GANNAWARRA SHIRE

DOMESTIC WASTEWATER MANAGEMENT PLAN

2020-2023

GANNAWARRA
Shire Council

Gannawarra Shire Council acknowledges the traditional owners of the land, their rich culture and connection to Country, and pays respect to Elders past, present, and emerging.

Disclaimer

Information contained in this document is based on available information at the time of writing. All figures and diagrams are indicative only and should be referred to as such. This is a strategic document which deals with technical matters in a summary way only. While the Gannawarra Shire Council has exercised reasonable care in preparing this document it does not warrant or represent that it is accurate or complete. Council or its officers accept no responsibility for any loss occasioned to any person acting or refraining from acting in reliance upon any material contained in this document.

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Executive Summary

The Shire of Gannawarra is located in northern Victoria and is home to a significant number of environmental assets including the Ramsar listed Kerang Lakes, Gunbower Forest and the Murray River.

Some residential areas of the Shire have been sewered for a number of years. Other towns and areas rely on septic tanks for onsite wastewater management. It is estimated that there are between 2,000 and 2,500 septic tanks across the Shire.

The development of a Municipal Domestic Wastewater Management Plan (DWMP) provides an opportunity for Council to strategically assess wastewater disposal within the municipality and develop appropriate strategies and actions to prevent or minimise wastewater issues.

The effectiveness of onsite domestic wastewater management varies throughout the Shire. There are instances where domestic wastewater is not managed effectively and others where old systems continue to provide an effective means of disposal.

The prolonged dry conditions have served to mask the more obvious signs of poor wastewater management.

Challenges for wastewater management in the Shire of Gannawarra result from a combination of factors, including:

- Poor land capability for disposal which reduces the ability to dispose treated wastewater to land;
- Small allotments and inadequate space for wastewater disposal;
- Inadequately sized disposal areas;
- Ageing and/or poorly maintained domestic wastewater management systems (septic systems);
- Household behaviour reducing system efficiency including high water use within the home and over-watering of gardens;
- Mosquito breeding in pooled stagnant water; and
- Increased use of grey water due to ongoing dry conditions.

The DWMP addresses potential risks to public health and the environment that result from the treatment and disposal of wastewater from homes and businesses in unsewered areas.

While the scope of a DWMP does not extend to the disposal of sludge from septic tank systems as this is regulated through the Environment Protection Authority (EPA), this has been included in this DWMP due to Council managing an EPA licensed disposal site.

The development of the DWMP is consistent with government policy direction, including the State Environment Protection Policy (Waters) 2018, which requires Council to develop such a plan.

1 Introduction

Local governments throughout Victoria are required to prepare a Domestic Wastewater Management Plan (DWMP) to address potential risks to public health and the environment that result from treatment and disposal of wastewater from homes and businesses in unsewered areas.

The development of a DWMP is consistent with Government policy direction, including the State Environment Protection Policy (Waters) 2018 that requires councils to develop such plans.

Improved domestic wastewater management is an important issue for Gannawarra Shire. While some residential areas have been sewered, a number of small towns and areas surrounding sewered towns rely on onsite domestic wastewater management systems, commonly known as septic tank systems.

The exact number of septic systems in the Shire is unknown but is thought to total between 2,000 and 2,500. This number is based on the number of lots with dwellings outside of sewered districts in the Gannawarra Shire. As at the review date for this plan, Council had complete records for 641 of these systems.

While development outside of sewered areas across the Gannawarra Shire has remained relatively low, there are pressures on land in terms of development in high-amenity areas near lakes and the Murray River and associated tributaries such as the Gunbower Creek.

The initial DWMP was created with funding received from the Department of Environment, Land, Water and Planning (formerly DSE). This plan is based on the initial plan developed for Gannawarra Shire Council by RM Consulting Group in 2007.

The review of this DWMP provided an opportunity for Council to strategically assess the wastewater issues within the municipality. The reviewed plan articulates Council's policy on domestic wastewater and its management into the future.

A further review will be conducted in 2023. The review will take into consideration changes to legislation, local context, actions achieved and what new actions need to be incorporated to drive further improvements in the management of domestic wastewater across the municipality into the future.

2 Context

2.1 Goals and Objectives

The goals of the Gannawarra Shire DWMP are to:

- Protect public health;
- Promote environmental best practice by reducing the impact of domestic wastewater on the local environment; and
- Promote sustainable development across the municipality by ensuring domestic wastewater is managed within the capability of the land.

The objectives of the DWMP are to:

- Develop a policy for management of domestic wastewater to enable consistent decision making;
- Develop a case for the provision of sewerage to urban and township areas where appropriate;
- Identify opportunities for improvement in Council management systems.
- Develop an appropriate financial model to adequately resource the implementation, system inspection and monitoring of the DWMP.

2.2 Risks Associated with Domestic Wastewater

The following summary of risks associated with domestic wastewater is drawn from *Domestic Wastewater Management: a planning guide for local government (2005)* prepared by the Municipal Association of Victoria (MAV):

Public Health Risks

- Raw sewage can carry a range of pathogens including bacteria, viruses, protozoa, Helminths (intestinal worms), and inhaled moulds and fungi;
- Human diseases caused from these pathogens range from mild gastroenteritis to cholera, dysentery and hepatitis;
- The public can be exposed to these pathogens via contaminated drinking water, swimming or boating in contaminated water bodies, eating contaminated foodstuffs such as shellfish, or contact with domestic animals that have been exposed; and
- Septic overflows can cause organic rich pooling, increasing mosquito breeding capacity resulting in a public pest and possible disease vector.

Environmental Risks

- Contamination of groundwater by nitrate, ammonia and faecal pathogens;
- Seepage can raise the groundwater table causing salinity in certain areas;
- Surface runoff adds nitrogen and phosphorus to water catchments, stimulating algal and weed growth and causes land degradation, namely erosion;
- Effluent carries suspended solids, ammonia and organic matter, which can affect fish, aquatic plants and micro-organisms;
- Effluent can be carried into other bodies of water and cause further pollution; and
- Risks associated with the inappropriate disposal of raw sewage by unauthorised persons.

Economic Risks

- Indirect perception that the area is unsafe could decrease tourist-generated revenue;
- Tourism capacity could be limited where enforced maximum seasonal septic loads exist;
- Algal blooms or large mosquito outbreaks could impact on tourism potential;
- Poor septic management decreases land amenity and economic value;
- A build-up of salt or soil nutrient concentration decreases land productivity;
- Contaminated water bodies can negatively impact on aquaculture and agriculture using the water;
- For home owners, replacing failing systems or connection to reticulated sewerage can be very expensive; and
- Possibility of increased maintenance to stormwater drains which receive effluent due to excessive weed growth and scouring.

Legal Risks

- Council can be found liable for failure to discharge their statutory responsibilities; and
- Risk of litigation is increasing as law firms become more proactive in seeking cases.

A further risk is the lack of resources to address poor onsite wastewater system management that may lead to the above outcomes.

2.3 State Legislation and Policies

The list of legislative requirements regarding domestic wastewater management are summarised below.

Environment Protection Act 1970

The Environment Protection Act 1970 (The Act) is the primary legislation used to regulate onsite wastewater management systems. The Act outlines the need for permits for the installation of new, or the alteration of existing onsite wastewater management systems, as well as the provision to require certain conditions relating to the installation and use of onsite wastewater management systems and their need for ongoing maintenance.

Environment Protection Amendment Act 2018 (comes into force 1 July 2021)

From 1 July 2021, the Environment Protection Authority (EPA) will enforce new laws aimed at preventing harm to public health and the environment from pollution and waste. When the amended Act comes into force, the EPA will have enhanced powers to prevent risks to the environment and human health. Stronger sanctions and penalties may be issued to hold environmental polluters to account.

The General Environmental Duty is a centrepiece of the new laws. It applies to all Victorians. If activities are conducted that pose a risk to human health and the environment, those risks must be understood. Reasonably practicable steps must be taken to eliminate or minimise them. In an Australian first, the General Environmental Duty is criminally enforceable.

Public Health and Wellbeing Act 2008

The Public Health and Wellbeing Act 2008 provides the legislation for Council to address potential public health nuisances which may arise from inadequately performing or failing septic tank systems. It is also a means to address any public health issues that cannot be addressed by the Environment Protection Act 1970.

Environment Protection Authority Code of Practice Onsite Wastewater Management No 891.4 - July 2016

The Code of Practice Onsite Wastewater Management (The Code) provides standards and guidance to ensure the management of onsite wastewater (up to 5,000 L/day) protects public health and the environment as well as uses resources efficiently.

The Code has been written to support the wastewater industry, regulators such as local governments and property owners to design, install and/or manage onsite wastewater management systems in accordance with the Environment Protection Act 1970 and the State Environment Protection Policy (Waters) 2018.

State Environment Protection Policy (Waters) 2018

The State Environment Protection Policy (Waters) 2018 sets a statutory framework for the protection of the uses and values of Victoria's fresh and marine water environments. In relation to onsite domestic wastewater management, this policy ensures that residential developments and

subdivisions located outside areas provided with reticulated sewerage are able to adequately contain domestic wastewater within the property boundaries.

Section 29 requires councils to develop a Domestic Wastewater Management Plan (DWMP) that;

(a) identifies the public health and environmental risks associated with the onsite domestic wastewater management systems;

(b) sets out strategies to minimise those risks;

(c) identify, cost, prioritise and evaluate options to provide –

(i) solutions to prevent discharge of sewage beyond allotment boundaries and minimise impacts on groundwater; and

(ii) for the compliance assessment and enforcement of onsite domestic wastewater management systems in accordance with the plan; and

(d) if applicable, have regard to the Guidelines for planning permit applications in open, potable water supply catchment areas and any relevant guidelines authorised by the Authority.

A DWMP must be reviewed and updated at intervals of no more than five years.

An internal audit must be conducted to assess progress and report on progress of the implementation of the Domestic Wastewater Management Plan every three years with a report published on the Council website.

Australian and New Zealand Standards

The following standards are relevant to the design, construction and installation of onsite wastewater management systems:

AS/NZS 1546.1:2008 Onsite Domestic Wastewater Treatment Units – Septic Tanks

AS/NZS 1546.2:2008 Onsite Domestic Wastewater Treatment Units – Waterless Composting Toilets

AS/NZS 1546.3:2008 Onsite Domestic Wastewater Treatment Units – Aerated Wastewater

AS/NZS 1547:2000 Onsite Domestic Wastewater Management

AS/NZS 3500 National Plumbing and Drainage – Domestic Installations

2.4 Stakeholder Roles, Responsibilities and Regional Planning

Within Gannawarra Shire, there are a number of stakeholders with direct and indirect roles and responsibilities in domestic wastewater management. These are listed and described below:

- Gannawarra Shire Council;
- Environment Protection Authority;
- Coliban Water;
- Lower Murray Water;
- Grampians Wimmera Mallee Water;
- North Central Catchment Management Authority;

- Goulburn Murray Water; and
- Department of Environment, Land, Water and Planning.

2.4.1 Gannawarra Shire Council

The Gannawara Shire Council is responsible for the following areas in relation to the treatment and disposal of domestic wastewater:

- Ensure new subdivisions in unsewered areas are provided with reticulated sewerage or that allotments are capable of treating and containing domestic wastewater onsite;
- Issuing permits to install new septic tank systems and issuing certificates to use septic tanks;
- Refusing permits if it is not an EPA approved system, if the site is unsuitable and/or the area for the treatment and disposal of effluent is not sufficient;
- Ensuring that septic systems operate correctly;
- Ensuring that any Nuisance conditions arising from septic tank systems are abated;
- Submitting an annual report to the EPA on septic tank activity; and
- Ensuring that property owners comply with conditions on septic tank permits and certificates.

2.4.2 Environment Protection Authority

The Environment Protection Authority (EPA) is responsible for the protection of the Victorian environment. The EPA's responsibilities for the management of domestic wastewater include:

- Declaration of State Environment Protection Policies (SEPPs) that set environmental objectives to be achieved;
- Establishing standards for discharge to surface water and off-site;
- Approving the design and type of septic tank systems which can be installed for the issue of a permit to install a septic tank system;
- The publication and updating of the Septic Tank Code of Practice;
- Receipt and collation of municipal annual returns to enable the Authority to identify trends impacting on the environment in sensitive areas and to provide a basis for future domestic wastewater planning and research;
- Promoting provision of sewerage to unsewered areas;
- Approval of systems discharging more than 5,000 litres per day; and
- Regulating the disposal of raw sewage from the pump out of domestic wastewater management systems by sewage sludge contractors. The Environment Protection Act 1970 includes works approval and licensing requirements administered by EPA Victoria, to ensure appropriate control of such discharges.

2.4.3 Landholders

Landholder's responsibilities include:

- Connecting to a sewerage system where it is available;
- Obtaining a septic tank permit before a building permit is issued and installing the system;
- Obtaining a certificate to use the system once installed;
- Obtaining a permit to make alterations to the existing system; and
- Complying with the conditions of the permit.

2.4.4 Coliban Water, Lower Murray Water and Grampians Wimmera Mallee Water

Water and sewerage services across the municipality are provided and maintained by Coliban Water, Lower Murray Water and Grampians Wimmera Mallee Water.

It is a legislative requirement under the Water Act for water authorities to manage the implementation of all new sewerage schemes. Where a town is identified for connection to reticulated sewer, councils must discuss sewerage provision options with their local water authority. Water authorities are unable to identify the need for sewerage, as their role is restricted to service provision only. They can provide support to councils and the EPA, but they cannot require communities to connect and pay for scheme that they may commercially benefit from.

Urban water corporations supply treated water for drinking, and in doing so they must ensure they comply with the requirements of the Victorian Safe Water Drinking Act 2003. Source water for drinking supplies is taken from waterways and channels, along with groundwater. Urban water corporations are also referral authorities under the Water Act 1989 and Planning and Environment Act 1987.

2.4.5 North Central Catchment Management Authority

The core business of the North Central Catchment Management Authority (CMA) is to coordinate the development and implementation of the North Central Regional Catchment Strategy in partnership with the community. The North Central CMA is a referral authority under the Catchment and Land Protection Act. Key strategies relevant to the DWMP include:

- Regional River Health Strategy;
- River Health Plans;
- Floodplain Management Strategy;
- Nutrient Management Strategies;
- Streamflow Management plans;
- Bulk Water Entitlements;
- Rural Drainage Strategies;
- Groundwater Management Plans;
- Wetland Management Plans;
- Dryland Salinity Management Plans.

2.4.6 Goulburn Murray Water

Goulburn Murray Water (GMW) is a rural water authority and manages water storage, delivery and drainage systems across northern Victoria. The GMW Corporate Plan sets out the strategic direction of the organisation across the following key areas: services, environment, people, assets, finances and relationships. GMW is also a referral authority under the Water Act 1989 and Planning and Environment Act 1987.

2.4.7 Department of Environment, Land, Water and Planning

The Department of Environment, Land, Water and Planning (DELWP) is responsible for management of Victoria's natural resources.

2.4.8 Municipal Association of Victoria

The Municipal Association of Victoria (MAV) is committed to improving and raising the profile of domestic wastewater management in Victoria. The MAV has been working in partnership with Victorian councils, EPA Victoria, DELWP, water authorities and other stake holders to develop a range of planning and management tools to assist council's with the management of domestic wastewater.

The *Model Land Capability Assessment Report* provides an example of an all-encompassing land capability assessment (LCA). It is aimed at providing environmental health officers with a suitable template by which to assess LCA reports, and simultaneously provide LCA assessors with a model that generally provides adequate information to environmental health officers for making a sound judgment on an application. It was updated in 2014 and remains a relevant guide for councils developing DWMPs.

2.5 Linkages to other Council Plans

Council has a number of strategic plans outlining the vision and objectives for the municipality and its communities including the Council Plan 2017-2021 (incorporating the Municipal Public Health and Wellbeing Plan) and the Shire of Gannawarra Planning Scheme.

This DWMP also links closely to Council's Environmental Sustainability Strategy (2013), Arbovirus Plan (2017), Urban and Rural Strategy Plan (2007) and Lake Charm, Kangaroo Lake and Gunbower Creek Environs Strategy (2013).

2.5.1 Gannawarra Planning Scheme

The Gannawarra Shire Planning Scheme recognises that there are a number of key issues facing the Gannawarra Shire in terms of appropriately managing wastewater. From a land use and development perspective it is recognised that the efficient and effective management of domestic wastewater has a role to play in guiding settlement patterns and safeguarding our natural assets and resources.

