This document was produced by the former Murray-Darling Basin Commission, and is provided as reference material.

The contents of this document may not represent the programs, approaches, strategies or views of the current Murray-Darling Basin Authority.
Integrated catchment management in the Murray–Darling Basin

A process through which people can develop a vision, agree on shared values and behaviours, make informed decisions and act together to manage the natural resources of their catchment: their decisions on the use of land, water and other environmental resources are made by considering the effect of that use on all those resources and on all people within the catchment.

Our values
We agree to work together, and ensure that our behaviour reflects the following values.

Courage
• We will take a visionary approach, provide leadership and be prepared to make difficult decisions.

Inclusiveness
• We will build relationships based on trust and sharing, considering the needs of future generations, and working together in a true partnership.
• We will engage all partners, including Indigenous communities, and ensure that partners have the capacity to be fully engaged.

Commitment
• We will act with passion and decisiveness, taking the long-term view and aiming for stability in decision-making.
• We will take a Basin perspective and a non-partisan approach to Basin management.

Respect and honesty
• We will respect different views, respect each other and acknowledge the reality of each other’s situation.
• We will act with integrity, openness and honesty, be fair and credible, and share knowledge and information.
• We will use resources equitably and respect the environment.

Flexibility
• We will accept reform where it is needed, be willing to change, and continuously improve our actions through a learning approach.

Practicability
• We will choose practicable, long-term outcomes and select viable solutions to achieve these outcomes.

Mutual obligation
• We will share responsibility and accountability, and act responsibly, with fairness and justice.
• We will support each other through necessary change.

Our principles
We agree, in a spirit of partnership, to use the following principles to guide our actions.

Integration
• We will manage catchments holistically; that is, decisions on the use of land, water and other environmental resources are made by considering the effect of that use on all those resources and on all people within the catchment.

Accountability
• We will assign responsibilities and accountabilities.
• We will manage resources wisely, being accountable and reporting to our partners.

Transparency
• We will clarify the outcomes sought.
• We will be open about how to achieve outcomes and what is expected from each partner.

Effectiveness
• We will act to achieve agreed outcomes.
• We will learn from our successes and failures and continuously improve our actions.

Efficiency
• We will maximise the benefits and minimise the costs of actions.

Full accounting
• We will take account of the full range of costs and benefits, including economic, environmental, social and off-site costs and benefits.

Informed decision-making
• We will make decisions at the most appropriate scale.
• We will make decisions on the best available information, and continuously improve knowledge.
• We will support the involvement of Indigenous people in decision-making, understanding the value of this involvement, and respecting the living knowledge of Indigenous people.

Learning approach
• We will learn from our failures and successes.
• We will learn from each other.

Strategy-in-summary

The Basin Salinity Management Strategy (BSMS) guides communities and Governments in working together to control salinity and protect key natural resource values within their catchments, consistent with the principles of the Integrated Catchment Management Policy Statement (ICM). It establishes targets for the river salinity of each tributary valley and the Murray-Darling system itself, that reflect the shared responsibility for action both between valley communities and between States.

It provides a stable and accountable framework that, over time, will generate confidence in how we are tracking our joint efforts to manage salinity.

Objectives

The Strategy will:

• Maintain the water quality of the shared water resources of the Murray and Darling Rivers for all beneficial uses. River salinity at Morgan, South Australia, will be maintained at less than 800 EC for 95 per cent of the time;

• Control the rise in salt loads in all tributary rivers of the Murray-Darling Basin, and through that control, protect its water resources and aquatic ecosystems at agreed levels, meeting the end-of-valley targets;

• Control land degradation and protect important terrestrial ecosystems, productive farm land, cultural heritages, and built infrastructure at agreed levels Basin-wide expressed as within-valley targets;

• Maximise net benefits from salinity control across the Basin.

Implementing salinity and catchment management plans

Managing trade-offs with the available within-valley options

Ensuring Basin-wide accountability: monitoring, evaluating, and reporting

Setting salinity targets

Developing capacity to implement the Strategy

Constructing salt interception works

Identifying values and assets at risk

Targeting reforestation and vegetation management

Redesigning farming systems
The States will analyse and review the available within-valley options and arrangements, under salinity and within-valley targets and monitoring. The partner Governments will work with catchment communities to identify important values and assets throughout the basin at risk of salinity, and the nature and timeframe of risk. This Strategy emphasises the triple-bottom-line approach, requiring a balance between economic, environmental and social values.

Setting salinity targets
The Commission and partner Governments will administer a comprehensive knowledge generation program to support Basin and within-valley planning and implementation. The partner Governments will work with catchment communities to implement national, Basin and State initiatives by improving access to and use of the knowledge and decision tools generated by investigations and salinity research and development. This process will be supported by further capacity building for catchment planning, including communication and education.

Identifying values and assets at risk
The partner Governments will work with catchment communities to identify important values and assets throughout the basin at risk of salinity, and the nature and timeframe of risk. This Strategy acknowledges gains made by existing plans, but requires that actions in existing and new plans, or the plans themselves, will need to be assessed and reported against the end-of-valley and Basin targets and recorded on Salinity Registers.

Implementing salinity and catchment management plans
This Strategy acknowledges gains made by existing plans, but requires that actions in existing and new plans, or the plans themselves, will need to be assessed and reported against the end-of-valley and Basin targets and recorded on Salinity Registers.

Developing capacity to implement the Strategy
The Council will adopt end-of-valley targets and social and economic needs. The States will assist communities to understand and agree the options with affected groups, industries and people through best practice planning processes.

Implementing salinity and catchment management plans
This Strategy acknowledges gains made by existing plans, but requires that actions in existing and new plans, or the plans themselves, will need to be assessed and reported against the end-of-valley and Basin targets and recorded on Salinity Registers.

The partner Governments will continue and enhance support for land and water management plans (LWMPs) in irrigation regions. The partner Governments will enhance support for development and implementation of ICM Policy-compliant salinity and catchment management plans in dryland regions.

Redesigning farming systems
The partner Governments will coordinate and enhance research and development into new farming and forestry systems that deliver improved control of groundwater recharge in the high rainfall grazing, winter rainfall cropping, and summer rained cropping zones.

Over and above current programs the Commission will enhance research and development into new industries based on salinised resources, such as broadacre salinity agronomy, saline aquaculture, and salt harvesting.

Targeting reforestation and vegetation management
The partner Governments recognise the necessity for landscape change specifically targeted at salinity control. In order to facilitate such targeted change, where changes farming systems are not adequate, the Commission will further develop the concept of a vegetation bank to have the capacity to finance extension of forestry outside of traditional forestry areas.

The partner Governments will further consider the financing of native vegetation management, rehabilitation and land stewardship, and the commercialisation of short rotation tree crops, particularly for the wheatbelt.

Constructing salt interception works
The Commission will construct and operate new joint (partner Government funded) salt interception works to protect Basin-wide assets and values, including the shared water resources of the Murray and Darling Rivers. This will provide protection beyond the benefits from simply meeting end-of-valley targets, based upon agreed cost sharing and benefit allocation principles. The benefits will continue to include salt disposal entitlements to offset the impacts of future actions that aggravate salinity.

Ensuring Basin-wide accountability: monitoring, evaluating, and reporting
The partner Governments will demonstrate accountability by reporting to the Commission and Council through State end-of-valley Report Cards and Commission Salinity Registers that record the salinity effects of actions, including salt interception schemes and salinity and catchment management plans.

The Council will receive audits every five years for each valley and Commission Register every, assessing impacts on river salinity and progress towards targets, with the provision to require further action if necessary.

Implementation
By March 2002 Council will finalise the scale of the joint program of salt interception schemes, and arrangements for cost sharing and allocation of credits.

At the outset, the partner Governments are aligning their investments under the National Action Plan for Salinity and Water Quality and State strategies, to support the delivery of this Strategy.

As soon as practicable accountability arrangements of this Strategy will be enshrined in a revised Schedule to the Murray-Darling Basin Agreement (MDBA). This Strategy will be reviewed in 2007 and 2015.
Foreword

This Strategy sets out how Basin communities and Governments will work together to control salinity and protect important environmental values and assets. It contains accountability arrangements that are the ‘first of a kind’ for salinity strategies in Australia. By specifying river salinity targets to be met in the year 2015, this new Strategy builds on the success of the 1988 Salinity and Drainage Strategy in reducing River Murray salinity while addressing the challenge of dryland salinity across the Basin in the longer term.

The Basin Salinity Management Strategy is the Murray-Darling Basin Ministerial Council’s response to the threats of salinity to water quality, environmental values, regional infrastructure and productive agricultural land. These were quantified in the 1999 Basin Salinity Audit and in the 2001 reports from the National Land and Water Resources Audit. This Strategy was developed by the Murray-Darling Basin Commission over two years, through a process involving extensive community consultation and public comment. The Council is confident it has widespread acceptance, and at the time of its release significant work is already underway to bring about its implementation.

This Strategy comes at a time when salinity control and management is being given priority attention throughout Australia. In finalising the Strategy, the Murray-Darling Basin Commission has taken all care to ensure compatibility with the National Action Plan on Salinity and Water Quality, State salinity strategies, and regional catchment or salinity management plans.

Importantly, this Strategy implements the principles set out in the Council’s Integrated Catchment Management Policy Statement.

Our Governments are committed to tackling salinity over the long haul, and through this Strategy will:
• Take actions to cap the rise in dryland salinity to ensure important environmental, economic and cultural assets are protected;
• Ensure that the regional development aspirations of communities can be accommodated; and
• Work together to maintain the water quality at Morgan within agreed standards over the next 15 years.

The river salinity targets provide the framework for each Government and regional community to agree on the investment in sustainable farming systems, targeted reforestation, salt interception schemes, flow management and new commercial uses of salt and salinised land necessary to achieve them. Government investment will include a seven-year joint salt interception program to gain defined salinity benefits, and an on-going commitment to research and development of sustainable land management practices for the longer term.

Importantly, the targets are the basis for accountability arrangements to track effort and progress on these commitments. Targets, which are interim at the outset, will be finalised in the early years of this Strategy. The targets will give partner governments, catchment bodies and their communities very clear signals on the level of effort and associated trade-offs needed to protect their catchments, while protecting water quality downstream.

