (such as rural) already exists. Protection of public water supply sources is a high priority in these areas. P2 areas are managed in accordance with the principle of risk minimisation and so some development is allowed under specific guidelines.

Priority 3 (P3) source protection areas are defined to minimise the risk of pollution to the water source. P3 areas are declared over land where water supply sources need to co-exist with other land uses such as residential, commercial and light industrial developments. Protection of P3 areas is achieved through management guidelines rather than restrictions on land use. If the water source does become contaminated, then water may need to be treated or an alternative water source found.

In addition to priority classifications, wellhead protection zones and reservoir protection zones are defined to protect the water source from contamination in the immediate vicinity of production wells and reservoirs. Wellhead protection zones are usually circular, with a radius of 500 metres in P1 areas and 300 metres in P2 and P3 areas. Reservoir protection zones usually consist of a 2 kilometre buffer area around the top water level of a reservoir and include the reservoir itself. These zones do not extend outside water reserves. Special restrictions apply within these zones.

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Summary

The Dandaragan Town Water Supply is obtained from a Water Corporation wellfield, which draws groundwater from the Leederville Formation. A series of spears, drawing water from the shallow superficial groundwater aquifer is also used to augment the public water supply. The Leederville Formation is unconfined in the Dandaragan area, and therefore vulnerable to contamination.

The Dandaragan Water Reserve was proclaimed in June 1970 to cover a large proportion of the probable recharge areas. It is proposed to extend the existing Water Reserve to cover more of the recharge areas and to classify it for Priority 1 and Priority 3 source protection.

The water reserve should be managed to minimise the risk of the pollution to the water source. Therefore, signs indicating the location of the reserve should be erected, and any development proposals within the reserve should be assessed for their impact on water quality.

Extensive consultation has occurred throughout the development of this plan. A draft plan was released for comment to all key stakeholders including the Water Corporation, Ministry for Planning, Department of Environmental Protection, Department of Land Administration, Department of Conservation and Land Management, Shire of Dandaragan and the Conservation Council. These comments have been addressed in the preparation of this plan.

1. Introduction

The purpose of this report is to provide a plan to protect the groundwater resource, which is used to supply the town of Dandaragan, from contamination.

The town of Dandaragan is located approximately 160 kilometres north of Perth (Figure 1). Dandaragan is the administrative centre for Jurien, Badgingarra and Cervantes.

The existing Dandaragan Water Reserve was declared in June 1970 under the *Country Areas Water Supply Act, 1947*.

The Dandaragan region has a Mediterranean climate with warm to hot, dry summers and cool, wet winters. The average rainfall at Dandaragan is about 460 millimetres per year.

2. Hydrogeology

Dandaragan is located in the Perth Basin.

Existing production bores have been drilled into the Leederville Formation, which comprises of an interbedded sequence of sandstone, shale, siltstone and minor conglomerate.

The Leederville Formation is essentially unconfined in the Dandaragan area, although thin low-permeability sediments of the Coolyena Group may overlie it.

Groundwater flow is toward the south or south east.

The recharge areas of the Leederville Formation are located to the north west of the townsite.

Groundwater in the Leederville Formation in this area has been found at a depth of 26 metres below ground level.

Several spears, used to supplement peak demand, draw water from the shallow perched aquifer.

As the aquifers are unconfined in the Dandaragan area and the depth to water is relatively shallow, they are considered to be vulnerable to contamination.

Plate 1. Bores drilled into the Leederville aquifer (shallow spears in background).