The key issues facing the Gannawarra Shire in terms of land use planning and wastewater management are listed in Clause 21.01-3 to Clause 21.10-3 of the Gannawarra Planning Scheme and include:

- Improvements in road access and wastewater management may allow additional land to be considered for development in the future. (Clause 21.01-3)

- Land with water frontage (Murray River, Gunbower Creek, Kerang lakes, water courses and wetlands) is increasingly targeted for residential development. While this type of development can be facilitated, it needs to be managed to ensure environmental values are maintained. (Clause 21.01-3)

- Ensuring that natural assets are maintained and improved as a result of any development. (Clause 21.03-2)

- Promoting consistent planning and management along the river corridor by councils, government agencies and community organisations. (Clause 21.03-3)

- Minimising the impacts of unsewered towns and individual wastewater treatment systems on land in the catchment. (Clause 21.05-2)

- Protecting water quality, environmental and landscape values of nearby waterbodies, including lakes, rivers and streams. (Clause 21.07-2)

- Supplying reticulated sewerage wherever practicable; unless each lot can contain and absorb wastewater without impacting downstream or on nearby land. (Clause 21.07-2)

- Providing services including water supply, sewerage, electricity, telecommunications and reticulated drainage in a cost effective manner. (Clause 21.10-3)

- Providing reticulated sewerage to all residential developments wherever practicable; and where this is not feasible, ensuring that wastewater is contained on the lot or treated through a local treatment system (Clause 21.10-3)

3 Project Management

3.1 Development Process

The Gannawarra DWMP 2007 was prepared using the Municipal Association of Victoria's Model Municipal Domestic Wastewater Management Plan. The process undertaken included:

- Development of a project brief;
- Engagement of a consultant team;
- Field investigation of towns and areas;
- Risk assessment and options evaluation;
- Development of action plans;
- Development of policy and planning tools to assist with implementation of the action plans; and
- Workshops with the Project Advisory Group.

A review of wastewater issues in the Golf Links Estate, Cohuna and the township of Quambatook was undertaken prior to the commencement of this process. A number of community meetings were held to discuss sewerage options at the Golf Links Estate prior to development of the 2007 DWMP.

Paladin White was commissioned by Gannawarra Shire Council in 2006 to provide land capability for effluent disposal assessments of Kangaroo Lake, Lake Charm, Racecourse Lake and Macorna. This information was used as supporting material to the development of the initial DWMP.

3.2 Land Capability – Minimum Lot Size Guidelines

In parallel with the development of the DWMP, Minimum Lot Size Guidelines have been prepared based on land capability for effluent disposal.

It should be noted that Clause 32.03-3 (Low Density Residential Zone) of the Victorian Planning Provisions states the following for the subdivision of land:

Each lot must be at least the area specified for the land in a schedule to this zone. Any area specified must be at least:

- 0.4 hectare for each lot where reticulated sewerage is not connected. If no area is specified each lot must be at least 0.4 hectare.

The Minimum Lot Size Guidelines will provide a tool for Council to use to ensure that future subdivisions are designed to ensure sustainable effluent disposal.

3.3 Review

A review of the original 2007 Gannawarra DWMP was undertaken in 2020. In accordance with the State Environment Policy (Water) 2018 (Vic) a further review will be conducted in 2023. The review will take into consideration changes to legislation, local context, actions achieved and what new actions need to be incorporated to drive further improvements in the management of domestic wastewater across the municipality into the future.

4 Regional Profile

4.1 Shire Description

The Gannawarra Shire is located in northern Victoria and covers an area of 3,736 square kilometres (Figure 4-1). Primary centres are Kerang, Cohuna and Koondrook. Kerang is approximately a three hour drive north of Melbourne. Smaller outlying communities include Leitchville, Quambatook, Murrabit, Lake Charm, Lalbert, Macorna and Mystic Park.

The Shire has a population of approximately 10,459 (as at the 2016 Census). Gannawarra Shire has an ageing population with 27.6 per cent of the population being aged 65 years and over. The median age is 49.

Population numbers for the primary centres increased slightly at the 2016 Census, however population of smaller outlying towns and districts experienced a decline.

Housing development remains relatively low and centred on the primary centres of Kerang, Cohuna and Koondrook.

With 57 lakes, swamps and marshes, the Gannawarra region forms one of Australian's largest and most important wetlands.

The majority of land within the Gannawarra Shire is land subject to inundation with the Avoca River, Loddon River, Little Murray River, and the Pyramid Creek, plus associated tributaries running through the municipality. Gannawarra is bordered by the Murray River with associated tributaries, such as the Gunbower Creek, running through the shire.

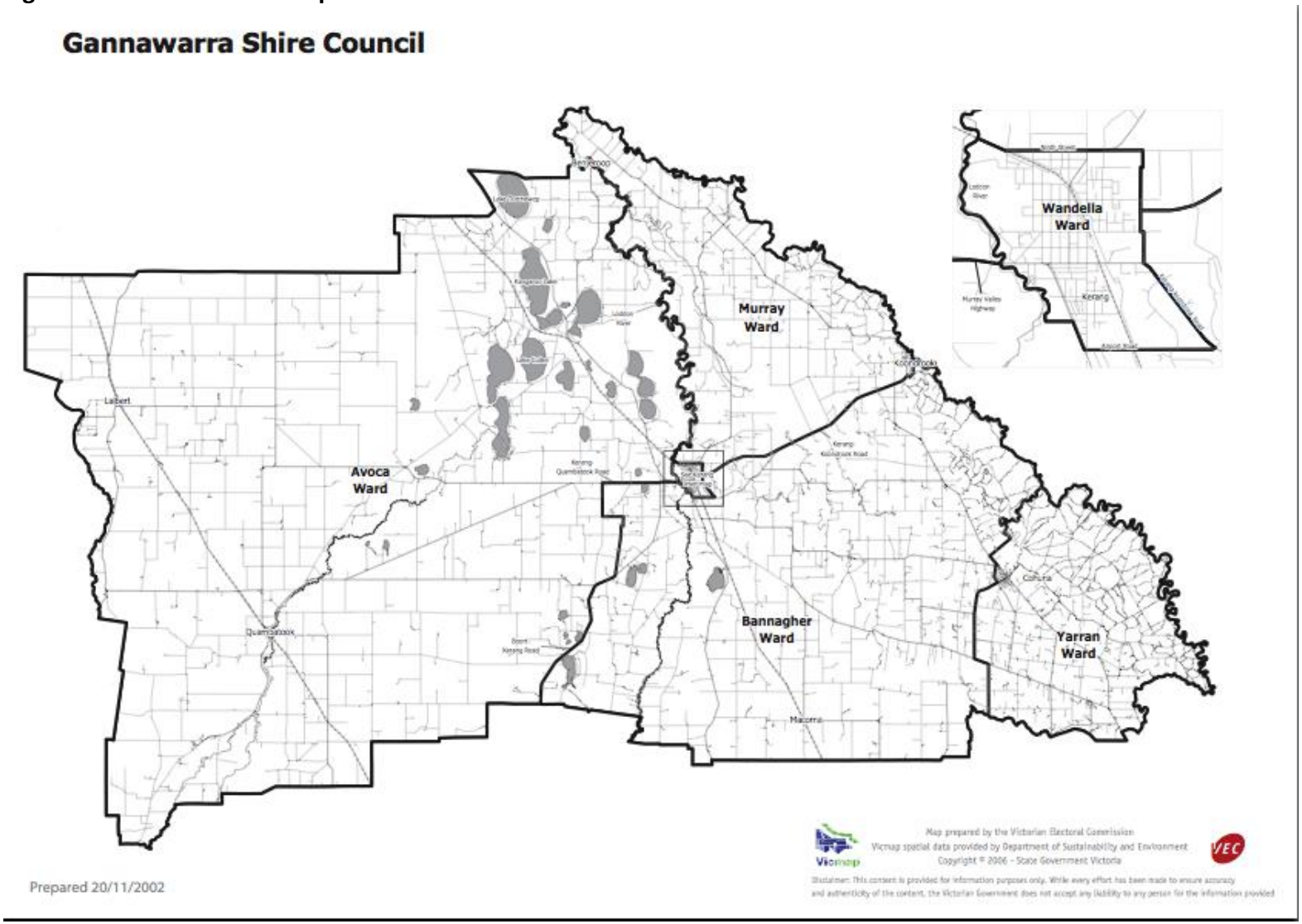
The area is characterised by a warm climate with average summer temperatures of 31^{o}C and average winter temperatures of 14^{o}C. The average annual rainfall is 373 millimetres.

Despite ongoing changes to irrigation and ongoing rural change, the major industry of the region remains agriculture supporting over 20 per cent of local employment.

Tourism is associated with the Murray River, Kerang Lakes and Gunbower Island.

There are no declared water supply catchments located in Gannawarra Shire.

Figure 4-1 Map of Gannawarra Shire



5 Current Wastewater Situation

5.1 Overview

Wastewater in the Shire of Gannawarra is managed by one of the following methods:

- Reticulated sewerage in some towns;
- Combination of reticulated sewerage and septic tanks within towns;
- Septic tanks in unsewered towns; and
- Septic tanks in rural living estates and farming areas.

The Gannawarra Shire Council is responsible for the management of domestic wastewater wherever reticulated sewerage is not provided.

The regional water authorities (Coliban Water, Lower Murray Water and Grampians Wimmera Mallee Water) are responsible for implementing and maintaining reticulated sewerage (and water) systems.

Table 5-1 indicates which towns or areas of the municipality are sewered and which areas rely on septic tanks systems (or both).

Table 5-1 Current Wastewater Management in Gannawarra Shire

Current wastewater management	Towns/Localities	Major Issues
Reticulated sewerage	Cohuna* Kerang* Koondrook* Leitchville* Murrabit*	Policies and guidelines for future growth
Septic tanks in sewered towns	Cohuna* Kerang* Koondrook* Leitchville* Murrabit*	Future growth to connect to existing system
Septic tanks in unsewered towns	Lalbert* Macorna* Quambatook*	Options for managing wastewater in unsewered towns Planning for sustainable growth
Septic tanks in rural living estates and farming areas	Golf Links Estate, Cohuna Borough Drive, Kerang* Kangaroo Lake Lake Charm Mystic Park* Farming Land	Management of individual septics Policies and guidelines for future growth

*Towns with a reticulated water supply

The number of onsite domestic wastewater systems across the Gannawarra Shire is estimated at between 2,000 and 2,500.

On-site wastewater systems, also commonly referred to as septic tank systems, can comprise one or more of the following:

- All waste tank systems (septic tank and absorption line);
- Aerated wastewater treatment systems - AWTS (aerobic package treatment plants and irrigated effluent disposal area);
- Blackwater (toilet effluent) only septic systems with greywater discharged directly to the ground – commonly referred to as split systems;
- Composting toilets; and
- Greywater re-use systems.

EPA approves all systems over 5,000 litres, however those discharging solely to land up to 100,000 litres per day don't require a licence. All other systems over the 5,000 litre threshold require a licence.

These properties are not considered within this DWMP.

5.2 Wastewater Management Challenges

Wastewater management challenges in the Gannawarra Shire arise due to a combination of factors, including:

- Poor land capability for wastewater disposal, which reduces the ability to dispose to land;
- Small allotments and inadequate space for wastewater disposal;
- Inadequately sized disposal areas;
- Ageing and/or poorly maintained systems;
- Non-compliant systems.

Many of the septic tanks systems in use throughout the Gannawarra Shire which were approved prior to amalgamation of the Shires of Cohuna, Kerang and Borough of Kerang in 1995, and that have not been altered or upgraded since, will no longer comply with the current EPA Guidelines and Standards.

Wastewater management issues are exacerbated in unsewered towns and areas that have a reticulated water supply or a license to extract water from lakes and waterways. Provision of reticulated water reduces the imperative to conserve water, compared to rainwater-only supply. This tends to result in greater household water use, leading to larger volumes of wastewater being discharged, beyond the intended capacity of the system and disposal area.

Household fittings such as dishwashers, top load washing machines, bath tubs and spas also add load to onsite wastewater systems and disposal areas.

The visible impact of poor on-site wastewater management has been masked in recent years due to ongoing dry conditions and drought. However, in average and higher rainfall years, the impacts of poor wastewater management can be seen in street drains and runoff into neighbouring properties in non-sewered township and rural living estates.

Desludging of Domestic Wastewater Management Systems

Over time, the sludge and scum layers build up and need to be removed for the septic tank to function properly. The sludge and scum needs to be pumped-out with a vacuum suction system by an authorised person. The frequency of desludging depends on a number of variables. A well-functioning septic tank – one that is not overloaded with liquid, organic matter or synthetic material – typically only needs to be desludged once every 3 to 8 years (depending on the size of the tank with most domestic systems that treat 'all waste' being 3,200 litre capacity).

The Quambatook Night Soil Depot at the former Quambatook landfill site is the only location within Gannawarra Shire available for the disposal of raw sewage generated from the desludging process of domestic wastewater management systems.

While this is an EPA licensed site for the authorised disposal of sludge from septic tank systems, this site is nearing the end of its life. Council manages this EPA licensed disposal site. This site is required to be upgraded to comply with current standards or replaced by alternative options.

While the scope of a DWMP does not extend to the disposal of sludge from septic tank systems this has been included in this DWMP so as to capture this issue in a Council strategy and work towards a solution.

There is also potential to investigate partnering with Coliban Water to develop a septic waste discharge point at the Cohuna Wastewater Treatment Plant.

5.3 Values Requiring Protection

Inappropriately managed domestic wastewater poses a number of risks to public health, environmental and economic values (refer section 2.2 for details). Critical among these is public health, which is important across all towns/areas considered.

Environmental and economic values vary according to the local situation. Some of the key values in the region include:

- The Murray River is Australia's longest river. It provides economic benefits to the region from tourism and agriculture and is also a source of raw water that is used to produce potable water for many towns along the river.

- The Gunbower Forest is part of the Gunbower and Koondrook-Pericoota Forests. The Gunbower Forest covers 19,540 hectares and is designated as a wetland of international importance under the Ramsar convention. It is an important breeding area for colonial waterbirds as well as being visited by migratory birds listed under international treaties; the Japanese Australia Migratory Bird Agreement (JAMBA) and the Chinese Australia Migratory Bird Agreement (CAMBA). The forests also have strong social and cultural meaning for the indigenous communities of the region. (Department of Sustainability and Environment, 2003)

- Kerang Wetlands are designated a wetland of international importance under the Ramsar convention. The site is part of an extensive wetland system comprising 100 wetlands that occur within the Loddon-Murray Region. The site covers an area of 9,419 hectares and comprises permanent and temporary wetlands. It is an important breeding area for colonial waterbirds as well as being visited by migratory birds listed under international treaties; JAMBA and CAMBA. It includes the world's largest ibis rookery at Middle Reedy Lake. The wetlands are also rich in Aboriginal cultural heritage providing a reliable source of water as well as food, medicines, shelter

clothing and food. The Wetlands also provide significant economic benefits around tourism, recreation and most importantly, irrigated agriculture. The wetlands are used for storage and conveyance of irrigation water as well as flood mitigation

- The Torrumbarry Irrigation Area covers 167,000 hectares along the River Murray from Gunbower in the east to Nyah in the west and southwards to include the towns of Cohuna and Kerang. In the past, dairy farms have dominated around Cohuna and Leitchville, while mixed farming is more common around Kerang where fat lambs and beef cattle are raised, and cereal, fodder, lucerne and oil seed crops are also widely produced.

