STATE PLANNING COMMISSION

# NATURAL RESOURCES AND ENVIRONMENT

## BACKGROUND PAPER

August 2018

Government of South Australia
Department of Planning, Transport and Infrastructure

saplanningcommission.sa.gov.au

# CONTENTS

PURPOSE OF THIS BACKGROUND PAPER ..... 4
PART 1: WHY ARE OUR NATURAL RESOURCES AND ENVIRONMENT IMPORTANT? ..... 5
PART 2: RELEVANT POLICY CONTEXT ..... 14
PART 3: MAJOR THEMES FOR OUR NEW SYSTEM ..... 19
TABLE OF FIGURES ..... 59
GLOSSARY ..... 60
APPENDICES ..... 65
REFERENCES ..... 76

Natural Resources and Environment Background Paper
State Planning Commission
August 2018
ONLINE: 978-0-7590-0292-0

Oaklands Wetland. Source: Michael Mullan

# PURPOSE OF THIS BACKGROUND PAPER

This document is the State Planning Commission's *Natural Resources and Environment Background Paper*, a technical report supporting the *Natural Resources and Environment Policy Discussion Paper* which aims to:

- provoke thought and discussion about how current policy supports South Australia's planning goals in relation to the integration of our natural resources and environment.
- identify existing policies that are ready to be transitioned to the first iteration of the Planning and Design Code Policy Library and those policy areas that will require more significant reform over time.

This paper provides background to these issues through the lens of the following policy themes:

1. Sustainable and liveable urban environments
    - Green Infrastructure and Water Sensitive Urban Design
    - Sustainable Design
    - Waste
2. Water security and quality
    - Mount Lofty Ranges Water Protection Area
    - Other Water Protection Areas
    - River Murray
3. Biodiversity
4. Coastal environments
5. Natural hazards
6. Environment protection and public health
    - Site Contamination
    - Interface including noise and air emissions.

This paper provides a summary of the investigations undertaken on behalf of the Commission which:

- Highlight relevant trends influencing decisions that may require a planning policy response
- identify gaps or deficiencies in existing natural resources and environment related policy that need to be addressed to ensure alignment with state strategic directions
- identify opportunities to consolidate existing policy
- highlight investigations and research to be undertaken to inform proposed policy directions
- recommend policy directions for the Code, including the identification of where existing policy should be transitioned and where further investigations are necessary.

The *Natural Resources and Environment Policy Discussion Paper* and this background paper are closely aligned with the Commission's ongoing *Green Infrastructure, Water Sensitive Urban Design and Environmental Resilience technology* Conversation Area. This paper is intended to be read in support of the *Natural Resources and Environment Policy Discussion Paper*, which is the primary paper and includes policy recommendations. The Discussion Paper is available to download at: www.saplanningportal.sa.gov.au.

# PART 1: WHY ARE OUR NATURAL RESOURCES AND ENVIRONMENT IMPORTANT?

Natural resources and our environment underpin South Australia's economic prosperity and social wellbeing. They provide us with water, food, fuel and fibre, and support industries and communities as well as our quality of life. They provide climate regulation, air and water filtration, natural pest control and cultural, spiritual, economic and recreational benefits. To ensure we can continue to access and benefit from our natural resources and the opportunities they provide, we need to manage them carefully and balance their use and protection.

We recognise that past decisions have changed our natural environment and now more than ever we need to protect our natural assets so they can continue to support our communities and the planning system has a key role to play.

The following section outlines the importance of our natural resources and environment and some of the key trends relating to:

- Mitigating and adapting to climate change
- Incorporating green infrastructure and water sensitive urban design
- Protecting and securing our water resources
- Valuing and enhancing biodiversity
- Building resilience to hazards.

It is also explored what these issues mean for land-use policy with links provided to the major policy themes for our new system discussed in Part 3 of this paper.

Blue Lake, Mount Gambier. Source: SATC (Adam Bruzzone)

## Mitigating and adapting to climate change

Climate change impacts including increases in the frequency and intensity of extreme weather events (such as heatwaves, bushfire, flood and drought); warming; drying and sea level rise, all of which affect community health, safety and wellbeing, primary production and natural landscapes.

The state's future prosperity and liveability will depend on how effectively we address and respond to these impacts.

Responding to climate change requires both mitigation and adaptation. Mitigation refers to actions that reduce the emission of greenhouse gases by moving away from fossil fuel energy and increasing the long-term storage of carbon dioxide or other forms of carbon (sequestration). Adaptation refers to actions that avoid, adjust, withstand or benefit from climate change. The way in which we manage our built and natural environments will have direct and long term implications on our ability to adapt to climate change impacts.

### *Links to Major Policy Themes*

The following major policy themes described in Part 3 of this paper are relevant to mitigating and adapting to climate change:

1. Sustainable and Liveable Urban Environments
2. Water Security and Quality
3. Biodiversity
4. Coastal Environments
5. Natural Hazards.

Solar photovoltaic panels being installed. Source: DEW

### *Key trends – what are we seeing?*

**A warmer and drier climate with more extreme weather events**

Climate projections[1] indicate there will be:

- Warming temperatures in all seasons across South Australia. By 2100 it is projected that average temperatures will increase by up to 3°C.
- Increasing frequency and intensity of heatwaves and hot days. By 2100 it is projected that Adelaide will experience more than 15 days over 40°C per year and Marree will experience more than 50 days over 50°C per year.
- Reduced annual rainfall and more time spent in drought. By 2100 it is projected that winter and spring rainfall will decrease by between 10% and 45%.
- Sea level rise and an increase in coastal erosion. By 2100 it is projected that South Australian mean sea level will rise by up to 80cm, with an increase in storm surge events and coastal erosion.
- Increasing bushfire risk. By 2100 it is projected the number of days of very high or extreme fire danger index will increase across South Australia by between 25% and 120%.

**The cost of dealing with natural hazards is increasing significantly**

**The total costs of natural disasters in Australia are forecast to more than double in real terms to $39 billion per year by 2050[2].**

## Incorporating green infrastructure and water sensitive urban design

Green infrastructure is required to cool our urban areas through a network of green spaces and environmental or water management features that deliver a wide range of environmental, economic and social benefits. Green infrastructure features can operate and provide benefits at small scales such as living walls, roof gardens and pathways and larger scales such as parks and reserves, transport corridors, watercourses and wetlands.

Water sensitive urban design (WSUD) is closely linked to green infrastructure. WSUD integrates the management of the total water cycle into land use and development. This requires consideration of available water sources and use, water bodies, receiving environments and water quality and water quantity, including flooding.

More Australians die from extreme heat than from any other type of natural disaster[3]. The effect of heat on the community, infrastructure and services is cumulative. A single day of high temperature can have an impact and this impact escalates with successive days of high temperatures. In urban areas, heat is produced and retained by hard surfaces and structures such as roads, paving and windows. Increases in development and infill development in particular can lead to increases in the proportion of impervious areas and runoff.

In addition to the positive outcomes for community health and wellbeing, the benefits of green infrastructure and WSUD include:

- more attractive, greener and cooler urban areas
- lower building energy demand
- increased amenity
- the provision of clean water and clean air
- enhanced liveability, sustainability and resilience of urban communities
- improved wildlife habitat and biodiversity
- improved stormwater runoff quality and better management of stormwater runoff volumes and rates
- retention of water in the environment to increase soil moisture and sustain tree canopy.

Green infrastructure, Windsor Street, Parkside. Source: DPTI

## *Key trends – what are we seeing?*

### Reduced private open space

Infill development, increased dwelling density and a trend to larger houses on smaller allotments are reducing private open space in our urban areas[4].

### Loss of tree canopies in metropolitan Adelaide

Recent data indicates that many metropolitan Adelaide councils have experienced a decline in canopy cover and an increase in hard surfaces such as roads. For example, a recent report[5] found that 17 of the 19 councils had a loss of green cover over the period 2013 to 2016. (Refer Table 1).

**Table 1: Changes in land surface cover from 2013 to 2016**

| Land cover | Proportion of canopy cover 2013 | Proportion of canopy cover 2016 | Direction of change |
|---|---|---|---|
| Tree Canopy Cover | 21.4% | 19.5% | 1.9% Loss |
| Shrub Cover | 5.9% | 5.2% | 0.7% Loss |
| Grass Cover | 32.1% | 32.1% | Stable |
| Hard Surface | 40.6% | 43.2% | 2.6% Increase |

*Allotment sizes across Greater Adelaide have reduced significantly in recent years to around 371 square metres per allotment. This is the lowest median allotment size of all capital cities in Australia.*

*HIA-CoreLogic Residential Land Report, April 2018.*

## *WSUD projects across South Australia*

Water sensitive urban design projects have been undertaken across South Australia, including towns on Eyre Peninsula, Yorke Peninsula, the Mid North, Riverland and Limestone Coast. These projects include wetlands, infiltration, rainwater, stormwater and recycled water harvest and reuse which provide benefits including water for irrigation, water quality improvements, biodiversity corridors and enhanced amenity.

## *Links to Major Policy Themes*

The following major policy themes described in Part 3 of this paper are relevant to incorporating green infrastructure and water sensitive urban design:

1. Sustainable and Liveable Urban Environments
3. Biodiversity

# Protecting and securing our water resources

Naturally occurring fresh water resources in South Australia include surface water in watercourses, wetlands, lakes and groundwater. These water resources support agriculture, horticulture and industry and contribute to conservation, character, amenity, spiritual and recreation values.

Water security underpins sustainable economic development, population growth, primary production, food security and healthy ecosystems. The Australian Water Association defines water security as: 'the certainty the Australian community can have that its water needs will be met into the future on an economically, socially and environmentally sustainable basis'.

This requires the provision of:

- safe and affordable drinking water
- water to support industry and agriculture
- water management to create liveable communities
- water to protect the environment.

SA Water is responsible for the supply of drinking water and wastewater services across South Australia. This water is sourced from surface water, groundwater, sea water (via desalination) and the River Murray.

On average, the Greater Adelaide region sources about 60% of its domestic water from the Mount Lofty Ranges Watershed via 10 reservoirs. Unlike other states of Australia, where water catchment areas are almost entirely publicly owned, the Mount Lofty Ranges Watershed Protection Area (MLRWPA) has a high level of private ownership.

The River Murray is a critical water supply source for South Australia. Many regional communities and metropolitan Adelaide rely on the river for their domestic supply and to irrigate agriculture, horticulture and other industries.

While many of the state's towns and regional centres are serviced by water piped from the River Murray, other areas rely on local supply. This is provided by surface water systems and catchment and underground aquifers. For example, Kangaroo Island is generally heavily reliant on surface water, while in the South East, groundwater is used for domestic, industrial and primary production. The far west of the state relies on underground supply and surface water systems and catchment. In our remote northern areas the Great Artesian Basin is the largest source of water for primary production, mining, tourism and domestic activities.

River Murray, Bowhill. Source: SATC (Dave Hartley)

## *Key trends – what are we seeing?*

### Water sources

Water sources vary depending on rainfall and runoff. The figure below shows how from year to year, the proportion of water supplied to South Australia by SA Water (not including recycled wastewater or stormwater). In dry years, a lower volume of water is available from surface water sources, increasing the use of River Murray Water or desalinated sea water.

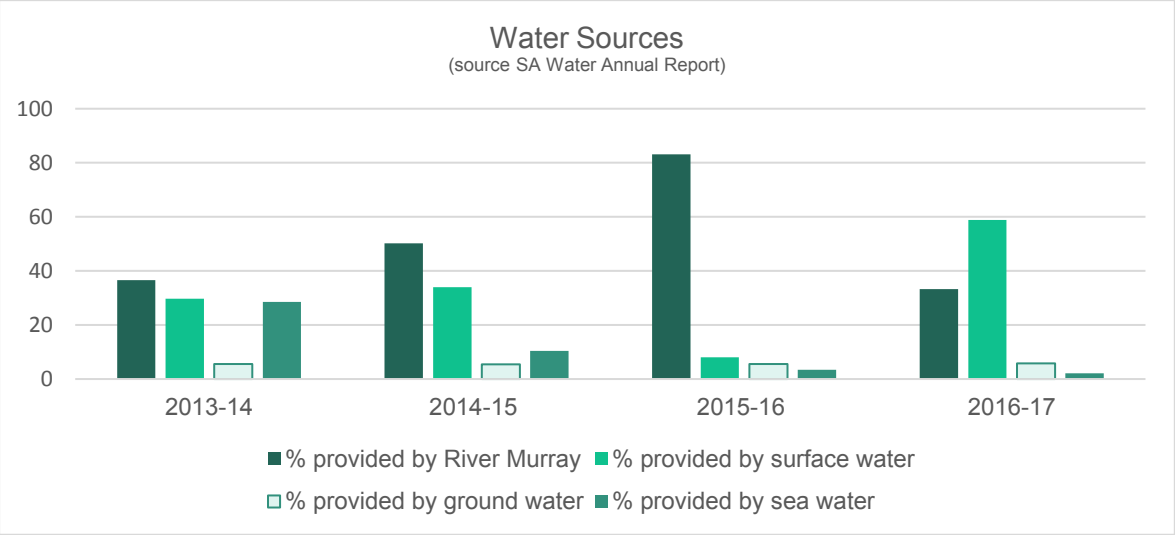



Figure 1: South Australian Water Sources. Source: SA Water

### Reduced rainfall and runoff

Climate change projections show decreases in rainfall across all of South Australia. Table 2 below shows the projected reductions in annual rainfall for the Natural Resource Management Regions by 2100. Some of the greatest reductions are projected for our productive agricultural regions.'

**Table 2: Projected reduction in rainfall for NRM Regions in South Australia by 2100**

| Natural Resources Regions | Rainfall reduction by 2100 |
|---|---|
| AMLR – Adelaide and Mount Lofty Ranges | 7.8- 17.4% |
| AW and SAAL – Alinytjara Wilurara; SA Arid Lands | 7.3-17.9% |
| EP – Eyre Peninsula | 10-20.9% |
| KI – Kangaroo Island | 18.2-18.8% |
| NY – Northern and Yorke | 14.1-26.9% |
| SAMDB – SA Murray-Darling Basin | 11.4-21.7% |
| SE – South East | 6.5 – 18.9% |

Source: SA Climate Ready, Climate projections for SA, Goyder Institute

## *Links to Major Policy Themes*

The following major policy themes described in Part 3 of this paper are relevant to protecting and securing our water resources:

1. Sustainable and Liveable Urban Environments
2. Water Security and Quality
3. Coastal Environments
4. Natural Hazards.

# Valuing and enhancing biodiversity

South Australia's natural environment includes some of the most biologically diverse ecosystems in the world[8].

Our patterns of land clearance, consumption and development have however fragmented and disrupted these natural eco-systems, resulting in a significant loss of biodiversity and natural character. This has led to reduced primary production yields; reduced liveability; increased public costs associated with remedial actions; increased nuisance from over abundant native species (such as Corellas, Lorikeets, Kangaroos, Deer and Flying Foxes); land degradation; water quality issues; and loss of biodiversity.

Action to protect and enhance our biodiversity needs to occur across every landscape, from our cities to the outback and must recognise that private landholders manage a large proportion of the state's land and its biodiversity.

### *Links to Major Policy Themes*

The following major policy themes described in Part 3 of this paper are relevant to valuing and enhancing biodiversity:

1. Sustainable and Liveable Urban Environments
3. Biodiversity.

### *Key trends – what are we seeing?*

**Loss of native vegetation**

Native vegetation covers about 85% of South Australia's total land area. In the arid northern part of the state, more than 95% of native vegetation cover remains however in southern temperate areas, only 26% of native vegetation cover remains[6].

**Threatened and extinct species**

South Australia has some of the highest extinction rates in Australia. Since European settlement at least 23 mammals, two birds and 26 plants have become extinct. The number of threatened species is growing and today 63% of the state's mammals, 29% of birds and 23% of vascular plants are considered threatened[7].

Deep Creek Conservation Park, Fleurieu Peninsula. Source: SATC (Benjamin Neville)

# Building resilience to hazards

A hazard is anything that has the potential to cause damage or harm including natural hazards such as extreme weather (heatwaves, storms and severe winds); bushfires; floods (riverine, flash flood, sea inundation and dam burst); coastal erosion; landslip; and earthquakes.

Communities are also exposed to man-made hazards associated with the storage and management of hazardous materials, noise, air pollution and contamination of land and groundwater. Many contamination issues are the legacy of a lack of awareness about the long-term impacts of waste disposal. Past chemical disposal practices considered appropriate at the time, such as pouring down drains, are no longer acceptable by today's standards. Certain soil and groundwater contaminants can cause health problems if humans are exposed to high enough concentrations over a period of time.

