GOVERNMENT OF WESTERN AUSTRALIA

# CERVANTES WATER RESERVE

# WATER SOURCE PROTECTION PLAN

## Cervantes Town Water Supply

WATER RESOURCE PROTECTION SERIES

WATER AND RIVERS COMMISSION REPORT WRP 8

1999

WATER AND RIVERS COMMISSION

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*Cover Photograph: The Pinnacles - Nambung National Park*

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## Cervantes Town Water Supply

Water and Rivers Commission
Policy and Planning Division

WATER AND RIVERS COMMISSION
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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 Cervantes 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

Cervantes is a fishing and holiday town located about 230 kilometres north of Perth in the Shire of Dandaragan. The public water supply is obtained from a Water Corporation wellfield, which draws water from the Tamala Limestone. The Tamala Limestone is an unconfined aquifer vulnerable to contamination.

The proposed Water Reserve includes the wellfield and recharge areas. It also provides protection for future drinking water supplies as the wellfield develops. The immediate area of the current wellfield at Cervantes and all land within the proposed Water Reserve belonging to the Crown should be classified for Priority 1 source protection. The remaining part of the proposed Cervantes Water Reserve should be classified for Priority 2 source protection.

The Water Reserve should be managed to minimise the risk of the pollution to the water source. 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 Cervantes, from contamination.

Cervantes is a holiday town located approximately 230 kilometres north of Perth in the Shire of Dandaragan (Figure 1). The Pinnacles (Nambung National Park) attracts a growing number of tourists to the Cervantes region and increases its value as a recreation centre. About 150,000 tourists per year visit the national park.

Cervantes is also an important centre for the Western Australian rock lobster fishing industry.

The region experiences a temperate climate with a winter rainfall pattern. Rainfall data is not recorded for Cervantes, but the average rainfall for nearby Jurien Bay (25 kilometres north) is about 560 millimetres.

The existing water scheme supplying Cervantes consists of four shallow bores located 4 kilometres east of the townsite (Plate 1). The Cervantes wellfield is located within Land Act Reserve 24522 which is vested in the National Parks and Nature Conservation Authority.

There is no existing Water Reserve declared under the Country Areas Water Supply Act to protect the water source.