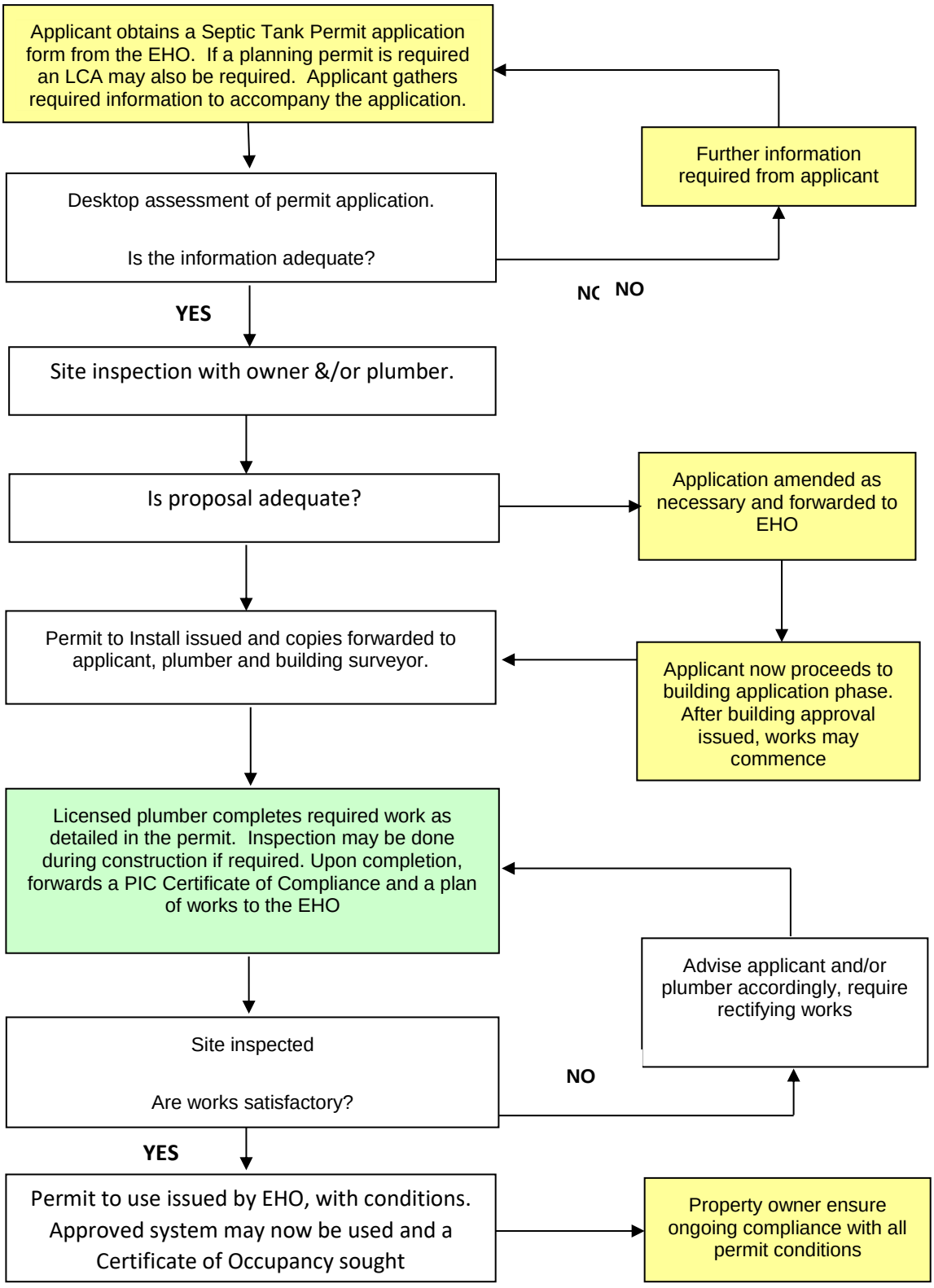
- The Pyramid-Boort Irrigation Area covers 166,215 hectares and extends from the Waranga Western Channel (WWC) in the south, to the Macorna Channel in the north. The township of Macorna is the only Gannawarra Shire town that falls into this irrigation area.

- Many other waterways, such as the Gunbower Creek, the source drinking water supply for Cohuna, are also important for regional agriculture.

Note that at the time of reviewing this DWMP in 2020 significant changes to the irrigation industry across Gannawarra Shire are underway.

5.4 Septic Tank Approval Process

The following diagram outlines the Shire's process for approving septic tank permit applications.



It should be noted that a Land Capability Assessment (LCA) outlining options for the onsite treatment of wastewater does not imply a planning permit will be given. An LCA identifies the constraints for wastewater treatment and options for mitigation; however, the existence of an LCA does not automatically mean that the identified management actions will occur.

5.5 Land Capability Assessment

A Land Capability Assessment (LCA) may be required prior to approval of a septic tank permit. The Land Capability Assessment Framework 2014 offers standard guidelines and criteria for undertaking LCAs. There is however little guidance on the qualifications of a person carrying out a LCA. As a result, the type, quality and level of detail provided by consultants in LCA reports varies considerably. This variation and uncertainty regarding the technical capabilities of consultant authors introduces an element of risk when determining whether or not to grant approval for domestic wastewater disposal. Guidelines and a Model Land Capability Assessment Report template prepared by the MAV aimed to standardise and improve LCA reports across Victoria however this remains an issue.

Note that at the time of reviewing this DWMP in 2020 a Land Capability Assessment Minimum Standards Guide is being developed by City of Greater Bendigo that is aimed at improving LCAs received by the Gannawarra Shire Council and surrounding councils.

5.6 Monitoring and Compliance Systems

Local government is responsible for ensuring domestic wastewater systems operate effectively and that property owners comply with the condition on Septic Tank Permits and that any Nuisance conditions arising from domestic wastewater systems are abated.

While Council is capable of enforcing compliance for installation of new systems (dating back to April 1995), monitoring and enforcement of older wastewater systems is significantly hampered by poor historic records.

Systematic shire-wide monitoring is not possible due to the lack of knowledge regarding the exact number and type of wastewater systems and location of disposal fields. There are often no records, or incomplete records, pertaining to the original permit conditions of older systems.

Aerated wastewater treatments systems (AWTS) require regular servicing and notification to Council that a service has been completed. Incomplete records for older AWTS installations, and an inadequate reminder system, results in many AWTS systems not being serviced according to the manufacturer's standards.

It is therefore difficult for Council to implement an adequate compliance regime unless there is an obvious breach resulting in visible off-site discharge of effluent.

A clear non-compliant situation exists in the case of split systems where greywater is discharged directly outside the property boundary. These systems no longer comply with exiting legislative requirements but an old and valid permit may still exist.

The legislated power to act on old, now inappropriate permits and to force compliance is through the Nuisance provision of the *Public Health and Wellbeing Act 2008.*

A comprehensive monitoring and compliance program for Gannawarra Shire will require:

- Establishment of a comprehensive database to record details of all domestic wastewater systems; and
- Additional resources (financial and staff) within the Environmental Health Department.

Note that at the time of reviewing this DWMP in 2020 the Victorian Government intends that a new Environment Protection Amendment Act 2018 will take effect from 1 July 2020. It is expected that this legislation will provide more stringent guidance to councils on monitoring and compliance of septic tank systems. A further assessment will be undertaken at this time.

5.7 Auditor General's Report

In the 2006 audit report 'Protecting our Environment and Community from Failing Septic Tanks', it was found that agencies were not effectively protecting the environment from poorly performing onsite systems. Since then policy has evolved, priorities for water authorities and community views have changed, and councils and water authorities have implemented a range of new initiatives to better understand and manage domestic wastewater risks.

This issue was re-examined in the 2018 report 'Managing the Environmental Impacts of Domestic Wastewater' to determine whether agencies are effectively protecting the environment and public health from poorly performing onsite systems.

The audit focused on the management of domestic wastewater in two parts of metropolitan Melbourne where unsewered areas have been identified as high-risk—the Yarra Ranges and the Mornington Peninsula. The performance of the two responsible councils, and the responsible water authorities, were examined. The regulatory and oversight roles of EPA and DELWP were also examined.

A summary of the findings includes:

- Managing risks by addressing information gaps and improving risk assessment frameworks;
- Addressing environmental and health impacts through water quality monitoring programs, and understanding exposure to potential risks and impacts through the use of permits for onsite systems, compliance inspections and education of property owners;
- The provision of sewer to backlog areas through various backlog programs and projects;
- Investigate and evaluate alternative wastewater services that can deliver environmental and health benefits more cost-effectively and efficiently;
- Address longstanding issues with the regulatory framework and its tools to improve clarity around roles, responsibilities, enforcement powers and processes which impede effective implementation of the framework by councils and water authorities. This includes enforcing connection to sewer;
- Improving reporting and accountability- Councils must plan effectively and report their results to ensure that their activities are transparent and that they are accountable to the community and other levels of government. Property owners must also report maintenance activities to Council, and water authorities need to report to councils the number of properties that connect to sewer in a timely way; and
- Consider how integrated water cycle management can benefit the community and the environment, rather than planning and managing different water and wastewater streams in isolation.

6 Local Wastewater Management Profiles

6.1 Priority Townships and Localities

Information collected by the Gannawarra Shire Council in preparing the Country Towns Water Supply and Sewerage Program – (Paladin White, 2005), together with local knowledge and experience of Environmental Health Officers, has allowed priority townships and localities to be identified for further consideration by this DWMP. These towns and localities are listed below:

By assessing values, threats and wastewater management issues, a numerical ranking has been assigned to the priority towns and localities in the Gannawarra Shire. The outcomes of the risk assessment are summarised in Table 6-1.

Land capability for effluent disposal was classed from existing soil datasets which covers most of the irrigated areas of the Shire. Data was not available for the dryland areas. Maps for towns showing the land capability for effluent disposal are in Appendix 3.

The following sections discuss each town/locality, including the relevant wastewater management issues, the risk assessment results and options for improving the wastewater management.

Table 6-1 Ranking of Priority Towns/Localities in the Gannawarra Shire

Priority Towns	Rank
Cohuna Golf Links	1 – High
Quambatook	2 – High
Kangaroo Lake	3 – High
Cohuna	4 - Moderate
Lake Charm	5 - Moderate
Koondrook	6 - Moderate
Kerang	7 – Moderate
Lalbert	8 – Low
Cohuna Island Road	9 – Low
Macorna	10 – Low

6.2 Septic Tanks in Sewered Towns

6.2.1 Cohuna

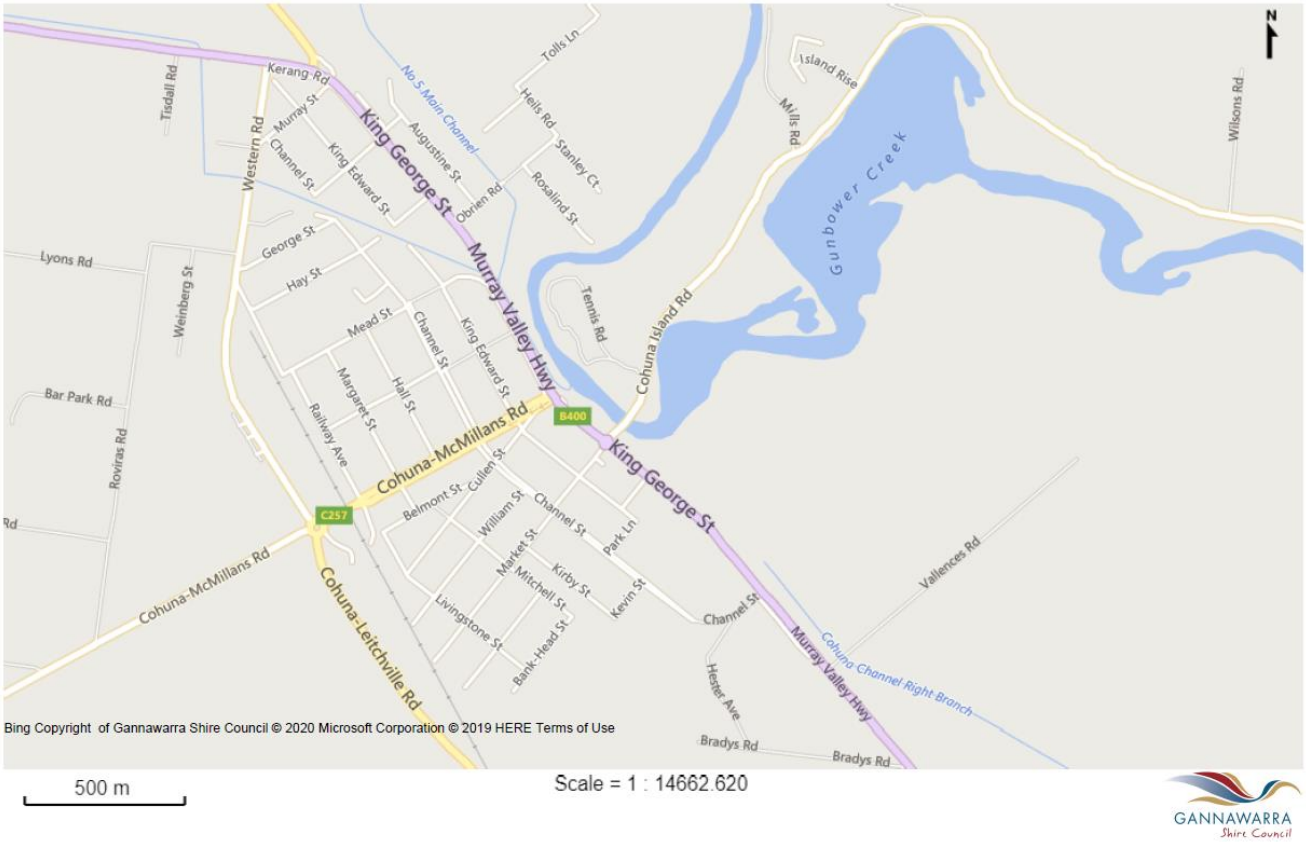
Description

Cohuna is located on the Gunbower Creek in the eastern end of the Shire and has a population of 2,458 (based on the 2016 Census). Cohuna supports the surrounding agricultural areas and tourism associated with the Murray River and its tributary, the Gunbower Creek, as well as Gunbower Island.

The Murray River ecosystem is a high value economic and environmental asset, providing for irrigation of farms surrounding Cohuna as well as recreation and tourism. The river also provides important riparian habitat and supports a diversity of instream fauna.

Most homes in Cohuna were connected to reticulated sewerage in the 1990s. While newer developments have connected to the reticulated sewerage system over recent years, there are homes on the town fringes that still have onsite wastewater disposal systems.

Coliban Water provides water and wastewater service to Cohuna with reticulated water sourced from the Gunbower Creek.



Key Wastewater Management Issues

- Stormwater outfall is to the Gunbower Creek via the Barr Creek;
- Relatively flat topography and variable land capability (ranges from low to very good across the town – Appendix 3) can result in sullage pooling in depressions;
- Septic systems may be in close proximity to irrigation channels which supply water for domestic purposes to rural users and following treatment, for Cohuna's potable water supply.
- A small subdivision north of the town along the Cohuna Island Road was identified as a significant issue in 2006 primarily due to the small block sizes – the Island Rise subdivision has since been connected to the reticulated sewerage system.
- A review of the risk rating of Cohuna Island Road is included as a future action due to its proximity to the Cohuna Water Treatment Plant and Gunbower Creek.

Risk Assessment

Cohuna has very high public health values and moderate to high environmental values threatened by a range of poor wastewater management practices.

Based on the risk assessment, Cohuna is the fourth highest priority township in the Gannawarra Shire.

6.2.2 Kerang

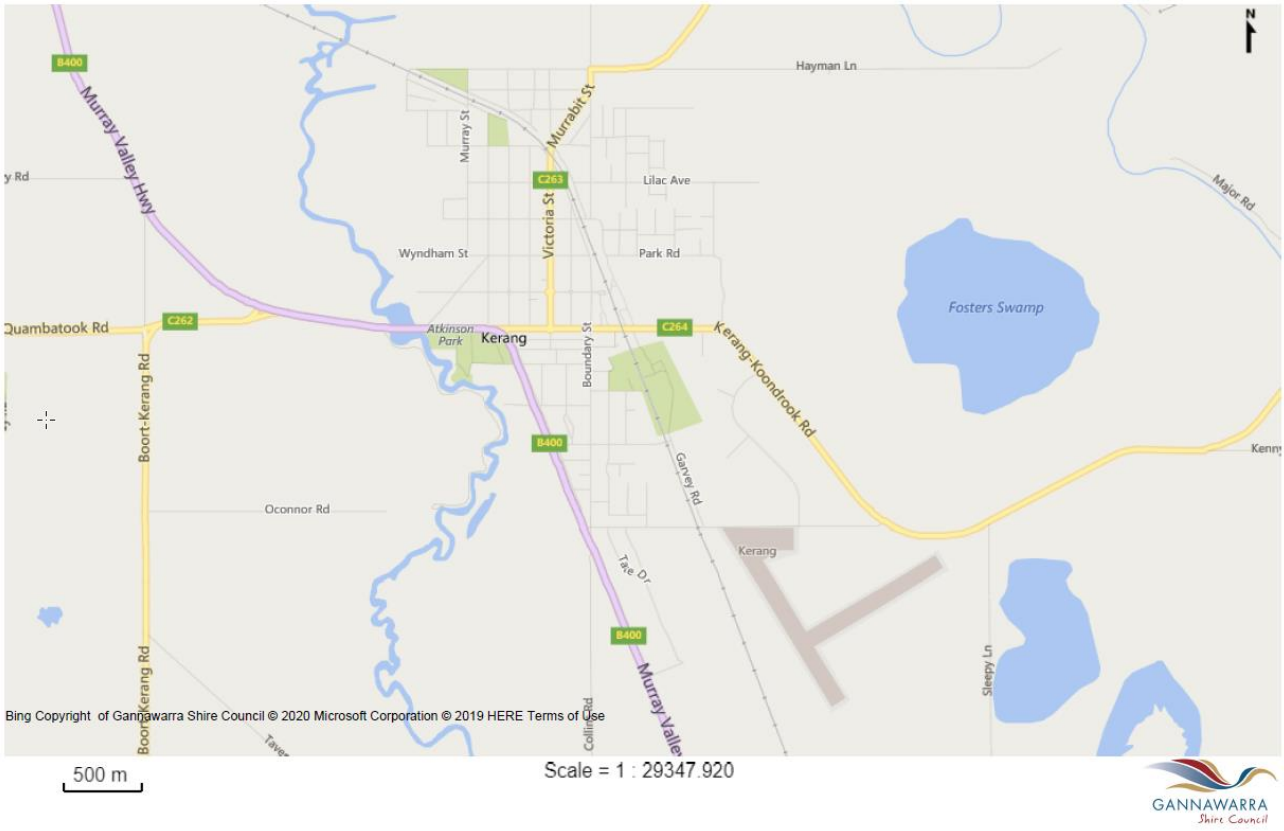
Description

Kerang is the main service centre in Gannawarra, has a population of 3,893 (based on the 2016 Census) and is located in the centre of the Shire on the Loddon River.

