SA Murray-Darling Region

Strengthening Basin Communities Program
Climate Change Adaptation Project -
Horticultural and Rural Lands Review Policy Direction Discussion Paper



URPS

December 2011

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Prepared for SA Murray-Darling Basin Region

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Executive Summary

Purpose of the Paper

The Horticultural and Rural Lands Review, Policy Direction Discussion Paper seeks to build resilience within the communities of the South Australian Murray-Darling Basin (SA MDB) by providing for flexibility in land use planning, to accommodate future land use trends under predicted climate change scenarios. It is envisaged that this increased flexibility will be balanced by policy to protect the needs of existing land uses and protecting the natural resource base upon which the region's prosperity depends.

Guiding Principles

The following principles have been proposed to guide the development of future policy relating to climate change Development Plan initiatives.

Strategic Level

- Uphold the principles of ecologically sustainable development in designing adaptation and mitigation approaches, including environmental integrity, social equity and participation, economic viability and the precautionary principle.
- Plan now, to prevent further risks associated with climate change. For example some coastal amenity communities experiencing population growth will experience pressure for rapid development approval, before climate change considerations have been factored into planning and assessment frameworks.
- When undertaking strategic land use allocation planning processes, the following specific considerations should be taken into account:
  - The potential impact of the settlement or infrastructure, including the location and configuration of development, on the vulnerability of existing settlements (ie flooding, bushfire, other extreme climate impacts), natural habitat or biodiversity, including downstream impacts;
  - The location of existing and planned settlements / developments in relation to access routes, services, and infrastructure, and the likelihood of continued access to these facilities in the event of an emergency;

Development Plans

- Development Plan policies should seek to provide a high degree of flexibility (ie minimize non-complying lists and increase complying developments/envisaged land uses) to respond to new opportunities and build community resilience.
- Development Plan policies should seek to take a risk management approach to new opportunities/policies (with the knowledge that if a policy position fails it can be amended and its impacts, in certain circumstances, can be limited/contained).

- Subject to local circumstances, planning policy should be relatively consistent across local government areas.
- Development Plan policies are only one of many tools available to be used to address climate change adoption issues. Acknowledge the limitations of the Development Act/Development Plan framework. For instance, Development Act/Development policy can only be triggered if 'development' as defined by the Development Act is proposed to be undertaken.

Agricultural Production

- Identifying and preserve sustainable agricultural lands through planning controls and incentives to support agricultural production, while permitting compatible economic activities to coexist. Thereby increase farm incomes and employment generating activities.
- Enabling multi function use of agricultural lands, provided that additional uses do not threaten the long term quality of the land for agricultural production. Examples of additional uses include decentralised energy or power plants such as wind or solar farms.
- Determine appropriate land uses for long term unsuitable agricultural lands (eg tourism accommodation, rural living) and thereby increasing population levels that in turn will provide greater catchments to local community services and businesses.

Policy Directions

The Discussion Paper has concludes with a number of recommendations. A sample of these recommendations includes the following:

High Priority Recommendations

- Promote one primary production zone (rather than a combination of horticulture, rural and primary production zones).
- Allow second dwellings in rural areas within existing homestead sites, while ensuring land division around the second dwelling is non-complying.
- List wind / solar farms (and other alternative energy sources) as envisaged uses in primary production zones.
- Ensure site management plans are required for intensive animal keeping and horticulture activities.
- Identify and map locations in Development Plans of key NRM relevance (Eg Ramsar and prescribed areas), Consider aligning map data/titles with Department of Environment and Natural Resources language and criteria (ie Areas of High Environmental Significance). An alternative position is to include this information in Regional NRM Plans and by way of Regulation 14 of the Development Plan and Section 29 of the Development Act, ensure Council's Development Plans refer to the regional NRM Plans.

- Develop a consistent and readily available definition (and location) of the River Murray Floodplain, and the River Murray System and Tributaries area. It is noted that the 'River Murray Protection Area; (which includes the River Murray Floodplain Area and the River Murray Tributaries Area – refer to Schedule 8.1 (6) (a), is different to the 1956 floodplain. The River Murray Floodplain Area referred to in the Development Regulations extends in most cases much further than the physical extent of the 1956 flood event.

- The clauses in Schedule 8 of the Development Regulations relating to referrals to non-EPA environmental agencies need to be more clearly expressed and/or simplified. The current language is difficult to interpret and leads to potential errors in the referral processes.

Medium Priority Recommendations

- Ensure appropriate size farm gate sales (ie shops) and tourism activities as envisaged land uses in primary production zones.

- Encourage Councils to adopt the State's Better Development Plan, Forestry Module into their Development Plans.

- NRM Boards and PIRSA provide greater information to local government regarding the potential negative and positive impacts of commercial forestry and the implications on development assessment processes.

- Undertake additional district focussed economic, social and environmental investigations regarding opportunities and potential impacts of new commercial forestry (ie different species) targeted at the carbon sequestration market.

- Facilitate opportunities that increase the capacity of State and Local Government elected members, staff and applicants to have better regard to existing NRM (including climate change/water resources) Development Plan policies (e.g. education and training).

- Facilitate opportunities that increase the capacity of local government Elected Members, Council Strategic Planning and Policy Committees, Council Regional Forums, Development Assessment Panel members, staff and applicants to better understand natural resources management outcomes and the value this brings.

1.0 Introduction

1.1 Background

This document is a draft report of the Horticultural and Rural Lands Review Policy Direction component of the broader project titled "Strengthening Basin Communities – Planning Component: Climate Change Impact Assessment-Adaptation and Emerging Opportunities for the SA Murray-Darling Region".

This paper is comprised of the following sections.

- Section 1.0: The project objectives and study area are identified
- Section 2.0: Provides a description of the study area, supported by ABS data and GIS maps
- Section 3.0: Summarises the legislative responsibilities of local governments and planning authorities
- Section 4: Provides an overview of the preliminary recommendations from Report 1
- Section 5: Provides a summary of additional literature, (including Environment, Resources and Development Court determinations) that has been reviewed that was not available during the preparation of Milestone 1 Report (initial literature review)
- Section 6: Reports on the results of the Council staff telephone survey and consultations with Local Government representatives post Milestone 1 and 2 Reports
- Section 7: Provides discussions regarding forest plantations
- Section 8: Lists the papers findings and recommendations.

1.2 Objective

Based on the outcomes of the initial literature review (Report 1) and additional investigations and consultation (Report 2), this report discusses where statutory planning policy, legislation and government practices are required to be amended to address the uncertainty associated with climate change.

1.3 What Does Climate Change Mean for the South Australian Murray Darling-Basin?

Having regard to the overarching project managed by the Environment Institute, in the South Australian Murray-Darling Basin, climate change is likely to result in warmer, drier conditions in the future. There might also be greater variability in what is already

a variable climate. The potential impacts of these climate changes on the agriculture and forestry sectors include less water for irrigation, increased risk of fire, damage to crops and soils due to flooding, land degradation, crop failure and livestock heat stress and potentially death.

The potential productivity losses in the agricultural and forestry sectors as a result of climate change may lead to a fall in gross regional product, and farm incomes in some regions. Experience in rural communities during drought periods has shown that loss of income can lead to a range of impacts including increased workload, family conflict and withdrawal from social groups and communities.

Impacts of changed climatic conditions could include land owners and communities striving to facilitate land use and development opportunities that build upon market conditions. For instance, some landowners may be well placed to utilise their sites for green energy and carbon sequestration opportunities.

1.4 The Approach

The following investigations have been undertaken in preparing this report:

- Review of Report 1, including literature and review of Council's Development Plans
- Review of Report 2, including, additional literature review, Councils telephone survey, GIS and ABS data analysis
- Local government capacity building and engagement, workshop held 10 November 2011.
- Local government consultation, including workshop held on 9th May 2011
- Additional review of Development Plans and forestry information.

2.0 Study Area

2.1 Participating Local Governments

This study focuses on planning policy opportunities in the following local government areas:

(a) Renmark Paringa Council
(b) Berri Barmera Council
(c) District Council of Loxton Waikerie
(d) Regional Council of Goyder
(e) Mid Murray Council
(f) District Council of Karoonda East Murray
(g) Southern Mallee Council
(h) Rural City of Murray Bridge
(i) Coorong District Council

Due to other rural and horticultural land use projects being undertaken as part of SBC funding and Councils' own initiatives, URPS was requested to exclude the following localities:

(a) Alexandrina Council
(b) Mount Barker District Council
(c) The township of Cadell (and surroundings) and the River Murray corridor within the Mid Murray Council area

Apart from the Regional Council of Goyder, the remaining Councils within the study area are included within the Department of Planning and Local Government (DPLG) Murray and Mallee Region.

In summary the Murray and Mallee Region:

- covers 53,938 square kilometres
- has a population supported by primary production and processing, including horticulture/viticulture, dairying and intensive livestock production
- is situated in the South Australian Murray-Darling Basin Natural Resources Management (SA MDB NRM) region, which is divided into the following five units:
  - river corridor
  - Coorong and Lower Lakes
  - Murray Mallee
  - Eastern Mount Lofty Ranges and Murray Plains and

- South Olary Plains

- contains Murray Bridge, which has an economy based on food production and processing, and is the centre for government services in the region
- contains several major road and rail routes to the eastern states
- is a popular tourism destination featuring houseboat holidays and nature-based tourism associated with the River Murray and various conservation parks, and attracts more than 711,000 overnight visitors a year.

2.2 Review of GIS and ABS Data

A preliminary review of Geographical Information Systems (GIS) and Australian Bureau of Statistics (ABS) data was undertaken to supplement the findings of Report 1 and the Council surveys. The objective of the data review was to obtain a strategic level understanding of key trends with respect to:

- Population levels
- Employment levels
- Land Use changes

Information was sourced and mapping produced by Avante Mapping Solutions.

2.3 ABS Data

Tables contained in **Appendix A** provide details from the 2001 and 2006 ABS censuses relating to a range of data (by Council area) including:

- Number of persons
- Income levels
- Household size
- Occupation type
- Industry of Employment

Appendix B displays key information spatially.

The most recent ABS census was undertaken in 2006. The next census will be undertaken in 2011.

At a regional level the following observations are made:

- The region decreased its population from 71,249 people in 2001 to 70,853 people in 2006. (Decrease of 396 people - 0.5%). Most Council's apart from the Rural City

of Murray Bridge and to a lesser extent, Coorong District Council, all experienced a decrease in population levels.

- Increase in population levels of retirement aged group (65 years plus) from 10,255 persons in 2001 to 11,625 persons in 2006. (Increase of 1,270 people – 10.9%). This increase in retirees places greater pressure to (i) ensure there is appropriate housing stock in towns and (ii) to create dwellings in primary production areas (potentially near their existing homestead).
- There has been a decrease in the number of occupied dwellings from 33,856 dwellings in 2001to 27,376 dwellings in 2006. (Decrease of 6,480 occupied dwellings – 19%). This decrease is reflected across each Council area. Interpretation of this data needs to consider the large number of holiday homes/shacks within the region and their temporary use.
- The average household size across the region decreased from 2.6 persons per household to 2.2 persons.
- People employed in the agriculture, forestry and fishing industries decreased from 8,888 people in 2001 to 4,965 people in 2006. This represents a decrease of 3,923 people (44%). All local government areas recorded a decrease.
- People employed in manufacturing decreased from 3,526 people in 2001 to 2,740 people in 2006. This represents a decrease of 786 people (22%).
- People employed in the retail industry decreased from 3,760 people in 2001 to 1,493 people in 2006. This represents a decrease of 2,267 people (60%).
- People employed in the accommodation, cafes and restaurants industry decreased from 1,240 people in 2001 to 534 people in 2006. This represents a decrease of 706 people (57%).

2.4 GIS Land Use Data

Broad land use GIS data from 2003 and 2008 data sets were reviewed to document trends in rural land uses. Data was grouped into the following categories:

- **Conservation and natural environments** - Land used primarily for conservation purposes, based on the maintenance of the essentially natural ecosystems present.
- **Production from relatively natural environments** - Land used primarily for primary production with limited change to the native vegetation.
- **Production from dryland agriculture and plantations** - Land used mainly for primary production, based on dryland farming systems.
- **Production from irrigated agriculture and plantations** - Land used mostly for primary production based on irrigated farming.
- **Intensive uses** - Land subject to extensive modification, generally in association with closer residential settlement, commercial or industrial uses.

- **Water -** Water features. Water is regarded as an essential aspect of the classification, but it is primarily a cover type

In summary, the data leads to the following observations:

- There has been an increase of 3,404.64 square kilometers of land allocated to 'Conservation and Natural Environments'. The largest contributions came from land within Mid Murray Council, Loxton Waikerie Council and the District Council of Goyder.
- There has been an increase of 56.40 square kilometres of land allocated in the Intensive uses category. The largest contributions came from land within Coorong Council, Southern Mallee Council, Mid Murray Council and Murray Bridge Council. However, these total figures disguise a decrease of 16.34 square kilometres in Loxton Waikerie District Council.
- Production from Dryland Agriculture and Plantations increased by 698.43 square kilometres, with the largest increases from land within the Mid Murray Council and Loxton Waikerie District Council. However, land in the Coorong District Council recorded a decrease of 155.89 square kilometres.
- Production from Irrigated Agriculture and Plantations increased by 105.65 square kilometres. The largest increases came from land within Southern Mallee District Council, Loxton Waikerie District Council and Coorong District Council. However, land within the District Council of Goyder recorded a decrease of 30.76 square kilometres.
- Production from the 'Relatively Natural Environments' category decreased by 4,578.04 square kilometres. The largest contributors were from land within the Mid Murray Council and the Loxton Waikerie District Council.
- The Water category grew in total by 315.04 square kilometres. The largest contribution came from land within the Coorong District Council (4, 23.93 square kilometres). However, decreases were recorded in Renmark Paringa District Council, Mid Murray Council and Loxton Waikerie Council.

3.0 Role of Local Government and Planning Authorities

3.1 Introduction

Previous discussions relating to land use management responsibilities indicated the need to clarify the legislative role (and responsibility) of local governments and planning authorities. Planning authorities include State and local governments.

3.2 The Local Government Act 1999

The stated objectives of the Local Government Act include:

(b) to encourage the participation of local communities in the affairs of local government and to provide local communities, through their councils, with sufficient autonomy to manage the local affairs of their area; and

(d) to ensure the accountability of councils to the community; and

(e) to improve the capacity of the local government system to plan for, develop and manage local areas and to enhance the capacity of councils to act within their local areas as participants in the Australian system of representative government; and

to encourage local government to manage the natural and built environment in an ecologically sustainable manner; and

(g) to define the powers of local government and the roles of council members and officials.

Councils can further the objectives of the Local Government Act through the preparation of climate change adaptation plans. This project investigates how planning policy can be used as a tool to meet this end.

3.3 The Development Act 1993

Both the DPLG and local governments have a key responsibility in administrating the requirements of the Development Act. Key aspects of the Development Act where articulated in Report 1, however, it is useful to identify the broad overarching purpose of the Act.

The Development Act states that its objective is "*to provide for proper, orderly and efficient planning and* development in the State and, for that *purpose includes:*

(a) to establish objectives and principles of planning and development; and

(b) to establish a system of strategic planning governing development; and

(c) to provide for the creation of Development Plans—

(i) to enhance the proper conservation, use, development and management of land and buildings; and

(ii) to facilitate sustainable development and the protection of the environment; and

(iia) to encourage the management of the natural and constructed environment in an ecologically sustainable manner; and

(iii) to advance the social and economic interests and goals of the community; and

(e) to provide for appropriate public participation in the planning process and the assessment of development proposals; and

(ea) to promote or support initiatives to improve housing choice and access to affordable housing within the community; and

Ultimately, from planning strategy, planning policy and development assessment perspectives, planning authorities need to provide integrated and balanced decisions based on the objectives of the Act (noting development assessment decisions should be based on policies contained in Council's Development Plans).

4.0 Report 1: Preliminary Recommendations

4.1 Introduction

The following preliminary recommendations were presented in Report 1 for discussion purposes. They are categorised as follows:

- Murray-Darling Basin Small Block Irrigators Exit Grant Package
- Council's Development Plans
- Development Regulations
- Capacity Building

As a result of discussions with local government representatives and further testing, some of these preliminary recommendation have not been progressed as final recommendations.

4.2 Murray-Darling Basin Small Block Irrigators Exit Grant Package

Recommendation: Undertake evidence based research that articulates potential negative impacts of the "Exit Grant Package eligibility requirements", given the package may potentially have the following planning impacts:

- The cessation of farming activities may result in land owners seeking to retain their residence in their farm house while desiring to sell the majority of the remaining farming land. This can be problematic given many Council Development Plan's primary production zones (or similar) discourage the division of land, as such division is typically considered to erode the long term primary production opportunities of the locality.
- The 'locking-out' of irrigated farming for at least five years may have short term impacts such as discouraging neighbouring farms to expand by way of purchasing these "locked-out" lots. The lack of expansion opportunities may undermine confidence in the locality's primary production future, particularly for farmers who are purchasing water entitlements and seeking to reinvest in the region.

4.3 Council's Development Plans

4.3.1 Land Use Planning

State water targets include maintaining positive salinity levels. Planning strategies to achieve these targets may include encouraging irrigators to relocate to more suitable sites.

Recommendation: Development Plan planning policies may be required to promote alternative land uses for high salinity areas such as tourism/recreation and/or residential/rural living activities that are underpinned by water sensitive urban design / best practice land management principles. It is noted that Regional Plans do not necessarily encourage the wide spread adoption of rural living activities.

4.3.2 Water Availability

There is little guidance provided in Council Development Plans regarding the link between the availability of water and water use and approving development. Currently the planning system may approve a form of development within a non-prescribed area that is dependent on water to operate. In this case, the planning authority is potentially dealing with a "hypothetical development" and may be able to refuse to proceed with the development application. Having said that, a more conservative and recommended approach would be to assess the development application. Any decisions regarding determining if an application is "hypothetical" should be associated with legal advice.

Furthermore, it is noted that with the advent of 'unbundling' of water from land as has occurred in other States, it shouldn't be automatically assumed that land that was traditionally irrigated has (or will have) water allocated to it. A rural landowner might simply trade in 'lease' water for when irrigation is needed.

Recommendations: Where available, it is recommended that Prescribed Water Resources Area Maps be incorporated in Council Development Plans or readily accessible location (eg DPLG Atlas Website, or Regional NRM Plans[1]).

4.3.3 Site/Land Management

There is a need for greater policy provisions across the Council Development Plans that encourage Applicants to prepare concise farm/site management plans for uses such as horticulture and intensive

[1] Regulation 14 (Prescribed Plans) of the Development Regulations identifies Regional NRM Plans as being appropriate for reference in a Council's Development Plan, pursuant to section 29 (1) (b) of the Development Act.

animal keeping. While it is acknowledged such issues are also the responsibility of other government instruments such as the Natural Resources Management (NRM) Board, a site management plan can assist Council officers in assessing the likely impacts of a proposal. They can also be used to reinforce conditions of consent attached to a development approval.

Recommendation: Amendments to schedule 5 of the Development Regulations should be considered to encourage the submission of site management plans in certain circumstances.

It is acknowledged that in a limited number of local government areas within the region, farmers are encouraged to present irrigated management drainage plans to support their development applications.

4.3.4 Number of Similar Zones

Development Plans contain significant variation across similar zones. There is merit to consider a more consistent approach to the identification of zone Objectives and Principles of Development Control. This issue will be addressed (in part) when Council's convert to the same version of the Better Development Plan (BDP).

Recommendation: Work with DPLG to further review the content of the BDP modules to broaden the level of coverage and appropriateness of NRM issues. This is in part being undertaken now via the URPS and Regional NRM Board project.

4.3.5 Complying Developments

Recommendation: Linked to appropriate land uses and associated complying development conditions, seek to increase the number of complying developments within Council's Development Plan and thereby create greater certainty for land owners. Complying developments vary across the reviewed Development Plan zones. This issue will be addressed when Councils convert to the same version of the BDP. This issue is not considered to be significant as (i) local variations are appropriate, to some level, and (ii) developments that are required to be referred to government agencies via Schedule 8 of the *Development Regulations* cannot be processed as complying developments.

4.3.6 Non-Complying Developments

Recommendation: There is merit to consider a more consistent regional approach to identify what should be listed as "non-complying" and how zone policy should be written. Currently, Development Plans contain significant variation across similar zones, including in respect to dwellings and land division This issue, in part, may be addressed when Council's convert to the same version of BDP.

4.3.7 Maps

Recommendation: There is a need to specifically identify and map locations in Development Plans of key NRM relevance (Eg Ramsar and prescribed areas, River Murray Protection Areas etc). Consider aligning maps/titles with Department of Environment and Natural Resources (DENR) language and criteria (ie Areas of High Environmental Significance). Alternative strategies to incorporate maps in Development Plans, is to have these maps contained within Regional Natural Resources Management Plans. By way of Section 29 Development Act, Development Plans can refer to Regional NRM Plans (refer to Regulation 14 of the Development Regulations).

Recommendation: Consideration drafting a consistent definition for the River Murray Protection Area – River Murray Floodplain Area (River Murray Act) and the River Murray Flood Zone and River Murray Fringe Zone (as defined within some Council Development Plans). The existing inconsistent approach creates considerable confusion within the region.

It is noted that 'River Murray Protection Area (which includes the River Murray Floodplain Area and the River Murray Tributaries Area – refer to Schedule 8.1 (6) (a), is different to the 1956 floodplain. The River Murray Floodplain Area referred to in the Development Regulations extends in most cases much further than the physical extent of the 1956 flood event.

4.4 Development Regulations

4.4.1 Schedule 1 Definitions

Recommendation: From an NRM perspective, consider amending Development Regulations to provide separate definitions for irrigated and non-irrigated farming. Irrigated agriculture may have similar impacts as irrigated horticulture, but is not deemed to be a change of land use if the existing use is dryland farming.

This needs to be further considered as there may be a lesser requirement for this recommendation in prescribed areas. Although there may be a valid NRM reason for this position, this preliminary recommendation needs further consideration as there may be valid practical farm management reasons why this recommendation may not be a high priority for Councils to implement.

Recommendation: Transfer the commercial forestry definition from schedule 8 to schedule 1. Schedule 8, Clause 3A of the Development Regulations provides a definition for commercial forestry. "Commercial forest means a forest plantation where the forest vegetation is grown or maintained so that it can be harvested or used for commercial purposes (including through the commercial exploitation of the carbon absorption capacity of the forest

vegetation)." A more appropriate location for this definition would be in Schedule 1 (Definitions) of the Development Regulations.

4.4.2 Schedule 8 Referrals

Recommendation: Referral determination processes could be simplified. The clauses in Schedule 8 of the Development Regulations relating to referrals to non-EPA environmental agencies need to be more clearly expressed and/or simplified. The current language is difficult to interpret and leads to potential errors in the referral processes.

Recommendation: Consider formally recognising the roles being undertaken by the NRM Board in providing advice to planning authorities. This needs to be balanced with the NRMB's resource implications associated with this task and potentially increasing development application assessment timeframes that will add costs to the Applicant.

4.4.3 Development Assessment Panels

Recommendation: In partnership with local governments and relevant government agencies, investigate the merits of promoting the use of people with specific experience in natural resources management on "regional" DAP or "regional" strategic planning committees and/or forums.

4.5 Capacity Building

Recommendation: Facilitate opportunities via education and training that increase the capacity of local government elected members, staff and applicants to have better regard to existing NRM (including climate change/water resources) Development Plan policies.

Recommendation: Facilitate opportunities that increase the capacity of local government Elected Members, Council Strategic Planning and Policy Committees, Council Regional Forums, staff and applicants to better understand natural resources management outcomes and the value this brings. This may involve the preparation of guidelines which provide further detail to the generally broad NRM policies currently outlined within these Development Plans.

5.0 Literature Review

In addition to the literature review contained in Report 1, the following relevant documents are available and have now been summarised:

- Environment Institute Report " Strengthening Basin Communities Program – Planning Component Consultancy SBC033A.1/2 Climate Change impact assessment, adaptation and emerging opportunities for the SA Murray-Darling region: Milestone 1 Report" (29 August 2010)
- URPS "Alexandrina Council Rural Areas Strategy and Action Plan" (2009) (Report received National (2010) and State (2009) Planning Institute of Australia Award of Excellence).
- Renmark Paringa Council Development Plan Conversion and Alignment Development Plan Amendment (September 2010), prepared by Development Answers Pty Ltd

5.1 Climate Change: Impact on Agricultural Lands & Rural Enterprises

The Environment Institute Report " Strengthening Basin Communities Program – Planning Component Consultancy SBC033A.1/2 Climate Change impact assessment, adaptation and emerging opportunities for the SA Murray-Darling region: Milestone 1 Report" (29 August 2010) provides a strategic context regarding impacts of climate change on agriculture and rural enterprises. Extracts of the report include the following:

"Current climate change projections indicate an increase in temperatures and a decrease in rainfall over the SA MDB and a higher frequency of extreme weather events. These conditions will have significant effects on current production systems whether dryland agriculture or in the case of irrigated agriculture through reduced river flows and water allocations.

There is general concern about the possible reduced income base for regional councils that could hamper the adaption to the many issues within the different council areas. The economic viability of maintaining infrastructure, which supports all aspects of the economy from agriculture and industry, to tourism, may be compromised. Similarly, rural centres and towns could become unviable and find themselves stranded as the economic activity that supports them diminishes. For the councils in the SA MDB NRM region a major part of this economic activity is driven by the agriculture sector. The total gross value of agriculture in the SA MDB NRM region exceeds $1.2 billion from a diverse range of broadacre cropping and grazing to irrigated horticulture and viticulture.

Most broadacre agriculture has been preceded by large scale clearing of deep rooted perennial native vegetation and replacement by shallow rooted annual systems. This change in land use has resulted in substantial degradation in the biological, nutritional and water resources in the landscape. Climate change has the potential to exacerbate these changes in our landscape functions. Reduced rainfall and increased temperature are known to reduce agricultural yields and increase the risk of environmental problems such as wind erosion.

Dryland cropping and pasture will be effected by shortened growing season duration with higher temperatures while reduced rainfall will almost always reduce yield potential. Similarly, higher temperatures will increase the stress imposed on livestock and reduce the abundance and quality of their feed. Irrigated crops will also be affected; decreased rainfall will result in less river flow and likely reduced water allocations, insufficient cold will reduce seed set for some fruit crops and higher temperatures will affect fruit quality for other crops. The reduced risk of frost will be advantageous for some crops but these benefits can be quickly overshadowed by the prospect of lower rainfall amounts.

The report provides additional discussion on potential impacts and alternative agricultural production.

5.2 Alexandrina Council Rural Areas Strategy and Action Plan

This report sought to articulate the views and aspirations of the farming community within the Alexandrina Council area. Although this Council area does not form part of this particular Rural and Horticultural Lands Review Study, the report's findings can be transferred (in part) to the broader region.

The face of farming is likely to change dramatically in the next 20 years as the average age of dryland farmers is 58 years and 56 years for apple growers. Farmers are ageing and many of them do not have children willing to 'take on the farm'. Six out of eight livestock farms are not likely to be managed by the children of existing farmers.

These changes are likely to have a significant impact on rural townships, threatening the survival of local businesses and services. This is particularly an issue given farmers and farm workers who live locally are major contributors to civic life and community organisations. They have a strong tradition of active involvement in emergency services, sporting clubs, churches, developing and maintaining community facilities and township amenities.

Consideration will also need to be given to the kinds of support older farmers will need as they age, ranging from care packages to enable them to remain in their homes, to affordable retirement units in nearby towns and supported low and high level care beds when they are no longer able to live independently.

The report also highlighted the importance of off-farm income and security to be able to plan for long term investment. This requires a clear planning policy framework and assurance that water and utilities will be available to support the operation.

The report concluded that farmers would like to see Council take a more proactive approach to helping them assess their options with respect to development of their land. Key directions for further investigation identified by the report included:

- Ability to realign allotment boundaries to create a limited number of smaller blocks for rural living, while retaining land for farming in one larger allotment with no further land division allowed.
- Ability to provide a second dwelling either for a family member working on the farm or to enable older parents to retire into a more appropriate house designed to support "ageing in place". It was suggested that this could be tied by encumbrance to the title to ensure it is only used for farm related purposes.
- Value adding to products through processing, including farm gate sales, cellar doors, tasting, cooking schools.
- Farm based tourism accommodation.
- Larger scale processing facilities such as wineries which could be located in or near townships.
- Workforce accommodation, especially for seasonal viticulture and horticulture activities.