**Plate 1. Production bore 2/72.**

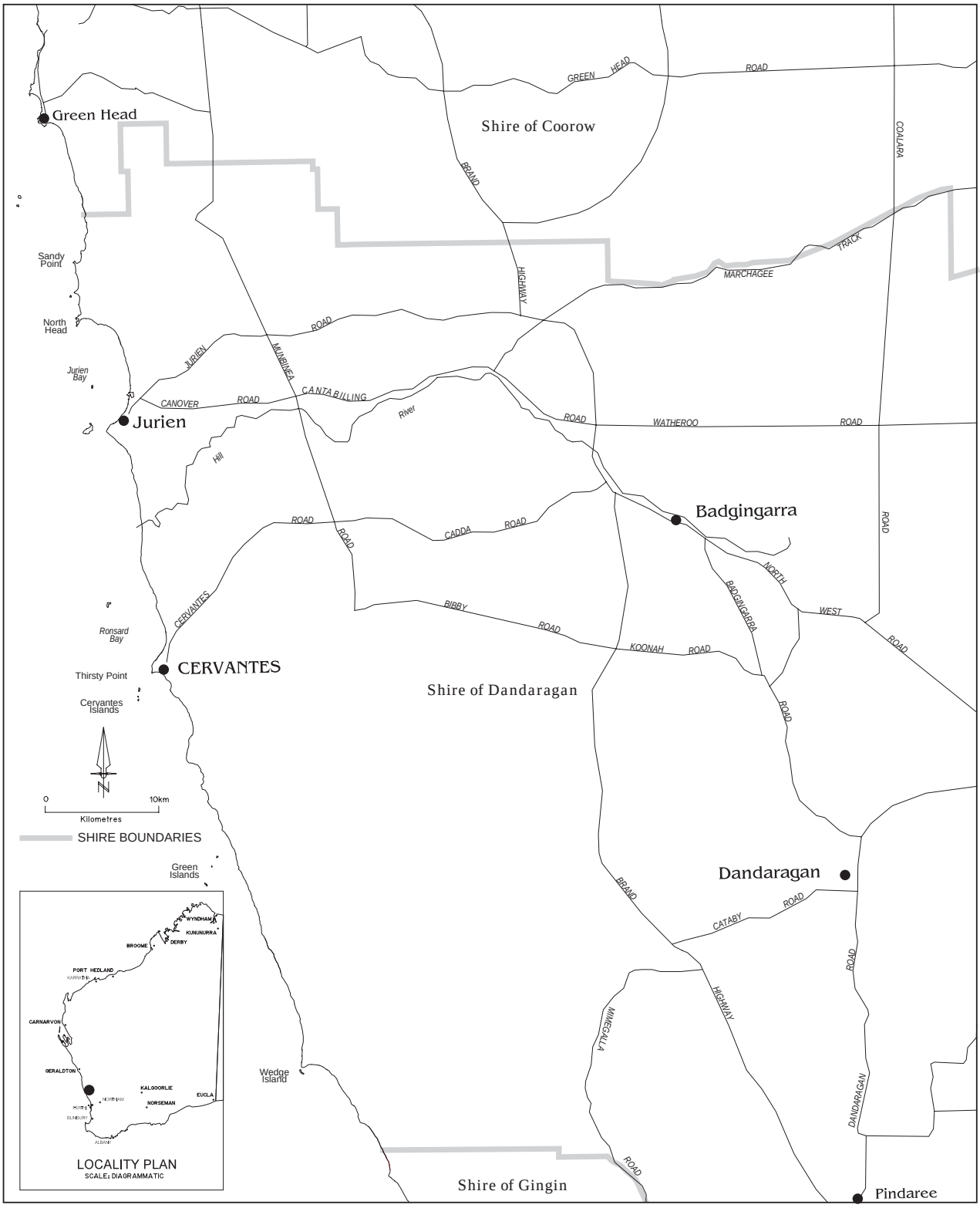



**Figure 1. Cervantes locality map**

## 2. Hydrogeology

Cervantes is located in the north of the Perth Basin. The Cervantes wellfield draws water from the Pleistocene Tamala Limestone, a part of the superficial formations containing hard limestone interbedded with minor sandy limestone. The Tamala Limestone is about 40 metres thick and extends inland for about 10 to 15 kilometres. In the vicinity of the wellfield the Tamala Limestone overlies the Kockatea Shale which has low permeability.

The depth to the water table in the Cervantes area is shallow and varies from 3 to 8 metres below ground level. Therefore, the Tamala Limestone formation in the Cervantes region is considered to be vulnerable to contamination.

Groundwater flow is to the west discharging to the ocean. Groundwater recharge is mainly by direct infiltration of rainfall, westerly flow from the Guildford Formation and upward flow from the underlying Mesozoic sediments. Occasional recharge of mainly brackish groundwater from the Nambung River also occurs in this area.

## 3. Scheme description

The existing Cervantes town water supply scheme consists of four production bores (2/72, 1/76, 1/85 and 7/91) spaced about 350 metres apart, one observation bore (6/91) and two abandoned bores (1/89 and 1/72). The production bores are screened in the shallow aquifer between 7 and 20 metres below ground level. The wellfield operates on a duty/standby basis using two bores on and two off. This permits the aquifer to recover and spreads the draw over the entire wellfield.

Pump test analyses for the Cervantes wellfield show a very transmissive aquifer and accordingly high possible production rates. Since there is a possibility of salt water intrusion in this area, maximum recommended production rates have been determined below the aquifer capacity. The average production capacity of the existing Cervantes water supply scheme has been restricted to about 260,000 kilolitres per year which is below the safe yield of 314,000 kilolitres per year (WAWA, 1994). Abstraction in 1994/95 was approximately 184,092 kilolitres (WAWA, 1995).

Salinity in production bore 1/85 has been decreasing since 1988, while in bores 1/76 and 2/72 has increased. Salinity levels in bore 1/76 have been recorded above 1000 milligrams per litre Total Dissolved Salts. This is a result of movement of the saltwater interface between the wellfield and the coast.