The town has been serviced by a reticulated sewerage system since the 1930s. This system has received upgrades and extensions to service most homes within the town.

Lower Murray Water provides water supply and wastewater management services to Kerang and water is sourced from the Goulburn Murray Water channel system, Murray River and the Loddon River. Water for Kerang's potable water supply comes primarily via a pipeline from the Murray River at Koondrook.

Stormwater from Kerang discharges to the Loddon River which is also a source of water for domestic purposes for some downstream users.



Key Wastewater Management Issues

- The all-waste systems have problems being overloaded where there are more than two residents per home;
- Some all-waste systems do not have alarms to warn of pump failure so problems may go unnoticed;
- The transpiration beds are poorly maintained and are of an inadequate size;

- The aerated wastewater treatment systems generally were found to be operating satisfactory though the irrigation areas may not be of sufficient size in wet years;
- Relatively flat topography and low to very low land capability (Appendix 3. Effluent Disposal Maps Area 5 and 6) makes onsite effluent disposal difficult and ponding treated effluent and/or sullage is common, especially in wet seasons;
- Septic systems may be in close proximity to irrigation channels which supply water for domestic purposes to rural users and following treatment, the potable supply for the town.

Risk Assessment

Kerang has a very high public health values and high environmental values threatened by a range of poor wastewater management practices.

Based on the risk assessment, Kerang is the seventh highest priority township in the Gannawarra Shire.

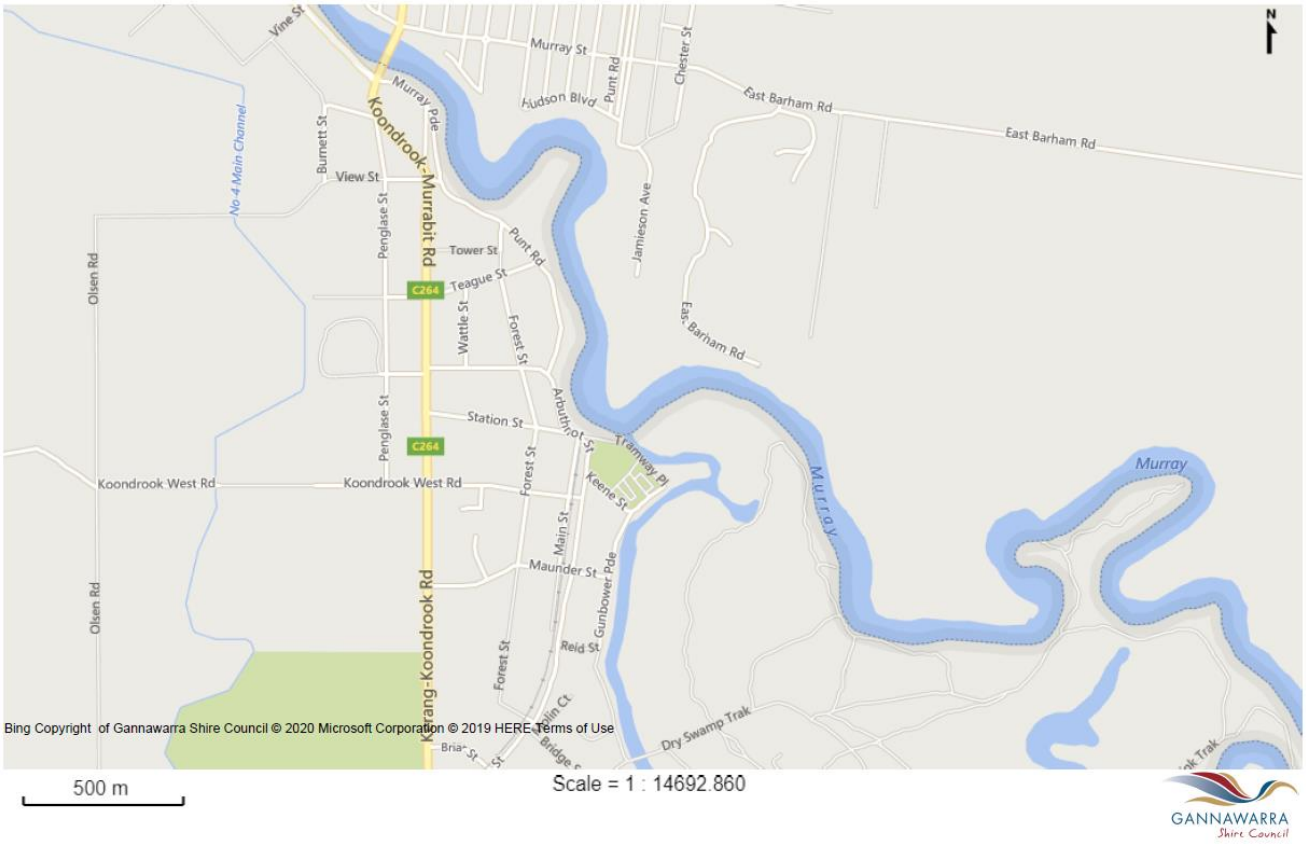
6.2.3 Koondrook

Description

Koondrook is located on the Murray River north-east of Kerang and has a population of 991 (as at the 2016 Census).

The reticulated sewerage system in Koondrook was commissioned in 2000. A number of homes on the fringes of the town are not connected to the system. Most of the septic tanks in use in Koondrook are split systems with sullage disposed directly to the land surface.

Lower Murray Water provides wastewater and water supply services to Koondrook. The water supply is drawn from the Murray River. Council has constructed a wetland to capture and treat stormwater from part of the town prior to discharge to the Murray River.



Key Wastewater Management Issues

- Most of the older septics are split systems with sullage disposal untreated to the surface.
- Most of the land within Koondrook has poor to moderate capability for effluent disposal (Appendix 3. Effluent Disposal Maps Area 7)

Risk Assessment

Koondrook has very high public health values and high environmental values threatened by a range of poor wastewater management practices.

Based on the risk assessment, Koondrook is the sixth highest priority township in the Gannawarra Shire.

6.2.4 Leitchville and Murrabit

Note that the townships of Leitchville and Murrabit are not considered as part of the risk assessment within this DWMP.

While prior to the installation of sewerage systems, both townships experienced significant environmental and public health risk, the installation of sewerage systems means that domestic wastewater is no longer considered a risk.

6.3 Septic Tanks in Unsewered Towns

6.3.1 Macorna

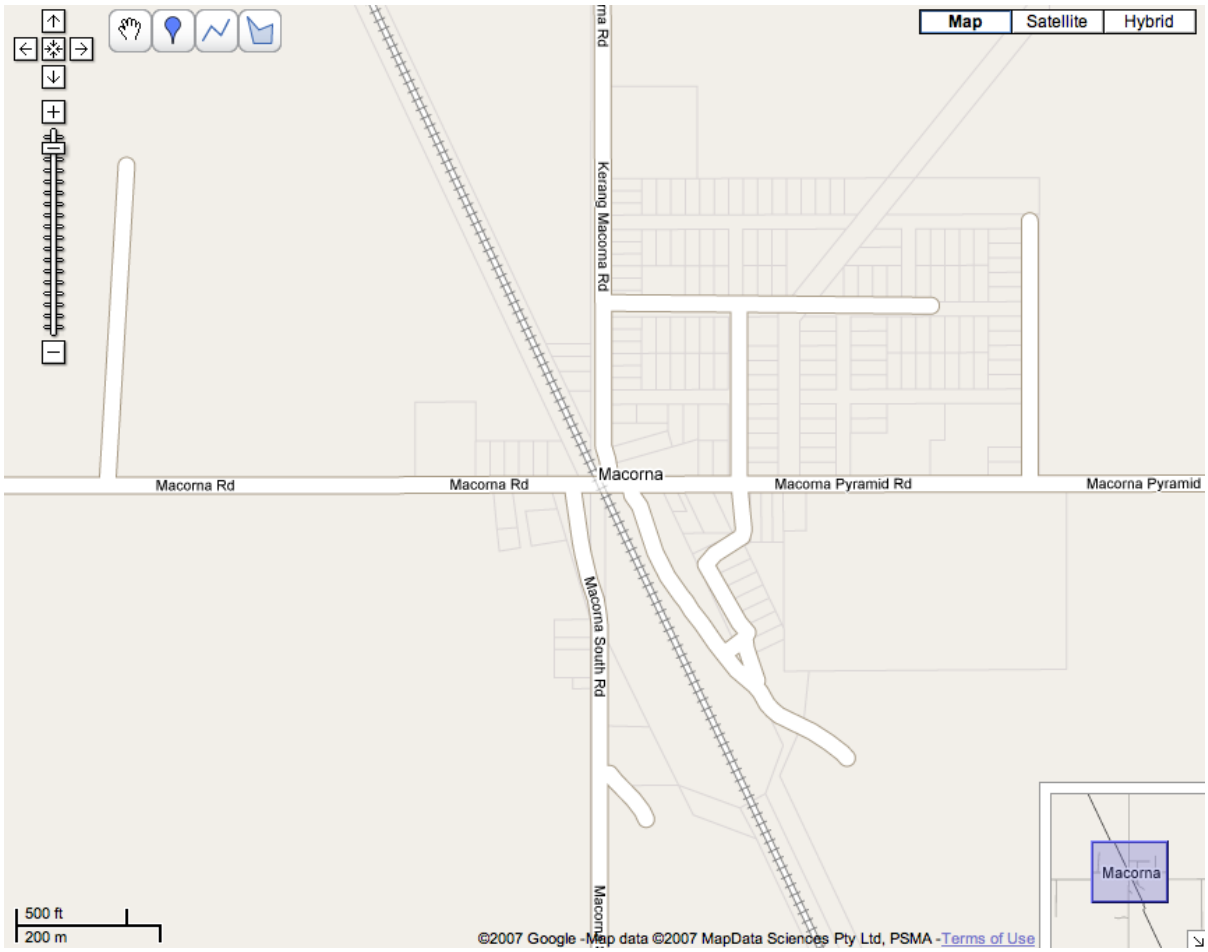
Description

Macorna is a small hamlet, 30km south east of Kerang off the Loddon Valley Highway. The town has a population of less than 90 (as at the 2016 Census).

A major subdivision of land in Macorna took place in 1885. Many blocks are less than 1,000 square metres. The land is flat and has very poor land capability for effluent disposal (land capability class for effluent disposal varies between 6a and 6b). This, together with small block size, has prevented construction of a dwelling on most allotments.

The township has a roughly formed earthen stormwater system. There are no natural waterways through or near the town.

The Macorna Recreation Reserve has an effluent pond for onsite effluent treatment and disposal.



Key Wastewater Management Issues

The key wastewater management issues at Macorna include:

- Small block sizes with insufficient area for sustainable domestic wastewater disposal;
- Heavy soils with slow infiltrations resulting in a poor land capability for effluent disposal.

Macorna is a low priority, unsewered town.

An Urban and Rural Strategy (Parsons Brinckerhoff, 2007) recommended that land currently zoned Township within Macorna should be zoned Farming to indicate that the town is not suited to further urban development. This re-zoning has not occurred to date.

The land within the "township" of Macorna is zoned Township Zone (TZ) and the surrounding land is Farming Zone (FZ). Whilst the township boundary contains the TZ blocks, some land around the boundary contains small FZ lots.

Within the TZ a planning permit is not required for a dwelling.

A minimum lot size of 4,000m^2 is required to build.

Risk Assessment

Risk Assessment tables show that Macorna has very high public health values and low environmental values threatened by a range of poor wastewater management practices.

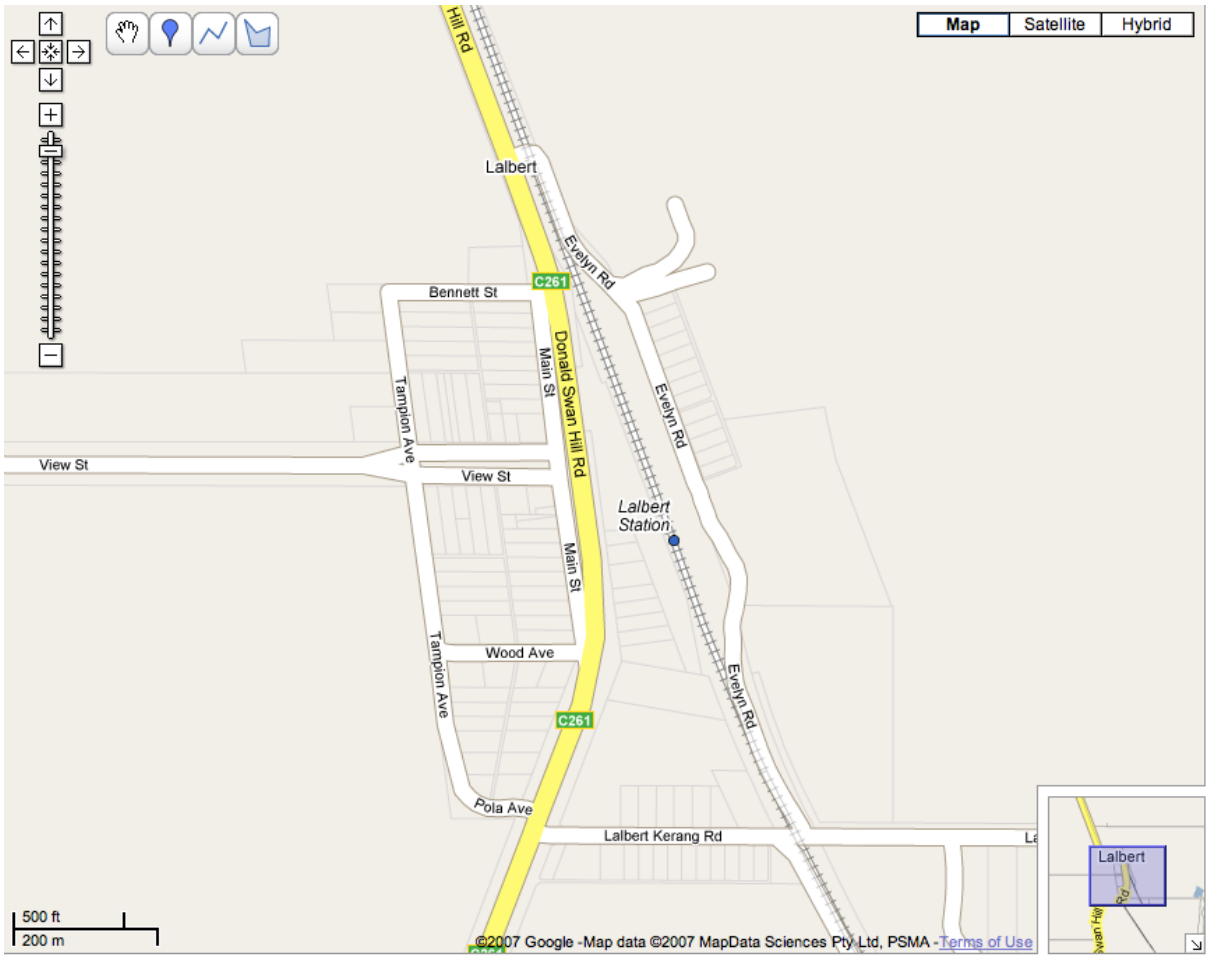
Based on the risk assessment, Macorna is the lowest priority township in the Gannawarra Shire.