Together these hazards impact the health and wellbeing of our communities, infrastructure, essential services and economies.

*The Supplement to the 2011 First Pass National Assessment of Climate Change Risks to Australia's Coast estimated between 31,000 and 48,000 residential buildings were exposed to the combined impacts of inundation and erosion risks as a result of a sea-level rise of 1.1m, with an estimated replacement cost of between $5 and $8 billion.*

*Department of Climate Change and Energy Efficiency 2011,* Climate Change Risks to Coastal Buildings and Infrastructure: A Supplement to the First Pass National Assessment, *Commonwealth of Australia.*

Flinders Chase National Park, Kangaroo Island. Source: Tourism Australia (Greg Snell)

### *Key trends – what are we seeing?*

**The cost of dealing with natural hazards is increasing significantly**

The total costs of natural disasters in Australia are forecast to more than double in real terms to $39 billion per year by 2050[9].

Recent extreme weather events have resulted in loss of life and property. In September 2016 a severe storm system moved across South Australia. Initial estimates for repairing public infrastructure included $20 million for major roads, $3.5 million for rural jetties and around $ 1.2 million for passenger rail infrastructure. Primary producers in the Northern Adelaide plains were heavily impacted, with initial costs estimates of damage of more than $50 million with more than 300 primary producers affected. The Pinery bushfire in November 2015 resulted in 2 fatalities, 91 homes destroyed and $61 million in insurance costs. The Sampson Flat bushfire in January 2015 resulted in 134 people injured, 27 homes destroyed and $24.9 million insurance costs[10].

## *Links to Major Policy Themes*

The following major policy themes described in Part 3 of this paper are relevant to building resilience to hazards:

4. Coastal Environments
5. Natural Hazards
6. Environment Protection and Public Health.

# PART 2: RELEVANT POLICY CONTEXT

The existing policy environment in South Australia will provide the foundation for drafting policy content for the new Code. A thorough review of the following documents has resulted in the identification of the strengths and limitations of existing policy within development plans and the South Australian Planning Policy Library (SAPPL), including opportunities for policy consolidation, where policy gaps currently exist and highlight new and emerging policy areas. The results of this review are discussed under the major policy themes in Part 3 of this paper.

## Strategic Directions

### *Draft State Planning Policies (SPPs)*

Once in place, the State Planning Policies (SPPs) will outline the high-level planning priorities for SA and enable the new system to respond to current and future opportunities and challenges. In drafting the new Code Policy Library, the Commission must ensure the policies developed align with the direction set out in the relevant SPPs.

The SPPs relevant to Environment and Natural Resources are:

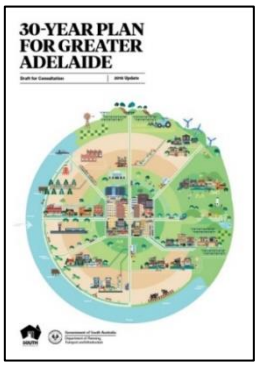
- Biodiversity (required by legislation)
- Climate change (required by legislation)
- Design Quality (required by legislation)
- Coastal Environment
- Water Security and Quality
- Natural Hazards
- Emissions and Hazardous Activities.

### *Regional Plans*

As with the SPPs, the directions set out in Regional Plans will provide the strategic foundation for the Code Policy Library. Given they are yet to be proclaimed under the new Act, the current Planning Strategies for South Australia will serve as the state's interim Regional Plans. It is important to note that where there is conflict between a Regional Plan (Planning Strategy) and the SPPs, the SPPs will prevail.

#### The 30-Year Plan for Greater Adelaide

First released in 2010 and updated in 2017, the 30-Year Plan is the state government's strategic land use plan for the Greater Adelaide region. The plan sets out future directions for growth, with an emphasis on providing greater affordable living choices, healthy neighbourhoods, improved utilisation of infrastructure, enhanced liveability and a more compact, sustainable urban form.




The 30-Year Plan for Greater Adelaide – 2017 Update. Source: DPTI

The Plan includes a number of specific policy themes of relevance to our environment and natural resources:

- Climate Change
- Water
- Biodiversity

- Emergency Management and Hazard Avoidance
- Infrastructure
- Design Quality.

Implementation of the strategic directions of the Plan is guided by six targets, the following two of which are directly relevant to this discussion paper:

**Target 1:** Containing our urban footprint and protecting our resources (85% of all new housing built in established urban areas by 2045 in metro Adelaide and 90% in Outer Greater Adelaide will be built in established townships and designated urban development areas).

**Target 5:** A green liveable city (20% increase in urban green cover by 2045).

For a list of relevant policies refer to Appendix 1.

### Regional Planning Strategies

The other seven planning strategies (known as Regional Plans) contain goals and objectives for the protection of local natural environments across the rest of the state. The overall goals are fairly consistent across the regional strategies with the detailed targets being regionally specific:

- Recognise and protect the region's environmental assets
- Ensure the efficient use of water and energy
- Protect people, property and the environment from exposure to hazards
- Sustainably manage waste, wastewater and stormwater
- Create conditions for the region to become resilient to the impacts of climate change
- Foster sustainable alternative energy and water supply industries.

For a list of relevant policies refer to Appendix 1.

## *Other Government Strategic Plans*

There are a number of other government strategic directions relevant to this paper, see Figure 2 and Appendix 3.

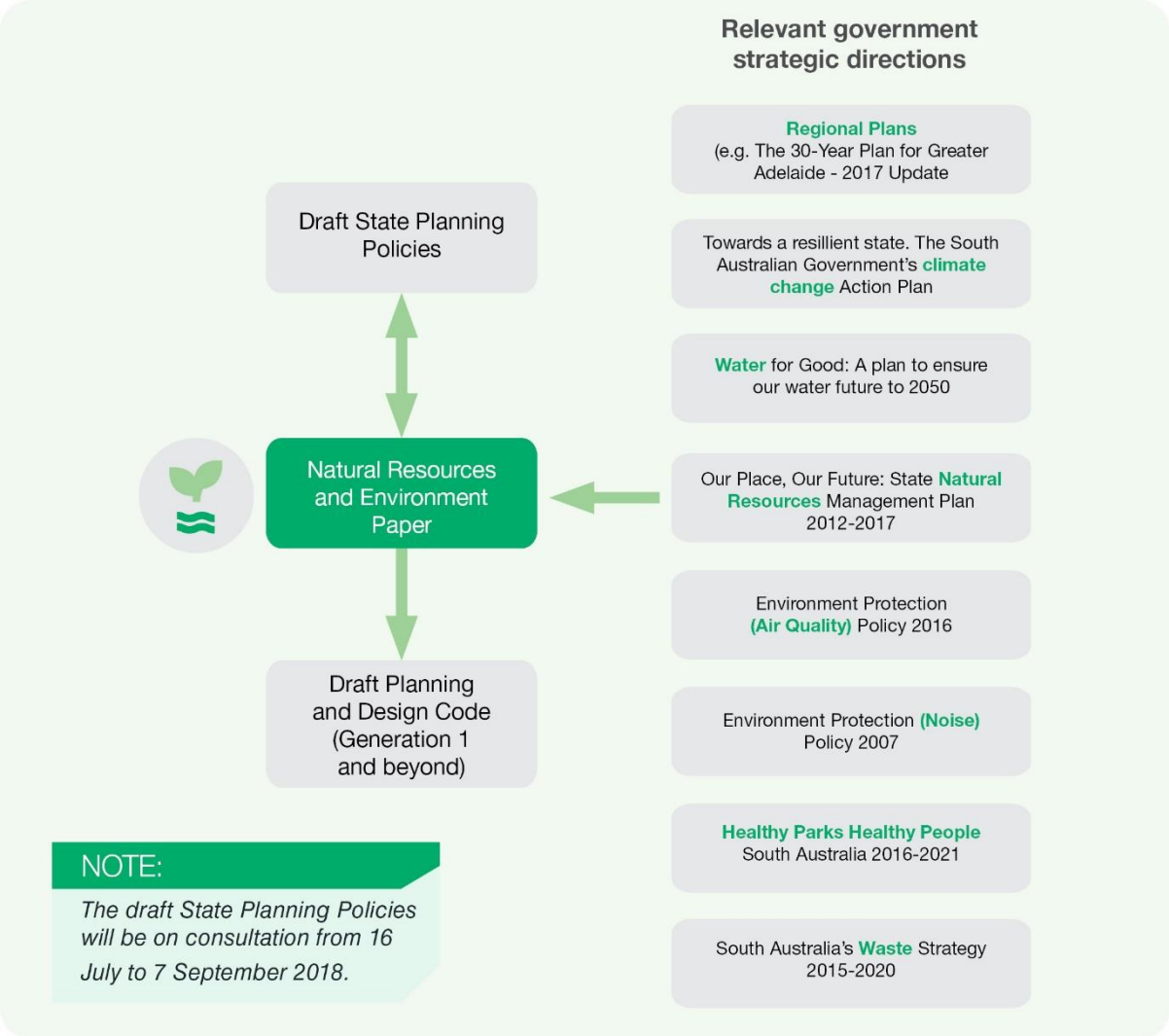
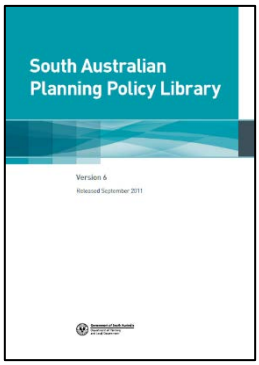



Figure 2: The Natural Resources and Environment Policy Discussion Paper in relation to new planning instruments and other government strategic directions.

## The South Australian Planning Policy Library (SAPPL)

The state's current planning policies are contained in the South Australian Planning Policy Library (SAPPL). The library encourages best practice policy application and a consistent Development Plan format across the state. The SAPPL sets a solid foundation in relation to planning policy, and thus, will be our starting point in transitioning to the Code.




The South Australian Planning Policy Library. Source: DPTI

For a copy of the SAPPL please visit:

www.sa.gov.au/topics/planning-and-property/land-and-property-development/planning-professionals/south-australia-s-planning-policies

The SAPPL contains policies that address the protection of our natural resources and environment and policies that seek to enhance our access to the natural environment. Some of these policies are found within specific land use topics, while others apply generally.

The SAPPL also contains zones that are specifically aimed at protecting our natural resources and environment (for more detail see Appendix 2).

### *General policies*

General policies apply across the state and are included in policy modules that cover:

- **Coastal areas** (environmental protection, maintenance of public access and hazard risk minimisation)
- **Design and Appearance** (climate smart building and siting policies)
- **Energy efficiency** (on-site energy generation and energy efficient design)
- **Hazards** (flooding, bushfire, salinity, acid sulphate soils, site contamination, landslip and containment of chemical and hazardous materials)
- **Interface Between Land Uses** (protection of land uses from negative impacts including noise, air quality and rural interface)
- **Land Division** (allotment layout for optimal building siting for energy efficiency; preservation of landscape and environmental features; waste and stormwater management)
- **Landscaping, Fences and Walls** (planting of trees and shrubs to provide shade and shelter; minimise heat absorption; maximise stormwater reuse; and promote water and biodiversity conservation)
- **Medium and High Rise Development (3 or more storeys)** (climate smart building siting and design techniques including water sensitive design and green roofs)
- **Metropolitan Open Space Systems** (conservation and restoration of existing and modified habitats)
- **Natural Resources** (water sensitive urban design, biodiversity and native vegetation and soil conservation)
- **Open Space and Recreation** (incorporates existing vegetation and natural features, water courses, wildlife habitat and other sites of natural or cultural value, link habitat, wildlife corridors, public open spaces and existing recreation facilities, enable effective stormwater management, planting and retention of large trees and vegetation.
- **Renewable Energy Facilities** (siting and design impacts)
- **Residential Development** (climate smart building siting and design techniques including water sensitive design, provision of private open space and landscaping)
- **Sloping Land** (soil stability and water quality).

**Environmental sustainability** is also covered under a range of other topics, such as land division, medium and high rise development, transport and access.

The SAPPL also calls up specific maps, largely through the general modules, which are located at the back of Development Plans. These maps relate to:

- Natural Resources
- Noise and Air Emissions
- Bushfire Risk.

### *Zones*

The following SAPPL zones provide specific guidance for environmental and natural resources land uses:

- Coastal Conservation Zone
- Coastal Open Space Zone
- Coastal Settlement Zone
- Coastal Marina Zone
- Conservation Zone
- Open Space Zone
- River Murray Flood Zone
- Water Protection Zone
- Watershed Protection (Mount Lofty Ranges) Zone.

## Development Plan Reviews

There are a number of existing variations to SAPPL policy relating to natural resources and environment policies, as well as within those Development Plans that have not yet been converted to include SAPPL content.

These variations need to be understood and common ground established to achieve the required level of policy consistency across the state via the new Code.

## The Planning and Design Code

Whilst recognising that there are a number of areas for potential policy improvement, many of the issues raised regarding inconsistencies or policy gaps in existing policy are actually covered in the SAPPL. It is the application of the policies by various authorities that results in inconsistencies or perceived policy gaps. For example:

- Planning is an ‘on balance’ assessment and different planning authorities place greater emphasis on different policies
- Some general policy (which is where a considerable proportion of natural resources and environment policy sits) is not used consistently for assessment of all types of development.

The new Code provides an opportunity to achieve better consistency, resulting from the system calling up the relevant policies for each development type or location. This should reduce the current level of inconsistency in whether a particular policy applies or not to a particular development type. *The Planning and Design Code: How does it work? Technical Discussion Paper* provides more detail regarding how the future system will work.

# PART 3: MAJOR THEMES FOR OUR NEW SYSTEM

Based on the outcomes of the investigation and research phase, we have identified areas of common interest and grouped issues related to our environment and natural resources into broad policy themes for further consideration. These themes are:

1. **Sustainable and liveable urban environments**
    - Green Infrastructure and Water Sensitive Urban Design
    - Energy Efficient Design
    - Waste Management
2. **Water security and quality**
    - Mount Lofty Ranges Water Protection Area
    - Other Water Protection Areas
    - River Murray
3. **Biodiversity**
4. **Coastal environments**
5. **Natural hazards**
6. **Environment protection and public health**
    - Site Contamination
    - Interface including Noise and Air Emissions.

Under each of these themes, the following information is provided:

- A summary of existing planning policy
- A summary of the key issues, challenges and opportunities
- Acknowledgment other relevant planning system levers.

## Recommendations

Based on the review of the current policy environment and key trends, the accompanying *Natural Resources and Environment Policy Discussion Paper* provides a series of policy transition and reform recommendations for the Planning and Design Code under each of the key themes.

## 1. Sustainable and Liveable Urban Environments

This topic identifies opportunities to make our urban environments more liveable and sustainable with a focus on:

- green infrastructure and water sensitive urban design
- energy efficient design
- waste management.

Street verge incorporating WSUD techniques. Source: Water Sensitive SA

## 1.1 Green Infrastructure and Water Sensitive Urban Design

There is increasing awareness of the importance of, and opportunities to better facilitate, green infrastructure and water sensitive urban design (WSUD) in urban environments to assist with urban cooling, reduce building energy use and improve biodiversity.

Green infrastructure (GI) describes a network of green spaces, street trees, water systems and other urban vegetation (including wetlands, rain gardens, green walls and roofs) that can deliver multiple environmental, economic and social values to urban settlements. WSUD brings components of the water cycle together, including supply and demand, mains water, wastewater, rainfall, runoff and groundwater, and contributes to the local character, environment and community.

Urban densification and or/regeneration, climate change, increasing health costs, decreasing water quality and declining biodiversity are driving an increased interest in green infrastructure and WSUD due to the multiple socio-cultural, economic and environmental benefits that they can provide. Therefore *The 30-Year Plan for Greater Adelaide* includes a target seeking increased urban green cover (trees and shrubs) (Target 5).

A rooftop garden. Source: Water Sensitive SA

### Summary of existing planning policy

- Policies relating to GI and WSUD are found in the following general modules of SAPPL:
  - **Land Division:**
    - requires road reserves to be of a width and alignment that can accommodate street tree planting, landscaping and street furniture
    - plays a role in protecting remnant vegetation and water courses.