Water samples from the bores and the tank outlets at Cervantes have generally been in accordance with the Australian Drinking Water Guidelines (NH&MRC and ARMCANZ, 1996), There is no evidence indicating contamination of the aquifer.

## 4. Existing and proposed land use

The Cervantes wellfield is located in Reserve 24522, which is vested in the National Parks and Nature Conservation Authority (Figure 2). The purpose of the reserve is for conservation and water protection and supply. This reserve is covered with undisturbed native vegetation.

A large part of the recharge area (the proposed Cervantes Water Reserve) is taken up by the Southern Beekeepers' Nature Reserve 36053. This is gazetted as a 'C' class reserve for the purpose of 'Apiculture and the Conservation of Flora'. This reserve is vested in the National Parks and Nature Conservation Authority.

It is proposed to upgrade the status of the reserve to 'A' class miscellaneous reserve and amend its purpose to 'Conservation, Recreation, Apiculture and Water'. Land use activities within miscellaneous reserves are normally related to wildlife conservation, recreation and historical features.

The remaining part of the recharge area is private land which is used for sheep grazing and other extensive agricultural activities.

Future activities within the proposed Water Reserve are likely to be a continuation of the existing conservation and rural land use.

## 5. Potential for contamination

There are few existing or potential groundwater contaminant sources in the immediate vicinity of the Cervantes wellfield.

The existing extensive agricultural land uses do not pose a risk to the town water supply.

The main road to Cervantes passes through the recharge area of the aquifer. With the large volume of traffic associated with the tourist industry there is some risk of fuel spillages caused by vehicle accidents.

## 6. Proposed proclaimed area

It is proposed to proclaim a Water Reserve to protect the recharge areas, which supply water to Cervantes. The proposed boundary is shown in Figure 2.

The eastern boundary of the proposed Water Reserve has been defined along the eastern limit of the Tamala Limestone, covering the key recharge areas. The northern and southern extension of the proposed Water Reserve allows for future public water supply development. The western boundary is located along a line sufficiently downgradient of any potential wellfield such that the zone of influence of any bore will not extend outside the Water Reserve.

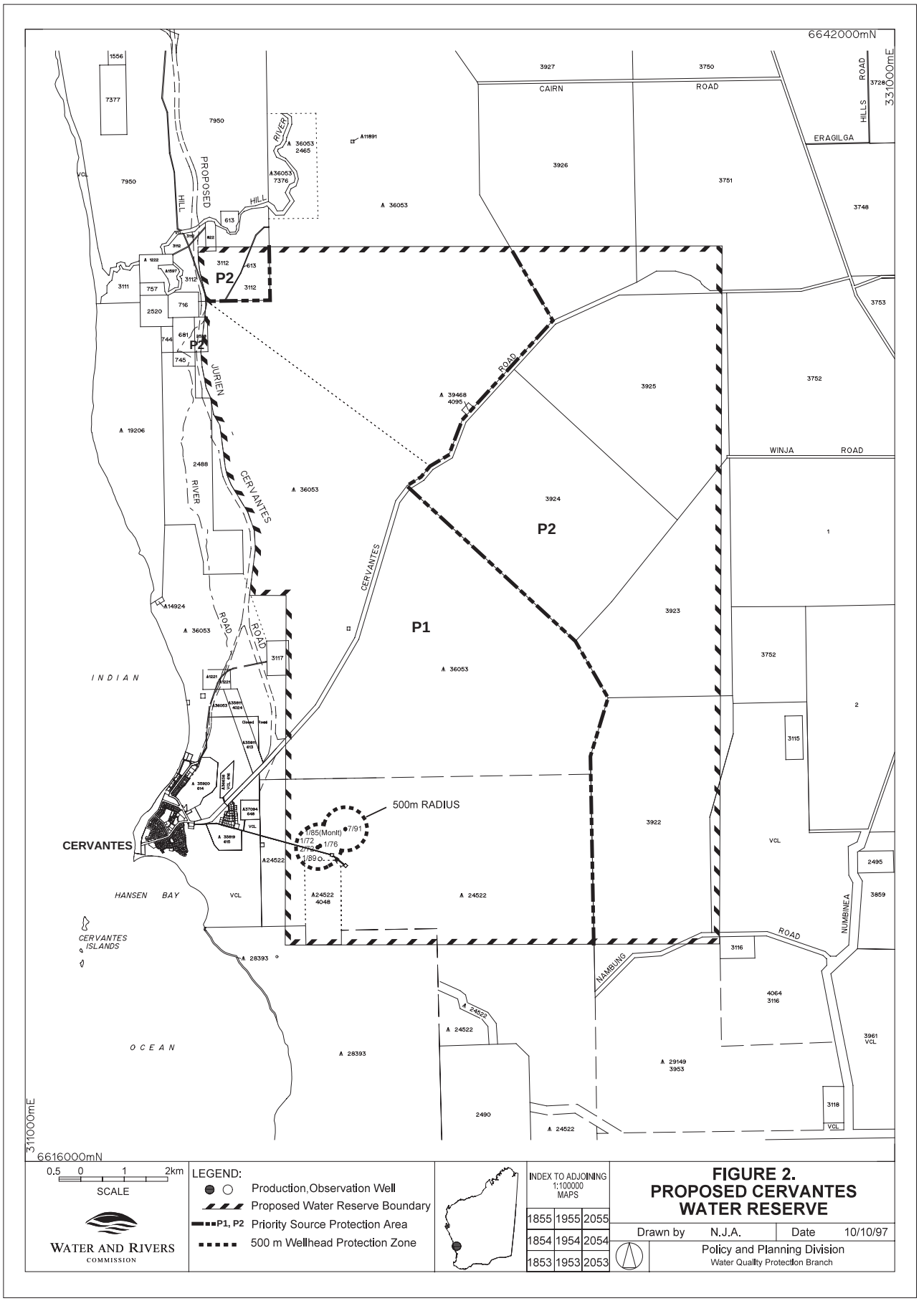
The immediate area of the current wellfield and the Southern Beekeepers' Nature Reserve 36053 should be classified for Priority 1 source protection area according to the following criteria:

- The area covers key recharge zones for groundwater that are presently being used for public water supply and planned for future expansion;
- The wellfield is of strategic importance to the town of Cervantes, and the maintenance of a high quality water supply has significant benefits to the community;
- The water quality in the area is of a pristine nature;
- The aquifer is very vulnerable to contamination;
- The area is largely undeveloped, and land development proposals can be directed to other less sensitive areas;
- Priority 1 classification is compatible with the objective for the National Park/Nature Reserve.

Circular wellhead protection zones measuring 500 metres in diameter should be established around each production bore as shown in Figure 2.

The remainder of the proposed Cervantes Water Reserve should be classified for Priority 2 source protection according to the following criteria:

- The area is a key recharge area for existing public water supplies;
- The aquifer is very vulnerable to contamination;
- The area is largely undeveloped;
- The land is privately owned;
- Current and planned land use is compatible with Priority 2 classification.


6642000mN
331000mE
311000mE
6616000mN
CAIRN ROAD
ERAGILGA HILLS ROAD
WINJA ROAD
CERVANTES
JURIEN ROAD
NAMBUNG ROAD
NUMBINEA ROAD
PROPOSED HILL
HILL RIVER
CERVANTES RIVER
INDIAN OCEAN
HANSEN BAY
CERVANTES ISLANDS
P1
P2
500m RADIUS
1/85(Monit)
7/91
1/72
1/76
1/89
0.5 0 1 2km
SCALE
WATER AND RIVERS COMMISSION
LEGEND:
Production,Observation Well
Proposed Water Reserve Boundary
P1, P2 Priority Source Protection Area
500 m Wellhead Protection Zone
INDEX TO ADJOINING 1:100000 MAPS
1855 1955 2055
1854 1954 2054
1853 1953 2053
FIGURE 2.
PROPOSED CERVANTES WATER RESERVE
Drawn by N.J.A.
Date 10/10/97
Policy and Planning Division
Water Quality Protection Branch

# Recommendations

1. The proposed Cervantes 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 2 classifications given to the Water Reserve.

3. All development proposals in the Water Reserve which are likely to impact on water quality should be referred to the Water and Rivers Commission.

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, particularly along Cervantes Road.