5.3 Riverland Futures Taskforce and Development Plan Amendments

As noted by a number of Riverland related Council Development Plan Amendments, (ie Renmark Paringa, Loxton Waikerie and Berri Barmera Councils), The Riverland Futures Project was established by the State Government in 2008 to recognise and respond to the economic, social and environmental challenges facing the Riverland community. In general challenges affecting the Riverland community can be summarised as:

- Drought, that is, its effect on the irrigated horticulture industry
- Structural changes in the economy e.g. export markets, employment generation and retention
- Demographic changes e.g. population growth vs decline
- Infrastructure constraints e.g. electricity, water, sewerage
- Environmental sustainability e.g. salinity, native vegetation

- Land supply i.e. for employment-generating activity

The Taskforce was charged with two broad responsibilities:-

- Formulation of long-term economic and development goals (ie over the next 30 years) for the Riverland Community
- Preparation of a regional strategy to influence future funding decision making exercises by the public and private sector.

In association with the above responsibilities and tasks, the Riverland Futures Projects has undertaken the preparation of Structure Plans to promote a growth target of an extra 7,000 residents, equating to 3,180 new dwellings (at an occupancy rate of 2.2 people per dwelling), over the next 30 years. This target reflects that State Strategic Plan target of a 2 million population by 2050.

The Better Development Plan Conversion and Alignment Development Plan Amendment project is being undertaken in partnership, with the Riverland Futures Taskforce. The BDPs will be consistent with the Structure Plans, noting that some of the longer term aspirations of the Structure Plans, for example, zoning of marina sites and regional waste management facilities will form part of the future regional considerations.

The key goal is for the creation of consistent policy and zoning across the region. This should assist in decision –making by the newly-gazetted Riverland Regional Development Assessment Panel.

As noted in the Draft Renmark Paringa Better Development Plan Conversion and Alignment DPA (Sept 2010), Councils desire is to continue to promote the traditional agricultural and horticultural activities, whilst at the same time promoting a range of allied rural based enterprises and value added industrial investment opportunities. Council also seeks to encourage alternative horticultural development, such as glasshouses, greenhouses, fruit and vegetables, floriculture and environmentally sustainable outcomes. The DPA provides scope for other forms of allied agricultural activities, such as aquaculture. Innovation is encouraged, for example, the opportunity to undertake aquaculture in conjunction with the salt interception schemes, subject to meeting relevant environmental and site suitability criteria.

The DPAs propose one centralised Primary Production Zone (BDP Module) with recognition of Horticultural Areas via clear Policy designation and related policy. The former Dryland Farming Zone and Horticulture Zone will now form one consolidated Primary Production Zone, with a Policy Area for the existing horticultural area.

The DPAs recommend the following land division/dwelling criteria for the Primary Production Zone:

- Land division minimum of 100 hectares for general farming
- Land division minimum of 8 hectares for horticulture

- Intensive animal keeping to be 'non-complying', Horticulture Policy Area
- Non-complying criteria for new dwellings in the Horticulture Policy Area, on land less than 8 hectares or less than 100 hectares outside of these areas, unless for special cases, for example, the use of the land for farming purposes is guaranteed.

These policies are relatively consistent with existing Development Plan policy across the Riverland, and in-fact have been strengthened to better protect agricultural land from being divided for non-agricultural purposes.

This approach has been supported by PIRSA as part of their representation on the Riverland Futures Taskforce Reference Group.

The Primary Production Zone and Horticulture Policy Area is now based on the BDP Policy Module, inclusive of additional policy content to set policy control for land division, dwellings and associated development, in line with the other investigations.

'Farming' and 'horticulture' are listed as 'complying' in the current Development Plan for the Horticulture Zone, but have no corresponding conditions in Table RePa/3. In consultation with the Department of Planning and Local Government, it is considered that although these land use activities are promoted in the Zone, that they should be the subject of a merit assessment in the new Primary Production Zone.

The Renmark Paringa Council has decided to adopt a different approach to the management of land division in the Horticulture Policy area, when compared to the Loxton Waikerie and Berri Barmera Council. It has decided to adopt its current policy within the new BDP module, being:

- Horticultural land division minimum of 8 hectares
- No provision or allowance for the excision of dwellings

This policy control came as a result of the 2004 Section 30 Review, and subsequent Development Plan Amendment, where Council introduced a minimum allotment size of 8 hectares in the Horticulture Zone, or where a boundary alignment occurs and the resultant number of allotments less than 8 hectares is not greater than prior to the land division. The amendment removed the provision to excise dwellings. This was undertaken to address the creation of quasi-country living style development and the gradual fragmentation of horticulture in areas that Council has not envisaged for future country living style development (or its associated infrastructure). Land use conflict, particularly between existing horticultural activities and new residential development was also a concern.

Council supports the retention of the strong land division policies that restrict the division of horticultural land, and land should be held for possible horticultural production for future generations.

5.4 Environment Resources and Development Court Determinations

Appendix C contains a summary of two Environment Resources and Development Court Determinations. These determinations should be considered within the context of how existing environmental focussed Development Plan policies and the Natural Resources Management Act can be utilised by planning authorities in assessing development applications that have a potential detrimental impact on ecological sustainable outcomes.

6.0 Local Government Consultations

Engagement with Local Government representatives was undertaken via a series of phone interviews to establish Council priorities for investigation during September and October 2010, followed by a workshop on 9 May 2011 to establish consensus over the preferred policy direction for the project.

6.1 Council Staff Interviews

6.1.1 Introduction

Based on the findings of Report 1, in mid October 2010 URPS undertook telephone surveys with staff from the following organisations for the purpose of identifying Council specific trends in land use change and any associated planning policy gaps:

- Loxton Waikerie Council (Graham McInnes)
- Mid Murray Council (Geoff Parsons)
- Coorong Council (Tim Tol)
- Rural City of Murray Bridge (Simon Channon)
- Karoonda East Murray (Mike Penhall)
- Southern Mallee (Harc Wordsworth)
- Renmark Paringa (Jared White)
- Regional Council of Goyder (John Brak)
- Berri Barmera Council

6.1.2 Council Responses

Council staff responses are summarised under the questions asked. It is noted that the following responses are the opinions of the surveyed officers and no not necessarily constitute final recommendations of the project.

6.1.3 What are the top three Planning Strategy/Development Plan issues that your planning authority will need to address in the next 5 -10 years in the horticulture/rural/primary projection zones/policy areas?

The following issues were raised by a number of Councils:

- The importance of retaining land for primary production by maintaining minimum allotment sizes related to land capability and preventing additional dwellings on horticultural and farming allotments below a certain minimum size.
- The desirability of retaining the use of existing farm dwellings which may require boundary realignments or one off land division.
- Concerns about alternative land uses that could be considered for marginal farming and horticultural land.
- Changing crop types can involve significant changes in land management practices and water use. This can increase salinity and draw down impacts on neighbouring properties. This 'may' indicate that some changes in crop types, especially those that involve introducing or increasing the use of irrigation should require development approval.

Other issues raised by specific Councils included:

- The pressure of rural living
- Potential for forestry/carbon sequestration
- Impacts of land use change from low (one annual crop) to high (3 to 4 crops a year) on road infrastructure
- Shift from use of River Murray water to ground water
- Land use conflict
- Recognition of the importance of biodiversity and protecting native vegetation.

6.1.4 How do you think your Council's Development Plan policy should be updated to have regard to the impacts of climate change?

Those Councils which have or are undertaking Better Development Plans DPAs will have additional policies related to:

- Energy efficiency
- Natural resources management
- Renewable energy and
- Water Sensitive Urban Design (WSUD)

For other Councils, there has not yet been any consideration of Climate Change in their Development Plans. For some this was because the main Climate Change impacts in their area relate to variability in rainfall and intensity of rainfall events and these are difficult to address through planning policy.

Other Council planners consider that the wide variations across their Council areas mean that a single policy approach would not address the range of Climate Change impacts.

Some of the other issues raised were:

- Increased bushfire risk
- Need to define 'irrigated' farming due to impact on water resources
- Importance of flexibility to allow farmers to diversify crop type and land management practices to adapt to climate change
- Need to be more open to alternative farming and land uses and recognise the impacts of climate change on the ability to farm

6.1.5 Is there a need to capture a change from dryland farming to irrigated farming as 'development' (noting farming is not horticulture as per Development Regulations definitions) to be assessed via the Development Act?

This is not an issue for the following Councils:

- Coorong
- Goyder
- Mid Murray (either dry land farming or horticultural)
- Murray Bridge
- Loxton –Waikerie

It would be supported in the following Councils because of the impact of increased water use on groundwater resources:

- Southern Mallee
- Karoonda East Murray

Renmark Paringa's DPA will introduce a Primary Production Zone that replaces the current Dryland Farming and Horticultural Zone. Horticultural policies will be extended across the zone.

6.1.6 Are there localities in your Council area that should not be contained within a horticulture/rural/ primary production

zone/policy area, if so, where are these localities and what is an alternative land use for these localities?

While most Councils had some specific areas they wished to nominate for removal from primary production zones the common themes were marginal farming land with remanent native vegetation that could be zoned conservation and areas on the fringe of township that could be more appropriately zoned as rural living. In some cases this would formalise existing land use patterns.

For some Councils there are really only Rural Zones and Township Zones so no change is required.

There is increasing pressure from the community to continue a perceived 'dwelling right' on each horticultural allotment. This increases land use conflict, increases value of horticultural land (sometimes beyond the reach of nearby farmers who would like to increase their land holdings), and places further pressure on Council infrastructure and services such as road maintenance and waste collection.

6.1.7 Are there additional localities in your Council area that should be contained within a horticulture/rural/primary production zone/policy area, if so, where are these localities?

The following Councils have not identified any additional localities:

- Renmark Paringa
- Southern Mallee
- Goyder (may reverse Enterprise Zone to Primary Production)
- Karoonda East Murray
- Mid Murray
- Berri Barmera

Loxton Waikerie Council would seek to indentify horticultural policy areas within dry land farming zones based on the recognition of existing large scale horticultural and viticultural enterprises.

6.1.8 Do you believe that there should be greater consistency within the region for land uses/development identified as "complying" and "non-complying" in Council Development Plan lists?

All of the respondents surveyed support a similar approach across Councils as this gives the Development Plan greater credibility.

It was noted however, that individual Councils may need to take a different approach to achieve specific outcomes. An example is the Renmark Paringa Council which has resolved not to allow the excision of dwellings in

horticultural zones even though other Riverland Councils will continue with their existing policies.

6.1.9 In principle, what kinds of development should be listed as complying development (assuming there will be appropriate complying development conditions prepared)?

Most respondents would prefer to see most land uses considered on merit (ie neither complying or non-complying). Even change from grazing to cropping can have impacts that need to be considered.

Activities such as farming, haysheds and implement sheds are seen as compatible with general farming and so can be 'complying'. A few Councils considered that this could also apply in horticultural zones, although this was not a general view.

A Council also suggested that solar farming and wind generation should be complying development.

6.1.10 In principle, what kinds of development should be listed as non-complying?

Similarly respondents who participated in the survey would prefer to assess realistic land uses on merit in Primary production and Horticultural zones.

Some Councils considered that additional dwellings should be non-complying while others felt a more flexible approach would assist in housing for older farmers, farm managers and workers.

Some intensive animal keeping was considered to be inappropriate in Primary Production Zones.

Land division below certain minimum sizes based on farming activity is also generally considered to be a reasonable inclusion in the non-complying list.

It was considered that if a particular land use is not envisaged in the zone then as well as including it in the non complying list, policy is needed within the Development Plan to assist Council in supporting refusal.

6.1.11 Would you like to see Prescribed Water Resources Area maps contained in Council's Development Plans?

Almost all of the respondents who were interviewed expressed strong support for including prescribed Water Areas in the Development Plan.

Goyder does not have any prescribed Water Areas and this is a key issue for Council because there is a lack of information available to assess the impacts of changes of land use e.g. dry land farming to sheep feed lots on water use and drawn down on neighbouring properties.

6.1.12 Do you believe you or your organisation has the skills to use natural resources management/environmental/water related Development Plan policies when assessing development applications?

Most Councils reported that they do not have this expertise in house and that they tend to rely on staff from the NRM Boards. Several suggested that NRM Boards need more resources to support Councils.

Several planners noted the difficulty of obtaining advice from referral agencies such as the EPA and Department of Water. Often these agencies provide written advice that does not assist Councils to set legally enforceable planning conditions. (The Environment Resources and Development Court has the right to strike out inappropriate planning conditions).

A couple of Councils do have access to staff with skills in environmental management but this is the exception.

Some Council's considered that this was an area that needed more focus (e.g. training for planners).

6.1.13 Other Comments:

Survey respondents raised a number of other issues that they wanted to see addressed by the Review. These included:

- Councils are looking for guidance on alternative uses for farming land when it is not longer viable. (Report 1 associated within this study included a review of envisaged land uses within Council's existing Development Plan. Council's are seeking information regarding potential alternative land uses that are likely to be driven by the private sector (ie carbon sequestration)
- The need to maintain the referral process to environment and water agencies (even strengthen referrals to NRM Boards).
- Land packages in the Riverland which mean that people are unable to use land for 5 years. While it is considered important to keep land in horticulture there is some sympathy for allowing houses on blocks smaller than 8 hectares.
- If climate change and water availability are our biggest issues then mapping ground water and managing this with an understanding of the interrelationship of land use and water should be a priority for the NRM Board.

6.2 Regional Local Government Workshop

After the circulation of Milestone Report 2, URPS and the Environment Institute meet with a range of Council's and facilitated a regional local government workshop on 9th May 2011 at the Murray Bridge Natural Resources Centre.

The workshop provided an opportunity for an open forum for Council representatives to pilot test, discuss and inform the recommendations of the Horticultural and Rural Lands Review.

The workshop focussed discussion on proposed guiding principles to drive policy change and key recommendations.

6.2.1 Guiding Principles

The following principles have been proposed to guide the development of future policy relating to climate change Development Plan initiatives.

Strategic Level

- Uphold the principles of ecologically sustainable development in designing adaptation and mitigation approaches, including environmental integrity, social equity and participation, economic viability and the precautionary principle.
- Plan now, to prevent further risks associated with climate change. For example some coastal amenity communities experiencing population growth will experience pressure for rapid development approval, before climate change considerations have been factored into planning and assessment frameworks.
- When undertaking strategic land use allocation planning processes, the following specific considerations should be taken into account:
    - The potential impact of the settlement or infrastructure, including the location and configuration of development, on the vulnerability of existing settlements (ie flooding, bushfire, other extreme climate impacts), natural habitat or biodiversity, including downstream impacts;
    - The location of existing and planned settlements / developments in relation to access routes, services, and infrastructure, and the likelihood of continued access to these facilities in the event of an emergency;

Development Plans

- Development Plan policies should seek to provide a high degree of flexibility (ie minimize non-complying lists and increase complying

developments/envisaged land uses) to respond to new opportunities and build community resilience.

- Development Plan policies should seek to take a risk management approach to new opportunities/policies (with the knowledge that if a policy position fails it can be amended and its impacts, in certain circumstances, can be limited/contained).
- Subject to local circumstances, planning policy should be relatively consistent across local government areas.
- Development Plan policies are only one of many tools available to be used to address climate change adoption issues. Acknowledge the limitations of the Development Act/Development Plan framework. For instance, Development Act/Development policy can only be triggered if 'development' as defined by the Development Act is proposed to be undertaken.

Agricultural Production

- Identifying and preserve sustainable agricultural lands through planning controls and incentives to support agricultural production, while permitting compatible economic activities to coexist. Thereby increase farm incomes and employment generating activities.
- Enabling multi function use of agricultural lands, provided that additional uses do not threaten the long term quality of the land for agricultural production. Examples of additional uses include decentralised energy or power plants such as wind or solar farms.
- Determine appropriate land uses for long term unsuitable agricultural lands (eg tourism accommodation, rural living) and thereby increasing population levels that in turn will provide greater catchments to local community services and businesses.

6.2.2 Policy Direction

The following table was populated at the regional local government workshop. The table presents the following information:

- Suggested planning policy and other policy options;
- Potential benefits of the presented option;
- Potential risks associated with the option;
- Recommendation if to proceed with the option; and
- Priority ranking regarding the option and associated recommendation.

Issues (Policy / Procedurals)	**Potential Benefits (NRM / Social / Economic)**	**Potential Risks (NRM / Social / Economic)**	**Recommendation (Proceed / Uncertain/ Don't Proceed)**	**Priority (High / Medium / Low)**
PLANNING POLICY				
1. Promote one primary production zone (rather than a combination of horticulture, rural and primary production zones).	• Flexibility • Bio Security • Value adding – onsite waste/water by products • Crop Rotation • Minimise Land use intensification by diversification	• Land use may not be consistent with land capability analysis • Land use conflicts (Chemical) • Irrigation systems need to be centralised • Clean/green – perception	• Proceed • Further investigation – "priority" • - more work on "buffers" policy compliance issue	High

Issues (Policy / Procedurals)	Potential Benefits (NRM / Social / Economic)	Potential Risks (NRM / Social / Economic)	Recommendation (Proceed / Uncertain/ Don't Proceed)	Priority (High / Medium / Low)
		that it may be compromised by land use conflict		
2. Consolidate min allotment size for non-complying developments across the region.	• Consistent Policy – same for all • Certainty?	• Doesn't acknowledge local conditions/soil type • Very rigid – no flexibility • Possibly more non complying applications	• Don't Proceed	Low
3. Associated with the "Murray-Darling Basin Small Block Irrigators Exit Grant Package", allow land division of existing dwellings on a farm site if the remaining portion of the land is amalgamated with a neighbouring farm (and no further land division is permitted).	• Provides flexibility and economic gain for owner • Retains land in Horticulture • Retains housing opportunity	• Short term Policy, longer implication • Will land return to horticulture? • What size excision (conflicting land use) • Bigger issues if land never returns to horticulture	• Uncertain • What would happen if remaining land is not required to be amalgamated?	Low
4. Allow existing 2nd dwellings to be divided from farm site	• Creates more economic potential • Could create viable farming units • Benefits depend on allotment sizes	• Creates more land use conflict • Further fragmentation of farmland • Can affect viability of farming properties • The '2nd dwelling' is not the major issue – the land	Uncertain	Medium

Issues (Policy / Procedurals)	Potential Benefits (NRM / Social / Economic)	Potential Risks (NRM / Social / Economic)	Recommendation (Proceed / Uncertain/ Don't Proceed)	Priority (High / Medium / Low)
		division is.		
5. Allow 2nd dwellings in rural areas within existing homestead site, while ensuring land division around the second dwelling is non-complying.	<u>More than 1 Dwelling</u> • Aging in place • Farmland • Managers residence • Tourism accommodation • A generic approach Any resulting land division • Should be 'non-complying' • Ability for special case Policy should be developed based upon: • Need • Clustering of dwellings • Appropriate effluent management • Siting/design • Water supply • Power – solar – wind • Relocatable options	• Fragmentation of land • When asset is no longer needed – over capitalised	Proceed	High
6. List forestry as non-complying in high quality primary production land (identified via policy area).	• Protection of designated primary production land • Protection of Forestry industry	• Impacts of forestry in other rural areas i.e. water table (hydrology), what other	Uncertain Investigate further	Low

Issues (Policy / Procedurals)	Potential Benefits (NRM / Social / Economic)	Potential Risks (NRM / Social / Economic)	Recommendation (Proceed / Uncertain/ Don't Proceed)	Priority (High / Medium / Low)
In alternative rural areas, forestry can be listed as an envisaged land use.	• Spatial application	land uses being displaced • Is marginal land suitable for forestry? • Removes potential for diversification for primary producers – depending on scale		
7. List wind / solar farms (and other alternative energy sources) as envisaged uses in primary production zones.	• Alternative/complimentary land use • Can use non productive land • Not using local natural resources	• Environmental impacts: visual, noise perceived health and fauna • Need for additional infrastructure (power lines)	Proceed	High
8. List farm gate sales (ie shops) and tourism activities as envisaged land uses in primary production zones	• Straight to pocket revenue stream • More disposable income to be potentially spent within the community/Reg.	• Clearance of vegetation – incremental impact from multiple developments • Loss of primary production land to other land use • Increase in traffic on existing road infrastructure • Change in amenity • Perceived inequity between retailers in existing zoned areas and roadside operators	Proceed provided risks are considered/minimized possibly a merit based assessment	Medium

Issues (Policy / Procedurals)	Potential Benefits (NRM / Social / Economic)	Potential Risks (NRM / Social / Economic)	Recommendation (Proceed / Uncertain/ Don't Proceed)	Priority (High / Medium / Low)
9. Promote State Planning Strategies to have better regard to salinity mapping/data and associated land capability mapping to highlight areas of low farming value that could be set aside for alternative user (rural living).	• Informed decisions • More certainty in land use • Flexibility in land division/amalgamation policy (also a risk) • More awareness in relation to salinity	• High • More responsibility for planners • Is it land use – or land management? • Increased likelihood for land use conflict • Uncertain as to how it would be best utilized i.e. DPA state or DA or something else	• Uncertain – depends on the avenue at which its implemented	Low
PROCEDURAL				
10. Site management plan required for intensive animal keeping and horticulture activities	• Comprehensive information provided at application stage • Speed up assessment process • Indentifies to developers if use viable • Minimize appeal potential • Useful enforcement tool	• Individual plans won't take into account cumulative impact • High cost of preparation – not done properly • Requires multi-disciplinary assessment	Proceed	High
11. There is a need to specifically identify and map locations in	• Clearly defined – know it exists for:	• Don't align with policy areas	Proceed	High

Development Plans of key NRM and water relevance.	o Landowners/purchasers o Planning – ensure referrals occur • Policy areas reflect consistency • Ensure compliance with legislation • Improves relevance of development plan • Policy can support/protect development in flood area/ provide incentives	• Flood plain/protection is accurate with what is needed on the ground • Policy doesn't reflect land use issues/outside jurisdiction. • Water protection area changes without development plan being amended. • Definitions/names aren't consistent/inaccurate • Could admit a liability (flooding) issue for councils.	• Should be included in development plan as a constraint map. Not necessarily a zone/policy area • Consider other issues from other Departments etc.	
12. Facilitate opportunities that increase the capacity of local government elected members, staff and applicants to have better regard to existing NRM (including climate change/water resources) Development Plan policies (e.g. education and training).	• Better regard to policy • Greater ownership of policy hence greater respect/ support across community • better quality applications • greater level of knowledge • funding opportunities from state/Federal sources • perhaps overshadow other policies		Proceed – tailor information to suite 2030 2070	Medium

The workshop participants also suggested the following additional recommendations for consideration:

- One Development Plan for the Region (that includes one Primary Production Zone)
- Consider establishing a cap/maximum limit regarding the amount of land (or proportion of land) that is permitted for forestry across an allotment / region.
- Reduced the number of Schedule 8 Development Regulations referrals.

6.2.3 Recommendations and Priorities

Based on the outcomes of the workshop, the following priorities where proposed:

High Priority Recommendations

- Promote one primary production zone (rather than a combination of horticulture, rural and primary production zones).
- Allow second dwellings in rural areas within existing homestead sites, while ensuring land division around the second dwelling is non-complying.
- List wind / solar farms (and other alternative energy sources) as envisaged uses in primary production zones.
- Ensure site management plans are required for intensive animal keeping and horticulture activities.
- Specifically identify and map locations in Development Plans of key NRM and water relevance, and Consider developing a consistent and readily available definition (and location) of the River Murray Floodplain, and the River Murray Tributaries Protection

Medium Priority Recommendations

- Ensure appropriate size farm gate sales (ie shops) and tourism activities as envisaged land uses in primary production zones.
- Facilitate opportunities that increase the capacity of State and Local Government elected members, staff and applicants to have better regard to existing NRM (including climate change/water resources) Development Plan policies (e.g. education and training).
- Facilitate opportunities that increase the capacity of local government Elected Members, Council Strategic Planning and Policy Committees, Council Regional Forums, Development Assessment Panel members, staff and applicants to better understand natural resources management outcomes and the value this brings.

Low Priority Recommendation

- Consolidate min allotment size for non-complying developments across the region.
- Associated with the "Murray-Darling Basin Small Block Irrigators Exit Grant Package", allow land division of existing dwellings on a farm site if the remaining portion of the land is amalgamated with a neighbouring farm (and no further land division is permitted).
- Promote State Planning Strategies to have better regard to salinity mapping/data and associated land capability mapping to highlight areas of low farming value that could be set aside for alternative user (rural living).
- Allow existing second dwellings to be divided from farm site.

7.0 Commercial Forestry

7.1 Definitions and Development Regulation Processes

The impact of commercial forestry was considered, particularly given plantations carbon absorption capacity. The Development Regulations contain the following definition for commercial forestry:

> *"Commercial forest means a forest plantation where the forest vegetation is grown or maintained so that it can be harvested or used for commercial purposes (including through the commercial exploitation of the carbon absorption capacity of the forest vegetation)."*

The Natural Resources Management (Commercial Forests) Amendment Bill 2010 is proposing to use the identical definition for commercial forestry as that incorporated within the Development Regulations.

The commercial forestry definition can encompass a number of tree species, not necessary limited to pine trees or blue glum. Some of these alternative plantations may have an acceptable level of impact on a regions water resources and on soil structure.

Depending on the circumstances and location, the planting of a commercial forestry can require the referral (pursuant to Schedule 8 of the Development Regulations) to either the Chief Executive of the Department of the Minister responsible for the administration of the Natural Resources Management Act 2004 or the Minister for the time being administering the River Murray Act 2003.

Furthermore in some locations, commercial forestry created by a change in the use of land, occupying a site having an area of 20 hectares or more, requires the approval of the State's Independent Development Assessment Commission (DAC)[2].

With the potential introduction of a carbon tax by the Federal Government over coming years, investment in commercial forestry for the purpose of carbon sequestration is expected to increase significantly, depending on the price per tonne. Forestry for carbon sequestration is established under different design criteria and requires a different management regime compared to traditional plantation forests.

In the first instance a forest established for carbon sequestration is generally established in perpetuity, or may have a lease of up to 90 years before harvesting is permitted.

[2] Refer to Clause 3A of Schedule 10 of the Development Regulations.

7.2 Commercial Forests Potential Risks and Benefits

Previous investigations by URPS have indicated that commercial forestry has become a significant land use with some regions, with implications for other water users, including the environment. There are some complex social, economic and environmental issues associated with the industry that will need to be management.

The State Government's *"Managing the water resource impacts of plantation forests. A Statewide policy framework"* (2009) has been developed to articulate the South Australian Government position on the management of the water resource impacts of plantation forests.

While the sustainable management of water resources is the key driver of this policy framework, recognition of the benefits of plantation forests to the State is fundamental. The long-term sustainable development of plantation forests and the forest products sector in South Australia will be a key consideration when implementing this policy framework

The scope of the policy framework is restricted to plantation forests that are grown for commercial reasons, including carbon sequestration. It does not relate farm forestry, large-scale revegetation with permanent plantings to achieve biodiversity outcomes, or irrigated plantation forests. Although these activities fall outside the scope of this framework, they should nevertheless be included in regional water balances and in water allocation planning.

The framework adopts a number of positions that are relevant to this paper, including:

- Increasing knowledge of environmental water requirements is a key research priority
- Plantation forests, regardless of species, can be assumed to reduce runoff (including groundwater recharge) by 85% and access groundwater through direct extraction when the depth to the groundwater table is less than 6 metres. This position statement is based on the understanding that "*there is strong evidence that the runoff reduction (including groundwater recharge) due to plantation forests is in the order of 70-100%.....lower rainfall catchments are likely to have greater reductions in runoff than high rainfall catchments...The value of 85% reduction runoff due to plantation forests is appropriate to use in South Australia*"[3]

  This policy position is also supported by the SA Murray-Darling Natural Resources Management Board in its Draft Water Allocation Plan for the Eastern Mount Lofty Ranges Prescribed Water Resources Area. For instance, the Plan states:

[3] Government of SA. Managing the water resource impacts of plantation forests. A Statewide policy framework (2009)

"The volume of water intercepted and used by plantation forestry has the potential to affect the availability of water resources to other water users, including water-dependent ecosystems. Plantation forestry can affect water resources by:

(a) Intercepting rainfall at closed canopy which will:
- *reduce surface water runoff ;*
- *change the volume, timing and duration of flow, which may be critical for maintaining habitats; and*
- *reduce underground water recharge.*

(b) Directly extracting underground water in areas where plantation forestry overlies shallow watertables (Government of South Australia, 2009).

In accordance with the state-wide policy framework for managing the water resources impacts of plantation forests, interception of rainfall by plantation forestry (regardless of species) is considered to reduce surface water runoff and underground water recharge by 85% (Government of South Australia, 2009)."