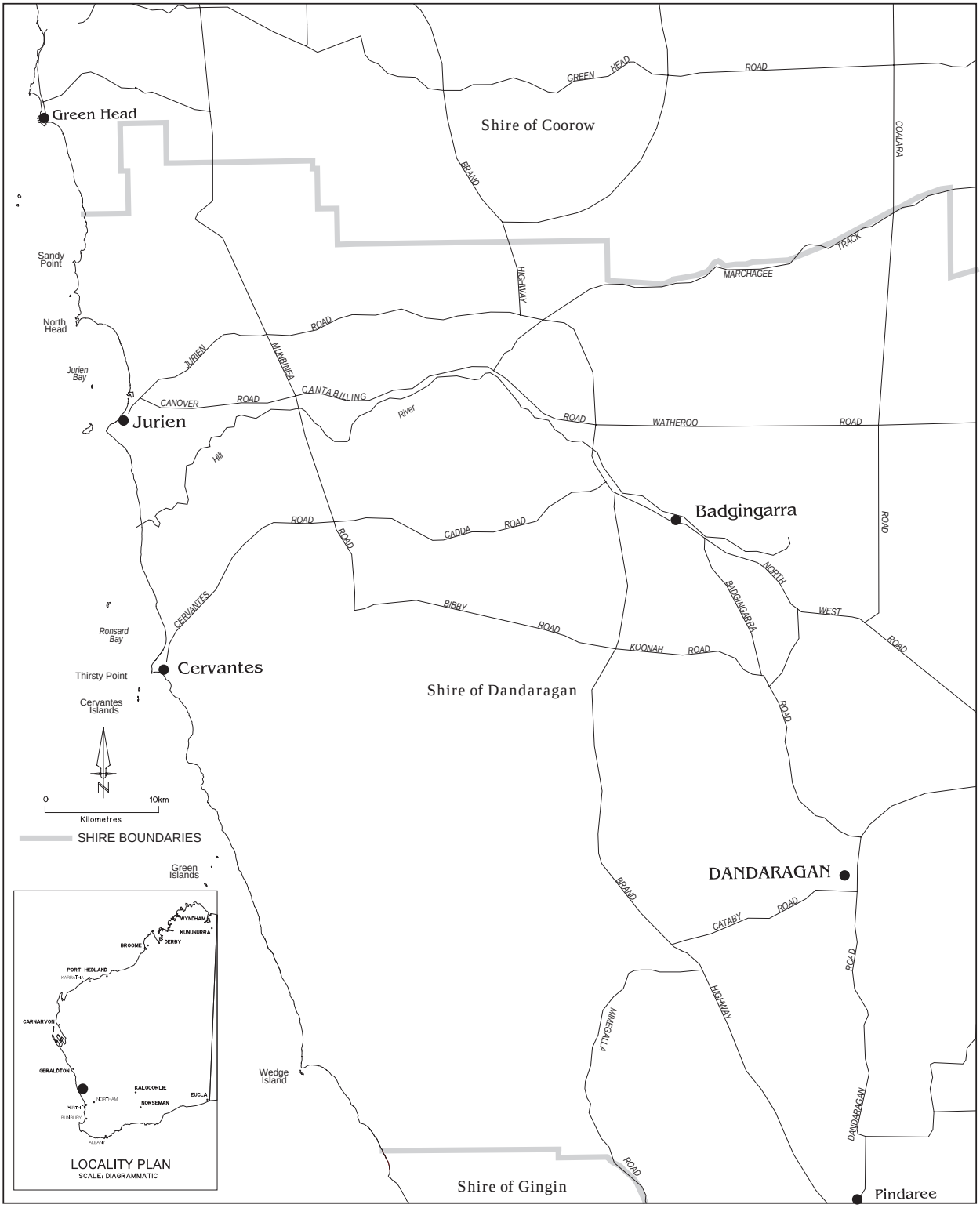


Figure 1. Dandaragan locality map

3. Scheme description

The existing Dandaragan town water supply scheme consists of two production bores (1/81 and 1/82), two monitoring bores (1/77 and 2/77), and several shallow spears (Plate 1 & Figure 2).

The Dandaragan wellfield is located in close proximity to the north east boundary of the townsite. The production bore 1/81 is screened from 106 to 114 metres below ground level, while bore 1/82 is screened between 102 and 114 metres.

The production bores operate on a duty/standby basis and the spears are only occasionally used to meet peak demand.

Water pumped from the wellfield undergoes chlorination, aeration and filtration and it is directed to a storage tank (Plate 2).

Average annual abstraction from the Dandaragan wellfield is about 40,000 kilolitres (WAWA, 1993).

Salinity in both production bores has remained stable (about 500-550 milligrams per litre Total Dissolved Salts) over the period of monitoring.

All chemical components of the water from the production bores, with the exception of iron levels in bore 1/82, are within the current Australian Drinking Water Guidelines (NH&MRC and ARMCANZ, 1996).

Plate 2. Water pumped from the Dandaragan wellfield is chemically treated and stored in the tank.

4. Existing and proposed land use

The Dandaragan wellfield is located within Reserve 36020, which is vested in the Minister for Water Resources and administered by the Water Corporation.

The recharge area is used for extensive agricultural activities, mainly stock grazing (Plate 3).

Dandaragan townsite is contained within the existing Dandaragan Water Reserve. Septic systems are used for domestic waste water disposal.

There is an active landfill site (Reserve 26950) at the north west corner of the existing Water Reserve (Figure 2).

A service station is located within the existing Water Reserve at lot 3764, downgradient of the wellfield.

The land immediately adjacent to the north of the wellfield (lot 5) is zoned for light industrial purposes. The lot is not sewered.

Future land use within the recharge area is likely to be a continuation of existing rural and residential land uses.