- **Landscaping, Fences and Walls:** contains significant policy seeking landscaping and development that minimise hard paved surfaces to achieve a number of benefits.
- **Medium and High Rise Development (3 or more storeys):** policy encouraging rainwater tanks and green roofs.
- **Metropolitan Open Space System:** plays a significant role in the conservation and restoration of existing and modified habitats and stormwater management in association with recreation, aquifer recharge and water quality management.
- **Residential Development**, which requires:
  - allotments to be designed to accommodate landscaping and private open space and WSUD systems
  - dwellings at ground level to provide front landscaping that contributes to the spatial and visual structure of the street while maintaining adequate privacy for occupants
  - minimum private open space
  - private open space at ground level to be designed to provide a consolidated area of deep soil to:
    - assist with ease of drainage for effective deep planting
    - reduce urban heat loading and improve micro-climatic conditions around sites and buildings.

- The SAPPL currently contains some policies specific to WSUD in the Natural Resources general module (see Appendix 2).
- The SAPPL currently has minimal policy to address GI as it is an emerging issue.
- SAPPL currently has general policy to address WSUD, however 'Deemed to Satisfy' policy will provide for greater consistency.
- Some Development Plans, such as the City of Adelaide, provide incentive-based policy, whereby greater building heights are considered subject to provision of additional features including roof gardens or green walls/facades.

### Key issues, challenges and opportunities

- The generic (non-performance-based) nature of existing SAPPL policy for green infrastructure and water sensitive urban design (WSUD) means that development assessments are open to interpretation, resulting in inconsistencies from Council to Council and sometimes within Councils.
- Several South Australian Development plans provide for green infrastructure and WSUD outcomes via performance-based policies for stormwater runoff quality and flow management, that have yet to be incorporated into SAPPL. A stocktake of green infrastructure and WSUD policy from all SA Councils is needed to inform the Planning and Design Code. In the absence of measurable policy objectives, other Councils regulate stormwater management through engineering requirements, which are not always readily accessible to prospective applicants.
- A consistent approach to green infrastructure and WSUD policy would provide an even playing field for all sectors of the development industry.
- There is no single solution to deliver green infrastructure and WSUD in our communities, each approach should be site and context specific (Case Study 1). If flexibility in the provision

of green infrastructure and WSUD is sought by the community and industry, offset schemes could provide a mechanism for offsite solutions, provided performance-based policy is established as the benchmark for trading.

- Existing policy can be difficult to interpret and apply therefore the development of simple Deemed to Satisfy solutions where possible would be beneficial.
- Recent studies are highlighting the challenges of relying entirely on public land to plant the recommended level of urban green cover for health and wellbeing benefits as the rate of loss on private land outstrips the ability to replace it with urban green cover on public land.
- Development of WSUD and GI policies for the different scales and types (infill or greenfields) of development (Figure 3) such as:
    - Single allotment / 2-for-1 land divisions
    - Medium scale land divisions and development
    - Large scale infill land divisions and development
    - Greenfields sites
    - Larger scale measures incorporated into landscape design (e.g. slowing stormwater flows and improving stormwater quality).
- Need to work with local government and industry groups to consider varied tree planting regimes to increase tree canopy cover (e.g. reduce distances between plantings).
- Work through current impediments to achieving increased street and public open space tree plantings (issues with the use of structural soils, etc.).

**Policy Conversation Area: Green Infrastructure, Water Sensitive SA and Environmental Resilience**

The Commission has identified GI and WSUD as a one of its seven Policy Conversation Areas. This places the focus on how to better facilitate GI and WSUD to support climate change resilience and the creation of healthy and liveable communities.

To support this, the Commission and the Department of Planning, Transport and Infrastructure (DPTI) have been contributing to the Green Infrastructure and WSUD investigation project (led by Water Sensitive SA in collaboration with multiple government agency, council and industry partners), which will produce a separate discussion paper for consultation.

This consultation will involve engaging with industry groups and the broader community on the proposed policy approach and related issues. For further details refer to Box 1 below.

Figure 3: Examples of WSUD and GI. Source: Water Sensitive SA

### How can offset schemes support delivery of GI and WSUD?

A planning system that supports sustainable on-site green cover and stormwater management targets while offering mechanisms for off-site solutions where appropriate, may provide the most efficient and affordable model for delivering urban green cover and tree canopy targets within the 30-Year Plan and state WSUD objectives.

Examples of existing models for voluntary offsets or in-lieu schemes for stormwater management include the City of Kingston (Victoria) and Blacktown City Council (New South Wales). Each council has developed a WSUD strategy that sets out preferred precinct or catchment scale solutions as opposed to smaller on-site measures. The Seattle Green Factor, an international model for enhanced urban greening on private allotments, is a score-based assessment framework that provides for improved quality and increased area of landscaping in new development. This model has the potential to be adapted to cater for a voluntary urban green cover offset scheme, should a council deem that an offsite solution provides the greatest benefit to the community.

The Water Sensitive SA InSite stormwater assessment tool for small-scale development, currently in testing, could be readily adapted to support an offset scheme.

### Box 1: Green Infrastructure and Water Sensitive SA Background Paper

In response to the opportunity provided by the new Planning and Design Code, Water Sensitive SA (WSSA) has partnered with a number of key stakeholders (including DPTI) to develop a contemporary, workable suite of planning policies for WSUD and GI. Investigations and research was combined with practitioner workshops and input from industry leaders including from developer, engineering, landscaping, health and planning.

This work has culminated in the development of *'Performance Based Planning Provisions and Assessment Framework for Green Infrastructure and Water Sensitive Urban Design -Background Paper'*. The paper seeks to inform and support the development of:

- high level objectives and principles for GI and WSUD under the PDI Act
- performance-based planning provisions for GI and WSUD for the Code, Standards and Guidelines
- a framework to enable an assessment of green infrastructure and WSUD elements of a development against the performance criteria.

The paper recommends performance-based measures for GI and WSUD in the form of proposed desired outcomes, performance assessed and deemed to satisfy criteria. The proposed policies are intended to be flexible, transparent, measurable and apply to all scales of development. Draft provisions cover policy issues including canopy cover, flooding control, water conservation and stormwater quality improvements. The paper also recommends other assessment tools including:

- the development of a green cover performance measure, which could be assessed through calculation of a green cover score based on a range of landscaping features such as trees, shrubs, irrigated turf, vertical gardens
- an online stormwater assessment tool to enable simple assessment of WSUD requirements for small-scale applications, for example for developments on allotments of less than 2500 $m^2$ for residential development and 5000$m^2$ for commercial development.

This report is available at: www.watersensitivesa.com.

## CASE STUDY 1 – Lightsview

This is one of a series of case studies aimed at demonstrating the range of WSUD solutions being applied by practitioners in South Australia.

### About the site

**Organisation**
Joint venture Renewal SA and PEET

**Local Government area**
City of Port Adelaide Enfield

**Development type**
Major infill development

**WSUD feature type**
- stormwater re-use
- wetlands
- bioretention systems

**Total site area**
100 hectares

**Proportion of site public open space**
15.7%

**Total number of dwellings**
3500 (at completion)

**Date commenced**
2008

**Date completed**
Ongoing (expected 2020)

### Annual benefits

✓ 84 ML p.a.[2] stormwater reuse

✓ 52 ML p.a.[2] stormwater reuse within 1,300 households

✓ 9 hectares of open space irrigated with 32 ML p.a.[2] stormwater

### *Project planning & design*

Creating a green, walkable suburb at Lightsview – applying the Heart Foundation's Heathy by Design Guidelines – required an affordable, climate-independent water resource to sustain the leafy streets and expansive park network. The Salisbury Water stormwater harvesting and managed aquifer recharge scheme provides an alternative water resource to this development that has enabled Lightsview to become arguably Adelaide's greenest infill suburb.

With a dwelling yield of 35 dwellings per hectare, Lightsview's gross housing density1 (in the mid-range of the medium density development spectrum) is balanced by streetscapes and parks that will constitute 16% of the site at full development.

It is the streetscapes that currently sets Lightsview apart from other developments in Adelaide. Verges of generous proportions offer space for shared paths and deep soil zones that will allow street trees to reach their full height potential and canopy cover. The sustainable water supply has supported the establishment of a vast network of healthy street trees surrounded by grassy verges, mitigating the urban heat impacts to great effect.

The site, which was once CSIRO and South Australian Medical Research Institute grazing land and the former Ross Smith Secondary School, provided an opportunity to redevelop 100 hectares of land within 10 kilometres of the Adelaide CBD. While the largely undeveloped site afforded the design flexibility of a greenfield site, its location within the catchment has meant that the site also must cater for stormwater flows from upstream catchments. This has been addressed with an innovative approach to multi-functional public open spaces that puts people and place making as the overriding design criteria rather than more traditional approaches that offer a single objective flood management solution.

More information on this case study and other case studies can be found on the Water Sensitive SA website www.watersensitivesa.com.

[1] As defined by Planning Strategy for Metropolitan Adelaide
[2] As at March 2018

Financial partners
RenewalSA people partnerships progress
Government of South Australia
PEET

Source: Water Sensitive SA. www.watersensitivesa.com

| Other system tools and levers | Proposed next steps |
|---|---|
| **Online WSUD assessment tool**<br><br>Continue to work with WSSA in the development of their online stormwater assessment tool and associated guideline. | Further refinement and consultation. |
| **Green cover assessment tool**<br><br>Continue to work with WSSA in the development of a green cover assessment tool. | Further research and consultation. |
| **Design standards and guidelines**<br><br>Draft standards and guidelines for providing appropriate GI and WSUD for public and private realm and for different scales of development. | Consider outcomes of WSSA's GI and WSUD report and work being finalised by the Cooperative Research Centre for Water Sensitive Cities to prepare a guideline for residential and mixed use building forms at a range of scales to support this (due end of 2018).<br><br>Work with ODASA and other key stakeholders. |
| **Off-set schemes**<br><br>Explore how off-set schemes may give developers flexibility in how they deliver GI and WSUD outcomes. | Further research and consultation. |
| **Regulations**<br><br>Review the current open space requirement for land divisions and consider alternative approaches to better link development density, different types of neighbourhoods, and community health and wellbeing outcomes. (Action 58)[11] | Further research and consultation. |
| **Heat mapping and consistent methodology to measure urban green cover**<br><br>Ensure a consistent methodology for heat mapping to inform action such as planting in urban areas[12].<br><br>Develop a process to ensure consistency in how green canopies and other GI are measured[5]. | DEW and local councils, through their regional climate change adaptation plans are coordinating with input from other key stakeholders, including DPTI. |

## *1.2 Energy Efficient Design*

Design that responds to the environment promotes the sustainable use of resources, minimises greenhouse gas emissions and builds resilience to the effects of climate change. Well-designed places achieve the highest technical and environmental performance while reducing ongoing operating and maintenance costs. Ultimately, good design supports healthy lifestyles and creates successful places that current and future generations can enjoy.

Energy efficient design can include building orientation and design, window placement, eave width, solar access and infrastructure and materials selection. A sustainably designed development plays a fundamental role in creating sustainable and liveable urban environments. Promoting renewable energy sources and neighbourhood level alternative energy supplies and storage in new developments to reduce energy costs and carbon footprint is also important.

Whilst the Building Code is an important tool in achieving energy efficient buildings, the planning system also plays a significant role in setting policy for design tools such as allotment creation at land division stage and building orientation to ensure solar and natural light access for habitable buildings.

Other sustainable design considerations include:

- Water use and water efficiency measures
- Water heating options
- Material choices
- Landscaping including irrigation requirements.

Cladich Pavilions, Aldgate. Source SATC (Brad Griffin)

### Summary of existing planning policy

- The SAPPL provides a dedicated general policy module for assessment of a building's energy efficiency (**Energy Efficiency** General Module).
- Policies regarding solar and natural light access for habitable buildings (or rooms) is found in the following general modules:
  - **Design and Appearance:** addresses overshadowing and ensuring adequate sunlight access, including minimising overshadowing of solar collectors
  - **Land Division**: creates allotments that facilitate optimum solar access
  - **Residential Development:** addresses the role of private open space location for passive energy efficiency (reducing urban heat loading and micro-climatic conditions)
  - **Medium and High Rise Development (3 or more storeys):** addresses the design and siting of buildings to be energy and water efficient and to minimise detrimental micro-climatic impacts on adjacent land and buildings.

### Key issues, challenges and opportunities

- Planning policy seeking energy efficient design tends to focus primarily on passive design methods such as allotment and building orientation and design to ensure habitable rooms have adequate natural light and solar access. These policies also tend to be relatively sound where they apply to residential buildings but perhaps could be better applied to other non-residential built form such as consulting rooms, offices, educational establishments, retail and community, where there is a high level of human use.
- There is a need to give better consideration to overshadowing of solar panels and solar hot water services and the improved performance of buildings to reduce energy consumption.
- On the neighbourhood scale, policies could encourage consideration of community or shared energy-saving facilities. For example, electric car charging facilities[13], communal solar lots/wind turbines etc. These policies could be reinforced by or complemented by design guidelines.
- Policies regarding renewable infrastructure in larger scale industries needs to be reviewed, e.g., policy guidance on assessing solar farms[14].

| Other system tools and levers | Proposed next steps |
|---|---|
| **Develop Guidelines**<br>Develop and implement guidelines for climate resilient buildings, assets and spaces[15] (including shared energy-saving facilities).<br>Facilitate design leadership through developing guidelines for carbon neutral and energy efficient building design and material use (Action 60)[16]. | Research and scoping.<br>*Note: Needs to align with the National Construction Code.* |

## 1.3 Waste Management

Waste management has shifted from reliance on landfill as the primary method of disposal to a focus on avoidance and reuse. The waste management hierarchy (Figure 4) is recognised internationally as an aspirational framework for sustainability and underpins *South Australia's Waste Strategy 2015−2020*.

Recognising there are instances where waste cannot be avoided, the hierarchy provides a framework to maximise the useful life of materials. *The 30-Year Plan for Greater Adelaide* seeks to support a zero waste culture by reducing the waste footprint of new development. Whilst maintaining this goal of waste management, we also need to be mindful of the need to plan for increased amounts of waste and for new types of waste.

Planning policy has an important role to play to ensure waste collection methods, required infrastructure, access/timing for collection, and vehicle type are considered at the development assessment stage.

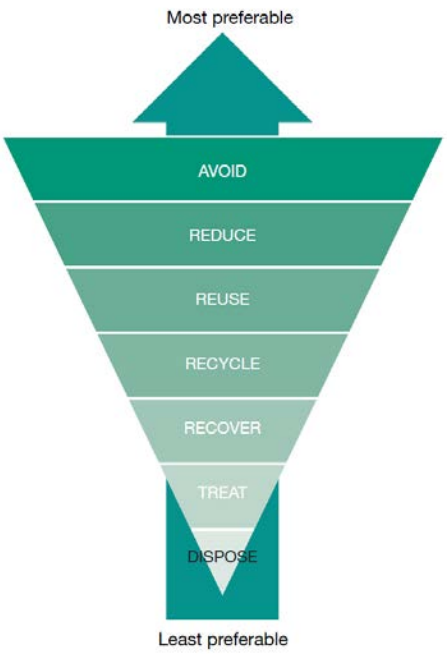



Figure 4: The Waste Management Hierarchy

At the smaller scale, with our changing denser urban form, consideration needs to be given to how we collect and relocate waste and recyclables, with the design of apartment buildings often not properly considered and new tighter subdivision layouts not providing adequate room to manoeuvre large waste transfer vehicles.

The effective management of effluent disposal and waste minimisation is also essential to protect public health and minimise environmental impacts. This is particularly relevant in regional areas where public infrastructure is sometimes limited.

Household waste and recycling bins. Source: Zero Waste SA

### Summary of existing planning policy

- Policies regarding waste management are found in the following general modules:
  - **Design and Appearance:** Outdoor Storage and Service Areas (covering screening; convenient location; access by service and delivery vehicles; and siting away from sensitive land uses).
  - **Land Division:** Roads and Access (ensuring road reserves are of a width and alignment that provides for the efficient movement of service and emergency vehicles).
  - **Medium and High Rise Development (3 or more storeys):** Site Facilities and Storage (requiring development provide a dedicated area for the on-site collection and sorting of recyclable materials and refuse, and for developments with a ground floor area of 2000m² or more to provide for the communal storage and management of waste).
  - **Natural Resources:** protection of waterbodies from waste and other pollutants.
  - **Residential Development:** Site Facilities and Storage (requiring group dwellings, multiple dwellings and residential flat buildings to include household waste and recyclable material storage areas to be located away from dwellings).
- Other general modules contain policies for the appropriate consideration of the waste aspects of an application.
- The SAPPL includes two general policy modules dedicated to waste:
  - **Waste**
  - **Waste Management Facilities.**
- The policies contained in these provide objectives for the consideration of waste at the broadest level (reflecting the waste hierarchy) down to seeking appropriate on site provision for the storage of recyclables and refuse. The policies also cover waste water and liquids.
- The City of Adelaide Development Plan offers the following policies:
  - A dedicated area for on-site collection and sorting of recyclable materials and refuse should be provided within all new development.
  - A dedicated area for the collection and sorting of construction waste and the recycling of building materials during construction as appropriate to the size and nature of the development should be provided and screened from public view.
  - Development greater than 2000 m² of total floor area should manage waste by:
    - a) containing a dedicated area for the collection and sorting of construction waste and recyclable building materials
    - b) on-site storage and management of waste
    - c) disposal of non-recyclable waste
    - d) incorporating waste water and stormwater re-use including the treatment and re-use of grey water.

