Marina and Mooring Structure Development along the River Murray in South Australia

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Introduction and background

About this guide
This guide is intended to assist developers and other proponents who are preparing development applications for marina and mooring structure development, as well as councils, communities and governments that are considering and assessing such applications.

The South Australian Department of Planning and Local Government (DPLG) is responsible for planning and development decisions along the River Murray and for overseeing the assessment and approval processes related to marina and mooring structure development. These processes have been established to ensure that marina and mooring structure development is suitably located and follows leading practice in design, construction, maintenance and operation.

Marinas are defined as facilities for the accommodation of large river craft, such as houseboats. They may also include commercial facilities and residential activities. Mooring structures are defined as structures built to secure large river craft. They may be sited in marinas, along riverbanks or on the riverbed. (See Appendix 1 for more detailed definitions.)

DPLG strongly recommends that proponents consult this guide, in conjunction with the Environment Protection Authority’s Code of Practice for Vessel and Facility Management: Marina and Inland Waters (2008), before lodging a development application.

For further information, contact DPLG on 08 8303 0600.

General background
South Australia’s River Murray supports a diverse range of commercial, industrial and agricultural activities and is an iconic location for tourism, recreation and conservation.

During the past 10 to 15 years the water quality and environmental health of the River have seriously declined. The main contributors to this decline are a lack of adequate water flows, increases in salinity and pollutant loads (especially nutrients), bank erosion and a loss of native vegetation and habitat.

The South Australian Government has embarked on a series of initiatives to improve the water quality and ecological health of the River system. This guide is one such initiative. It aims to encourage the optimal siting and sustainable development of marina and mooring structures, reduce the potentially adverse effects associated with the accommodation of houseboats and other large craft on the river environment, and provide greater certainty for developers, councils and the community regarding where and how marina and mooring structures should be built.
Policy background

In the late 1980s the South Australian Government undertook a review of the Murray Valley and the adverse impacts on the health of the River in terms of:

- water quality and water allocation
- recreation and tourism
- boating activities, including houseboating
- agriculture and irrigation
- mining
- land and wetland management
- nature conservation and heritage.

The review found that, while a range of boating opportunities should be provided on the River, the effects of such activities on water quality, the river environment and other users should be minimised. The review therefore made a number of recommendations regarding the establishment and management of mooring structures and marinas. The recommendations were to:

- define locational criteria for mooring structures and marinas with a view to allowing development of such facilities in specified locations
- define appropriate design standards for mooring structures and marinas
- require marinas to provide adequate effluent disposal facilities
- prohibit long-term occupation of houseboats in fixed locations outside marinas.

The use of houseboats and the demand for marina and residential developments on the River have steadily increased during the past two decades, giving rise to the preparation of a draft Houseboat, Mooring and Marina Strategy for the River Murray by the South Australian Government Interagency River Murray Working Group in 2008.

The draft strategy underwent widespread consultation among councils, state government agencies, industry and stakeholder groups, non-government organisations and members of the public during 2008–09.

The consultation process resulted in the preparation of this guide to marina and mooring structure development.
Under South Australia’s *Development Act 1993* (the Act), all activity defined as ‘development’ must be approved by a ‘relevant authority’ before the activity can be undertaken. Heavy penalties may apply to anyone undertaking development without approval.

The construction of marinas and mooring structures for river craft, including houseboats, is considered development under the Act and therefore any proposals for such development must undergo assessment and obtain development approval. While this process varies according to the type of development proposed, in general the proponent of the development must:

• lodge a development application form and pay associated fees
• provide a detailed description of the proposed development
• provide technical plans and specifications of a suitable quality.

Proponents must lodge their applications with the council in whose area the proposed development is to be situated. The application is then assessed by the relevant authority, as follows:

• for a single mooring structure or group of less than five mooring structures, the authority is the local council, which delegates assessment to qualified staff or to its Development Assessment Panel
• for marina developments and groups of five or more mooring structures, the authority is the independent state authority known as the Development Assessment Commission (DAC).

Development applications may require a number of ‘consents’, such as development plan consent, which involves assessment against the provisions of the local development plan, and building rules consent, which involves assessment against the Building Code of Australia and other relevant Australian standards. If land is to be subdivided under the proposal, land division consent is also required.

Large marina development and development with residential and/or commercial components may be declared ‘Major Development’ by the Minister responsible for the Act.
Major Development applications must be lodged with the DAC, pursuant to section 46 of the Act. The DAC thoroughly assesses the environmental, social and economic effects of the development and provides opportunities for public comment. It also determines the level of assessment required for Major Development proposals, as follows:

- an Environmental Impact Statement (EIS) may be required for complex proposals that are likely to have effects beyond the boundaries of the site
- a Public Environmental Report (PER), also known as a Targeted EIS, may be required for less complex proposals involving a narrower range of issues
- a Development Report (DR) may be required for proposals that are not expected to raise complex issues.

(See Chapter 6 for detailed descriptions of assessment levels.)

Final decisions on Major Development proposals are made by the Governor of South Australia on the advice of Cabinet.

Some applications for development plan consent may be referred to state government agencies and statutory authorities for advice or direction; for example:

- the Environment Protection Authority (EPA)
- the Minister for the River Murray (under the River Murray Act) or the Department for Water (DFW) acting on behalf of the Minister
- the Department of Environment and Natural Resources (DENR)
- agencies responsible for Native Title, Aboriginal heritage and Non-Aboriginal heritage
- the Department for Transport, Energy and Infrastructure (DTEI).

In some situations—depending on the categorisation of the proposed development—the local community or adjoining landowners may be invited to comment on an application.

As a result of the assessment process, the relevant authority may:

- grant consent to an application without change, or
- grant consent to an application subject to conditions, or
- refuse the application.

(See Appendix 2 for further details about the development assessment and approval process.)
This chapter outlines the leading practice principles that have been established to guide the development of marinas and mooring structures in order to ensure the ongoing health of the River Murray and environs.

Development proponents should consider these principles in conjunction with the site suitability checklist in Chapter E in order to identify sites that are best suited to marina and mooring structure development and that are unlikely to generate adverse environmental, economic and social effects.

**Marina development**

Leading practice marina development should be sited in locations:

- close to existing townships or settlements with adequate infrastructure connections
- away from sensitive floodplains or wetlands
- away from Aboriginal heritage sites and objects
- away from habitat that supports threatened native flora or fauna species
- away from high salinity impact/discharge zones
- at least 3 kilometres upstream and 0.5 kilometres downstream of a water supply intake
- where the effect of the marina on the ecological health of the river will be neutral or beneficial
- where surrounding landscape scenic values are not adversely affected.

Leading practice marina development should be designed to:

- ensure that water quality along the River is maintained or improved
- ensure that the quality of discharges to the River is equal to or better than the quality of River water that enters the marina
- minimise the evaporative loss of River water
- accommodate changes in weir pool levels of up to or minus 1 metre for environmental flow manipulation purposes
- maintain or improve habitat for native fauna
- complement and enhance the amenity of the area.
Leading practice marina development should be constructed in a manner that:

- minimises turbidity
- does not use contaminated fill material
- does not spread pest plants and animals
- minimises environmental harm, following the duty of care and objectives set out in the River Murray Act 2003
- adheres to the requirements of the Environment Protection Act 1993
- provides adequate operational facilities, such as waste disposal, boat launch and wash down facilities, and public toilets.