5. Potential for contamination

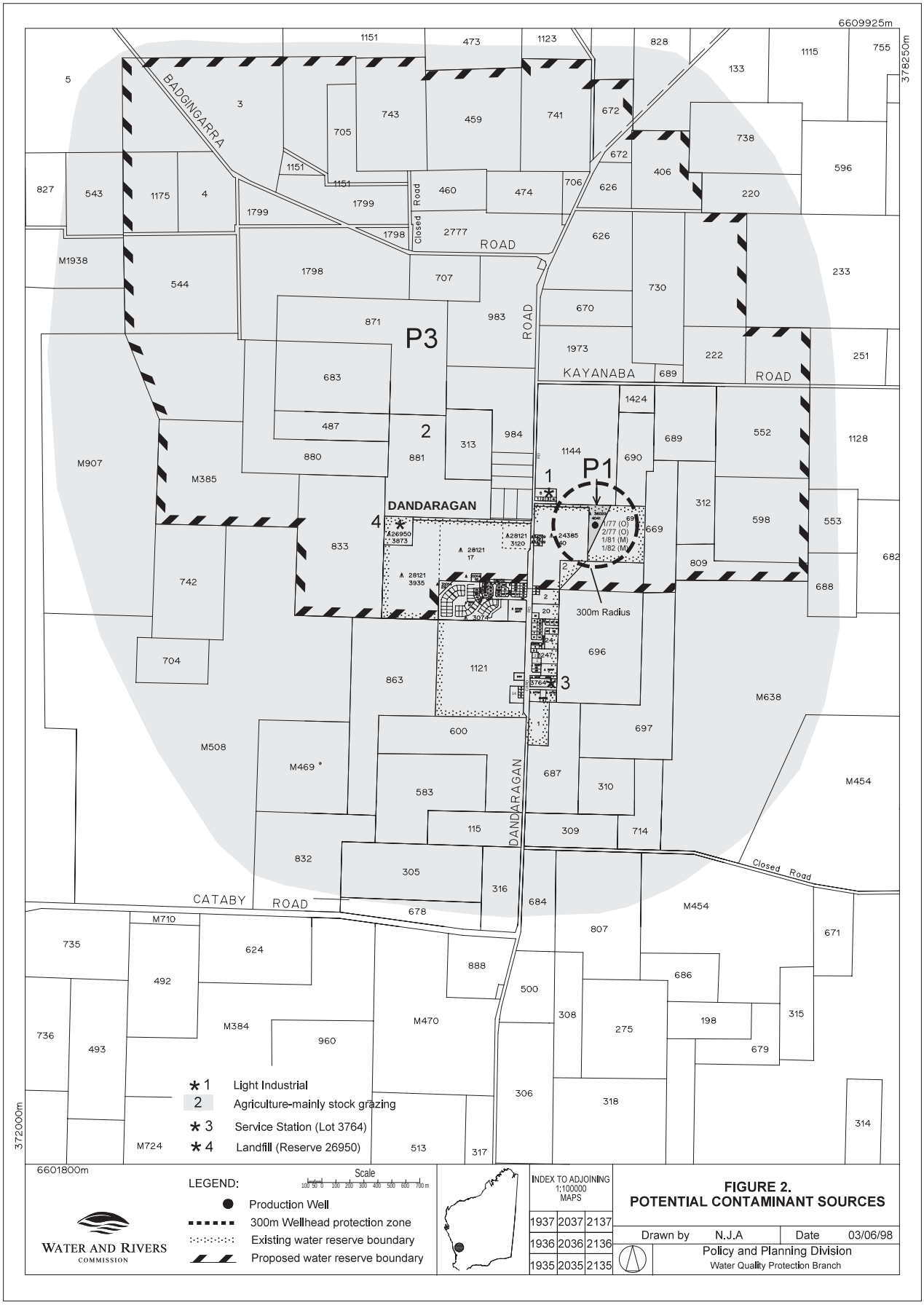
Most of the urban area, including the service station, is well downgradient and not considered to be a direct risk of contamination to the drinking water supply (Figure 2).

The light industrial subdivision has not yet been developed. Therefore the risks are not known at this stage.

The landfill site, to the east of the wellfield, does pose a risk of contamination to groundwater. However, with some uncertainty in the groundwater flow direction and its location west of the wellfield, it is unlikely to impact on water drawn for drinking water supply.

The low risks associated with the existing agricultural land uses are considered acceptable for maintenance of water quality.

Plate 3. The Water Reserve is surrounded by land used for stock grazing.


6609925m
378250m
372000m
6601800m
BADGINGARRA
ROAD
Closed Road
ROAD
KAYANABA
ROAD
DANDARAGAN
ROAD
CATABY
ROAD
Closed Road
DANDARAGAN
P1
P2
P3
300m Radius
1/77 (O)
2/77 (O)
1/81 (M)
1/82 (M)
A26950
3873
A28121
3120
A24385
50
28121
17
28121
3935
3764
1 Light Industrial
2 Agriculture-mainly stock grazing
3 Service Station (Lot 3764)
4 Landfill (Reserve 26950)
LEGEND:
Scale
100 50 0 100 200 300 400 500 600 700 m
Production Well
300m Wellhead protection zone
Existing water reserve boundary
Proposed water reserve boundary
WATER AND RIVERS
COMMISSION
INDEX TO ADJOINING 1:100000 MAPS
1937 2037 2137
1936 2036 2136
1935 2035 2135
FIGURE 2.
POTENTIAL CONTAMINANT SOURCES
Drawn by N.J.A
Date 03/06/98
Policy and Planning Division
Water Quality Protection Branch

6. Proposed proclaimed area

The existing Dandaragan Water Reserve covering the wellfield area and the townsite was proclaimed in July 1970. The current Water Reserve is not based on the most probable areas of groundwater recharge. The boundaries of the proposed Water Reserve have been amended to include the most probable recharge areas as shown in Figure 3.

The recharge areas of the Leederville Formation in the Dandaragan region are understood to be located to the north west of the townsite. However, the boundaries of the recharge zone are difficult to define accurately due to the poor delineation of the areas of Leederville Formation outcrop.