### Key issues, challenges and opportunities

- Some buildings (particularly high-rise) have inadequate space to store and/or sort the refuse and recycling generated by the development and this needs to be considered as part of the development from the beginning.

- Consider current best practice waste management policies such as City of Adelaide and other leading waste management guidelines.
- Consider waste depots within regions to allow for waste collection and processing prior to it being moved to landfill.
- Provide enough flexibility to reflect new technologies (for example smaller/more adaptable waste relocation vehicles).
- Currently policy addresses winery wastewater however doesn't address other emerging uses such as distilleries, cideries and breweries[17].

| Other system tools and levers | Proposed next steps |
|---|---|
| **Regional Plans**<br>Consider the location of waste depots within regions to allow for waste collection and processing prior to it being moved to landfill. | Consider during preparation of future regional plans. |

## 2. Water Security and Quality

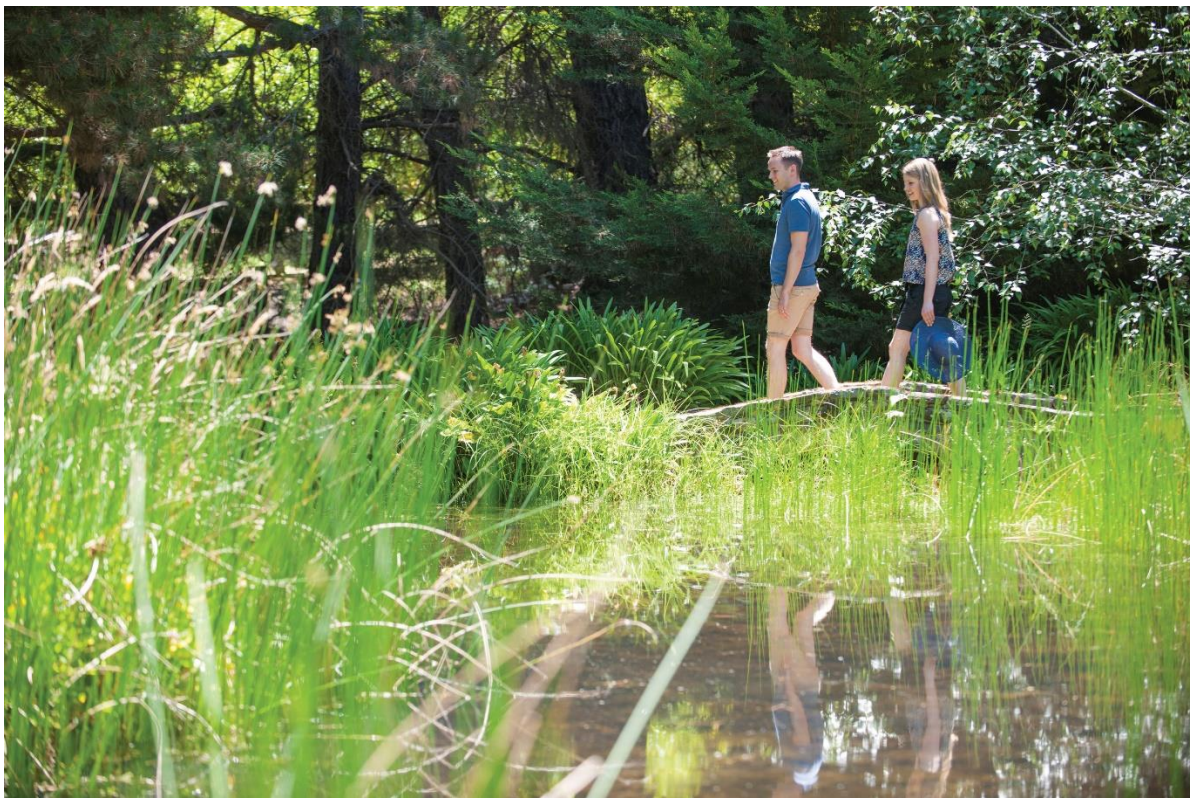
To ensure South Australia's water quality and security, the South Australian Government has declared areas of the state as water protection areas under Part 8 of the *Environment Protection Act 1993*. Activities and development within these areas are subject to special conditions, with the management of run-off being critical to ensuring good drinking water supply. In addition, a number of surface water and groundwater resources across the state have been prescribed under the *Natural Resources Management Act 2004* to manage water extraction and use. The Water Allocation Plans developed for prescribed water resources set rules about the volume of extraction and use of water to ensure sustainable use of the resource.

From a planning perspective, land use, building type, siting and storm water design are some of the most important contributors to sustainable water quality and security, including minimising the impacts of stormwater and wastewater discharge into marine and groundwater.

Getting the policy right for this issue is particularly important in South Australia, being one of the driest habitable places on earth. Water quality and security are fundamental to the sustainability of settlements and industry in our regional areas and, unlike other capital cities, one of our main water supply catchments is in fragmented private ownership, containing a myriad of land uses and built form.

This section covers:

- Mount Lofty Ranges Watershed Protection Area
- Other Water Protection Areas
- River Murray.



Natural landscapes near Oakbank. Source: SATC (Mike Haines)

## 2.1 Mount Lofty Ranges Watershed Protection Area

It is important to protect and secure water resources in the Mount Lofty Ranges Watershed. Unlike other states of Australia where water catchment areas are almost entirely publicly owned, the Mount Lofty Ranges Watershed Protection Area (MLRWPA) has a high level of private ownership. A further challenge in getting the right planning policy balance is that it is also an important area for primary production within South Australia, is populated and has significance as a tourist destination.

Mount Lofty Botanic Gardens, Crafers. Source: SATC (Isaac Forman/Serio)

### Summary of existing planning policy

- While the SAPPL provides a Water Protection Zone and a Watershed Protection (Mount Lofty Ranges) Zone (with the option for two underlying policy areas), the MLRWPA is covered by the following zones and policy areas across nine different Development Plans:
    - **Watershed (Primary Production) Zone**
    - **Watershed Protection (Mount Lofty Ranges) Zone**
    - **Watershed Protection (Primary Production) Zone**
    - **Hills Face Zone (Watershed Policy Area 2)**
    - **Watershed Protection Zone**
    - **Watershed Zone.**
- With the exception of the Hills Face Zone, the underlying envisaged uses in all of these zones are similar to those in Primary Production zones, however with water protection featuring in the primary objectives for the zones.

### Key issues, challenges and opportunities

- The following issues will require consideration for the MLRWPA:
  - inconsistencies with referrals resulting from changes to non-complying forms of development across planning authorities
  - emerging land uses with similar impacts are not subject to the same requirements (e.g. breweries and cideries versus wineries)
  - there is no policy guidance for other emerging land uses including value adding activities
  - some known high impact land uses are currently unrestricted (for example dairies, cideries), whilst other low impact uses are restricted(for example small scale on-farm sales, restaurants, cellar door sales).
- Some issues are ongoing land management issues rather than point-in-time development assessment matters.
- There is opportunity to adopt relevant findings from the EPA's recent work in:
  - investigating a 'hierarchy of acceptable effects' from 'beneficial' in Watershed Area 1, to 'neutral' in Watershed Area 2, to 'negligible adverse' in Watershed Area 3 for site run off (refer to Figure 5)
  - developing a Mount Lofty Ranges Watershed Overlay Development Application Assessment Guideline in partnership with other key agencies including relevant local governments, DPTI, SA Water and SA Health.
- Opportunity exists to further the work undertaken as part of the Mount Barker Rural (Primary Production Protection) Development Plan Amendment (DPA) and introduce a MLRWPA Overlay across the entire MLRWPA (refer to Case Study 2).

# Mount Lofty Ranges Watershed

The Mount Lofty Ranges Watershed has been divided into 3 sub- regions based on the relative potential of land uses/activities in these areas to generate pollutants that could threaten drinking water quality:

- Watershed Areas 1 – greatest risk
- Watershed Areas 2 – intermediate risk
- Watershed Areas 3 – least risk.

As such, new developments must demonstrate:

- a beneficial effect on water quality in Watershed Areas 1
- a beneficial, or at least neutral impact on water quality in Watershed Areas 2
- a negligible adverse, neutral or beneficial impact on water quality in Watershed Areas 3.

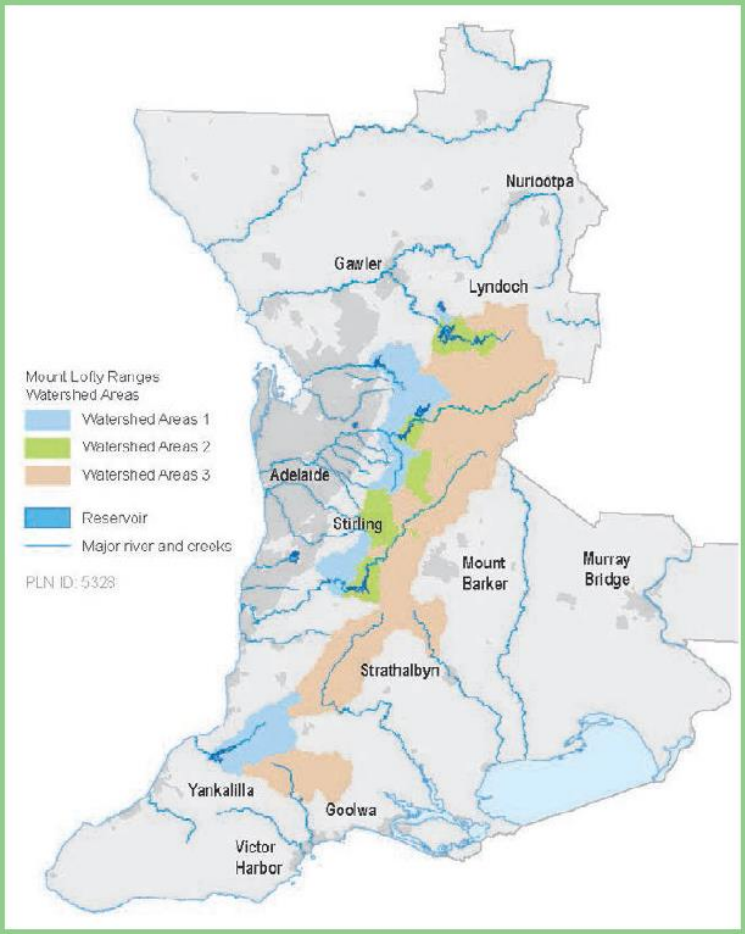



Figure 5: Development of a hierarchy of acceptable effects to be based on the Mount Lofty Watershed Areas. Source: The 30-Year Plan for Greater Adelaide – 2017 Update.

**CASE STUDY 2 – The Mount Barker Rural (Primary Production Protection) Development Plan Amendment**

The Mount Barker Rural (Primary Production Protection) Development Plan Amendment (DPA) was a pilot project for introducing improvements in planning policy applying to the MLRWPA. This DPA underwent considerable engagement with key agencies to arrive at an agreed position and was gazetted on 8 August 2017. The DPA:

- Deleted the Watershed (Mount Lofty Ranges) Zone and Primary Production (Mount Lofty Ranges) Zone and replaced them with the Primary Production Zone.
- Introduced a new General Module called the Mount Lofty Ranges Watershed Overlay.
- Provided a definitive non-complying list integrated into the Primary Production Zone.
- Introduced Watershed Areas 1, 2 and 3 with associated policies and mapping to reflect the varying risk factors to water quality within each of these areas.
- Provided greater flexibility for:
  - alterations and additions to existing dwellings
  - value adding opportunities (on farm sales/restaurants and cellar doors sales)
  - tourist accommodation, home based industry and industry (outside Watershed Area 1).
- Increased water quality controls for new dairies given the widely recognised impacts of this land use (currently on merit without restriction across the Watershed).

| Other system tools and levers | Proposed next steps |
|---|---|
| **Referrals**<br><br>Ensure referrals to the EPA are consistent across the MLRWPA (an Overlay would assist with this). | Undertake as part of the drafting of the PDI Act General Regulations. |
| **Guidelines**<br><br>Assist the EPA with development of the Mount Lofty Ranges Watershed Overlay Development Application Assessment Guidelines. | EPA to lead. |

## 2.2 Other Water Protection Areas

Prescribed surface and groundwater resources are managed under the provisions of the *Natural Resources Management Act 2004*[18] through a system of Water Allocation Plans (WAPs), permits and licences. The WAPs set the amount of water that will be available, the types of activities that are permitted and how water will be allocated to users. The management of groundwater and surface water resources in the state, including implementation of the WAPs, is the responsibility of the Department of Environment and Water (DEW).

Non-prescribed water is a particularly important resource within regional areas where water supply from the River Murray is not available and where water is obtained through direct extraction from groundwater or natural watercourses, rainwater collection, stormwater harvesting and wastewater reuse systems.

Knowledge of the quantity and quality of non-prescribed water resources is limited, hindering the effective management and potential development of these water systems. Primary production activities are a significant user of non-prescribed water, while mining and tourism activities are becoming increasingly significant users. Ongoing research and monitoring is undertaken by DEW in order to better understand the capacity of the resources and the potential impact of increased demand, changes in land use and climate.

Views at K1 Winery, Adelaide Hills. Source: SATC (Adam Bruzzone)

### Summary of existing planning policy

- Other than for the Mount Lofty Ranges Water Protection Area, which currently has specific zones, the SAPPL provides general policy seeking to ensure the protection of water resources, found mainly in the Natural Resources general module and a **Water Protection Zone** for which the main objective is water protection.

### Key issues, challenges and opportunities

- The following issues require consideration:
  - Whether there is merit in introducing a water protection overlay that identifies all known and mapped water protection areas including prescribed surface and groundwater resources.
  - Ways to ensure the sustainable use of non-prescribed water resources.
  - Need to resolve or provide clarity regarding when dams become 'development' and require development approval and the separate requirements for a water affecting activity permit.
  - Opportunity exists to consider the learnings from the recent Rural City of Murray Bridge Regional Integrated Water Management DPA in the development of a future overlay for all Prescribed Water Resources Areas under the *Natural Resources Management Act 2004*.

| Other system tools and levers | Proposed next steps |
|---|---|
| **Referrals**<br>Ensure that appropriate referrals are in place. | Undertake as part of the drafting of the PDI Act General Regulations. |

## 2.3 River Murray

The River Murray is the life-blood of the state, providing essential water for irrigation, industry, domestic and recreational use and our precious wetlands and floodplains. The river is a critical water supply source for towns and metropolitan Adelaide; is used for primary production (about 7%); and is also a popular tourism and recreation destination. All of these often-competing demands need to be considered in the policy framework for the Code.

Policy for land-use activities, their location and intensity clearly has an impact on water resources, their ongoing availability and quality. In regional towns and communities, the combined supply of wastewater from SA Water Wastewater Treatment Plants and Local Government Community Wastewater Management Schemes together with stormwater capture and reuse is becoming increasingly important to meet demand and reduce environmental impact.

River Murray, Bowhill. Source: SATC (Adam Bruzzone)

### Summary of existing planning policy

- Policy related to the River Murray and environs is found in the following general modules:
  - **Hazards**
  - **Infrastructure**
  - **Marinas and Structures**
  - **Natural Resources**.
- Zones specific to the River Murray and fringe areas are:
  - River Murray Flood Zone (SAPPL)
  - River Murray Fringe Zone (SAPPL)
  - River Murray Zone – Urban Waterfront.

- The River Murray mouth located within the jurisdiction of the Coorong Council and Alexandrina Council Development Plans and has a range of zones including:

**Alexandrina Council Development Plan:**

- Conservation
- Rural Living
- Primary Production (Hindmarsh Island)
- Coastal Conservation
- Coastal Settlement

**Coorong District Development Plan:**

- Conservation
- Primary Production
- River Murray Flood Plain
- River Murray Fringe
- Primary Production.