The Basin Salinity Management Strategy is presented in four sections. The first section specifies the objectives of the Strategy in controlling salinity over the next 15 years. The second section lays out the principles of the Strategy and their consistency with the principles of integrated catchment management. The third section is the Strategy itself and outlines the nine key elements essential to bring about salinity control. The last section describes the implementation and review arrangements for the Strategy over in 15 year life.

In agreeing to the Basin Salinity Management Strategy, the Murray-Darling Basin Ministerial Council recognises that sustained investment will be necessary to achieve salinity outcomes. The accountability arrangements will give all Governments and communities confidence that their shared efforts will achieve real outcomes for their catchments and the Basin over the 15 year period and beyond.

The Hon. Warren Truss
Chairman, Murray-Darling Basin Ministerial Council
Minister for Agriculture, Fisheries and Forestry (Commonwealth)

The Hon. Richard Amery
Minister for Agriculture, and Minister for Land and Water Conservation (New South Wales)

The Hon. Sherryl Garbutt
Minister for Environment and Conservation, and Minister for Women’s Affairs (Victoria)

The Hon. Mark Brindal
Minister for Water Resources, Minister for Employment and Training, and Minister for Youth (South Australia)

The Hon. Stephen Robertson
Minister for Natural Resources, and Minister for Mines (Queensland)

Mr Brendan Smyth
Minister for Urban Services (Australian Capital Territory)
Catchment management regions of the Murray-Darling Basin
Contents

Strategy-in-summary ii

Foreword v

Part One: The Need for Further Action
1.1 Past action, salinity trends and Strategy objectives 1
  1.1.1 Past action 1
  1.1.2 Salinity trends 1
  1.1.3 Strategy objectives 1

Part Two: Strategic Approach - Context and Principles
2.1 Context for this Strategy 3
  2.1.1 National Action Plan For Salinity and Water Quality 3
  2.1.2 Basin ICM Policy Statement 3
  2.1.3 Basin Salinity Management Strategy 3
  2.1.4 State salinity initiatives 3
  2.1.5 Regional salinity plans 4
  2.2 Basin strategic approach 4
  2.3 Principles 5
    2.3.1 Interpreting the ICM Policy Statement 5
    2.3.2 Specific to this Strategy 5
  2.4 Commitment to this Strategy 6
    2.4.1 Council endorsement 6
    2.4.2 Implementing Council’s decision through the Murray-Darling Basin Agreement 7
    2.4.3 Drafting a revised Schedule to the Agreement 7

Part Three: Implementation
3.1 Developing capacity to implement the Strategy 9
  3.1.1 Basin-wide capacity 9
  3.1.2 Within-valley capacity 9
  3.1.3 Communication and education 9
  3.1.4 Institutional reform 9
  3.2 Identifying values and assets at risk 10
    3.2.1 Basin-wide 10
    3.2.2 Commission/Council roles in protecting values and assets 10
  3.3 Setting salinity targets 11
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1 The need for targets</td>
<td>11</td>
</tr>
<tr>
<td>3.2 Council’s target sites at end-of-valley and Morgan</td>
<td>11</td>
</tr>
<tr>
<td>3.3 Processes for Council target setting and review</td>
<td>12</td>
</tr>
<tr>
<td>3.4 State within-valley targets</td>
<td>14</td>
</tr>
<tr>
<td><strong>3.4 Managing trade-offs with the available within-valley options</strong></td>
<td>14</td>
</tr>
<tr>
<td>3.4.1 Land management options</td>
<td>14</td>
</tr>
<tr>
<td>3.4.2 Engineering options</td>
<td>14</td>
</tr>
<tr>
<td>3.4.3 Flow management</td>
<td>15</td>
</tr>
<tr>
<td>3.4.4 Living with salt</td>
<td>15</td>
</tr>
<tr>
<td>3.4.5 Managing trade-offs</td>
<td>15</td>
</tr>
<tr>
<td>3.5 Implementing salinity management plans</td>
<td>15</td>
</tr>
<tr>
<td>3.5.1 Current status</td>
<td>15</td>
</tr>
<tr>
<td>3.5.2 More action in irrigation regions</td>
<td>15</td>
</tr>
<tr>
<td>3.5.3 More action in dryland regions</td>
<td>16</td>
</tr>
<tr>
<td>3.5.4 Assessing contribution of plans to meeting targets</td>
<td>16</td>
</tr>
<tr>
<td>3.5.5 Additional works to meet Basin target</td>
<td>16</td>
</tr>
<tr>
<td><strong>3.6 Redesigning farming systems</strong></td>
<td>17</td>
</tr>
<tr>
<td>3.6.1 Collaboration in research and development</td>
<td>17</td>
</tr>
<tr>
<td>3.6.2 Mimicking natural systems</td>
<td>17</td>
</tr>
<tr>
<td>3.6.3 Criteria-based assessment of research and development potential</td>
<td>17</td>
</tr>
<tr>
<td>3.6.4 Current prospects for agro-ecological zones</td>
<td>17</td>
</tr>
<tr>
<td>3.6.5 New industries based on salinised resources</td>
<td>18</td>
</tr>
<tr>
<td><strong>3.7 Targeting reforestation and vegetation management</strong></td>
<td>18</td>
</tr>
<tr>
<td>3.7.1 The vegetation bank concept</td>
<td>18</td>
</tr>
<tr>
<td>3.7.2 Forestry outside of its traditional zone</td>
<td>19</td>
</tr>
<tr>
<td>3.7.3 Native vegetation management, rehabilitation and land stewardship</td>
<td>19</td>
</tr>
<tr>
<td>3.7.4 Short rotation tree crops</td>
<td>19</td>
</tr>
<tr>
<td><strong>3.8 Constructing joint (Commission) salt interception works</strong></td>
<td>20</td>
</tr>
<tr>
<td>3.8.1 Joint works under the <em>Salinity and Drainage Strategy</em></td>
<td>20</td>
</tr>
<tr>
<td>3.8.2 New joint works</td>
<td>20</td>
</tr>
<tr>
<td>3.8.3 Cost sharing and benefit allocation for joint works</td>
<td>20</td>
</tr>
<tr>
<td>3.8.4 Investigating, constructing and operating joint works</td>
<td>21</td>
</tr>
<tr>
<td><strong>3.9 Ensuring Basin-wide accountability: monitoring, evaluating and reporting</strong></td>
<td>21</td>
</tr>
<tr>
<td>3.9.1 Salinity credits and debits</td>
<td>21</td>
</tr>
<tr>
<td>3.9.2 Valley Report Cards</td>
<td>21</td>
</tr>
<tr>
<td>3.9.3 Administering Commission Registers</td>
<td>21</td>
</tr>
<tr>
<td>3.9.4 Reporting to Council</td>
<td>22</td>
</tr>
<tr>
<td>3.9.5 Accountability under Schedule C</td>
<td>22</td>
</tr>
</tbody>
</table>
### Part Four: Initiation and Review

<table>
<thead>
<tr>
<th>4.1 Initiation</th>
<th>25</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1.1 Completing the Salinity &amp; Drainage Strategy</td>
<td>25</td>
</tr>
<tr>
<td>4.1.2 Finalising end-of-valley targets and monitoring framework</td>
<td>25</td>
</tr>
<tr>
<td>4.1.3 Finalising cost sharing and benefit allocation arrangements for the new joint works program</td>
<td>25</td>
</tr>
<tr>
<td>4.1.4 Revising Schedule C</td>
<td>25</td>
</tr>
<tr>
<td>4.1.5 Developing modelling/assessment frameworks</td>
<td>25</td>
</tr>
<tr>
<td>4.1.6 Establishing a group to oversee Strategy implementation</td>
<td>25</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4.2 Review</th>
<th>25</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.2.1 Mid-term review</td>
<td>25</td>
</tr>
<tr>
<td>4.2.2 Beyond this Strategy - post 2015</td>
<td>26</td>
</tr>
</tbody>
</table>

### Abbreviations

| Abbreviations | 26 |
Areas forecast to contain land of high hazard or risk of salinity in 2050

Salinity data compiled by National Land & Water Resources Audit
Copyright Commonwealth of Australia 2001
Part One: The Need for Action

1.1 Past action, salinity trends, and Strategy objectives

1.1.1 Past action
River Murray salinity has been significantly reduced through implementation of the 1988 Salinity & Drainage (S&D) Strategy, and this has been achieved while undertaking the rehabilitation of degraded lands and allowing for new irrigation development. This was made possible by limiting the amount of salt entering the river through construction of salt interception schemes, and due to the effectiveness of State salinity action plans and land and water management plans (LWMP). The indicative target of keeping river salinity at Morgan, South Australia, below the 800 EC threshold at least 95 per cent of the time is close to being met.

1.1.2 Salinity trends
The 1999 Basin Salinity Audit has shown that salt, previously stored in the landscape, is now being mobilised on a massive scale by rising groundwater tables due to land use changes across the Murray-Darling Basin. ‘Business as usual’ would mean that the reduction in lower River Murray salinity achieved over the last decade would be cancelled out within 20 to 30 years, and median salinity levels would exceed the Australian Drinking Water Guidelines for good quality water within 50 to 100 years.

Average river salinities in key tributary rivers will rise significantly, endangering their use for irrigation and urban purposes within 20 to 50 years, and about 3.4 million ha of land in the eastern and southern regions of the Basin will be salt-affected within 50 years.

Although environmental implications are not well understood, river salinity levels are having serious impacts on floodplain wetlands of national and international importance. The current impact costs of dryland salinity in eight tributary valleys of the Basin are estimated to be $247 million per year. The impact costs of salinity to consumptive users of River Murray water total $47 million per year.

1.1.3 Strategy objectives
The Murray-Darling Basin is the food-bowl of the nation and is a major contributor to Australia’s important and burgeoning food export markets. The Basin is home to unique and environmentally significant natural features, many of which are subject to international treaties. Over two million people directly depend on the natural resources of the Basin for their livelihood, and their future prosperity is dependent upon its sustainable management. These values are at risk from salinity.

Under current trends, future Basin-wide salinity impacts will be so large that it will not be feasible to contain or reduce them in all at risk areas. The high cost of salinity prevention and rehabilitation will prohibit protection or restoration of natural resource values in all parts of the Basin.

