



### A N N U A L **R E P O R T** 2 0 1 1 - 1 2



#### About this report

This is the report of the Chief Executive of the Murray–Darling Basin Authority to parliament on the performance of the MDBA in 2011–12. It reports our performance against our outcome, deliverables and key performance indicators as outlined in the Portfolio Budget Statements. We have prepared our report in accordance with the *Requirements for annual reports 2011–12*, issued by the Department of the Prime Minister and Cabinet and approved by the Joint Parliamentary Committee of Public Accounts and Audit.

#### How to use this report

The Murray–Darling Basin Authority annual report 2011–12 contains:

- a report on the MDBA's performance against the four outcome objectives specified in the Portfolio Budget Statements
- a report on MDBA corporate and governance activities
- MDBA financial statements
- appendixes and endmatter, including the MDBA's ecologically sustainable development and environmental performance, a glossary and a comprehensive index.

This report may contain photographs of Indigenous people who have passed away. The use of the terms 'Aboriginal' and 'Indigenous' reflects usage in different communities within the Murray–Darling Basin.



A silver ARA award was received for the MDBA's 2010-11 report





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#### **Electronic copies**

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#### Office of the Chief Executive

TRIM Rof: D12/47453

The Hon Tony Burka Minister for Sustainability, Environment, Water, Population and Communities Parliament House CANBERRA ACT 2600

Dear Minister

It is my pleasure to present the annual report of the Murray-Darling Basin Authority (MDBA) for the year ended 30 June 2012.

This report has been prepared in accordance with the requirements for annual reports prepared by the Joint Committee of Public Accounts and Audit under s. 63 of the Public Service Act 1999.

In accordance with the Commonwealth Fraud Control Guidelines 2011, I certify that MDBA has prepared fraud risk assessments and fraud control plans, and has in place appropriate fraud prevention, detection, investigation, reporting and data collection procedures and processes that meet MDBA's specific needs. I certify also that I have taken all reasonable measures to minimise the incidence of fraud in the MDBA and to investigate and recover the proceeds of fraud against the MDBA.

The report notes that significant progress has been made in preparing the proposed Basin Plan, which was given to you on 28 August 2012 for your consideration.

Under sa. 214(1) of the Water Act 2007, the Chief Executive must, as soon as practicable, prepare and give to the Minister and to each other member of the Murzay–Darling Ministerial Council, a report on MDBA operations during that year. This annual report must include contents listed under sa. 214(2) of the Water Act.

Subsection 214(3) of the Water Act requires you as Minister to table this annual report in each House of Parliament within 15 sitting days of that House after the day on which you receive the report.

Yours sincerely

Rhondda Dickson Chief Executive

GPO Box 1801 Canberra ACT 2001 Telephone 02 6279 0470 Facsimile 02 6279 0133

Rhondda Dickson/Emillia gov au

WWW.ENdba.poy.au

# ABOUT US

The Murray–Darling Basin Authority leads the planning and management of Basin water resources in collaboration with partner governments and the community.

# **OUR VISION**

To achieve a healthy working Basin through the integrated management of water resources for the long-term benefit of the Australian community.



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# **OUR ROLE**

The Murray–Darling Basin Authority (MDBA) is an independent, expertise-based agency that advises a six-member Authority (of which the Chief Executive is a member) in undertaking Basin-wide strategy, policy, planning and delivery functions. We work in collaboration with other Australian Government, Basin state government, local government and regional bodies; industry groups; irrigators, scientists and research organisations; and Murray–Darling Basin communities, including Indigenous communities, who have a special relationship with the environments and resources of the Murray–Darling Basin; and the broader Australian community.

The MDBA is enabled by the Murray–Darling Basin Agreement (Schedule 1 of the *Water Act 2007*), a partnership of the Australian Government and the governments of New South Wales, Victoria, South Australia, Queensland and the Australian Capital Territory.





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# HIGHLIGHTS FOR 2011–12

#### Transboundary water management arrangements

- Consulted extensively with communities, industry and environment groups, experts and other government agencies to develop the proposed Basin Plan.
- Released the Proposed Basin Plan a draft for consultation and supporting documents on 28 November 2011.
- Published a socioeconomic synthesis report, Socioeconomic analysis and the draft Basin Plan (parts A and B), in November 2011.
- Published The proposed groundwater baseline and sustainable diversion limits: methods report.
- Conducted a 20-week formal consultation period on the proposed Basin Plan.
- Analysed the nearly 12,000 submissions received during the Basin Plan consultation period.
- Released the Proposed Basin Plan a revised draft, Proposed Basin Plan consultation report and The socioeconomic implications of the proposed Basin Plan on 28 May 2012.
- Published Hydrologic modelling to inform the proposed Basin Plan methods and results in February 2012.
- Published The proposed "environmentally sustainable level of take" for surface water of the Murray–Darling Basin: method and outcomes.
- Published the Assessment of environmental water requirements for the proposed Basin Plan reports for 24 sites across the Basin.
- Established the Northern Basin program, to support the Northern Basin Advisory Committee.

### **River and ecosystem health**

- Increased water delivery flexibility to maximise river health by resolving various impediments to environmental watering of River Murray sites.
- Achieved ecological objectives at icon sites through the use of The Living Murray (TLM) environmental water.
- Delivered nearly 292 GL of environmental water to five of the six TLM icon sites.
- Published *The Living Murray annual environmental watering plan 2011–12.*
- Peak salinity at Morgan, South Australia remained below 800 EC in 2011–12.
- 'Murray–Darling Basin rivers: ecosystem health check, 2008–2010' (Sustainable Rivers Audit report 2) in production.

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### **Knowledge into action**

- Basin Plan Knowledge and Information Directory finalised collaborative head agreements with other federal agencies to improve access to externally held Basin Plan data.
- Established the Strategic Policy and Integration Advisory Group, as recommended by the Strategic Programs Review.
- Substantial Indigenous engagement on the Basin Plan, including publication of *A yarn on the river*, aimed at getting Indigenous Australians to participate in developing the proposed Basin Plan.
- Conducted the audit of the annual Cap on water diversions.
- Published the *Water audit monitoring report 2010–11*.
- Furthered community understanding of The Living Murray program by publishing a range of communications products.

### **River Murray operations assets**

- Operated the River Murray to maximise water delivery while ensuring that high flows were passed through water storages without increasing peak flows.
- Salt interception schemes diverted approximately 362,508 tonnes of salt from the River Murray.
- Forecasted timing and magnitude of flow peaks and recessions along the River Murray System to assist with management of construction works.
- Decline of non-native aquatic weed *Egeria densa* in Lake Mulwala, to around 1% of the lake's volume in early 2012, following a four-year control program.
- Over 7,000 GL passed through the barrages to the Coorong and the Southern Ocean.
- South Australia received its full yearly entitlement of 1,850 GL for the first time since 2002–03.

# **CHIEF EXECUTIVE'S REVIEW**

### 2011–12 was a challenging year.

Communities and industry across the Murray–Darling Basin faced some of the highest summer rainfall events on record, and the resulting floods exacted a toll on many towns and properties across the region.

The rain brought welcome news too, with the high-flowing rivers replenishing water storages and rejuvenating wetland and floodplain ecosystems. Among other highlights, this meant that South Australia was able to receive its full water entitlement for the first time since 2002–03.

2011–12 was an important year for the development of transboundary water management arrangements. We held many targeted meetings with stakeholders and state officials throughout 2011 to help shape how water planning and management could be coordinated across the Basin.

This consultation culminated in the release of the *Proposed Basin Plan — draft for consultation* on 28 November 2011, which marked the start of a formal five-month consultation process. In this time we met with over 170 groups and received almost 12,000 submissions on the draft plan. Each and every submission was reviewed and, as a result, over 300 changes were made to the proposed plan to better meet the needs of the Basin's communities and environment and Basin state governments. A revised version of the proposed plan was presented to water ministers from the six Basin governments on 28 May 2012.



We continued to manage a suite of water, land and other natural resource projects on behalf of the Basin governments. Highlight achievements included the delivery of environmental water to numerous sites in the River Murray System to boost bird-breeding events and native fish spawning, and to improve the condition of wetland vegetation.

We also achieved significant outcomes in salinity management, diverting approximately 362,508 tonnes of salt from the River Murray through salt interception schemes. The Basin-wide salinity target was also met, with peak salinity at Morgan, South Australia remaining below 800 EC in 2011–12.

We continued to build our corporate governance and workplace culture, and I am pleased to report that we achieved our best result yet in Comcover's Risk Management Benchmarking Survey.