- In non-prescribed areas, and in the absence of assessments of the condition of the water resource and the extent of use of the resource, 25% of the median annual adjusted yield can be used as an indicator of the sustainable use limit for a catchment or sub-catchment.
- In areas where the 25% use limit is used, technically robust monitoring programs should be developed and implemented to enable an assessment of the water resources, and to provide more certainty on the sustainable use limit to guide further water use decisions. Such monitoring should take place in a timely manner and monitoring results should be incorporated into management decisions within an adaptive management framework.
- Buffer widths for streams, wetlands and water-dependent ecosystems will be:
  - 20 metres for surface water resources
  - Informed by water allocation plans and/or detailed analysis for groundwater resources
- Wetlands and water-dependent ecosystems assessed as matters of national environmental significance under the Environment Protection and Biodiversity Conservation Act 1999 should be managed in a manner than maintains or enhances their ecological values, recognising that in some situations wider buffers may be required for biodiversity benefits.
- Restrictions on activities that disrupt the soil are required in drainage lines to prevent local erosion and associated water quality problems.

- Modelling, monitoring and field investigations should be completed to inform the development of regionally-appropriate buffer widths for groundwater systems.

A joint statement by CSIRO Forestry and Forest Products and CSIRO Land and Water "*Maximising the benefits of new tree plantations in the Murray-Darling Basin*" contains the following information as context to decision making processes.

The benefits and disbenefits of establishing plantations on agricultural lands is summarized in the following table:

Potential Benefits of Plantations	Potential Disbenefits of Plantations
Enhance rural economics	Reduced stream runoff volume for downstream use
Reduced local recharge assisting in salinity control	Reduced low flows for streams
Reduced stream pollutant loads	Increased stream salt concentrations through reduction of dilution flows (for plantings in high rainfall areas)
Decreased stream salt concentrations (for plantings in low-medium rainfall areas)	Degraded soil physical and chemical properties
Carbon sequestration	Competition for water, nutrients, and light with agricultural crops.
Biodiversity enhancement	
Improved soil physical and chemical properties	
Improved soil structure	
Other on-farm benefits such as stock shelter and wind breaks	

- Extensive land use change is proposed to assist with landscape restoration, and this will be a mix of change to perennial pastures, biodiversity plantings and commercial forestry.
- In low to medium rainfall zones (about 500-800 mm) and in salinised landscapes overlying local (responsive) groundwater systems, the objectives for this land use change will be to intercept more water and salt entering rivers. This will lead to a decrease in water yield (also known as *stream flow*). However, planting in areas where the maximum salt is

generated and will be intercepted will ensure optimum reduction of salt entering rivers with least reduction in water yield.

- In some catchments and locations within catchments, land use change that decreases water yield can also cause a long-term *increase* in river salinity. Thus, in instances where the main objectives of land use change are not driven primarily by salinity control (but by, for example, enhanced biodiversity, carbon sequestration, reversal of acidification, other environmental benefit, or commercial forestry), it is important that appropriate tools are used to predict the effects of proposed land use changes and locations on water yield and salt flow to rivers, as a basis for decision making.

- The impact of establishing new plantations in reducing stream flows is greatest for high rainfall zones. If future plantations are established under low to medium rainfall, then this effect will be reduced. Research tools have been developed and tested (and are being refined for general use) to predict the impact of revegetation on the suite of environmental values, and to use these as a basis to help design landscapes.

- Where decreased water yield is an issue for plantation development, it may be possible to substantially decrease water yield reductions through careful on-farm planning, location of plantations, and management through silviculture such as thinning, However, these manipulations also need to be considered in the light of potential impacts on productivity and hence economic return.

- Increasingly, forest industries and related initiatives are recognising the need to integrate commercial forestry goals with environmental remediation. The Plantations 2020 Vision states as a Principal Goal:

    - Recognition and delivery of environmental services from commercial timber plantations through their strategic location and optimal management',

    - and aims to develop 'capacity for developing commercial plantations in lower rainfall zones or where trees are a partial solution for addressing environmental issues, and

    - 'Accessible information on developing commercial plantations and farm forests in a way that is compatible with Landcare and other environmental benefits.'

- The establishment of new plantations in agricultural landscapes will have a range of environmental outcomes. Using the right scientific and planning tools, combined with alignment with regional community objectives, forestry aims to play an important role in realising net environmental benefits, with the added advantage of providing an economic return that will help pay for the scale of revegetation needed to address some of Australia's environmental problems.

7.3 Commercial Forestry and Council's Development Plans

The tables contained in **Appendix D** identify the Council wide and Zone specific policies relating to forestry. There are very few Development Plans within the study area that list commercial forestry as non-complying land uses in rural (or similar) zones, these include:

- Berri Barmera Council, Landscape Zone and Western Approach Zone
- Regional Council of Goyder, Primary Production Zone, where located within the Township Fringe Policy Area 1
- Mid Murray Council, River Murray Zone of the River Settlement Policy Area
- Murray Bridge Council, River Murray Flood Zone

The remaining zones within the study area neither list commercial forestry as complying or non-complying developments, therefore the land use will be deemed to be an "on-merit" development. Therefore, the application will be assessed against the Objectives, Desired Character Statement and Principles of Development Control contained in the Council Development Plan.

Carbon sequestration forests have the potential to provide significant biodiversity values to the SA Murray-Darling Basin region, provided there are no significant impacts on water resources.

In particular carbon sequestration forests can provide habitat connectivity along wildlife corridors, providing protection to threatened fauna species in the local area. Other benefits include enhanced local biodiversity by providing buffers to existing remnant vegetation

The BDP Policy Library provides principles of development control with respect to fire management, watercourse protection, clearance from power lines and separation distances from other land uses. The policy could be enhanced by providing guidance to applicants regarding principles to achieve biodiversity enhancement. Examples of potential additional principles of development control include:

Commercial Forestry for carbon sequestration should:

(a) Be compatible with the biodiversity of the local landscape

(b) use vegetation communities appropriate to the soil type and location, in particular:

i. Use local native species of local provenance

ii. Provide a suitable, biodiverse mix of overstorey, understorey and ground lay overstorey, understorey and ground layer

(c) Provide habitat connectivity along wildlife corridors, in particular consider the needs of threatened flora and fauna species in the local area

(d) Enhance local biodiversity by providing buffers to existing remnant vegetation

(e) Provide for adequate access and fire breaks to promote appropriate bushfire management, eg mosaic burns.

The State's Better Development Plan, Forestry Module provides some level of guidance to local government. The incorporation of module (refer to **Appendix E)** and the abovementioned policies into Council's Development Plan should be encouraged.

7.4 Recommendations

Having regard to the literature review contained in this section, the discussions associated with the regional planners workshop, it is also recommended that:

- Information be provided to local government regarding the potential negative and positive impacts of commercial forestry (including impact of different species)
- Additional investigations regarding opportunities and potential impacts of new commercial forestry (ie different species) targeted at the carbon sequestration market
- Update DBP Policy Library - Forestry Module with the above-mentioned principles (or similar) and promote its inclusion within Council's Development Plans.

8.0 Findings and Recommendations

It is envisaged that the Horticultural and Rural Areas Review Policy Direction Discussion Paper will be utilised by all three levels of government to promote adaption strategies associated with the Development Regulations, Development Plan policy and capability building.

In some respects, the following findings relate to issues beyond the capacity of a Development Plan. However, it is considered that these issues be at the very least identified and 'flagged' for further considerations.

8.1 Planning Strategies and Council's Development Plans

8.1.1 Land Use Planning

- **Recommendation 1: Ensure primary production zone policies are drafted in a positive manner that promotes a wide variety of potentially appropriate land-uses.** Planning policies should not "lock-out" alternative rural and environmental based opportunities, such as alternative crops and wind/solar farms.

- **Recommendation 2: Encourage second dwellings (via a complying or on-merit development standards) in primary production zones (and similar) subject to land division being a non-complying development.** The complying/on-merit development conditions for the second dwellings can include conditions such as (i) it is located within 50 metres of the existing dwelling on the same allotment, (ii) meets Australian Standards for Universal Design, (iii) shares a common power and water supply (where a mains water supply is connected) and waste water treatment system (upgraded to meet current environmental and health requirements) with the existing dwelling (iv) shares the existing dwelling's access/egress point to the road network and (v) is located at least 40 metres from all adjoining property boundaries. This policy change will promoting aging in place objectives, and provision of farm management/workers accommodation.

- **Recommendation 3: Subject to locality specific investigations, Development Plan policies may be required to promote alternative land uses for high salinity areas such as tourism/recreation and/or residential/rural living activities that are underpinned by water sensitive urban design / land management principles.** State water targets include maintaining positive salinity levels. Planning strategies to achieve these targets may include encouraging irrigators to relocate to more suitable sites. Allow opportunities for greater farm gate retailing and tourism development/accommodation opportunities and thereby increase and diversify farmer's income. However, it is noted that Regional Planning

Strategies do not necessarily encourage the wide spread adoption of rural living activities.

- **Recommendation 4: Ensure environmentally sensitive areas are "buffered" from a range of intensive agricultural activities** (eg feed lots and horticultural sites associated with intensive spaying). For instance, the State Government's "*Managing the water resource impacts of plantation forests: A Statewide policy framework*" (2009) states that buffer widths from commercial forestry from streams, wetlands and water-dependent ecosystems will be 20 metres for surface water resources.

8.1.2 Forestry Plantations

- **Recommendation 5: Information be provided to local governments regarding the potential negative and positive impacts of commercial forestry (including impact of different species).**
- **Recommendation 6: Additional investigations regarding opportunities and potential impacts of new commercial forestry (ie different species) targeted at the carbon sequestration market be undertaken and their implications for Development Plan policy.**
- **Recommendation 7: Update DBP Policy Library - Forestry Module with previously mentioned Development Plan policies (or similar) and promote its inclusion within Council's Development Plans.**

8.1.3 State's Better Development Plan Policy Library

- **Recommendation 8: In collaboration with DPLG ensure better representation of water sensitive urban design policies within Development Plans**. How water sensitive urban design (WSUD) policies are presented in Development Plans and within the State's Policy Library, requires further investigations and agreement among government agencies. Opinions are divided between (i) WSUD policies being contained within a standalone Council Wide or Overlay Section or (ii) be included with the existing Council Wide Natural Resources Module.
- There needs to be a broader understanding within the regions that water sensitive urban design policies are also applicable to urban/township (in addition to intensive farming operations), settings within the regions (not just in metropolitan Adelaide).
- **Recommendation 9: In collaboration with DPLG provide greater use of consistent language.** Within Council's Development Plans and the BDP Policy Library, consistent terms should be used to avoid confusion regarding the intent of policy. For instance, there is an inconsistent use of terms such as "property", "land" and/or "sites". Furthermore, policies often refer to "development and structures", "animal keeping development" or "development' (including land division etc). It is

recommended that the term "development" be used in isolation to avoid policy confusion. Development is clearly defined in the Development Act.

8.1.4 Water Availability

- There is little guidance provided in Council Development Plans regarding the link between the availability of water and water use and approving development. Currently the planning system may approve a form of development within a non-prescribed area that is dependent on water to operate, unless in circumstances, where the planning authority is of the opinion that the water is unlikely to be available. In this case, the planning authority is dealing with a "hypothetical development" and can potentially refuse to proceed with the development application (subject to legal advice). It is noted that with the advent of 'unbundling' of water from land as has occurred in other States, it shouldn't be automatically assumed that land that was traditionally irrigated has (or will have) water allocated to it. A rural landowner might simply trade in 'lease' water for when irrigation is needed.

- **Recommendation 10: Development Plans should be updated to contain watercourse and flood plain maps.** The Development Regulations refer to Watercourse Zone or Flood Plain delineated within a Development Plan. For these Regulations to have affect Development Plans must contain maps of these flood prone areas or at the very least clearly refer to the maps in other appropriate documents if they are not to be incorporated within the Development Plan. Regulation 14 of the Development Regulations list regional natural resources management plans as an appropriate document. The regional plan can be linked to the Development Plan via a section 29 Development Act process.

8.1.5 Site/Land Management

- There is a need for greater policy provisions across the Council Development Plans that encourage Applicants to prepare concise farm/site management plans for uses such as horticulture and intensive animal keeping. These plans could also provide preliminary irrigation drainage management processes for certain land uses (eg intensive animal keeping and horticulture). While it is acknowledged such issues are also the responsibility of other government agencies such as the NRM Board, a site management plan can assist Council officers in assessing the likely impacts of a proposal. They can also be used to reinforce conditions of consent attached to a development approval.

- **Recommendation 11: Amendments to schedule 5 of the Development Regulations should be considered to encourage the submission of site management plans in certain circumstances.** It is noted, that a planning authority must be able to make an informed decision on a development application. The planning authority, within reason, can request an

Applicant to provide a range of information that is directly related to the assessment of the Development Application against the provisions of the Council Development Plan.

8.1.6 Number of Similar Zones

- **Recommendation 12: Promote a more uniform and consistent approach to primary production zones (and similar).** For instance, many horticultural areas could appropriately fit within a primary production zone framework. Strive to promote consistent policy through the region, while recognising that there will be a need to have regard to local circumstances.

8.1.7 Complying Developments

- **Recommendation 13: Linked to appropriate land uses (as envisaged by the zone) seek to increase the number of complying developments within Council's Development Plans.** Thereby create greater certainty for landowners

- Complying developments vary across reviewed Development Plan zones. This issue will be addressed when Council's convert to the same version of the BDP. It is noted that (i) local variations are appropriate to some level, and (ii) developments that are required to be referred to government agencies via Schedule 8 of the Development Regulations cannot be processed as complying developments.

8.1.8 Non-Complying Developments

- **Recommendation 14: There is merit in considering a more consistent regional approach to identify what should be listed as "non-complying".** This issue, in part, may be addressed when Councils convert to the same version of BDP Development Plans.

8.1.9 Maps

- **Recommendation 15: There is a need to identify and map locations in Development Plans of key NRM relevance** (Eg Ramsar and prescribed areas etc). Consider aligning maps/titles with DENR language and criteria (ie Areas of High Environmental Significance). Alternative strategies to incorporate maps in Development Plans, is to have these maps contained within Regional NRM Plans. By way of Section 29 Development Act, Development Plans can refer to Regional NRM Plans (refer to Regulation 14 of the Development Regulations).

- **Recommendation 16: Consideration drafting a consistent definition for the River Murray Protection Area – River Murray Floodplain Area (River**

Murray Act) and the River Murray Flood Zone and River Murray Fringe Zone (as defined within some Council Development Plans). The existing inconsistent approach creates considerable confusion within the region.

- It is noted that 'River Murray Protection Area (which includes the River Murray Floodplain Area and the River Murray Tributaries Area – refer to Schedule 8.1 (6) (a), is different to the 1956 floodplain. The River Murray Floodplain Area referred to in the Development Regulations extends in most cases much further than the physical extent of the 1956 flood event.

8.2 Development Regulations

8.2.1 Definitions (Schedule 1)

- **Recommendation 17: From an NRM perspective, consider amending Development Regulations to provide separate definitions for irrigated and non-irrigated farming.** Irrigated agriculture may have similar impacts as irrigated horticulture, but is not deemed to be a change of land use if the existing use is dryland farming.

- This needs to be further considered as there may be a lesser requirement for this recommendation in prescribed areas. Although there may be a valid NRM reason for this position, this preliminary recommendation needs further consideration as there may be valid practical farm management reasons why this recommendation may not be a high priority for Councils to implement.

- **Recommendation 18: Provide a definition for watercourses.** Development Plans (including BDP) use the terms "watercourse", "1st order stream" and "3rd order stream" however, these are not clearly defined or explained. This issue needs to be addressed to promote clarity and consistent application of policy across the State. An option would be to rely on the Natural Resources Management Act definition of a watercourse. If this definition is to be adopted, it should be incorporated within Schedule 1 of the Development Regulations. It is noted that Schedule 2, Clause 7 of the Development Regulations essentially defines the 'River Murray System and Tributaries' via a link to the River Murray Act.

- **Recommendation 19: Transfer the commercial forestry definition from schedule 8 to schedule 1.** Schedule 8, Clause 3A of the Development Regulations provides a definition for commercial forestry. "Commercial forest means a forest plantation where the forest vegetation is grown or maintained so that it can be harvested or used for commercial purposes (including through the commercial exploitation of the carbon absorption capacity of the forest vegetation)." A more appropriate location for this definition would be in Schedule 1 (Definitions) of the Development Regulations.

8.2.2 Schedule 8 Referrals to Government Agencies

- **Recommendation 20: Schedule 8 relating to referrals to non-EPA environmental agencies need to be rewritten to promote its interpretation and implementation.** The language within existing referrals is overly complex.
- **Recommendation 21: Consider formally recognising the roles being undertaken by the NRM Boards in providing advice to planning authorities.** This needs to be balanced with the NRM Board's resource implications associated with this task and potentially increasing development application assessment timeframes that will add costs to the Applicant.
- **Recommendation 22: Review systems that promote State Government referral agencies to respond within legislative timeframes and ensure responses have regard to relevant Development Plan policy and protocols for drafting valid planning conditions.**
-

8.2.3 Schedule 9: Public Notification Categories

- **Recommendation 23: Review public notification categories to ensure envisaged land uses within a zone do not necessarily trigger Category 3 public notification processes** (e.g. State wide notification and third party appeal rights to the Environment Resources and Development Court).
- **Recommendation 24: Consider a greater use of Category 1 public notification processes when developments are clearly listed as envisaged land uses within a Zone.**
- Alternatively, public notification categories can be amended via updates to Council Development Plans. However, within the principle of striving to streamline the South Australian Planning system to promote greater consistency across Councils, amendments to Schedule 9 of the Development Regulations are favoured over updates to individual Development Plans.

8.3 Capacity Building

- **Recommendation 25:** Facilitate opportunities via education and training that increase the capacity of local government elected members, staff and applicants to have better regard to existing NRM (including climate change/water resources) Development Plan policies.
- **Recommendation 26:** Facilitate opportunities that increase the capacity of local government Elected Members, Council Strategic Planning and Policy Committees, Council Regional Forums, staff and applicants to better understand natural resources management outcomes and the value this brings. This may involve the preparation of guidelines which

provide further detail to the generally broad NRM policies currently outlined within these Development Plans.

- **Recommendation 27: In partnership with local governments and relevant government agencies, investigate the merits of promoting the use of people with specific experience in planning and natural resources management on "regional" DAP or "regional" strategic planning committees and/or forums.**

8.4 Murray-Darling Basin Small Block Irrigators Exit Grant Package

Recommendation 28: Undertake evidence based research that articulates potential negative impacts of the "Exit Grant Package eligibility requirements", given the package may potentially have the following planning impacts:

- The cessation of farming activities may result in land owners seeking to retain their residence in their farm house while desiring to sell the majority of the remaining farming land. This can be problematic given many Council Development Plan's primary production zones (or similar) discourage the division of land, as such division is typically considered to erode the long term primary production opportunities of the locality.
- The 'locking-out' of irrigated farming for at least five years may have short term impacts such as discouraging neighbouring farms to expand by way of purchasing these "locked-out" lots. The lack of expansion opportunities may undermine confidence in the locality's primary production future, particularly for farmers who are purchasing water entitlements and seeking to reinvest in the region.

Appendices

Appendix A: ABS Data and Definition of Land Use Classifications

	Berri Barmera (DC)	Goyder (DC)	Karoonda East Murray (DC)	Loxton Waikerie (DC)	Mid Murray Council	Murray Bridge (RC)	Renmark Paringa Council (DC)	Southern Mallee (DC)	The Coorong (DC)
Landuse - 2008 (km^2)									
Conservation and Natural Environments	246.39	908.04	782.40	1,878.01	1,327.34	202.86	151.94	2,081.83	1,662.37
Intensive Uses	51.95	103.06	97.64	175.02	171.62	105.20	41.71	118.81	153.72
Production from Dryland Agriculture and Plantations	88.18	4,151.95	3,519.46	5,566.84	3,867.99	1,184.46	516.84	3,444.52	6,059.22
Production from Irrigated Agriculture and Plantations	81.88	9.74	8.65	251.78	96.50	86.56	151.10	56.88	100.31
Production from Relatively Natural Environments	0.00	1,500.70	0.00	0.00	702.31	0.00	0.00	0.00	0.04
Water	38.97	14.38	0.00	91.99	86.66	245.26	38.44	0.13	886.97
Landuse - 2003 (km^2)									
Conservation and Natural Environments	216.59	41.79	501.16	1,005.51	371.15	121.52	134.89	1,841.72	1,602.21
Intensive Uses	50.38	103.22	89.91	191.37	155.99	92.93	39.65	103.14	135.74
Production from Dryland Agriculture and Plantations	53.19	4,159.64	3,465.64	5,259.65	3,447.61	1,203.69	427.48	3,469.01	6,215.10
Production from Irrigated Agriculture and Plantations	83.07	40.50	4.88	227.15	77.71	75.32	136.51	15.54	77.07
Production from Relatively Natural Environments	60.71	2,326.15	345.83	1,173.65	2,089.92	95.67	48.28	271.45	369.43
Water	43.44	16.56	1.27	105.16	110.03	235.22	112.46	0.58	463.03
Landuse Change from 2003 - 2008 (km^2)									
Conservation and Natural Environments	29.80	866.25	281.24	872.50	956.19	81.34	17.04	240.11	60.16
Intensive Uses	1.57	-0.16	7.73	-16.34	15.63	12.27	2.06	15.66	17.99
Production from Dryland Agriculture and Plantations	34.99	-7.70	53.82	307.19	420.38	-19.23	89.36	-24.50	-155.89
Production from Irrigated Agriculture and Plantations	-1.19	-30.76	3.77	24.64	18.79	11.24	14.59	41.34	23.23
Production from Relatively Natural Environments	-60.71	-825.45	-345.83	-1,173.65	-1,387.61	-95.67	-48.28	-271.45	-369.39
Water	-4.47	-2.18	-1.27	-13.17	-23.37	10.04	-74.02	-0.46	423.93
Census Data - 2006									
Selected Characteristics									
Total Persons	10,932	4,185	1,163	11,604	8,035	17,679	9,449	2,135	5,671
Total Males	5,367	2,106	588	5,904	4,236	8,791	4,745	1,097	2,878
Total Female	5,565	2,079	575	5,700	3,799	8,888	4,704	1,038	2,793
Dwellings	4,188	1,687	440	4,511	3,181	6,794	3,563	833	2,179
Total Youth (0-14)	2,281	814	224	2,386	1,342	3,588	2,016	470	1,221
Total Working Age (15-64)	6,904	2,607	729	7,311	5,257	11,189	5,992	1,314	3,583
Total Retired Age (65+)	1,747	763	211	1,907	1,436	2,902	1,441	352	866
Median age of persons	39	43	44	41	46	39	39	40	40
Median individual income ($/weekly)	392	336	327	404	326	369	412	408	368
Median family income ($/weekly)	1,001	786	803	1,020	781	890	1,013	1,001	848
Median household income ($/weekly)	758	617	634	759	616	672	758	746	643
Median housing loan repayment ($/monthly)	867	600	650	780	693	867	815	529	650
Median rent ($/weekly)	125	98	50	114	100	130	120	60	78
Average household size	2	2	3	2	2	2	3	2	2
Occupation Type									
Managers	835	616	263	1,329	744	1,013	802	464	894
Professionals	606	155	64	576	270	630	431	97	210
Technicians & Trades	612	255	43	608	502	993	466	110	248
Community & Personal Service	458	122	34	426	288	701	317	58	155
Clerical & Administrative	513	147	38	479	275	806	415	77	205
Sales	378	97	25	387	203	694	342	56	175
Machinery Operators	312	108	21	336	237	530	314	69	162
Labourers	1,001	306	64	1,269	698	1,827	1,079	165	461
Industry of Employment									
Agriculture, forestry & fishing	457	438	225	1,096	520	467	647	383	732
Mining	9	25	3	18	15	41	6	0	3
Manufacturing	529	146	6	402	289	932	315	19	102
Electricity, gas, water & waste services	66	6	0	49	43	83	45	3	9
Construction	208	75	14	237	183	363	181	29	92
Wholesale trade	89	27	5	132	64	172	102	37	47
Retail trade	224	63	12	244	120	496	232	21	81
Accommodation & food services	100	31	3	81	57	127	101	10	24
Transport, postal & warehousing	176	52	7	161	117	228	146	24	104

Information media & telecommunications	10	3	0	23	12	56	25	3	4
Financial & insurance services	34	0	3	28	10	36	25	0	10
Rental, hiring & real estate services	21	0	0	18	19	33	20	4	9
Professional, scientific & technical services	54	14	6	46	30	64	31	0	13
Administrative & support services	86	5	3	70	56	91	175	13	18
Public administration & safety	132	48	12	120	115	236	58	25	58
Education & training	75	25	6	79	49	118	60	16	28
Health care & social assistance	86	15	6	64	30	120	46	10	29
Arts & recreation services	11	3	3	13	8	43	5	0	9
Other services	109	32	4	91	60	172	60	29	51
Census Data - 2001									
Selected Characteristics									
Total Persons	11,280	4,239	1,214	11,944	8,448	16,532	9,722	2,210	5,660
Total Males	5,664	2,182	649	6,159	4,484	8,323	4,939	1,147	2,887
Total Female	5,616	2,057	565	5,785	3,964	8,209	4,783	1,063	2,773
Dwellings	4,402	1,722	474	4,689	3,458	6,492	3,787	861	2,236
Total Youth (0-14)	2,367	916	271	2,582	1,605	3,747	2,116	532	1,284
Total Working Age (15-64)	7,205	2,635	758	7,560	5,506	10,403	6,229	1,349	3,597
Total Retired Age (65+)	1,649	672	181	1,736	1,324	2,361	1,346	321	765
Median age of persons	37	40	39	37	41	36	37	37	38
Median individual income ($/weekly)	376	303	320	361	293	315	359	390	325
Median family income ($/weekly)	885	702	780	842	711	731	865	845	748
Median household income ($/weekly)	715	580	635	686	564	606	689	688	625
Median housing loan repayment ($/monthly)	611	454	459	559	533	574	606	433	502
Median rent ($/weekly)	108	81	71	105	94	99	102	70	87
Average household size	2.68	2.57	2.65	2.65	2.63	2.62	2.70	2.62	2.61
Occupation Type									
Managers and administrators	758	544	295	1,202	656	836	754	415	868
Professionals	563	135	44	517	285	563	397	95	175
Tradespersons and related workers	552	192	45	504	413	909	404	134	260
Advanced clerical and service workers	118	46	15	135	73	130	97	22	60
Intermediate clerical, sales and service workers	695	142	30	524	330	835	524	93	221
Intermediate production and transport workers	380	104	27	400	267	596	358	85	185
Elementary clerical, sales and service workers	332	98	10	346	183	610	256	49	152
Labourers and related workers	1010	259	61	1413	674	1,257	1,106	139	391
Industry of Employment									
Agriculture, forestry and fishing	1,008	673	351	1,933	945	1,017	1,314	527	1,120
Mining	3	6	6	10	13	15	3	0	0
Manufacturing	808	167	6	492	412	956	498	69	118
Electricity, gas and water supply	72	9	0	63	37	61	39	3	0
Construction	228	65	19	236	165	365	171	33	92
Wholesale trade	270	50	12	467	150	395	361	79	94
Retail trade	624	169	26	651	363	1,050	528	99	286
Accommodation, cafes and restaurants	257	70	6	190	212	185	177	30	113
Transport and storage	151	54	16	171	153	267	139	25	104
Communication services	37	21	6	37	22	98	40	12	16
Finance and insurance	84	17	9	63	17	92	65	8	27
Property and business services	240	59	6	215	144	307	191	10	51
Government administration and defence	138	49	12	92	82	244	83	38	122
Education	305	96	41	276	171	334	213	56	142
Health and community services	464	133	49	419	192	560	311	81	137
Cultural and recreational services	50	4	0	48	38	149	46	6	18
Personal and other services	164	28	9	133	104	286	97	3	46

ALUM Classification version 6

Land use class definitions

Five primary levels of land use are distinguished in order of generally increasing levels of intervention or potential impact on the natural landscape. Water is also included in the classification as a sixth primary class. For catchment scale land use mapping currently being coordinated through BRS under AFFA, MDBC and Audit programs, the minimum expected level of attribution is to the tertiary level for 'Conservation and natural environments' and to the secondary level elsewhere (as shown in part D ALUM Classification v6 - summary). Tertiary classes presented here under primary levels 2, 3, 4, 5 and 6 are under continuing development, and are presented as suggestions/recommendations rather than mandatory elements of the classification.

While tertiary level data is valuable in many natural resource planning and management applications, it is expensive to collect. Generally, mapping is completed to the tertiary level only where pre-existing data is available, or where tertiary level information (eg, crop type) is of particular interest to the mapping agency. BRS has tested alternative mapping approaches using geocoded data from the ABS Agricultural Commodities Census (Ag Stats) which could provide a cost-effective basis of mapping some of these data (Randall and Barson 2001).