This means that in different areas, careful choices will need to be made between three approaches to salinity management: to attempt to reverse it; to limit its rate of spread and impacts; or to let it take its course. A ‘business as usual’ approach is not acceptable.

This Strategy has a Basin-wide focus and emphasises the first two approaches, and will:

- maintain the water quality of the shared water resources of the Murray and Darling Rivers for all beneficial uses - agricultural, environmental, urban, industrial and recreational;
- control the rise in salt loads in all tributary rivers of the Basin and, through that control, protect their water resources and aquatic ecosystems at agreed levels;
- control land degradation and protect important terrestrial ecosystems, productive farm land, cultural heritage, and built infrastructure at agreed levels Basin-wide; and
- maximise net benefits from salinity control across the Basin.

The means of achieving these objectives will be the application of targets for the shared water resources (less than 800 EC for 95 per cent of the time at Morgan), for each tributary valley (end-of-valley salinity, salt load and flow) and for other Basin-wide values and assets (State within-valley management targets).
Key features of the Murray-Darling Basin

Legend

- Average yearly rainfall (500 & 800 mm)
- State boundaries
- Main rivers
- Irrigation areas

Agricultural Zones

- Winter rainfall grazing
- Rangelands
- Summer rainfall grazing
- Inland sheep belt
Part Two: Strategic Approach - Context and Principles

2.1 Context for this Strategy
This Strategy provides a framework for implementing salinity management actions across the Basin, including those associated with the National Action Plan (NAP) for Salinity and Water Quality and State salinity initiatives, under a 15-year program of action.

2.1.1 National Action Plan for Salinity and Water Quality
The NAP was endorsed by the Council of Australian Governments on 3 November 2000. It is a seven year national framework that targets salinity and water quality protection with the joint resources of the Commonwealth, State and territory Governments backed by an over-arching Inter-Governmental Agreement. The Agreement requires that the implementation of the NAP will be consistent with the multilateral approach under this strategy to ensure that Basin-wide and interstate issues are adequately addressed.

The NAP targets nine priority regions in the Basin for addressing salinity and water quality issues. Other Commonwealth natural resources management initiatives, this Strategy, and State salinity initiatives will direct resources to NAP regions and also to regions outside of the NAP regions.

2.1.2 Basin ICM Policy Statement
The Murray-Darling Basin Integrated Catchment Management Policy Statement (ICM) states the high-level goals and principles within the commitment that community and Governments will 'do all that needs to be done to manage and use the resources of the Basin in an ecological sustainable way' (see inside back cover).

The ICM Policy Statement sets standards for all new Basin strategies. This Strategy is the first to be developed according to the standards, and it will:

• be recognisably part of a larger setting, showing links to other strategies and plans at national, Basin, State and catchment levels, and links with actions addressing other issues;
• be based on a clear set of principles;
• have clearly defined priority actions and locations for attention at Basin, State and catchment levels, for delivery through and in support of catchment strategies and action plans;
• take account of the economic, environmental and social contexts within which the Strategy must operate, and of the economic, environmental and social impacts of the Strategy;

• have clear, achievable and measurable targets and timeframes;
• outline the mechanisms for achieving targets;
• have mechanisms for defining options and managing trade-offs between conflicting interests;
• define roles, responsibilities and accountabilities; and outline the skills and capacities required to meet these responsibilities and accountabilities;
• include practical monitoring, evaluation and reporting processes; and
• include provision for reviewing and revising the Strategy to learn from successes and failures.

2.1.3 Basin Salinity Management Strategy
Under the Murray-Darling Basin Initiative, the Murray-Darling Basin Ministerial Council (MDBMC) has responsibility for whole-of-Basin outcomes, while the States in partnership with regions are responsible for within-valley outcomes. These responsibilities are reflected throughout this Strategy.

Specifically, Council will adopt end-of-valley and Basin targets, which will cap rising salinity from all catchments and thus protect values and assets Basin-wide. The NAP, this Strategy and State salinity initiatives will each adopt the same targets with the Council receiving annual reports and ensuring accountability arrangements to meet the objectives of this Strategy.

Catchment plans will be expected to meet the requirements of the NAP, this Strategy and State initiatives, requiring that they quantify their salinity effects at the target sites and on the Commission’s salinity registers, and meet Basin reporting and auditing requirements. Salinity registers are discussed in more detail below in section 3.9.

2.1.4 State salinity initiatives
All of the Basin States have introduced new salinity initiatives. These initiatives, while focussed on whole-of-state and within-valley actions, will contribute to meeting Council adopted end-of-valley and Basin targets, and will also meet the requirements of the NAP bilateral agreements.

The State initiatives are listed below. More details are available from documents prepared by the relevant States.
New South Wales
NSW released Taking on the Challenge: NSW Salinity Strategy in August 2000. Its objective is to slow down the rate of increase in salinity within 10 years, to meet targets reflecting salinity levels that the State is prepared to live with and can afford. Catchment management boards have been given the task of reviewing and making recommendations on interim end-of-valley targets.

Victoria
Victoria released its Salinity Management Framework: Restoring our Catchments in August 2000. The document confirms that review of salinity management plans is vitally important in order to capitalise on new information. Catchment management authorities have prime responsibility for this review.

South Australia
South Australia released its South Australian River Murray Salinity Strategy in June 2001. Within principles consistent with this Strategy and the NAP, it requires that salinity arising from irrigation will not impact on the River Valley, that regional groundwater discharge from the cleared Mallee districts towards the river valley will be managed, and that the health of the floodplain and wetlands along the Murray corridor will be protected and enhanced. Improved knowledge will be developed and applied to the catchment planning and decision processes.

In addition, South Australia has a State-wide Dryland Salinity Strategy that applies to the South Australian sector of the Basin where rising water tables are affecting the productive land systems around the lower lakes, Coorong, and Eastern Mount Lofty Ranges.

Queensland
Queensland will deliver ICM outcomes, including minimisation of salinity, through existing initiatives including vegetation management, water reform and improved land management practices. Salinity science workplans are being developed which support community groups in their development and implementation of strategies to address salinity and water quality. Both salinity and water-quality outcomes will be delivered within the framework of integrated catchment management and the NAP. Meanwhile, Queensland has committed itself to accountabilities and responsibilities for implementing this Strategy and the ICM Policy Statement.

2.1.5 Regional salinity plans
Under the NAP, this Strategy, and State salinity initiatives, regional organisations will develop salinity or catchment management plans that will cover among other things, performance measures, agreed outcomes, accountability and reporting mechanisms and compliance measures.

It is expected that, once a plan has been accredited under the NAP, it will meet the requirements of this Strategy and State initiatives and consequently attract an appropriate level of investment from Governments and the communities. As there is broad consistency between the requirements of the NAP, this Strategy and State salinity initiatives, this will ensure that plans and resources for regions outside the NAP will be consistent with those for regions covered by the NAP.

2.2 Basin strategic approach
Under this Strategy, the partner Governments are committing to the following nine elements of strategic action, to be implemented over the next 15 years:

- developing capacity to implement the Strategy;
- identifying values and assets at risk;
- setting salinity targets;
- managing trade-offs with the available within-valley options;
- implementing salinity and catchment management plans;
- redesigning farming systems;
- targeting reforestation and vegetation management;
- constructing salt interception works; and
- ensuring Basin-wide accountability: monitoring, evaluating, and reporting.

As part of this action, the Commission will manage a comprehensive knowledge generation program, coordinate and enhance further research and development (R&D) on farming and forestry systems, construct and operate salt interception schemes, further develop the vegetation bank concept and establish Basin-wide monitoring, evaluation and reporting arrangements.

Consistent with its responsibility for Basin outcomes, MDBMC will adopt end-of-valley and Basin targets, which will be the same for the NAP, this Strategy, and State initiatives.
2.3 Principles

The partner Governments have agreed to the principles outlined below. This Strategy interprets and applies the ICM principles (see inside back cover) to salinity management, and this interpretation forms the basis for the partner Governments’ commitment to and involvement in its delivery.

2.3.1 Interpreting the ICM Policy Statement

Inclusiveness

This Strategy supports the ICM principles of integration and informed decision making by committing to an inclusive, integrated catchment management approach to salinity planning, management and implementation.

Community/Government partnerships

This Strategy supports the principle of transparency by committing to community/Government partnerships that are open about how to achieve outcomes and what is expected from each partner. There is an expectation that communities and industry will actively participate in salinity management planning and implementation, and meet their duty of care to avoid actions that worsen salinity impacts.

2.3.2 Specific to this Strategy

Accountability

This Strategy supports the ICM principle of accountability by continuing States’ accountability for future actions that was a key feature of the S&D Strategy, and from 1 January 2000 includes Queensland under this principle. The S&D Strategy obliged NSW, Victoria and South Australia to be accountable for offsetting the salinity impacts of actions implemented after 1 January 1988 that significantly affect river salinity as measured at Morgan.

Within this Strategy, accountability is provided through the end-of-valley Report Cards and targets, the Commission Salinity Registers for the Basin, salinity credits and debits, and participation in a program of joint salt interception works. States in breach of this principle will be answerable to Council. There will five-yearly audits, assessing impacts on river salinity.

Responsibility

This Strategy commits the partner Governments to accept shared responsibility for further action to meet the Basin salinity target as measured at Morgan (less than 800 EC for 95 per cent of the time at Morgan) over 15 years.

In making this commitment, they are accepting a shared responsibility to address the legacy of history by ensuring that the combined State total of the Commission Registers remains in balance or in surplus. If a State’s contribution to the total of the Commission Registers goes into deficit then this will trigger an exception report to Council (with the Commission providing advice on proposed action to bring the account into balance or in surplus).
Throughout this Strategy, reference is made to the ‘legacy of history’ and ‘future actions’. This Strategy differentiates between accountability to offset the salinity impacts of future actions and responsibility to offset the future salinity impacts of past actions (the ‘legacy of history’). ‘Future actions’ are typically works or measures with salinity implications undertaken after 1 January 1988 by NSW, Victoria and South Australia, and from 1 January 2000 by Queensland. Future impacts of past actions or the ‘legacy of history’ refers to the inevitable future salinity impacts which occur after 1 January 2000 as a result of actions or decisions undertaken before 1 January 1988 by NSW, Victoria and South Australia, and before 1 January 2000 by Queensland.