### Key issues, challenges and opportunities

- The following issues will require consideration:
  - Development of a regional approach to River Murray issues. This includes referrals in the River Murray Water Protection Area, particularly in relation to shacks and waste water management (noting the review work being undertaken by the EPA 'River Murray Shack Waste Water Position Statement').
  - The land uses envisaged in the 1956 flood plain and lower Murray dairy flats areas (to provide greater opportunities).
  - A consistent approach to river structures and moorings on the river (including a new assessment pathway and design criteria for pontoons, jetties, landings, boat ramps etc.). These developments may not require a referral but consideration at the regional plan level to identify areas where they should not be contemplated.
  - The intensification of land use in close proximity to the river, wetlands and conservation areas through the creation of additional allotments.
  - Excavation and filling restrictions in flood plains, particularly in Marina Zones where such activities are inherent.
  - Inconsistencies in policy between zones/policy areas relating to wet area sizes for dwellings, sheds and enclosed ground level storage areas in flood plains.
  - Retaining and consolidating (where possible) key policies and zones relating to the protection of important natural environments, water bodies, biodiversity and conservation areas.
  - Policy refinement of various River Murray Zones/Policy Areas.
  - River Murray Fringe Zone objectives relating to farming often do not correlate with on-the-ground-activity, where many areas of the Fringe Zone are fragmented and not viable as farming areas.
  - There is an opportunity to correct anomalies in:
    - some River Murray Fringe Zones where tourist accommodation is an envisaged use, but 'motel' is listed as non-complying
    - the River Murray Fringe Zone relating to policy and non-complying inconsistency relating to workers accommodation in association with envisaged forms of development in the zone.

- Including a reference to the three SAMDB Ramsar sites (Coorong and Lakes Alexandrina and Albert; Banrock Station Wetland Complex; Riverland) where applicable.
- The intent of the use of 'Key Ramsar Habitat Site' and buffers for specific areas as per the Alexandrina Council Development Plan, rather than the general overlay for the whole Ramsar site.

| Other system tools and levers | Proposed next steps |
|---|---|
| **Referrals**<br>Review referrals for the River Murray. | Undertake as part of the drafting of the PDI Act General Regulations. |
| **Other**<br>Review use of 1956 flood level. | Work through with relevant stakeholders. |

## 3. Biodiversity

Biodiversity is the foundation of a healthy ecosystem, sustaining regional industries and communities. Landscapes that hold less biodiversity (due to human impact) become less productive and this is evident in soil structure and fertility decline, decreased water quality, lost agricultural production, increased production costs and increased treatment costs.

Sustainable management of a biologically diverse environment and its natural resources ensures greater resilience to change and natural variability, increases productivity and supports a healthier lifestyle. South Australia is home to a raft of important natural resources and ecosystems including marine nurseries; vulnerable native vegetation including woodlands and grasslands; diverse marine and coastal biota; mangrove stands; samphires; saltmarsh; and wetlands of national and international importance. Urban biodiversity should also be supported through a diverse and connected network of green infrastructure. There are also many wellbeing and enjoyment benefits to people living in urban areas (see Box 3)

It is important to delineate and maintain areas with significant environmental values; protect landscape health, preserve biodiversity; and improve development certainty and transparency. This includes:

- Nature Protection Areas: These are largely undeveloped areas that retain significant environmental values recognised through legislation. This includes protected public lands (such as conservation parks), private protected lands (through Heritage Agreements) and areas of native vegetation. These areas should be protected from development unless specific exemptions apply.
- Complementary Developed Areas: These are areas where there is a mutually beneficial co-existence between developments and significant environmental values. This may include areas developed for primary production or recreation where the specific character of development and the environmental values are compatible. (These values are often different to those contained in protection areas). Retaining the character of these areas should be supported by ensuring the compatibility of future development.

Natural character can be used to describe the combined benefit or influence of natural elements, processes and patterns and human experiences that benefit from these.

Cleland Wildlife Park, Crafers Source: SATC (Adam Bruzzone)

**Box 2: The New Zealand Coastal Policy Statement 2010 provides a meaning of the term natural character:**

*Natural character is not the same as natural features and landscapes or amenity values and may include matters such as:*

a) *natural elements, processes and patterns*
b) *biophysical, ecological, geological and geomorphological aspects*
c) *natural landforms such as headlands, peninsulas, cliffs, dunes, wetlands, reefs, freshwater springs and surf breaks*
d) *the natural movement of water and sediment*
e) *the natural darkness of the night sky*
f) *places or areas that are wild or scenic*
g) *a range of natural character from pristine to modified*
h) *experiential attributes, including the sounds and smell of the sea; and their context or setting.*

## Summary of existing planning policy

- Policy that seeks to protect and enhance our natural environment or to encourage landscaping and open space provision is found in the following general modules:
  - **Coastal Areas**
  - **Infrastructure**
  - **Land Division (Design and Layout)**
  - **Metropolitan Open Space System**
  - **Natural Resources**
  - **Open Space and Recreation**
  - **Significant Trees**
  - **Siting and Visibility**.
- SAPPL Zones specific to enhancing our natural environment and fringe areas are:
  - Coastal Conservation Zone
  - Community Zone (Recreation Policy Area)
  - Conservation Zone
  - Hills Face Zone
  - Open Space Zone
  - Primary Production Zone: Landscape Protection Policy Area.

## Key issues, challenges and opportunities

- The need for all development to consider contextual 'natural character' values (refer to Box 2 above for further information about 'natural character').
- Duplication of policy through use of separate zones where overlays may be more effective.
- The accelerated loss and fragmentation of intact native vegetation.
- Policies subject to different interpretation and application.

- Native vegetation needs to be better mapped and protected.
- There is conflict between Native Vegetation Regulations 2017 and the Development Regulations 2008 regarding the definition of a building for setback distances, resulting in different interpretations by councils.
- Consider mapping and using overlays for areas of nature protection and for vulnerable species (linking with mapping from the *Environment Protection and Biodiversity Conservation Act, 1999*).
- Consider how tools of the planning system can assist the better management of the interface between protected areas and adjoining land uses. For example:
    - avoiding planting olives or vineyards in close proximity to the edge of a protected area
    - ensuring adjacent land uses do not result in the need for additional clearing of conservation parks for bushfire management.
- Identify in the Code and provide policy to protect areas of significant landscape and amenity value, including landscapes that form attractive backgrounds and entrances to towns and tourist developments (particularly important in our regional areas).
- Ensure greater policy clarity for land uses in sensitive areas (for example tourism accommodation, caretakers' residences and dwellings) to avoid the need for interpretation.
- Consider policies that encourage carbon sequestration and the opportunity to use native vegetation to enhance biodiversity or set aside existing biodiversity for that purpose.
- Land division adjacent to waterbodies should provide for public access along the waterbody.
- Smaller allotments are resulting in loss of space for deep rooted trees.

**Box 3: Benefits to people residing in cities derived from connecting with wildlife**

By Professor Chris Daniels

The greatest benefit is enjoyment. There are few families who have never fed ducks in the local park – and wildlife can sometimes even become part of the family. For instance, in Australia many people feed resident magpies, kookaburras and even possums. The local animal becomes a type of 'wild pet' and may even be given a name. Moreover, urban wildlife is often the primary means through which children connect with and experience nature, helping them develop positive attitudes towards the environment. Also, understanding and connecting with animals forces us to consider bigger issues, causing us to question the environmental needs of animals and how, as humans, we impact on their ability to survive and what we should be doing to help. Ultimately, caring for local wildlife opens the door to understanding the broader needs of the planet.

The successful incorporation of biodiversity must be considered at all stages of urban development. It should be constantly revised as conditions change. If a community is to be constructed on a greenfield site, the retention of natural bushland and large trees is necessary to support those species that would otherwise find it impossible to survive. In developed communities, local parks should be redesigned to offer food and shelter to wildlife. In high-density communities, tree-lined streets, median strips and roof gardens can all make a big difference to the retention and preservation of wildlife.

| Other system tools and levers | Proposed next steps |
|---|---|
| **Referrals**<br>Ensure that appropriate referrals are in place. | Part of the drafting of the PDI Act General Regulations. |

## 4. Coastal Environments

South Australia contains 5067 kilometres of coastline (the majority of which is covered by the Coastal Conservation Zone) and contains settlements, primary production land and the Metropolitan Adelaide area. Coastal areas support important ecological systems and environments and also play a key role in the state's economy through aquaculture, recreation and tourism, transport and industry facilities.

The legislative framework for management of South Australia's coast is provided through a number of Acts including:

- *Coast Protection Act 1972*
- *Environmental Protection Act 1993*
- *Adelaide Dolphin Sanctuary Act 2005*
- *Development Act 1993*
- *Planning, Development and Infrastructure Act 2016*.

The coastline can be a contested space and the legislation provides high level guidance and policy for a balanced approach to the range of competing interests for development while recognising the its environmental, cultural and economic significance.

It is important to protect coastal features and biodiversity including:

- Habitats that are highly sensitive to the direct impacts of development.
- Important geological and/or natural features of scientific, educational or cultural importance.
- Landscapes of very high scenic quality.

'The Jetty' Port Willunga. Source: SATC (Andrew Kleingeld)

### Coast Protection Board (CPB)

The Coast Protection Board (CPB) is the statutory authority responsible for the state's coast and for administering the *Coast Protection Act 1972*.

The CPB is responsible for the sustainable use of the South Australian coast for the benefit of society, the economy and the environment (*Strategic Plan 2012-2017*).

Whilst it is important to note that the CPB's Strategic Plan is currently under review, the three existing strategic priorities of the CPB are:

- Adaptation of existing development to coastal hazards and the impacts of climate change.
- Ensuring new development is not at risk from current and future hazards.
- Planning for resilience in coastal ecosystems to adapt to the impacts of climate change.

Schedule 8 of the Development Regulations 2008 includes referrals for certain development to the CPB for **direction** in some instances and **regard** in others. In the new planning system, referrals will be for direction only.

### Environment Protection Authority (EPA)

The Environment Protection Authority (EPA) has a responsibility through the *Environment Protection Act 1993* and Environment Protection (Water Quality) Policy to ensure water quality and discharge into coastal waters are appropriate and will not cause environmental harm or nuisance. The EPA will generally undertake an assessment (amongst other things) in relation to the Water Quality Policy and 'general environmental duty' to assess the impact on marine habitat.

A number of coastal activities are referred to the EPA including dredging, marine and boating facilities, earthworks drainage and port facilities.

### Summary of existing planning policy

- Policies related to coastal environments are found in the following general modules:
  - **Coastal Areas**
  - **Infrastructure**
  - **Land Division (Design and Layout)**
  - **Metropolitan Open Space System**
  - **Natural Resources**
  - **Open Space and Recreation**
  - **Siting and Visibility**.
- The SAPPL includes a suite of coastal zones to safeguard areas of environmental significance and to protect development from coastal hazards while facilitating appropriate development activity. These zones are:
  - Coastal Conservation Zone
  - Coastal Settlement Zone
  - Coastal Marina Zone
  - Coastal Open Space Zone.

- Policies within these zones seek to:
  - **protect the coastal environment** (including a range of sensitive coastal features and habitats that have a direct relationship to the marine and terrestrial environment) that are affected to some degree by coastal processes, from inappropriate development.
  - **protect development** from coastal hazards such as flooding, dune drift, erosion (including the impacts of climate change) and acid sulphate soils
  - **recognise** places of historic, cultural or scientific significance
  - support the future **provision of appropriate public access** to the coast and foreshore.
- The coastal zones generally apply to land containing:
  - coastal landforms and habitats highly sensitive to the direct impacts of development, including beaches, coastal dunes and cliffs, coastal wetlands, tidal estuaries, salt marsh and mangrove areas
  - important coastal geological or other natural features of scientific, educational, heritage or cultural importance
  - buffers to achieve separation between development and sensitive coastal habitats or important marine fauna sites
  - coastal landscapes of high scenic quality
  - areas exposed to coastal hazards (including flooding, erosion, acid sulfate soils and sand dune drift) where there are no adequate measures to mitigate the hazard or confirmed strategies to provide future protection
  - coastal protection measures such as erosion buffer areas, seawalls and levee banks.
- Currently Development Plans also contain non-coastal zones along the coast where there are no sensitive coastal features and where hazards can be addressed by embedding specific provisions (e.g. minimum site and floor levels).
- The Land Not Within a Council Area (Coastal Waters) Development Plan, which covers land bound by the state's borders with Western Australia and Victoria, also contains relevant policy that needs to be considered in creating the Code.

### Key issues, challenges and opportunities

- Consider introducing a coastal areas overlay (or two for metropolitan and non-metropolitan areas) for the purpose of providing the framework for referrals.
- Consider whether an overlay(s) would provide a good framework to better reflect some of the important coastal considerations that are relevant irrespective of the underlying land uses.
- Consider application of the Residential Code through new 'Deemed to Satisfy' provisions to avoid development in areas subject to hazards.
- Update hazard mapping and recognise that climate change is likely to create increased hazard levels.
- Policy solutions need to reflect projected risks as a result of taking climate change into account.
- Policies need to provide for the protection, preservation, and provision of space for migration of coastal features and habitats adapting to sea level rise (e.g. the migration of dune systems and mangroves) (Box 4).

- Ensure greater policy clarity for land uses in sensitive areas (e.g. tourism accommodation, caretakers' residences and dwellings) to avoid the need for interpretation.
- Resolve the overlap between the 'High Water Mark' and 'Low Water Mark' in Development Plans.
- Review policy within the Land Not Within a Council Area (Coastal Waters) Development Plan as it is unclear what activities are promoted or discouraged.
- Review aquaculture zoning, especially policy for waste water and buffer widths, and for appropriately located on-shore support facilities.
- Review the practicality of applying some (non-hazard related) coastal policies to urban areas.
- Review the operation of individual septic systems versus community waste water disposal systems.
- Address objectives and methodology of determining sea level rise a whole of coast/state infrastructure approach (Box 4).
- Balance the coastal environment with coastal freight (shipping and ports, etc.).
- Plan for resilience in coastal ecosystems to adapt to the impacts of climate change.

**BOX 4 – Sea Level Rise**

One of the consequences of climate change and rising global temperatures is that sea levels around the world are rising. At the same time, some parts of the coast are subsiding. Average global sea level has been rising over recent decades at a rate of approximately 3.4 millimetres per year.

Though the effects of this sea level rise along the coast are gradual, they are highly significant over the long term. Increases in sea level cause greater erosion of dunes and loss of beaches, increasing shoreline erosion at many locations.

Sea level rise will also:

- be likely to change the angle at which waves strike the shore, leading to changes in rates of littoral sand drift and consequently, changes in the locations at which beaches build up or erode.
- affect both the size of areas flooded and increase the frequency of widespread flooding.

This will not only have impacts on infrastructure and development, but also the location and species mix of coastal ecosystems and habitats.

Under natural conditions, as the sea level rises, species would naturally start to retreat landward to more suitable conditions. Unfortunately, in some locations development would prevent this natural retreat and changes in species composition or at worst, species or habitat loss may start to occur.

Development will also be at risk due to changes in sea level. The need to allow for sea level rise in coastal developments has been acknowledged worldwide.

Source: DEW

| Other system tools and levers | Proposed next steps |
|---|---|
| **Referrals**<br>Review referrals for the coast. | Undertake as part of the drafting of the PDI Act General Regulations. |
| **Definition**<br>Review definition of dredging. | EPA and DPTI to lead. |
| **Other**<br>Review metrics used to determine sea level rise and apply consistently across the state. | Coast Protection Board to lead. |

## 5. Natural Hazards

Planning policy plays a key role in minimising the potential impact of hazards. Inappropriately located or designed development and land uses can increase the exposure to and impact of hazards such as terrestrial and coastal flooding, bushfire, drought, extreme heat, erosion, acid sulphate soils, storms and dust events, riverbank collapse and cliff erosion.

It is important to minimise risk to people, property and the environment from exposure to hazards by designing and planning for development in accordance with the risk hierarchy of:

- Avoid
- Accommodate
- Adapt.

Bushfire in Mallee scrub. Source:DPTI

### How to consider climate change

Climate projections are usually presented as an average of a 30-year period, reported as average annual data for a future time horizons, commonly 2030, 2050, 2070 and 2090. Choosing a projection timeframe should consider the lifetime of the decisions that will be made.

Many decisions made today have lifetimes that exceed 70 years. For example, a new suburb would be expected to exist for at least 70 years so the planning for this must consider climate projections to at least 2090.

### Summary of existing planning policy

- Existing planning policy seeks to minimise impacts, generally adhering to a risk management hierarchy that seeks to avoid permanent development within and adjacent to areas at risk from hazards; adapts the design of buildings and infrastructure to minimise risk in the long term; or protects development through requirements for amelioration or protective works.
- In an urban context, much is being done to minimise the impacts of development on increasing localised flooding through using WSUD (post and pre-development flows).
- Policies related to address natural hazards are found in the following general modules:
  - Hazards (flooding, bushfire, salinity, acid sulphate soils)
  - Coastal Areas
  - Land Division (design and layout).
- SAPPL Zones specific to natural hazards include:
  - Conservation Zone
  - Open Space Zone.