There were some very demanding times in 2011–12, particularly as staff were drafting the proposed Basin Plan and then undertaking the extensive consultation and revision. A high level of flexibility, responsiveness and, above all, commitment to meeting high standards was shown by staff across the agency throughout the year.

There will be more challenges in 2012–13. The proposed Basin Plan is scheduled to be finalised, and Basin governments will be reviewing their priorities for the joint work needed to keep the rivers operating efficiently for irrigation and to improve the condition of wetlands and floodplains.

The MDBA is fortunate to have highly dedicated staff and I am confident that by further strengthening our relationships with the governments and communities of the Basin, the agency will continue to be a vibrant and fulfilling place to work in the years ahead.

I look forward to working with our many stakeholders in government, industry and Basin communities as we seek to achieve our goals over the next 12 months.

Rhondda Dickson Chief Executive MDBA

### **CHIEF FINANCE OFFICER'S REPORT**

The MDBA's financial position at 30 June 2012 remained sound, with total equity (net assets) of \$155.3 million. See Figure 1 (on page 4) for more information about our equity position.

For the second financial year, projected expenditure was greatly affected by major flooding throughout the Murray–Darling Basin, mainly during summer and autumn of 2011–12, resulting in:

- numerous program activities, such as major environmental works and measures, being disrupted and delayed
- significant third-party contractor claims and expenses amounting to \$7.9 million in 2011–12 (\$11.4 million in 2010–11), in addition to contingent liabilities of some \$3.6 million at 30 June 2012 (refer Note 20 to the financial statements, page 223).

The resulting underspending in 2011–12 means that the MDBA will have higher spending over forward estimates for at least two years. These unspent funds have been retained and set aside in the Murray–Darling Basin Special Account. The financial effects of this underspending will be increased forward-year expenditure and, more immediately, cash accumulation in the Murray–Darling Basin Special Account.

Other pressures on the MDBA's financial position have to do with revenue. In June 2012, the New South Wales Government announced that it would reduce its future funding contributions to the MDBA for the delivery of functions under the Murray–Darling Basin Agreement by \$19.8 million in 2012–13. All other Basin state governments have committed to maintain their 2012–13 contributions as previously advised.

The Basin Officials Committee will review Murray–Darling Basin Agreement programs and will recommend long-term program delivery options and funding arrangements to the MDBA. The committee will report to the Murray–Darling Basin Ministerial Council in early 2013.

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### **General and special purpose reporting**

The MDBA's general purpose financial report (see pages 177–224) sets out our objectives as well as our economic dependency on the Australian Government's policy and parliamentary appropriations to administer the agency and its functions.

The report also covers ongoing funding arrangements with the Australian Government and the governments of New South Wales, Victoria, South Australia, Queensland and the Australian Capital Territory to deliver functions required under the Murray–Darling Basin Agreement.

The MDBA plays a leading role as the manager of key infrastructure assets throughout the Basin. Infrastructure assets comprise \$2.5 billion in River Murray Operations assets (e.g. Hume and Dartmouth dams and the locks and weirs on the River Murray) and \$498 million in water entitlements managed under The Living Murray program.

These assets do not form part of MDBA's general purpose financial report. They are reported separately in special purpose financial reports, to reflect the underlying unincorporated joint ventures that own and control these assets.

These special purpose financial reports are not included in this report, but are audited annually by the Auditor-General, Australian National Audit Office. In turn, the asset values reported in the special purpose financial reports provide the formal basis for the Australian Government and participating state governments to calculate their respective shares in the underlying assets and to report them in their respective balance sheets (i.e. their interest in the joint ventures).

### **Funding operating deficits**

The Special Account is integral to understanding the MDBA's financial performance, with operating deficits progressively and purposefully being met from funds through this account. Unlike many other agencies, the MDBA's recurrent annual revenues are augmented by an equity funding component that allows the agency to draw on the funds shown as being to the credit of its Special Account.

The balance of the Special Account was \$196.5 million at 30 June 2012. More information about the Special Account is shown in figures 1 and 3 (page 4).







Figure 1. MDBA financial performance and Murray–Darling Basin Special Account (2008–09 to 2011–12)

Figure 2. MDBA financial performance (2007–08 to 2011–12)

Figure 3. Movement in MDBA total equity and Murray–Darling Basin Special Account (2007–08 to 2011–12)

### **Financial results**

The 2011–12 deficit reflects planned expenses to complete Environmental Works and Measures Program projects for which funding was transferred from the Murray–Darling Basin Commission within the framework of the MDBA's current funding from the Special Account. Figure 2 maps MDBA's operating results against government revenues. In our first financial reporting period, government revenues included other revenue of \$441.50 million, which represented a transfer of MDBC funds into the Special Account balance.

### **Internal controls**

The MDBA's internal control framework is supported by the work of an audit committee (with an independent chair) and a comprehensive internal audit program. The Auditor-General issued an unqualified audit opinion for MDBA's 2011–12 financial statements, which has consistently been the case since the MDBA was established in 2008. As part of the audit process, the Auditor-General advised that the MDBA has appropriate financial controls in place and that these operated effectively and reliably during the past year.

### **Meeting different accountabilities**

The MDBA has a relatively intricate governance model in place, one characterised by multi-tiered accountabilities extending beyond meeting our obligations under the *Financial Management and Accountability Act 1997*<sup>1</sup> and other legislative and regulatory requirements.

Some MDBA programs or aspects of programs are implemented directly, while others are implemented through state government agencies that manage the Basin in partnership with federal government agencies.

The MDBA's governance structure and the overlapping tiers of accountability and reporting requirements exercise significant influence on the efficacy of the MDBA's budgetary and financial management framework.

While the MDBA's corporate plan is the primary conduit for planning and budgeting, these requirements are linked to many different internal processes, but they always adhere to the MDBA-approved expenditure authority, including the limit of any estimated annual deficits.

George Knezevic Chief Finance Officer

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<sup>1</sup> Unless otherwise indicated, all Acts referred to in this annual report are Commonwealth Acts.

### **ABOUT THE MURRAY-DARLING BASIN**

The Murray–Darling Basin extends through substantial areas of Queensland, New South Wales, Victoria and South Australia, and includes the entire Australian Capital Territory.

Covering over 1 million km<sup>2</sup>, or 14%, of the Australian mainland, the Basin's floodplains, forests and wetlands provide habitats for diverse and unique native plant and animal species. It is Australia's most important agricultural area, yielding over 40% of our agricultural produce and generating around \$15 billion per year for our national economy.

The Basin is home to more than 2 million people (see Figure 4) and its water resources directly and indirectly support millions more. The industries it supports provide regional jobs and high-quality food and fibre for Australians or for export.

For millennia, the Basin's waters and other natural resources have sustained the Indigenous peoples who lived there, meeting their social, spiritual and cultural values.

From the start of European settlement of the Basin, our use of its resources has focused on securing water for human consumption and agricultural use, with little understanding of the effects of these changes on the environment.

Over time, overallocation of water to consumptive uses and river regulation caused the environmental health of the Basin and its dependent ecosystems to decline.

Fauna and flora species that once thrived in the Basin are now listed as rare and protected under federal and state legislation. At least 35 bird and 16 mammal species that live in the Basin are endangered, and Murray cod (*Maccullochella peelii*), Australia's largest freshwater fish species, which was once widespread, is in severe decline, as are many other native fish species. During the millennium drought iconic species such as river red gums (*Eucalyptus camaldulensis*) became severely stressed, with populations significantly declining in some parts of the Basin.





# THE MURRAY-DARLING BASIN AUTHORITY

The Murray–Darling Basin Authority (MDBA) is part of the Sustainability, Environment, Water, Population and Communities portfolio, and reports to its minister, the Hon Tony Burke (the Commonwealth Minister for Water).

The MDBA was established under the federal *Water Act 2007* as an independent, expertise-based statutory agency; our role includes advising a six-member Authority, of which our Chief Executive is a member, about Basin-wide strategy, policy and planning.

The MDBA undertakes activities that support the sustainable and integrated management of the water resources of the Murray–Darling Basin in a way that best meets the social, economic and environmental needs of the Basin and its communities.

We lead the planning and management of Basin water resources, and coordinate and maintain collaborative long-term strategic relationships with other Australian Government, Basin state government and local agencies; industry groups; scientists and research organisations.

More information about the MDBA is available on our website, <www.mdba.gov.au>.

### **Our functions**

The Water Act requires the MDBA to undertake a number of functions:

- construct and operate River Murray assets such as dams and weirs
- develop the proposed Basin Plan
- advise the Commonwealth Minister for Water on the accreditation of state water resource plans
- develop a water rights information service that facilitates water trading across the Basin
- manage water sharing between the states
- manage all aspects of Basin water resources, including water, organisms and other components and ecosystems that contribute to the physical state and environmental value of the Basin's water resources
- measure and monitor water resources in the Basin
- gather information and undertake research
- engage and educate the community in the management of the Basin's resources.