1. Conservation and natural environments - Land used primarily for conservation purposes, based on the maintenance of the essentially natural ecosystems present.

2. Production from relatively natural environments - Land used primarily for primary production with limited change to the native vegetation.

3. Production from dryland agriculture and plantations - Land used mainly for primary production, based on dryland farming systems.

4. Production from irrigated agriculture and plantations - Land used mostly for primary production based on irrigated farming.

5. Intensive uses - Land subject to extensive modification, generally in association with closer residential settlement, commercial or industrial uses.

6. Water - Water features. Water is regarded as an essential aspect of the classification, but it is primarily a cover type.

(i) CONSERVATION AND NATURAL ENVIRONMENTS

A relatively low level of human intervention, with the anticipated consequence of little change to natural ecosystems. There may be change in the condition of the land in response to natural processes in isolation from any imposed use. The land may be formally reserved by government for conservation purposes, or conserved through other legal or administrative arrangements. Areas may have multiple uses, however nature conservation is the prime use. Some land may be unused as a result of a deliberate decision of the government or landowner, or due to circumstance.

1.1 Nature conservation Tertiary classes 1.1.1 – 1.1.6 are based on the Collaborative Australian Protected Areas Database (CAPAD) classification (Cresswell and Thomas 1997).

1.1.1 Strict nature reserve Protected area managed mainly for science. An area of land possessing outstanding or representative ecosystems, geological or physiological features and/or species, which is available primarily for scientific research and/or environmental monitoring.

1.1.2 Wilderness area Protected area managed mainly for wilderness protection. A large area of unmodified or slightly modified land, retaining its natural character and influence, without permanent or significant habitation, which is protected and managed so as to preserve its natural condition.

1.1.3 National park Protected area managed mainly for ecosystem conservation and recreation. A natural area of land, designated to: a) protect the ecological integrity of one or more ecosystems for this and future generations; b) exclude exploitation or occupation detrimental to the purposes of designation of the area, and c) provide a foundation for spiritual, scientific, educational, recreational and visitor opportunities, all of which must be environmentally and culturally compatible.

1.1.4 Natural feature protection Protected area managed for conservation of specific natural features. Area containing one or more specific natural or natural/cultural feature which is of outstanding value because of its inherent rarity, representative or aesthetic qualities or cultural significance.

1.1.5 Habitat/species management area Protected area managed mainly for conservation through management intervention. Area of land and/or sea subject to active intervention for management purposes so as to ensure the maintenance of habitats and/or to meet the requirements of specific species. This may include areas on private land.

1.1.6 Protected Landscape Protected areas managed mainly for landscape conservation and recreation. Area of land where the interaction of people and nature over time has produced an area of distinct character with significant aesthetic, cultural and/or ecological value, and often with high biological diversity.

1.1.7 Other conserved area Land under forms of nature conservation protection that fall outside the scope of the CAPAD classification, including heritage agreements, voluntary conservation arrangements, registered property agreements etc.

1.2 Managed resource protection Tertiary classes 1.2.1 – 1.2.4 are based on the CAPAD classification. These areas are managed primarily for the sustainable use of natural ecosystems. This includes areas with largely unmodified natural systems managed primarily to ensure the long-term protection and maintenance of biological diversity, water supply, aquifer or landscape while providing a sustainable flow of natural products and services to meet community needs.

1.2.1 Biodiversity Managed for biodiversity.

1.2.2 Surface water supply Managed as a catchment for water supply.

1.2.3 Groundwater Managed for groundwater.

1.2.4 Landscape Managed for landscape integrity.

1.2.5 Traditional indigenous uses Managed primarily for traditional indigenous use.

1.3 Other minimal use Areas of land that are largely unused (in the context of the prime use) but may have ancillary uses. This may be the result of a deliberate decision by the manager or the result of circumstances. The land may be available for use but for various reasons remains 'unused'.

1.3.1 Defence Natural areas allocated to field training, weapon testing and other field defence uses.

1.3.2 Stock route Stock reserves under intermittent use or unused.

1.3.3 Residual native cover Land under native cover, mainly unused (no prime use) or used for non-production or environmental purposes eg to conserve native vegetation and wildlife or for natural resources protection.

1.3.4 Rehabilitation Land under rehabilitation or unused because of weed infestation, salinisation, scalding and similar hazards.

(ii) PRODUCTION FROM RELATIVELY NATURAL ENVIRONMENTS

Land generally subject to relatively low levels of intervention. The land may not be used more intensively owing to its limited capability. The structure of the native vegetation generally remains intact despite deliberate use, although the floristics of the vegetation may have changed markedly. Where the native vegetation structure is, for example, open woodland or grassland, the land may be grazed. Where the native grasses have been deliberately and extensively replaced with improved species, the use should be treated under 3. Production from dryland agriculture and plantations.

2.1 Grazing natural vegetation Land uses based on grazing by domestic stock on native vegetation where there has been limited or no deliberate attempt at pasture modification. Some change in species composition may have occurred.

2.2 Production forestry Commercial production from native forests and related activities on public and private land. Environmental and indirect production uses associated with retained native forest (eg prevention of land degradation, wind-breaks, shade and shelter) are included in an appropriate class under 1. Conservation and natural environments.

2.2.1 Wood production Managed for sawlogs and pulpwood.

2.2.2 Other forest production Managed for non-sawlog/pulpwood production, including oil, wildflowers, fire-wood and fence posts.

(iii) PRODUCTION FROM DRYLAND AGRICULTURE AND PLANTATIONS

Land in this class is used principally for primary production, based on dryland farming systems. Native vegetation has largely been replaced by introduced species through clearing, the sowing of new species, the application of fertilisers or the dominance of volunteer species. The range of activities in this category includes plantation forestry, pasture production for stock, cropping and fodder production, and a wide range of horticultural production.

3.1 Plantation forestry Land on which plantations of trees or shrubs (native or exotic species) has been established for production or environmental and resource protection purposes. This includes farm forestry. Where planted trees are grown in conjunction with pasture, fodder or crop production, class allocation should be made on the basis of either prime use or multiple class attribution.

3.1.1 Hardwood production Managed for hardwood sawlogs or pulpwood.
3.1.2 Softwood production Managed for softwood sawlogs or pulpwood.
3.1.3 Other forest production Managed for non-sawlog/pulpwood production, including oil, wildflowers, fire-wood and fence posts.
3.1.4 Environmental Environmental and indirect production uses (eg prevention of land degradation, wind-breaks, shade and shelter).

3.2 Grazing modified pastures Pasture and forage production, both annual and perennial, based on significant active modification or replacement of the initial vegetation. Land under pasture at the time of mapping may be in a rotation system so that at another time the same area may be, for example, under cropping. Land in a rotation system should be classified according to the land use at the time of mapping. Suggested tertiary classes for legume and grass pasture types can be fitted to the pasture attributes collected through the ABS Agricultural Census.

3.2.1 Native/exotic pasture mosaic Pastures in which there is a substantial native species component despite extensive active modification or replacement of native vegetation. This class may apply where native and exotic pasture is patterned at a relatively fine spatial scale.
3.2.2 Woody fodder plants Woody plants used primarily for the purpose of providing forage for livestock grazing. Examples include Tagastaste and Leucaena.
3.2.3 Pasture legumes
3.2.4 Pasture legume/grass mixtures
3.2.5 Sown grasses

3.3 Cropping Land under cropping. Land under cropping at the time of mapping may be in a rotation system so that at another time the same area may be, for example, under pasture. Land in a rotation system should be classified according to the land use at the time of mapping. Cropping can vary markedly over relatively short distances in response to change in the nature of the land and the preferences of the land manager. It may also change over time in response to market conditions. Fodder production, such as lucerne hay, is treated as a crop as there is no harvesting by stock.

At the tertiary level it is suggested that classes be based on commodities / commodity groups that relate to ABS level 2 agricultural commodity categories (see part J ABS agricultural commodity levels).

3.3.1 Cereals
3.3.2 Beverage & spice crops
3.3.3 Hay & silage
3.3.4 Oil seeds
3.3.5 Sugar
3.3.6 Cotton
3.3.7 Tobacco
3.3.8 Legumes

3.4 Perennial horticulture Crop plants living for more than two years that are intensively cultivated, usually involving a relatively high degree of nutrient, weed and moisture control. Suggested tertiary classes are based on the ABS commodities Level 2 categories that relate to horticulture (see part J, ABS agricultural commodity levels).

3.4.1 Tree fruits
3.4.2 Oleaginous fruits
3.4.3 Tree nuts
3.4.4 Vine fruits
3.4.5 Shrub nuts fruits & berries
3.4.6 Flowers & bulbs
3.4.7 Vegetables & herbs

3.5 Seasonal horticulture Crop plants living for less than two years that are intensively cultivated, usually involving a relatively high degree of nutrient, weed and moisture control. Suggested tertiary classes are based on the ABS commodities Level 2 agricultural commodity categories that relate to horticulture (see part J ABS agricultural commodity levels).

3.5.1 Fruits
3.5.2 Nuts
3.5.3 Flowers & bulbs
3.5.4 Vegetables & herbs

3.6 Land in transition Areas where the land use is unknown and cannot reasonably be inferred from the surrounding land use.

3.6.1 Degraded land Land is severely degraded (e.g. from soil erosion, salinity or weed/shrub invasion) and is not under active rehabilitation.

3.6.2 Abandoned land Land where a prior pattern of agriculture may be observed but not currently under production (e.g. an orchard where trees remain but site invaded by woody shrubs with trees not pruned or dying).

3.6.3 Land under rehabilitation Land in the process of rehabilitation for agricultural production (i.e. not for purposes under 5. Intensive uses or 1. Conservation and natural environments)

3.6.4 No defined use Land cleared of intact native vegetation where the proposed land use is not known.

(iv) PRODUCTION FROM IRRIGATED AGRICULTURE AND PLANTATIONS

This class includes agricultural land uses where water is applied to promote additional growth over normally dry periods, depending on the season, water availability and commodity prices. This includes land uses that receive only one or two irrigations per year, through to those uses that rely on irrigation for much of the growing season. Baxter and Russell (1994) argue that the degree of intervention involved in irrigation and its potential impacts on hydrology and geohydrology are sufficient to warrant creation of this primary class.

4.1 Irrigated plantation forestry Land on which irrigated plantations of trees or shrubs have been established for production or environmental and resource protection purposes. This includes farm forestry.

4.1.1 Irrigated hardwood production Managed for hardwood sawlogs or pulpwood.

4.1.2 Irrigated softwood production Managed for softwood sawlogs or pulpwood.

4.1.3 Irrigated other forest production Managed for non-sawlog/pulpwood production, including oil, wildflowers, fire-wood and fence posts.

4.1.4 Irrigated environmental Environmental and indirect production uses (eg prevention of land degradation, wind-breaks, shade and shelter).

4.2 Irrigated modified pastures Irrigated pasture production, both annual and perennial, based on a significant degree of modification or replacement of the initial native vegetation. This class may include land in a rotation system that at other times may be under cropping. Land in a rotation system should be classified according to the land use at the time of mapping. Cropping/pasture rotation regimes are treated as land management practices.

4.2.1 Irrigated woody fodder plants Irrigated woody plants used primarily for the purpose of providing forage for livestock grazing.
4.2.2 Irrigated legumes
4.2.3 Irrigated legume/grass mixtures
4.2.4 Irrigated sown grasses

4.3 Irrigated cropping Land under irrigated cropping. This class may include land in a rotation system that at other times may be under pasture. Land in a rotation system should be classified according to the land use at the time of mapping. Cropping/pasture rotation regimes are treated as land management practice.

4.3.1 Irrigated cereals
4.3.2 Irrigated beverage & spice crops
4.3.3 Irrigated hay & silage
4.3.4 Irrigated oil seeds
4.3.5 Irrigated sugar
4.3.6 Irrigated cotton
4.3.7 Irrigated tobacco

4.3.8 Irrigated legumes

4.4 Irrigated perennial horticulture Irrigated crop plants living for more than two years that are intensively cultivated, usually involving a relatively high degree of nutrient, weed and moisture control.

4.4.1 Irrigated tree fruits
4.4.2 Irrigated oleaginous fruits
4.4.3 Irrigated tree nuts
4.4.4 Irrigated vine fruits
4.4.5 Irrigated shrub nuts fruits & berries
4.4.6 Irrigated flowers & bulbs
4.4.7 Irrigated vegetables & herbs

4.5 Irrigated seasonal horticulture Irrigated crop plants living for less than two years that are intensively cultivated, usually involving a relatively high degree of nutrient, weed and moisture control.

4.5.1 Irrigated fruits
4.5.2 Irrigated nuts
4.5.3 Irrigated flowers & bulbs
4.5.4 Irrigated vegetables & herbs

4.6 Irrigated land in transition Areas where irrigated production may be carried out but land use is unknown and cannot reasonably be inferred from the surrounding land use. Evidence or knowledge of irrigated use or of existing irrigation infrastructure should be present.

3.6.1 Degraded irrigated land Land is severely degraded (e.g. from soil erosion, salinity or weed/shrub invasion) with evidence of irrigation or irrigation infrastructure. Not under active rehabilitation.

3.6.2 Abandoned irrigated land Land where a prior pattern of irrigated agriculture may be observed but not currently under production. There is evidence of irrigation or irrigation infrastructure. (Eg. irrigated horticultural plantation where trees are still retained but site invaded by woody shrubs and trees not pruned or dying).

3.6.3 Irrigated land under rehabilitation Land is in the process of rehabilitation for irrigated agriculture (i.e. not for purposes under 5. Intensive uses or 1. Conservation and natural environments). Evidence of irrigation or irrigation infrastructure.

3.6.4 No defined use (irrigation) Land cleared of intact native vegetation where the proposed land use is not known. Evidence of irrigation or irrigation infrastructure.

(v) INTENSIVE USES

Land uses involving high levels of interference with natural processes, generally in association with closer settlement. The level of intervention may be sufficiently high as to completely remodel the natural landscape — the vegetation, surface and groundwater systems and the land surface.

5.1 Intensive horticulture Intensive forms of plant production.

5.1.1 Shadehouses
5.1.2 Glasshouses
5.1.3 Glasshouses (hydroponic)

5.2 Intensive animal production Intensive forms of animal production (excludes associated grazing/pasture). Agricultural production facilities such as feedlots, piggeries etc may be included as tertiary classes.

5.2.1 Dairy
5.2.2 Cattle
5.2.3 Sheep
5.2.4 Poultry
5.2.5 Pigs
5.2.6 Aquaculture

5.3 Manufacturing and industrial Factories, workshops, foundries, construction sites etc. This includes the processing of primary produce eg sawmills, pulp mills, abattoirs, etc.

5.4 Residential

5.4.1 Urban residential Houses, flats, hotels, etc.

5.4.2 Rural residential Characterised by agriculture in a peri-urban setting, where agriculture does not provide the primary source of income.
5.4.3 Rural living Characterised by rural residential areas that comprise a substantial amount of native vegetation.

5.5 Services Land allocated to the provision of commercial or public services resulting in substantial interference to the natural environment. Where services are provided land that retains natural cover an appropriate classification under (i) Conservation and Natural Environments should be applied (eg 1.1.7; 1.3).

5.5.1 Commercial services Shops, markets, financial services, etc.
5.5.2 Public services Education, community services, etc.
5.5.3 Recreation and culture Parks, sports grounds, camping grounds, swimming pools, museums, places of worship, etc.
5.5.4 Defence facilities Defence research and development establishments, testing areas, firing ranges, etc. Defence lands of significant area, retaining natural cover should be allocated to 1.3.1
5.5.5 Research facilities Government and non-government research and development areas.

5.6 Utilities

5.6.1 Electricity generation/transmission Coal-fired, gas-fired, solar-powered, wind-powered or hydroelectric power stations, sub-stations, powerlines, etc.
5.6.2 Gas treatment, storage and transmission Facilities associated with gas production and supply.

5.7 Transport and communication

5.7.1 Airports/aerodromes
5.7.2 Roads
5.7.3 Railways
5.7.4 Ports and water transport
5.7.5 Navigation and communication radar stations, beacons, etc.

5.8 Mining

5.8.1 Mines
5.8.2 Quarries
5.8.3 Tailings Tailings areas and other previously mined areas under rehabilitation are included in 1.3.4

5.9 Waste treatment and disposal Waste material and disposal facilities associated with industrial, urban and agricultural activities.

5.9.1 Stormwater
5.9.2 Landfill Disposal of solid inert wastes (but not including over-burden).
5.9.3 Solid garbage Disposal of wastes including waste from processing plants.
5.9.4 Incinerators
5.9.5 Sewage

(vi) WATER

Water features are regarded as essential to the classification because of their importance for natural resources management and as points of reference in the landscape. The inclusion of water is, however, complicated as it is normally classified as a land cover type. At the secondary level the classification identifies water features, both natural and artificial. Tertiary classes relate water features to intensity of use.

Because water is a land cover rather than a land use, water classes may not be mutually-exclusive with other land use classes at particular levels in the classification. Generally, water classes should take precedence so that, for instance, a lake in a conservation reserve will be classed as Lake (6.1) or Lake - conservation (6.1.1) rather than Nature conservation (1.1). Water features to which a conservation tertiary class applies may be attributed using multiple use attribution procedures (see part G for technical details).

6.1 Lake

6.1.1 Lake - conservation Feature relates to uses included in 1. Conservation and Natural Environments.
6.1.2 Lake - production Feature relates to uses included in 2. Production from Relatively Natural Environments.
6.1.3 Lake - intensive use Feature relates to uses included in 5. Intensive Uses.

6.2 Reservoir or dam

6.2.1 Reservoir – water stored for use outside the farm
6.2.2 Water storage - intensive use/farm dams Water stored for on-site immediate use on farm. Feature may relate to uses included in 5. Intensive Uses
6.2.3 Evaporation basin Disposal of irrigation drainage waters.
6.2.4 Effluent pond

6.3 River

6.3.1 River - conservation Feature relates to uses in 1. Conservation and Natural Environments.
6.3.2 River - production Feature relates to uses in 2. Production from Relatively Natural Environments.
6.3.3 River - intensive use Feature relates to uses in 5. Intensive Uses.

6.4 Channel/aqueduct

6.4.1 Supply channel/aqueduct
6.4.2 Drainage channel/aqueduct

6.5 Marsh/wetland

6.5.1, Marsh/wetland - conservation Feature relates to uses in 1. Conservation and Natural Environments.
6.5.2, Marsh/wetland - production Feature relates to uses in 2. Production from Relatively Natural Environments.
6.5.3, Marsh/wetland - intensive use Feature relates to uses in 5. Intensive Uses.

6.6 Estuary/coastal waters

6.6.1 Estuary/coastal waters - conservation Feature relates to uses in 1. Conservation and Natural Environments.
6.6.2 Estuary/coastal waters - production Feature relates to uses in 2. Production from Relatively Natural Environments.
6.6.3 Estuary/coastal waters - intensive use Feature relates to uses in 5. Intensive Uses.

AUSTRALIAN LAND USE AND MANAGEMENT CLASSIFICATION version 6 (March 2005)

1 Conservation and Natural Environments

1.1.0 Nature conservation
- 1.1.1 Strict nature reserves
- 1.1.2 Wilderness area
- 1.1.3 National park
- 1.1.4 Natural feature protection
- 1.1.5 Habitat/species management area
- 1.1.6 Protected landscape
- 1.1.7 Other conserved area

1.2.0 Managed resource protection
- 1.2.1 Biodiversity
- 1.2.2 Surface water supply
- 1.2.3 Groundwater
- 1.2.4 Landscape
- 1.2.5 Traditional indigenous uses

1.3.0 Other minimal use
- 1.3.1 Defence
- 1.3.2 Stock route
- 1.3.3 Residual native cover
- 1.3.4 Rehabilitation

minimum level of attribution

2 Production from Relatively Natural Environments

2.1.0 Grazing natural vegetation

2.2.0 Production forestry
- 2.2.1 Wood production
- 2.2.2 Other forest production

3 Production from Dryland Agriculture and Plantations

3.1.0 Plantation forestry
- 3.1.1 Hardwood production
- 3.1.2 Softwood production
- 3.1.3 Other forest production
- 3.1.4 Environmental

3.2.0 Grazing modified pastures
- 3.2.1 Native/exotic pasture mosaic
- 3.2.2 Woody fodder plants
- 3.2.3 Pasture legumes
- 3.2.4 Pasture legume/grass mixtures
- 3.2.5 Sown grasses

3.3.0 Cropping
- 3.3.1 Cereals
- 3.3.2 Beverage & spice crops
- 3.3.3 Hay & silage
- 3.3.4 Oil seeds
- 3.3.5 Sugar
- 3.3.6 Cotton
- 3.3.7 Tobacco
- 3.3.8 Legumes

3.4.0 Perennial horticulture
- 3.4.1 Tree fruits
- 3.4.2 Oleaginous fruits
- 3.4.3 Tree nuts
- 3.4.4 Vine fruits
- 3.4.5 Shrub nuts fruits & berries
- 3.4.6 Flowers & bulbs
- 3.4.7 Vegetables & herbs

3.5.0 Seasonal horticulture
- 3.5.1 Fruits
- 3.5.2 Nuts
- 3.5.3 Flowers & bulbs
- 3.5.4 Vegetables & herbs

3.6.0 Land in transition
- 3.6.1 Degraded land
- 3.6.2 Abandoned land
- 3.6.3 Land under rehabilitation
- 3.6.4 No defined use

4 Production from Irrigated Agriculture and Plantations

4.1.0 Irrigated plantation forestry
- 4.1.1 Irrigated hardwood production
- 4.1.2 Irrigated softwood production
- 4.1.3 Irrigated other forest production
- 4.1.4 Irrigated environmental

4.2.0 Irrigated modified pastures
- 4.2.1 Irrigated woody fodder plants
- 4.2.2 Irrigated pasture legumes
- 4.2.3 Irrigated legume/grass mixtures
- 4.2.4 Irrigated sown grasses

4.3.0 Irrigated cropping
- 4.3.1 Irrigated cereals
- 4.3.2 Irrigated beverage & spice crops
- 4.3.3 Irrigated hay & silage
- 4.3.4 Irrigated oil seeds
- 4.3.5 Irrigated sugar
- 4.3.6 Irrigated cotton
- 4.3.7 Irrigated tobacco
- 4.3.8 Irrigated legumes

4.4.0 Irrigated perennial horticulture
- 4.4.1 Irrigated tree fruits
- 4.4.2 Irrigated oleaginous fruits
- 4.4.3 Irrigated tree nuts
- 4.4.4 Irrigated vine fruits
- 4.4.5 Irrigated shrub nuts fruits & berries
- 4.4.6 Irrigated flowers & bulbs
- 4.4.7 Irrigated vegetables & herbs

4.5.0 Irrigated seasonal horticulture
- 4.5.1 Irrigated fruits
- 4.5.2 Irrigated nuts
- 4.5.3 Irrigated flowers & bulbs
- 4.5.4 Irrigated vegetables & herbs

4.6.0 Irrigated land in transition
- 4.6.1 Degraded irrigated land
- 4.6.2 Abandoned irrigated land
- 4.6.3 Irrigated land under rehabilitation
- 4.6.4 No defined use (irrigation)

5 Intensive Uses

5.1.0 Intensive horticulture
- 5.1.1 Shadehouses
- 5.1.2 Glasshouses
- 5.1.3 Glasshouses (hydroponic)

5.2.0 Intensive animal production
- 5.2.1 Dairy
- 5.2.2 Cattle
- 5.2.3 Sheep
- 5.2.4 Poultry
- 5.2.5 Pigs
- 5.2.6 Aquaculture

5.3.0 Manufacturing and industrial

5.4.0 Residential
- 5.4.1 Urban residential
- 5.4.2 Rural residential
- 5.4.3 Rural living

5.5.0 Services
- 5.5.1 Commercial services
- 5.5.2 Public services
- 5.5.3 Recreation and culture
- 5.5.4 Defence facilities
- 5.5.5 Research facilities

5.6.0 Utilities
- 5.6.1 Electricity generation/transmission
- 5.6.2 Gas treatment, storage and transmission

5.7.0 Transport and communication
- 5.7.1 Airports/aerodromes
- 5.7.2 Roads
- 5.7.3 Railways
- 5.7.4 Ports and water transport
- 5.7.5 Navigation and communication

5.8.0 Mining
- 5.8.1 Mines
- 5.8.2 Quarries
- 5.8.3 Tailings

5.9.0 Waste treatment and disposal
- 5.9.1 Stormwater
- 5.9.2 Landfill
- 5.9.3 Solid garbage
- 5.9.4 Incinerators
- 5.9.5 Sewage

6 Water

6.1.0 Lake
- 6.1.1 Lake - conservation
- 6.1.2 Lake - production
- 6.1.3 Lake - intensive use

6.2.0 Reservoir/dam
- 6.2.1 Reservoir
- 6.2.2 Water storage - intensive use/farm dams
- 6.2.3 Evaporation basin
- 6.2.4 Effluent pond

6.3.0 River
- 6.3.1 River - conservation
- 6.3.2 River - production
- 6.3.3 River - intensive use

6.4.0 Channel/aqueduct
- 6.4.1 Supply channel/aqueduct
- 6.4.2 Drainage channel/aqueduct

6.5.0 Marsh/wetland
- 6.5.1 Marsh/wetland - conservation
- 6.5.2 Marsh/wetland - production
- 6.5.3 Marsh/wetland - intensive use

6.6.0 Estuary/coastal waters
- 6.6.1 Estuary/coastal waters - conservation
- 6.6.2 Estuary/coastal waters - production
- 6.6.3 Estuary/coastal waters - intensive use

Appendix B: GIS Maps

LGA Name	Landuse Type - 2008 (km^2)					
	Conservation and Natural Environments	Intensive Uses	Production from Dryland Agriculture and Plantations	Production from Irrigated Agriculture and Plantations	Production from Relatively Natural Environments	Water
Coorong DC	1,662.37	153.72	6,059.22	100.31	0.04	886.97
Mid Murray Council	1,327.34	171.62	3,867.99	96.50	702.31	86.66
Renmark Paringa Council	151.94	41.71	516.84	151.10	0.00	38.44
Southern Mallee DC	2,081.83	118.81	3,444.52	56.88	0.00	0.13
The Berri Barmera Council	246.39	51.95	88.18	81.88	0.00	38.97
The DC Of Karoonda East Murray	782.40	97.64	3,519.46	8.65	0.00	0.54
The DC Of Loxton Waikerie	1,878.01	175.02	5,566.84	251.78	0.00	91.99
The Regional Council Of Goyder	908.04	103.06	4,151.95	9.74	1,500.70	14.38
The Rural City Of Murray Bridge	202.86	105.20	1,184.46	86.56	0.00	245.26
Total	9,241.17	1,018.73	28,399.45	843.40	2,203.05	1,403.35

avante MAPPING SOLUTIONS

URPS

Government of South Australia
South Australian Murray-Darling Basin Natural Resources Management Board

Strengthening Basin Communities Program

Broad Landuse - 2008

Legend

- Capital Cities
- River Murray
- Murray Darling Basin Boundary
- Local Government Areas
- State Boundaries

Landuse - 2008

- Conservation and Natural Environments
- Intensive Uses
- Production from Dryland Agriculture and Plantations
- Production from Irrigated Agriculture and Plantations
- Production from Relatively Natural Environments
- Water

0 25 50
Kilometres

N

Location Map

Data Properties

Map Grid of Australia - Zone 54 (UTM)
Geocentric Datum of Australia 1994 (GDA94)
Australian Height Datum (AHD) levels in metres
Map generated November 2010 by
Avante Mapping Solutions
www.avantemapping.com.au
Roads, Towns, DCDB: DEH
LGAs, Census Data: ABS

LGA Name	Landuse Type - 2003 (km^2)					
	Conservation and Natural Environments	Intensive Uses	Production from Dryland Agriculture and Plantations	Production from Irrigated Agriculture and Plantations	Production from Relatively Natural Environments	Water
Coorong DC	1,602.21	135.74	6,215.10	77.07	369.43	463.03
Mid Murray Council	371.15	155.99	3,447.61	77.71	2,089.92	110.03
Renmark Paringa Council	134.89	39.65	427.48	136.51	48.28	112.46
Southern Mallee DC	1,841.72	103.14	3,469.01	15.54	271.45	0.58
The Berri Barmera Council	216.59	50.38	53.19	83.07	60.71	43.44
The DC Of Karoonda East Murray	501.16	89.91	3,465.64	4.88	345.83	1.27
The DC Of Loxton Waikerie	1,005.51	191.37	5,259.65	227.15	1,173.65	105.16
The Regional Council Of Goyder	41.79	103.22	4,159.64	40.50	2,326.15	16.56
The Rural City Of Murray Bridge	121.52	92.93	1,203.69	75.32	95.67	235.22
Total	5,836.54	962.33	27,701.02	737.74	6,781.08	1,087.76