**Mooring structure development**

Leading practice mooring structure development should be located:

- outside navigation channels so they do not pose a safety or navigation hazard
- so as to allow safe access from the navigable channel
- away from environmentally sensitive areas
- away from erosion prone areas
- more than 50 metres away from a wetland
- away from formally designated water recreation areas (for example, for swimming, skiing, etc)
- more than 100 metres away from either side of a ferry crossing
- more than 150 metres away from either side of a lock
- a safe distance from submerged pipes and powerlines
- more than 3 kilometres upstream and 0.5 kilometres downstream of town water supply intakes
- away from areas in which damage, disturbance to, or interference with any heritage site or object might be caused
- a minimum of 6 metres from other structures used for boat mooring
- a minimum of 3 metres from all adjacent property boundaries

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1 Property boundaries are not an extension of land boundaries, but extend perpendicular to the bank from where the land boundary meets the water. This is especially important for allotments with a narrow front at the water and a wide rear.
Leading practice mooring structure development should be designed to:

- stabilise the riverbank and minimise disturbance of the riverbank or riverbed
- ensure that appropriate erosion control devices are in place
- facilitate removal of pest plants (for example, willows)
- ensure revegetation with native species to compensate for any disturbance of the riverbank
- not be used for permanent occupation (on-board living), unless the structure is part of a dedicated, approved marina facility that meets current government standards
- allow for the safe mooring of vessels under expected riverine conditions (including increased water flows and floods, as far as practicable)
- have the structure’s terminal end located in water that is deep enough to prevent the lowest point of the boat from touching the benthos and prevent damage from propeller wash
- not extend further than the line of existing structures
- not adversely affect scenic quality or amenity value, either through the structure itself or its use by a houseboat.

Leading practice mooring structure development should be constructed so that structures:

- do not exceed 10 per cent of the River width
- can be certified by an appropriately qualified professional to safely resist the combined effects of expected loads, including:
  - the weight of the mooring structure itself
  - operational loads, such as pedestrians on the decking, vessel collision and mooring loads
  - environmental loads, such as currents, wind, wave actions and debris, up to the 1956 flood level
  - tidal loads, storm surges and sea-level rise from global warming in coastal areas
- allow for easy maintenance that will not cause harm to the River
- contribute positively to habitat provision
- have dimensions limited to those enabling the structure to perform its primary function
• are raised a sufficient distance to:
  – obviate the need for steps and other alterations to the riverbank
  – allow sunlight to reach the benthos (by using mesh over the first two metres)
  – ensure that no part of the deck is less than 1 metre from the riverbed.
Guidelines for the preparation of a marina or mooring structure development proposal

Proposal structure and contents
DPLG recommends that marina and mooring structure development proposals or applications include the following sections:

1 Executive summary
This should provide a concise overview of the proposal and the details covered under the headings discussed below. While not required for smaller development proposals, an executive summary is highly recommended for those proposals requiring an EIS or PER as part of the Major Development (section 46) assessment process.

2 Introduction
This should briefly cover:
- the background to, and objectives of, the proposed development
- details about the proponent
- relevant legislative requirements and approval processes.

3 Need for the proposed development
This should describe the rationale for the proposed development, including:
- the specific objectives that the proposed development is intended to meet, including market objectives
- the expected benefits and costs of the proposed development, including those that cannot be adequately described in monetary or physical terms (for example, effects on scenic values)
- the environmental, economic and social arguments supporting the proposal.
4 Description of the proposed development
This should describe in detail:
• the proposed development
• the existing environment and the locality in which it is to be sited
• the location, layout, elevation and appearance of structures (and buildings, where relevant), an indicative land division plan (if relevant), a description of easements and infrastructure requirements and availability
• the staging (if relevant) and timing of the proposal, including expected dates for construction and operation
• the management arrangements for the construction and operational stages.

5 Assessment of expected environmental, social and economic impacts
For medium- to large-scale development proposals, proponents should identify and describe all likely environmental, social and economic effects of the proposed development. (Refer to the comprehensive list of potential effects of marinas and mooring structures in Chapter F.)

6 Consistency with development plan policy
This should include an assessment of the proposal against the relevant provisions (council-wide and zone provisions) of the local development plan.
Proposals assessed as part of the Major Development process may also require a discussion of the proposal’s consistency with legislation beyond the Development Act 1993.

7 Avoidance, mitigation, management and control of adverse effects
This should describe how the proponent will avoid, mitigate, satisfactorily manage and/or control any potentially adverse effects of the proposed development on the physical, social and economic environment.

8 Appendices
Any technical and additional information relevant to the proposal (for example, maps, plans, elevations, graphs, tables, photographs, reports, and certificates of title) should be included as appendices, as well as a glossary (if appropriate).
Site plans

Site plans in development proposals should illustrate the following:

• all features to scale, including a bar-scale and a North Arrow
• an elevation view and a section view
• the location of existing and proposed features, including:
  – any dwellings and outbuildings on the property
  – the proposed structure(s), including dimensions and materials to be used
  – the depth of water at the point where any part of the structure(s) will touch the riverbed
  – the depth to which piles will be driven into the riverbed
  – any navigable sections of the river
  – existing vegetation (including trees, shrubs, groundcovers and reeds)
  – any submerged or partially submerged wood
  – the property boundaries of the allotment and adjoining allotments
  – any registered or recorded Aboriginal site, object or remains (as advised by representatives of local Aboriginal people and/or the Minister for Aboriginal Affairs and Reconciliation)
  – any Heritage Places, Historic Shipwrecks or other culturally significant features on the land or in the water in proximity to the site.
The following checklist sets out the environmental, social and economic factors that proponents, planners and others should consider when investigating potential sites for marina and mooring structure development along the River Murray.

Proponents should address all the factors identified in this checklist that are relevant to the proposed development site. While this will not guarantee approval of the proposal, it will nonetheless facilitate a faster and smoother assessment process. Failing to address all relevant factors places the proposal at risk of not proceeding through the application process.

Proponents are advised to download and complete the online version of this checklist (available on sa.gov.au) and attach it with their development proposal.

### Environmental Factors

Check to make sure that the proposed development:

<table>
<thead>
<tr>
<th>No</th>
<th>Factor</th>
<th>Examples (including but not limited to)</th>
<th>✓ = ok, x = not met</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td>E1</td>
<td>Does not negatively impact on legally protected native plants and animals or legally protected habitats and ecosystems in accordance with legislation.</td>
<td>Matters of National Environmental Significance (EPBC Act) Protected under National Parks and Wildlife Act 1972 Native Vegetation (Native Vegetation Act 1991)</td>
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<tr>
<td>E2</td>
<td>Does not negatively impact on a Prescribed Water Resource (including surface water, groundwater or watercourse) in accordance with legislation.</td>
<td>Angas Bremer Prescribed Wells Area (PWA), Mallee PWA, Noora PWA, Peak Roby Sherlock PWA, River Murray Prescribed Watercourse, Marne Saunders Prescribed Water Resources Area (Natural Resource Management (NRM) Act 2004)</td>
<td></td>
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<tr>
<td>E3</td>
<td>Does not negatively impact on a Water Protection Area in accordance with legislation.</td>
<td>Declared water protection areas under the Environment Protection Act 1993</td>
<td></td>
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<tr>
<td>E4</td>
<td>Does not negatively impact on a River Murray Protection Area in accordance with legislation.</td>
<td>Declared River Murray Protection Areas under the River Murray Act 2003</td>
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<tr>
<td>No</td>
<td>Factor</td>
<td>Examples (including but not limited to)</td>
<td>✓ = ok, x = not met</td>
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<td>E5</td>
<td>Does not negatively impact on water quality in accordance with legislation.</td>
<td>Compliance with the Environment Protection (Water Quality) Policy 2003 under Environment Protection Act 1993</td>
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<td>E6</td>
<td>Does not pollute the environment in accordance with legislation.</td>
<td>Compliance with Environment Protection Act 1993</td>
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<tr>
<td>E7</td>
<td>Does not introduce, or facilitate an increase in, listed pest plants and animals or noxious species and exotic organisms in accordance with legislation.</td>
<td>Natural Resource Management (NRM) Act 2004 Fisheries Management Act 2007</td>
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<td>E9</td>
<td>Is located in an area of suitable geology, soils and topography, avoiding unstable areas, acid sulfate soils and locations vulnerable to rapid change or erosion.</td>
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<tr>
<td>E10</td>
<td>Will be able to deal adequately with any waste management requirements in accordance with legislation.</td>
<td>Compliance with Environment Protection Act 1993 and/or Public and Environmental Health Act 1987</td>
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<tr>
<td>E11</td>
<td>Will meet site contamination requirements in accordance with legislation.</td>
<td>Compliance with Environment Protection Act 1993</td>
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<tr>
<td>No</td>
<td>Factor</td>
<td>Examples (including but not limited to)</td>
<td>✓ = ok, x = not met</td>
<td>Comments</td>
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<tr>
<td>12</td>
<td>Will not alter water flows or sediment movements resulting in environmental harm or the creation of hazards to other river users.</td>
<td>Sediment accumulation and movement, water flow patterns</td>
<td></td>
<td></td>
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<tr>
<td>13</td>
<td>Does not negatively impact on significant wetlands.</td>
<td>Significant wetlands along the river that are not legally protected through listing</td>
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<tr>
<td>14</td>
<td>Site has capacity for a constructed wetland.</td>
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<tr>
<td>15</td>
<td>Is located on an appropriately sized area of floodplain to provide for off-floodplain housing.</td>
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</table>
### Social Factors

Check to make sure that the proposed development:

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<tr>
<th>No</th>
<th>Factor</th>
<th>Examples (including but not limited to)</th>
<th>✓ = ok, x = not met</th>
<th>Comments</th>
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<tr>
<td></td>
<td></td>
<td></td>
<td>On site off site</td>
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<tr>
<td>S1</td>
<td>Does not negatively impact on landscape amenity in accordance with planning policy.</td>
<td>State government planning policy, local council development plans and River Murray Act 2003</td>
<td></td>
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</tr>
<tr>
<td>S2</td>
<td>Does not negatively impact on cultural heritage in accordance with legislation.</td>
<td>State Heritage register under the Heritage Places Act 1993 and Shipwrecks under the Historic Shipwrecks Act 1981</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S3</td>
<td>Does not negatively impact on Aboriginal heritage in accordance with legislation.</td>
<td>Claims, titles, rights and sites under the Native Title Act 1993 (Commonwealth) and Aboriginal Heritage Act 1988 (SA)</td>
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<tr>
<td>S4</td>
<td>Does not negatively impact on sites of geological significance in accordance with legislation.</td>
<td>Sites of geological significance on the State Heritage register (Heritage Places Act 1993)</td>
<td></td>
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</tr>
<tr>
<td>S5</td>
<td>Does not have an overall negative impact on river access and access rights.</td>
<td>Local council development plans Licences and approvals under the Crown Lands Act 1929</td>
<td></td>
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</tr>
<tr>
<td>S6</td>
<td>Does not negatively impact on river safety.</td>
<td>Licences and approvals under the Harbours and Navigation Act Ferry crossings, locks and river bends</td>
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<tr>
<td>S7</td>
<td>Is not located within 3 km upstream and 500 m downstream of a SA Water off-take point.</td>
<td>SA Water off-take points for potable water supply</td>
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</tr>
<tr>
<td>No</td>
<td>Factor</td>
<td>Examples (including but not limited to)</td>
<td>✓ = ok, x = not met</td>
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<td></td>
<td></td>
<td>On site</td>
<td>Off site</td>
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<tr>
<td>S8</td>
<td>Does not negatively impact on local cultural heritage not protected by law.</td>
<td>Sites of local cultural significance</td>
<td></td>
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<tr>
<td>S9</td>
<td>Will have appropriate social services for increased population.</td>
<td>Hospital, suitable township, etc</td>
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</table>
## Economic Factors

Check to make sure that the proposed development:

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<th>No</th>
<th>Factor</th>
<th>Examples</th>
<th>✓ = ok, ✗ = not met</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Does not negatively impact on primary production activities.</td>
<td>Risk of damage to irrigation infrastructure including in-take points, pumps, channels, pipes, etc Water quality reduction around water in-take points</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Does not negatively impact on commercial or recreational fishing activity.</td>
<td>Recreational fishing spots that also generate local tourism and other commercial activity Commercial fisheries or other aquaculture industries Fisheries habitat that contributes to natural fish production</td>
<td></td>
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<tr>
<td>3</td>
<td>Has access to required infrastructure.</td>
<td>Power, sewerage, transport, roads, etc</td>
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<tr>
<td>4</td>
<td>Complies with land tenure requirements.</td>
<td>Crown lands, council development plans</td>
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<tr>
<td>5</td>
<td>Is located a suitable distance from an existing off-river marina.</td>
<td>Close proximity of off-river marinas increases the risk of financial failure as a result of over supply and low demand.</td>
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</table>
This chapter identifies in detail the various issues that may affect marina and mooring structure development proposals. Proponents should consider all these issues and address those that are relevant, depending on the type and scale of the proposed development.

Proposals requiring an EIS, PER or DR as part of the Major Development assessment process should address all the issues identified by the DAC when completing their application.

1 Environmental issues

Climate change and sustainability

- Potential effects of climate change: the likely implications, including implications of sea level rise, and the need to adopt adaptive management strategies.
- Resource use: minimise or reduce the use of resources during construction and operational phases.
- Greenhouse gas emissions: minimise, reduce and ameliorate emissions through the use of alternative or renewable energy sources and off-sets.
- Reduced water availability: reduce reliance on the River through greater use of recycled water (particularly stormwater and waste water) and reuse of grey water.
- Waste management: incorporate recycling and resource recovery strategies for any residential uses or tourist facilities.
River Murray

- Upstream and downstream users of the River: minimise the effects of proposed development on potable water supplies and downstream water supply intakes.
- Visual amenity: minimise the visual effects of the proposed development, especially the appearance and built form of buildings and structures (including earthworks, roads and infrastructure) from the River and environs.
- Native flora and fauna: minimise the effect of proposed development on riverine native flora and fauna, especially as a result of discharges from the marina waterways and by increased human activity.
- Biodiversity: minimise the effect of proposed development on the biological diversity and conservation significance of any wetland or riverine system, including design and management measures to mitigate habitat fragmentation, loss of connectivity, pest species and potential changes to hydrology and water quality.
- Recreational and commercial boating: minimise and mitigate the effects of boat movements and activities, including pollutant loads, the risk of spills and noise.
- Environmental flows: proposed development should not adversely impact on the River’s environmental flows.
- Riverbank protection: measures to protect the riverbank, existing wetlands and waterways from erosion, litter and pest plants during and after construction (including buffers) should be incorporated into proposed development.
- Public access – management of public access to the riverfront, including any mooring of houseboats during both construction and operational phases, is required.
- Historic shipwrecks: measures to protect any historic shipwrecks within the area, in accordance with the Historic Shipwrecks Act 1981, are required.
Water quality

- Water discharge: the proposed development should not have any adverse impact on water quality and the health of the River.
- Water quality: measures to protect and maintain suitable water quality in waterways and existing and constructed wetlands should be incorporated into proposed development, particularly the management of run-off and the control of pollutant and micro-organism sources.
- Water allocation: arrangements for securing a water allocation for the filling and maintenance of water levels in the proposed marina basin, waterways and constructed wetland, should be included.
- Pollution: measures to prevent pollutants, fertilisers, herbicides and pesticides from entering the marina and waterways should be incorporated.