The MDBA carries out these functions directly and through Basin state government agencies in partnership with the Australian Government. More information about the MDBA's role and structure can be found in this section and in Part 9, Division 2 of the Water Act.

#### **Our aspirations**

The MDBA is seeking to establish a workplace that captures our passion for and commitment to our vision of sustainably managing the Basin's water resources into the future.

We aspire to be a fair, capable, inspirational and tolerant workplace, and to support and value our people and their skills and diversity. To support these goals, we adhere to the Australian Public Service Values and Code of Conduct.

More information about our vision, strategies, outcome and programs is available on our website, <www.mdba.gov.au>.

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### **Our governance**

The MDBA's governance comprises:

- the Commonwealth Minister for Water (the Hon Tony Burke)
- the six-member Murray–Darling Basin Authority
- the Murray–Darling Basin Ministerial Council
- the Basin Officials Committee
- the Basin Community Committee.

More information about the Authority, Ministerial Council and the committees, their membership and their activities during 2011–12 can be found in Appendix A, including the relationships between the governance bodies themselves (see Figure A.1, page 228).

### **Agency structure**

The MDBA consists of the Chief Executive and MDBA staff. Our governance structure is discussed in Appendix A (see page 228). The Murray–Darling Basin is managed through a partnership of the Australian Government and the governments of the Basin states (New South Wales, Victoria, Queensland, South Australia and the Australian Capital Territory).

During 2011–12, the MDBA structure was based around the following key program areas:

- Policy and Planning Division
- Environmental Management Division
- Information and Compliance Division
- River Management Division
- Corporate Services Division.

Figure 5, on page 16, shows the MDBA's organisational structure at 30 June 2012.

#### **Finance**

In 2011–12, MDBA incurred departmental expenditure of \$199.512 million. Our funding derives from:

- Australian Government appropriations for MDBA functions as described under s. 172 of the Water Act, interest equivalency on funds credited to the Special Account and the Australian Government's contribution to the delivery of functions agreed under Schedule 1 of the Water Act (the Murray–Darling Basin Agreement 2008)
- contributions from the Basin states to fund the delivery of functions agreed to under the Murray–Darling Basin Agreement
- other revenue, including sale of assets, property revenues, hydro-generation and recovery of salinity mitigation and operation costs.

More information about our expenditure can be found in the Chief Finance Officer's report for 2011–12 (page 2) and in 'Financials' (page 177).

### **Reporting against our agency outcome**

The MDBA receives funding under the Australian Government's Portfolio Budget Statements (PBS); we manage our performance using a single outcome:

Equitable and sustainable use of the Murray–Darling Basin by governments and the community, including through development and implementation of a Basin plan, operation of the River Murray System, shared environmental management programs, research, information and advice.

To provide a more accurate indication of our performance against this outcome, the MDBA's deliverables and key performance indicators are measured against our four program outcomes:

- 1.0 Transboundary water management arrangements
- 2.0 River and ecosystem health
- 3.0 Knowledge into action
- 4.0 River Murray operations assets.

The program objectives align closely with the MDBA's key strategies:

- Basin Plan to prepare, implement and enforce the Basin Plan, including the accreditation of state water resource plans.
- Environmental management to develop and implement strategies for the protection and enhancement of the Basin's shared water and other natural resources.
- River management to manage, operate and sustain River Murray assets to deliver states' shares of water and environmental outcomes in the River Murray System.

Responsibility for implementing these strategies is shared across MDBA operational divisions, which is reflected in the structure of this annual report.

### **Strategic direction**

During 2011–12, the MDBA completed the proposed Basin Plan — a comprehensive planning regime for the integrated management of water and other natural resources in the Murray–Darling Basin — in tandem with delivering programs for our Basin funding partners. Through cooperative Basin-scale programs, we:

- implemented schedules to the Murray–Darling Basin Agreement
- managed river health, including catchment impacts
- managed and delivered environmental water
- monitored resource condition
- provided Basin-wide data and information management capabilities to support our functions
- directed the sharing of River Murray waters, ensuring the reliability of entitlement flows and allocations to Basin states
- constructed, managed and operated River Murray assets and various works and measures.

Implementing a Basin-wide regime for managing water and other natural resources involves challenging and complex water and environmental management issues. To carry out our functions under the Water Act, particularly those relating to the proposed Basin Plan, during 2011–12, we:

- worked closely with states, communities, industry and environmental stakeholders in developing the proposed Basin Plan
- began reviewing the operation of schedules to the Murray–Darling Basin Agreement before the Basin Plan first takes effect, to assess the extent to which they are consistent with the proposed Basin Plan.

### **Strategic Programs Review**

We made significant progress in implementing recommendations made by the Strategic Programs Review of environmental and river management programs during 2011–12. This review was undertaken by SKM Pty Ltd on behalf of the Murray–Darling Basin Ministerial Council (following advice from the Basin Officials Committee) during the previous financial year.

Among the recommendations implemented was the establishment of the Strategic Programs Implementation Advisory Group to make recommendations to the Basin Officials Committee on investment across joint programs and strengthen the relationship between Basin jurisdictions and the Murray–Darling Basin Authority. The advisory group oversaw development of:

- a new strategic framework
- qualification and prioritisation criteria for assessing programs for joint investment
- improved performance reporting mechanisms.

Chapter 3, 'Knowledge into action', and Chapter 5, 'Management and accountability', provide more information about the Strategic Programs Review. **see pages 77 and 168** ►

### **Staffing**

As at 30 June 2012, MDBA had 334 employees, 299 of whom were ongoing and 35, non-ongoing.

Our staff profile by job classifications and gender (see Table 11) shows that female staff are overrepresented in the APS 1 to 6 levels but are underrepresented at the EL 2 and SES levels; the difference at the EL 1 level is minimal.

Most of our staff are in the 35-to-44 (105), 25-to-34 (87) and 45-to-54 (83) age brackets. Three of our staff are 65+ and only 12 staff are under 25 years of age.

We maintain a merit list of suitable job candidates to reduce our recruitment processes and to ensure we have access to people with the technical skills and knowledge we require to carry out our responsibilities under the Water Act.

More information about our staffing profile is in Chapter 5, 'Management and accountability'. see page 158 ►

### **The Authority**

The MDBA is overseen by the Murray–Darling Basin Authority (the Authority), which consists of the Chief Executive, a part-time chair and four part-time members. Each Authority member is appointed by the Governor-General and must have expertise in one or more fields relevant to the activities of the agency itself — for example, water resource management, hydrology, freshwater ecology, resource economics, irrigated agriculture, public sector management and financial management.

At 30 June 2012 Authority members were:

#### **Craig Knowles**

The Hon Craig Knowles was appointed Chair of the Authority from 1 February 2011. As a member of the Labor Government in New South Wales, he was Minister for Planning and Housing (1995–99); Minister for Health (1999–2003); Minister for Infrastructure, Planning and Natural Resources (2003 to August 2005); and Minister for Forests and Lands (2003 to January 2005).

Before entering parliament, Mr Knowles worked in property, land management, planning and valuation, in both the private sector (1978–86) and for New South Wales public sector agencies including the Macarthur Development Corporation, the Premier's Department, the Office of State Development and the Department of Business and Consumer Affairs (1986–90).

#### **Dianne Davidson**

Dianne Davidson has a strong management background in natural resources, particularly water and irrigated agriculture. She is a former member of the South Australian Premier's Climate Change Council and has served on the South Australian Murray–Darling Basin Natural Resource Management Board.

#### **Rhondda Dickson**

Dr Rhondda Dickson was the Acting Chief Executive and Authority member from 2 June to 30 September 2011, with her formal appointment as Chief Executive taking effect on 1 October 2011. She is an experienced leader in natural resource management policy, most recently holding senior positions in the Department of Agriculture, Fisheries and Forestry and the Department of the Prime Minister and Cabinet.

#### Diana Gibbs

Diana Gibbs was appointed on 3 November 2011. Diana is a resource economist with postgraduate qualifications in environmental studies, and has been involved in resource development planning in Australia, Africa, the Middle East and South-East Asia. She has worked extensively throughout the Basin, particularly in New South Wales.

#### **David Green**

David Green has been involved in water policy and water reform in Queensland since the mid-1990s. He is a former Queensland Water Commissioner and former board member of the South East Queensland Water Grid Manager. He has extensive experience in water resource management and planning, economics, governance and water trading matters.