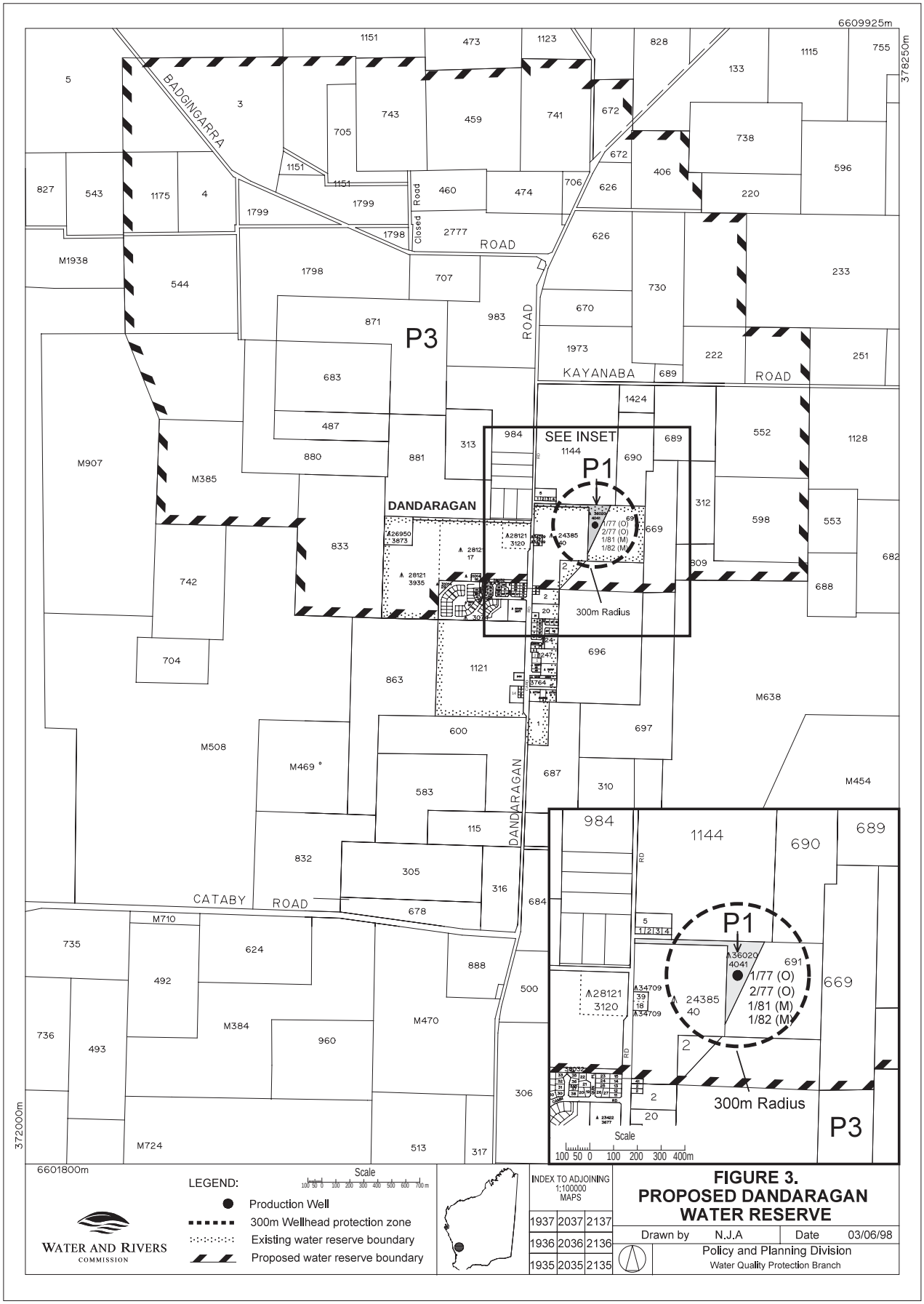
The area of the proposed Water Reserve covering the wellfield (Land Act Reserve 36020) should be classified for Priority 1 source protection for the following reasons:

- The area is in Crown ownership;
- The area is currently used for public water supply;
- Additional protection is given to the local aquifer tapped by the spears.

A circular wellhead protection zone of 300 metres radius around bore 2/82 should secure the immediate area around the wellfield. Within this wellhead protection zone special restrictions will apply to the storage of fuel and other designated substances.

The remainder of the proposed Water Reserve should be classified for Priority 3 source protection according to the following criteria:

- Significant other groundwater resources exist in the vicinity;
- The land is generally privately owned;
- The recharge area for the wellfield is difficult to define accurately;
- Land use activities within the proposed Water Reserve are compatible with Priority 3 classification.


6609925m
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LEGEND:
Production Well
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Existing water reserve boundary
Proposed water reserve boundary
WATER AND RIVERS COMMISSION
INDEX TO ADJOINING 1:100000 MAPS
1937 2037 2137
1936 2036 2136
1935 2035 2135
FIGURE 3.
PROPOSED DANDARAGAN WATER RESERVE
Drawn by N.J.A
Date 03/06/98
Policy and Planning Division
Water Quality Protection Branch

Recommendations

1. The proposed Dandaragan Water Reserve should be gazetted under the *Country Areas Water Supply Act 1947*.

2. Planning strategies should incorporate the management principles outlined in the Water and Rivers Commission's *Land use compatibility in Public Drinking Water Source Areas* (Appendix 1) and reflect the Priority 1 and Priority 3 classifications given to the Water Reserve.

3. All development proposals in the proposed Water Reserve which are likely to impact on water quality should be referred to the Water and Rivers Commission. This particularly would apply to the light industrial subdivision to the north west of the wellfield.

4. Signs should be erected along the boundaries of the Water Reserve to define the reserve and promote public awareness of the need to protect water quality.