Native vegetation (terrestrial and aquatic)

- Native vegetation clearance: the extent and significance of native vegetation (individual species and communities) that may need to be cleared or disturbed during construction should be minimised, with remnant stands incorporated into the design to compensate for the loss of native vegetation and habitat and to deliver significant environmental benefit. Any communities or individual species listed under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 should be protected.
- Biodiversity: changes in biological diversity at the interface between the proposed development and existing vegetation (the ‘edge effect’) should be appropriately managed.
Native fauna (terrestrial and aquatic)

- Fauna and/or habitat loss or disturbance: the extent and significance of fauna and habitat loss and disturbance should be minimised and the ability of communities or individual species to recover (especially the occurrence of threatened or significant species) should be described.

- Conservation status: the status of faunal communities or individual species, including any listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*, should be described.

Groundwater and land contamination

- Existing groundwater and land related environmental conditions: these conditions should be described (and supported by site specific investigations), including possible contamination sources.

- Acid sulfate soils: management measures to address acid sulfate soils should be described during construction and operation.

- Land contamination measures: procedures to identify whether the land is contaminated and management measures that would be required during construction and operation should be incorporated.

- Fill: short- and long-term effects of fill placement and the construction of channels and basins on land and/or groundwater quality and movement should be described.

Management

- Environmental risk: any risk of causing or exacerbating environmental problems in the locality should be described, along with mitigation measures and their expected effectiveness.

- Water quality and ecosystems: design and management requirements to maintain suitable water quality and healthy ecosystems, particularly the establishment of a suitable hydrological regime that takes into consideration the implications of environmental flow regimes.

- Waste management: arrangements for managing solid waste, black water and grey water and strategies for households and tourist facilities to incorporate recycling and resource recovery should be described.

- Pests: management of pest plants and animals within and around the proposed development should be described.

- Maintenance dredging or removal of aquatic plant growth: including disposal options and effects on the environment and community.
Monitoring

- Measures: steps to monitor, manage and rehabilitate effects on the River and groundwater supplies should be described.
- Dust: the control and monitoring of all potential sources of air pollution (especially dust), including measures for the reduction or elimination of dust, should be described.

General

- Noise: identify all potential noise sources associated with the operation of the proposed development, and describe the extent to which these noise emissions could be reduced and contained to minimise the associated effects upon the environment, the marina community and the wider locality.
- Nuisance insects: measures to control nuisance insects, particularly mosquito populations and other potential disease vectors that could pose a risk to human health should be discussed.
2  Risk/hazard management

• Public safety: measures to ensure public safety during construction and operation, including permitted recreational use of water bodies, should be incorporated.

• Pollution: procedures and strategies to prevent, manage and mitigate pollution spills, sewage leaks, discharges from houseboats and algal blooms should be described.

• Hazardous materials: measures to manage and contain hazardous, flammable or explosive materials in the commercial areas or on boats should be outlined.

• Flood protection: flood mitigation strategies and compliance with relevant flood protection policies in the development plan should be described.

• Riverbank protection: design measures to protect the bank from wave action should be incorporated.

3. Effects on communities

• Township character: the effects of the proposal on the existing character of a township and surrounds should be described.

• Township integration: how the proposal would be integrated with the existing township (including linking proposed and existing walking and cycling trails) should be described.

• Traffic: measures to manage and mitigate traffic generation and truck movements to and from the site during construction and the impact on local roads should be described.

• Tourism and recreation: effects on existing tourism and recreation activities (including infrastructure) should be described.

• Adjoining land uses: the potential impact from adjoining land uses on the proposed development should be described.

• Land tenure: land tenure arrangements (both during and after construction) for the proposed development and the opportunities for commercial, private recreational or public access to berths, launching facilities or other associated facilities should be described.

• Public facilities: the location and availability of public facilities including telephones, toilets, open space, recreation areas and the lighting of public areas should be outlined.
4. Economic issues

- Employment and investment: the effects of the proposed development on local employment and investment, including the ‘multiplier effect’, should be described.
- Business: the potential for the proposal to attract and enhance the business operations of other allied industries, tourism and commercial ventures should be outlined.
- Infrastructure: potential costs or savings to the government of infrastructure expansion and maintenance with regard to transport networks, electricity supply, water supply, sewerage or management of the River should be identified and described.

5. Native Title and Aboriginal heritage

- Cultural significance: the significance of the proposed location to Aboriginal people, including anthropological, archaeological, historical or traditional significance, should be described.
- Sites or objects: the potential impact that the proposal may have on any Aboriginal sites or objects listed in the SA Register of Aboriginal Sites and Objects or that may be determined by the Minister pursuant to the Aboriginal Heritage Act 1988 after consultation with Aboriginal councils or groups should be described.
- Aboriginal Heritage Act 1988: measures to ensure compliance with the Act should be detailed.
- Native Title: any native title issues in respect of the requirements of the Native Title Act 1993 (Commonwealth) and the Native Title Act 1994 (South Australia) should be detailed.

6. Non-Aboriginal heritage

- Sites: the potential impact that the proposal may have on any sites listed on the National Heritage List (under the Environment Protection and Biodiversity Conservation Act 1999) or on the South Australian Heritage Register should be described.
- Heritage places and historic shipwrecks: measures to ensure compliance with the Heritage Places Act 1993 and the Historic Shipwrecks Act 1981 should be outlined.
7. **Construction and operational effects**

- Site construction plan: a site construction plan and strategies to minimise effects on the local environment should be provided.

- Earthworks: the proposed approach for dredging/floodplain excavation and earthworks drainage, frequency, disposal of excavated material, maintenance activities and effects on water quality and the environment, particularly turbidity, should be detailed.

- Construction materials: the source and origin of any construction materials, including revetments and fill for land forming, and the effects of the storage of construction materials on local amenity should be described.

- Fill: the implications of placing any large amount of fill on the floodplain, particularly contamination and implications for natural drainage, water circulation and flood management should be detailed.

- Turbidity: measures to minimise turbidity, particularly from boating movements and wave action, should be described.

- Management agreements: management agreements for the construction and operation of the proposed development should be described.

- By-laws and encumbrances: any proposed by-laws and encumbrances to control and manage activities, particularly to ensure that the development is environmentally sustainable in the long-term, should be described.

8. **Effects on infrastructure requirements**

- Impacts: the impact of the proposed development on gas, electricity, water, sewerage, stormwater management, communication systems and local roads should be described.

- Water sensitive urban design (WSUD): WSUD measures and the implications of adopting them for minimising water use and managing stormwater and wastewater should be discussed.

- Waste disposal: facilities to be provided for waste disposal from recreational, commercial and permanently occupied vessels, including black water, grey water and solid waste should be described.

- Emergency services: emergency services arrangements should be detailed.
9. **Planning and environmental legislation and policies**

- Development plan: the proposal's variance from and consistency with the relevant provisions of the development plan should be described.