Sharing benefits and costs

Under this Strategy, current landholders will not be expected to individually accept responsibility for the future impacts of past actions. However, the impacts are real and need to be dealt with. Collectively, past and current landholders, and society as a whole, are represented by today’s Governments. That is not to say that today’s Governments automatically have to address the whole problem from within current resources. Rather, this Strategy requires them to establish a decision making regime in which the appropriate trade-offs are carefully considered, remedial measures are agreed multi-laterally and the allocation of salinity credits generated by joint works reflects cost sharing arrangements. The Strategy also acknowledges that the social impacts of the various salinity management options need to be considered, and that responsibility should be shared across generations as well as localities. Furthermore, it recognises that communities in the more salt-affected regions or localities should not have to bear all the costs of intervention.

To most effectively handle this shared responsibility, the partner Governments have agreed to a further joint program of salt interception works to achieve a reduction of at least 46 EC, and potentially up to 61 EC, in average river salinity at Morgan (to offset the ‘legacy of history’ and provide salt disposal entitlements for future actions) within seven years. In an evolutionary step from past practice, the partner Governments have agreed to a series of cost sharing and benefit allocation principles under current flow regimes (i.e., the Cap on diversions). These are listed below in section 3.8. In summary, the joint works program will offset those ‘legacy of history’ effects, which are not offset by in-valley actions in the first seven years, with the Commonwealth’s credits directed towards offsetting the ‘legacy of history’, and possibly future actions that provide environmental and social benefits.

Optimal investments

This Strategy supports the ICM principles of efficiency and full accounting by committing to investment in salinity based on a full and proper assessment of all the benefits and costs (economic, environmental, and social) within the valleys and downstream. Investment will proceed where the sum of all benefits exceeds the sum of all costs. This recognises that there have to be limits to the levels of investment in protection and that these limits will vary within and between river valleys and States.

Balanced decisions

This Strategy further supports the ICM principles of efficiency and full accounting by committing the states and valley communities to taking balanced decisions and making careful trade-offs between a range of salinity management options including, but not necessarily limited to, those discussed below in section 3.4. For example, trade-offs will need to be made between engineering options that provide immediate salinity benefits but treat the symptoms not the causes, landscape change options that treat the cause but provide longer-term and less certain benefits, and flow management options that can provide immediate salinity benefits (e.g., dilution flows) but can affect availability of water for irrigation and environmental purposes.

In practice, the States and their communities will achieve the end-of-valley and Basin salinity targets through a changing balance of engineering, landscape change and flow management options, that reflects their relative costs and prevailing social values.

2.4 Commitment to this Strategy

2.4.1 Council endorsement

This Strategy was requested by Council following its consideration of the Basin Salinity Audit in 1999. It has been developed by the partner...
Governments and Basin communities through a lengthy process of informed debate and consultation, based on the Draft Basin Salinity Management Strategy released in September 2000. This Strategy provides a comprehensive, strategic and well thought out approach to the most challenging environmental issue facing the Basin and the nation.

In endorsing this Strategy in March 2001, and its major policies including salinity targets, accountability, salinity credits and debits, redesigning farming systems, further development of the vegetation bank concept and joint salt interception works, Council has signalled that it is prepared to take decisive action.

2.4.2 Implementing Council’s decision through the Murray-Darling Basin Agreement

The Murray-Darling Basin Initiative is the partnership between the Governments and Basin communities that has been established to give effect to the Murray-Darling Basin Agreement (MDBA). The purpose of the Agreement is ‘to promote and coordinate effective planning and management for the equitable, efficient and sustainable use of the water, land and other environmental resources of the Murray-Darling Basin.’

This purpose is achieved through Council considering and determining major policy issues such as salinity, and developing, considering and authorising measures to address those issues. This Strategy is the Council’s 15-year response to salinity, and its key elements will be given a statutory basis in a revised Schedule C to the Agreement. The Commission will be responsible for implementing this Strategy within the terms of the Agreement and Schedule C.

2.4.3 Drafting a revised Schedule to the Agreement

The accountability arrangements of this Strategy will be enshrined in a revised Schedule C to the Agreement, which builds on the current Schedule in the following ways:

- consideration of works and measures Basin-wide;
- including Queensland in accountability arrangements, with 1 January 2000 as the effective date;
- responsibility for ‘legacy of history’ effects, with 1 January 2000 as the effective date, for all partner Governments;
- targets for each tributary valley and the shared rivers at Morgan;
- a new joint works program, to address the ‘legacy of history’ and provide salt disposal entitlements (SDEs);
- revised cost sharing and salinity credit allocation for Victoria, NSW, South Australia and the Commonwealth, under the new joint works program;
- provisions for Queensland to participate in the joint works program, if required, after five years of Strategy implementation;
- integration of the credits and debits of the previous S&D Register into the new Commission A and B Registers of this Strategy;
- provision for annual reporting by States to the Commission, and review and audit of actions on the Commission Registers at least once every five years; and
- provision for exception reporting to Council and obligations for the partner Governments to be brought to account.
BASIN SALINITY MANAGEMENT STRATEGY 2001-2015

Property planning

Water-table testing

Mapping salinity
Part Three: Implementation

3.1 Developing capacity to implement the Strategy

The partner Governments will assist catchment communities to implement national, Basin and State initiatives by improving access to and use of the knowledge and decision tools generated by salinity R&D and other relevant investigations.

3.1.1 Basin-wide capacity

The Commission has responsibility for Basin-scale issues associated with implementing this Strategy. It requires enhanced capacity in knowledge of Basin scale bio-physical and socioeconomic processes, design and management of Basin-scale salinity management actions, and design and operation of accountability arrangements supported by Basin-level monitoring, evaluation and reporting.

The Commission and partner Governments will administer a comprehensive ‘knowledge generation’ program to support Basin-scale and within-valley planning and implementation.

Priority project areas for knowledge generation include flow and salinity models for the Murray and Darling Rivers, regional catchment hydrology models, and Basin-scale geophysical, land use, ecological, and socioeconomic information.

Priority project areas for designing and managing Basin salinity actions include resolving cost sharing and benefit allocation arrangements for new joint interception works, further developing the vegetation bank concept, and researching new terrestrial and aquatic production systems that can meet water-use standards and productively utilise saline land and water resources.

Priority actions for improving capacity in ensuring accountability through Basin-level monitoring, evaluation and reporting are discussed below in section 3.9.

3.1.2 Within-valley capacity

The States have responsibility for within-valley issues associated with implementing the Strategy, and will require adequate capacity in predicting salinity and salt load trends, assessing the effects and trade-offs associated with salinity management options, and assessing the merits of investing in salinity compared with other catchment health targets.

Priority project areas for salinity and salt load predictive tools include flow and salinity models for tributaries to the Murray and Darling Rivers, and local to regional catchment hydrology models that can interface with geophysical and other spatial information (for example, the distribution of salt in the landscape).

Priority project areas for assessing the effects of options, working through the trade-offs and deciding whether to invest in salinity or other issues include gaining more information on socioeconomic profiles and trends in catchment communities, developing tools to assess local and regional trade-offs associated with various salinity management options, and developing community processes for agreeing on preferred options.

The Commission supports the States by facilitating cross-border collaboration, coordinating data collection and analysis, encouraging the development of consistent salinity modelling and prediction tools, and assisting the States in communicating results.

3.1.3 Communication and education

Communication and education activities under this Strategy and the ICM Policy Statement will be planned and undertaken in conjunction with each other and coordinated by the Commission. Specifically, the Commission’s Communication Strategy Guide will be applied to all relevant projects and activities to ensure ‘best practice’.

There are three main communication tasks: information exchange, community involvement and support of networks. The Commission will invest in production, dissemination and sharing of technical knowledge, in collaboration with partner Governments, catchment communities and R&D knowledge providers. Community involvement will focus on the assessment and feedback in development of end-of-valley targets and salinity and catchment management plans. Existing information and community networks will be supported logistically and in the provision of knowledge from the Commission’s investigations projects.

A key communication activity under this Strategy is the release of a series of companion documents providing more detail on each of its key elements.

3.1.4 Institutional reform

Challenges

Under Commonwealth, Basin and State salinity initiatives, catchment management organisations are developing new salinity and catchment management plans. With Government assistance, they will be expected to play key roles in achieving salinity targets specified in the plans.
Issues
The partner Governments recognise that there are a number of institutional issues to be resolved concerning the evolving roles of catchment management organisations and local Governments.

The level of involvement of catchment management organisations in delivering salinity targets will vary as they have different powers, responsibilities and capacities. In some States their principal roles are in coordination and communication, whereas in others they are decision makers and accountable for outcomes on investment.

Local Governments have legislative responsibility for planning, but they have yet to develop a clear brief for what they can do in relation to salinity targets. In the absence of regional planning mechanisms, Local Governments can be limited in their ability to regulate new development at the scales required.

Developing institutional arrangements
This Strategy draws its direction from the ICM Policy Statement for the continued evolution of institutional arrangements that provide for community participation in salinity and catchment management planning, and coordinating salinity and natural resource management strategies with regional economic development strategies.

This is work-in-progress, with all States developing arrangements with catchment communities and the Commonwealth for the way in which natural resource management outcomes are delivered.

3.2 Identifying values and assets at risk
Consistent with the objectives of this Strategy, the Basin and end-of-valley river salinity targets are set to achieve two outcomes: maintenance of the water quality of the rivers downstream; and the ‘right signals’ for actions upstream to control river salinity and land degradation, and protect important natural values and built assets in the catchments.

3.2.1 Basin-wide
The MDBA provides the Commission with the power to coordinate the management of the Murray and Darling Rivers below Menindee Lakes (the shared rivers).

In 1988 the MDBC adopted the S&D Strategy to reduce salinity in the River Murray as measured at Morgan on the basis that the River Murray and most irrigation areas in the southern Basin were at risk from salinity. At that time it was also considered that dryland salinity would have a modest impact that could be offset by Strategy works for at least several decades and the effects of irrigation and dryland salinity on the Darling River were insignificant.