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URPS

Government of South Australia
South Australian Murray-Darling Basin Natural Resources Management Board

Strengthening Basin Communities Program

Broad Landuse - 2003

Legend

- Capital Cities
- River Murray
- Murray Darling Basin Boundary
- Local Government Areas
- State Boundaries

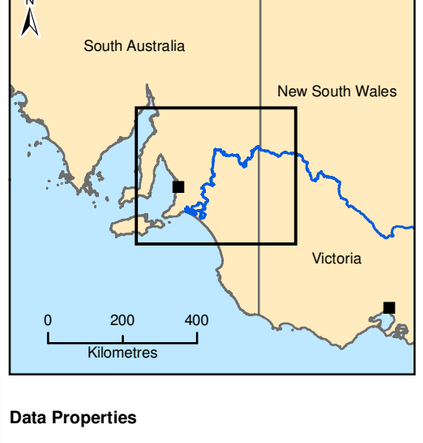
Landuse - 2003

- Conservation and Natural Environments
- Intensive Uses
- Production from Dryland Agriculture and Plantations
- Production from Irrigated Agriculture and Plantations
- Production from Relatively Natural Environments
- Water

0 25 50
Kilometres

N

Location Map



Data Properties

Map Grid of Australia - Zone 54 (UTM)
Geocentric Datum of Australia 1994 (GDA94)
Australian Height Datum (AHD) levels in metres
Map generated November 2010 by
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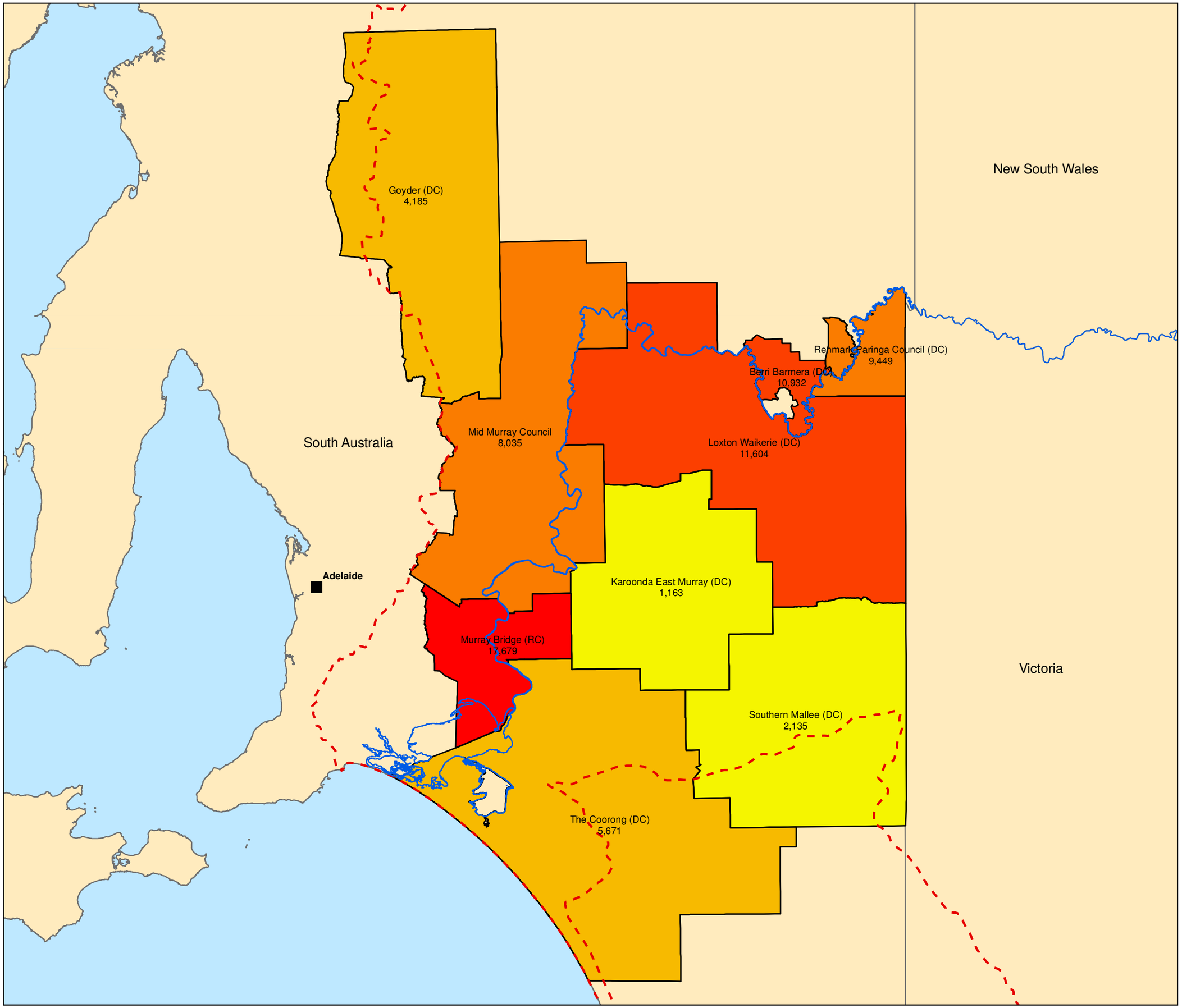

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URPS

Government of South Australia
South Australian Murray-Darling Basin Natural Resources Management Board

Strengthening Basin Communities Program

Total Population - 2006

Legend

- Capital Cities
- River Murray
- Murray Darling Basin Boundary
- Local Government Areas
- State Boundaries

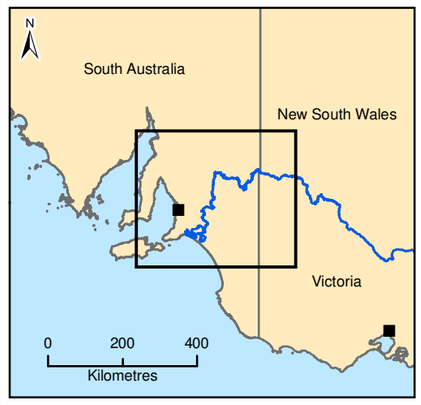
Census Data - 2006
Total Population - LGA

- 1,163 - 2,135
- 2,136 - 5,671
- 5,672 - 9,449
- 9,450 - 11,604
- 11,605 - 17,679

0 25 50
Kilometres

N

Location Map



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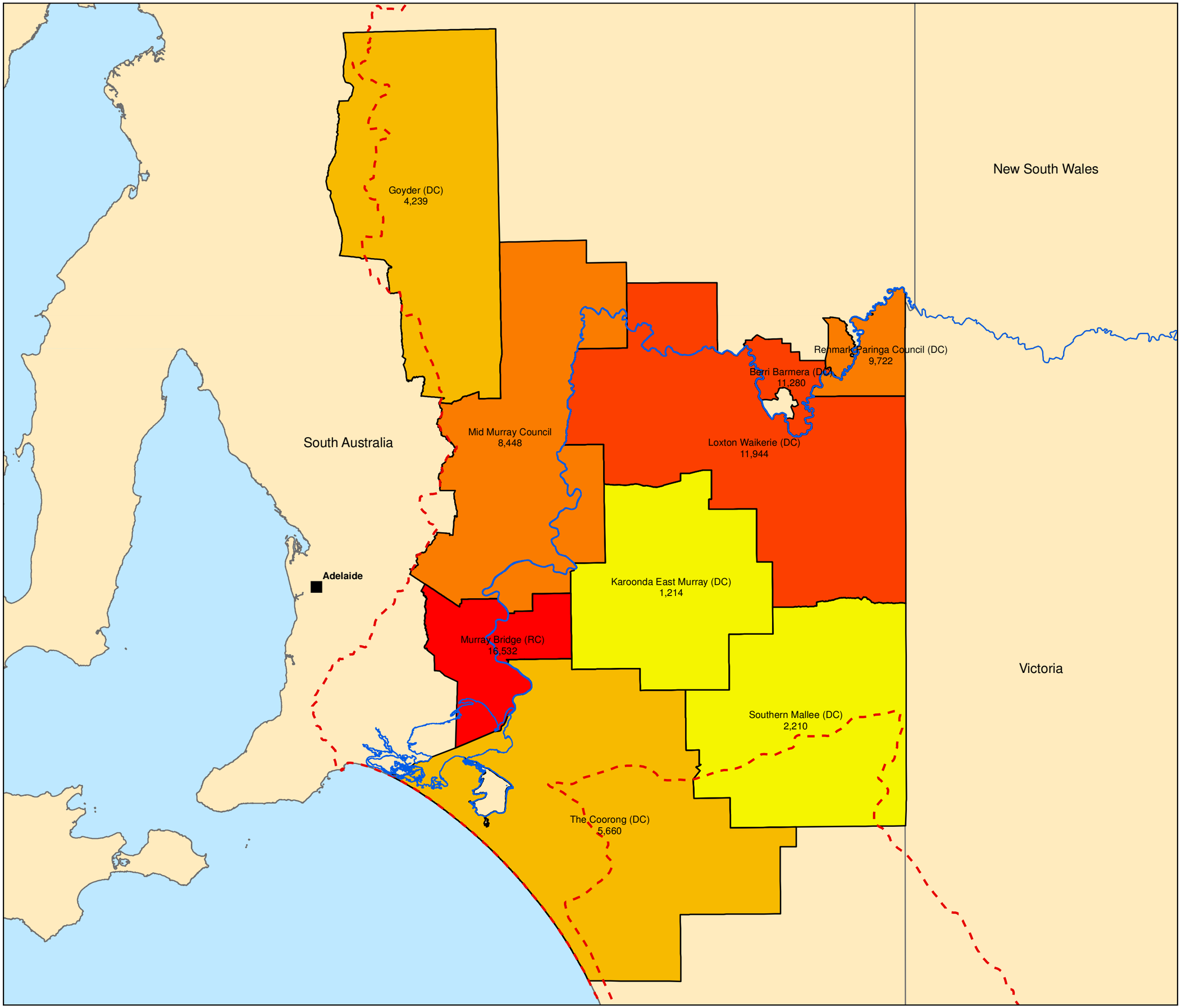

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URPS

Government of South Australia
South Australian Murray-Darling Basin Natural Resources Management Board

Strengthening Basin Communities Program

Total Population - 2001

Legend

- Capital Cities
- River Murray
- Murray Darling Basin Boundary
- Local Government Areas
- State Boundaries

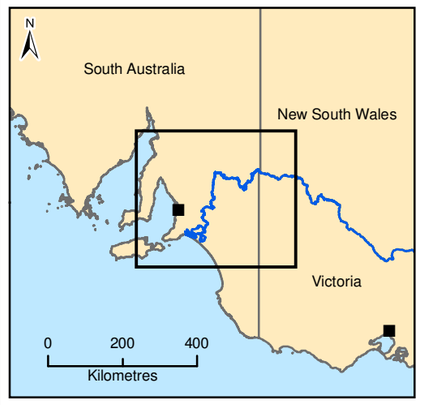
Census Data - 2001
Total Population - LGA

- 1,214 - 2,210
- 2,211 - 5,660
- 5,661 - 9,722
- 9,723 - 11,944
- 11,945 - 16,532

0 25 50
Kilometres

N

Location Map



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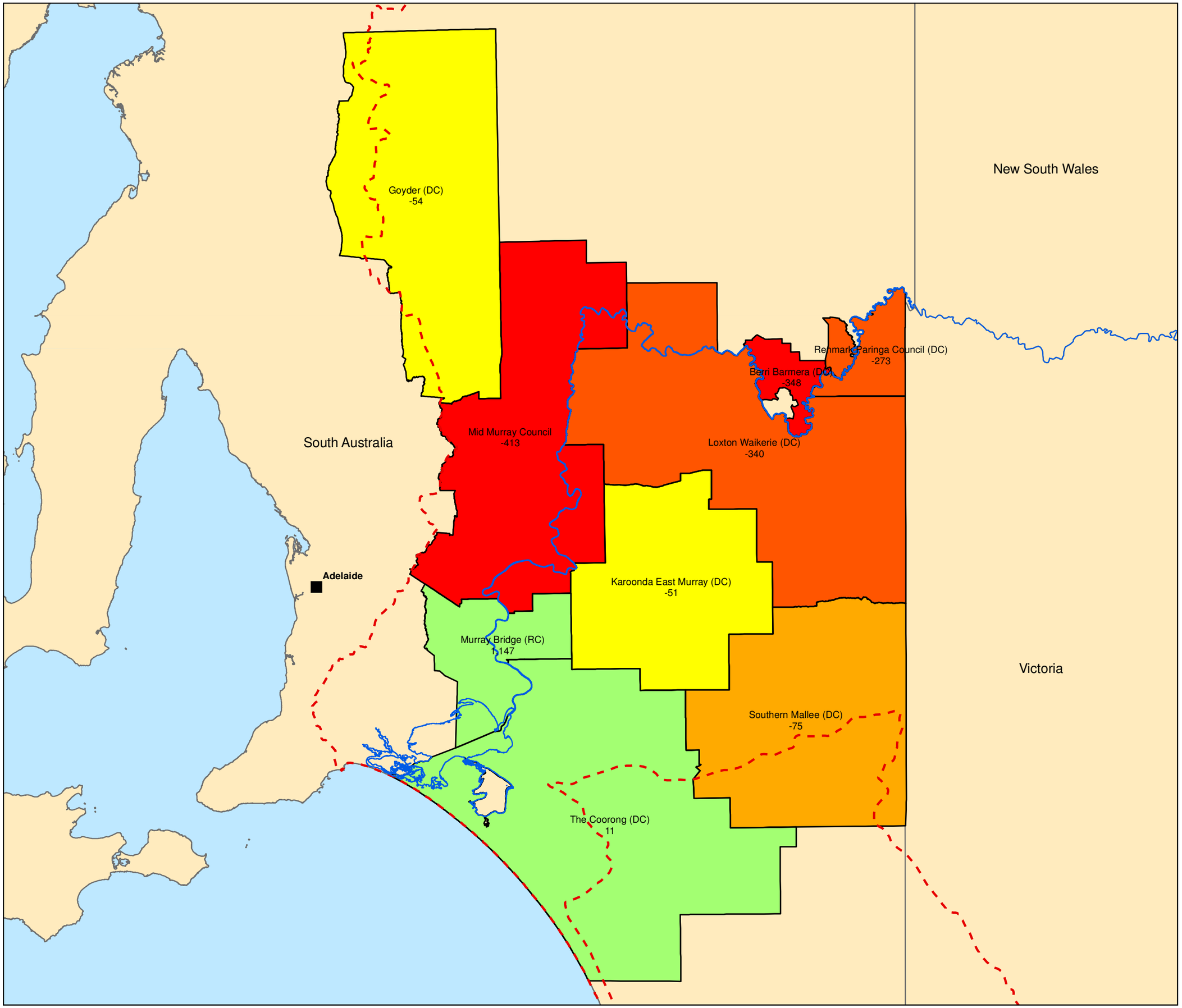

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URPS

Government of South Australia
South Australian Murray-Darling Basin Natural Resources Management Board

Strengthening Basin Communities Program

Population Change 2001-2006

Legend

- Capital Cities
- River Murray
- Murray Darling Basin Boundary
- Local Government Areas
- State Boundaries

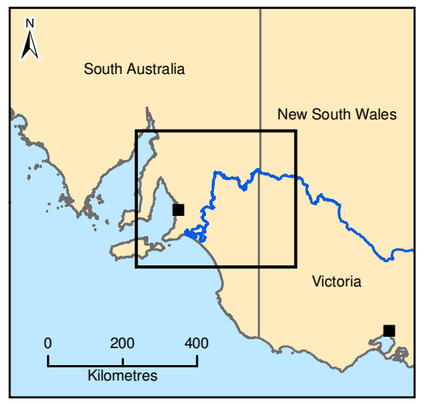
Census Data 2001-2006
Population Change - LGA

- 1 to 1,147
- 0 to - 59
- -60 to -249
- -250 to -347
- -348 to -413

0 25 50
Kilometres

N

Location Map



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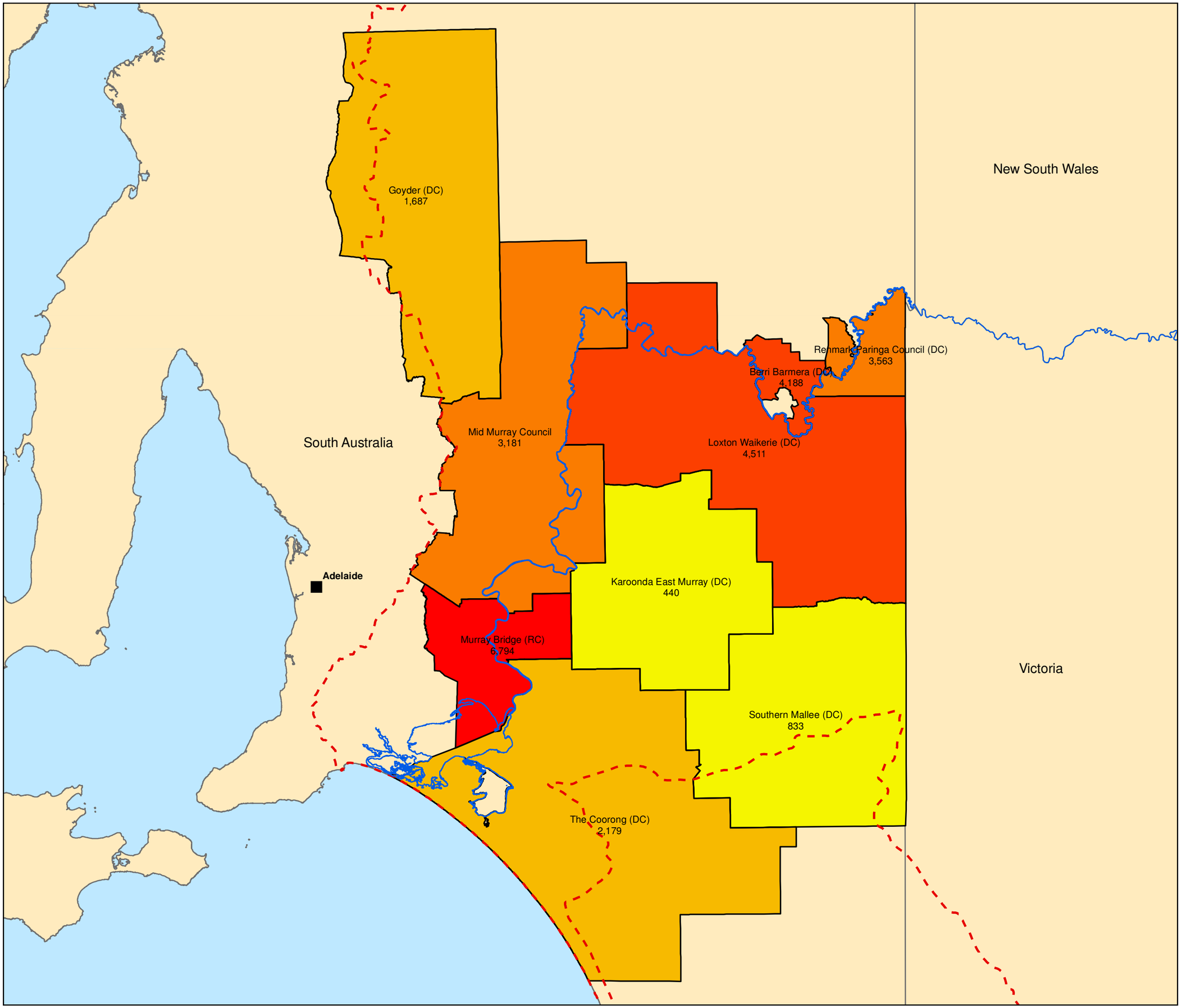

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Government of South Australia
South Australian Murray-Darling Basin Natural Resources Management Board

Strengthening Basin Communities Program

Dwelling Count - 2006

Legend

- Capital Cities
- River Murray
- Murray Darling Basin Boundary
- Local Government Areas
- State Boundaries

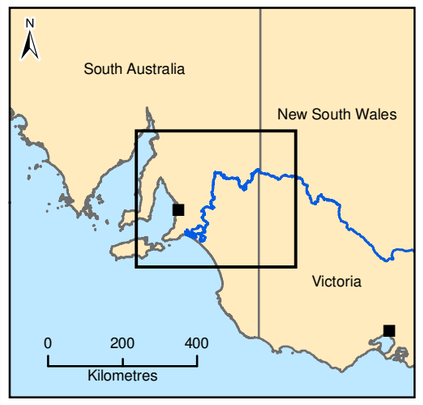
Census Data - 2006
Dwelling Count - LGA

- 440 - 833
- 834 - 2,179
- 2,180 - 3,563
- 3,564 - 4,511
- 4,512 - 6,794

0 25 50
Kilometres

N

Location Map



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Government of South Australia
South Australian Murray-Darling Basin Natural Resources Management Board

Strengthening Basin Communities Program

Dwelling Count - 2001

Legend

- Capital Cities
- River Murray
- Murray Darling Basin Boundary
- Local Government Areas
- State Boundaries

Census Data - 2001
Dwelling Count - LGA

- 474 - 861
- 862 - 2,236
- 2,237 - 3,787
- 3,788 - 4,689
- 4,690 - 6,492

0 25 50
Kilometres

N

Location Map

Data Properties

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Goyder (DC)
1,722

New South Wales

Renmark Paringa Council (DC)
3,787

Berri Barmera (DC)
4,402

Mid Murray Council
3,458

South Australia

Loxton Waikerie (DC)
4,689

Karoonda East Murray (DC)
474

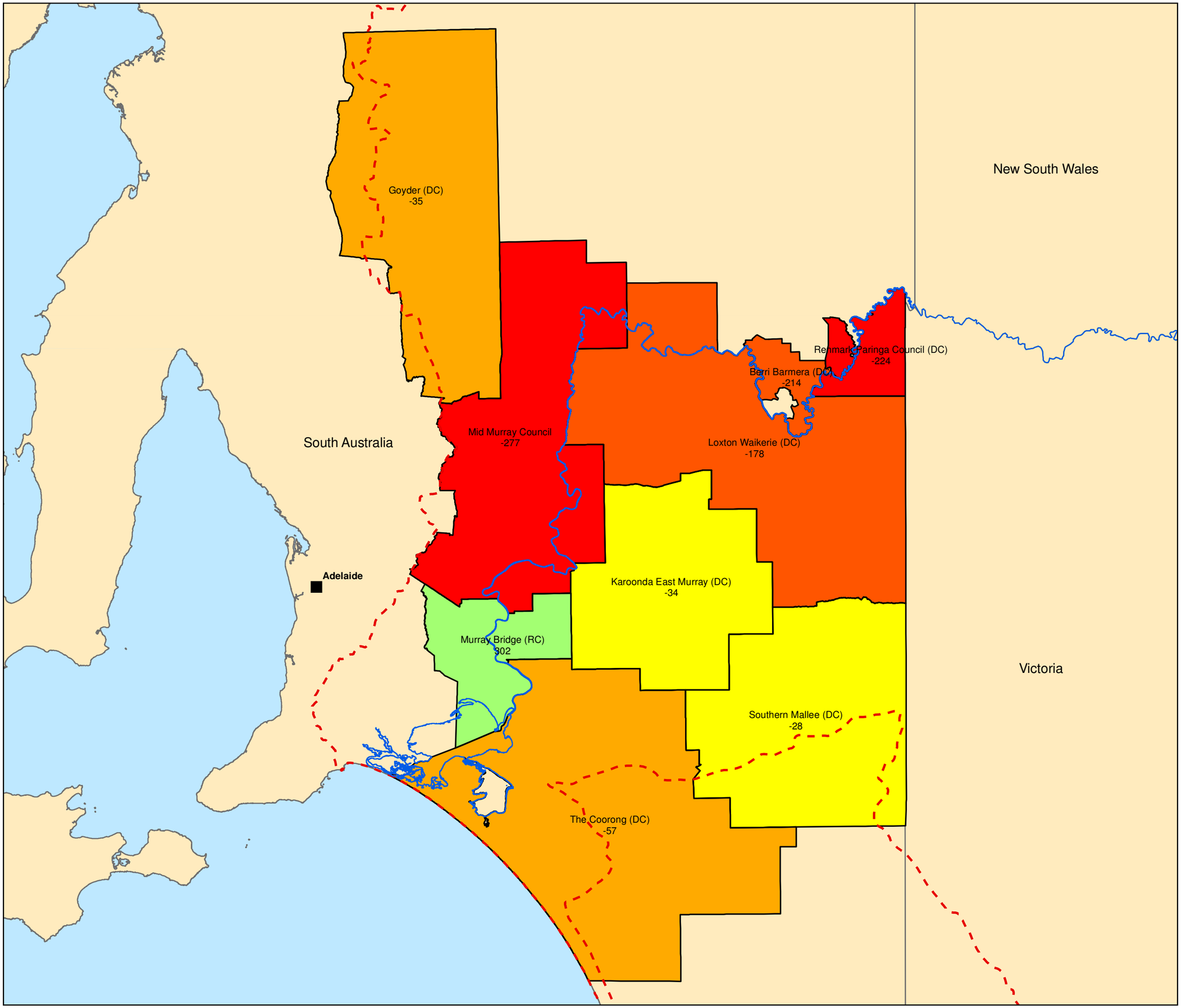
Adelaide

Murray Bridge (RC)
6,492

Victoria

Southern Mallee (DC)
861

The Coorong (DC)
2,236



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Government of South Australia
South Australian Murray-Darling Basin Natural Resources Management Board

Strengthening Basin Communities Program

Dwelling Count Change 2001-2006

Legend

- Capital Cities
- River Murray
- Murray Darling Basin Boundary
- Local Government Areas
- State Boundaries

Census Data 2001-2006
Dwelling Count Change - LGA

- 1 - 302
- 0 to -34
- -35 to -177
- -178 to -223
- -224 to -277

0 25 50
Kilometres

N

Location Map

Data Properties

Map Grid of Australia - Zone 54 (UTM)
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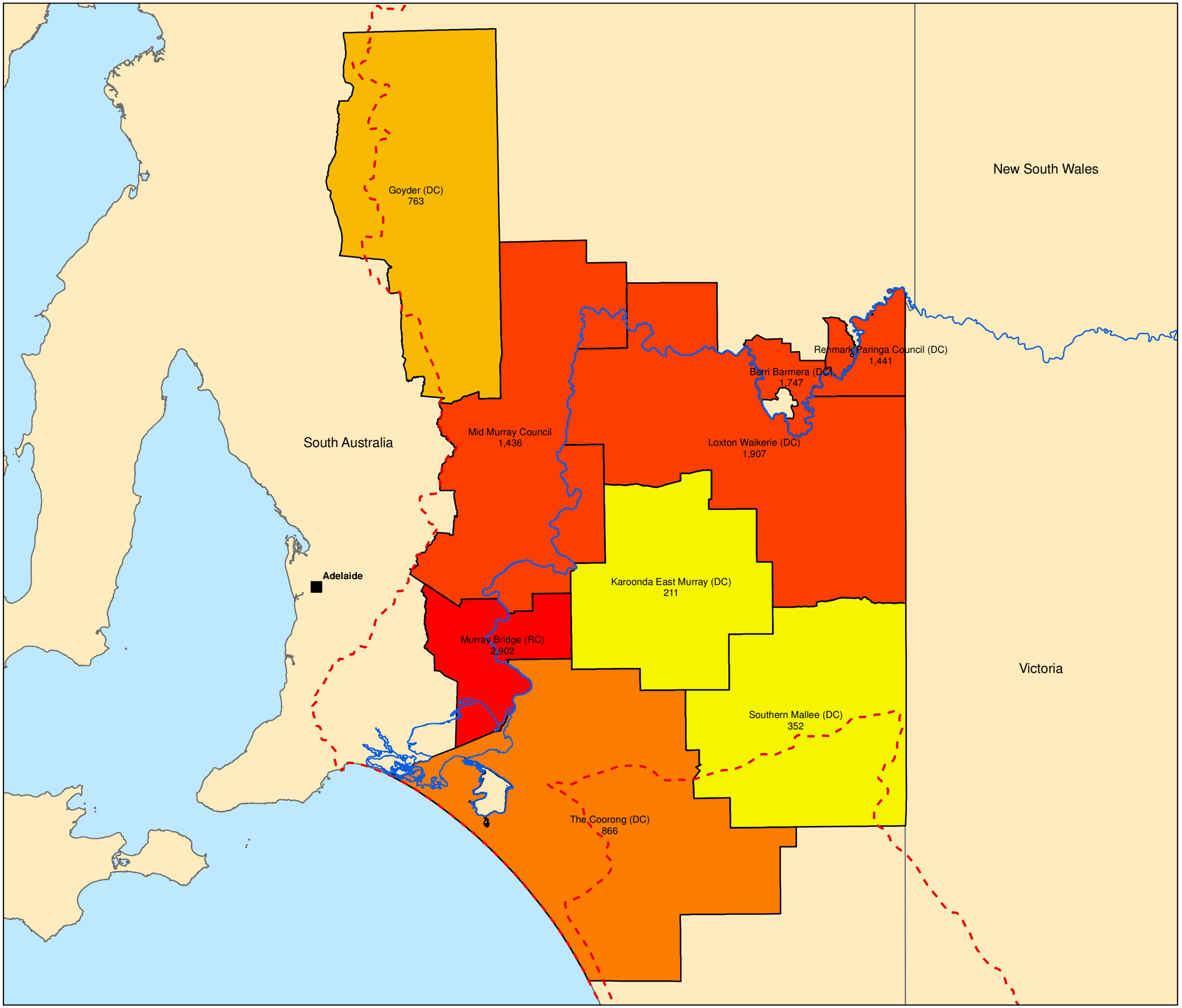