- *Environment Protection Act 1993*: the proposal's variance from and compliance with the provisions of the Act, including strategies regarding any non-compliance issues that may arise (for example, separation distances) should be described.

- *River Murray Act 2003*: the proposal's variance from and consistency with the requirements of the Act and the Murray-Darling Basin Agreement should be described.

- Legislative requirements: the requirements and the range of approvals needed to complete the proposed development should be detailed.
**Marina**

A marina is a facility used primarily for the sheltered and secure accommodation of river craft, particularly houseboats and larger vessels, and may comprise a range of facilities, such as:

- mooring structures, berths, pontoons, piers or other securing facilities
- boat launching ramp
- dry dock or slipping areas
- slipways or hoists
- wharves or jetties
- chandlery
- boat construction, maintenance, repair or sale facilities
- kiosk, fuel supplies, power, water, effluent pump, toilets, showers
- land based areas for hardstand boat storage and car parking
- tourist or recreation areas
- commercial facilities (for example, tavern or store)
- tourist accommodation
- residential allotments, especially waterfront and/or dry land allotments
- waterfront housing estates with provision for private mooring structures.

**Off-river marinas**

Marinas developed in a wetland on a backwater/anabranch or in a basin excavated on the floodplain. Formal off-river marinas are usually fully constructed developments with abutting boardwalks, jetties, bank treatments, mooring structures and associated boating and visitor facilities (for example, River Glen Marina near Murray Bridge, Kia Marina near Mannum and the Hindmarsh Island Marina).

**On-river marinas**

Rows of houseboats moored to the riverbank. These can range from large-scale (for example, at Morgan, Berri and Waikerie) to small-scale, informal marinas (for example, at Kingston-on-Murray and Paringa).

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2 Marinas on the River Murray are intended mainly for houseboats, but may also be used by other large vessels that have similar impacts (ie, provide for overnight stays and have the same potential pollutant sources).
**Canal estate development**

Development that:

- incorporates wholly or in part a constructed canal, or other waterway or water body, that is inundated by or drains to a natural waterway or natural water body by surface water or groundwater, and
- where the titles to the subdivided lots extend into, abut or are proximate to the constructed waterway, and
- includes the construction of dwellings (which may include tourist accommodation) which may or may not require the use of a sufficient depth of fill material to raise the level of all or part of that land on which the dwellings are to be located in order to comply with requirements relating to residential development on flood prone land, and
- may include provision for individual private mooring structures associated with waterfront allotments.

Waterfront canal estates increasingly provide private mooring structures; these can be considered ‘de facto’ marinas as they usually provide moorings and potentially have the same impact on the river as a traditional marina.

**Mooring structure**

A built structure used for securing a vessel; may be located in a marina development, along the riverbank or in the riverbed. They are preferable to trees and infrastructure for drinking water, piping, etc, which are not appropriate for mooring.

**Mooring site**

A formally recognised and approved location where the activity of mooring can occur using an approved mooring structure.

**Swing mooring**

A permanent mooring structure that sits on the riverbed with a floating buoy attached. These types of moorings are prevalent in the Lower Lakes (Albert and Alexandrina) but are not common on the main river channel.

**River craft**

Any vessel with overnight accommodation.
River Murray
As declared under the River Murray Act 2003, the River Murray includes the main stem and
floodplain, and all anabranches, backwaters, wetlands, estuaries, coastal areas (including
the Coorong and Lower Lakes) and tributaries (including the tributaries of the Eastern
Mount Lofty Ranges). The River also includes the natural resources associated with the
River (and floodplain etc), including not only water, soil, minerals, vegetation, air, animals
and ecosystems, but also cultural heritage, natural heritage, amenity and geological values.

River Murray Valley
Includes all land adjacent the River Murray, comprising four main physical features: the
waterfront, floodplain, valley face and fringe zone.

Waterfront
Land immediately adjoining the mainstream or backwaters, and within 100 metres of normal
pool level.

Floodplain
Land in the Murray Valley subject to flooding, however rarely flooding occurs.

Flood zone (as defined by the development plan under the Development Act)
Land which was inundated by flood waters during the 1956 flood.

Valley face
The slopes and cliffs visible from the River Valley.

Fringe zone (as defined by the Development Act)
An area immediately adjacent to the Flood Zone and Valley face.

Large vessel
A vessel that is generally in excess of 7.5 metres in length with facilities for overnight
accommodation.

Water off-take
Infrastructure (for example, channel, pipework) required for drawing water for the purposes
of filtered and unfiltered water supply.
**Black Water**
Wastewater from toilets or urinals, defined as either treated or raw (untreated). It contains diseases causing bacteria and viruses that can result in human illness from direct contact, or by consumption of affected fish and shellfish. It also contributes to nutrient build-up in ecosystems that result in changes to habitat and the proliferation of nuisance pest species.

**Grey Water**
Water that has been used for washing, laundering, bathing or showering. It may contain dissolved or undissolved by-products such as fat and oil, food scraps that contain nutrients, household chemicals, soap and detergent rich in phosphate and nitrate, and microbiological pathogens. If discharged into aquatic environments it can damage ecosystems, lead to nutrient enrichment (algal blooms) and pose significant human health risks.
Overview

In South Australia, specific types of activity are defined as ‘development’ and need approval before they can be undertaken.

The Development Act 1993 (the Act) defines ‘development’ to include:

• a change in the use of land or buildings
• the creation of new allotments through land division (including Strata and Community Title division)
• building work (including construction, demolition, alteration and associated excavation/fill)
• cutting, damaging or felling of significant trees (in designated locations)
• specific work in relation to State and Local Heritage Places
• prescribed mining operations
• other acts or activities in relation to land as declared by the Development Regulations.

No development should be undertaken in South Australia without an appropriate development approval being obtained from a ‘relevant authority’ after an application and assessment process. Heavy penalties may apply to persons undertaking development without approval.

This section outlines the general development application and assessment system, as well the system as it relates to marina and mooring structure development along the River Murray. Possible assessment paths are shown in Figure 1.
Minister makes declaration the development/project is of major environmental, social or economic importance.

Proponent lodges development application or project proposal, (with relevant fees) to give enough information for Development Assessment Commission to identify issues.

Department of Planning and Local Government prepares a preliminary description of significant issues; and may invite written submissions from agencies.

Commission consults criteria in Regulations, relevant authorities; reports to Minister on decisions regarding level of assessment and content of Guidelines.

Proponent prepares EIS, PER or DR.

EIS, PER or DR released for comment and public meeting held.

Proponent responds (where required) to submissions and matters raised by public and relevant bodies.

Minister prepares Assessment Report; copies of all reports available to council/s and public.

Application (usually revised) forwarded for decision-making by Governor, or material forwarded to relevant Minister if a project.

**Figure 1** Major Developments or Projects – assessment processes and decision-making

- Minister’s declaration in South Australian Government Gazette
- Proponent’s application/proposal
- Department of Planning and Local Government SA invites written submissions from agencies on Guidelines
- Commission decides level of assessment, main issues to be addressed in Guidelines and reports to Minister
- EIS, PER or DR prepared using Guidelines
- EIS, PER or DR exhibited and public meeting held if required
- Written response from proponent
- Assessment Report prepared by the Minister and made publicly available
- Decision making
Lodging a development application
The process for obtaining development approval varies according to the type of development proposed. The process generally involves the lodgement of:

- an application form and fees, which vary according to the type of development and consent being sought
- plans and details describing the proposed development
- technical plans of footings and structures and technical specifications (for example, in the case of building work).