The Basin Salinity Audit has shown that since 1988 the situation has changed and future irrigation and dryland salinity rises could threaten the values of not only the River Murray but also the health of the Basin as a whole. While a principal value affected is water quality for consumptive uses (including irrigation, domestic and industrial use), other equally important values are now recognised as being at risk, including environmental values, farm productivity and infrastructure (including roads, services and towns).

Under this Strategy and State initiatives, partner Governments are identifying values and assets at risk of salinity and setting end-of-valley and within-valley salinity targets to protect key values and assets. These values and assets include surface and groundwater resources, terrestrial and aquatic ecosystems and species, highly productive farmland, indigenous cultural heritage, and built infrastructure.

3.2.2 Commission/Council roles in protecting values and assets
An important consideration is the capacity of salinity and catchment management plans, LWMPs and major actions to contribute to this Strategy’s objectives within valleys and across valleys. In assessing plans and actions for inclusion on the Commission Registers, the Commission will provide advice to the relevant governments, and as part of a State’s consultative process in developing these plans may advise the catchment bodies.

The States, through annual reporting via the Commission to Council, will advise on the level of protection being afforded to within-valley values and assets, including the shared rivers (see section 3.3 below). The Commission in the consolidated annual report to Council will advise on the balance of effort across valleys and the capacity to meet Strategy objectives. The end-of-valley and Basin targets, in conjunction with the accountability arrangements in the form of monitoring, evaluating and reporting will ensure the protection of Basin-wide values and assets.

Basin and end-of-valley targets seek to maintain water quality of the rivers downstream and send the right signals for actions upstream.
3.3 Setting salinity targets

3.3.1 The need for targets

Through the ICM Policy Statement, the Council has indicated its commitment to targets for catchment health. River salinity and salt loads are important indicators of catchment and Basin health. While the Basin’s river flows and salinities are naturally variable, trends in salinity and salt loads can provide important information on catchment condition.

Within this Strategy, the concept of targets has been applied to river salinity and salt load at various points across the Basin. In setting the quantum of targets, consideration needs to be given to key values and assets that are put at risk from salinity and the nature and scale of action to protect them.

3.3.2 Council’s target sites at end-of-valley and Morgan

A key feature of this Strategy is Council’s adoption of salinity targets for each tributary valley and a Basin target at Morgan in South Australia. The Basin target, which is for the shared rivers, is to maintain the salinity at Morgan at less than 800 EC for 95 per cent of the time.

These targets themselves do not represent the full range of outcomes sought, but they are a way of measuring progress towards achieving the Strategy’s objectives. Council’s adoption of these targets will provide the impetus for actions across the Basin, and the basis for accountability arrangements for the partner Governments.

While end-of-valley targets allow for further rises in salinity, they are in effect a ‘cap’ on salinity that gives the appropriate signals for protecting key values and assets in the valleys, and also encourage the States to meet their obligations to protect the shared rivers.

Council, through the ICM Policy Statement, is committed to targets for catchment health. Salinity and salt load targets at various points across the Basin drive actions to achieve catchment health while protecting key values and assets.

Illustration of end-of-valley and within-valley targets for a catchment
3.3.3 Processes for Council target setting and review

The partner Governments nominated an interim set of end-of-valley targets for stream salinity and salt loads, and these were considered by catchment communities during the public comment period for the draft Strategy. Each State has set its own program for finalisation of targets. The interim, Council adopted targets are listed in Table 1.

While there is a need for targets to be adaptive, they will only be changed where there is adequate justification. This will provide certainty and integrity for the Strategy and will ensure that stakeholders’ efforts are directed to finding creative and innovative ways to meet the targets.

In some parts of the Basin, end-of-valley target sites will be augmented with ‘interpretation sites’ to assist in attributing salinity to its source, however these sites will not include targets or specific accountability provisions.
### Table 1. Summary of Basin Salinity Management Strategy

#### Targets as at July 2001

<table>
<thead>
<tr>
<th>Valley Reporting Site</th>
<th>Without Intervention Salinity Audit Prediction Contribution to Morgan Salinity - 2015 (EC - µS/cm)</th>
<th>Valley 2015 Target</th>
<th>Valley</th>
<th>Median</th>
<th>95%ile</th>
<th>Average</th>
<th>Contribution to Morgan</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All partner Govts.</td>
<td></td>
<td>110%</td>
<td>98%</td>
<td>110%</td>
<td></td>
<td></td>
<td>+68</td>
</tr>
<tr>
<td>South Australia</td>
<td></td>
<td>95%ile</td>
<td>Average</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lock 6 to Morgan</td>
<td></td>
<td>tba</td>
<td>tba</td>
<td>110%</td>
<td>Murray at Morgan</td>
<td>+50</td>
<td></td>
</tr>
<tr>
<td>Below Morgan</td>
<td></td>
<td>tba</td>
<td>tba</td>
<td>tba</td>
<td>Murray at Murray Bridge</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>NSW</td>
<td></td>
<td>Median</td>
<td>80%ile</td>
<td>Average</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Murray-Darling Basin</td>
<td></td>
<td>108%</td>
<td>112%</td>
<td>tba</td>
<td>Murrumbidge at Ralinauld</td>
<td>+6</td>
<td></td>
</tr>
<tr>
<td>Lachlan</td>
<td></td>
<td>108%</td>
<td>106%</td>
<td>103%</td>
<td>Lachlan at Forbes</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Bogan</td>
<td></td>
<td>137%</td>
<td>93%</td>
<td>133%</td>
<td>Bogan at Gongolgon</td>
<td>+3.2</td>
<td></td>
</tr>
<tr>
<td>Macquarie</td>
<td></td>
<td>108%</td>
<td>126%</td>
<td>114%</td>
<td>Macquarie at Carinda</td>
<td>+4.3</td>
<td></td>
</tr>
<tr>
<td>Camden</td>
<td></td>
<td>105%</td>
<td>tba</td>
<td>tba</td>
<td>Camden at EvY</td>
<td>+0.2</td>
<td></td>
</tr>
<tr>
<td>Namoi</td>
<td></td>
<td>108%</td>
<td>110%</td>
<td>116%</td>
<td>Namoi at Goangra</td>
<td>+6.4</td>
<td></td>
</tr>
<tr>
<td>Gwydir</td>
<td></td>
<td>103%</td>
<td>101%</td>
<td>100%</td>
<td>Gwydir at Collarenebi</td>
<td>+0.1</td>
<td></td>
</tr>
<tr>
<td>NSW Border Rivers</td>
<td></td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>Barwon at Morgan</td>
<td>+0.1</td>
<td></td>
</tr>
<tr>
<td>NSW Upper Murray</td>
<td></td>
<td>tba</td>
<td>tba</td>
<td>tba</td>
<td>Barwon at Heywoods</td>
<td>tba</td>
<td></td>
</tr>
<tr>
<td>Barwon-Darling</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>tba</td>
<td></td>
</tr>
<tr>
<td>NSW Riverine Plains</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>tba</td>
<td></td>
</tr>
<tr>
<td>NSW Mallee Zone</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>tba</td>
<td></td>
</tr>
<tr>
<td>Western Victoria</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wimmera</td>
<td></td>
<td>tba</td>
<td>tba</td>
<td>tba</td>
<td>Wimmera at Horsham Weir</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Avoca</td>
<td></td>
<td>102%</td>
<td>102%</td>
<td>102%</td>
<td>Avoca at Quambatook</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Loddon</td>
<td></td>
<td>103%</td>
<td>101%</td>
<td>101%</td>
<td>Loddon at Laanecorrie</td>
<td>+0.7</td>
<td></td>
</tr>
<tr>
<td>Campaspe</td>
<td></td>
<td>101%</td>
<td>101%</td>
<td>101%</td>
<td>Campaspe at Pumps</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Goulburn</td>
<td></td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>Goulburn at Goulburn Weir</td>
<td>+0.8</td>
<td></td>
</tr>
<tr>
<td>Broken</td>
<td></td>
<td>136%</td>
<td>136%</td>
<td>136%</td>
<td>Broken at Casey’s Weir</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Owenh</td>
<td></td>
<td>100%</td>
<td>tba</td>
<td>101%</td>
<td>Owenh at Pechelba East</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Kiewa</td>
<td></td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>Kiewa at Bandiana</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Vic Upper Murray</td>
<td></td>
<td>tba</td>
<td>tba</td>
<td>tba</td>
<td>Murray at Heywoods</td>
<td>tba</td>
<td></td>
</tr>
<tr>
<td>Vic Riverine Plains</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>tba</td>
<td></td>
</tr>
<tr>
<td>Vic Mallee Zone</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>tba</td>
<td></td>
</tr>
<tr>
<td>Queensland</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Old Border Rivers</td>
<td></td>
<td>tba</td>
<td>tba</td>
<td>tba</td>
<td>Barwon at Morgan</td>
<td>+0.5</td>
<td></td>
</tr>
<tr>
<td>Moonie</td>
<td></td>
<td>tba</td>
<td>tba</td>
<td>tba</td>
<td>Moonie at Fenton</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Condamine Balonne</td>
<td></td>
<td>tba</td>
<td>tba</td>
<td>tba</td>
<td>Condamine Balonne</td>
<td>+0.5</td>
<td></td>
</tr>
<tr>
<td>Warrego</td>
<td></td>
<td>tba</td>
<td>tba</td>
<td>tba</td>
<td>Warrego at Cunnamulla</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Faroo</td>
<td></td>
<td>tba</td>
<td>tba</td>
<td>tba</td>
<td>Faroo at Cunnamulla</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>ACT</td>
<td></td>
<td>Median</td>
<td>80%ile</td>
<td>Average</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes:
1. Percentage of 2000 conditions, utilising 1975-2000 climatic benchmark
2. tba = to be advised

The States have established processes for finalising the interim end-of-valley targets.

Once adopted by Council end-of-valley targets will only be changed where there is adequate justification, to provide certainty and integrity for this Strategy.

---

_Australia Map_
3.3.4 State within-valley targets
The States have initiated processes to establish within-valley management targets to protect important values and assets from salinity, and to assist in meeting Council adopted end-of-valley and Basin targets. Within-valley management targets will recognise local priorities such as land area protected and priority ecological outcomes, and while they may be used for reporting this Strategy’s progress to Council, their resolution is a State matter. However, they will be consistent with the targets adopted by Council for end-of-valley river salinity, salt load and flow.