### Key issues, challenges and opportunities

- Bushfire mapping, methodology and possibly policy need updating (with reference to recent changes to Victorian and New South Wales policy).
- Consider bushfire hazard when developing parks or retaining vegetation in urban areas that are deemed bushfire prone.
- Policy requires special consideration when encouraging higher-density development in bushfire prone areas to ensure an adequate balance between density and provision of bushfire mitigation tools (e.g. access, water tanks).
- Consider the integration between water re-use and ensure adequate on-site supply of water for bushfire fighting purposes. Whilst both mutually beneficial, the two can be at odds with each other (e.g. re-using water leaves less on site to fight a fire – this is also a Building Code issue).
- Flood mapping needs to be consistent across and within different jurisdictions (including the mapping methodology) and be linked with the new Code.
- Ensure consistency of terminology for flood related policy.
- Introduction of an Overlay may offer an efficient way of keeping flood mapping up-to-date.
- There is a need for nuanced policy relating to the level of risk for flooding and other hazard policy (i.e. high medium or low).
- Need to update flooding policy to meet best practice by referring to floodway function as well as physical traits.
- Green infrastructure (such as street trees and green public spaces) will help cool urban areas and mitigate extreme heat.
- Acid sulphate soil areas could be applied as an overlay (using mapped areas in existing Development Plans) subject to consistency of data.
- All hazard mapping needs to be regularly kept up to date.
- Hazard policy needs to ensure sensitive land uses and key infrastructure are not located in areas subject to hazard risk.

**CASE STUDY 3 – Management of natural hazards, New Zealand example**

Management of risks from natural hazards is identified as a matter of national significance in New Zealand planning legislation with responsibilities identified across all tiers of government. National and regional policies describe the need for land use planning to ensure development does not occur in hazard prone areas and that development does not exacerbate hazards. The identification of land at risk of hazard is undertaken at a local scale. Overlay maps for varying hazards are provided with a guidance table on the levels of risk each hazard class poses, for example Hazard Class 1 poses a high risk to people and Hazard Class 3 poses a low risk, for example short-term flooding.

A matrix for areas included in multiple overlays supports the consideration of concurrent hazards such as flood and land instability. Proposed land uses are categories by their sensitivity. Sensitive land uses include schools, residential areas, hospitals and visitor accommodation. Least sensitive land uses include farming, forestry, conservation and temporary activities. Particular provisions for combinations of sensitivity, hazard and risk are defined and avoid establishment of sensitive activities in high risk areas or require buildings to be used for sensitive activities in coastal hazard overlay to be relocatable. These provisions mean the planning system considers both the hazard and the nature of the proposed development.

| Other system tools and levers | Proposed next steps |
|---|---|
| **Data**<br>Work with various stakeholders, including local government in flood data collection and mapping. | Research and investigation. |

# 6. Environment Protection and Public Health

This section discusses some of the planning policy challenges and opportunities in relation to:

- Site contamination
- Interface (including noise and air emissions).

Note: Other non-natural hazards (e.g. landslip and storage of hazardous materials) are not discussed in this paper as no issues have been raised to date. Therefore, it is envisaged the policy in the SAPPL Hazards general module will transition over to the Code.

Adelaide Airport. Source: Adelaide Airport Limited.

## 6.1 Site contamination

It is important to ensure the risks posed by known or potential contamination of sites are adequately managed to enable appropriate development and safe use of land. A number of land parcels in South Australia have some form of site contamination, most often within the layers of soil below the surface. Certain contaminants left behind by previous land uses can cause problems for human health if they are present in high enough concentrations. Contamination does not only occur in soil but also in surface and ground water, causing ongoing issues for land uses.

Increasing urban infill puts pressure on using land once occupied by activities that may have left contaminants. Locating residential areas within close proximity to existing and ongoing industrial uses therefore needs to be carefully considered. The ways in which we address these issues are important to ensure we provide healthy and liveable environments to live (Box 5).

The banks of the Port River at Osborne. Source: ASC

### Summary of existing planning policy

- The SAPPL **Hazards** general module includes a section providing site contamination policies.
- Policies and statements within desired character statements flagging a need to consider potential site contamination are also found throughout Development Plan zones, particularly where contamination is suspected.
- Given the limited knowledge regarding where site contamination occurs, policies or statements triggering consideration of potential site contamination are often referenced in zone ‘desired character’ and policies.

### Key issues, challenges and opportunities

- Site contamination policies and referrals need to be more consistently applied.
- Lack of policies for planners to use in assessment when no referral is triggered (lots of unknown contaminated sites so need to have policies to trigger proper investigations).
- Aligning the policy response with sensitivity of land-use is important.

**BOX 5 – Who is responsible for site contamination?**

**The polluter pays**

Responsibility for site contamination is assigned according to the '**polluter pays**' principle – this means that the original polluter is liable for any clean up and associated costs caused on and off the source site, regardless of when it was caused.

Site contamination is often historical in nature, and the original polluter may no longer exist or be able to be identified. In these cases liability can pass to the current site owner.

Under the *Environment Protection Act 1993*, known or suspected groundwater contamination must be reported to the EPA who can then require assessment and if necessary remediation, which means to treat, contain, remove or manage the contamination. In most cases, the original polluter or past/current site owner must undertake or fund this work, including a communication and engagement program to keep affected communities informed.

The EPA administers and enforces the Act to ensure responsible parties undertake this work appropriately. It also makes information on contaminated sites available to the public.

Pollution of groundwater has been an offence since 1995, when the Act came into operation. Where there is sufficient evidence, the EPA can prosecute, which can sometimes be difficult because it is often the result of previous industrial activity that may have occurred a long time ago.

Understanding the timing of the contamination and identifying the polluter is therefore not always possible, and in some cases companies identified as polluters in the past no longer exist.

**Buyer beware**

Investigating and cleaning up contaminated sites can be expensive. Prospective land purchasers should be aware of the risk of potential contamination and carry out careful, thorough pre-purchase enquiries (due diligence).

When buying, selling or leasing property, you and/or your real estate agent should **search contaminated sites information** (available on the EPA website) as part of any routine due diligence enquiry.

Source: EPA

| Other system tools and levers | Proposed next steps |
|---|---|
| **Referrals**<br>Ensure appropriate referrals are in place. | Undertake as part of the drafting of the PDI Act General Regulations. |

## 6.2 *Interface including noise and air emissions*

Effective management of air and noise emissions across the interface between activities and people or sensitive environments (often called sensitive receptors or sensitive receivers) is important to ensure that communities are adequately protected from potential impacts. This will continue to be a challenge in South Australia as our population grows, urban densification increases and mixed use areas become more common. Several approaches may be needed to understand and manage the risks to communities from ambient air quality and exposure to environmental noise.

Within regional and remote areas, rural populations may be exposed to a greater range of hazards such as those associated with intensive animal keeping facilities, mining operations, logging and timber activities, agricultural activities, landfills and sewage treatment facilities. Pollution may impact groundwater and surface water resources, resulting in air pollution by odours and particulates (open burning). The expansion in intensive animal keeping operations and specialisation of livestock have resulted in increased waste and biosecurity risks.

The Northern Expressway. Source: DPTI (Don Brice)

### Summary of existing planning policy

- As interface issues can occur between a number of different land uses, the SAPPL contains policies relating to interface issues in a dedicated general policy module; **Interface Between Land Uses**. A number of other general modules and zones also contain interface policy, including **Building Near Airfields**, the **Urban Renewal Zone** and the **Primary Production Zone**.
- The SAPPL also has overlays to identify some interface issues including the Air and Noise Emissions overlay.

### Key issues, challenges and opportunities

- Opportunity to reduce repetition of policy.
- Consider impacts such as air quality and/or noise for certain developments (e.g. a new heavy industry alongside an existing heavy industry).
- Review policies relating to interface particularly in light of recent policy amendments and movement towards more mixed use zoning, for example residential alongside industry or commercial uses.
- Consider the interface between EPA responsibilities and what the planning system can achieve.

| Other system tools and levers | Proposed next steps |
|---|---|
| **Referrals**<br>Ensure that appropriate referrals are in place. | Undertake as part of the drafting of the PDI Act General Regulations. |
| **Other**<br>The EPA is currently working with a range of stakeholders to develop a noise and air quality monitoring program. | TBC. |

# TABLE OF FIGURES

Figure 1: South Australian Water Sources. Source: SA Water ..... 10
Figure 2: The Natural Resources and Environment Policy Discussion Paper in relation to new planning instruments and other government strategic directions. ..... 16
Figure 3: Examples of WSUD and GI. Source: Water Sensitive SA ..... 24
Figure 4: The Waste Management Hierarchy ..... 30
Figure 5: Development of a hierarchy of acceptable effects to be based on the Mount Lofty Watershed Areas. Source: The 30-Year Plan for Greater Adelaide – 2017 Update. ..... 36

# GLOSSARY

## Acronyms

| | |
|---|---|
| **AILA** | Australian Institute of Landscape Architects |
| **CFS** | Country Fire Service |
| **DEW** | Department for Environment and Water |
| **DPTI** | Department of Planning, Transport and Infrastructure |
| **EPA** | Environment Protection Authority |
| **CPB** | Coast Protection Board |
| **GI** | Green Infrastructure |
| **SAFECOM** | South Australian Fire and Emergency Services Commission |
| **SATC** | South Australian Tourism Commission |
| **WSUD** | Water Sensitive Urban Design |
| **WSSA** | Water Sensitive South Australia |

## Definitions

| | |
|---|---|
| **Areas of high environmental significance** | These areas include protected public lands (e.g. national and conservation parks), areas of private/public lands under a heritage agreement, and land containing high value native vegetation. These areas will be protected from development unless a specific regulatory exemption applies. |
| **Biodiversity** | This term describes the variety of life in all its forms and at all levels of organisation, as well as the ecological and evolutionary processes through which genes, species and ecosystems interact with one another and with their environment. |
| **Carbon emissions** | This term describes the carbon dioxide and carbon monoxide in the atmosphere and is produced by vehicles and industrial processes. |
| **Carbon neutral** | Pertaining to or having achieved a state in which the net amount of greenhouse gases emitted into the atmosphere is reduced to zero because it is balanced by actions to reduce or offset these emissions. |
| **Carbon sequestration** | Carbon sequestration is the general term used for the capture and long-term storage of carbon dioxide. Capture can occur at the point of emission (e.g. from power plants) or through natural processes (such as photosynthesis), which remove carbon dioxide from the earth's atmosphere and which can be enhanced by appropriate management practices. |
| **City** | For the purposes of this paper, city is defined as the City of Adelaide. |
| **Climate change** | Climate change is a long-term change in the statistical distribution of weather patterns over periods of time that range from decades to millions of years. It may be a change in the average weather conditions or a change in the distribution of weather events with respect to an average, for example, greater or fewer extreme weather events. Climate change may be limited to a specific region, or may occur across the whole Earth. |
| **Coastal habitats and landforms** | These include beaches, coastal dunes and cliffs, coastal wetlands, tidal estuaries, saltmarsh and mangrove areas and coastal geological features. |
| **Density** | Density is a measure of the population (persons) or the number of dwelling units in a given area. |

| | |
|---|---|
| **Design Standards** | To increase the emphasis on design in the planning system, the *Planning, Development and Infrastructure Act 2016* enables the State Planning Commission (see definition below) to prepare design standards relating to the public realm and infrastructure.<br>This is an important innovation and represents the first time a system-wide approach to public realm design has been provided for in planning legislation.<br>**Design standards**:<br>• specify design principles and standards<br>provide design guidance in relation to infrastructure and public realm |
| **Development Plan** | Development Plans seek to promote the provisions of the Planning Strategy and include planning or development objectives or principles. They are currently the principal documents in South Australia used to assess development.<br>At present, every Local Government Area has a Development Plan, however these documents will transfer into one Planning and Design Code for the State under the new legislation. |
| **Greater Adelaide** | The Greater Adelaide Planning region covers an area of 9000 square kilometres and extends from Victor Harbor in the south to Kapunda in the north and from Gulf St Vincent in the west to Murray Bridge in the east.<br>The region includes 27 Local Government Areas (Adelaide Plains, Light, Barossa, Gawler, Playford, Salisbury, Tea Tree Gully, Adelaide Hills, Mount Barker, Campbelltown, Port Adelaide Enfield, Charles Sturt, Prospect, West Torrens, Walkerville, Adelaide, Norwood Payneham & St Peters, Unley, Burnside, Holdfast Bay, Mitcham, Marion, Onkaparinga, Yankalilla, Victor Harbor, Alexandrina and Murray Bridge). |
| **Greater Adelaide Capital City** | The Australian Bureau of Statistics has developed these areas to provide a stable and consistent boundary that defines the functional extent of each of Australia's capital cities. The area is designed to include the urban area of the city as well as people who regularly socialise, shop or work within the city, but live in the small towns and rural areas surrounding the city. It is important to note that these areas do not define the built up edge of the city. This area has been used to describe metropolitan Adelaide in this paper. |
| **Greenfield sites** | These are typically areas that are zoned for future urban development bit are currently still used for agriculture or other low intensity uses. |
| **Greenhouse gas emissions** | Greenhouse gases are naturally occurring gases in our atmosphere that trap heat and keep our earth warm enough for life to survive. Carbon dioxide ($CO^2$) is the primary greenhouse gas in our atmosphere and its concentrations are increasing as a result of human activities. The main human activity that emits $CO^2$ is the combustion of fossil fuels (coal, natural gas and oil) for energy and transportation, although certain industrial processes and land use changes also emit $CO^2$.<br>Continued emissions of greenhouse gases will lead to further climate changes including a warmer atmosphere, a warmer and more acidic ocean, higher sea levels and larger changes in precipitation patterns.<br>The extent of future climate change depends on what we do now to reduce greenhouse gas emissions. The more we emit, the larger future changes will need to be. |
| **Green infrastructure** | The network of green spaces and water systems that delivers multiple environmental, social and economic values and services to urban communities. |
| **Growth areas** | These areas have been identified for urban expansion. They will be subject to further intensive investigations and public consultation. |

| | |
|---|---|
| **Healthy neighbourhoods** | Healthy neighbourhoods are places where people can live, learn, work and play. They offer a wide range of services that can easily reached on foot or by bicycle, including schools, health care, shops, parks, playing fields and public transport. They also provide streets and public spaces which support diverse and vibrant public life, biodiversity and physical activity. |
| **Heritage** | Local heritage place means a place that is designated as a place of local heritage value by a Development Plan. State heritage place means either a place entered, either on a provisional or permanent basis, in the South Australian Heritage Register or a place within an area established as a State Heritage Area by a Development Plan. |
| **High rise development** | Buildings of more than seven storeys in height. |
| **Infill** | Infill is the rededication of land in an urban environment to new construction. Infill also applies within an urban area to construction on any undeveloped land that is not on the urban fringe.<br>Infill housing is the development or construction of additional housing units into an existing subdivision or neighbourhood. These can be provided through the division of existing land or homes into multiple units or by creating new residential lots by further subdivision or boundary adjustments. Units may also be built on vacant lots. |
| **Medium rise development** | Buildings of between three to six storeys in height. |
| **Metropolitan Adelaide** | See definition of Greater Adelaide Capital City Statistical Area. |
| **Natural resources** | These resources includes soil, water and marine resources; geological features and landscapes; native vegetation; native animals and other native organisms; and ecosystems. |
| **Neighbourhoods** | Neighbourhoods are local areas within towns and cities recognised by people who live there as distinct places with their own character and approximate boundaries. |
| **Planning and Design Code (P&DC)** | The State Planning Commission will be responsible for preparing and maintaining a new 'Planning and Design Code', which will require a new approach to the drafting, presentation and interpretation of zoning rules.<br>The new code will be based on a more design-oriented style of zoning that focuses on built form and mixed use development. The code will set out a comprehensive set of planning rules for development assessment purposes, classified into zones, subzones and overlays. These will be applied in each region in a manner consistent with the relevant regional plan. This will make the code the single point of reference for development assessment. |
| **Planning Strategy** | The Planning Strategy outlines the State Government's direction for land use change and development in South Australia. The strategy has various volumes covering different geographic areas of the state:<br>• The Draft 30-Year Plan for Greater Adelaide<br>• Plans for regional South Australia.<br>Each volume of the strategy is reviewed every five years and can be altered from time to time to align it with legislative requirements or to incorporate policy changes following consultation within government and the community. |