#### **Barry Hart AM**

Professor Barry Hart is an Emeritus Professor at Monash University and has over 35 years' experience in freshwater ecology and natural resource management. He also chairs a number of government scientific and strategic advisory committees, and is director of an environmental consulting company. In the 2012 Queen's Birthday Honours, Professor Hart was bestowed with a Member of the Order of Australia for services to conservation and the environment.



L to R: Mr David Green, Professor Barry Hart AM, Dr Rhondda Dickson, the Hon Craig Knowles, Ms Dianne Davidson, Ms Diana Gibbs

### **Executive Team**

The executive leadership of the Murray-Darling Basin Authority comprises:

#### **Rhondda Dickson, Chief Executive**

Dr Rhondda Dickson is an experienced leader in natural resource management policy and has over 20 years' experience working with states and territories in developing and implementing national polices. Rhondda has been closely involved in the development of the National Action Plan for Water Quality and Salinity, national forest policy and national approaches to vegetation management.

She has worked across the full scope of practical natural resource management within the federal Department of Agriculture, Fisheries and Forestry, the Department of Environment, the former Department of Primary Industries and Energy, and CSIRO.

#### **Russell James, Executive Director Policy and Planning**

Russell James is Executive Director Policy and Planning. He joined the MDBA in 2011, having worked with the Department of Sustainability, Environment, Water, Population and Communities where he significantly contributed to water reform, including the Water for the Future initiative. He has been closely involved in a number of other natural resource reforms, including the National Action Plan on Salinity and Water Quality and structural adjustment of the Commonwealth fishing industry; he has also worked in the private forestry sector in New South Wales and Tasmania.

In his current role, Russell works extensively with Australian Government and Basin state government agencies and Basin community stakeholders in finalising the proposed Basin Plan and developing strategies for its implementation. His other areas of responsibility include water resource planning, social and economic analysis and advice, and developing and implementing arrangements for the 2015 review of sustainable diversion limits in the Basin.

#### Jody Swirepik, Executive Director Environmental Management

Jody Swirepik is Executive Director Environmental Management Division. Jody's formal qualifications are in applied science and focus on water management and freshwater aquatic ecology, with an Honours (First) on aquatic plants and a masters degree focusing on the impact of carp (*Cyprinus carpio*).

Jody began work at the Murray–Darling Basin Commission (MDBA's predecessor) in 2001, developing the Sustainable Rivers Audit. She then worked on The Living Murray program for a number of years, receiving a Public Service Medal for her work in this area.

Before 2001, Jody worked for seven years for the New South Wales Environment Protection Authority, implementing the 1994 Council on Australian Governments' water reforms and developing the early environmental flows rules for inland New South Wales.

#### Fraser MacLeod, Executive Director Information and Compliance

Dr Fraser MacLeod is Executive Director Information and Compliance. He joined the MDBA in 2009 from the South Australian Department for Water, Land and Biodiversity Conservation. Fraser has over 15 years' experience in European agricultural and environmental policy, integrated rural development, research and information management and, more recently, in integrated natural resource management in Australia.

In his current role, Fraser leads a range of programs that contribute to developing a new plan for the management of the water resources in the Murray–Darling Basin.

#### **David Dreverman, Executive Director River Management**

David Dreverman is Executive Director River Management. David joined the Murray–Darling Basin Commission in 2000 as Manager Assets and was appointed General Manager River Murray Water in 2003. David transferred to MDBA in late 2008, when it subsumed the functions of the MDBC. David has worked in the consulting engineering industry with SMEC, the Hydro-Electric Commission of Tasmania and Australian Power & Water. For more than 35 years he has been involved with large dam and hydropower projects, both in Australia and overseas, and, more recently, in the management of the River Murray System.

#### Frank Nicholas, Executive Director Corporate Services

Frank Nicholas joined MDBA as Executive Director Corporate Services in September 2008. Frank is responsible for leading the Corporate Services Division, which provides financial, human resource, legal, information technology, governance, planning, office services, records management, parliamentary and secretariat advice and support to MDBA.



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#### **OBJECTIVE 1.0**

# TRANSBOUNDARY WATER MANAGEMENT ARRANGEMENTS

Improved water security and access through transparent statutory Basin-wide planning arrangements for water management that reduces uncertainty in the development of complementary water plans by the Basin states.

PREPARING THE BASIN PLAN

IMPLEMENTATION ARRANGEMENTS

PROVIDING CERTAINTY FOR WATER ACCESS ARRANGEMENTS

#### **Objective 1.0**

## TRANSBOUNDARY WATER MANAGEMENT ARRANGEMENTS

A chart showing key performance indicators for these deliverables is included at the end of this chapter. **see further information on page 44** 

## Portfolio Budget Statements — deliverables

Deliverables	PBS target	Results
By early 2012 to present a plan for the integrated management of Basin water resources for adoption by the Commonwealth Minister for Water.	ONGOING	Groundwater and surface water sustainable diversion limits (SDLs) prepared as part of proposed Basin Plan.
		Extensive engagement and consultation resulted in stakeholders developing further understanding of key Basin Plan policy settings. A number of technical and other reports were published in the lead up to the release of the proposed Basin Plan and the public consultation period, to assist stakeholders to understand the science underpinning the plan. Nearly 12,000 submissions were received by the MDBA during the consultation period, all of which were published, except where confidentiality was requested. All submissions were analysed by the Authority and changes made to the proposed Basin Plan.
	YES	The <i>Proposed Basin Plan</i> was released for consultation on 28 May 2011. On 28 May 2012 the <i>Proposed Basin Plan</i> — <i>a revised draft</i> was provided to the Commonwealth Minister for Water and members of the Murray–Darling Basin Ministerial Council for their comment, along with <i>The socioeconomic implications of the proposed Basin Plan</i> . On 6 August 2012 the altered <i>Proposed Basin Plan</i> was returned to the Minister for Water and Ministerial Council members. The MDBA compiled two extensive consultation reports to accompany the May and August versions of the Basin Plan. These reports detailed how the MDBA had addressed the submissions received, the extent to which the submissions had affected the content of the Basin Plan and details of the changes made.
	ONGOING	The final version of the Basin Plan, which will reflect the Commonwealth Minister for Water's suggestions, is due for completion in late 2012.
Between 2012	Basin Plan implementation strategy in development.	
and 2019, all relevant state-based	and 2019, all relevant state-based water resource ONGOING blans are to be accredited under the Basin Plan.	Water resource plan accreditation handbook in development.
water resource plans are to be accredited under the Basin Plan.		Pathway identified for transitioning existing water planning framework to Basin Plan arrangements.
Provide certainty of access to available resources by clarifying Basin water management arrangements by 2015.	YES	A preliminary review of schedules B, D, E, F, G and H of the Murray–Darling Basin Agreement to ensure their alignment with the Basin Plan.
		Initiated extensive development, with Basin states, of a method and process for adjusting SDLs without recourse to parliament.
		Surface water planning negotiations with the states, including consideration of transitional and interim water resource plans, to be facilitated by intergovernmental agreement.

### **Overview**

The waters of the Murray–Darling Basin support a complex matrix of social, economic and environmental needs, all of which need to be balanced and protected to ensure we have a healthy working Basin that supports resilient communities and industries and the Basin's diverse ecosystems into the future.

To achieve a healthy working Basin, we need to balance the competing needs of all Basin users, including the environment. We need to look after the water needs of communities and industries while also protecting and restoring the ecological and other values of water-dependent ecosystems to ensure the Basin's continued productivity.

The millennium drought (c. 1997 to c. 2009) exposed the shortcomings of water management in the Basin — fragile wetlands and ecosystems were brought to the brink of collapse, rivers ceased to flow, irrigators had no water to raise crops, and towns and cities experienced water restrictions. It became apparent that to protect the Basin's water and other natural resources, we would have to manage them in an integrated, mutually supportive way across state boundaries.

Under the *Water Act 2007*<sup>1</sup>, the Murray–Darling Basin Authority (MDBA) is responsible for developing and overseeing a planning framework to manage the Basin's water resources in the national interest.

Among other requirements, the MDBA must work to:

- protect, restore and provide for the Basin's ecological values and ecosystem services
- ensure the return to environmentally sustainable levels of extraction of over-allocated or overused water resources
- promote the use and management of Basin resources in a way that optimises economic, social and environmental outcomes
- give effect to relevant international agreements (e.g. the Convention on Wetlands of International Importance, the Ramsar Convention).

During 2011–12, the MDBA completed the proposed Basin Plan, which was published on 28 November 2011. Following the plan's release the MDBA conducted a 20-week public consultation period. The MDBA published and analysed nearly 12,000 submissions along with feedback from the detailed consultation and technical workshops. The revised plan with a report on the public consultation was published on 28 May 2012 and referred to the Murray–Darling Basin Ministerial Council for comment. The revised Basin Plan incorporating Ministerial Council comments will be provided to the Commonwealth Minister for Water late in 2012, with the plan's implementation expected to begin in 2013.