6.3.2 Lalbert

Description

Lalbert is located on the western fringe of the Shire on the Donald Swan Hill Rd approximately 75 kilometres west of Kerang. The town has a population of 151 (as at the 2016 Census).

Lalbert has a water supply managed by Grampians Wimmera Mallee Water sourced from storages in the Grampians or from Murray River via the Wimmera Mallee Pipeline.



Key Wastewater Management Issues

- Some split systems are discharging to the surface;
- Systems are poorly maintained;
- Upgrades to toilet facilities at the recreation reserve have been carried out.

Risk Assessment

Risk Assessment show that Lalbert has a very high public health values and low environmental values threatened by a range of poor wastewater management practices.

Based on the risk assessment, Lalbert is the eighth highest priority township in the Gannawarra Shire.

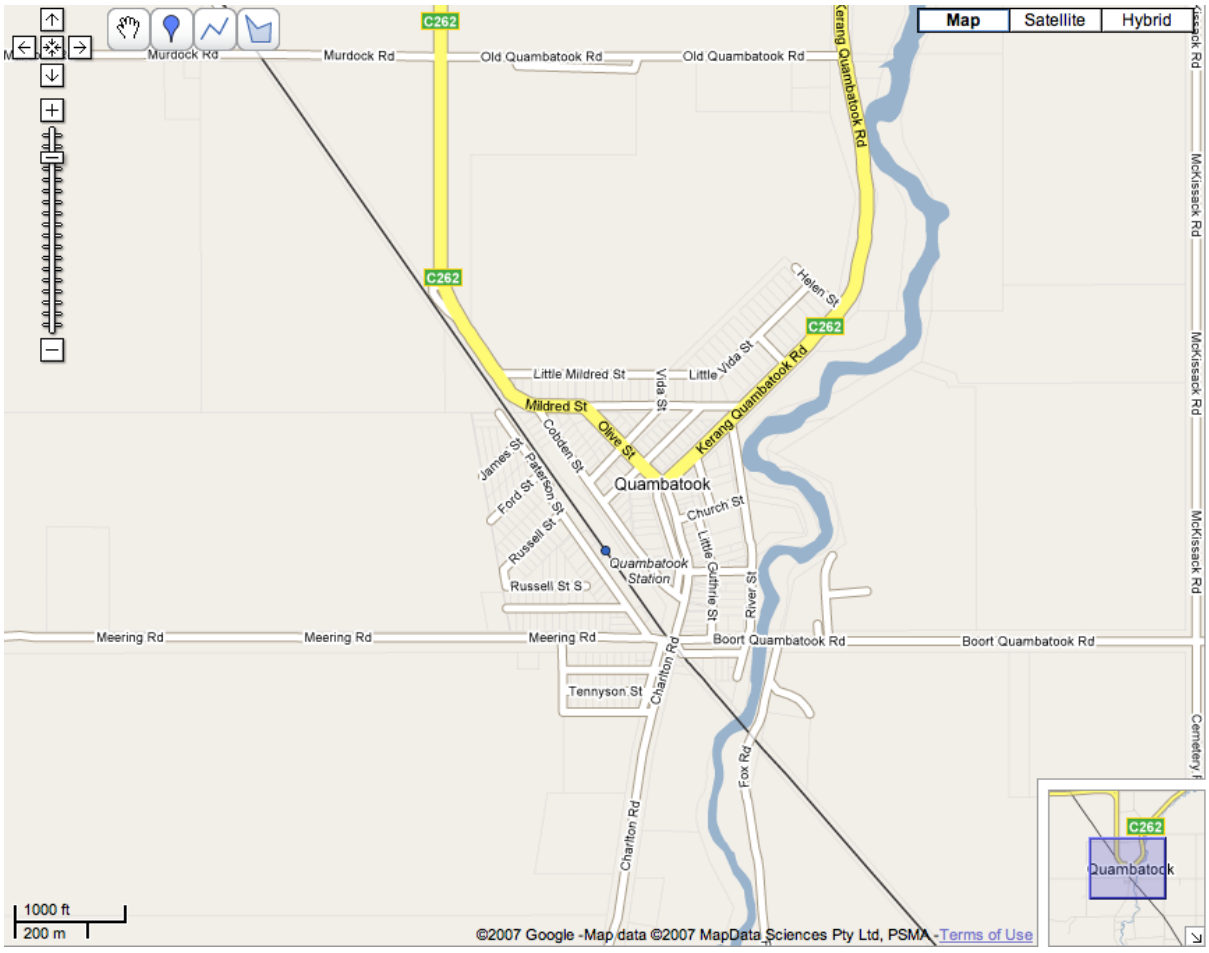
6.3.3 Quambatook

Quambatook is located 40 kilometres west of Kerang on the Avoca River. It has an ageing population of 250 (as at the 2016 Census).

Quambatook has a reticulated water supply from the Normanville Pipeline, managed by Grampians Wimmera Mallee Water.

The stormwater is collected in table drains and discharged to the Avoca River. A scheme to collect and treat the stormwater from the town and grains silos for use on the local recreation reserve has been completed.

The caravan park, golf club and football club combined have an effluent pond for onsite effluent treatment and disposal.



Key Wastewater Management Issues

A review of the wastewater issues at Quambatook in 2005 (Paladin White) noted the following wastewater problems:

- Old and poorly maintained septic systems;
- Undersized systems and disposal field for some commercial premises and community facilities which experience intermittent high loadings; and
- Avoca River receives stormwater and runoff from Quambatook

- Heavy clay subsoils have a low capacity to treat and retain wastewater ;

The former Quambatook Night Soil Depot is the only location within Gannawarra Shire available for the disposal of raw sewage generated from the de-sludging process of Domestic Wastewater Management Systems.

Risk Assessment

Risk Assessment tables show that Quambatook has very high public health values and moderate environmental values threatened by a range of poor wastewater management practices.

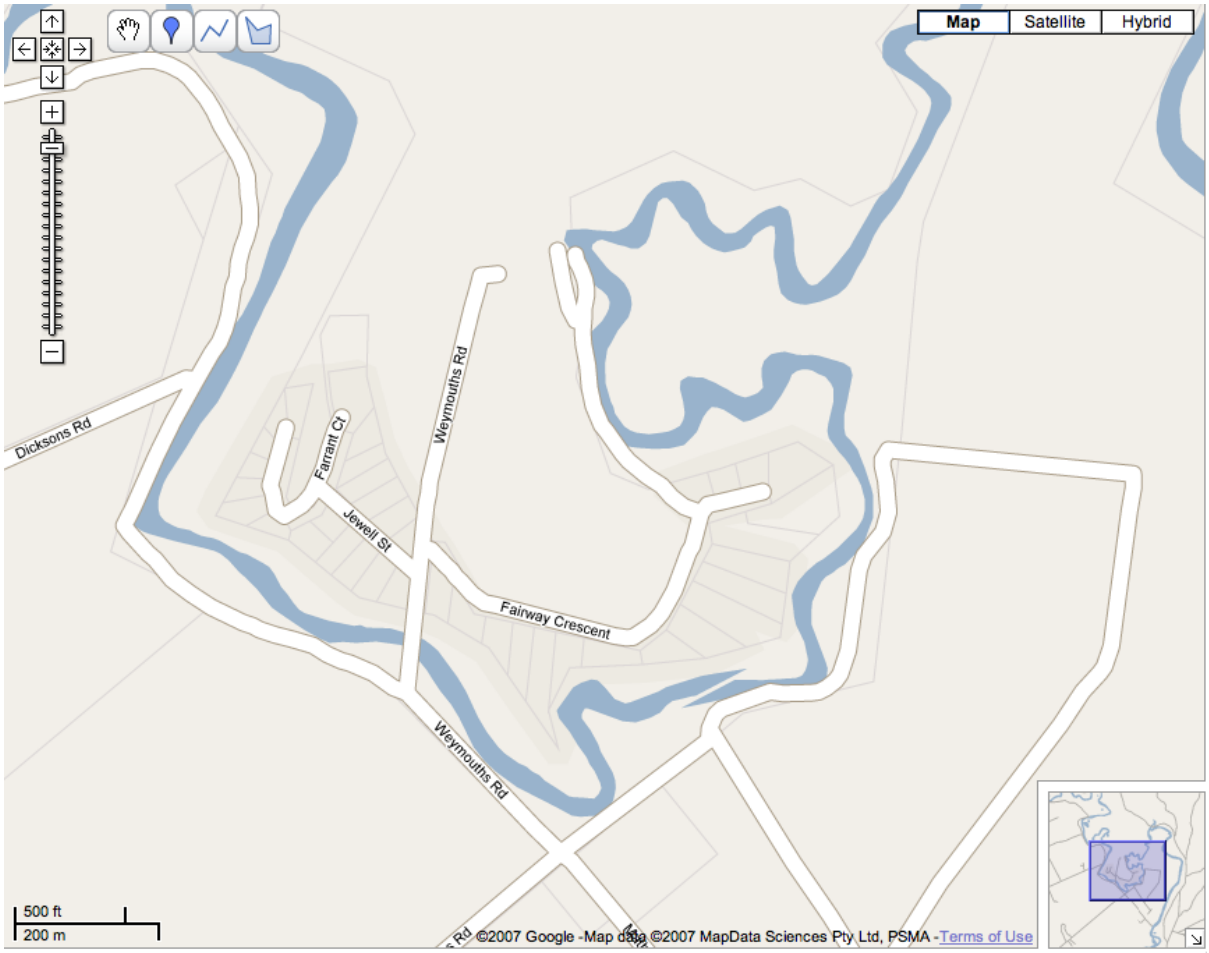
Based on the risk assessment, Quambatook is the second highest priority township in the Gannawarra Shire.

6.4 Septic Tanks in Rural Living Estates

6.4.1 Golf Links Estate, Cohuna

The Golf Links Estate is located north of Cohuna on the Gunbower Creek. The estate was established in the 1970s. It is a small residential estate and there are no community facilities.

Water supply is a non-reticulated, non-potable supply from individual entitlements pumped from the Gunbower Creek with rainwater collected in tanks for drinking purposes.



Key Wastewater Management Issues

A review of the wastewater issues at the Golf Links Estate in 2005 (Paladin White) noted the following wastewater problems:

- Offsite discharge of greywater;
- Onsite ponding of surface water (including some greywater);
- Inadequate setback of disposal fields from Gunbower Creek and from neighbouring properties (in breach of EPA Code of Practice);
- Inadequately sized, poorly managed and sited disposal fields;
- Poorly maintained systems;

- No provision for a reserve field now required by the EPA;
- Properties have a water right resulting in some heavily watered gardens reducing disposal efficiency as well as high in-house water use placing pressure on disposal fields;
- Eight vacant blocks cannot be developed due to area and location constraints;
- Deep, poorly structured clays have poor internal drainage have a low capacity to treat and retain wastewater onsite;
- Stormwater and runoff flow directly into the Gunbower Creek which is also a water supply for residents.

Risk Assessment

Risk Assessment tables demonstrate that the Golf Links Estate has very high public health values and moderate to very high environmental values threatened by a range of poor wastewater management practices.

Based on the risk assessment, the Golf Links Estate is the highest priority in the Gannawarra Shire.

6.4.2 Cohuna Island Road

The Cohuna Island Road area is located between the Gunbower Creek and the Murray River north-east of Cohuna. It is a rural living estate set amongst farming land.

The Gunbower Creek and Murray River both have significant economic and environmental values providing for irrigation, recreation and tourism, riparian habitat and supporting a diversity of instream fauna. . Gunbower Creek is the source of Cohuna's potable water supply. The northern fringes of the locality around the Gunbower Forest Ramsar Site which is also one of the six icon sites identified by the Murray Darling Basin Commission Living Murray Initiative.

The land has a flat topography. The area has not had a comprehensive land capability assessment.

Capability assessment of land elsewhere adjacent the Murray River indicates there is complexity and diversity of land types immediately adjacent to the river.

Key Wastewater Management Issues

- Some areas have sandy soils which have high percolation rates which have excellent drainage, but may hide problems associated with system failure;
- Blocks are too small for effective onsite wastewater disposal;
- Poorly managed systems, particularly the packaged treatment plants with some not serviced according to the manufacturer's instructions.

Risk Assessment

Risk Assessment tables demonstrate that the Cohuna Island Road has very high public health values and low environmental values threatened by a range of poor wastewater management practices.

Based on the risk assessment, Cohuna Island Road is the ninth highest priority in the Gannawarra Shire.

Note that some properties along Cohuna Island Road have been connected to the reticulated sewerage system since 2007 including Council managed properties of Apex Park, Cohuna Caravan Park, Cohuna Recreation Reserve and Cohuna Pool, along with the Island Rise subdivision. Other properties along Cohuna Island Road remain reliant on septic systems for disposal of domestic wastewater. A review of the risk rating of Cohuna Island Road is included as a future action due to its proximity to the Cohuna Water Treatment Plant and Gunbower Creek.

6.4.3 Kangaroo Lake

Kangaroo Lake is 20 kilometres North West of Kerang. Residential development, both permanent and weekends, around the lake occurs at the north east corner and along the northern and western shores. No reticulated water is available to residents. Water supply is from rainwater tanks and the lake.

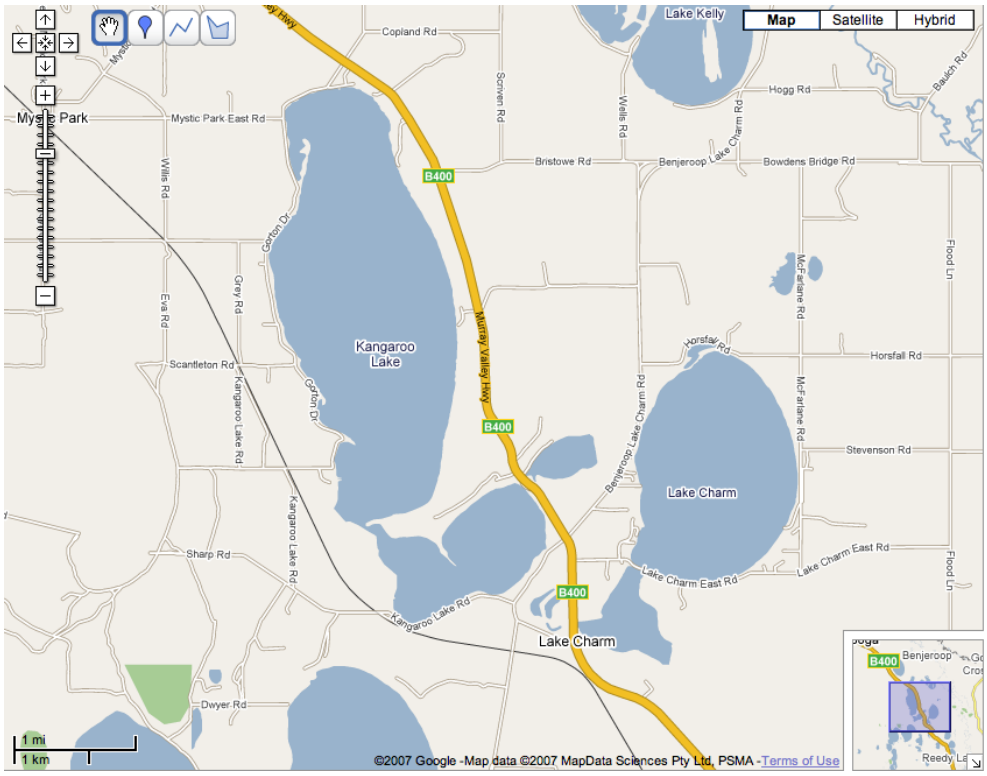
Beyond the fringe of lakeside development, there are areas of irrigated horticulture, largely grape vines.

Kangaroo Lake is a permanent freshwater lake and is popular for water-based recreation activities. The lake is also a water supply reserve, managed by Goulburn Murray Water as part of the Torrumbarry Irrigation System.

Crown Land on the western foreshore of the Lake is managed by the Kangaroo Lake Committee of Management.