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URPS

Government of South Australia
South Australian Murray-Darling Basin Natural Resources Management Board

Strengthening Basin Communities Program

Retired Population - 2006

Legend

- Capital Cities
- River Murray
- Murray Darling Basin Boundary
- Local Government Areas
- State Boundaries

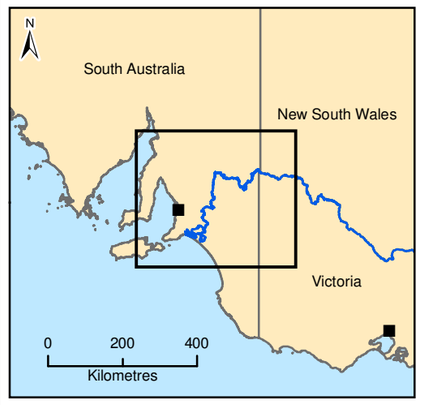
Census Data - 2006
Total Retired Population (65 Yrs +) - LGA

- 211 - 352
- 353 - 763
- 764 - 866
- 867 - 1,907
- 1,908 - 2,902

0 25 50
Kilometres

N

Location Map



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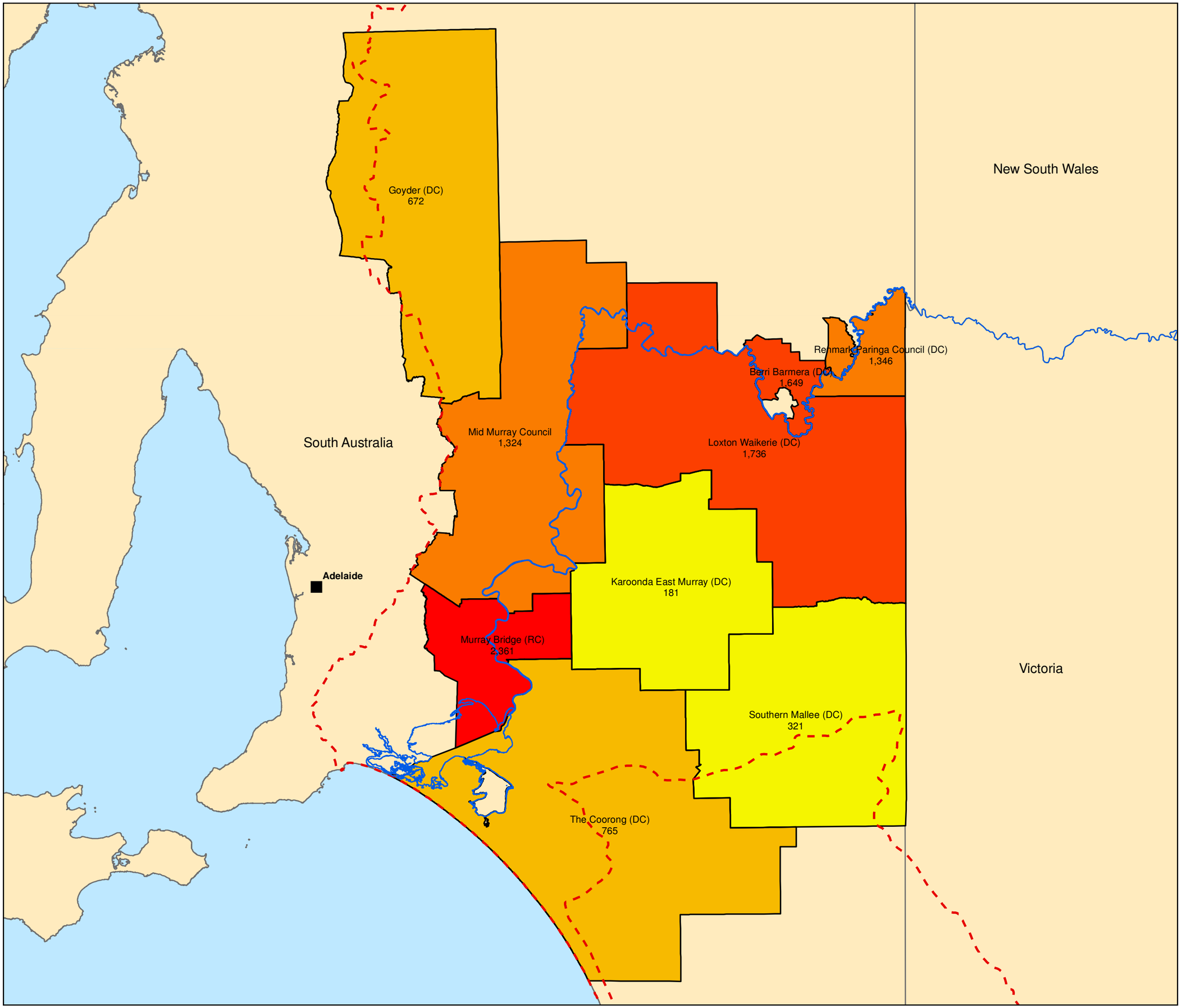

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URPS

Government of South Australia
South Australian Murray-Darling Basin Natural Resources Management Board

Strengthening Basin Communities Program

Retired Population - 2001

Legend

- Capital Cities
- River Murray
- Murray Darling Basin Boundary
- Local Government Areas
- State Boundaries

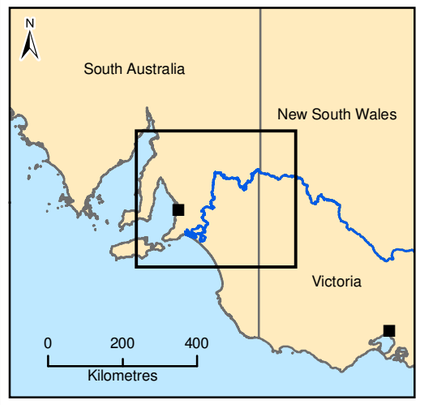
Census Data - 2001
Total Retired Population (65 Yrs +) - LGA

- 181 - 321
- 322 - 765
- 766 - 1,346
- 1,347 - 1,736
- 1,737 - 2,361

0 25 50
Kilometres

N

Location Map



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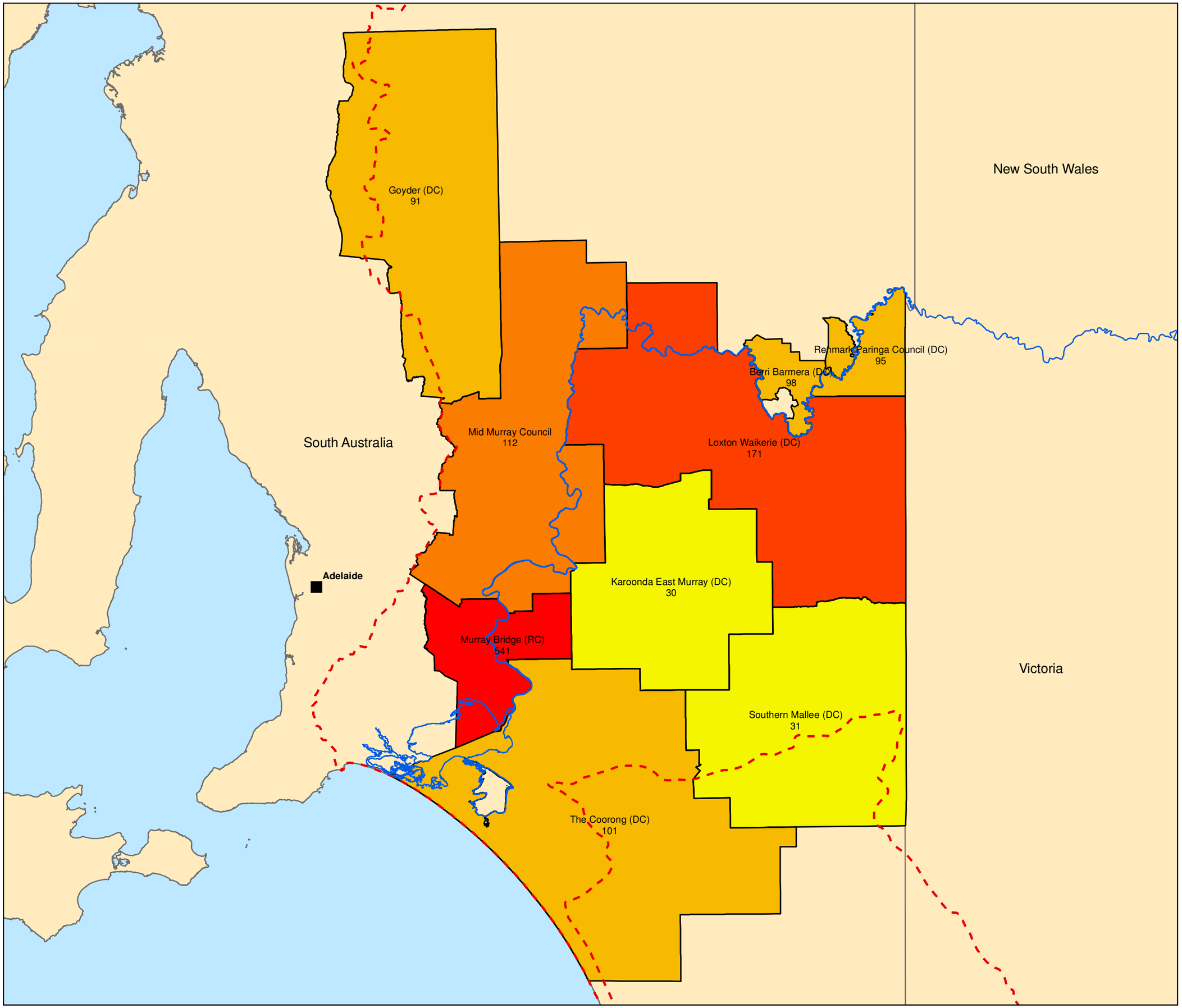

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Government of South Australia
South Australian Murray-Darling Basin Natural Resources Management Board

Strengthening Basin Communities Program

Retired Population Change 2001-2006

Legend

- Capital Cities
- River Murray
- Murray Darling Basin Boundary
- Local Government Areas
- State Boundaries

Census Data 2001-2006

Total Retired Population Change (65 Yrs +) - LGA

- 30 - 31
- 32 - 101
- 102 - 112
- 113 - 171
- 172 - 541

0 25 50
Kilometres

N

Location Map

Data Properties

Map Grid of Australia - Zone 54 (UTM)
Geocentric Datum of Australia 1994 (GDA94)
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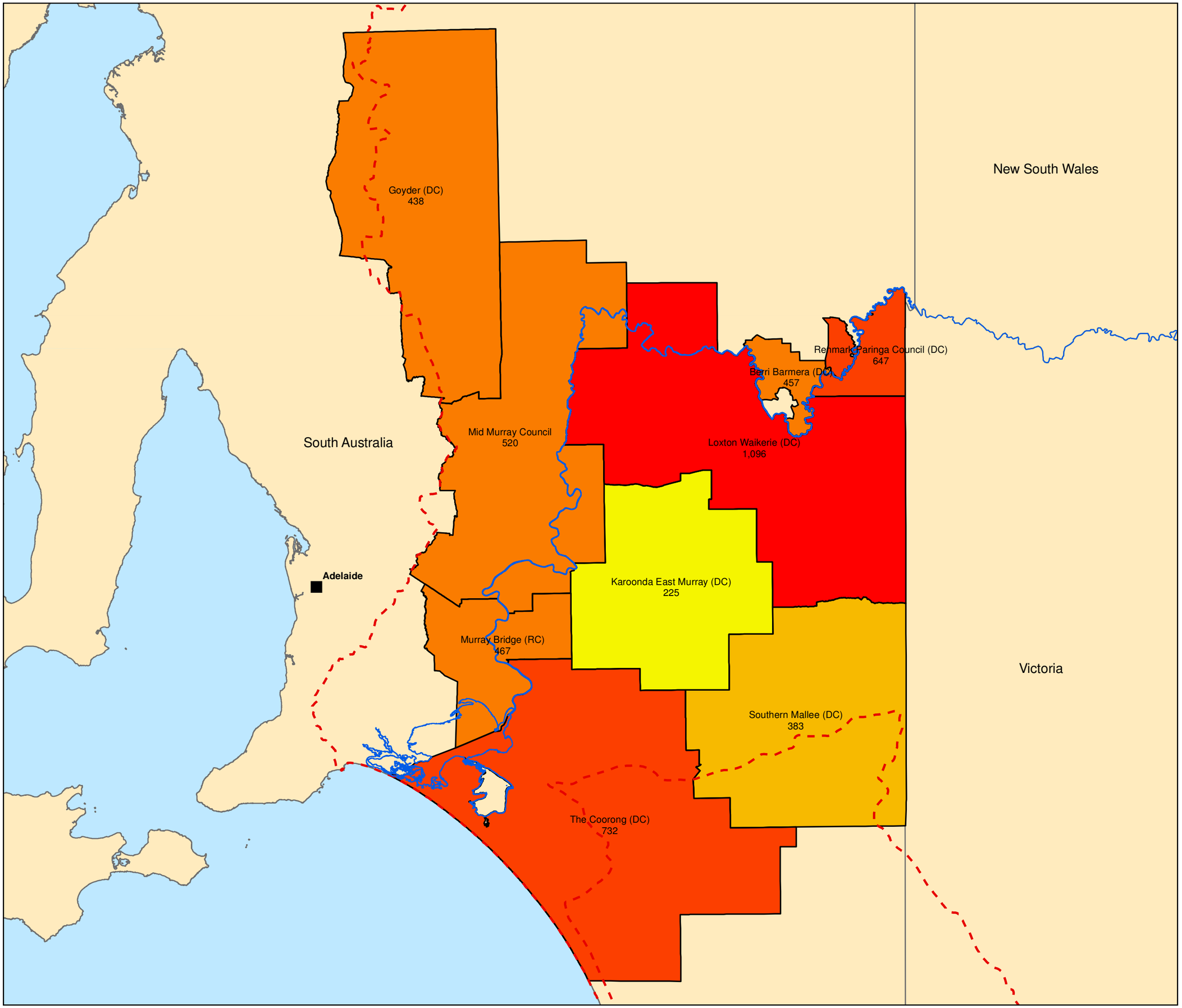

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URPS

Government of South Australia
South Australian Murray-Darling Basin Natural Resources Management Board

Strengthening Basin Communities Program

Industry of Employment - 2006 Agriculture, Forestry & Fishing

Legend

- Capital Cities
- River Murray
- Murray Darling Basin Boundary
- Local Government Areas
- State Boundaries

Census Data - 2006

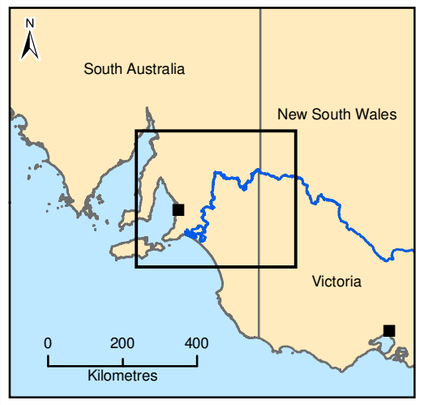
Employment - Agriculture, Forestry & Fishing - LGA

- 225
- 226 - 383
- 384 - 520
- 521 - 732
- 733 - 1,096

0 25 50
Kilometres

N

Location Map



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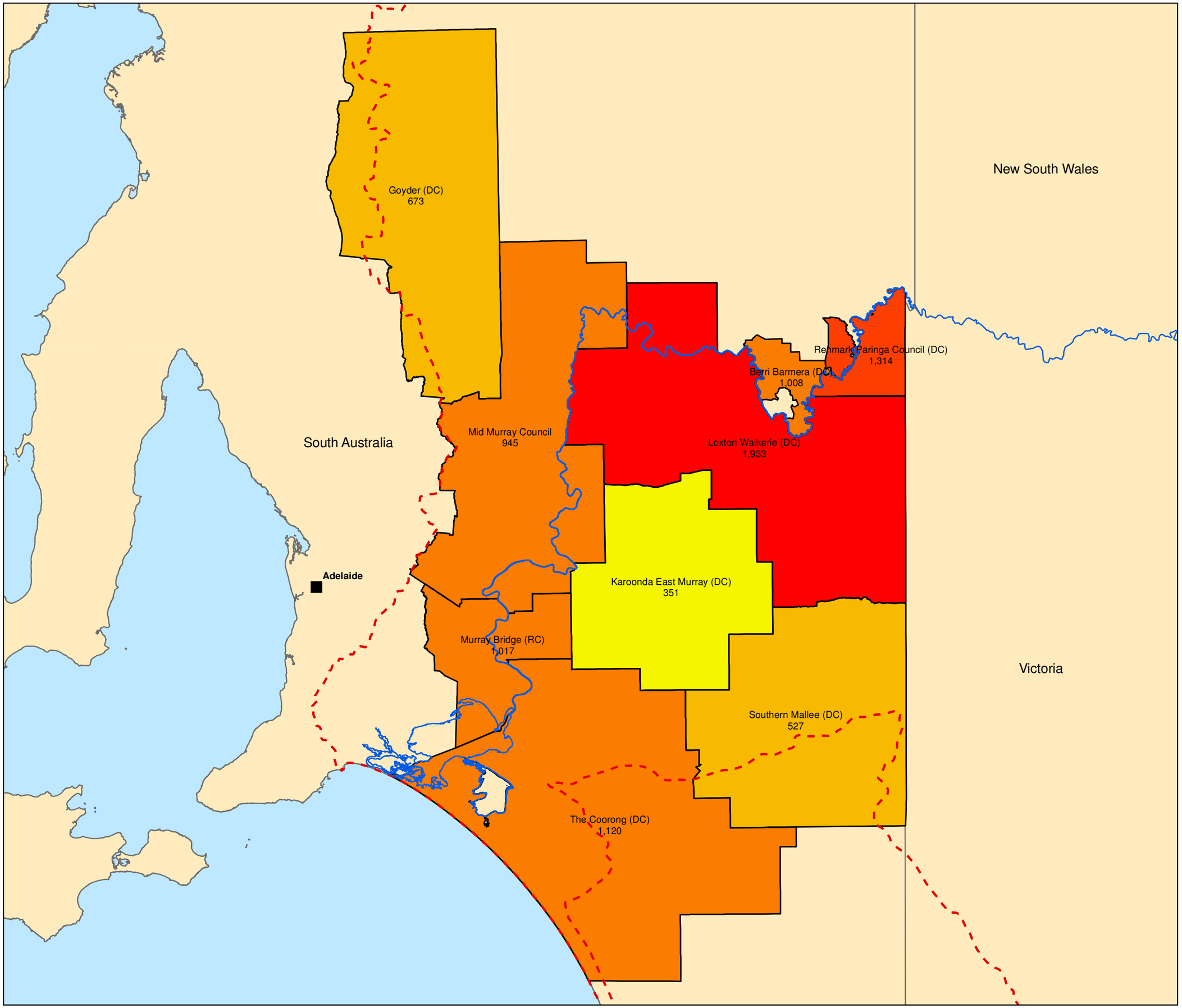

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URPS

Government of South Australia
South Australian Murray-Darling Basin Natural Resources Management Board

Strengthening Basin Communities Program

Industry of Employment - 2001 Agriculture, Forestry & Fishing

Legend

- Capital Cities
- River Murray
- Murray Darling Basin Boundary
- Local Government Areas
- State Boundaries

Census Data - 2001

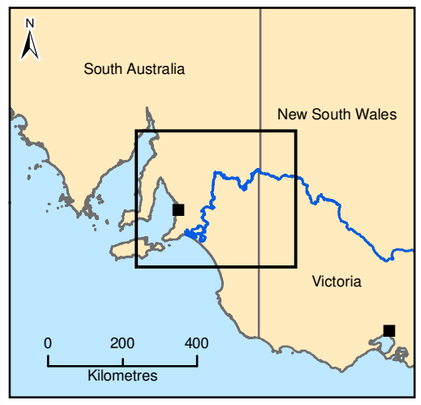
Employment - Agriculture, Forestry & Fishing - LGA

- 351
- 352 - 673
- 674 - 1,120
- 1,121 - 1,314
- 1,315 - 1,933

0 25 50
Kilometres

N

Location Map



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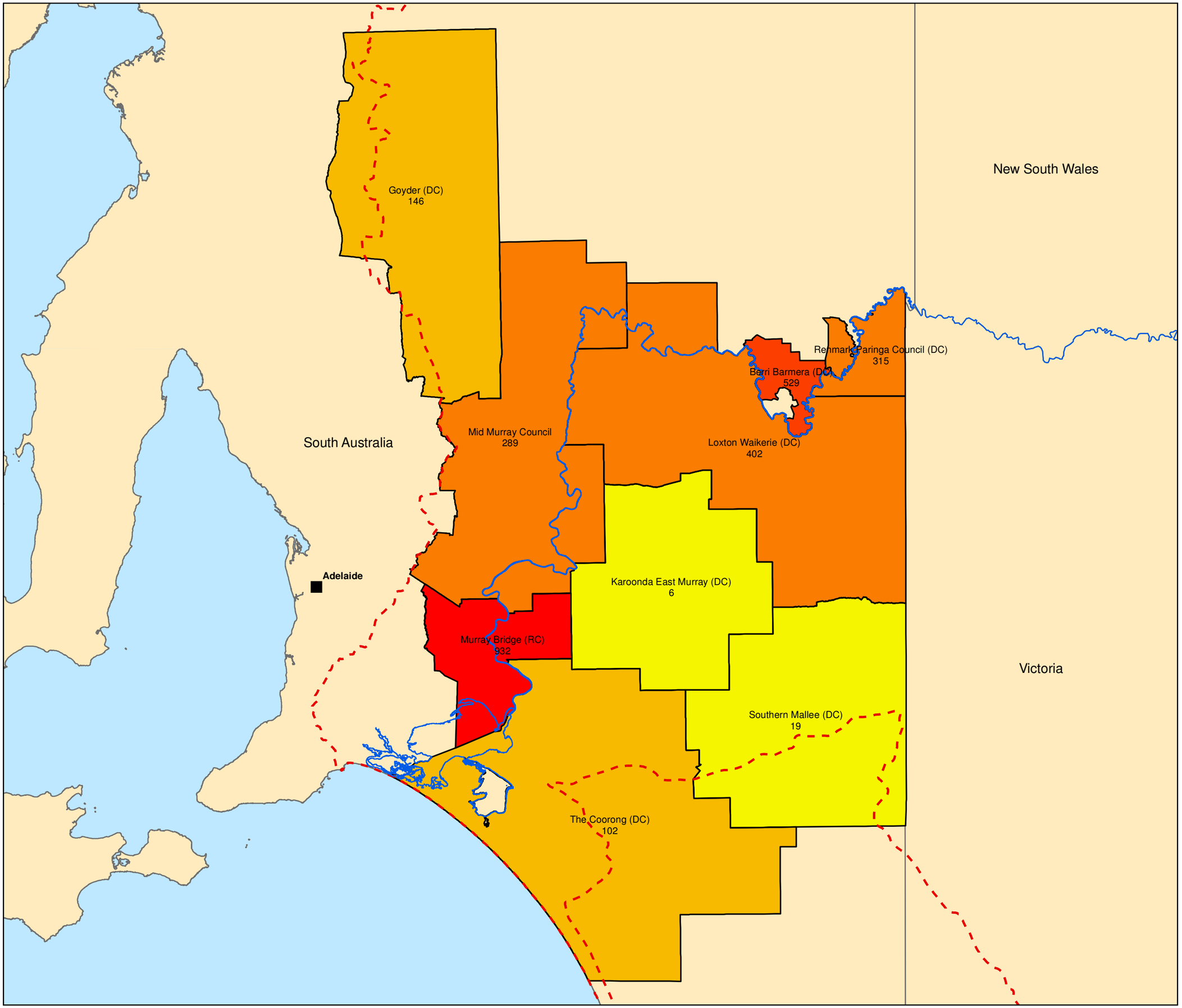

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Government of South Australia
South Australian Murray-Darling Basin Natural Resources Management Board

Strengthening Basin Communities Program

Industry of Employment - 2006 Manufacturing

Legend

- Capital Cities
- River Murray
- Murray Darling Basin Boundary
- Local Government Areas
- State Boundaries

Census Data - 2006
Employment - Manufacturing - LGA

- 6 - 19
- 20 - 146
- 147 - 402
- 403 - 529
- 530 - 932

0 25 50
Kilometres

N

Location Map

Data Properties

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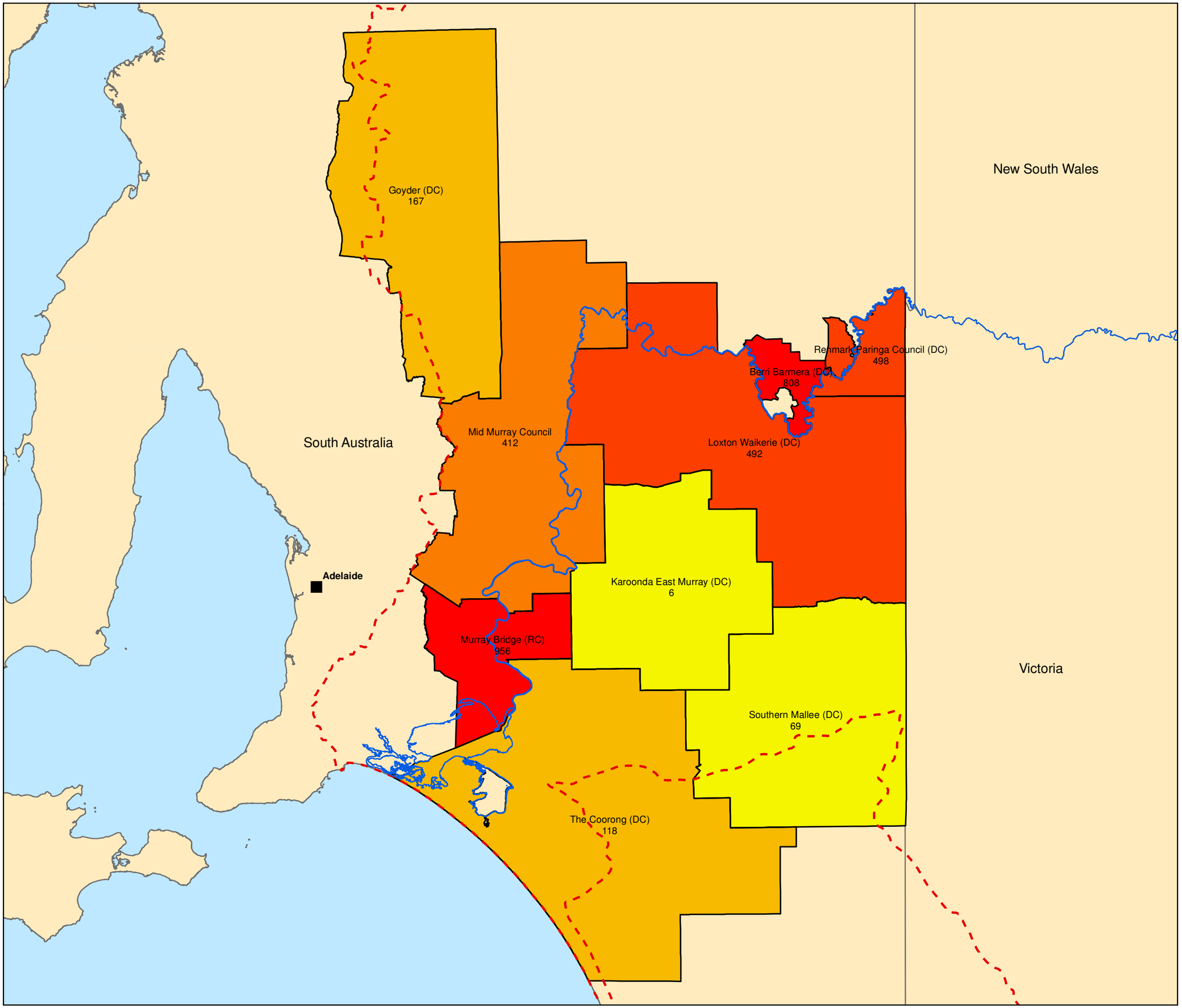