5. A process should be put in place to address any spillage of pollutants within the Water Reserve.

6. A surveillance program should be established to identify any incompatible land uses or potential contaminant threats within the Water Reserve.

7. Implementation of these recommendations should be reviewed one year after this plan is endorsed. A full review of this protection plan should be undertaken approximately every five years.

Implementation strategy

No.	Description	Implemented by	Timing
1.	Gazettal of Water Reserve.	Program Manager, Protection Planning (WRC).	1999-2000
2.	Incorporation into land planning strategies.	Shire of Dandaragan.	Ongoing
3.	Referral of development proposals: (i) WRC to provide the Shire of Dandaragan with guidelines for referral of development proposals. (ii) referral of development proposals.	(i) Program Manager, Assessment and Advice (WRC) (ii) Shire of Dandaragan, Ministry for Planning and Department of Environmental Protection.	(i) 1999-2000 (ii) Ongoing
4.	Erection of signs: (i) development of guidelines for signage. (ii) determine number and location of signs required. (iii) erect signs.	(i) Program Manager, Protection Planning (WRC). (ii) Regional Manager (WRC) in consultation with Water Corporation. (iii) Regional Manager (WRC) in consultation with the Water Corporation.	(i) 1999-2000 (ii) 1999-2000 (iii) 2000-2001

(continued)

5.	Incidents covered by WESTPLAN – HAZMAT in the Dandaragan Water Reserve should be addressed through the following measures: (i) The Dandaragan Local Emergency Management Advisory Committee (through the Northam Emergency Management District) being familiar with the location and purpose of the Dandaragan Water Reserve. (ii) The locality plan for the Dandaragan Water Reserve being provided to the Fire and Rescue Services headquarters for the HAZMAT Emergency Advisory. (iii) The Water Corporation advising the HAZMAT Emergency Advisory Team during incidents in the Dandaragan Water Reserve. Personnel dealing with WESTPLAN - HAZMAT incidents in the area given ready access to a locality map of the Water Reserve and training to understand the potential impacts of spills on the groundwater resource.	(i) Dandaragan Local Emergency Management Advisory Committee through WRC (Swan-Goldfields-Agricultural region) (ii) WRC (Swan-Goldfields-Agricultural region) (iii) Water Corporation	(i) 2000-2001 (ii) 2000-2001 (iii)2000-2001
6.	Surveillance program: (i) develop guidelines for the surveillance of Water Reserves. (ii) implement the surveillance program.	(i) Program Manager, Assessment and Advice (WRC). (ii) Regional Manager (WRC) in consultation with the Water Corporation.	(i) 1999-2000 (ii) On completion of surveillance guidelines.
7.	Review of this plan and recommendations.	Water Quality Protection Branch (WRC).	(i) Initial review-2000-2001. (ii) Full review-2004-2005.

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Water Authority of Western Australia 1993, *Gingin Groundwater Area Management Plan.* Report No. WG 160, October 1993.

Western Australian Planning Commission 1996, *Central Coast Regional Strategy*.

Glossary

Abstraction	Pumping groundwater from an aquifer.
Allocation	The quantity of groundwater permitted to be abstracted by a well licence, usually specified in kilolitres/year (kL/a).
Alluvium (alluvial)	Detrital material which is transported by streams and rivers and deposited.
Aquifer	A geological formation or group of formations capable of receiving, storing and transmitting significant quantities of water.
Bore	A narrow, lined hole drilled to monitor or withdraw groundwater.
Borefield	A group of bores to monitor or withdraw groundwater.
Catchment	The area of land which intercepts rainfall and contributes the collected water to surface water (streams, rivers, wetlands) or groundwater.
Diffuse source pollution	Pollution originating from a widespread area (e.g. urban stormwater runoff, agricultural runoff). The opposite of point source.
Effluent	The liquid, solid or gaseous wastes discharged by a process, treated or untreated.
Groundwater	Water which occupies the pores and crevices of rock or soil.
Hydrogeology	The study of groundwater, especially relating to the distribution of aquifers, groundwater flow and groundwater quality.
Leaching/ leachate	The process by which materials such as organic matter and mineral salts are washed out of a layer of soil or dumped material by being dissolved or suspended in percolating rainwater; the material washed out is known as leachate. Leachate can pollute groundwater and waterways.
mAHD	Australian Height Datum. Height in metres above Mean Sea Level +0.026 m at Fremantle.
Nutrients	Minerals dissolved in water, particularly inorganic compounds of nitrogen (nitrate and ammonia) and phosphorus (phosphate) which provide nutrition (food) for plant growth. Total nutrient levels include the inorganic forms of an element plus any bound in organic molecules.
Nutrient load	The amount of nutrient reaching the waterway over a given time (usually per year) from its catchment area.
Pesticides	Collective name for a variety of insecticides, fungicides, herbicides, algicides, fumigants and rodenticides used to kill organisms.
Point source pollution	Specific localised source of pollution (e.g. sewage or effluent discharge, industrial waste discharge).
Pollution	Water pollution occurs when waste products or other substances (e.g. effluent, litter, refuse, sewage or contaminated runoff) change the physical, chemical, biological or thermal properties of the water, adversely affecting water quality, living species and beneficial uses.