Paladin White documented the properties of soils around Kangaroo Lake (Paladin White 2007) and found that the soils are predominantly loams with poorly draining clay subsoils are lesser areas of more permeable deep sandy loams and sandy clays. There are also areas with impermeable calcrete bands.

The Caravan Park has an EPA license for onsite disposal of effluent.



Key Wastewater Management Issues

- Land capability for effluent disposal in areas with tight clays, reactive sands and sandy loams with an impermeable calcrete layer through to poor land capability for effluent disposal varies to good land capability for effluent disposal with freely draining sands;

- Undersized disposal fields sited too close to the lake (should be setback 60m from foreshore);
- Properties too small to contain wastewater onsite;
- Some heavily watered gardens reduces the disposal efficiency and may result in runoff of effluent/sullage;
- Seasonal pressure on disposal fields and septic systems from holiday homes;
- Risk of effluent entering the lake directly through runoff or indirectly via subsoil intrusion, particularly on the northern and western shores where soils have high percolation rates; and
- Some more steeply undulating blocks have potential for wastewater to move offsite.

Risk Assessment

Risk Assessment tables demonstrate that Kangaroo Lake has very high public health values and very high environmental values threatened by a range of poor wastewater management practices.

Based on the risk assessment, Kangaroo Lake is the third highest priority township in the Gannawarra Shire.

6.4.4 Lake Charm and Racecourse Lake

Lake Charm and Racecourse Lake are located approximately 16 kilometres north west of Kerang.

Development around the Lake Charm is located in the south west and south east corners and along the eastern and northern shores and includes two caravan parks. Additional amenities blocks are located at the yacht club.

Development around Racecourse Lake is on the eastern shore and includes a caravan park, general store, service station, and a primary school.

There is no reticulated water supply and residents rely on rainwater tanks and the pumping from the lake for domestic purposes.

Paladin White documented the properties of soils around Lake Charm and Racecourse Lake (Paladin White 2007) and found that the soils are predominantly loam topsoils with poorly draining clay subsoils and lesser areas of permeable deep sand and sandy clays. There are also areas with impermeable calcrete bands.

Key Wastewater Management Issues

- Poor land capability for effluent disposal (slow percolation and calcrete barriers);
- Undersized disposal fields sited too close to the lake (should be setback 60m from foreshore);
- Properties too small to contain wastewater onsite;
- Seasonal pressure on disposal fields and septic systems from holiday homes;
- Risk of effluent entering the lake directly through runoff or indirectly via subsoil intrusion;
- Some more steeply undulating blocks have potential for wastewater to move offsite; and
- Some properties are low lying and wet conditions could reduce effectiveness of disposal.

Risk Assessment

Risk Assessment tables demonstrate that Lake Charm has very high public health values and low to very high environmental values threatened by a range of poor wastewater management practices.

Based on the risk assessment, Lake Charm is the fifth highest priority township in the Gannawarra Shire.

7 Action Plan

7.1 Introduction

A strategy has been developed to improve domestic wastewater management in the Gannawarra Shire. This is consistent with the goals and objectives for this DWMP, as outlined in Section 2.1.

7.2 Guiding Principles

The following key principles have provided guidance in development of the actions plans.

Appropriate Onsite Management

Individual onsite management of domestic wastewater is considered appropriate provided: allotments are large enough to contain all waste sustainably, soil types are suited to disposal, systems installed meet current EPA standards, and systems are managed and maintained appropriately. Where onsite management is not appropriate, Council will consider innovative solutions to domestic wastewater management, as well as traditional reticulated sewerage.

Protection of public health and the environment

Domestic wastewater poses a risk to public health and the environment. Raw sewage carries pathogens that can cause diseases such as hepatitis. It also contains nutrients that can cause environmental contamination resulting in algal growth in surface water. Councils have a responsibility to manage these risks and as such need to ensure the development of appropriate strategies.

Sustainable Development

Council aims to promote sustainable development of communities across the municipality. Strategic planning within the Shire will aim to incorporate domestic wastewater as a priority to ensure it is managed within the capability of the land.

7.3 Overview of Action Plan

The Action Plan consists of four priority areas to support the achievement of the guiding principles:

- Information Management
- Monitoring and Compliance
- Communication and Education
- Strategic Planning

Action Plan: Priority Area 1: Information Management

Council is responsible for implementing the requirements of the relevant legislation relating to onsite wastewater management systems. In order to do this effectively, Council's Environmental Health Officers must use an appropriate system that records and maintains the relevant data and allows for reminders to be set for land owners to either pump out or have their system serviced.

Council currently uses Treatment Plant Navigator as the data management system that allows for the management of wastewater specific information. Information within this system dates back to amalgamation in 1995 and at the date of review of this DWMP numbered 641 permits. This system does not allow for reminders to be set for land owners.

Council however has access to a specific Health Manager system and it may be more appropriate to consolidate systems. Resources to enable 641 permits to be transferred to a new system are currently not available within the Environmental Health team.

Action No.	What	How
1.1	Use Council's current Onsite Wastewater Management System database to input data relating to current installations and alterations	Accurately record all data relating to current and new installations and alterations throughout the installation or alteration process
1.2	Use Council's current onsite wastewater management system database to input data relating to past or historic installations or alterations	Through the process of complaint investigation, gather data relating to existing systems and input into database
1.3	Implement a management system to monitor compliance with existing system requirements	Investigate opportunities to incorporate database into Health Manager system. Maintain a register of odour and septic complaints to identify poor performing systems
1.4	Determine the number and location of septic tanks in the Gannawarra Shire	Develop a project and seek funding for resources to enable details to be collected and collated

Action Plan: Priority Area 2: Monitoring and Compliance

On construction of a new home or renovation of an existing home that incorporates a septic tank system, a septic tank permit is issued that details:

- The type of system and the conditions relating to installation and maintenance of the system;
- The approved installation plan incorporating positioning of the proposed effluent disposal area.

A compliance program seeks to ensure that property owners are complying with the conditions of the septic tank permit. This can be achieved by:

- Monitoring certificate of maintenance and sampling requirements submitted regularly by property owners;
- Conducting regular site inspections in high risk areas for high-risk systems.

Note that the maintenance and monitoring required is dependent on the type of septic system in place. Regular compliance monitoring is particularly relevant to Aerated Wastewater Treatment Systems (AWTS).

Compliance is a legislative responsibility for local government.

There is limited capacity with Council's Environmental Health team to proactively monitor wastewater treatment systems across the Gannawarra Shire.

The most efficient and effective way to manage the risks associated with wastewater is to ensure that all new installations and alterations to existing onsite wastewater management systems are compliant now and going forward and to address non-compliance through the planning and building permit process.

Action No.	What	How
2.1	Investigate all wastewater complaints	When a complaint is received, information will be recorded in Council's onsite wastewater management system database and investigated
2.2	Undertake Compliance Inspections for all new installations and alterations	Assess applications according to legislation, attend onsite and issue permits where appropriate
2.3	Assess planning referrals for proposed developments and building permits for alterations to existing buildings	When referrals are received from the planning and building department, make assessments of compliance, or otherwise of existing septic tank system
2.4	Develop an appropriate financial model to adequately resource the implementation, system inspection and monitoring of the domestic wastewater systems	Develop proposal for consideration of Council as part of budget process

Action Plan: Priority Area 3: Communication and Education

Poor wastewater management can arise because property owners don't know:

- They have a septic system;
- Their obligations and permit conditions;
- How a septic system works;
- How to prevent problems occurring;
- How to detect when a problem arises;
- The risks or detrimental impacts that can result from poorly operated septic systems.

This is exacerbated when there is change of home ownership and the new home owner is not made aware that they have a septic system and a septic tank permit applies to the property.

Action No.	What	How
3.1	Educational document to be distributed to applicants with a permit to install or alter an onsite wastewater management system	Update and promote Council's Septic Tank Owners Operation and Maintenance Guidelines and make this available from Council's website
3.2	Communication to community	Develop a communication strategy relating to onsite wastewater management systems

Action Plan: Priority Area 4: Strategic Planning

Consideration of domestic wastewater management should play a more significant role in determining town planning policy for unsewered towns and rural residential areas.

Council currently restricts development of small unsewered allotments that are unable to retain wastewater onsite. In the future reticulated sewerage is likely to be restricted to augmentation of existing schemes and areas where septic tank effluent poses a significant threat to environmental and public health values. This will have implications for landowners who perceive an existing entitlement to develop small allotments.

Council should seek to prevent subdivisions with allotments of insufficient size to ensure sustainable onsite effluent disposal.

This DWMP should also be used as an advocacy or supporting document for funding to support installation or expansion of reticulated sewerage systems in high priority growth areas.
One issue to be further investigated is the lack of EPA licensed sites for the authorised disposal of sludge from septic tank systems. Council manages an EPA licensed disposal site. This site is required to be upgraded to comply with current standards or replaced by alternative options.

Legislation changes should also be reviewed to ensure that this DWMP remains relevant.

Action No.	What	How
4.1	Ensure that the Minimum Lot Size Guidelines are adopted as a reference document	Promote a high level of understanding of the Guidelines across Council so that they are implemented into decision making by all relevant departments
4.2	Use this DWMP for advocacy or supporting document for funding to support installation and expansion of reticulated sewerage systems in high priority growth areas	Assess high priority growth areas identified in this DWMP for future advocacy and funding opportunities
4.3	Investigate alternative disposal methods for raw sewage from the desludging of domestic wastewater systems	Work with the EPA and other authorities as necessary to develop a solution
4.4	Review risk assessment of Cohuna Island Road, Cohuna	Develop project and seek funding to support a review of risk rating of Cohuna Island Road
4.5	Assess the performance of the various systems to inform future decisions related to approval of septic waste treatment systems	Investigate the development of a project and seeking funding for a system-based sampling and testing of the effluent of the treatment systems
4.6	Ensure that this DWMP remains relevant	Review legislation changes relating to the DWMP

8 References

Department of Sustainability and Environment, (2003). Gunbower Forest Ramsar Site; Strategic Management Plan.

Department of Sustainability and Environment, (2004). Kerang Wetlands Ramsar Site; Strategic Management Plan.

Municipal Association of Victoria, (2005). Model Municipal Domestic Wastewater Management Plan.

Paladin White, (2005). A review of the wastewater issues at the Cohuna Golf links Estate and Quambatook Township.

Paladin White, (2007). Support material for the Gannawarra Shire Wastewater Management Plan.

Parsons Brinckerhoff, (2007). Gannawarra Urban & Rural Strategy Plan.

Sinclair, Knight, Mertz, (2010). Kangaroo Lake Domestic Septic Tank and Groundwater Impacts Hydrological Assessment.

Victorian Auditor-General's Office, (2018). Managing the Environmental Impacts of Domestic Wastewater.

Appendix 1. Glossary of Terms

Sewage	Means any waste containing human excreta or domestic wastewater
Greywater or sullage	Domestic wastewater from bathrooms, kitchens and laundries
Blackwater	Waste directly from the toilet
Stormwater	Rainfall run-off carried through the stormwater system (ie. Town street drains and so on)
Failed systems with offsite discharge	Components of the septic system are no longer functioning so that untreated effluent is discharging beyond the property boundaries
Treated effluent with offsite discharge	The system is satisfactorily treating the waste but the distribution of the treated effluent is not functioning satisfactorily (eg. Blocked lines, compromised disposal field) and is discharging beyond the property boundaries (commonly occurs in wet weather)
Treated effluent with onsite discharge	The system is satisfactorily treating the waste but the distribution of the treated effluent is not functioning satisfactorily (eg. Blocked lines, compromised disposal field) and is discharging within the property boundaries
Treated effluent with offsite sullage discharge	A split septic system, where the blackwater is treated by the septic system and greywater is discharged directly to the stormwater system. Commonly permitted in the past but no longer complies with EPA regulation.
Reuse of wastewater	Onsite reuse of household greywater
Land capability	The capability of land to support a particular use and in this case, effluent disposal
Ineffective regulation	Many septic systems eg. Split systems discussed above, no longer complying with current regulation. However, local government cannot retrospectively change septic tank permits, so have no authority to require an upgrade of these non-compliant systems
Stormwater infrastructure	Stormwater infrastructure can contribute to wastewater management problems if it does not efficiently drain discharged effluent. Causing ponding and stagnation. It can also increase the risk of exposure of the public to effluent.

Appendix 2. Minimum Lot Size Guidelines

This guideline provides information to Council to assist with planning decisions and ensuring that new subdivisions have lot sizes that will ensure all effluent is contained onsite.

This guideline applies to all scenarios for onsite domestic wastewater management, regardless of treatment methods or land-application method.

Recommended Lot Sizes for New Subdivisions
The following lot sizes are considered appropriate for new subdivisions (considering only the issue of onsite domestic wastewater management). Determination of these lot sizes has included an element of conservatism (in particularly, the flow rates specified are significantly higher than average rates per household). These values are designed to ensure that on-site wastewater management systems will operate effectively with minimal input from Council.

Soil Category	**Typical soil texture**	**Indicative permeability (Ksat)**		**1000 litres/day**
		Range (m/day)	**Design (m/day)**	
1	Gravels and sands	>3.0	-	-
2	Sandy loams	1.4 to >3.0	1.4	4000 m^2
3	Loams	0.5 to 3.0	0.5	
4	Clay loams	0.12 to 0.5	0.12	6000 m^2
5	Light clays	0.06 to 0.12	0.07	
6a	Medium clays	~ 0.06	0.06	
6b	Heavy clays	<0.06	0.04	8000 m^2
6c	Poorly structured heavy clays	<0.06	0.035	

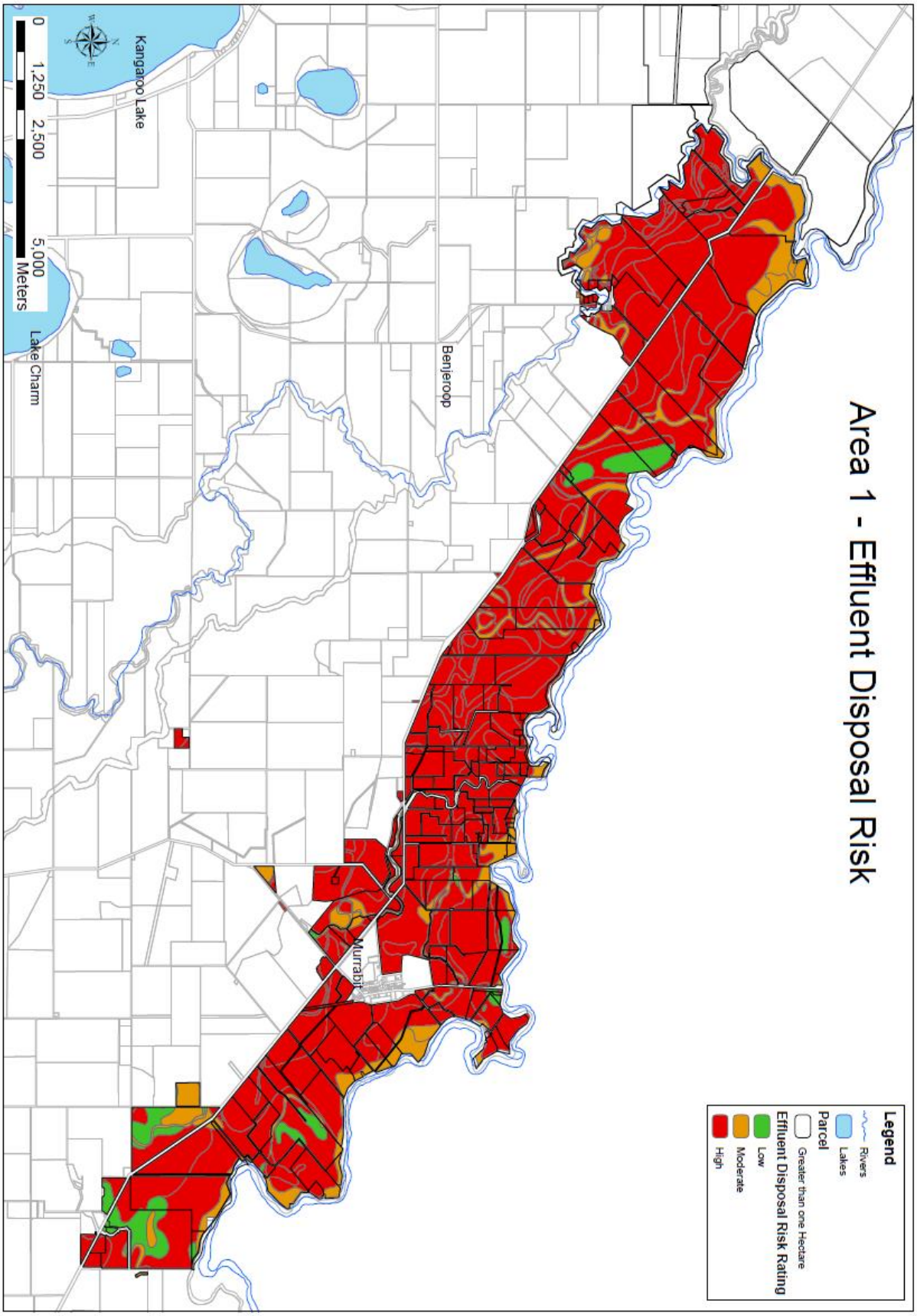
Notes:

1. Calculations are based on 400 mm annual rainfall and 600 mm wide ETA trenches. (This is the standard trench width adopted by Council). Note that different widths may be adopted in different places and this may affect the lot sizes required).
2. Based on <15% of the area of each lot to be set aside for effluent disposal.
3. Setbacks account for at least half of this areas to be set aside.
4. Treatment to 20/30 quality effluent may reduce the thresholds above the 1-2 categories.
5. For sprinkler irrigation, larger lots will be required, generally at least 600 m^2
6. Other site limitations such as proximity to watercourses, shallow groundwater (<1.2 m), slope (> 20%) or shallow depth to bedrock (<0.5 m) may result in a requirement for a larger lot size, or may make the site unsuitable for onsite wastewater management.