The Basin Officials Committee is currently considering options to introduce more cost-effective arrangements for delivering agreed MDBA joint functions under the future Basin Plan, to ensure that, where agreed, relevant jointly funded programs that align with emerging Basin Plan responsibilities will be delivered in the most effective and efficient way. The review will consider the Joint Program Strategic Framework developed in 2010–11 and any implications for public liability arising from dam safety.

<sup>1</sup> Unless otherwise indicated, all Acts referred to in this annual report are Commonwealth Acts.

# Highlights

- Consulted extensively with communities, industry and environment groups, experts and other government agencies to develop the proposed Basin Plan.
- Released the Proposed Basin Plan a draft for consultation and supporting documents on 28 November 2011.
- Published a socioeconomic synthesis report, Socioeconomic analysis and the draft Basin Plan (parts A and B), in November 2011.
- Published The proposed groundwater baseline and sustainable diversion limits: methods report.
- Conducted a 20-week formal consultation period on the proposed Basin Plan.
- Analysed the nearly 12,000 submissions received during the Basin Plan consultation period.
- Released the Proposed Basin Plan a revised draft, Proposed Basin Plan consultation report and The socioeconomic implications of the proposed Basin Plan on 28 May 2012.
- Published Hydrologic modelling to inform the proposed Basin Plan — methods and results in February 2012.
- Published The proposed "environmentally sustainable level of take" for surface water of the Murray–Darling Basin: method and outcomes.
- Published the Assessment of environmental water requirements for the proposed Basin Plan reports for 24 sites across the Basin.
- Established the Northern Basin program, to support the Northern Basin Advisory Committee.

# PREPARING THE BASIN PLAN

The *Water Act 2007* sets out the mandatory content for the Basin Plan and the consultation process that must be undertaken before a final plan is presented to the Commonwealth Minister for Water for decision.

# Basin Plan consultation, communication and engagement

Working with people is essential to the development and implementation of the Basin Plan. Effective consultation, communication and engagement provide us an opportunity to draw on people's knowledge and to build support for, and involvement in, the Basin planning process. We believe that by working with people now and in the future we will be able to deliver an adaptive Basin Plan.

#### **Engagement with Basin states**

The MDBA rescheduled its planned August 2011 release of a proposed Basin plan for comment, following discussions with Basin state government ministers and officials in June and July 2011

because Basin states had sought further development in order to resolve broader issues before the draft plan could be released.

In June 2011 the MDBA created the Basin Plan Working Group as a standing forum for consultation with the Basin states. Chaired by the MDBA, its membership includes officials from each Basin state and from the Department of Sustainability, Water, Environment, Population and Communities.

The working group played an important role before and after the release of the proposed Basin Plan on 28 November 2011. Between June 2011 and May 2012, the group held 17 regular meetings, six additional workshops, five technical teleconferences and one special teleconference.

Formal consultation continued through the Basin Officials Committee and the Murray–Darling Basin Ministerial Council.<sup>2</sup> The MDBA also held numerous meetings with the states on a wide range of issues as part of developing the proposed Basin Plan.

The MDBA held more than 200 multilateral and bilateral meetings and working group sessions, all of which enabled detailed discussion of the proposed Basin Plan, the regulation impact statement process and the transition pathway from 2012 to 2019. This work was invaluable in refining and improving the proposed plan, and will help ensure the plan's practical implementation.

As well as these meetings and group sessions, the Chair of the Murray–Darling Basin Authority (the Authority), Hon Craig Knowles, participated in less formal ministerial forums, usually held monthly, to facilitate cooperation between governments during development of the Basin Plan.

#### Social and economic policy partners

When developing the proposed Basin Plan, we used the best available social and economic knowledge to determine the plan's effect on Basin communities.

We worked closely with other Australian Government departments and with Basin state agencies and other groups when undertaking our social and economic analysis, including:

- the Australian Bureau of Agricultural and Resource Economics and Sciences, to model the Basin Plan's economic impacts and assess its effects on Basin communities
- research organisations, to identify communities particularly vulnerable to the proposed Basin Plan
- Monash University and University of Queensland economic modellers, to evaluate the economic impacts of the Basin Plan
- Basin communities and industry groups, to discuss the Basin Plan's social and economic implications
- researchers, experts and Basin state representatives interested in social and economic analysis.

More information about the Basin Officials Committee and the Legislative and Governance Forum on the Murray–Darling Basin is in Appendix A of this report. **see page 228** ►

<sup>2</sup> On 13 February 2011, the Council of Australian Governments decided that, from 30 June 2011, the Murray–Darling Basin Ministerial Council should be known as the Legislative and Governance Forum on the Murray–Darling Basin. However, when exercising powers and functions under the Murray–Darling Basin Agreement and the Water Act, the forum convenes as the Murray–Darling Basin Ministerial Council.








Left: MDBA officers participate in a survey to measure vegetation responses to environmental watering, Macquarie Marshes, March 2012. Top and bottom right: Macquarie Marshes vegetation.

#### Advisory Committee on Social, Economic and Environmental Sciences

The MDBA's scientific evidence base will be supported by a high-level advisory committee — the Advisory Committee on Social, Economic and Environmental Sciences. In May 2012, the MDBA announced the committee's formation and sought expressions of interest for membership from eminent researchers. The committee, once fully established, will identify and advise the MDBA on the strategic science needs required to implement the proposed Basin Plan.

# Engaging communities and stakeholders in the draft plan's development

We developed effective and inclusive engagement and communication strategies to help develop the proposed Basin Plan.

These strategies were informed by feedback from the public and recommendations made by the House of Representatives Standing Committee on Regional Australia inquiry into the impact of the Murray–Darling Basin Plan on regional Australia (the Windsor inquiry).

As development of the proposed plan progressed towards its publication, we:

- engaged Basin communities and other stakeholders early in the process
- drew on local knowledge (localism)
- held smaller and more targeted meetings
- held meetings in more locations
- gave all stakeholders the opportunity to be heard and to help shape the Basin Plan.

This 'no surprises' approach to discussing our thinking at each step of the Basin Plan's development enabled us to improve the plan, test ideas and identify gaps. Members of the sixmember Murray–Darling Basin Authority and MDBA staff toured the Basin extensively, including as many stakeholders as possible in the development of the draft plan. We held numerous multilateral and bilateral meetings with federal and state government agencies, and met with representatives from peak industry groups, local government and Basin communities.

#### **Traditional owners**

Our approach to engaging with Indigenous people began some time ago, with from-the-groundup involvement of the Murray Lower Darling Rivers Indigenous Nations and Northern Basin Aboriginal Nations. As a result, these traditional owner organisations have been involved in capacity-building projects such as cultural flows research and their participation in and endorsement of the design of a progressive formal consultative process for the proposed Basin Plan.

Engaging Indigenous people in the consultation process proved to be highly successful — we visited around 30 Aboriginal communities across the Basin; these visits were informal and lasted up to five days to allow time for people to participate in the submission process. The visits were facilitated by local Aboriginal people, with independent facilitators on hand to help them make submissions. We also developed communications products, such as *A yarn on the river* — *getting Aboriginal voices into the Basin Plan* to facilitate Aboriginal input to the Basin Plan.

### **Proposed Basin Plan public consultation period**

To obtain their views on what stakeholders felt was needed to deliver this reform, we invited people to make submissions on the proposed plan. Our invitation was published in the *Commonwealth of Australia Special Gazette* (S187, 28 November 2011), in Basin metropolitan and regional newspapers, and on our website, <www.mdba.gov.au>.

As required by the Water Act, once the *Proposed Basin Plan — draft for consultation* and its supporting documents were published, we began a 20-week consultation period, which ran from 28 November 2011 to 16 April 2012.

During this time our engagement activities included:

- tailoring meetings to accommodate the needs of stakeholders, generally based on advice from community leaders and local government
- conducting 24 community meetings throughout the Basin, enabling people to have a say, hear more about the plan itself and talk to staff from the MDBA and other federal government agencies
- holding 56 round-table and technical meetings with community leaders and key stakeholder groups (e.g. peak bodies, environmental non-government organisations, water user groups, local councils and members of the scientific community)
- conducting 18 bank briefings in nine regions and five water trade meetings with irrigation infrastructure operators
- presenting information at approximately 17 conferences and workshops.

The consultation period was extended by four weeks to compensate for the Christmas–New Year holiday.

The establishment of our online blog ('Free Flow', <freeflow.mdba.gov.au>) enabled the public to communicate directly with MDBA staff about the proposed Basin Plan.