Development applications—with the exception of declared Major Developments and land divisions—are lodged with the council in whose area the land relevant to the application is situated. Major Developments and land divisions are assessed by the independent state authority called the Development Assessment Commission (DAC).

Assessment process (consents and approvals)
A development application may require a number of ‘consents’ before it receives final development approval. These consents can be granted on the basis of a single application in most cases. The consents that make up a final approval are commonly ‘building rules consent’ (which involves assessment against the building rules) and ‘development plan consent’ (which involves assessment against the provisions of the local area development plan; a development plan contains the objectives, policies, zoning, maps and standards for development in the area.) If land is being subdivided, a separate ‘land division consent’ is also required.

Some applications for development plan consent are referred to state agencies and statutory authorities for advice or direction. Those bodies may include, for example, the Environment Protection Authority or the Minister for the River Murray. In some situations, the local community or adjoining landowners may be invited to comment on an application.

Building rules consent is granted by the council or a private certifier of building work. The local council is responsible for issuing the final development approval after checking that all consents are consistent. No work can commence until the development approval is issued.
Relevant authority (development plan consent)

The application is then assessed and decided by the ‘relevant authority’. The local council is most often the relevant authority; it must delegate assessment to qualified staff or a council Development Assessment Panel (DAP) made up of a majority of independent members. The assessment process may be undertaken by a group of adjoining councils known as a Regional Development Assessment Panel (regional panel), if one exists. In some instances the DAC is the assessment and decision making body.

The DAC is the decision-making authority for about half of all development applications in the River Murray, River Murray Flood or Flood zones, including marina and mooring structure development for five or more boats, nearly all land divisions, and some dwellings.

Complying, non-complying and merit development

Land uses and activities that are listed as ‘complying’ and ‘non-complying’ in the development plan are subject to specific development assessment rules. If a development application is listed as complying by either the development plan or Schedule 4 of the Development Regulations, development plan consent must be granted, provided the application meets all the standards for complying development. If a complying standard is not met, the application defaults to a ‘merit’ assessment.

Where a land use or activity is defined as 'non-complying', it is considered to be incompatible with the objectives for that zone and therefore inappropriate, and will generally not be granted consent. However, non-complying land uses may be approved if they meet the policies in the development plan read ‘as a whole’. This can occur only where both the DAC and the DAP (or regional panel) agree, and the application has undergone a rigorous assessment process.

Development that is not listed as either complying or non-complying in the development plan and Development Regulations is subject to a merit assessment. Such applications are assessed against all the relevant policies in the development plan.

Decision (development plan consent)

After the assessment process, the relevant authority can decide to:

- grant consent to an application without change;
- grant consent to an application subject to conditions; or
- refuse the application.

A development application must be refused if it is ‘seriously at variance’ with the policies in the relevant development plan.

The council, regional panel or the DAC must advise the applicant and any member of the community who was eligible to comment on the proposal of its decision and of their appeal rights (if any) in relation to the decision.
Major Development assessment

Under section 46 of the Development Act 1993, the Minister responsible for the Act can declare a proposed development a 'Major Development' if he or she believes such a declaration is appropriate or necessary for proper assessment of the proposed development, and where the proposal is considered to be of major economic, social or environmental importance.

This triggers a thorough state government assessment process with opportunity for public comment before any decision is made on whether the proposal warrants an approval (the final decision is made by the Governor, on the advice of Cabinet).

The decision on whether a development will be declared Major is based on a number of factors, including the degree to which the development or project has a significant effect on:

- adjacent land uses and activities
- natural resources
- services and infrastructure
- air and water
- ecology
- heritage
- the community
- the economy.

The degree to which the effects are predictable and the extent to which prior planning has occurred are also relevant. The process of assessment will vary according to the likely impact of the activity.

Three levels of assessment may be required in the Major Development process:

- Environmental Impact Statement (EIS), for complex issues
- Public Environmental Report (PER) or 'targeted EIS' for a narrow range of complex issues
- Development Report (DR) for general planning-related issues.

The key steps in the Major Development process are shown in Figure 1. Further information is available from <sa.gov.au/planning/majordevelopments>.
River Murray marinas and mooring structures

Development approval
The construction of a marina or mooring structure requires development approval under the Act.

For a single mooring structure or a group of less than five mooring structures, a council DAP may grant development plan consent. For five or more mooring structures, the DAC is the decision-making authority for development plan consent. Large, multi-component marina proposals (especially those with an associated residential land division) are usually declared as Major Developments and decisions are made by the Governor (based on advice from Cabinet) after state government assessment.

When considering a development proposal, the DAP or the DAC must assess the application against the zone policies in the relevant development plan before making a decision. An application can be either refused or granted consent (with conditions applied) if it is not seriously at variance with the development plan provisions.

Comment must be sought on a marina or mooring structure development application from the Minister for the River Murray in certain situations (River Murray Act). The Department for Water, Land and Biodiversity Conservation (DWLBC), acting on behalf of the Minister, either provides advice or direction (on whether the application should be refused or approved subject to certain conditions) under prescribed circumstances. DWLBC can provide comment on a range of matters that affect the health of the river, including the general impact on the environment, land degradation, amenity, water quality implications, water flow and flooding, and vegetation (exotic and native).

Comment is also often sought from other agencies that are responsible for Native Title, Aboriginal heritage and Non-Aboriginal heritage.

The referral of a development application from a relevant authority (for example, from a council to the Minister for the River Murray) occurs automatically and may incur an additional fee.

Crown lands
Proposals and applications for mooring structure and marina development usually also involve Crown land. (In many instances, the riverbank comprises a strip of Crown land, to which private, or freehold, land adjoins.) Permission is required from the Department for Environment and Heritage (Crown Lands) to allow a private landowner to gain access over Crown land to the river; a lease or licence is usually required to allow structures to be placed on Crown land and for access rights. This can happen only after development approval is gained. Generally, only one mooring structure per landowner (or land parcel) is allowed. The granting of a lease on Crown land usually requires a Native Title notification process to be undertaken first.
Additional Approvals

River Murray Act (State)

The River Murray Act 2003 was established by the South Australian Government to protect the health of the River Murray, while recognising the social and economic significance of the river to the State. It aims to coordinate activities that may affect the health of the river by integrating protection into other acts that affect the River, including the Development Act 1993.

The ‘River Murray’ is defined to include:

- the River Murray system, including the main stem and all anabranches, tributaries, wetlands and flood plains
- the natural resources of the River Murray, being: soil, water, air, vegetation, animals and ecosystems connected or associated with the River Murray system
- cultural heritage and natural heritage, and amenity and geological values associated or connected with the River Murray system, and minerals and other substances and facilities administered under any of the Mining Acts, to the extent that activities undertaken in relation to them may have an impact on the River.

The Act contains a wide range of powers for promoting protection of the River Murray. These include a ‘duty of care’, whereby all people undertaking activities that could impact on the river have a duty not to harm the river through their actions and the ability to establish management agreements between the Minister and landowners to assist conservation efforts. In addition, there is a capacity to regulate or prohibit activities deemed to be harming the river through regulations, and a referral mechanism that requires (a) referral of certain applications for statutory authorisations (eg. licenses, permits) made under other Acts to the Minister for the River Murray, and (b) the referral of certain statutory planning instruments (eg. council development plans) to the Minister for the River Murray. The Minister also has the power under the Act to undertake various works and measures to promote the health of the River.

Duty of care

The River Murray Act 2003 established a ‘duty of care’, which is a duty to take reasonable precautions to ensure that the actions undertaken by a person/organisation do not cause harm to the health of the River.