3.4 Managing trade-offs with the available within-valley options
Options for salinity management range from the more immediate and certain outcomes of salt interception schemes to longer-term and less certain benefits associated with reforestation. Optimising their adoption on a catchment scale faces two significant challenges: the inability of current farming systems to address salinity in many areas, and the trade-offs associated with their adoption. Many options affect profitability, can reduce water resource security and have social impacts. A key task for this Strategy is to assist catchment management planning deal with these challenges.

3.4.1 Land management options
Irrigation
For irrigation areas, there are a number of land management options that can achieve effective groundwater control and enhance profitability. They include more efficient water use, water re-use schemes, repairing or replacing water supply infrastructure, and the siting of new irrigation development into low salinity impact areas. However, even best-practice irrigation can have salinity impacts and additional interventions such as drain diversion or groundwater interception may be required.

Broadacre dryland
For broadacre dryland areas, effective options are limited. In the more productive areas of the wheatbelt, opportunity cropping in summer rainfall areas and incorporating lucerne into cereal cropping systems in winter rainfall areas can achieve a degree of groundwater control whilst maintaining productivity. These are less effective or not appropriate for drier parts of the wheatbelt and in the Mallee zone, where groundwater response times are much longer. For the high rainfall zone (>600 mm average annual rainfall) used for sheep and cattle grazing, there are no effective options at present. New systems involving careful targeting and management of woody plants in the landscape will be required. These systems include forestry and farm forestry, and conservation, rehabilitation and stewardship of native vegetation.

3.4.2 Engineering options
Drainage and conversion of open channels
Responsible drainage and re-use of low salinity drainage water are features of best-practice irrigation. Conversion of open channels to piped water supplies or treatment of the channels, to reduce seepage, can also assist in minimising impacts.

Salt interception and disposal schemes
Salt interception and disposal schemes divert groundwater or irrigation drainage water to safe disposal sites. They can also provide site-specific protection of highly-valued community assets such as urban infrastructure and biodiversity.
Groundwater pumping
Relatively fresh rising groundwater can sometimes be pumped to the surface in sufficient quantities for irrigation, achieving a dual benefit of increasing production while maintaining or reducing groundwater levels.

3.4.3 Flow management
Dilution and environmental flows
Dilution flows are intentional storage releases that reduce salinity concentrations. Environmental flows are flows, or characteristics of flow patterns, that are either maintained or created to improve riverine ecosystem and floodplain wetland condition.

Maintaining flows from high rainfall areas
A high proportion of the Basin’s total river flows originate from relatively small areas, for example the Upper Murray that receives >800 mm average annual rainfall. Maintaining these flows is particularly important for managing salinity concentrations.

Principled approach to flows
Water supply and management throughout the Basin has historically been focused on ensuring reliable supplies for irrigation, mainly because of the undisputed benefits to regional economies and to the Basin as a whole.

It is becoming apparent, however, that increased priority must be given to maintaining flows from high rainfall areas and providing for more dilution and environmental flows. Unless this more balanced approach prevails, urban and other water users will have less water of poorer quality, and entire riverine ecosystems will be threatened.

Further clarification of water property rights will assist in achieving a more balanced approach.

3.4.4 Living with salt
‘Living with salt’ options are currently limited but could include saltland agronomy, ‘shandying’ saline irrigation water with fresh water, applying irrigation re-use water to salt tolerant crops, changing crop selection, salt harvesting and processing, timber production using moderate salinity groundwater, rehabilitation and land stewardship and experimental saline aquaculture.

3.4.5 Managing trade-offs
Almost all of the above options involve trade-offs. In addition to the trade-offs that can be associated with managing flows for irrigation, dilution and environmental purposes, there can be large trade-offs associated with change in land use. For example, large-scale revegetation has to be carefully planned to ensure that the long-term salinity and salt load benefits outweigh the costs of establishment, structural adjustment and reduced flows.

The optimal mix of options will vary according to valley-specific targets and circumstances, and will need to be dynamic and subject to periodic revision. The Commission will assist the partner governments with improved knowledge and techniques to support these decisions, and work with them on appropriate policies.

3.5 Implementing salinity management plans
3.5.1 Current status
The partner Governments have for over a decade supported development and implementation of irrigation LWMPs, salinity management plans and catchment management plans. There are about 200 plans throughout the Basin. In many cases, partnerships between the Landcare movement and non-government organisations have been major factors in plan success.

Currently, catchment management organisations are developing new plans or reviewing existing plans in the context of this Strategy, the NAP and State salinity strategies.

3.5.2 More action in irrigation regions
Irrigation LWMPs and joint salt interception works under the S&D Strategy have delivered substantial improvements in water quality in the Lower Murray. But these improvements are at risk from dryland salinity and also from the growing requirement in irrigation regions for SDEs. These include entitlements required for new developments arising from water trading.

This Strategy continues and enhances support for LWMPs, and for recording salinity outcomes of LWMPs on a salinity register. Accounting for offsetting the impacts of future development and for maintaining the Commission Registers in positive balance will provide the incentive for LWMP implementation and review.
3.5.3 More action in dryland regions

This Strategy also enhances support for further development and implementation of plans for dryland regions. In particular, it will assist in meeting community demand for improved capacity to predict and quantify the effects of various salinity management options, and to assess the trade-offs associated with different mixes of options. Key Strategy initiatives such as further developing the vegetation bank concept will attract significantly increased resources for plan implementation.

Under Commonwealth, Basin and State salinity initiatives salinity management plans are being developed or reviewed, to take end-of-valley and within-valley salinity targets into account and improve accountability arrangements.

3.5.4 Assessing contribution of plans to meeting targets

The design and delivery of outcomes from individual catchment plans will be essential to achieve Basin-wide outcomes. Under this Strategy, States and the Commission will assist individual catchment plans to assess the contribution of proposed works to meeting the end-of-valley and Basin targets.

To assess the effectiveness of proposed actions, individual catchment plans will need to document:

- assessed baseline conditions (as at 1 January 2000) for end-of-valley salinity, salt load and flow regimes;
- expected ‘legacy of history’ impacts on end-of-valley salinity, salt load and flow for 2015, 2050 and 2100;
- agreed end-of-valley salinity and salt load targets; and
- predicted effects of proposed significant in-valley actions on end-of-valley salinity, salt load and flow conditions at 2015, 2050 and 2100.

3.5.5 Additional works to meet Basin target

It is apparent that river salinity and salt loads would respond only slowly to within-valley landscape-change options and would therefore allow salinity rises in the medium term. Under the S&D Strategy the partner Governments have undertaken a joint works program which has reduced river salinity in the River Murray. The anticipated slow reduction in the rate of increase in salt exports from dryland regions as a result of within-valley action threatens this reduction and the Basin target at Morgan.

While the essence of this Strategy is to cap salt mobilisation and export from across the Basin landscape, thereby avoiding the need for further salt interception schemes, it is clear that this is achievable only in the longer term. In the short term it is necessary to continue with salt interception schemes to buy time for the benefits of actions to cap salt mobilisation and export from the landscape to take effect.

A new joint program of salt interception works will be undertaken over the first seven years of this Strategy. The aim is to maintain benefits to water users drawing on the shared rivers, and to provide an additional contribution to preserving water quality as measured at Morgan, beyond that deliverable by actions addressing the ‘legacy of history’ within the tributary valleys. There is also an incentive under this Strategy to develop other, complementary, mitigation works. More details on the works program are in section 3.8.2.
3.6 Redesigning farming systems

3.6.1 Collaboration in research and development

This Strategy will coordinate a range of initiatives researching new farming systems that can use more rainfall than existing systems. These initiatives include the Cooperative Research Centre (CRC) for Plant-based Management of Dryland Salinity, the CRC for Catchment Hydrology, the Joint Venture Agroforestry Program (JVAP), the Redesigning Agriculture for Australian Landscapes Program, and industry RD&D organisations.

The National Dryland Salinity Program (NDSP) will continue to play a key role in national priority setting and coordinating activities under the above initiatives. Through its participation, the Commission will seek to extend collaboration to commodity RD&D corporations, and their capacity to develop new, sustainable options.

3.6.2 Mimicking natural systems

Recent reviews of farming systems for their current effectiveness and future prospects in salinity control have pointed to the need for RD&D into new farming and forestry systems that are a radical change from the present. The CSIRO has indicated that recharge rates under future land uses will need to mimic the average recharge rates of natural vegetation (0.5 mm to 10 mm annual rainfall equivalent) if salinity is to be controlled. This is a major reduction from current rates under annual crops and pastures (15 mm to 130 mm). The challenge is to develop commercial systems with this characteristic. Depending on profitability, they will have their place, particularly where important values and assets are under threat. But they may not be universally adopted across the Basin for technical and social reasons.

3.6.3 Criteria-based assessment of RD&D potential

The Commission, through its involvement in the CRC for Plant-based Management of Dryland Salinity, is party to a new and potentially powerful ‘criteria-based approach’ to targeting RD&D investment. The CRC’s Board has adopted the following parameters within which projects are selected and progress is assessed for programs and the CRC as a whole:

- Impact on recharge: the primary measure of salinity control, estimated as deep drainage in rainfall equivalents (see above 3.6.2), or in proportion to the discharge capacity of the target catchment;
- Impact on productivity and profitability: a farm or paddock level measure, often gross margin analysis;
- Area of which solutions are applied: an estimate of the scale of application;
- Time to complete development and dependence on other activities: the CSIRO has estimated up to 25 years for RD&D to produce new perennial options;
- Economic benefits: incorporating the broader non-farm considerations of benefits and costs, from regional economic development to off-site environmental impacts; and
- Environmental indicators of success: as yet measures of environmental protection are undeveloped.

The Commission will continue to develop this criteria-based approach and seek to apply it to RD&D investment into options for the agro-ecological zones of the Basin.

3.6.4 Current prospects for agro-ecological zones

For the purposes of this Strategy, there are three agro-ecological zones with different prospects for current and future salinity management.

High rainfall grazing
Defined as land receiving >600 mm average annual rainfall, options for this zone include changing land use from grazing to forestry and farm forestry, and managing native vegetation (both grasslands and woodlands) for a more appropriate balance between production and provision of ecosystem services.