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Government of South Australia
South Australian Murray-Darling Basin Natural Resources Management Board

Strengthening Basin Communities Program

Industry of Employment - 2001 Manufacturing

Legend

- Capital Cities
- River Murray
- Murray Darling Basin Boundary
- Local Government Areas
- State Boundaries

Census Data - 2001

Employment - Manufacturing - LGA

- 6 - 69
- 70 - 167
- 168 - 412
- 413 - 498
- 499 - 956

0 25 50
Kilometres

N

Location Map

Data Properties

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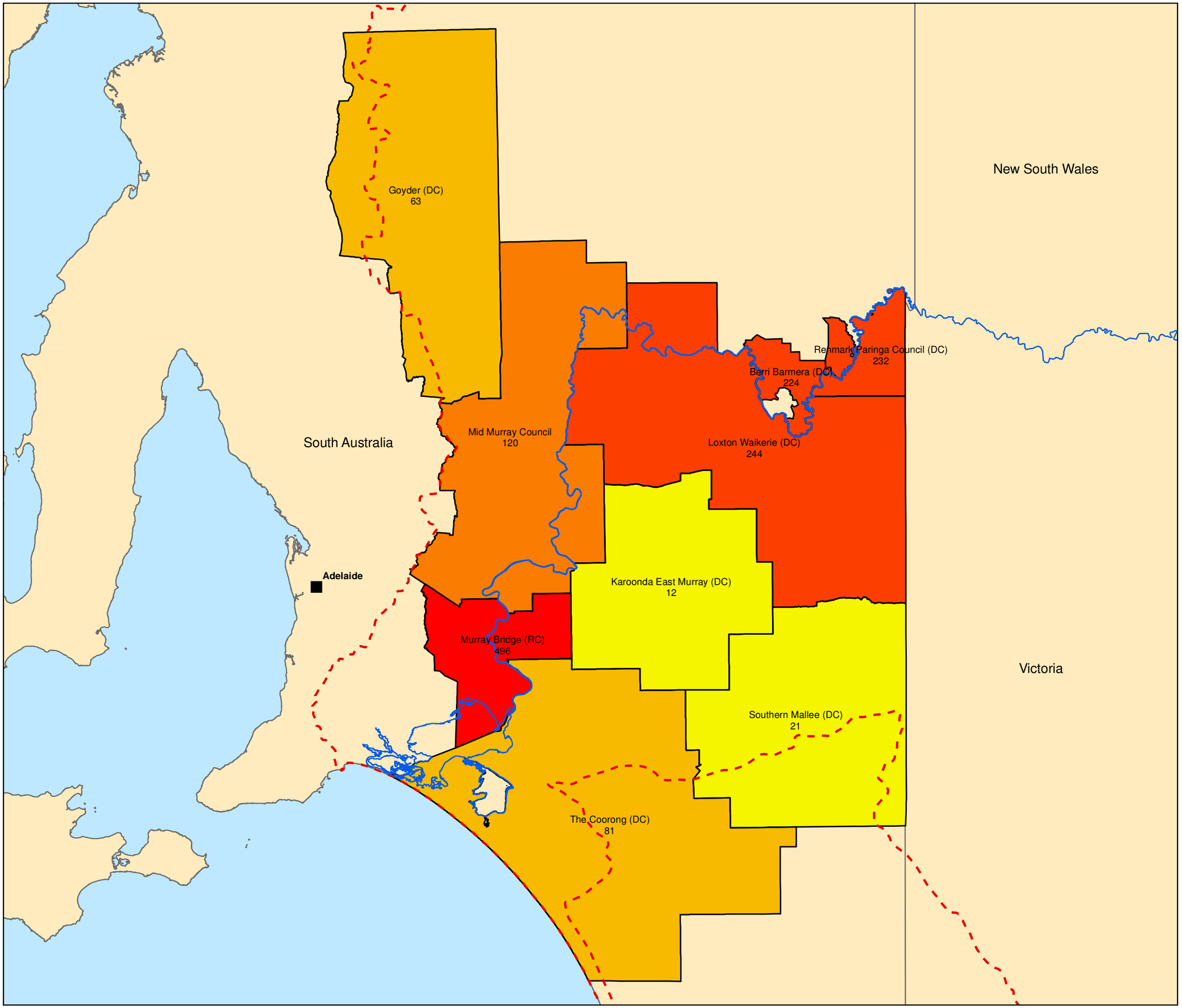

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Government of South Australia
South Australian Murray-Darling Basin Natural Resources Management Board

Strengthening Basin Communities Program

Industry of Employment - 2006 Retail Trade

Legend

- Capital Cities
- River Murray
- Murray Darling Basin Boundary
- Local Government Areas
- State Boundaries

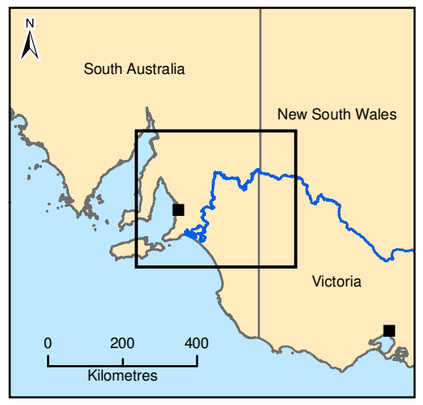
Census Data - 2006
Employment - Retail Trade - LGA

- 12 - 21
- 22 - 81
- 82 - 120
- 121 - 244
- 245 - 496

0 25 50
Kilometres

N

Location Map



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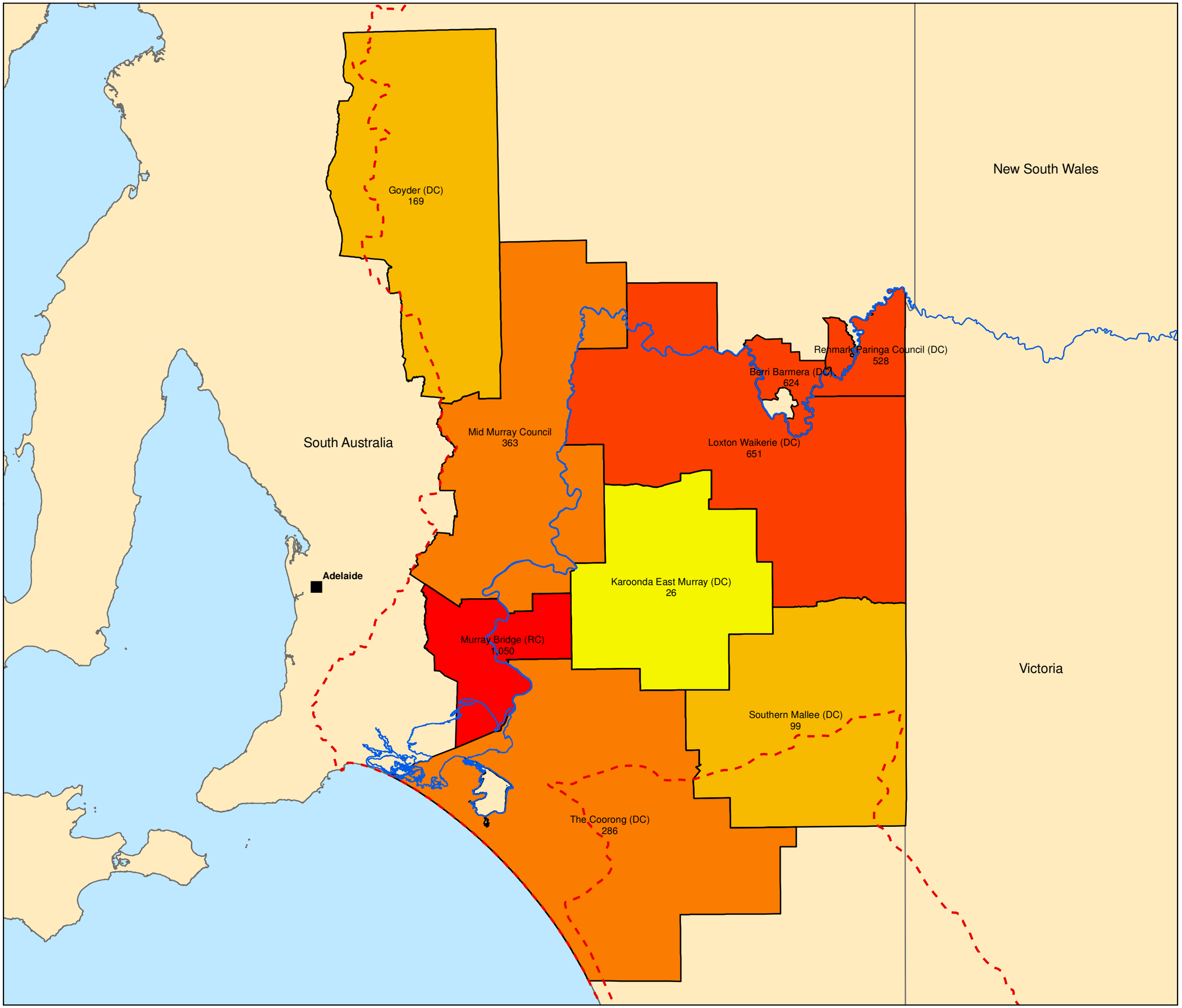

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Government of South Australia
South Australian Murray-Darling Basin Natural Resources Management Board

Strengthening Basin Communities Program

Industry of Employment - 2001 Retail Trade

Legend

- Capital Cities
- River Murray
- Murray Darling Basin Boundary
- Local Government Areas
- State Boundaries

Census Data - 2001

Employment - Retail Trade - LGA

- 26
- 27 - 169
- 170 - 363
- 364 - 651
- 652 - 1,050

0 25 50
Kilometres

N

Location Map

Data Properties

Map Grid of Australia - Zone 54 (UTM)
Geocentric Datum of Australia 1994 (GDA94)
Australian Height Datum (AHD) levels in metres
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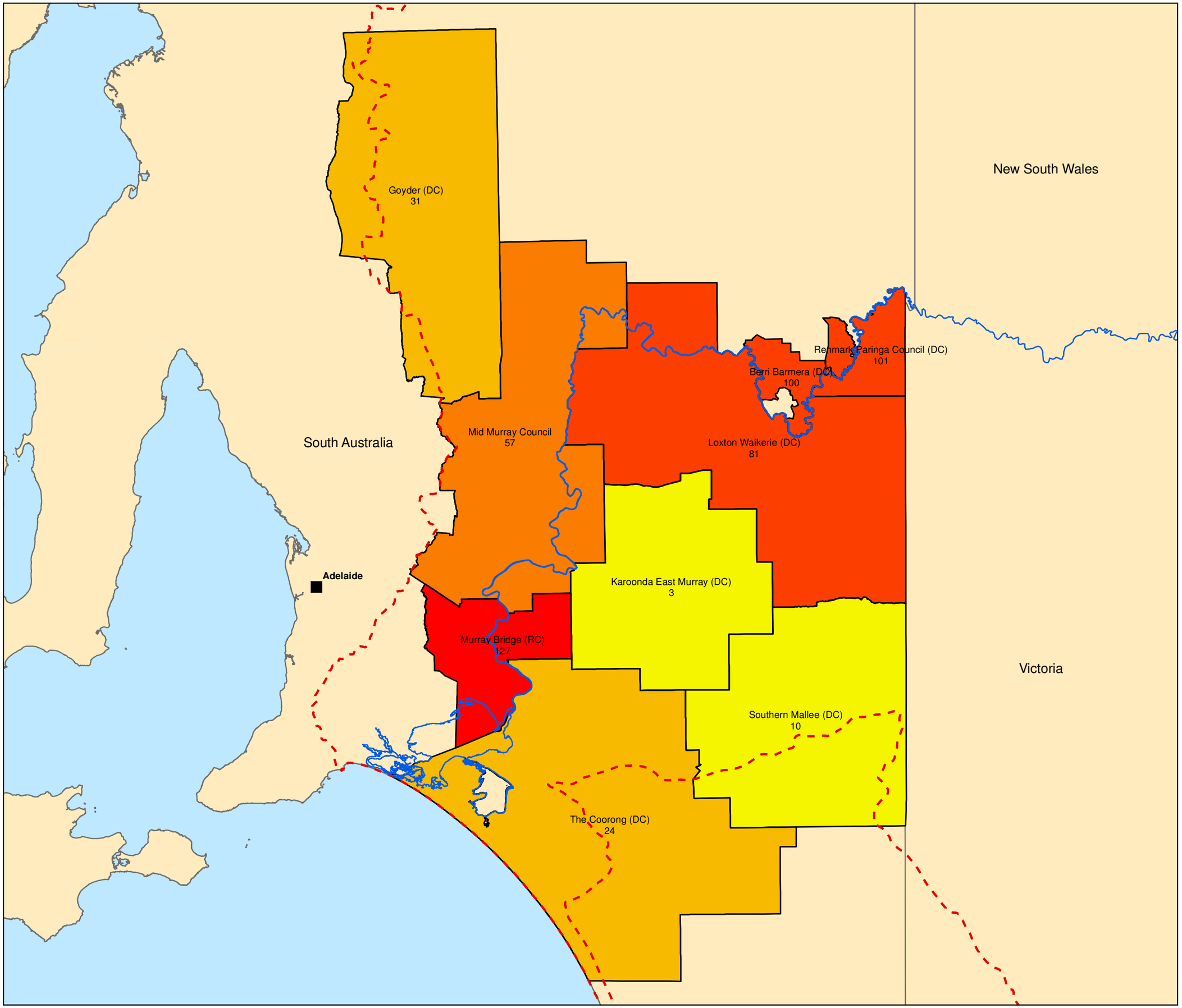

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Government of South Australia
South Australian Murray-Darling Basin Natural Resources Management Board

Strengthening Basin Communities Program

Industry of Employment - 2006
Accomodation and Food Services

Legend

- Capital Cities
- River Murray
- Murray Darling Basin Boundary
- Local Government Areas
- State Boundaries

Census Data - 2006

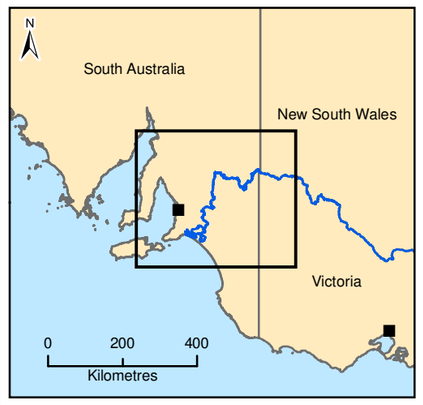
Employment - Accomodation and Food Services - LGA

- 3 - 10
- 11 - 31
- 32 - 57
- 58 - 101
- 102 - 127

0 25 50
Kilometres

N

Location Map



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Geocentric Datum of Australia 1994 (GDA94)
Australian Height Datum (AHD) levels in metres
Map generated November 2010 by
Avante Mapping Solutions
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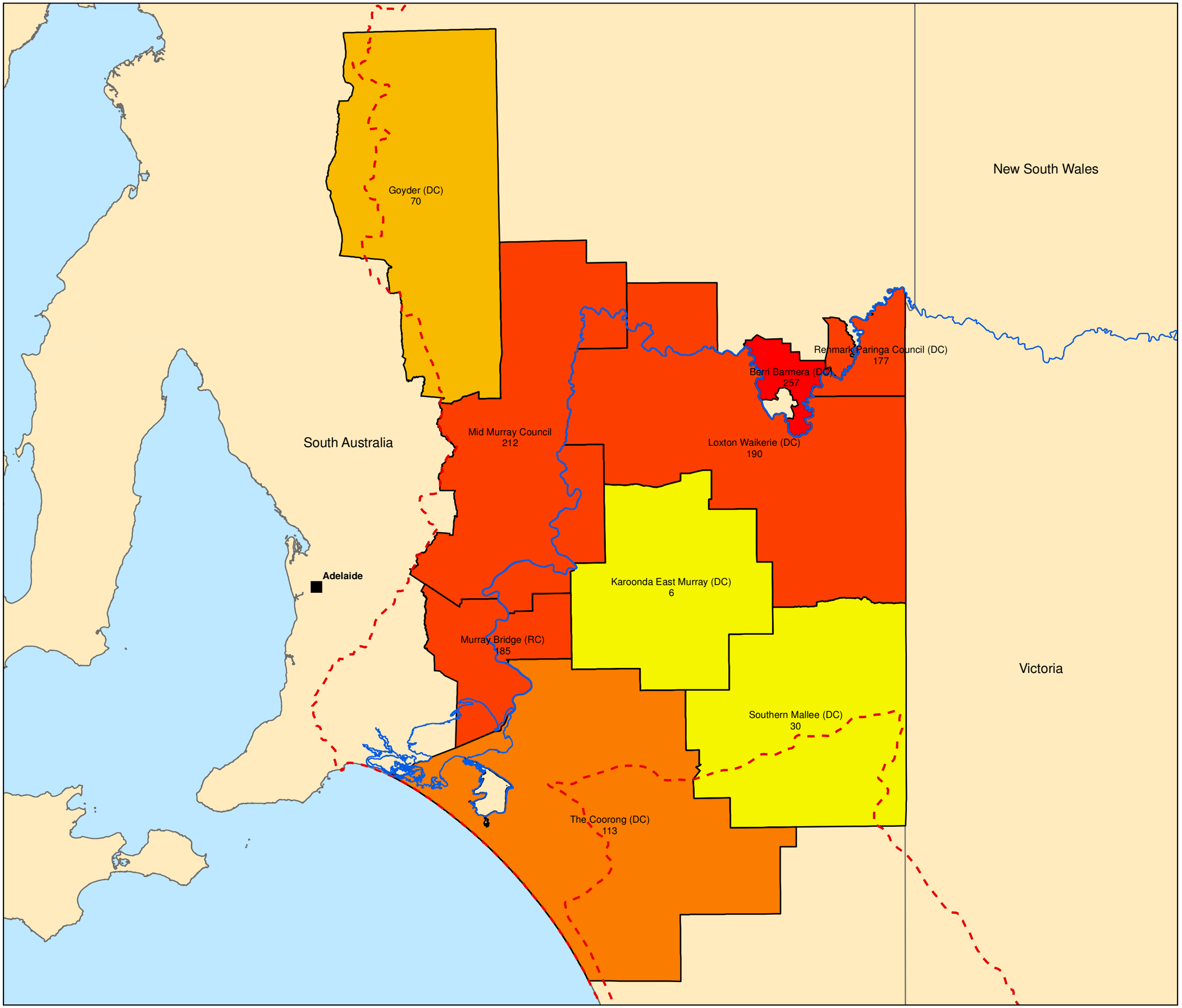
Roads, Towns, DCDB: DEH
LGAs, Census Data: ABS



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URPS

Government of South Australia
South Australian Murray-Darling Basin Natural Resources Management Board

Strengthening Basin Communities Program

Industry of Employment - 2001 Accomodation and Food Services

Legend

- Capital Cities
- River Murray
- Murray Darling Basin Boundary
- Local Government Areas
- State Boundaries

Census Data - 2001

Employment - Accomodation and Food Services - LGA

- 6 - 30
- 31 - 70
- 71 - 113
- 114 - 212
- 213 - 257

0 25 50
Kilometres

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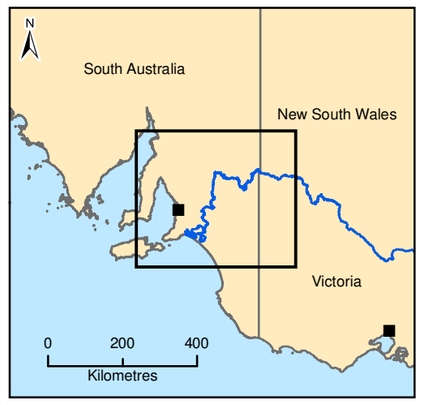
Location Map



Data Properties

Map Grid of Australia - Zone 54 (UTM)
Geocentric Datum of Australia 1994 (GDA94)
Australian Height Datum (AHD) levels in metres
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Appendix C: Environment Resources and Development Court

Relevant NRM Determinations

The following two Environment Resources and Development Court determinations, provide learning opportunities in respect to how the Courts interpret Development Plan policy.

Northcape Properties Pty Ltd v District Council of Yorke Peninsula [2007] SAERDC

This development application sought approval for a land division at Marion Bay. The ERDC dismissed the appeal (concurred with Council's refusal), because it held the view that the development application had insufficient regard to Development Plan provisions that sought the consideration of coastal retreat, the conservation of native vegetation and the location of coastal reserves.

What is particularly of interest in this determination is the Court's consideration of PDC 31 that stated "Development should be set-back a sufficient distance from the coasts to provide an erosion buffer which will allow for at least 100 years of coastal retreat for single buildings ....". Based on this (and other Development Plan provisions), the court went on to state "[the application] fails also to make adequate provision for the inland retreat of the foreshore and dunes and associated native vegetation over the next "100 years" in addition to the expressed intent of the Development Plan for land divisions to provide coastal reserves and public access to the coastal environment."

Lindner and Whetstone v Regional Council of Goyder and Others (No 2). [2006] SAERDC 67.

The Lindner and Whetstone matter is of interest as it refers to a decision of the Full Court of the Supreme Court regarding a development application and the relevance of the Natural Resources Management Act.

Mr Lindner and Mr Whetstone appeal a decision of the Regional Council of Goyder to grant Development Plan Consent for a feedlot to be operated by Princess Royal Station. The Court considered a number of key Development Plan provisions, including Objective 40 that stated:

> *Objective 40: Protection of all water resources from pollution or excessive usage which would threaten the long-term reliability of existing resources.*

The determination included the following commentary:

> "Sulan J, in his judgment, said "The Court [ie the ERD Court] did not give adequate consideration to the extent to which the Act [ie the Natural Resources Management Act 2004] and its operation comprehensively deals with the protection of natural resources, including water and that it provides a detailed system of monitoring and controlling activities. It is necessary that each of these factors are adequately considered when assessing an application. The ERD Court failed to have sufficient regard to the Act when assessing the importance and weight to be given to Objective 40 and was in error in concluding that the failure to comply with Objective 40 was not fatal to the application."
>
> "These matters, the objects, and, indeed, all of the provisions of the Natural Resources Management Act are to be borne in mind by this Court when assessing the importance and weight to be given to Objective 40 of the Development Plan."
>
> "We are fully cognizant of the provisions of the Natural Resources Management Act and we bear them in mind in undertaking the planning assessment of the proposed development afresh. We note that there is no provision of the Natural Resources Management Act which requires the referral of a development application to the Minister for Environment and Conservation for the assessment of the likely environmental impact of a proposal which involves the taking of water from an area which is not a prescribed area. That task must be performed by the relevant authority under the Development Act with reference to the relevant provisions of the Development Plan. The decision of Doyle J in Tuna Boat Owners Association of SA Inc v Development Assessment Commission & Anor (2000) 77 SASR 369 supports this approach."
>
> "In Tuna Boat Owners Association of SA Inc v Development Assessment Commission & Anor supra, a case in some respects analogous to this matter (though with different Development Plan provisions), Doyle CJ said at para 48: In assessing the proposed development against the Development Plan, the ERDC Court was required to consider whether the proposed development was ecologically sustainable. It was entitled to have regard to powers available to other authorities under legislation, and it was appropriate for it to do so. But the existence of those powers does not mean that the ERD Court, or any relevant authority acting under s.35 of the Act, either can or should take the view that the question of ecological sustainability is no longer its concern. It cannot be said that the question of ecological sustainability was not a matter properly the concern of a planning authority under the Development Plan, and its properly the exclusive concern of another statutory authority. The most that can be said is that ecological sustainability is properly the concern of each of them."

Appendix D: Review of Forestry Policies in Council's Existing Development Plans

Southern Mallee District Council Development Plan (Consolidated 28 August 2003)

Council Wide Policy

91 The area of the organic waste processing facilities on a site should:

(a) be located a minimum distance of 100 metres from any dam, river, creek, natural watercourse, channel or bore, and not within the area of a 1 in 100 year flood event; and

(b) not be located on areas with ground slopes of greater than 6 percent; and

(c) not be located on land subject to land slipping; and

(d) not be located within three kilometres of an airport used by commercial aircraft. If located closer than three kilometres the organic waste processing operations should incorporate bird control measures to minimise the risk of bird strikes to aircraft; and

(e) not be located within 250 metres of a public open space reserve, a forestry reserve, a National Park, a Conservation Zone or Policy Area.

Zone Policies

	General Farming Zone
Objective 1	The preservation of the productive rural land and the rural landscape.
Objective 2	Retention and protection of remnant native vegetation.
PDC 1	The Zone should be used primarily for farming with tourist activities as a secondary use.
Forestry PDCs	PDC 57 Land should not be used for commercial forestry purposes unless: (a) suitable fire breaks between existing vegetation, public roadways and adjoining owners are provided; (b) the plantation design meets the ETSA set-back requirements for transmission and distribution lines; (c) native vegetation clearance consent for the harvesting of any native vegetation has been obtained.
Forestry - Complying Developments	
Forestry Non-Complying Developments	

Murray Bridge Council (Development Plan consolidated – 9 December 2010 – BDP Converted Development Plan)

The Development Plan contains a Council wide (General Section) Forestry Module

	Primary Production Zone	River Murray Flood Zone	River Murray Fringe Zone
Objective 1	Economically productive, efficient and environmentally sustainable primary production.	Buildings and structures excluded from the zone where they are likely to impede or be damaged by floodwaters and/or fluctuating pool levels of the River Murray.	The natural character and visual attractiveness of the River Murray, valley face and surrounds unmarred by development.
Objective 2	Allotments of a size and configuration that promote the efficient use of land for primary production.	The conservation and improvement of water quality that sustains the natural environment and natural ecological processes associated with the River Murray.	Preservation and improvement of the water quality of the River Murray and Lake Alexandrina.
PDC 1	(Land Use) The following forms of development are envisaged in the zone: ▪ bulk handling and storage facility ▪ commercial forestry ▪ dairy farming ▪ farming ▪ horticulture ▪ intensive animal keeping ▪ tourist accommodation (including through the diversification of existing farming activities and conversion of farm buildings).	The following forms of development are envisaged in the zone: ▪ a structure for the purpose of public recreation (e.g. landing and jetty) ▪ a structure for the purposes of water extraction, wetland management and irrigation management (e.g. channel, pumping stand, flood gate).	The following forms of development are envisaged in the zone: ▪ farming ▪ recreation facility
Other Forestry PDCs		PDC 9 Within those parts of the zone lying within a conservation area shown on the Location Maps: (a) no intensive agriculture or forestry should occur (b) access by road should be limited to that necessary to serve agricultural land, public utilities and recreation facilities (c) recreation facilities should be consistent with the conservation of the area's natural quality and character (d) swamps should not be drained (e) dredging should be limited to that necessary for public works.	PDC 12: Forestry plantations should only be established on existing cleared land. PDC 14: In those parts of the zone lying within a conservation area shown on the Location Maps: (a) no intensive agriculture, forestry, new holiday houses, or resort development, or other land use should occur (b) access by road should be limited to that necessary to serve agricultural land, public utilities and recreation facilities (c) recreation facilities should be consistent with the conservation of the area's natural quality and character.
Forestry - Complying Developments	No	No	No
Forestry Non-Complying Developments	No	Commercial forestry	No

Mid Murray Council (Development Plan consolidated 9 March 2010)

Council Wide Policy

138 The area of the organic waste processing facilities on a site should:

(a) be located a minimum distance of 100 metres from any dam, river, creek, natural watercourse, channel or bore, and not within the area of a 1 in 100 year flood event; and

(b) not be located on areas with ground slopes of greater than 6 percent; and

(c) not be located on land subject to land slipping; and

(d) not be located within three kilometres of an airport used by commercial aircraft. If located closer than three kilometres the organic waste processing operations should incorporate bird control measures to minimise the risk of bird strikes to aircraft; and

(e) not be located within 250 metres of a public open space reserve, a forestry reserve, a National Park, a Conservation Zone or Policy Area.