| | |
|---|---|
| ***Planning, Development and Infrastructure Act (2016)*** | The new Planning, Development and Infrastructure Act 2016 was passed by Parliament on 12 April 2016. The Act will come gradually into operation over the next 5 years.<br>The Act places the emphasis on engaging communities early when the rules, such as the state-wide Planning and Design Code and other regulatory instruments are being written, rather than at the later stages of the planning process, when it is too late to influence outcomes. |
| **Public open space** | Open space is any open piece of land that is undeveloped and is accessible to the public. Open space usually refers to green space: land that is partly or completely covered with grass, trees, shrubs, or other vegetation. |
| **Public realm** | Public realm is defined as any publicly owned street, pathway, right of way, park, publicly accessible open space or any public or civic building and its facilities. |
| **Regional Plans** | The State Planning Commission (see above) must prepare a regional plan for each planning region. These plans must be consistent with relevant state planning policies and include:<br>• a long-term vision (over a 15 to 30-year period) for the region or area, including provisions about the integration of land use, transport infrastructure and the public realm<br>• maps and plans that relate to the long-term vision<br>• contextual information about the region or area, including forward projections and statistical data and analysis as determined by the Commission or required by a practice direction<br>• recommendations about zoning and a framework for development or management of infrastructure and the public realm.<br>Regional plans may be divided into parts relating to sub-regions, and may include structure plans, master plans, concept plans or other similar documents. Regional plans prepared by a joint planning board must comply with any practice direction issued by the Commission. |
| **South Australian Planning Policy Library (SAPPL)** | The state's current planning policies are contained in the South Australian Planning Policy Library (SAPPL). The library encourages best practice policy application and a consistent development plan format across the state.<br>The SAPPL are being reviewed for transition into the Planning and Design Code. |
| **State Planning Commission** | The Planning, Development and Infrastructure Act 2016 creates a new 'State Planning Commission' reporting to the Minister. Its responsibilities include provision of independent policy advice to government; guidance to councils and professionals; and coordination of planning with infrastructure delivery. The Commission will also serve as an assessment authority for prescribed classes of development applications. |
| **State Planning Policies (SPP)** | Set out the government's overarching goals or requirements for the planning system. These policies are to be taken into account when preparing other statutory instruments such as regional plans and design standards. They are not to be taken into account for the purposes of any assessment decision or application. |
| **Structure Plan** | A structure plan provides a vision and gives a broad spatial expression of the desired development outcomes for an area of change. This can include areas such as a transit corridor, centre, renewal area or greenfield site. Structure Plans can also be used to identify the regional distribution of targets, policies or actions relevant to an area. Structure Plans may also identify infrastructure and governance issues that will require resolution to facilitate the desired development outcomes of a broad spatial area. |

| | |
|---|---|
| **Sustainable development** | Forms of development that meet the needs of the present without compromising the ability of future generations to meet their needs. |
| **Townships** | Small urban centres separated from the built-up area of Adelaide. Townships often retain a unique history, character and function, with many containing public services, amenities and shops used by the surrounding community and tourists. |
| **Urban design** | Urban design is the collaborative and multi-disciplinary process of shaping the physical setting for life in cities and towns. It involves the design of buildings, groups of buildings, spaces and landscapes, and the establishment of frameworks and processes that facilitate successful development. |
| **Urban Form** | Urban form is:<br>a) the 'general pattern of building height and development intensity' and<br>b) (b) the 'structural elements' that define the city physically, such as natural features, transportation corridors (including the fixed rail/tram transit system), open space, public facilities, as well as activity centres and focal elements. |
| **Water security** | Water security means the availability of an appropriate quantity of water at an appropriate quality to meet the needs of the community. This includes the provision of potable and fit-for-purpose water supplies, the collection and treatment of wastewater and the management of stormwater. |
| **Water sensitive urban design (WSUD)** | Water sensitive urban design is an urban planning and engineering design approach which integrates the urban water cycle, including stormwater, groundwater and wastewater management and water supply into urban design to minimise environmental degradation and improve aesthetic and recreational appeal. |

# APPENDICES

## Appendix 1: Strategic Context

### *CLIMATE CHANGE*

#### Draft State Planning Policies:

**SPP 5 Climate Change** – *Our greenhouse gas emissions are reduced and development that is climate-ready is promoted so that our economy, communities and environment will be more resilient to climate change impacts*.

#### Regional Plans

- *The 30-Year Plan for Greater Adelaide* – Policies 105-114, Actions 59-63
- *The Eyre and Western Region Plan* – Principle 3, Policy 3.1-3.5
- *Far North Region Plan* – Principles 3, 6. Policies 3.8, 6.1-6.4
- *Kangaroo Island Plan* – Principle 2, Policy 2.8
- *Limestone Coast Region Plan* – Principle 2, Policy 2.6
- *Mid North Region Plan* – Principle 2, Policy 2.8
- *Murray and Mallee Region Plan* – Principle 3, Policy 3.6
- *Yorke Peninsula Regional Land Use Framework* – Objectives 1, 3. Strategies 1.1, 1.4, 1.6, 3.1, 3.2

#### Other government strategic directions

- *Towards a Resilient State- The South Australian Government's Climate Change Adaptation Action Plan, 2017*
- *South Australia's Climate Change Vision – Pathways to 2050*

### *WATER SENSITIVE URBAN DESIGN AND GREEN INFRASTRUCTURE*

#### Draft State Planning Policies:

**SPP 2 Design Quality** – *The Principles of Good Design are embedded within the planning system to elevate the design quality of South Australia's built and natural environment and public realm.*

**SPP 4 Biodiversity** – *Biodiversity is valued and conserved, and its integrity within natural ecosystems protected.*

**SPP 14 Water security and quality** – *South Australia's water supply is protected from the adverse impacts of development.*

#### Regional Plans:

- *Greater Adelaide* – Policies 85-86, 93, 95, 98-101, 103-104, 108, 111 (green infrastructure), 115-117 (WSUD), Actions 50, 59, 62, 63, 65, 117
- *Eyre and Western* – Policies 1.1-1.4, 1.6, 1.15 (green infrastructure)
- *Far North* – Principles 1, 2, 4. Policies 1.2, 2.1, 4.1, 4.3
- *Kangaroo Island* – Principles 1, 4. Policies 1.1-1.5, 1.8-1.12, 4.1, 4.3-4.8
- *Limestone Coast* – Principles 1, 4. Policies 1.1-1.5, 1.7, 1.9-1.12, 4.1, 4.3-4.8
- *Mid North* – Principles 1, 4. Policies 1.1-1.11, 4.1, 4.3-4.7
- *Murray and Mallee* – Principles 1, 2. Policies 1.1-1.11, 2.1-2.4, 2.6-2.11
- *Yorke Peninsula* – Objectives 2, 4, 16. Strategies 1.1-1.8, 2.1-2.3, 4.2, 4.3, 16.1, 16.2

### *WASTE*

#### Regional Plans

- *Greater Adelaide* – Policies 109-110, Actions 49, 52
- *Eyre and Western* – Principles 1, 2. Policies 1.5 (wastewater), 2.7

- *Far North* – Principles 3, 4, 7. Policies 3.8, 4.1, 4.2, 4.4, 4.5, 7.7 (identify land)
- *Kangaroo Island* – Principle 2, Policy 2.8
- *Limestone Coast* – Principle 2, Policy 2.6
- *Mid North* – Principle 2, Policy 2.8
- *Murray and Mallee* – Principle 3, Policy 3.6
- *Yorke Peninsula* – Objectives 4, 15. Strategies 4.1, 4.3, 15.1, 15.2

### Other government strategic directions

- *SA Strategic Plan* – Target 67 (2017)
- *The Environment Protection (Waste to Resources) Policy 2010*
- *South Australia's Waste Strategy 2015–2020*

## *ENERGY EFFICIENCY*

### Draft State Planning Policies:

**SPP 12 Energy** – *The ongoing provision of sustainable, reliable and affordable energy options that meet the needs of community and business.*

### Regional Plans

- *Greater Adelaide* – Policies 105, 107-109, 111-114. Actions 60, 61
- *Eyre and Western* – Principle 3, Policy 3.2-3.4
- *Far North Region*– Principles 2, 14. Policies 2.3, 14.1, 14.2.
- *Kangaroo Island* – Principles 4, 6. Policies 4.3, 4.5-4.7 6.7
- *Limestone Coast* – Principles 4, 6. Policies 4.3, 4.5, 4.6, 6.7
- *Mid North Region*– Principles 4, 6. Policies 4.3, 4.5, 4.6 6.7
- *Murray and Mallee* – Principle 2, Policies 2.3, 2.6, 2.9, 2.10, 2.11
- *Yorke Peninsula* – Objectives 2, 16. Strategies 2.3, 16.1, 16.2

### Other government strategic directions

- *SA Strategic Plan* – Target 60/61 (2017)

## *WATER SECURITY AND QUALITY*

### Draft State Planning Policy:

**SPP 14 Water Security and Quality** – *South Australia's water supply is protected from the adverse impacts of development*.

### Regional Plans:

- *Greater Adelaide* – Policies 115-117 (for Mount Lofty Ranges region), Actions 64, 65.
- *Eyre and Western* – Principle 1, Policy 1.1, 1.2, 1.6
- *Far North*– Principle 1, Policy 1.1-1.3
- *Kangaroo Island* – Principle 1, Policy 1.1-1.3
- *Limestone Coast* – Principle 1, Policy 1.1-1.3
- *Mid North Region* – Principle 1, Policy 1.1-1.4
- *Murray and Mallee Region* – Principle 1, Policy 1.1-1.4
- *Yorke Peninsula* – Objectives 1, 2, 16. Strategies 1.1-1.3, 2.1, 2.2, 16.1, 16.2

### Other government strategic directions

- *SA Strategic Plan* – Attaining Sustainability Objective
- Australian Water Association- 'Water Security for all Australians' -Discussion Paper www.awa.asn.au/AWA_MBRR/Publications/Water

## *BIODIVERSITY*

### Draft State Planning Policy:

**SPP 4 Biodiversity** – *Biodiversity is valued and conserved, and its integrity within natural ecosystems protected*.

### Regional Plans

- *Greater Adelaide* – Policies 90, 92-97, Actions 53, 54, 55
- *Eyre and Western* – Principle 1, Policy 1.9-1.15, 1.16-1.18 (protection of scenic landscapes)
- *Far North* – Principle 1, Policy 1.8-1.11, 1.12–1.14 (protection of scenic landscapes)
- *Kangaroo Island* – Principles 1, 2. Policies 1.6, 1.8-1.11, 2.5
- *Limestone Coast* – Principles 1, 2. Policies 1.6, 1.9-1.12, 2.4
- *Mid North* – Principles 1, 2. Policies 1.6, 1.8-1.11, 2.5
- *Murray and Mallee* – Principles 1, 2, 3. Policies 1.8, 1.10, 1.11, 1.15, 2.4, 3.3
- *Yorke Peninsula* – Objective 3 (core objectives of ESD)

### Other government strategic directions:

- *SA Strategic Plan* – Attaining Sustainability Objective
- *No Species Loss: A Biodiversity Strategy for South Australia 2006–2016*
- *Ecological Modelling (2017)*
- *Adelaide Conservation Action Plan: Greening Australia*: https://www.greeningaustralia.org.au/news/green-cities-program-underway-in-adelaide

## *COASTAL AREAS*

### Draft State Planning Policy:

**SPP 13 Coastal environment** – *Protect and enhance coastal and marine environment along with the protection of development from coastal processes*.

### Regional Plans

- *Greater Adelaide* – Policies 91, 118. Actions 54, 56, 66, 67
- *Eyre and Western* – Principles 2, 7, 8. Policies 2.8, 7.2, 7.4, 8.1
- *Far North* – Principle 1, Policy 1.5, 1.6
- *Kangaroo Island* – Principles 1, 2, 4, 8, 11, 12. Policies 1.5-1.7, 1.13, 1.14, 2.6, 4.2, 8.1-8.3, 8.5, 11.2, 11.4, 12.5
- *Limestone Coast* – Principles 1, 4, 8, 11, 12. Policies 1.5-1.8, 1.14, 4.2, 8.1, 8.2, 8.4, 8.7, 11.2, 11.4, 12.5
- *Mid North* – Principles 1, 2, 4, 7, 10, 11. Policies 1.5-1.7, 1.13, 2.6, 4.2, 7.2, 10.2, 11.5
- *Murray and Mallee* – Principles 1, 2, 3. Policies 1.5, 1.6, 1.8, 1.9, 1.16, 2.2, 3.4
- *Yorke Peninsula* – Objectives 13, 18. Strategies 1.4, 13.1, 13.2, 18.2, 18.3, 19.7

### Other government strategic directions

- *Adelaide's Living Beaches: A Strategy for 2005-2025*
- *Coast Protection Board Strategic Plan 2012 -2017* – Strategic Priority 1, 2, 3
- *Environment Protection (Water Quality) Policy 2015*
- *Eyre Peninsula Coastal Developmental Strategy 2007 – 9 Strategies*
- *Living Coast Strategy for South Australia 2004*
- *LGA Coastal Management Strategy 2003.*

## *NATURAL HAZARDS*

### Draft State Planning Policy:

**SPP 15 Natural hazards** – *Communities and developments are protected from the adverse impacts of natural hazards.*

### Regional Plans:

- *Greater Adelaide* – Policies 118-120, Actions 66, 67
- *Eyre and Western* – Principle 2, Policies 2.1, 2.3, 2.4, 2.8
- *Far North* – Principle 3, Policies 3.1-3.3, 3.5, 3.6
- *Kangaroo Island* – Principle 2, Policies 2.1, 2.4, 2.6
- *Limestone Coast* – Principle 2, Policies 2.1, 2.3-2.5
- *Mid North* – Principle 2, Policies 2.1, 2.4-2.6
- *Murray and Mallee* – Principle 3, Policies 3.1-3.4
- *Yorke Peninsula* – Objective 3

### Other Government Strategic Directions

- *Ministers Specifications (various)*
- *National Construction Code*

## *ENVIRONMENT PROTECTION & PUBLIC HEALTH (Site Contamination)*

### Draft State Planning Policy:

**SPP 16 Emissions and hazardous activities** – *Communities and the environment are protected from risks associated with emissions, hazardous activities and site contamination, whilst industrial development remains viable*.