There are two key challenges for RD&D into new land-use systems for the high rainfall grazing zone. Firstly, to ensure that the new systems are profitable, or in the case of native vegetation management, that ecosystem services can be valued. And secondly, to ensure the new systems offer sufficient flexibility for managers to achieve a balance between maintaining river flows, managing salinity, and meeting broader, regional socio-economic aspirations.

Winter rainfall cropping
Defined as land receiving 250 mm to 600 mm in uniform or winter dominant average annual rainfall and also including the Mallee which receives <400 mm average annual rainfall, this zone contains most of the wheatbelt.
Some current farming systems in this zone can be profitable and achieve the required balance between recharge control and surface water run-off (e.g., phase farming using lucerne with cereal cropping, and perennial pasture-grazing systems). However, reliance on these is risky and more options need to be developed. While extension of traditional plantation forestry into this zone could be feasible, perennial cropping and grazing systems are expected to be more popular.

For the Mallee zone, such options do not offer the same prospects for sustainability and profitability. Short rotation tree crops are a possible future option throughout the winter rainfall cropping zone, including the Mallee.

Potential new options include phase farming (discussed above under winter rainfall cropping) and companion farming. Companion farming is oversowing annual crops into perennial pastures. However, phase farming and companion farming present challenges for R&D. They are both likely to have productivity trade-offs, and there are no guarantees that the perennial component of the system will be at maximum growth during wetter than average years.

As with the winter rainfall cropping zone, short rotation tree crops, providing they can be proven commercially, may prove to be an effective option in the longer term for this zone.

3.6.5 New industries based on salinised resources

‘Living with salinity’ at levels of damage greater than now is inevitable, and this Strategy will enhance R&D into new industries based on salinised land and water resources. Potential new opportunities include developing more cost effective desalination plants, generating heat and electricity from salt disposal ponds, expanding saline aquaculture, producing more products from salt harvesting, developing improved saltland agriculture systems, breeding salt tolerant tree crops, and developing new irrigation technologies that allow the use of low-to-moderate salinity groundwater.

3.7 Targeting reforestation and vegetation management

Achieving the objectives of this Strategy is dependent on key parts of catchments and the Basin being planted or managed under perennial plants. Options for reforestation and vegetation management fall into three categories: forestry outside its traditional zone, native vegetation management and short rotation tree crops. Specific challenges include the targeting of areas as a scale of planting that maximises salinity benefits and minimises costs and other adverse impacts, and facilitating innovation in developing and trialling new revegetation options.

3.7.1 The vegetation bank concept

Under this Strategy, Council has agreed to further development of the concept of a vegetation bank, into which it would contribute funds for targeted investment in reforestation and vegetation management. The intention is for the vegetation bank to invest only in areas where there will be measurable salinity benefits. Consistent with the ICM Policy Statement, it will seek to maximise multiple objectives in catchment health. It will not compete directly with fully commercial forestry.

Financing arrangements under the vegetation bank will evolve to accommodate R&D outcomes as they occur. It is the intention over the duration of this Strategy, for the vegetation bank to provide finance for the following options:

• forestry outside of its traditional zone where it would not be commercial otherwise;
• native vegetation management, rehabilitation and land stewardship; and
• innovation for short rotation tree crops.

These options are considered to be the three most technically effective and socially acceptable vegetation related options for salinity management in the Basin. They also provide other benefits, for instance, forestry companion plantings contributing to biodiversity.
3.7.2 Forestry outside of its traditional zone

The Commission is working with partner Governments to attract corporate and public investment in plantation and farm forestry outside of its traditional >800 mm average annual rainfall zone. The objective is to direct investments to salinised catchments in the uplands receiving 500 mm to 800 mm average annual rainfall. Under the vegetation bank concept, investors’ contributions to forest establishment and maintenance will be in proportion to the commercial and public benefits generated by the new forests.

Commercial benefits include timber, other wood products, and carbon credits. Public benefits include salinity management, nutrient management, and biodiversity enhancement.

While there is adequate scientific and market knowledge to accurately quantify forest and wood values, and substantial progress is being made with valuing carbon sequestration, knowledge of the net public benefits of forestry is still uncertain, particularly at the regional scale.

The Commission is supporting a comprehensive research and investigations program to address this.

3.7.3 Native vegetation management, rehabilitation and land stewardship

Large areas of undulating and steep-hill country in the higher rainfall uplands of the Basin, are used for grazing, but profits are generally low.

There is an emerging view that where these lands are not reforested they should be rehabilitated and stewarded for a range of ecological services, including salinity management.

In addition to the higher rainfall uplands, this option is expected to be available in medium rainfall areas (mainly the more productive areas of the wheatbelt, receiving from 410 mm to 600 mm average annual rainfall) and in the Mallee (receiving <400 mm average annual rainfall).

To minimise the level of Government investment necessary to achieve agreed outcomes, Government funds could be allocated through a competitive process. An auction based system is being trialled in the Basin, where individual landholders and groups bid for public assistance to manage vegetation. Experience has shown that this can target investment to deliver higher conservation values, at least cost to Government, and with genuine commitment from landholders.

3.7.4 Short rotation tree crops

Short rotation tree crops have considerable potential to overcome the economic and social impediments encountered in extending forestry outside of its traditional zone and into the wheatbelt. These crops may prove a better long-term option for cleared areas of the Mallee region.

The development of new large-scale tree-crop industries is risky, expensive and difficult. Without a large public investment in early stage R&D, prospective new industries cannot get to the point where private investors become sufficiently convinced of their potential to be willing to invest in further development.

Existing R&D initiatives (discussed above in section 3.6) have the capability to overcome this, given more resources.

At present, arrangements for joint public and private investment in commercialising short rotation tree crops that have passed early-stage R&D are undeveloped. This issue confronts salinity strategies generally, and is being addressed through initiatives such as the Environmental Services Investment Fund under the NSW Salinity Strategy.

Key areas need to be under perennial plants to achieve this Strategy’s objectives.

Perennial plant options include forestry outside of its traditional zone, native vegetation management, and short rotation tree crops.
3.8 Constructing joint (Commission) salt interception works

3.8.1 Joint works under the S&D Strategy

Salt interception works are large-scale groundwater pumping and drainage projects that intercept saline flows and dispose of them, generally by evaporation.

The S&D Strategy provided for improving salinity at Morgan through a joint works program equivalent to 80 EC. Out of this 80 EC, 30 EC was provided to Victoria and NSW, as SDEs to offset accountable actions (implemented after 1 January 1988). In effect, under this arrangement, the partner Governments agreed to undertake salinity mitigation works to offset the historical legacy of salinity on the assumption it was less than 50 EC.

At the time it was considered that the underlying salinity trend was an increase of 1.5 EC per year and that the net 50 EC reduction would provide a buffer for 20 to 30 years. However, the Basin Salinity Audit estimated future salinity trends to be about 4 EC per year and that the buffer will be used up much sooner.

The S&D Strategy works program is jointly funded by the Commonwealth and the Governments of NSW, Victoria and South Australia, with the salinity benefits arising from the Commonwealth and South Australian contributions being allocated to river health.

3.8.2 New joint works

To maintain Morgan salinity at 800 EC or less for 95 per cent of the time for the duration of this Strategy, the 1999 Basin Salinity Audit found that a reduction in salinity of about 100 EC at Morgan will have to be found by new interventions over and above within-valley actions such as revegetation.

A new joint program of salt interception works, costing an estimated $60 million, will commence immediately to deliver at least 46 EC, and potentially up to 61 EC, over the first seven years. The partner Governments have agreed that joint salt interception schemes must be economic and technically certain, and all things being equal, the most economic schemes should proceed first.

The new program provides for a State (if it chooses) to contribute to joint works to offset ‘legacy of history’ and provide SDEs to offset the downstream impacts of future developments in that state. The State can also choose to implement actions within its borders to offset the ‘legacy of history’ or provide SDEs, if it considers such actions will be more cost effective for the State than contributing to joint works.

3.8.3 Cost sharing and benefit allocation for joint works

The Commission will review in the first 12 months of this Strategy, the scale of the program required, and the cost sharing and benefit allocation arrangements. Of the minimum 46 EC reduction in average salinity at Morgan, 31 EC will be allocated as ‘legacy of history’ offsets, and 15 EC as SDEs; however, it is highly likely that more credits will be needed to cover both the ‘legacy of history’ and new development.

The partner Governments have agreed to the following cost sharing and benefit allocation principles for the new joint works:

- each State will have equal access to a limited number of SDEs but will be accountable for offsetting the effects of future developments;
• partner Governments will have equitable access to the works, first right of refusal and credits generated will be allocated according to contribution to costs;
• the Commonwealth’s credits will be re-allocated to the State entries on the Commission Registers, in proportion to the ‘legacy of history’ affecting each State; and
• each State is to keep its contribution to the Commission Registers in balance or in surplus.

These principles allocate salinity credits in an equitable manner that acknowledges the historic and geographical differences between the States. Salinity credits arising from the Commonwealth’s contribution will be allocated to resolve State differences. In addition, the Commonwealth may allocate credits to the Commission A Register to offset actions to provide environmental and social benefits (e.g. wetland flushing).

3.8.4 Investigating, constructing and operating joint works

River Murray Water, as the operational arm of the Murray-Darling Basin Commission, coordinates the partner Governments in developing the investigation and construction programs, and the subsequent operation of joint works.

The Commission’s high-level inter-jurisdictional working group on salt interception will interpret the principles for undertaking the new joint works program, for the purposes of recommending to Council within 12 months the final number of EC credits to be delivered, along with cost sharing and benefit allocation arrangements.

Beyond the seven-year program, it is envisaged that additional investigation and construction of salt interception works will be required, along with other mitigation options, to deliver the additional EC credits necessary to maintain the Morgan target. Planning for this subsequent program will be in place before completion of the initial program.

3.9 Ensuring Basin-wide accountability: monitoring, evaluating and reporting

3.9.1 Salinity credits and debits

An important feature of the Basin salinity target at Morgan is that it is supported by a system of salinity credits and debits. Setting end-of-valley targets and establishing their contribution to the Basin salinity target provides the basis for Basin-wide application of Commission credits and debits. It generates a consistent currency through which trade-offs and Basin-wide accountability can be accommodated, and by convention the currency is EC units (a measure of salinity concentration) at Morgan.