The duty of care applies to everyone. It is not an offence to breach the duty but an order can be made that directs a person/organisation to alter the manner in which they undertake an activity so that it does not cause harm to the River, or directs the cessation of the activity altogether. It is an offence not to comply with such an order.
Environment Protection Act (State)

If a proposal or development application involves dredging or earthworks drainage activities, a licence under the Environment Protection Act 1993 must be sought from the Environment Protection Authority (EPA). In addition, an EPA licence is required for the conduct of:

- a marina with 50 or more berths (or dry storage) or
- works for the repair or maintenance of five or more vessels (or vessels greater than 12 metres in length).

Aboriginal Heritage Act (State)

Under the Aboriginal Heritage Act 1988 approval from the Minister for Aboriginal Affairs and Reconciliation is required to damage, disturb or interfere with an Aboriginal heritage site. The River Murray and its tributaries contain numerous sites of significance, so it is likely that any application for development along the river would have implications for Aboriginal heritage.

Proposals for any marina in those lands and waters or adjacent land must incorporate investigation into any activity having the potential to affect native title rights and resolution of any effect by notice or agreement recognised by the Native Title Act 1993 (Commonwealth).

Currently there are two registered claims to land and waters along the River Murray by the Ngarrindjeri and First Peoples of the River Murray and Mallee Region. The State must be involved in any negotiations about native title, particularly if it is proposed to fetter or extinguish those rights. Advice should be sought from the Native Title Section of the Crown Solicitor’s Office where any proposal may appear to affect native title rights.

All proponents need to consider this issue in the initial stages of preparing an application (scoping phase). Early consultation should be undertaken with the Department of Premier and Cabinet (Aboriginal Affairs and Reconciliation Division) and local Aboriginal groups. An archaeological survey usually needs to be undertaken to identify significant sites.

The absence of any recorded sites in the vicinity of a proposed development does not necessarily mean that such sites do not exist and further investigation may be required.
Native Vegetation Act (State)

Under the Native Vegetation Act 1991 an applicant who proposes to remove, damage or disturb any terrestrial or aquatic native vegetation is required to obtain approval for the vegetation clearance from the Native Vegetation Council (NVC). Whilst broad scale clearance of native vegetation (or large scattered trees) is generally prohibited, small-scale clearance of vegetation may be allowed but needs to be fully justified and compensated for (such as through protecting existing vegetation or revegetation) before the NVC will grant approval.

Under the Regulations of the Native Vegetation Act 1991 a proponent of a medium- to large-scale marina is exempt from the requirement to obtain approval for vegetation clearance if the proposal has been the subject of an EIS under the Major Developments provisions of the Development Act. Comments by the NVC on the EIS must be sought and included in the Government’s Assessment Report. Whilst statutory approval for vegetation clearance is not required from the NVC for Major Developments, suitable compensation for clearance needs to be achieved to the satisfaction of the NVC. This is achieved through the negotiation of a Significant Environmental Benefit (SEB).

Where the proposed native vegetation clearance is associated with a development application (excluding Major Development), the referral of the application from a relevant authority to the Minister for the River Murray (DWLBC) occurs automatically and a native vegetation clearance assessment also occurs under delegation from the NVC. This removes the need for a separate native vegetation clearance application and may incur an additional fee.

All proposals that involve vegetation clearance need to consider this issue in the initial stages of preparing an application (scoping phase). Early consultation should be undertaken with the Department for Land, Water and Biodiversity Conservation (Native Vegetation Section).
Environment Protection and Biodiversity Conservation Act (Commonwealth)

The Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (the EPBC Act) establishes an environmental assessment and approval system that is separate and distinct from state systems, and based on matters of ‘national environmental significance’ (NES).

Under the EPBC Act, proponents are legally obligated to refer any development likely to have a significant impact on a NES matter or on the environment of Commonwealth land (even if the action is taken outside Commonwealth land) to the Commonwealth Minister for the Environment and Heritage.

It should be noted that a proposal for a marina or mooring structure development along the River Murray may need to address the obligations under EPBC Act, even if it complies with local and state government requirements.

More detailed information on the obligations under the EPBC Act, including what constitutes a significant impact of matter of NES, can be found at the Australian Government Department of the Environment, Water, Heritage and the Arts website at <www.deh.gov.au/erin/ert/epbc/imap/map.html>, or by contacting the Department’s Community Information Unit on 1800 803 722.

The website provides access to a map that can be used to assess whether any matters of NES are present at a proposed development locality. If any matters are found, expert opinion should be sought as to whether the proposed marina or mooring structure development is likely to have a significant impact. If a significant impact is likely, the action should be referred to the Commonwealth Minister for the Environment and Heritage. Guidance on making a referral is available at <www.deh.gov.au/epbc/assessmentsapprovals/index.html>.

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3 The seven matters of National Environmental Significance are:

- World Heritage properties
- National heritage places
- Ramsar wetlands of international significance
- Threatened species and ecological communities
- Migratory species
- Commonwealth marine area
- Nuclear actions (including uranium mining)

For further information, visit the EPBC Act website at <www.deh.gov.au/epbc/matters/index.html>
The following research and analysis was undertaken by the South Australian Government Interagency River Murray Working Group during 2004–09.

Types of marinas and mooring structures

The facilities for the mooring of houseboats and larger vessels along the River Murray range from large-scale, formal, off-river marinas (for example, River Glen Marina near Murray Bridge, Kia Marina near Mannum and the Hindmarsh Island Marina), to medium- to large-scale, on-river marinas (for example, at Morgan, Berri and Waikerie), to small-scale, informal, on-river marinas (for example, at Kingston-on-Murray and Paringa).

Off-river marinas include those developed in a wetland on a backwater/anabranch or in a basin excavated on the floodplain. On-river marinas are comprised of rows of houseboats moored to the riverbank.

Formal off-river marinas are usually fully constructed developments with abutting boardwalks, jetties, bank treatments, moorings and associated boating and visitor facilities.

There is a growing trend for the development of waterfront residential canal estates that provide private mooring structures. These are ‘de facto’ marinas as they potentially have the same impact on the river as a traditional marina.

In addition, there are numerous locations where houseboats are moored either temporarily or permanently in small groupings or individually. These riverbank mooring sites usually involve securing boats to a post or pile on the bank, usually without protection of the bank, or with some ad hoc form of buffering, such as a timber rail to prevent erosion. In some instances trees are used as mooring structures.

Existing marinas and mooring sites

While the majority of marina developments in South Australia have been constructed or proposed for coastal locations, several marinas have previously been constructed along the River Murray. These include large residential marinas near Murray Bridge (for example, River Glen and Long Island) and on the Lower Lakes (for example, the Marina Hindmarsh Island and the Marina Wellington). A residential canal estate, with mooring structures for private boats and a small marina basin, has also been developed at Renmark (the Jane Eliza Estate development). More recently, a large residential marina has been proposed for Mannum and has been designed as a major facility for the mooring of houseboats and the control of associated pollution sources. Mannum currently has several small- to medium-scale, on-river marinas located near the township and a large-scale, formal, off-river marina located upstream (the Kia Marina).
A Supply and Demand Study\(^4\) conducted in 2005 identified 37 marinas along the River Murray from the South Australian border to the sea, including the Lower Lakes. The total number of mooring sites in these marinas was 1,473; of these, 803 were in marinas situated along the main channel of the River. Most of the moorings in marinas along the main channel were located in on-river marinas, while only 314 were located in off-river marinas. The remaining 670 moorings were located in marinas around Lakes Alexandrina and Albert (including Goolwa and Hindmarsh Island).