Zone Policies

	River Murray Zone	**River Murray Zone Conservation Policy Area**	**River Murray Zone Flood Plain Policy Area**	**River Murray Zone Primary Production Policy Area**	**River Murray Zone Recreation and Tourism Policy Area**	**River Murray Zone Shack Settlement Policy Area**	**River Murray Zone River Settlement Policy Area**
Objective 1	(Ecologically Sustainable Development) Ecologically sustainable development.	(Environment) Retention of native vegetation, wildlife habitat, features of cultural heritage significance and natural beauty.	(Ecologically Sustainable Development) Improvement to the sustainability of rural production and primary industries.	(Sustainable Industry) Operation and sustainability of rural production and primary industries.	(Environment) Development and the use of land for recreation and tourism facilities which does not contribute to the degradation of the River Valley and Flood Plain, especially significant wetlands.	Orderly and Economic Development.	An Area primarily for detached dwellings with local service facilities in appropriate locations.
Objective 2	(Ecologically Sustainable Development) Development which recognises the variety in the land types and corresponding character differences.	(Environment) Environmental water allocations to imitate natural flow regimes and the protection of wetlands of conservation significance.	(Ecologically Sustainable Development) Buildings and structures strictly limited, but where undertaken, compatible with the environmental qualities, built form, character of the surrounding area and landscape and designed not to impede the flow of flood waters.	No second Sustainable Industry objective.	No second Environment objective.	Preservation of the quality of the river water.	Development visually compatible with the River Valley, exhibiting a high standard of appearance through built form, design, external materials, colours, siting and landscaping.
PDC 1	(River Structures) All river structures including jetties, boat ramps, landings and pumping structures should be consequential on an authorised use of land.	(Ecologically Sustainable Development) All revegetation and screen plantings should be of locally occurring native species, preferably using seed sourced from the region.	(Ecologically Sustainable Development) Development should not be undertaken unless it is consistent with the Desired Future Character and Acceptable Uses of the Zone and Flood Plain Policy Area.	(Form of Development) Development should not be undertaken unless it is consistent with the Desired Future Character and Acceptable Uses for the Zone and Primary Production Policy Area.	(Form of Development) Development should not be undertaken unless it is consistent with the Desired Future Character and Acceptable Uses for the Zone and Recreation and Tourism Policy Area.	(Form of Development) Development should not be undertaken unless it is consistent with the Desired Future Character and Acceptable Uses for the Zone and Policy Area.	Development should not be undertaken unless it is consistent with the Desired Future Character and Acceptable Uses for River Settlement Policy Area.
Forestry PDC	nil	nil	nil	nil	nil	nil	nil
Forestry - Complying Developments	no	no	no	no	no	no	no
Forestry Non-Complying Developments	no	no	no	no	no	no	Commercial Forestry

Mid Murray Council (Development Plan consolidated 9 March 2010)

	Rural Zone	Rural Zone Policy Area No.1 – Greenways (Rural)	Rural Zone Policy Area No.13 Marine Watercourse	Rural Zone Policy Area No.14 Hills Policy Area	Rural Zone Policy Area No.15 Pastoral Policy Area	Rural Zone Policy Area No.16 Murray Plains Policy Area
Objective 1	(Sustainable Industry) Long-term operation and sustainability of rural production and primary industries.	An area for living in association with horticulture.	The character, aesthetic appearance, scenic beauty and amenity of the River Marne and River Somme and its environs are preserved and enhanced in order to: (a) undertake sustainable primary production; (b) protect water systems; (c) provide recreation areas, particularly passive recreation areas; (d) provide for native flora and fauna habitats; and (e) protect areas of scientific, archaeological or cultural significance	Retention of the open rural character as derived from large land holdings used for primary production and dispersed isolated built form.	n/a	n/a
Objective 2	No second Sustainable Industry objective.	No second objective.	Sustainable use of the River Marne's and River Somme's groundwater aquifer and catchments as sources of water for primary production.	No building development on the eastern face of the Mount Lofty Ranges.	n/a	n/a
PDC 1	(Form of Development) Development should not be undertaken unless it is consistent with the Desired Future Character and Acceptable Uses for the Zone.	Development should be for: (a) the erection of, or alteration or addition to, a detached dwelling or associated outbuilding; (b) small scale horticulture, farming, or the erection of an associated farm building; and (c) animal keeping in limited numbers on a non-commercial basis.	Development should not be undertaken unless it is consistent with the Desired Future Character for the Rural Zone and Marne Watercourse policy Area	Development should not be undertaken unless it is consistent with the Desired Future character and acceptable uses for the Rural Zone and Hills Policy Area.	Development should not be undertaken unless it is consistent with the Desired Future Character for the Rural Zone and Pastoral Policy Area.	Development should not be undertaken unless it is consistent with the Desired Future Character for the Rural Zone and Murray Plains Policy Area.
Forestry PDC	nil	nil	The following uses are unacceptable in that part of the Marne Watercourse Policy Area that comprises the hills face and gorge as defined in Figs HF(MWPA)/1 to 5 (additional to unacceptable use for the Rural Zone): horticulture, particularly viticulture and olive production; forestry; buildings on allotments less than 200ha in size.	The following uses are unacceptable in that part of the Hills Policy Area defined in Figures HF(HPA)/1 to 5 (additional to unacceptable uses for the Rural Zone: horticulture, particularly viticulture and olive production; forestry; buildings on allotments less than 200ha in size.l	nil	PDC 38: Forestry plantations should incorporate measures which reduce the risk and effects of fire. Design Techniques (ONE WAY of meeting requirements of the principle of development control) 38.1 plantations are provided with an external boundary firebreak consisting of either a: (a) 20 metre wide break; or (b) 10 metre wide break and a 10 metre wide fuel modified zone; 38.2 large plantations are divided into units not exceeding 400 hectares by firebreaks referred to in 38.1 above; 38.3 where possible, all firebreaks and access tracks are a minimum of 7 metres in width to allow for the simultaneous access of two fire trucks; 38.4 where practicable, vehicular

	Rural Zone	Rural Zone Policy Area No.1 – Greenways (Rural)	Rural Zone Policy Area No.13 Marine Watercourse	Rural Zone Policy Area No.14 Hills Policy Area	Rural Zone Policy Area No.15 Pastoral Policy Area	Rural Zone Policy Area No.16 Murray Plains Policy Area
						access tracks enclose individual plantation units generally not exceeding 40 hectares and of such dimensions that a hose lay can reach any point in the unit; 38.5 The following clearances from power lines are maintained when planting trees with an expected mature height of more than six metres; Minimum horizontal clearance distance between plantings and transmission lines (refer to table). 38.6 Internal fire access tracks are aligned to allow straight through access at junctions 38.7 Dead end fire access tracks are sign-posted and provide a suitable turn-around area for fire fighting vehicles 38.8 Plantations are set back from dwellings: (a) a minimum of 50 metres, combined with fuel reduction works within the plantation to provide a total of 100 metres from the northern or western alignment of the dwelling; and (b) a minimum of 35 metres, combined with fuel reduction works within the plantation to provide a total of 50 metres from the eastern and southern alignment of the dwelling. PDC 39 Commercial forestry should not result in the removal of native vegetation. PDC 40 Commercial forestry should not: (a) occur on land exceeding 35 percent; 1 in 3; 20 degrees slope; (b) involve cultivation in drainage lines or within 20 metres of a drainage line; (c) be located within 50 metres of the edge of stand of remnant native vegetation of greater than 1 hectare in size.
Forestry - Complying Developments	No	No	No	No	No	No
Forestry Non-Complying Developments	No	No	No	No	No	No

District Council of Karoonda East Murray (Development Plan consolidated 2 June 2005)

Council Wide Policy

PDC 6: Land division for rural purposes should not create allotments of less than 40 hectares, where the land contains an existing or approved commercial forestry, intensive animal keeping facility, horticultural use, market gardening, floriculture or a wholesale plant nursery.

PDC 38: The area of the organic waste processing facilities on a site should:

(a) be located a minimum distance of 100 metres from any dam, river, creek, natural watercourse, channel or bore, and not within the area of a 1 in 100 year flood event; and

(b) not be located on areas with ground slopes of greater than 6 percent; and

(c) not be located on land subject to land slipping; and

(d) not be located within three kilometres of an airport used by commercial aircraft. If located closer than three kilometres the organic waste processing operations should incorporate bird control measures to minimise the risk of bird strikes to aircraft; and

(e) not be located within 250 metres of a public open space reserve, a forestry reserve, a National Park, a Conservation Zone or Policy Area.

Zone Policies

	River Murray Fringe Zone	River Murray Flood Zone	Rural Fringe Zone	General Farming Zone
Objective 1	The visual character of the River Murray Fringe Zone not marred by development and the quality of the water of the River Murray preserved.	The preservation of the quality of the river water.	A Zone primarily accommodating diversified rural activities on a range of allotments of various sizes.	The preservation of the productive rural land and the rural landscape.
Objective 2	Land division enabling security of tenure for existing dwellings.	The conservation of the natural character of the river valley.	A Zone where the rural character adjacent Karoonda is enhanced through suitable landscaping and quality development.	Retention and protection of biodiversity including remnant native vegetation.
PDC 1	(Form of Development) New holiday houses in the River Murray Fringe Zone should be: (a) developed in compact groups and not in a linear form; (b) in groups of a size determined by environmental considerations; and (c) sited so	(Form of Development) No buildings, or structures, or levee banks, or earth mounds should be erected or constructed in the Flood Zone, which would impede, or be damaged by, flood waters.	(Form of Development) Accommodation of a range of rural activities on small rural allotments and residential development, which is ancillary to such rural activities.	(Form of Development) The Zone should be used primarily for primary production with tourist activities as a secondary use.
Forestry PDCs	PDC 12: Forestry plantations in the River Murray Fringe Zone should be established only on cleared land.			PDC 33: Land should not be used for commercial forestry purposes unless: (a) Suitable fire breaks between existing vegetation, public roadways, and adjoining owners are provided; (b) the plantation design meets the ETSA set-back requirements for transmission and distribution lines; (c) Native vegetation clearance consent for the harvesting of any native vegetation has been obtained
Complying Developments	No	No	No	No
Non-Complying Developments	No	No	No	No

Regional Council of Goyder (Development Plan consolidated 17 February 2011 – Converted BDP Development Plan)

The Development Plan contains a council wide (General Section) Forestry Module

	Primary Production Zone	Township Fringe Policy Area 1	Enterprise Policy Area 2
Objective 1	Economically productive, efficient and environmentally sustainable primary production.	A policy area primarily for low-intensity primary production compatible with the adjoining urban areas.	Intensive primary production precinct with sustainable activities and resource recovery as key elements of the production cycle.
Objective 2	Allotments of a size and configuration that promote the efficient use of land for primary production.	Preservation of rural character and scenic features as a backdrop to the town.	Accommodation of intensive animal keeping industries collocated with composting facilities and renewable energy industries.
PDC 1	(Land Use) The following forms of development are envisaged in the zone: ▪ tourist accommodation, including through the diversification of existing farming activities and conversion of farm buildings ▪ farming ▪ intensive animal keeping (especially within Enterprise Policy Area 2)	(Land Use) The following forms of development are envisaged in the policy area: ▪ farming ▪ low-intensity primary production	(Land Use) The following forms of development are envisaged in the policy area: ▪ farming and farm buildings ▪ intensive animal keeping ▪ organic waste composting facilities ▪ resource recovery ▪ supporting infrastructure
Forestry PDCs	PDC 3; Horticulture, forestry, dairies and viticulture should only occur where there is adequate water supply, soil conditions and relevant industry standards can be met.		
Complying Developments	No	No	No
Non-Complying Developments	Commercial forestry where it is located in the Township Fringe Policy Area 1	Commercial forestry where it is located in the Township Fringe Policy Area 1	Commercial forestry where it is located in the Township Fringe Policy Area 1

District Council of Renmark and Paringa (Development Plan consolidated 3 March 2011)

Council Wide Policy

PDC 160: The area of the organic waste processing facilities on a site should:
(a) be located a minimum distance of 100 metres from any dam, river, creek, natural watercourse, channel or bore, and not within the area of a 1 in 100 year flood event; and
(b) not be located on areas with ground slopes of greater than 6 percent; and
(c) not be located on land subject to land slipping; and
(d) not be located within three kilometres of an airport used by commercial aircraft. If located closer than three kilometres the organic waste processing operations should incorporate bird control measures to minimise the risk of bird strikes to aircraft; and
(e) not be located within 250 metres of a public open space reserve, a forestry reserve, a National Park, a Conservation Zone or Policy Area.

Zone Policies

	River Murray Flood Zone	River Murray Fringe Zone	Dryland Farming Zone	Horticulture Zone	Horticulture (Deferred Urban) Zone	
Objective 1	The preservation of the quality of the river water.	The visual character of the River Murray Fringe Zone not marred by development.	Retention of general agriculture as the dominant use of the land.	A viable irrigated horticulture industry, with the primary use of land being for horticultural activities.	A zone accommodating existing irrigated horticulture until required for future residential development.	
Objective 2	The conservation of the natural character of the river valley.	Maintenance of agriculture and horticulture in the Zone, and the retention of native vegetation.	Retention of the existing rural-bushland character of the zone and the significance of the land south of Sturt Highway as a scenic backdrop to the River Murray.	Retention of the scenic qualities of the zone, particularly along the Sturt Highway.	No second objective.	
PDC 1	(Form of Development) No buildings, or structures, or levee banks, or earth mounds should be erected or constructed in the Flood Zone which would impede, or be damaged by, flood waters.	(Mining) Mining operations should not be undertaken if equivalent resources are available elsewhere.	This zone should be developed primarily for general agriculture on large allotments.	Development should be primarily irrigated horticulture with the dryland farming areas being utilised for non-intensive farming and pastoral activities.	Development should be primarily horticulture activities that would not be prejudicial to the eventual development of the zone for residential purposes.	
Forestry PDC	PDC 12: In the River Murray Flood Zone: (a) intensive agriculture, forestry or other land use should not occur; (b) access by road should be limited to that necessary to serve agricultural land, public utilities and recreation facilities; (c) recreation facilities should be consistent with the conservation of the area's natural quality and character; (d) swamps should not be drained; and (e) dredging should be limited to that necessary for public works PDC 16: Forestry plantations in the River Murray Flood Zone should only be established on cleared land and trees not native to the area should not be planted on waterfront land.	PDC 5: In the River Murray Fringe Zone: (a) no intensive agriculture or forestry should occur; (b) access by road should be limited to that necessary to serve agricultural land, public utilities and recreation facilities PDC 7 Forestry plantations should only be established on cleared land.				
Forestry - Complying Developments	No	No	No	No	No	
Forestry - Non-Complying Developments	No	No	No	No	No	

District Council of Loxton Waikerie (Development Plan consolidated 10 February 2011)

Council Wide Policy

Objective 57: Commercial Forestry which is compatible with surrounding land uses in the Dryland Farming and Horticulture Zones.

PDC 54: Rural land may be divided if the division is for the purposes of farming, horticulture or commercial forestry that rationalises boundaries without creating any additional allotments.

PDC 110: The area of the organic waste processing facilities on a site should:

(a) be located a minimum distance of 100 metres from any dam, river, creek, natural watercourse, channel or bore, and not within the area of a 1 in 100 year flood event; and

(b) not be located on areas with ground slopes of greater than 6 percent; and

(c) not be located on land subject to land slipping; and

(d) not be located within three kilometres of an airport used by commercial aircraft. If located closer than three kilometres the organic waste processing operations should incorporate bird control measures to minimise the risk of bird strikes to aircraft; and

(e) not be located within 250 metres of a public open space reserve, a forestry reserve, a National Park or a Conservation Zone or Policy Area.

PDC 217: Forestry plantations should:

(a) not occur on land of a slope greater than 20 degrees;

(b) retain a 15 metre native vegetation vegetated buffer strip adjacent to a watercourse as defined by a blue line on a current 1:50 000 Government topographical map;

(c) not involve cultivation in drainage lines or within 20 metres of a major stream bank; and

(d) ensure artificial drainage lines (ie culverts, run-offs and constructed drains) minimise concentrated water flows onto plantation areas, and are integrated into natural drainage lines.

PDC 218: Commercial Forestry should be separated by an effective and maintained firebreak:

(a) not less than 20 metres wide from land which is not used for commercial forestry; and

(b) not less than 50 metres wide from a dwelling.

PDC 219: Commercial forestry should incorporate measures which reduce the risk and effects of fire including an external boundary firebreak consisting of either a

(a) 20 metre wide fire break; or

(b) 10 metre wide break and a 10 metre wide fuel modified zone.

	Flood Zone	Fringe Zone	Dryland Farming Zone	Horticulture Zone	Horticulture (Deferred Urban) Zone
Objective 1	The preservation of the quality of the river water.	The visual character of the Fringe Zone not marred by development.	The retention of general agriculture as the dominant use of the land and conservation.	A viable irrigated horticulture industry, which retains the character of the zone.	A zone retained for horticultural activities until required for urban expansion.
Objective 2	The conservation of the natural character of the river valley.	Maintenance and improvement of the quality of development along the River Murray.	The scenic valley landscape not impaired by development adjoining the Waikerie to Loxton to Lyrup arterial road.	Retention of the rural character of, and the bushland in, the dryland parts of the zone.	n/a
PDC 1	(Form of Development) No buildings, or structures, or levee banks, or earth mounds should be erected or constructed in the Flood Zone that would impede, or be damaged by flood waters.	Development not in keeping with the rural character of this zone should not be undertaken.	This Zone should be developed primarily for general agriculture on large allotments, other than in Policy Area 2 shown on Map LoWa/49, where smaller allotments may be created.	This zone should be developed primarily for irrigated horticulture.	This zone should continue to be used for horticultural activities until required for urban development.
Forestry PDCs	PDC 12 In those parts of the Flood Zone lying within a conservation area shown on Loxton Waikerie (DC) Structure Plan Map LoWa/1 (Overlay 1) Enlargement A to L: (a) no intensive agriculture, forestry or other land use should occur; PDC 16: Forestry plantations in the Flood Zone should only be established on cleared land.				
Forestry - Complying Developments	No	No	No	No	No
Forestry Non-Complying Developments	No	No	No	No	No

Berri Barmera Council (Development Plan consolidated 17 February 2011)

Council Wide Policies

PDC 65 Rural land may be divided if:

(a) the division is for the purposes of farming, horticulture or commercial forestry which rationalises boundaries without creating any additional allotments.

PDC 212 The area of the organic waste processing facilities on a site should:

(a) be located a minimum distance of 100 metres from any dam, river, creek, natural watercourse, channel or bore, and not within the area of a 1 in 100 year flood event; and

(b) not be located on areas with ground slopes of greater than 6 percent; and

(c) not be located on land subject to land slipping; and

(d) not be located within three kilometres of an airport used by commercial aircraft. If located closer than three kilometres the organic waste processing operations should incorporate bird control measures to minimise the risk of bird strikes to aircraft; and

(e) not be located within 250 metres of a public open space reserve, a forestry reserve, a National Park, a Conservation Zone or Policy Area.

Zone Policies

	Flood Zone	Fringe Zone	Landscape Zone	Horticulture Zone	Dryland Farming Zone	Rural Zone	Western Approach Zone
Objective 1	The preservation of the quality of the river water.	The visual character of the Fringe Zone not marred by development.	The retention and upgrading of the natural character of the zone as it is viewed from the Sturt Highway and the River Murray.	A viable irrigated horticulture industry which retains the character of the zone.	The retention of stock grazing as the dominant use of the land.	The retention of the rural-bushland character of the zone.	The upgrading of the visual character of the zone to provide an attractive entrance to the towns of Berri and Barmera.
Objective 2	The conservation of the natural character of the river valley.	Retention of the rural character of the zone.	Water quality of the River Murray not impaired by development.	Industries related to the processing of local primary produce and which serve to promote a viable horticulture industry.	The retention of the rural bushland character of the zone.	Exploitation of mineral deposits which minimise detriment to the zone's natural qualities.	Development in the western part of the zone within Berri should comprise primarily, horticulture and detached dwellings on large allotments, with dwellings set well back from and facing the Sturt Highway.
PDC 1	No buildings, or structures, or levee banks, or earth mounds should be erected or constructed in the Flood Zone which would impede, or be damaged by flood waters.	Land may be divided if: (a) the division is for the purpose of rationalisation of boundaries and no additional allotments are created; or (b) allotments larger than 100 hectares are created.	Development should comprise, or be associated with, primarily low-intensity living, tourism, outdoor recreation or natural or cultural conservation.	The zone should be developed primarily for irrigated horticulture.	The zone should accommodate broad scale rural activities.	Development in the zone should be primarily for open grazing, conservation and outdoor recreation purposes and where single detached dwellings on large allotments may be developed.	Development in the eastern part of the zone between Sturt Highway and the Flood Zone in Berri should comprise primarily, open space for public uses consistent with the town setting achieved on the River Murray frontage, east of the Berri town centre.
Forestry PDCs	PDC 12 In those parts of the Flood Zone lying within a conservation area shown on Fig R/3 (Overlay 1): (a) no intensive agriculture, forestry or other land use should occur; (b) access by road should be limited to that necessary to serve agricultural land, public utilities and the recreation facilities; PDC 16: Forestry plantations in the Flood Zone should be established only on cleared land and trees not native to the area		PDC 3 In that part of the zone lying within the Conservation Area shown on Fig R/3 (Overlay 1): (a) no irrigated horticulture, forestry, or intensive agriculture should take place;				

	Flood Zone	Fringe Zone	Landscape Zone	Horticulture Zone	Dryland Farming Zone	Rural Zone	Western Approach Zone
	should not be planted on waterfront land.						
Forestry - Complying Developments	No	No	No	No	No	No	No
Forestry Non-Complying Developments	No	No	Commercial Forestry	No	No	No	Commercial Forestry

ZONE POLICIES						
	Primary Industry Zone	**River Murray and Lakes Zone**	**Floodplain Policy Area**	**Primary Production Policy Area**	**Horticulture Policy Area**	**Recreation and Tourism Policy Area**
Objective 1	(Primary Industries) The long-term sustainability of primary industries.	(Ecologically Sustainable Development) Ecologically and culturally sustainable development.	(Ecologically Sustainable Development) Improvement to the sustainability of rural production and primary industries.	(Sustainable Development) Long-term operation and sustainability of rural production and primary industries.	A policy area for horticultural uses including orchards and flower production, plant nurseries and associated primary production.	(Environment) Development and the use of land for recreation and tourism facilities which does not contribute to the degradation of the River Murray, the lakes and the floodplain, especially significant wetlands.
Objective 2	(Primary Industries) The long-term protection of agricultural land from incompatible land use.	(Ecologically Sustainable Development) Development which recognises variety in the land types and corresponding character differences.	(Ecologically Sustainable Development) Buildings and structures strictly limited, but where undertaken compatible with the environmental qualities, built form, character of the surrounding area and landscape and designed not to impede the flow of floodwaters.	No second Sustainable Development objective.	Horticulture uses designed and managed so as to minimise adverse impacts on neighbouring land uses and the adjoining settlement area.	No second Environment objective.
Forestry Policies	PDC 62: Forestry plantations should incorporate: (a) 7 metre wide external boundary firebreaks for plantations of 40 hectares or less (b) 10 metre wide external boundary firebreaks for plantations of between 40 and 100 hectares (c) 20 metre wide external boundary firebreaks, or 10 metres with an additional 10 metres of fuel-reduced plantation, for plantations of 100 hectares or greater. PDC 63 Forestry plantations should incorporate vehicle access tracks: (a) within all firebreaks (b) of a minimum width of 7 metres with a vertical clearance of 4 metres (c) that are aligned to provide straight through access at junctions, or if they are a no through access track they are appropriately signposted and provide suitable turnaround areas for fire-fighting vehicles (d) that partition the plantation into units not exceeding 40 hectares in area. PDC 64: Forestry plantations should not occur on land with a slope exceeding 20 degrees nor within a separation distance (which may include forestry firebreaks and vehicle access tracks) of 50 metres of either of the following: (a) any dwelling including those on an adjoining allotment	(River and Lakes Structures) River and lakes structures, including jetties, landings and pumping structures, should be developed only in association with an existing or approved use of land.	(Form of Development) Development should not be undertaken unless it is consistent with the Desired Character and acceptable uses for the zone and Floodplain Policy Area.	(Form of Development) Development should not be undertaken unless it is consistent with the Desired Character and acceptable uses for the zone and the Primary Production Policy Area.	Development should be for primary production including horticulture and plant nurseries.	(Form of Development) Development should not be undertaken unless it is consistent with the Desired Character and acceptable uses for the zone and the Recreation and Tourism Policy Area.

ZONE POLICIES						
	Primary Industry Zone	**River Murray and Lakes Zone**	**Floodplain Policy Area**	**Primary Production Policy Area**	**Horticulture Policy Area**	**Recreation and Tourism Policy Area**
	(b) a reserve gazetted under the National Parks and Wildlife Act 1972 or Wilderness Protection Act 1992.					
Other PDC Categories	Water, Flooding, Intensive Animal Keeping, Air Quality, Land-Based Aquaculture, Olive Orchards and Irrigated Horticulture, Vegetation and Landscape Character, Noise Pollution, Hazards and Bushfires, Waste Treatment and Disposal, Built Form, Design and Siting, Dwellings, Seasonal Workers Accommodation, Tourist Accommodation Facilities, Rural Based Industrial Development, Grain Bulk Handling Facilities, Services, Land Division, Conservation, Advertisements & Forestry.	Moorings for Vessels with Overnight Accommodation, Wastes, Stormwater Drainage and Harvesting, Access, Bird Hides, Pump Houses and Meter Boxes, Car parks, Public Toilets & Conservation.	Water, Landscape Character, Soil, Vegetation Management, Irrigated Horticulture and Pasture, Recreation and Tourism, Related Development, Pollution, Built Form and Design, Infrastructure & Land Division.	Stormwater, Landscape Character, Soil, Waste, Flooding, Air and Noise Pollution, Chemicals, Bushfire, Built Form and Design, Land Division, Separation Distances to Primary Production, Irrigated Horticulture and Pasture, Olives, Dairying, Land Based Aquaculture, Intensive Animal Keeping &Tourism.	n/a	Environment, Recreation and Tourism, Flooding, Built Form and Design, Health and Safety, Land Division & Separation Distance to Primary Production.
Forestry - Complying Developments	No	No	No	No	No	No
Forestry Non-Complying Developments	No	No	No	No	No	No

Appendix E: DPLG Better Development Plan – Forestry Module

Forestry

OBJECTIVES

1 Forestry development that is designed and sited to maximise environmental and economic benefits whilst managing potential negative impacts on the environment, transport networks and surrounding land uses and landscapes.

PRINCIPLES OF DEVELOPMENT CONTROL

1 Forestry plantations should not be undertaken if they will cause or require the clearance of valued trees or substantially intact strata of vegetation, or detrimentally affect the physical environment or scenic quality of the rural landscape.

2 Forestry plantations should not occur:

(a) on land with a slope exceeding 20 degrees

(b) within a separation distance (which may include forestry firebreaks and vehicle access tracks) of 50 metres of either of the following:

(i) any dwelling including those on an adjoining allotment

(ii) a reserve gazetted under the *National Parks and Wildlife Act 1972* or *Wilderness Protection Act 1992*.

3 Forestry plantations should:

(a) not involve cultivation (excluding spot cultivation) in drainage lines or within 20 metres of a major watercourse (a third order or higher watercourse), lake, reservoir, wetland and sinkhole (direct connection to aquifer)

(b) incorporate artificial drainage lines (ie culverts, runoffs and constructed drains) integrated with natural drainage lines to minimise concentrated water flows onto or from plantation areas

(c) retain a minimum 10 metre width separation distance immediately to either side of a watercourse (a first or second order watercourse) and sinkhole (no-direct connection to aquifer). This separation distance should contain locally indigenous vegetation (including grasses) and unmodified topography to ensure water flow.

4 Forestry plantations should incorporate:

(a) 7 metre wide external boundary firebreaks for plantations of 40 hectares or less

(b) 10 metre wide external boundary firebreaks for plantations of between 40 and 100 hectares

(c) 20 metre wide external boundary firebreaks, or 10 metres with an additional 10 metres of fuel-reduced plantation, for plantations of 100 hectares or greater.

5 Forestry plantations should incorporate vehicle access tracks:

(a) within all firebreaks

(b) of a minimum width of 7 metres with a vertical clearance of 4 metres

(c) that are aligned to provide straight through access at junctions, or if they are a no through access track they are appropriately signposted and provide suitable turnaround areas for fire-fighting vehicles

(d) that partition the plantation into units not exceeding 40 hectares in area.

6 Forestry plantations should ensure the clearances from power lines listed in the Table following are maintained when planting trees with an expected mature height of more than 6 metres:

Voltage of transmission line	**Tower or Pole**	**Minimum horizontal clearance distance between plantings and transmission lines (in metres)**
500 kV	Tower	38
275 kV	Tower	25
132 kV	Tower	30
132 kV	Pole	20
66 kV	Pole	20
Less than 66 kV	Pole	20