Public Water Supply Area	(PWSA) As for UWPCA but allowing the taking of groundwater for public supplies.
Recharge	Water infiltrating to replenish an aquifer.
Recharge area (recharge zone)	An area through which water from groundwater catchment percolates to replenish (recharge) an aquifer. An unconfined aquifer is recharged by rainfall throughout its distribution.
Runoff	Water that flows over the surface from a catchment area, including streams.
Saltwater intrusion	The inland intrusion of saltwater into a layer of fresh groundwater.
Scheme supply	Water diverted from a source (or sources) by a water authority or private company and supplied via a distribution network to customers for urban, industrial or irrigation use.
Treatment	Application of techniques such as settlement, filtration and chlorination, to render water suitable for specific purposes including drinking and discharge to the environment.
Unconfined aquifer	An aquifer containing water, the upper surface of which is lower than the top of the aquifer. The upper surface of the groundwater within the aquifer is called the water table. An aquifer containing water with no upper non-porous material to limit its volume or exert pressure (see aquifer).
Underground Water Pollution Control Area	(UWPCA) An area defined under the Metropolitan Water Supply, Sewerage and Drainage Act, in which restrictions are put on activities that may pollute the groundwater.
Wastewater	Water that has been used for some purpose and would normally be treated and discarded. Wastewater usually contains significant quantities of pollutant.
Water quality	The physical, chemical and biological measures of water.
Watertable	The upper saturated level of the unconfined groundwater.
Well	A narrow lined hole drilled to enable the withdrawal of groundwater.
Wellfield	A group of wells used to abstract groundwater.

Appendix 1

Land use compatibility in Public Drinking Water Source Areas

LAND USE COMPATIBILITY IN PUBLIC DRINKING WATER SOURCE AREAS

Purpose

To provide information for activities that may impact on the quality of the State's water resources.

These notes provide a basis for developing formal guidelines in consultation with key stakeholders.

Scope

These notes apply to existing and proposed activities within Public Drinking Water Source Areas (PDWSAs).

PDWSAs include Underground Water Pollution Control Areas, Water Reserves and public water supply catchment areas declared under the *Metropolitan Water Supply, Sewerage and Drainage Act 1909*, and the *Country Areas Water Supply Act 1947*.

General requirements

The following notes reflect the Commission's current position. They are recommendations only, and may be varied at the discretion of the Commission.

Overview of Protection Framework

The Water and Rivers Commission is responsible for managing and protecting Western Australia's water resources. The Commission has developed policies for the protection of public drinking water source areas, which are based on three levels of priority classification.

Priority 1 (P1) source protection areas are defined to ensure that there is **no degradation** of the water source. P1 areas are declared over land where the provision of the highest quality public drinking water is the prime beneficial land use. P1 areas would typically include land under Crown ownership. P1 areas are managed in accordance with the principle of **risk avoidance** and so land development is generally not permitted.

Priority 2 (P2) source protection areas are defined to ensure that there is **no increased risk of pollution** to the water source. P2 areas are declared over land where low intensity development (such as rural) already exists. Protection of public water supply sources is a high priority in these areas. P2 areas are managed in accordance with the principle of **risk minimisation** and so some development is allowed under specific guidelines.

Priority 3 (P3) source protection areas are defined to **minimise the risk of pollution** to the water source. P3 areas are declared over land where water supply sources need to co-exist with other land uses such as

residential, commercial and light industrial developments. Protection of P3 areas is achieved through **management guidelines** rather than restrictions on land use. If the water source does become contaminated, then water may need to be treated or an alternative water source found.

In addition to priority classifications, **well-head protection zones** and **reservoir protection zones** are defined to protect the water source from contamination in the immediate vicinity of production wells and reservoirs. Well-head protection zones are usually circular, with a radius of 500 metres in P1 areas and 300 metres in P2 and P3 areas. Reservoir protection zones usually consist of a 2 kilometre area around the top water level of a reservoir and include the reservoir itself. These zones do not extend outside water reserves. Additional restrictions apply within these zones.

Land Use Compatibility Tables

These tables should be used as a guideline only. Further information relating to land use and developments within PDWSAs including those not listed in the table, can be obtained from the Commission's Water Quality Protection Branch.

These tables do not replace the need for assessment by the Commission. Please consult the Commission regarding any land use proposals in Public Drinking Water Source Areas that may impact on water resources.

Definitions Used In The Following Tables

Compatible	The development / land use is compatible with the management objectives of the priority classification.
Incompatible	The development / land use is incompatible with the management objectives of the priority classification.
Restricted	The development / land use may be compatible with the management objectives of the priority classification, with appropriate site management practices. Restricted activities should be referred to the Commission for assessment on a case specific basis.
Extensive	Where limited additional inputs are required to the land to support the desired land use. eg supplementary feed during seasonal dry periods.
Intensive	Where regular additional inputs are required to support the desired land use. eg irrigation, additional feed, fertilisers.

More information

We welcome your comment on these notes. They will be updated from time to time as comments are received or industry standards change.