#### How we dealt with submissions

The submissions process is summarised in the flow chart on page 28 (Figure 6).

We used a custom-built database to receive, manage and publish the nearly 12,000 submissions received during the consultation period. The database allowed members of the public to lodge their submissions online; submissions made by email, fax and post were entered into the database by MDBA staff.

Once entered onto the database, the submissions were reviewed by staff who identified and categorised the issues raised. Once this was completed, the contents of submissions were analysed further and individual submissions were then dealt with by the MDBA and the Authority in the following ways:

- submissions raising issues identified as relating to the content of the proposed Basin Plan — their potential to inform a change to the proposed Basin Plan was considered, and a potential policy response determined, with the Authority determining what action to take
- submissions raising issues relating to broader water reform (i.e. unrelated to specific proposed Basin Plan content) — we referred these to the Department of Sustainability, Environment, Water, Population and Communities and the Department of Regional Development Australia
- submissions raising issues unrelated to water reform we summarised these and recorded them in our database for reporting purposes, but took no further action.

We regularly provided the Authority with reports on the submissions received and analyses of the issues raised by submitters, to inform the policy response and the subsequent changes made to the Basin Plan approved by the Authority.



Figure 6. Submissions process flow chart for proposed Basin Plan consultation report, May 2012

CH-1

We published all submissions received during the feedback period on our website, unless submitters requested part or full confidentiality for their submissions.

In May 2012 we released *The socioeconomic implications of the proposed Basin Plan*, which includes a summary of the socioeconomic work commissioned by the MDBA. The report included findings from community consultations, economic modelling, analysis of community vulnerability and adaptive capacity, and assessments of the Basin Plan's expected benefits.

On 28 May 2012, we published the revised proposed Basin Plan and the *Proposed Basin Plan consultation report*, which includes a summary of submissions received, how they were addressed, their socioeconomic implications and any alterations made to the proposed plan as a result.

Appendix B of the consultation report (published as a second volume) outlines all changes made to the plan since 28 November 2011 in tabular form. Both volumes are available on the MDBA website, <www.mdba.gov.au>.

Members of the Murray–Darling Basin Ministerial Council were given copies of the reports for their statutory consideration, along with copies of *The socioeconomic implications of the proposed Basin Plan.* 

#### **Communicating the plan**

Communicating the complexities of the proposed Basin Plan and its science to Basin stakeholders in an equitable and easily accessible way is integral to our work. Stakeholders need good and reliable information to inform their opinions about the plan and to give us the feedback we need to inform the evolution of the plan over time.

During the year we researched the effectiveness of our communications strategy by conducting in-depth interviews and group discussions with Basin stakeholders and running an online survey. The key finding from our research is that Basin stakeholders regard the MDBA as a principal online source of information about the Murray–Darling Basin and the proposed plan.

More information about our communications strategy (including our education and internal programs) and outcomes during 2011–12 is in Chapter 3, 'Knowledge into action'. **see page 86** ►

## **Basin Plan content**

#### **Sustainable diversion limits**

One of the key objectives of the Basin Plan is to balance the water needs of communities, industries and the environment. The Basin Plan aims to do this by establishing new long-term average sustainable diversion limits that reflect an environmentally sustainable level of water use (or 'take'). The SDLs are limits on the volumes of water that can be taken for human uses (including domestic, urban and agricultural use) and are set at both a catchment and a Basin-wide scale.

#### Environmentally sustainable level of take

Under the proposed Basin Plan, environmental water needs will be balanced by establishing longterm average SDLs on the volume of water that can be taken from groundwater and surface water sources for human use. The Water Act requires that new limits must reflect an environmentally sustainable level of take (ESLT). To determine an environmentally sustainable level of water use, the MDBA developed a comprehensive set of local environmental objectives and ecological targets that reflect the Basin-wide environmental objectives and targets of the Basin Plan and the hydrological-ecological relationships required to sustain the Basin's water-dependent ecosystems and ecosystem services. This method also incorporates the assessment of the social and economic benefits and costs to changes in water use.

The MDBA's work in determining an ESLT continued in 2011–12, culminating in publication of *The proposed "environmentally sustainable level of take" for surface water of the Murray–Darling Basin: method and outcomes* in November 2011.

To estimate the required ESLT, we:

- determined the environmental water requirements of the Basin's water-dependent ecosystems by focusing on key environmental sites (known as 'hydrologic indicator sites')
- refined our estimates of environmental water requirements of these sites by considering their ecological flow requirements along with environmental water delivery opportunities and constraints
- prioritised our work on flow regions most volumetrically sensitive to determine an ESLT by focusing on the needs of high-flow environments (e.g. freshes and bankfull and overbank flows).

# A detailed report on this hydrological modelling, *Hydrologic modelling to inform the proposed Basin Plan — methods and results*, was published in February 2012.

The results of our environmental water requirement assessments of these sites — 24 individual volumes — were published on the MDBA website, <www.mdba.gov.au>, in March and April 2012. These reports provide a description of the detailed eco-hydrological assessment of environmental water requirements for a subset of the key environmental sites located throughout the Basin. This subset includes places like Narran Lakes, Barmah–Millewa Forest and the Coorong, Lower Lakes and Murray Mouth. These water requirements are used within the Basin-wide modelling process to inform the ESLT.

We combined the indicator site results with hydrological modelling to test whether the three proposed Basin-wide ESLT options — 2,400, 2,800 and 3,200 gigalitres per year (GL/y) — would be able to achieve the indicator sites' specified ecological targets and flow indicators. Using Basin climate and flow variability records created over the past 114 years, our models allowed thorough assessment of the different water availability conditions, water-sharing arrangements and environmental flows.

Our assessment focused mainly on the southern Basin and indicated that 2,400 GL/y was insufficient to achieve key environmental objectives for the River Murray downstream of the Murrumbidgee Junction, particularly when conditions were drier, while incremental benefits in the absence of revising certain constraints associated with the 3,200 GL/y option were considered insufficient to justify the additional recovery of water.

We then carried out some specific options assessments in the Condamine–Balonne region of the northern Basin, looking at the ability of alternative SDL options and water recovery strategies to achieve environmental objectives. This work led us to a proposed Basin-wide water recovery volume of 2,750 GL/y.

Our ESLT development method was reviewed by a CSIRO-led team of water scientists between July and November 2011. That team concluded that our method is sufficiently robust and our use of the current knowledge base in developing the proposed Basin Plan provides a suitable starting point for the adaptive management process outlined in the plan itself.

The review made a number of short-term recommendations to improve how we determined the ESLT, and these were adopted before the ESLT report was finalised. Review recommendations for longer term improvements will be undertaken over the next few years.

The CSIRO-led review was carried out while the MDBA was interpreting the results of modelling a reduction of 2,800 GL/y. The review subsequently concluded that, given current evidence, the 2,800 GL/y reduction scenario was inconsistent with the MDBA's established hydrologic and ecological targets. However, CSIRO noted that further analyses were required to assess more fully the reasons for the modelled shortfalls.

Our modelling showed that a number of flow indicators were not fully achieved with the proposed ESLT. Of these indicators, many fall just short of the desired value, are subject to model uncertainty and/or are constrained by factors other than the volume of held environmental water outside the responsibility of MDBA (e.g. water management policy or river operating constraints). We have started modelling work to understand more fully the effect on environmental outcomes of concurrently providing additional water and relaxing river system constraints.

After consulting with Basin state representatives, senior river operators and consultants, we are now reviewing all potential constraints and impediments to achieving the environmental watering objectives associated with the proposed Basin Plan. Impediments include policy, operational, physical and modelling constraints, which are now being assessed against the proposed Basin Plan's environmental objectives and targets. We are continuing to investigate major constraints and the works and measures that may overcome them.

More information about modelling is in Chapter 4, 'River Murray operations assets'. see page 118 >

#### Social and economic analysis

When developing the proposed Basin Plan, we used the best available social and economic knowledge to determine the plan's effect on Basin communities. We commissioned over 20 social and economic studies and considered a large number of other studies, which we used to inform our analysis of the Basin Plan's social and economic impacts.

For more information about our partners in determining the possible social and economic impacts of the proposed Basin Plan on Basin communities, **see page 23** ►

We ensured this knowledge would be made available to the Murray–Darling Basin Ministerial Council, key stakeholders and the general public by releasing the socioeconomic synthesis report, *Socioeconomic analysis and the draft Basin Plan* (parts A and B). The social and economic implications of the Basin Plan were further described in another MDBA document, *The socioeconomic implications of the proposed Basin Plan*, published in May 2012.