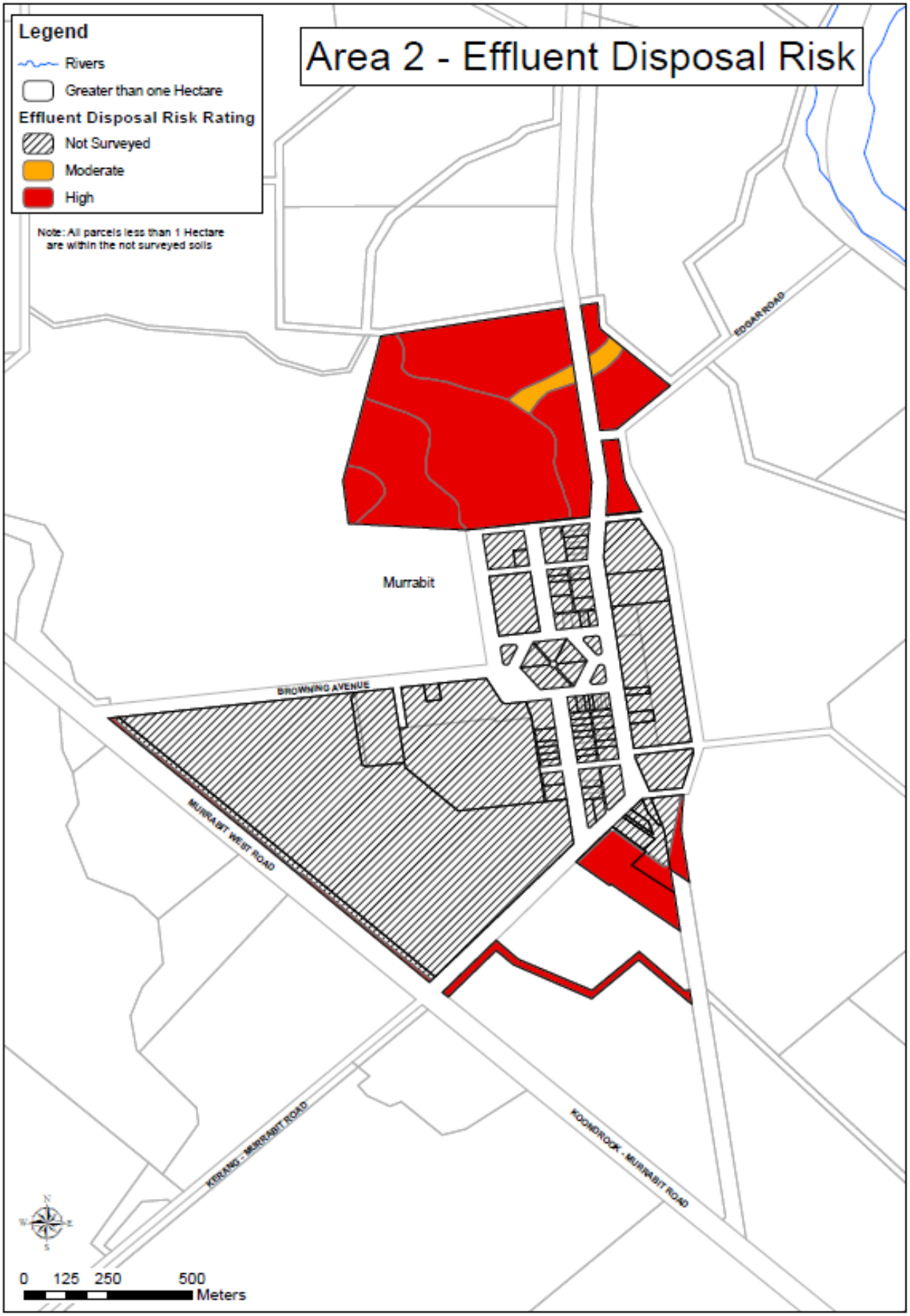
(Prepared by RMCG Consultants – 2007 Gannawarra DWMP)