If you wish to comment on the notes or require more information, please contact the Commission's Water Quality Protection Branch at the Hyatt Centre in East Perth.
Phone: (08) 9278 0300 (business hours) or Fax:(08) 9278 0585

Land Use Compatibility Tables

AGRICULTURE - ANIMALS

Development	**Priority 1**	**Priority 2**	**Priority 3**
Apiary	Restricted	Restricted	Restricted
Aquaculture eg. marron farms, fish farms, algae culture	Incompatible	Restricted	Restricted
Dairy Farming	Incompatible	Restricted	Restricted
Feedlots	Incompatible	Incompatible	Restricted
Livestock grazing (extensive)	Restricted	Compatible	Compatible
Livestock grazing (intensive)	Incompatible	Incompatible	Restricted[11]
Piggeries	Incompatible	Incompatible	Incompatible
Poultry farming (housed)	Incompatible	Restricted	Restricted
Stables	Incompatible	Restricted	Compatible
Stockholding and saleyards	Incompatible	Incompatible[7]	Restricted[7]

AGRICULTURE - PLANTS

Development	**Priority 1**	**Priority 2**	**Priority 3**
Broad acre cropping i.e. non-irrigated	Incompatible	Restricted[1]	Compatible
Floriculture (extensive)	Incompatible	Restricted	Compatible
Floriculture (intensive)	Incompatible	Incompatible	Restricted
Field horticulture	Incompatible	Incompatible	Restricted
Hydroponic horticulture	Incompatible	Restricted	Restricted
Orchards	Incompatible	Restricted	Compatible
Potted Nurseries	Incompatible	Restricted	Compatible
Silviculture (tree farming)	Restricted	Restricted	Compatible
Turf Farms	Incompatible	Incompatible	Restricted
Viticulture (wine & table grapes)	Incompatible	Restricted	Compatible

DEVELOPMENT - COMMERCIAL

Development	Priority 1	Priority 2	Priority 3
Aircraft Servicing	Incompatible	Incompatible	Restricted[6]
Amusement Centres	Incompatible	Incompatible	Compatible[6]
Automotive businesses	Incompatible	Incompatible	Restricted[6]
Boat Servicing	Incompatible	Incompatible	Restricted[6]
Caravan and trailer hire	Incompatible	Incompatible	Restricted[6]
Vehicle parking (commercial)	Incompatible	Incompatible	Compatible
Consulting rooms	Incompatible	Incompatible[7]	Compatible[6]
Cottage Industries	Restricted	Restricted	Compatible
Drive in / take-away food shops	Incompatible	Incompatible	Compatible[6]
Drive -in theatres	Incompatible	Incompatible	Compatible[6]
Dry Cleaning Premises	Incompatible	Incompatible	Restricted[6]
Farm supply centres	Incompatible	Incompatible[7]	Restricted
Fuel depots	Incompatible	Incompatible	Restricted
Garden Centres	Incompatible	Incompatible	Compatible
Local shops	Incompatible	Incompatible[7]	Compatible
Markets	Incompatible	Incompatible	Compatible[6]
Milk depots	Incompatible	Incompatible	Restricted
Restaurants	Incompatible	Incompatible	Compatible
Service Stations	Incompatible	Incompatible	Restricted
Transport Depots	Incompatible	Incompatible	Restricted
Veterinary Clinics / hospitals	Incompatible	Incompatible[7]	Restricted
Vehicle wrecking and machinery	Incompatible	Incompatible	Restricted

DEVELOPMENT - INDUSTRIAL

Development	Priority 1	Priority 2	Priority 3
General Industry	Incompatible	Incompatible	Restricted[6]
Heavy Industry	Incompatible	Incompatible	Incompatible
Light Industry	Incompatible	Incompatible	Restricted[6]
Power Stations	Incompatible	Incompatible	Incompatible

DEVELOPMENT - URBAN

Development	Priority 1	Priority 2	Priority 3
Aged and dependent persons	Incompatible	Incompatible	Compatible[6]
Amenity buildings	Incompatible	Restricted	Compatible
Airports or landing grounds	Incompatible	Incompatible	Restricted[6]
Cemeteries	Incompatible	Incompatible	Restricted
Civic buildings	Incompatible	Restricted	Compatible[6]
Clubs -sporting, recreation or community	Restricted	Restricted	Compatible[6]
Community halls	Restricted	Restricted	Compatible
Family Day Care Centres	Incompatible	Restricted	Compatible[6]
Funeral parlours	Incompatible	Incompatible	Compatible[6]
Health Centres	Incompatible	Incompatible	Compatible[6]
Hospitals	Incompatible	Incompatible	Restricted[6]
Medical centres	Incompatible	Incompatible	Compatible[6]

EDUCATION / RESEARCH

Development	Priority 1	Priority 2	Priority 3
Education centres	Restricted	Restricted	Compatible[6]
Primary / Secondary Schools	Incompatible	Incompatible	Compatible[6]
Scientific Research Institutions	Restricted	Restricted	Compatible
Universities	Incompatible	Incompatible	Restricted[6]

MINING AND MINERAL PROCESSING

Development	Priority 1	Priority 2	Priority 3
Extractive Industries	Restricted[2]	Restricted[2]	Restricted[2]
Mineral Exploration	Restricted[4]	Restricted[4]	Restricted[4]
Mining and mineral processing	Restricted[4]	Restricted[4]	Restricted[4]
Tailings Dams	Incompatible	Incompatible	Restricted