With the exception of the Marina Wellington and the Marina Hindmarsh Island, the majority of marinas and mooring sites appear to be primarily spread between Murray Bridge and the South Australian-Victorian border, with a high concentration in the upper reaches. The greatest concentration of mooring sites in marinas is within relatively close proximity to the towns that are relatively evenly disbursed along the middle reaches of the River from Murray Bridge.

The marinas in the Lower Lakes area are predominantly for the yacht cruising circuit and not for houseboats, whereas the ones on the main river channel are primarily for houseboats, with a few mooring sites used by smaller craft. It is worth noting that an increasing number of houseboats and large vessels are being moored on a permanent or semi-permanent basis at the Marina Hindmarsh Island (including the co-locating of the industries involved in the construction and maintenance of such vessels).

It is estimated that there are hundreds of unregistered or unlicensed ad hoc houseboat mooring sites along the length of the riverbank. In addition, approximately 3,000 jetties used primarily for small boats (for example, for waterskiing) and general recreation are located along the main channel of the River; a considerable portion of these jetties are unlicensed. These figures, while general in nature, appear evident from a recent Department of Environment and Heritage study of river structures along the River Murray.

**Drivers for marina development**

The development of river marinas and adjacent land has increased markedly over the past 15 years.

Traditionally, marinas along the River Murray have been established for the mooring of houseboats, with some also providing adjoining residential development or services for living on board houseboats. Many houseboats used for permanent living do not technically require development approval for a dwelling or residential use of the land, although there are good reasons why they should (such as for structural soundness and fire safety).

While there is still demand for mooring sites in marinas, recent trends indicate the River Murray is being viewed as an opportunity to satisfy the demand for residential development with water frontage or river views. It now appears that with the high cost and limited availability of coastal land, where marinas have traditionally been concentrated, the focus may have changed to the River Murray.

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\(^4\) The study was prepared by Collier International Consulting Services (SA) and provided as a supporting document to the draft Houseboat, Mooring and Marina Strategy for the River Murray (2008).
River marinas have the potential to provide a number of outcomes, including:

- better management and control of houseboats
- reducing the impact of houseboats and ad hoc mooring activity on the health of the river
- increased supply of land adjacent to the river
- the provision of recreational and commercial facilities
- a lifestyle destination in their own right.

Marinas can also potentially put a place on the map and contribute to the economic and social development of the surrounding community. However, the development of marinas can also pose serious and real risks, particularly to the environment. Therefore, it is necessary to ensure that they only occur at locations that will ensure their long-term environmental sustainability and economic viability.

**Demand for residential waterfront land**

The increase in demand for waterfront property has been fuelled by people seeking a permanent change in lifestyle (the ‘sea-change’ phenomenon) and also by ‘mum and dad investors’ buying a holiday house to meet several needs, such as a weekend escape, a retirement proposition, a long-term investment and, in some cases, a healthy yield. Waterfront property is an attractive proposition for ‘baby boomers’ as they approach or reach retirement (and, increasingly, begin to inherit their parents’ estates) and it is assumed that this demographic will continue to be a major contributor to this trend. There is also demand for holiday homes by people wishing to pursue recreational activities on the river, particularly waterskiing. The limited availability and increasing costs of holiday homes (shacks) is likely to encourage demand for residential opportunities associated with marinas.

The availability of land fronting the River Murray and suitable for residential subdivision has been relatively limited in recent years. However, there have been a few smaller developments and a couple of large projects. In particular, the Marina Hindmarsh Island development and the former Wellington Waters development (associated with the existing the Marina Wellington) have provided large numbers of waterfront allotments. Developers see these residential marinas (canal estates) as the best economic option due to the attraction of waterfront living and premium land sale prices.

Given that there is a restricted supply of river frontage, residential allotments (mainly provided through the shack free-holding process), it is expected that freshwater marinas would satisfy a growing demand for waterfront housing. This situation is likely to result in an increasing number of proposals for this type of development. This is demonstrated by the renewed interest in completing the residential component of the Jane Eliza Estate development at Renmark, which was only partly constructed (due to the depressed economic climate in the early 1990s). A large residential marina development proposed at Mannum has been declared a Major Development and its potential effects are currently being investigated.
Demand for houseboat mooring sites

The Supply and Demand Study (2005) found that the occupancy of the majority of the marinas was in excess of 80 per cent, with the exception of the marinas at Wellington and Hindmarsh Island, both of which were operating at around 65 per cent occupancy.

The study divided the primary user and demand groups for mooring sites into four categories:

**Owner occupiers**
Those who own their mooring facility (or the right to use it) and moor their own vessel, whether permanently or on a periodic basis. The most common form of owner occupier, when referring to a river marina, is the owner of the whole marina, who operates a commercial boat hire business from it, with the business vessels occupying the mooring sites.

**Investors**
Those who purchase a mooring facility principally for the potential income stream and/or capital gain that it provides. Mooring facilities owned by investors are generally offered for lease, on either a periodic or casual basis. There are only a small number of investors that have purchased individual mooring facilities. Further, given potential returns (excluding capital growth), it would take approximately 15 to 20 years to recover costs, which on the face of it, is not an attractive investment.

**Lessees**
Those who lease a mooring facility from a marina owner for the mooring of their vessel. Leases are usually for terms of 3, 6, 9 or 12 months. Terms are wide and varied due to the itinerant nature of many vessel owners and the simplicity of arranging to move to a new location.

**Casual users**
Those who moor their vessel at a location on a short-term basis, which may be a few days or weeks. Casual users are more likely to use ad hoc mooring structures (such as trees) instead of using dedicated mooring structures located along the river channel which are likely to be occupied on a more permanent basis and therefore unavailable to the casual user.

The study concluded that the proliferation of overnight stays dotted along the river, particularly between marinas, means that most casual users whether staying overnight or for a couple of days, would rather use these free resources.
Reference maps

MAP 1  Significant environmental features, the main raw water extraction points and protection areas along the River Murray from the border to Walkers Flat

MAP 2  Significant environmental features, the main raw water extraction points and protection areas along the River Murray from Walkers Flat to the sea

MAP 3  Location of all wetlands and key biodiversity areas along the Upper River Murray

MAP 4  Location of all wetlands and key biodiversity areas along the Lower River Murray and Lower Lakes

MAP 5  Locations of marinas along the Upper River Murray

MAP 6  Locations of marinas along the Lower River Murray and Lower Lakes

These maps have been produced by Department of Planning and Local Government (DPLG).

Data Source: Draft wetlands at January 2007, roads, shipwrecks, watercourse, local government boundary, protected areas, 1956 flood, vegetation heritage agreements and water protection area supplied by DEH. Protection areas supplied by DWLBC. Raw water zones supplied by EPA.

Projection: Lambert Conformal Conic

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MAP 1 Significant environmental features, the main raw water extraction points and protection areas along the River Murray from the border to Walkers Flat
MAP 2

Significant environmental features, the main raw water extraction points and protection areas along the River Murray from Walkers Flat to the sea.
MAP 3 Location of all wetlands and key biodiversity areas along the Upper River Murray
MAP 4 Location of all wetlands and key biodiversity areas along the Lower River Murray and Lower Lakes

* Refer to Biodiversity Plan for the South Australian Murray-Darling Basin for additional information about these areas.
MAP 5  Locations of marinas along the Upper River Murray
Locations of marinas along the Lower River Murray and Lower Lakes