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:<br>(i) WRC to provide the Shire of Dandaragan with guidelines for referral of development proposals.<br>(ii) referral of development proposals. | (i) Program Manager, Assessment and Advice (WRC)<br>(ii) Shire of Dandaragan, Ministry for Planning, Department of Environmental Protection and National Parks and Nature Conservation Authority. | (i) 1999-2000<br>(ii) Ongoing |
| 4. | Erection of signs:<br>(i) development of guidelines for signage.<br>(ii) determine number and location of signs required.<br>(iii)erect signs. | (i) Program Manager, Protection Planning (WRC).<br>(ii) Regional Manager (WRC) in consultation with Water Corporation.<br>(iii)Regional Manager (WRC) in consultation with the Water Corporation. | (i) 1999-2000<br>(ii) 1999-2000<br>(iii) 2000-2001 |

(continued)

| | | | |
|---|---|---|---|
| 5. | Incidents covered by WESTPLAN – HAZMAT in the Cervantes Water Reserve should be addressed through the following measures:<br>(i) The Dandaragan Local Emergency Management Advisory Committee (through the Northam Emergency Management District) being familiar with the location and purpose of the Cervantes Water Reserve.<br>(ii) The locality plan for the Cervantes Water Reserve being provided to the Fire and Rescue Services headquarters for the HAZMAT Emergency Advisory.<br>(iii) The Water Corporation advising the HAZMAT Emergency Advisory Team during incidents in the Cervantes Water Reserve.<br>(iv) 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)<br>(ii) WRC (Swan-Goldfields-Agricultural region)<br>(iii) Water Corporation<br>(iv) Dandaragan Local Emergency Management Advisory Committee | (i) 2000-2001<br>(ii) 2000-2001<br>(iii)2000-2001<br>(iv)2000-2001 |
| 6. | Surveillance program:<br>(i) develop guidelines for the surveillance of Water Reserves.<br>(ii) implement the surveillance program. | (i) Program Manager, Assessment and Advice (WRC).<br>(ii) Regional Manager, Mid-West Avon Region (WRC). | (i) 1999-2000<br>(ii) On completion of surveillance guidelines. |
| 7. | Review of this plan and recommendations. | Water Quality Protection Branch (WRC). | (i) Initial review-2000-2001.<br>(ii) Full review-2004-2005. |

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Water Authority of Western Australia 1995, *Jurien Groundwater Area Management Plan.* Report No. WG 202, August 1995.

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 on land use and 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 land use 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*.

## Preamble

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 that include three levels of priority classification of lands within 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, **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 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.

**Tables showing Land Use Compatibility with the PDWSA protection strategy**

These tables should be used as a guideline only. Further information relating to land use and development 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 land use is compatible with the management objectives of the priority classification. |
| *Incompatible* | The land use is incompatible with the management objectives of the priority classification. |
| *Restricted* | The land use may be compatible with the management objectives of the priority classification, with appropriate site management practices.<br><br>Restricted developments /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 animal feed only during seasonal dry periods. |
| *Intensive* | Where regular additional inputs are required to support the desired land use. eg irrigation, non forage animal feed dominates, fertilisers. |

## More information

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

| Land use | Priority 1 | Priority 2 | Priority 3 |
|---|---|---|---|
| Apiaries | 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*

| Land use | 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***

| Land use | 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 |
| Laboratories (analytical , photographic) | Incompatible | Incompatible | Compatible |
| Shops[7] and shopping centres | 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***

| Land use | 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***

| Land use | 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***

| Land use | 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***

| Land use | 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***

| Land use | 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***

| Land use | 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***

| Land use | 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***

| Land use | 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)***

| Land use | 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***

| Land use | 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***

| Land use | 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 / disposal facilities | Incompatible | Incompatible | Incompatible |
| Wastewater treatment plants | Incompatible | Incompatible | Restricted |
| Water treatment plants | Restricted | Restricted | Restricted |

***OTHER DEVELOPMENTS***

| Land use | Priority 1 | Priority 2 | Priority 3 |
|---|---|---|---|
| Caretaker's housing | Restricted | Restricted | Compatible |
| Construction projects ( not tabled) | 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 |

**Table 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 wellhead protection zones.