PROCESSING OF ANIMALS / ANIMAL PRODUCTS

Development	Priority 1	Priority 2	Priority 3
Abattoirs	Incompatible	Incompatible	Incompatible
Cheese / butter factories	Incompatible	Incompatible	Restricted[6]
Food Processing	Incompatible	Incompatible	Restricted[6]
Tanneries	Incompatible	Incompatible	Incompatible
Wool-scours	Incompatible	Incompatible	Incompatible

PROCESSING OF PLANTS / PLANT PRODUCTS

Development	Priority 1	Priority 2	Priority 3
Breweries	Incompatible	Incompatible	Restricted[6]
Composting / soil blending (commercial)	Incompatible	Incompatible	Restricted
Vegetable / food processing	Incompatible	Incompatible	Restricted[6]
Wineries	Incompatible	Incompatible	Restricted

SUBDIVISION

Development	Priority 1	Priority 2	Priority 3
Dog Kennel Subdivisions	Incompatible	Restricted	Restricted
Rural - minimum lot size = 4 hectares (un-sewered)	Incompatible	Compatible	Compatible
Rural - minimum lot size = 1 hectare (un-sewered)	Incompatible	Incompatible	Compatible
Special rural - minimum lot size = 2 hectares (un-sewered)[5]	Incompatible	Restricted[8]	Restricted[8]
Special rural - minimum lot size = 1 hectare (un-sewered)[5]	Incompatible	Incompatible	Restricted[8,]
Urban residential	Incompatible	Incompatible	Compatible[6]

Note: Subdivision of land to lots of any size is incompatible within Priority 1 areas.

SPORT AND RECREATION

Development	Priority 1	Priority 2	Priority 3
Equestrian centres	Incompatible	Incompatible	Compatible
Golf courses	Incompatible	Incompatible	Restricted
Irrigated recreational parks	Incompatible	Restricted	Restricted
Motor sports i.e permanent racing facilities	Incompatible	Incompatible	Restricted
Public Swimming Pools	Incompatible	Restricted	Restricted
Rifle Ranges	Restricted	Restricted	Compatible
Temporary recreational activities (active) eg four wheel driving, car rallies	Incompatible	Restricted[3]	Restricted[3]
Temporary recreational activities (passive) eg. horse riding, bush walking	Restricted	Restricted	Restricted

STORAGE OF TOXIC AND HAZARDOUS SUBSTANCES (THS)

Development	Priority 1	Priority 2	Priority 3
Above ground storage of THS	Restricted[13]	Restricted[13]	Restricted[13]
Bulk Storage Facilities for THS	Incompatible	Incompatible	Restricted[12]
Underground storage tanks for THS	Incompatible	Incompatible	Restricted

TOURISM ACCOMMODATION

Development	Priority 1	Priority 2	Priority 3
Bed and Breakfast accommodation	Incompatible	Restricted	Compatible
Caravan Parks	Incompatible	Incompatible	Restricted[6]
Holiday accommodation eg farm chalets	Incompatible	Restricted[9]	Compatible[6]
Motels, lodging houses, hostels	Incompatible	Incompatible	Compatible[6]

WASTE TREATMENT AND MANAGEMENT

Development	Priority 1	Priority 2	Priority 3
Deep well injection of liquid wastes	Incompatible	Incompatible	Incompatible
Class I, II and III Landfills	Incompatible	Incompatible	Restricted
Class IV and V Landfills	Incompatible	Incompatible	Incompatible
Recycling depots	Incompatible	Incompatible	Restricted
Refuse transfer stations	Incompatible	Incompatible	Restricted
Sewers (Gravity)	Incompatible	Incompatible	Compatible
Sewers (Pressure Mains)	Incompatible	Restricted	Compatible
Sewage pump station	Incompatible	Restricted[13]	Restricted
Used tyre storage facilities (wholesale)	Incompatible	Incompatible	Incompatible
Wastewater treatment plants	Incompatible	Incompatible	Restricted
Water treatment plants	Restricted	Restricted	Restricted

OTHER DEVELOPMENTS

Development	Priority 1	Priority 2	Priority 3
Caretaker's housing	Restricted	Restricted	Compatible
Construction projects	Restricted	Restricted	Restricted
Forestry	Restricted[1]	Compatible	Compatible
National Parks	Compatible	Compatible	Compatible
Nature Reserves	Compatible	Compatible	Compatible
Communications receivers/ transmitters	Restricted	Restricted	Restricted
Major Transport Routes	Incompatible	Restricted[10]	Compatible

Reference notes:

1. Restrictions apply to fertiliser application rates, with strict controls on the application of pesticides and field operations.
2. Restrictions apply to the storage of fuels and chemicals, with strict guidelines for rehabilitation.
3. Restrictions on the use of fuel and chemicals apply.
4. Subject to conditions placed on lease.
5. Special rural development requires appropriate planning justification, including provisions in the town planning scheme text.
6. Must be connected to deep sewerage, where practical, or otherwise to an approved waste disposal system that meets water quality protection objectives.
7. May be permitted if this use is incidental to the overall land use in the area and consistent with planning strategies.
8. Restrictions apply to siting of effluent disposal systems in areas with poor land capability and a shallow depth to groundwater.
9. Restrictions apply on density of accommodation.
10. Restrictions apply on road design and construction and the types of goods that may be carried.
11. Restrictions apply to stocking levels.
12. May be permitted if the type, volume and storage mechanisms for chemicals are compatible with water quality protection objectives.
13. Activity is incompatible in a wellhead protection zone.