3.9.2 Valley Report Cards

In addition to advising of works and measures that may have a significant effect at Morgan, each State has agreed to establish Report Cards for annual reporting arrangements on each of their tributary valleys. The design and layout of the Valley Report Cards will reflect the ‘legacy of history’ affecting each State, and will include details of predicted impacts of proposed actions (as detailed in Section 3.5.4) and actual implementation to date:

• assessed baseline conditions (as at 1 January 2000) for end-of-valley salinity, salt load and flow regimes;
• expected ‘legacy of history’ impacts on end-of-valley salinity, salt load and flow for 2015, 2050 and 2100;
• agreed end-of-valley salinity and salt load targets; and
• assessed effects of significant in-valley actions undertaken to date, including effects of catchment management plans on end-of-valley salinity, salt load and flow conditions for the current year, and at 2015, 2050 and 2100.

On an annual basis each State will prepare a consolidated Report Card for all valleys within the State for reporting to the Commission.

3.9.3 Administering Commission Registers

The system of salinity credits and debits for achieving the Morgan target will be managed through the Commission A Register (for tracking SDEs) and the Commission B Register (for actions to address the ‘legacy of history’).

The Commission Registers will keep account of all actions undertaken within the Basin after agreed baseline dates that will cause a significant increase or decrease in average salinity at Morgan. The agreed dates are:

• 1 January 1988 for accountability for future actions by NSW, Victoria and South Australia;
• 1 January 2000 for accountability for future actions by Queensland; and
• 1 January 2000 for responsibility to address the ‘legacy of history’ effects by partner Governments.

The States have agreed to establish tributary Report Cards for annual reporting of predicted impacts of proposed within-valley actions. Each State will prepare for the Commission a consolidated Report Card covering all tributaries within the State.
The Commission will establish two Registers to account for credits and debits of all actions that affect EC at Morgan. States in deficit on the Registers will be answerable to Council.

### Basin-wide Accountability Arrangements

- **Annual Implementation Reports**
- **Rolling (five-year) reviews & audits**
- **Exceptional reporting to ministerial council**

Within-valley Reporting: Catchment management organisations/States

Valley Report Cards: State reporting to Commission

Commission Registers: Commission

The effect of actions will be assessed with models using an agreed climatic/hydrologic sequence (otherwise known as the ‘benchmark period’). The benchmark period is from July 1975 to June 2000. An action will be considered as significant and included in the Commission Registers if it is assessed to cause a change in average EC at Morgan of 0.1 EC or higher within 30 years.

Under this Strategy, the current Sedo Strategy Register will be translated directly into the Commission A Register. The units of the Commission A Register will be Equivalent EC at Morgan, which recognises the economic impact on the shared rivers, and is a continuation of current practice.

The Commission B Register is being established to track ‘legacy of history’ impacts and to assess the effects of actions to address it, for example revegetation. The effects of these actions are less certain, and are often more time-lagged, than actions qualifying for the Commission A Register. In some cases these actions may result in short-term salinity costs, while providing longer-term salinity benefits.

The Commission Registers will operate in harmony using the common currency of Equivalent EC at Morgan. The States will keep the total of the Commission A Register as well as the cumulative total of both Commission Registers in balance, or in surplus.

In the early years of this Strategy there is not expected to be any trade between the Registers.

#### 3.9.4 Reporting to Council

This Strategy will incorporate transparent accountability arrangements whereby progress towards targets will be monitored and reported to Council annually. This follows the same principles as for the Cap on diversions.

Each year, States will collate data on all actions undertaken or proposed, and will report these against the agreed end-of-valley targets and against the Commission A and B Registers.

Basin monitoring and reporting requirements required for this Strategy will be consistent with NAP and other catchment and state-of-environment reporting needs. Synchronisation of these reporting requirements is a priority in the early years of Strategy implementation.

Reporting to the Commission and Council by the States will consist of:
- an annual report detailing progress with implementation of works and measures and a progressive estimate of salinity effects (at end-of-valley and/or Morgan as appropriate) of those works and measures actually implemented to date; and
- a rolling five-year review and audit for each valley and Commission Register entry, of the assessed effect on river salinity (at end-of-valley and/or Morgan as appropriate) due to actions implemented to date, as well as an update of the expected change in the future flow, salt load and salinity regime due to ‘legacy of history’ and any other emerging effects such as climate change.

#### 3.9.5 Accountability under Schedule C

If a State is found to be in deficit on the Commission A Register, it will be deemed to be in breach of the terms of Schedule C to the Agreement. The States will be directly answerable to Council for any breaches of the Commission A Register.

Should the total of the Commission A and B Registers for a State go into deficit, Council will receive an exception report from the Commission, with a proposed course of action to correct the situation.
4.1 Initiation

4.1.1 Completing the Salinity & Drainage Strategy

A number of outstanding issues from the S&D Strategy that require resolution will be resolved under this strategy:

- completing the S&D Strategy joint works program over the next three years to achieve its 80 EC reduction at Morgan;
- implementing remedial measures to some joint works schemes to ensure ongoing performance; and
- including South Australia in the new Commission A Register under Schedule C to the Agreement, with South Australia to offset the salinity impact of post-1 January 1988 developments by December 2002.

4.1.2 Finalising end-of-valley targets and monitoring framework

The partner Governments in consultation with catchment communities will finalise end-of-valley targets, along with agreed monitoring site locations. NSW, Victoria and South Australia have indicated that they will finalise end-of-valley targets by March 2004. While there is a need for targets to be adaptive, they will only be changed where there is adequate justification for resolution by the Commission and endorsement by Council.

To assist in the complex process of ongoing assessment of progress towards end-of-valley targets, a monitoring network for collecting continuous flow and salinity data to agreed standards will be required. This Strategy commits the partner Governments to establishing the required end-of-valley monitoring network, with implementation by December 2001.

4.1.3 Finalising cost sharing and benefit allocation arrangements for the new joint works program

The Council will finalise cost sharing and benefit allocation arrangements for the new joint works program by March 2002, after taking advice from the Commission’s high-level inter-jurisdictional working group on salt interception schemes. This will require:

- a decision on whether the new joint works program needs to deliver more than its proposed 46 EC (new information as at June 2001 suggests that a total of 61 EC may now be necessary, comprising 41 EC for offsetting the ‘legacy of history’ and 20 EC for SDEs); and
- the basis of cost sharing between partner Governments; and the basis for allocating salinity benefits between the Governments as SDEs and towards offsetting the ‘legacy of history’.

In the interim, the new joint works program delivering 46 EC will proceed, with 31 EC allocated as ‘legacy of history’ offsets and 15 EC allocated as SDEs (to be shared equally 7.5/46 each by NSW, Victoria and South Australia).

4.1.4 Revising Schedule C

The statutory requirements of the S&D Strategy are specified in Schedule C to the Agreement and provide for joint salt interception works, operating a Register of Morgan salinity credits and debits, and for reporting and accountability. As this Strategy replaces the S&D Strategy, Schedule C will be revised to give effect to its key elements, whilst preserving the achievements of the S&D Strategy.

4.1.5 Developing modelling/assessment frameworks

In order to support a rigorous and timely reporting process for Council, the States and the Commission will develop a suite of hydrologic and salt mobilisation models that will allow assessment of accountable actions against the agreed baseline conditions.

4.1.6 Establishing a group to oversee Strategy implementation

The monitoring, evaluation and reporting components, essential to ensure accountability under Strategy implementation will be overseen by a Basin Salinity Management Strategy working group, comprising senior staff from the partner Governments with technical or policy development responsibility for salinity management.

The working group will provide the necessary quality assurance and auditing, and will liaise closely with the high-level inter-jurisdictional working group on salt interception schemes.

4.2 Review

4.2.1 Mid-term review

This Strategy will be subject to a mid-term review in 2007 to determine the utility of the Strategy for ongoing implementation. As part of the mid-term review, the current state-of-play regarding predicted ‘legacy of history’ impacts and the effect of intervention actions undertaken to that time (as assessed by the rolling five-year review and audit process) will be collated into a new Basin Salinity Audit.
The mid-term review will confirm arrangements for the proposed extension to the new joint works program beyond 2007 to ensure that the Morgan target will be maintained. A Council statement may be made on the outcomes of the mid-term review.

4.2.2 Beyond this Strategy - post 2015

The life of this Strategy extends to 2015, however it is recognised that salinity management is a long-term challenge that will extend well beyond that date.

As this Strategy is implemented, consideration will be given to the most appropriate framework for salinity management beyond 2015. The Commission and Council will ensure that a seamless transition occurs from this Strategy to the subsequent framework.

### Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT</td>
<td>Australian Capital Territory</td>
</tr>
<tr>
<td>BSMS</td>
<td>Basin Salinity Management Strategy</td>
</tr>
<tr>
<td>CRC</td>
<td>Cooperative Research Centre</td>
</tr>
<tr>
<td>EC</td>
<td>Electrical conductivity</td>
</tr>
<tr>
<td>ha</td>
<td>hectares</td>
</tr>
<tr>
<td>ICM</td>
<td>Integrated Catchment Management</td>
</tr>
<tr>
<td>JVAP</td>
<td>Joint Venture Agroforestry Program</td>
</tr>
<tr>
<td>LWMP</td>
<td>Land and Water Management Plans</td>
</tr>
<tr>
<td>MDBA</td>
<td>Murray-Darling Basin Agreement</td>
</tr>
<tr>
<td>MDBMC</td>
<td>Murray-Darling Basin Ministerial Council</td>
</tr>
<tr>
<td>NDSP</td>
<td>National Dryland Salinity Program</td>
</tr>
<tr>
<td>NAP</td>
<td>National Action Plan</td>
</tr>
<tr>
<td>NSW</td>
<td>New South Wales</td>
</tr>
<tr>
<td>R &amp; D</td>
<td>research and development</td>
</tr>
<tr>
<td>S &amp; D</td>
<td>Salinity and Drainage</td>
</tr>
<tr>
<td>SDE</td>
<td>Salt disposal entitlements</td>
</tr>
</tbody>
</table>