Appendix 3. Land Capability for Effluent Disposal Maps

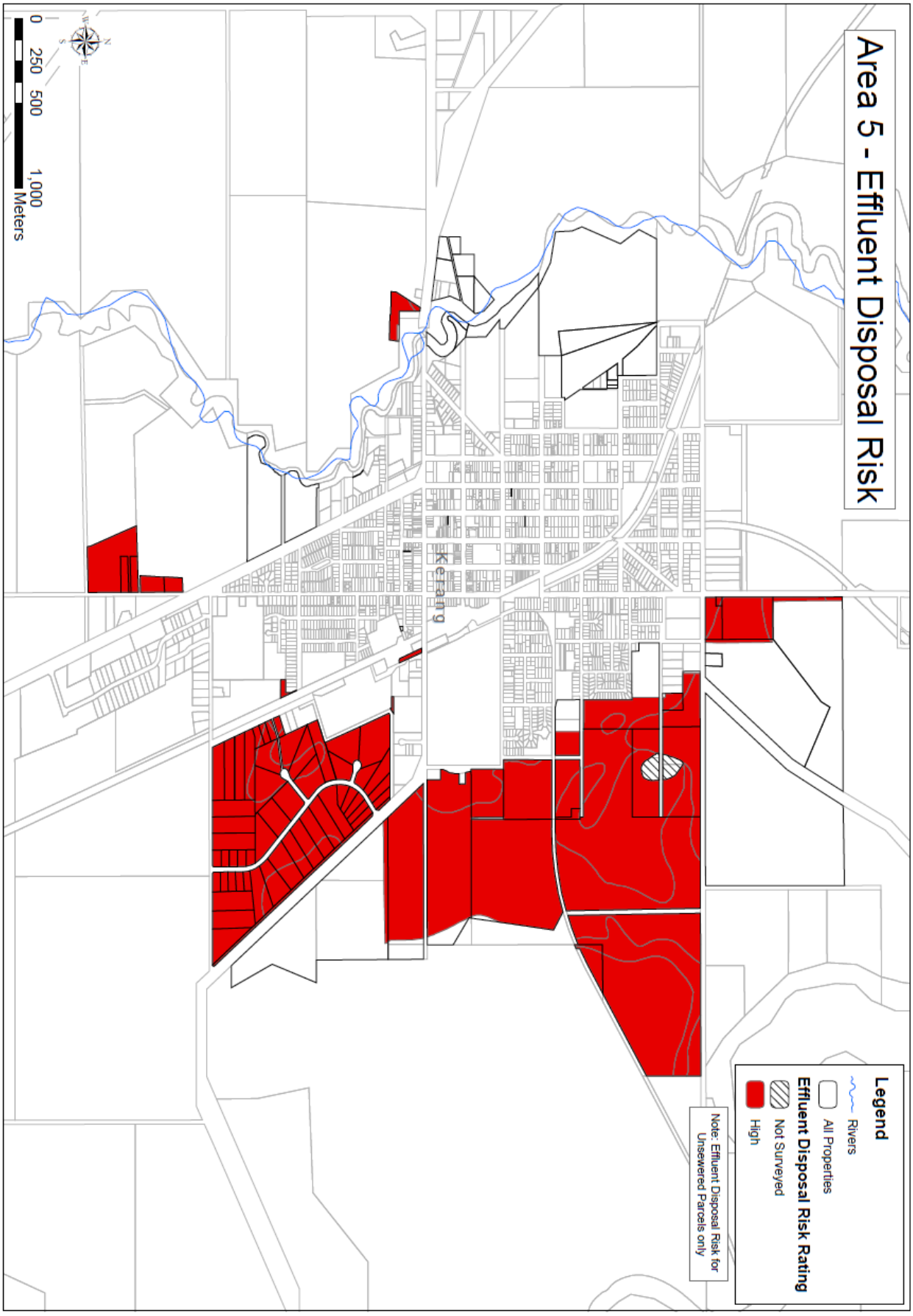
Area 1 – Murrabit and surrounds



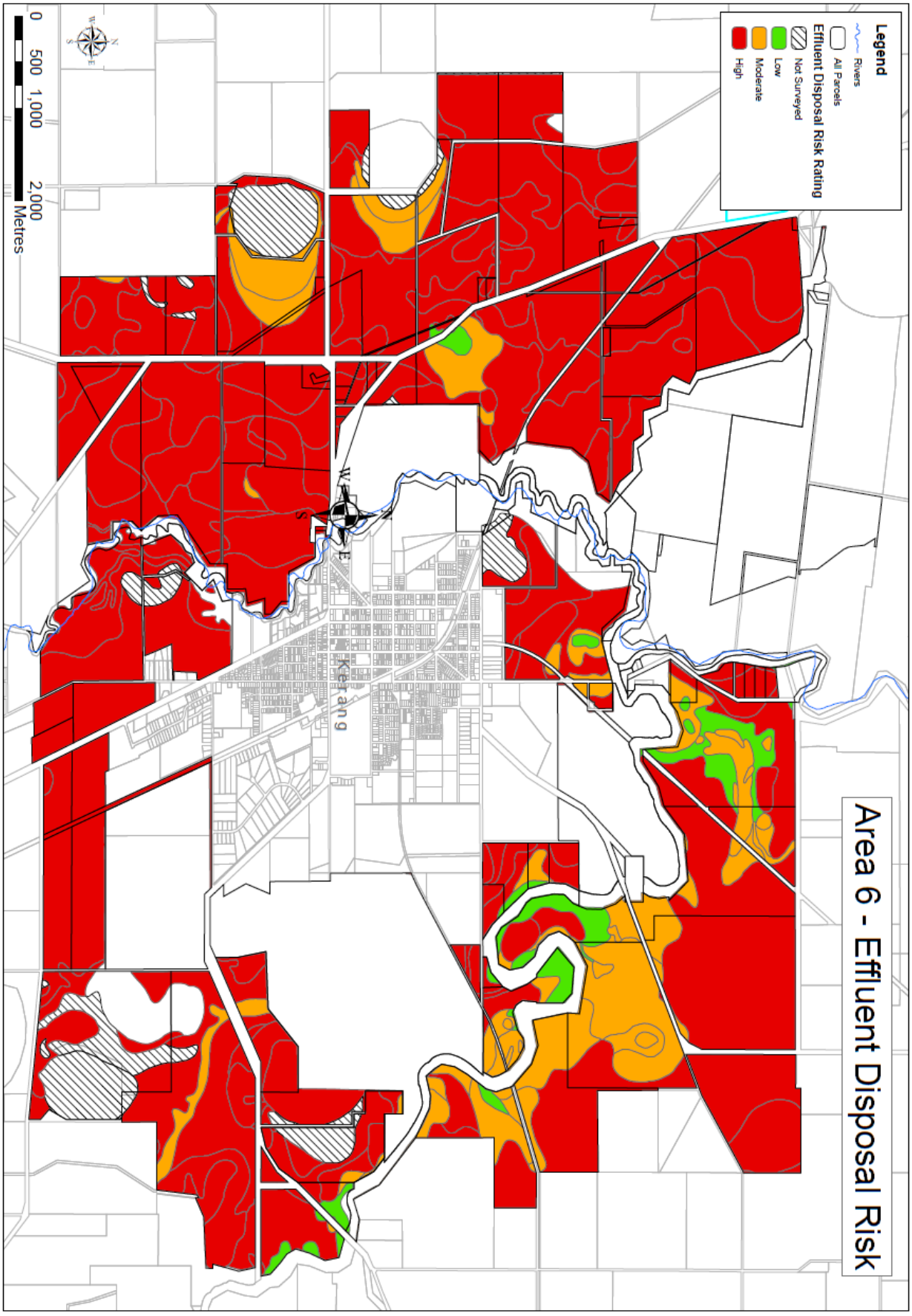
Area 2 – Murrabit



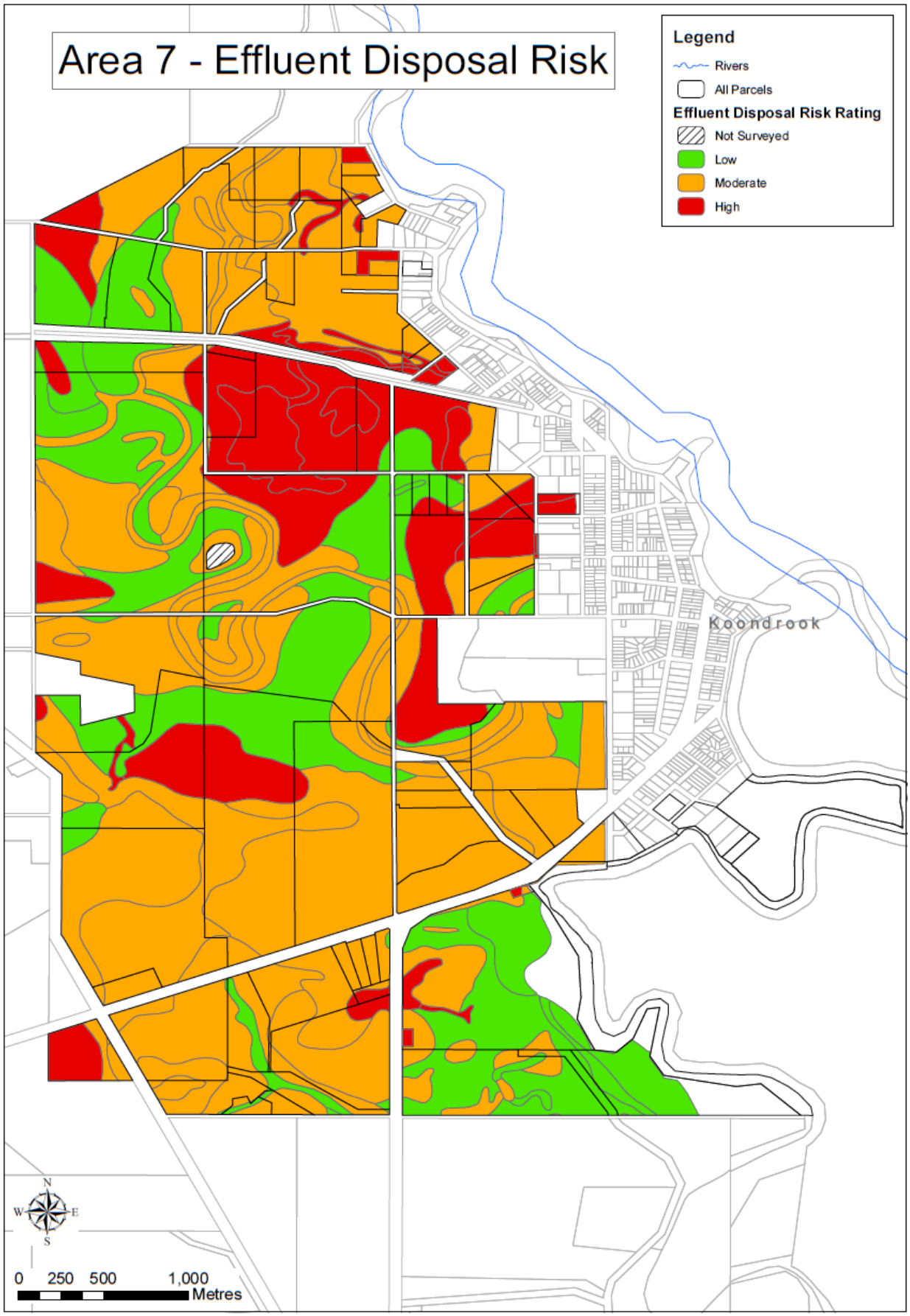
Area 5 – Kerang



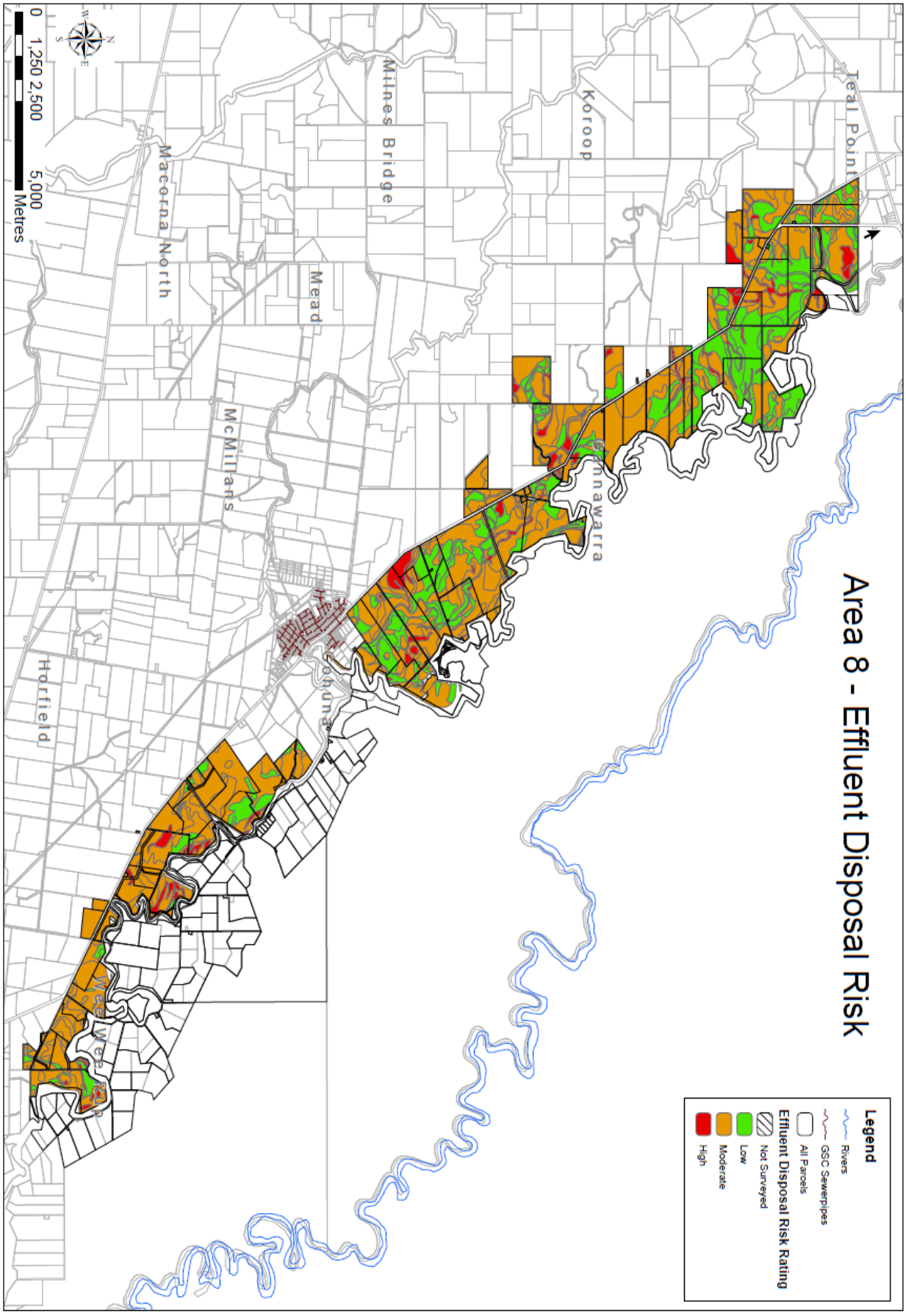
Area 6 – Kerang



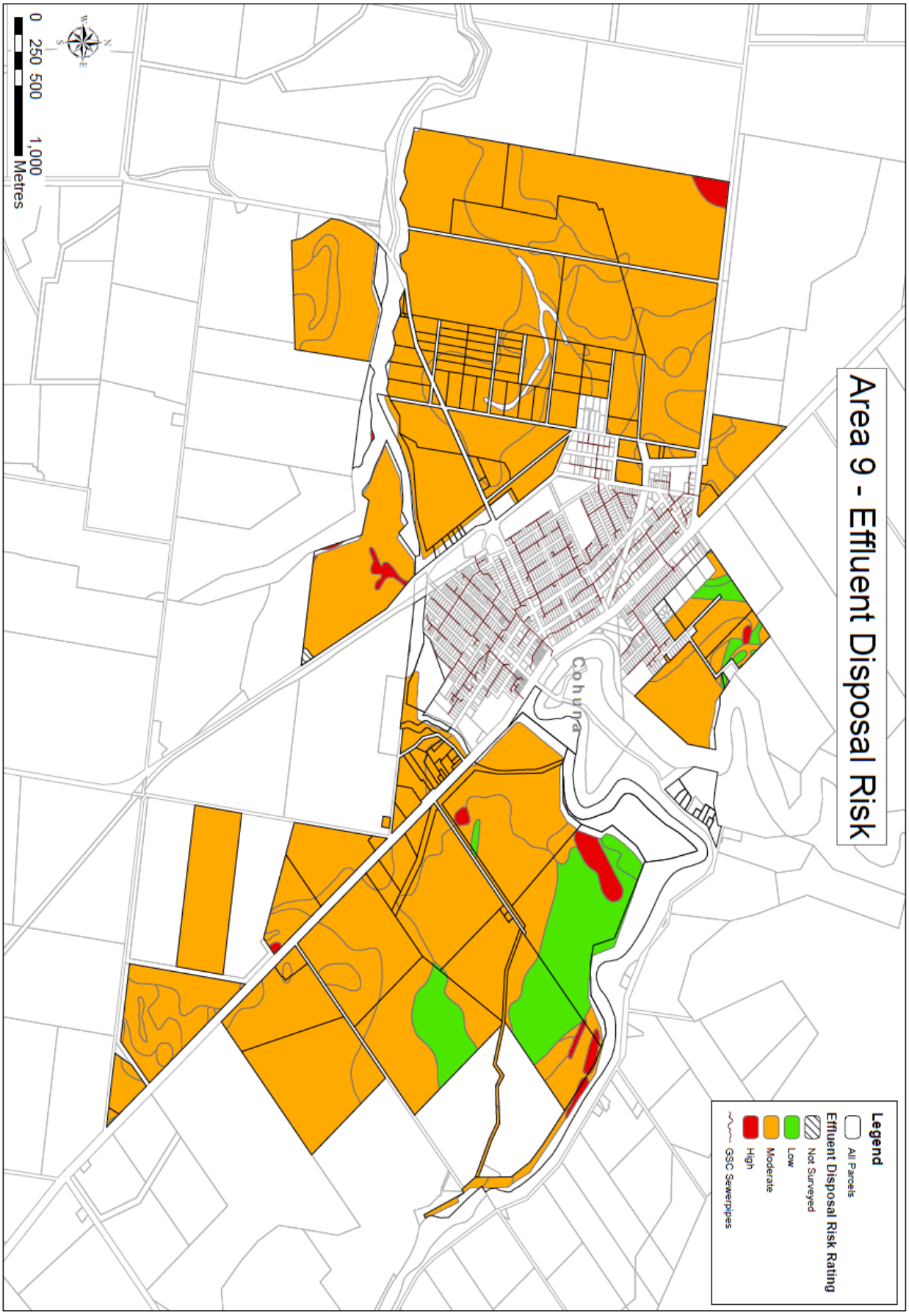
Area 7 – Koondrook

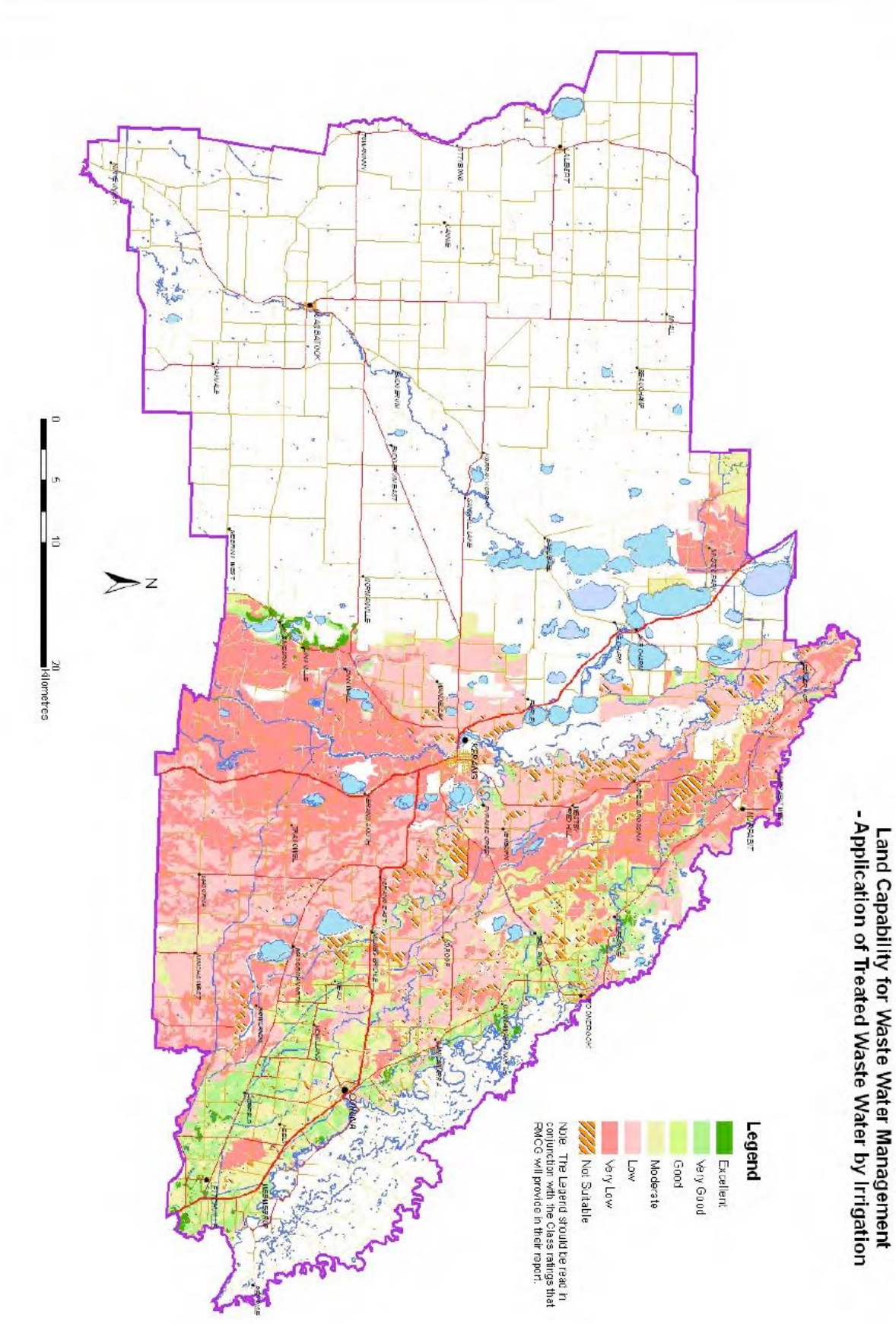


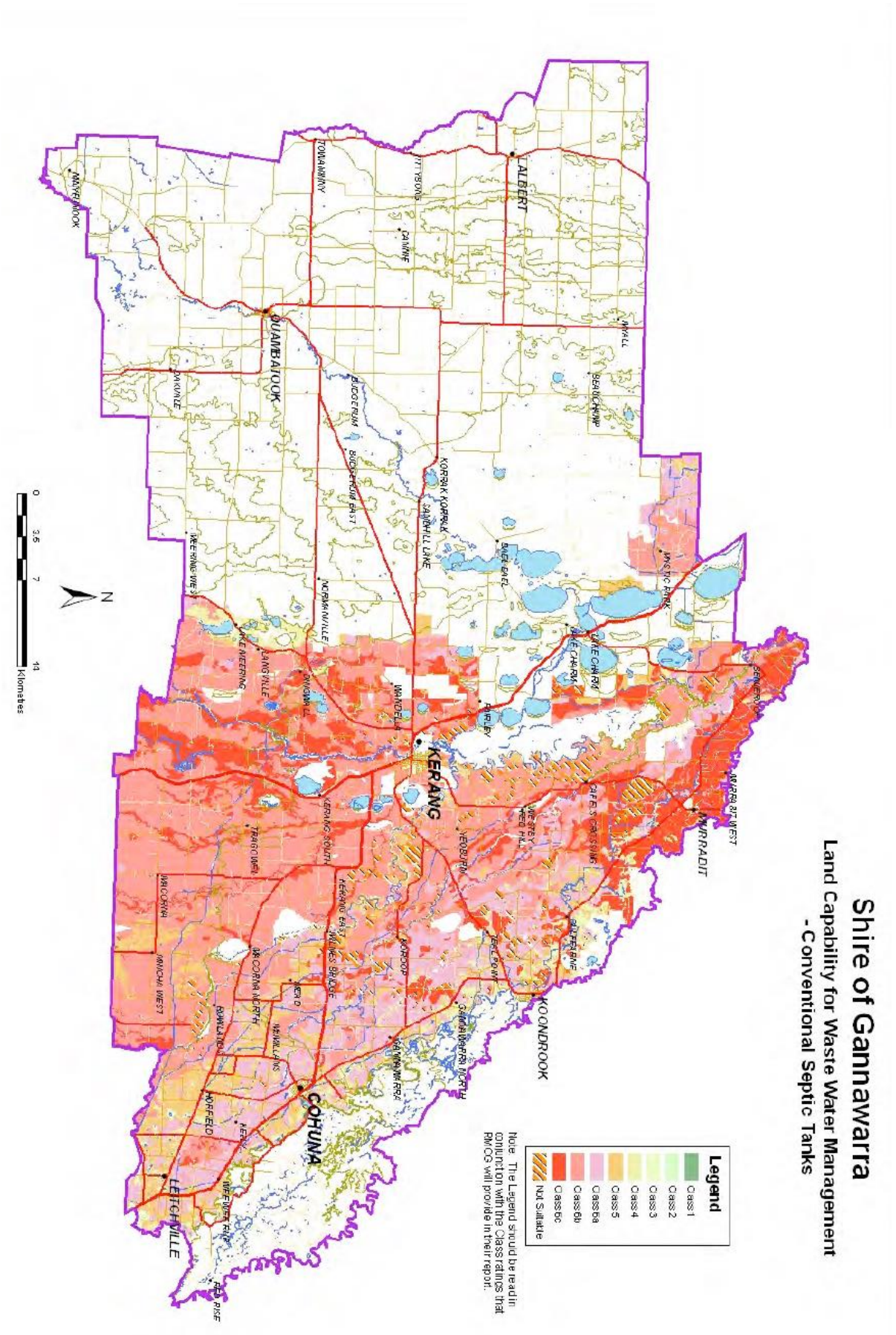
Area 8 – Cohuna



Area 9 – Cohuna




Land Capability for Waste Water Management
- Application of Treated Waste Water by Irrigation
Legend
Excellent
Very Good
Good
Moderate
Low
Very Low
Not Suitable
Note: The Legend should be read in conjunction with the Class ratings that RMCG will provide in their report.
N
0
5
10
20
Kilometres
RMCG
Consultants for Business, Communities & Environment


Shire of Gannawarra
Land Capability for Waste Water Management
- Conventional Septic Tanks
Legend
Class 1
Class 2
Class 3
Class 4
Class 5
Class 6a
Class 6b
Class 6c
Not Suitable
Note: The Legend should be read in conjunction with the Class ratings that RMCG will provide in their report.
KERANG
COHUNA
QUAMBATOOK
KOONDROOK
LEITCHVILLE
ALBERT
0
3.5
7
11
kilometres
N
RMCG
Consultants for Business, Communities & Environment