An independent review by KPMG confirmed that the best available science had been used to inform our consideration of the Basin Plan's socioeconomic implications. We considered additional social and economic evidence gathered during the formal 20-week consultation period from 28 November 2011 to 16 April 2012 to help us revise the proposed plan.









Jack Taylor Weir, on the Balonne River, St George, Queensland. During the floods of 2011–12, the water upstream of the weir was more than a metre over the bridge. We will continue to consider social and economic effects on Basin communities as implementation of the proposed Basin Plan progresses. Social and economic analysis will inform the SDL review proposed for 2015 and the 2017 socioeconomic review. It will also inform specific elements of the Basin Plan, particularly monitoring and evaluation, environmental watering plans and water resource planning.

More information about our engagement with research partners, other government agencies and Basin communities and industry groups is in Chapter 3, 'Knowledge into action'. **see page 73** 

#### **Groundwater planning**

During 2011–12 we continued to develop the groundwater management elements of the Basin Plan. Under the plan, Basin groundwater will be managed in an integrated way in all Basin states, with limits applied to groundwater use across the Basin for the first time.

We proposed groundwater SDLs based on transparent methods and assessments documented and published on the MDBA website, <www.mdba.gov.au>, including *The proposed groundwater baseline and sustainable diversion limits: methods report* and groundwater SDL resource unit summary report cards.

Gaps in our knowledge of the Basin's groundwater resources require further research, including of the connectivity between surface water and groundwater and interactions with the Great Artesian Basin, estimating groundwater recharge across the Basin, and determining the existence and groundwater dependence of environmental assets.

The introduction of groundwater SDLs and their associated management arrangements will protect the productive capacity of aquifers and groundwater-dependent ecosystems. In determining these SDLs, the MDBA used a consistent Basin-wide approach to assess the risk of groundwater extraction on:

- the ability of aquifers to continue to be productive over time
- groundwater-dependent ecosystems
- surface water resources fed from groundwater
- groundwater water quality (salinity).

Within the limits set by the SDLs, localised impacts will be managed through water management arrangements in water resource plans developed and implemented by the Basin states and accredited by the Commonwealth Minister for Water based on MDBA advice.

During the public consultation on the proposed Basin Plan, feedback relating to groundwater diversion limits focused on the impact that the proposed limits would have on surface water resources, and that, given the lack of groundwater information and data, the groundwater SDLs were set too high.

We responded to these concerns by reviewing our methods for determining groundwater SDLs in conjunction with obtaining technical advice from groundwater experts. As a result, groundwater SDLs have changed significantly; these changes are detailed in the *Addendum to the proposed groundwater baseline and sustainable diversion limits: methods report*, available at </www.mdba.gov.au>.

We are working with the Basin states to review current or develop new water resource planning rules and groundwater management arrangements; develop new numerical groundwater models; and ensure water resources plans are in place by 2019, are consistent with the Basin-wide planning framework and can be accredited under the Water Act.

As part of developing groundwater use requirements under the Basin Plan, we have formed close and productive working relationships with groundwater scientists, government agencies and state groundwater managers and planners.

Our strong links with state groundwater management agencies will be critical once the Basin Plan becomes operational, as will our partnerships with federal government agencies, such as the Bureau of Meteorology, Geoscience Australia and the National Centre for Groundwater Research and Training.

During the past year, we ran a workshop to assess methods of determining groundwater SDLs used in the Basin Plan, which enabled us to establish links with a number of groundwater experts.

Our relationship with these experts has:

- contributed to how we will determine groundwater SDLs under the proposed Basin Plan
- enabled us to consider priorities for the future groundwater work program.

#### **Environmental Watering Plan**

The Environmental Watering Plan is part of the proposed Basin Plan. The purpose of the Environmental Watering Plan is to set objectives and targets for environmental watering and an environmental management framework for planned and held environmental water that can be implemented in collaboration with the Australian Government, Basin states and communities.

During 2011–12, we consulted with federal and state government officers, the scientific community and the wider Basin community, including catchment management authorities. We also surveyed Basin environmental managers about their views on environmental watering successes and constraints.

We then reviewed the plan, taking into account issues raised in submissions received during the public consultation period, feedback given at public meetings and forums and ongoing feedback from the Basin Plan Working Group (see page 23).

The plan published in May 2012 includes an environmental management framework that requires development of a Basin-wide strategy for environmental watering. To support this strategy, the MDBA will use advice provided by river managers to identify and prepare annual environmental watering priorities for the Basin.

The revised Environmental Watering Plan in the proposed Basin Plan strongly emphasises setting overall objectives and establishing principles to guide decision-making on environmental water use throughout the Basin. For the first time, we will be able to coordinate environmental water use at a Basin-scale and across borders, protect and restore environmental assets and biodiversity dependent on Basin water resources, and achieve other environmental outcomes for the Basin as a whole.

The revised draft of the Environmental Watering Plan is available on the MDBA website, <www.mdba.gov.au>, along with other supporting documents.

#### Water Quality and Salinity Management Plan

The Water Quality and Salinity Management Plan is a mandatory component of the Basin Plan. The Water Act requires that the plan identifies key causes of water quality degradation in the Murray–Darling Basin and includes water quality and salinity objectives and targets for the Basin's water resources.

The Water Quality and Salinity Management Plan also identifies which agencies must have regard to those targets when performing their functions and provides for water quality measures to be included in state water resource plans.

Following publication of the proposed Basin Plan for public consultation in November 2011, the Water Quality and Salinity Management Plan was revised.

Specific information about managing Basin salinity is in Chapter 2, 'River and ecosystem health'. see page 63 ►

### **Trading rules**

We consulted targeted Basin stakeholder groups about the Basin Plan's water trading rules, in conjunction with the release of a discussion paper about the rules. As water trading rules will apply to a wide range of stakeholders, including irrigators and irrigation infrastructure operators, this targeted consultation allowed us to explore a number of issues in depth in small group discussions.

We coordinated quarterly meetings of the Trade Working Group and Trade Operators Panel, reporting to the Basin Officials Committee through the Natural Resource Management Committee on a number of interstate water market matters.

The Basin Plan's water trading rules will come into effect on 1 July 2014. Before then, we will develop guidelines to assist Basin states, irrigators and irrigation infrastructure operators in complying with the rules.

### **Critical human water needs**

Chapter 10 of the *Proposed Basin Plan — a revised draft* deals with critical human water needs under the Basin Plan and formalises the process of managing drought in the River Murray System by setting aside volumes of water specifically to meet critical human water needs during times of severe water shortages.

More information about this topic is provided in Chapter 4, 'River Murray operations assets'. see page 120 ►

### **Basin Plan monitoring and evaluation**

Under the Water Act, the MDBA must include in the Basin Plan a program to monitor and evaluate the plan's effectiveness. This program will inform the review and adaptive management of the Basin plan at 5- and 10-year intervals.

We used feedback from submissions received during the public consultation on the proposed Basin Plan and from discussions with major Basin stakeholders to refine and finalise Chapter 12 of the Basin Plan, 'Program for monitoring and evaluating the effectiveness of the Basin Plan'.

Our revised program sets out a high-level framework for monitoring and evaluating the Basin Plan's effectiveness. It includes key principles, outcomes to be monitored and evaluated, and processes for evaluation, review, adaptive management and audit.

We also developed proposals to establish Basin state monitoring, evaluation and information coordinators. At the time of writing this annual report, one state has signed an agreement and work has begun on an inventory of current monitoring, evaluation and information programs, including their alignment with the Basin Plan. Two other Basin states have expressed interest and proposals are being considered.

#### Basin Plan monitoring and evaluation program guidelines

During 2011–12 we prepared draft technical and operational guidelines that provide further information about our proposed approach to implementing the Basin Plan monitoring and evaluation program. These draft guidelines also set out the technical and operational arrangements recommended for monitoring and reporting.

Throughout 2012–13 we will continue to work with other federal agencies and the Basin states to refine the guidelines as part of implementing the more general Basin Plan monitoring and evaluation program.

# **IMPLEMENTATION ARRANGEMENTS**

The Basin Plan will largely be implemented via water resource plans developed by Basin state governments. These state plans must be accredited and in place by 2019, or earlier.

The MDBA is working with Basin states to ensure there is a smooth transition from the existing state plans to the new accredited plans by 2019. We are also working to ensure that the roles and responsibilities for implementing the Basin Plan — whether of Australian Government or Basin state agencies — are clear. As the plan is implemented, opportunities will arise for adaptive management and involvement of local communities.

## Adaptive management and localism

Adaptive management and localism are two key principles in our approach to develop, implement and revise the Basin Plan.