### Regional Plans

- *Greater Adelaide* – Policy 121, Action 68
- *Eyre and Western* – Principle 2, Policy 2.6
- *Far North* – Principles 3, 4. Policies 3.7, 4.1-4.3
- *Kangaroo Island* – Principles 1, 2, 4, 6, 7, 8, 9, 11, 12, 13. Policies 1.5, 1.8, 1.10, 2.4-2.6, 4.4, 6.3, 6.7, 6.9, 7.1, 8.1, 9.3, 10.1 11.2, 12.4, 13.4
- *Limestone Coast* – Principles 1, 2, 4, 6, 7, 8, 10, 11, 12, 13. Policies 1.5, 1.7, 1.9, 1.11, 2.3-2.5, 4.4, 6.3, 6.7, 6.11, 6.13, 7.1, 8.1, 10.1, 10.2, 11.2, 12.4, 12.8, 13.4
- *Mid North* – Principles 1, 2, 4, 6, 8, 9, 10, 11, 12. Policies 1.5, 1.8, 1.10, 2.4-2.6, 4.4, 6.3, 6.7, 6.10, 8.4, 9.1, 9.2, 10.2, 11.2, 12.4
- *Murray and Mallee* – Principles 1, 2, 3, 6, 7, 9, 10, 11, 12. Policies 1.1, 1.4-1.7, 1.10, 2.7, 3.2-3.4, 6.4, 6.5, 6.8, 6.11, 7.3, 7.5, 9.1, 9.2, 10.2, 10.6, 11.4, 11.8, 12.4
- *Yorke Peninsula* – Objectives 1, 3, 19

## *ENVIRONMENT PROTECTION & PUBLIC HEALTH (Interface – including noise and emissions)*

### Draft State Planning Policy:

**SPP 16 Emissions and hazardous activities** – *Communities and the environment are protected from risks associated with emissions, hazardous activities and site contamination, whilst industrial development remains viable.*

### Regional Plans

- *Greater Adelaide* – Policy 77, Actions 49, 52, 66, 67
- *Eyre and Western* – Principles 2, 12. Policies 2.7, 12.3
- *Far North* – Principle 3, Policy 3.8
- *Kangaroo Island*– Principles 1, 2, 6, 9, 11, 12. Policies 1.10, 2.8, 6.1, 9.3, 11.7, 12.6,
- *Limestone Coast* – Principles 1, 2, 6, 9, 11, 12. Policies 1.11, 2.7, 6.1, 9.3, 11.11, 12.6
- *Mid North* – Principles 1, 2, 6, 8, 10, 11. Policies 1.10, 2.8, 6.1, 8.4, 10.8, 11.6
- *Murray and Mallee* – Principles 1, 3, 5, 6, 8, 10, 11. Policies 1.13, 3.6, 5.5, 6.1, 8.3, 10.8, 11.6
- *Yorke Peninsula* – Objectives 9, 19

### Other Government Strategic Directions

- EPA's Noise Environment Protection Policy - currently under review.
- EPA's Evaluation Distances for effective air quality and noise management www.epa.sa.gov.au/files/12193_eval_distances.pdf

# Appendix 2: South Australian Planning Policy Library (SAPPL)

## *General Module Policies*

- Animal Keeping – water protection,
- Coastal Areas
- Energy Efficiency
- Hazards
- Interface Between Land Uses
- Land Division
- Landscaping, Fences and Walls
- Metropolitan Open Space System
- Natural Resources
- Open Space and Recreation
- Renewable Energy Facilities
- Significant Trees
- Sloping Land
- Waste

The SAPPL also contains **zones** that are specifically aimed at protecting the natural environment:

- **Coastal Conservation Zone** - To enhance and conserve the natural features of the coast including visual amenity, landforms, fauna and flora.
- **Coastal Open Space Zone** - Coastal land protected from development other than that necessary for conservation, recreational activity and public facilities. Development of foreshore areas for a range of passive and active outdoor recreation activities and open space development, conservation and revegetation, in a parkland setting.
- **Conservation Zone**- Coastal land protected from development other than that necessary for conservation, recreational activity and public facilities. Development of foreshore areas for a range of passive and active outdoor recreation activities and open space development, conservation and revegetation, in a parkland setting.
- **Hills Face Zone**-
    - A zone in which the natural character is preserved and enhanced or re-established in order to: (a) provide a natural backdrop to the Adelaide Plain and a contrast to the urban area (b) preserve biodiversity and restore locally indigenous vegetation and fauna habitats close to metropolitan Adelaide (c) provide for passive recreation in an area of natural character close to the metropolitan area (d) provide a part of the buffer area between metropolitan districts and prevent the urban area extending into the western slopes of the Mount Lofty Ranges (e) ensure that the community is not required to bear the cost of providing services to and within the zone.
    - A zone accommodating low intensity agricultural activities and public/private open space and one where structures are sited and designed in such a way as to: (a) preserve and enhance the natural character or assist in the re-establishment of a natural character in the zone (b) limit the visual intrusion of development in the zone, particularly when viewed from roads within the zone or from the Adelaide Plain (c) not create, either in themselves, or in association with other developments, a potential demand for the provision of services at a cost to the community (d) prevent the loss of life and property resulting from bushfires.

- **Open Space Zone** - A zone: (a) in which the open space character is preserved to provide a visual contrast to the surrounding urban area (b) comprising open space that accommodates a range of public and private activities in an open and natural setting, including: (i) passive and active recreation land uses (ii) habitat conservation and restoration.
- **Primary Production Zone – Landscape Protection Policy Area***- The long-term continuation of primary production. 2 Economically productive, efficient and environmentally sustainable primary production. 3 Allotments of a size and configuration that promote the efficient use of land for primary production. 4 Protection of primary production from encroachment by incompatible land uses and protection of scenic qualities of rural landscapes.
- **River Murray Flood Zone** - 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 conservation and improvement of water quality that sustains the natural environment and natural ecological processes associated with the River Murray. Conservation of the natural features of the river environment. 4 Restricted development in recognition of the hazards associated with floods, by minimising new structures and changes to existing natural ground levels.
- **River Murray Fringe Zone** - The natural character and visual attractiveness of the River Murray, valley face and surrounds unmarred by development. Preservation and improvement of the water quality of the River Murray. Retention of the rural character of the zone.
- **Water Protection Zone** - Protection of surface and underground water resources from pollution, contamination or unsustainable use. 2 Development excluded from the zone where it is liable to contribute to the contamination or pollution of surface and underground water resources or the reduction of aquifer recharge. Extensive areas of locally indigenous plant species established and retained in order to safeguard the catchment and recharge characteristics of the water resource.

**Watershed Protection (Mount Lofty Ranges) Zone** – Provision of a safe drinking water supply to Adelaide by improving the quality and quantity of water harvested from the Mount Lofty Ranges Watershed. Protection of unused catchments in the Mount Lofty Ranges Watershed from inappropriate development which may jeopardize their future use for water supply. Development liable to contribute to the pollution or reduction of surface and/or underground water resources excluded from the zone. Extensive areas of native vegetation to safeguard the catchment and recharge characteristics of the water resource. A zone primarily for farming activities on large land holdings that do not pollute water resources.

# Appendix 3: Other strategic documents and legislation that interface with the planning system regarding natural resources and the environment

## *Climate Change*

### Relevant legislation & referrals

- *Climate Change and Greenhouse Gasses reduction Act 2007*
- *Environment Protection Act 1993*

### Other Government Strategic Documents

- *Towards a Resilient State- The South Australian Government's Climate Change Adaptation Action Plan, 2017*
- *South Australia's Climate Change Vision – Pathways to 2050*

## *Sustainable Urban Environments (Waste)*

### Relevant legislation & referrals

- *Environment Protection (Waste to Resources) Policy 2010 (Waste to Resources Environment Protection Policy)*

### Other Government Strategic Documents

- *South Australian Better Practice Guide Waste Management for Residential and Mixed use Developments:* http://www.zerowaste.sa.gov.au/upload/resource-centre/publications/waste-management-for-residential-and-mixed-use developments/

## *Water Security*

### Relevant legislation & referrals

There are a number of pieces of legislation and relevant boards that interface with the planning system around the issue of **Water**:

- *Environment Protection Act 1993*
- *Environment Protection (Water Quality) Policy 2015*
- *Murray- Darling Basin Act 2008*
- *River Murray Act 2003*
- *South Eastern Water Conservation and Drainage Act 1992*
- *Natural Resources Management Act, 2004*
- *Marine Parks Act 2007*
- *South Australian Public Health Act 2011*
- *Water Industry Act 2012*
- *Adelaide Dolphin Sanctuary Act 2005.*

Referrals to EPA:

- In MLR and RM Water Protection Area where development is non-complying
- Land division over 50 allotments (for the assessment of wastewater and stormwater)
- Wastewater treatment plants etc
- Schedule 21 also, in some cases, includes lower thresholds for certain types of development within the RM. It also requires referral for piggeries and dairies within all water protection areas within certain thresholds.

Referrals to Minster for River Murray:

- Water affecting activities

### Other Government Strategic Documents

- *Australian Water Association- 'Water Security for all Australians' – Discussion Paper* www.awa.asn.au/AWA_MBRR/Publications/Water

## *Biodiversity*

### Relevant legislation & referrals

- *Adelaide Parklands Act 2005*
- *Native Vegetation Act 1991*
- *Natural Resources Management Act 2004*
- *Recreational Greenways Act 2000*
- *The Arkaroola Protection Act 2012.*

### Other Government Strategic Documents

- *Ecological Modelling (2017)*
- *Adelaide Conservation Action Plan: Greening Australia* https://www.greeningaustralia.org.au/news/green-cities-program-underway-in-adelaide
- *No Species Loss: A Biodiversity Strategy for South Australia 2006–2016*

## *Coastal*

### Relevant legislation & referrals

- *Adelaide Dolphin Sanctuary Act 2005*
- *Coast Protection Act 1972*
- *Environment Protection Act 1993*
- *The Marine Parks Act 2007.*

Referrals to the Coast Protection Board for certain activities on coastal land.

### Other Government Strategic Documents

- *Coastal Planning Information Package: A guide to coastal development assessment and planning policy (DEWNR)*
- *EPA Aquatic Ecosystem reporting* http://www.epa.sa.gov.au/data_and_publications/water_quality_monitoring/aquatic_ecosystem_monitoring_evaluation_and_reporting .
- *EPA Adelaide coastal waters study.* http://www.epa.sa.gov.au/environmental_info/water_quality/programs/adelaide_coastal_waters
- *Material handling on wharves* http://www.epa.sa.gov.au/files/4771455_cop_handling.pdf
- *Water quality improvement plan – Port River* http://www.epa.sa.gov.au/files/477899_wqip.pdf

## *Natural Hazards*

### Relevant legislation & referrals (Bushfire)

- Ministers Specifications
- National Construction Code Australia

### Relevant legislation & referrals (Flooding)

- *Natural Resources Management Act 2004.*

## *Environment Protection and Public Health (Site Contamination)*

### Relevant legislation & referrals

- *Environment Protection Act 1993*

## *Environment Protection and Public Health (Interface – including noise and emissions)*

### Relevant legislation & referrals

- *Environment Protection Act 1993*
- *Environment Protection (Air Quality) Policy*
- *Environment Protection (Noise) Policy*

### Other Government Strategic Documents

- *Evaluation Distances for effective air quality and noise management*
  http://www.epa.sa.gov.au/files/12193_eval_distances.pdf

# Appendix 4: Further information

## *Waste*

- http://www.epa.sa.gov.au/environmental_info/waste_management/reforming-waste-management-2015
- http://www.zerowaste.sa.gov.au/upload/resource-centre/publications/waste-management-for-residential-and-mixed-use-developments/ZWSA%20Better%20Practice%20Guide%20FINAL%20FOR%20WEB.pdf
- http://www.epa.sa.gov.au/environmental_info/waste_management/reforming-waste-management-2015
- http://www.zerowaste.sa.gov.au/upload/resource-centre/publications/waste-management-for-residential-and-mixed-use-developments/ZWSA%20Better%20Practice%20Guide%20FINAL%20FOR%20WEB.pdf

## *Biodiversity*

Review recent research for planning related recommendations:

- *Ecological Modelling (2017)*
- *Adelaide Conservation Action Plan: Greening Australia*: https://www.greeningaustralia.org.au/news/green-cities-program-underway-in-adelaide

## *Water Security and Quality*

- *AWA 'Water Security for all Australians' – Discussion Paper*

## *Coastal Environment*

- EPA Aquatic Ecosystem reporting. www.epa.sa.gov.au/data_and_publications/water_quality_monitoring/aquatic_ecosystem_monitoring_evaluation_and_reporting .
- EPA Adelaide coastal waters study. http://www.epa.sa.gov.au/environmental_info/water_quality/programs/adelaide_coastal_waters
- EPA Material handling on wharves http://www.epa.sa.gov.au/files/4771455_cop_handling.pdf
- DEW developing LiDAR data for coasts for consistency across decision making
- *Water Quality Improvement Plan – Port River* http://www.epa.sa.gov.au/files/477899_wqip.pdf
- *Coastal Planning Information Package: A guide to coastal development assessment and planning policy* (DEWNR).

# REFERENCES

[1] Climate Change in Australia, 2016

[2] Iag (2017) *Natural disaster costs to reach $39 billion per year by 2050*, 21 November 2017 www.iag.com.au/natural-disaster-costs-reach-39-billion-year-2050

[3] PricewaterhouseCoopers Australia (2011) *Protecting human health and safety during severe and extreme heat events: A national framework*, Commonwealth Government, Australia, https://www.pwc.com.au/industry/government/assets/extreme-heat-events-nov11.pdf

[4] Between 2010 and 2015 76% of dwelling growth in Greater Adelaide came from infill development.

[5] 202020 Vision (2017) *Where Should All The Trees Go? State by State – South Australia* http://www.202020vision.com.au/media/72935/wsattg_sa_fa3_lr.pdf

[6] Environment Protection Authority South Australia (EPA SA) (2013) *SOE Report 2013*, http://www.epa.sa.gov.au/soe_2013/

[7] Department of Environment, Water and Natural Resources (2007) *No Species Loss, A Nature Conservation Strategy for South Australia 2007-2017*, https://www.environment.sa.gov.au/files/sharedassets/public/plants_and_animals/nsl_strategy.pdf

[8] PIA (2016) *Through the lens: megatrends shaping our future*, Australia

[9] Iag (2017) *Natural disaster costs to reach $39 billion per year by 2050*, 21 November 2017 www.iag.com.au/natural-disaster-costs-reach-39-billion-year-2050

[10] Australian Institute for Disaster Resilience (2018) *Australian Disaster Resilience Knowledge Hub*, https://knowledge.aidr.org.au/disasters

[11] Government of South Australia (2017) *The 30-Year Plan for Greater Adelaide – 2017 Update*, South Australia www.livingadelaide.sa.gov.au

[12] Government of South Australia (2015) *Towards a Resilient State: The South Australian Government's Climate Change Adaptation Response*, South Australia

[13] See the Integrated Movements Systems Discussion Paper for further information.

[14] See the Productive Economy Discussion Paper for further information.

[15] Government of South Australia (2015) *Towards a Resilient State: The South Australian Government's Climate Change Adaptation Response*, South Australia

[16] Government of South Australia (2017) *The 30-Year Plan for Greater Adelaide – 2017 Update*, South Australia www.livingadelaide.sa.gov.au

[17] this issue will be considered as part of the proposed Mount Lofty Ranges Watershed Overlay policies – (see 2.1 for further detail)

[18] The *Natural Resources Management Act 2004* will be repealed and replaced with the *Landscape South Australia Act* over the next 12 months

## References from Discussion Paper


1. *Climate Change in Australia, 2016*
2. Iag (2017) *Natural disaster costs to reach $39 billion per year by 2050*, 21 November 2017 www.iag.com.au/natural-disaster-costs-reach-39-billion-year-2050
3. *State of the Environment Report 2013*, Environment Protection Authority South Australia http://www.epa.sa.gov.au/soe_2013/index.html
4. 202020 Vision (2015) *Where Should All The Trees Go? State by State – South Australia* http://www.202020vision.com.au/media/72935/wsattg_sa_fa3_lr.pdf
5. Wood L. and Martin, K. 2010, *What makes a good play area for children?* Centre for the Built Environment and Health, The University of Western Australia.
6. Department of Environment, Water and Natural Resources (2007) *No Species Loss, A Nature Conservation Strategy for South Australia 2007-2017*, https://www.environment.sa.gov.au/files/sharedassets/public/plants_and_animals/nsl_strategy.pdf
7. *The Economics of Climate Change* – Committee for economic development of Australia CEDAA 2014
8. Esty, D. C., Charnovitz, S, 2013, *Environmental Sustainability and Competitiveness: Policy Imperative and Corporate Opportunity*, Institute for International Economic Policy, George Washington University
9. Elzeyadi, I. "*Daylighting-Bias and Biophilia: Quantifying the Impacts of Daylight on Occupants Health*." In: Thought and Leadership in Green Buildings Research. Greenbuild 2011 Proceedings. Washington, DC: USGBC Press. 2011
10. Green Industries SA (2017), *Benefits of a Circular Economy in South Australia – Summary*, Government of South Australia
11. Plant, L.P., 2016, *Making the case for planning and investment in green infrastructure: a case study of street trees and property value impacts in Brisbane*, Australia, School of Geography, Planning and Environmental Management, The University of Queensland
12. Parkland Views: How a Park View Actually Affects House Prices, *Secret Agent Report*, Volume 5, March 2013.
13. *South Australia's Climate Change Strategy 2015-2050: Towards a low carbon economy*, Department of Environment, Water & Natural Resources
14. Department of Planning, Transport and Infrastructure, *The 30 Year Plan for Greater Adelaide 2017 Update*, page 25
15. Kardan, O., Gozdyra, P., Misic, B., Moola, F., Palmer, L.J., Paus, T. and Berman, M.G., (2015) *Neighborhood greenspace and health in a large urban center*. Scientific reports, 5.
16. http://202020vision.com.au/
17. Government of South Australia, (2015) *Premium Food and Wine from our Clean Environment Action Plan - Update 2015*, Primary Industries and Regions SA, Adelaide
18. Department of Premier and Cabinet (2016), *Premium food and wine exported to the world*, South Australian Government
19. Fleming, A., 'The importance of urban forests: why money really does grow on trees', *The Guardian*, 12 October 2016 accessed https://www.theguardian.com/cities/2016/oct/12/importance-urban-forests-money-grow-trees

# HOW YOU CAN GET INVOLVED

We invite you to participate and share your feedback on this policy discussion paper via:
**www.saplanningportal.sa.gov.au**

For more information, please contact us:
**dpti.planningengagement@sa.gov.au**

Government of South Australia
Department of Planning, Transport and Infrastructure

saplanningcommission.sa.gov.au