Adaptive management in essence is the idea of learning from doing. Applying an adaptive management approach will ensure the Basin Plan evolves over time by incorporating new knowledge, improved hydrologic modelling, prevailing climate conditions, previous outcomes and changing priorities. This approach also builds flexibility into planning — for example, it allows operational decisions to be made in real time and at the local scale, not in advance or at too broad a scale (i.e. Basin-wide scale).

Localism is about bringing governments together with local and regional communities to manage water and other natural resources in an integrated way. It involves communities to find locally relevant solutions to achieve the objectives of the Basin Plan. Involving communities in the development and implementation of such reforms provides them with ownership of the decisions and actions that are required in managing their part of the river system. To ensure their involvement, we have built into the proposed Basin Plan opportunities for local communities to participate in the ongoing development and management of the Basin Plan (including environmental watering).

We are committed to working with stakeholders on all aspects of our business, on implementing the Basin Plan and on joint programs and river operations.

More information about our engagement activities, including our partnerships and strategic alliances, is in Chapter 3, 'Knowledge into action'. **see page 92** ►

Involving Basin communities, other stakeholders and interested parties in the implementation of the plan is essential to ensuring we have a healthy working Basin. We want Basin communities and stakeholders to be closely involved in ensuring the health of the Basin's rivers and other resources to meet social, economic and environmental needs.









Bottom far left: A snowy scene taken near Buckland River, near Harrietville, Victoria. All other images: A strawberry farm at Allens Flat, Victoria. A combination of a sprinkler left on overnight and subzero temperatures created icicles on the fences.

## Implementing the plan

## **Implementation strategy**

A draft implementation strategy was circulated to members of the Basin Officials Committee with the revised proposed Basin Plan and other statutory and non-statutory documents, including chapter guidelines. The Basin states were invited to comment on the documents.

The strategy summarises roles and responsibilities that will be required under the Basin Plan to 2019. Additionally, the strategy outlines current and future governance arrangements and links between current programs and the Basin Plan. The strategy will evolve over time into an effective planning strategy as the Basin Plan is finalised, detailed work plans are developed and budgeting priorities and processes are agreed.

### **Transition pathway**

The MDBA has worked closely with the Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) and state water management agencies to develop appropriate approaches to continue recognition of state water planning arrangements up to the time when new water resource plans are developed for accreditation in accordance with the Basin Plan. These discussions will continue and will be resolved as the Basin Plan progresses.

Close relations with state water management agencies and SEWPaC will continue to be important for ensuring that development of accreditation of water resource plans goes smoothly. Early discussions have commenced regarding these processes and we will develop suitable structures to help us maintain and build these vital relationships.

## **Reviewing northern Basin arrangements**

Late in the 2011–12 financial year, the MDBA established the Northern Basin Program to establish and support the Northern Basin Advisory Committee, which will advise the MDBA about community and regional views on Basin Plan matters covering the entire Basin upstream of the Menindee Lakes. Over the next three years, NBAC will actively engage with and support the involvement of valley-based community committees across the northern Basin to examine options and proposals for:

- achieving water savings in the northern Basin, including implications for SDLs, social and economic impacts, and changes to management and operational rules
- efficient delivery of environmental outcomes through improved ecological analysis, changes to water rules and water-related environmental management
- new knowledge and research to augment water or environmental savings.

The MDBA recognises that water management needs throughout the Basin are not all uniform. The characteristics of the northern Basin river systems, their management and the industries and communities based around them differ from those in the south.

The northern Basin requires a different approach to the southern Basin in developing and implementing the Basin Plan — we need to accommodate the needs of the northern Basin's unique features.

Our approach to the northern Basin reflects our commitment to adaptive management and localism in implementing the Basin Plan. Our approach includes:

- working with existing groups and organisations on progressing elements of the Basin Plan implementation strategy
- establishing the Northern Basin Advisory Committee to advise us about development and implementation of a northern Basin work program and proposals to achieve water savings
- developing any necessary intergovernmental arrangements
   (i.e. between and among the Australian and the Basin state governments)
- aligning MDBA resources to specifically support northern Basin activities.

We will work with existing groups, the Northern Basin Advisory Committee and Basin states to develop an integrated work plan and priorities, initially for the next three years, as part of the broader Basin Plan implementation strategy. By the end of 2011–12, MDBA had considered potential members for the Northern Basin Advisory Committee and aligned staff resources to work on northern Basin activities.

## Accreditation requirements for water resource plans

Water resource plans set out how water resources will be managed, usually over a 10-year period, in specific geographical areas in the Basin. These plans manage groundwater resources, surface-water resources or a combination of both.

The Basin Plan will set out the requirements for water resource plans to enable the Basin states to align relevant elements of their water management with the Basin Plan. The requirements relate to a broad range of matters including managing all forms of take for consumptive use, environmental watering, water quality and consideration of Indigenous values and uses.

Developed by the Basin states (or in certain circumstances by the MDBA), water resource plans need to be approved by the Commonwealth Minister for Water. As noted above, accredited water resource plans covering all areas of the Basin will be developed no later than 2019.

During the year, the MDBA has worked to develop and refine the water resource plan requirements set out in Chapter 9 of the proposed Basin Plan, taking account of views expressed by state agencies and other key stakeholders.

The MDBA has also communicated with state water planners about water resource plan requirements. Work has begun on developing clear accreditation processes so that both internal and external stakeholders clearly understand the MDBA's advisory and accreditation role.

Challenges going forward include:

- clarifying how and when the Basin states will replace transitional and interim water resource plans with accredited water resource plans
- developing clear accreditation processes so that both internal and external stakeholders clearly understand the MDBA's advisory and accreditation role
- developing productive relationships with state water planners
- building internal capacity for assessing and accrediting water resource plans.

## PROVIDING CERTAINTY FOR WATER ACCESS ARRANGEMENTS

## **Murray–Darling Basin Agreement**

Under the agreement, the MDBA undertakes significant functions on behalf of the six Basin state governments — the Australian Government and the governments of New South Wales, Victoria, Queensland, South Australia and the Australian Capital Territory.

The agreement is designed to promote and coordinate the effective planning and management of natural resources and river management operations (specifically of the River Murray) to achieve the efficient, equitable and sustainable use of the Basin's water and other resources. The agreement provides a vehicle for joint action to improve management of water and related natural resources where they are of Basin-wide significance and a collaborative approach by the Basin states will improve potential benefits.

While Basin states retain responsibility for managing the Basin's natural resources within their jurisdictions, they contribute funding to deliver joint program functions such as The Living Murray and the Sustainable Rivers Audit, and to implement elements of the Basin Plan.

Under the agreement, the MDBA carries out the decisions of the Legislative and Governance Forum on the Murray–Darling Basin, which is chaired by the Commonwealth Minister for Water and comprises Basin state ministers with responsibility for the Basin, and the Basin Officials Committee, which facilitates cooperation and coordination between the Australian Government, the MDBA and the Basin states in funding works and managing the Basin's water and other resources.

Early in 2012 the MDBA carried out a preliminary review of the legal consistency of schedules B, D, E, F, G and H of the Murray–Darling Basin Agreement with the proposed Basin Plan. This review, required under clause 152 of the agreement, was pre-emptive, to allow sufficient time for consultation and to ensure the timely completion of the review proper, which will be undertaken once the Basin Plan is adopted.

The agreement requires us to consult with the Basin Officials Committee as we conduct the review, and to make recommendations to the Murray–Darling Basin Ministerial Council on the changes to the schedules. During our preliminary review, a number of inconsistencies between the schedules and the plan were identified; these will be assessed in the review that will follow the Basin Plan's adoption.

Results of our preliminary review were made available to the Authority and the Basin states to help them prepare recommendations to review certain sections of the proposed Basin Plan following the public consultation process, in which matters of consistency were also addressed.

Consultation with the Basin Officials Committee during the preliminary review of the schedules was supported by direct engagement with relevant advisory panels or working groups with expert knowledge of each schedule. All these groups have jurisdictional representation and we used their advice to complete the preliminary consistency review.

## **Compliance and assurance**

Under the Water Act, the MDBA is required to establish processes to ensure compliance with the Basin Plan. During 2011–12, we began developing an integrated compliance and assurance strategy in partnership with the Basin states.

The strategy's focus is on assurance activities that will transparently demonstrate that all parties subject to the Basin Plan discharge their obligations appropriately. The strategy will adopt an intelligence-driven, risk management approach that will systematically identify and prioritise compliance issues for treatment.

The MDBA will work with stakeholders to align, as far as practicable, operational compliance activities with identified strategic priorities.

During 2011–12, we continued to work with Basin states and the Department of Sustainability, Environment, Water, Population and Communities to deliver the Council of Australian Governments' National Framework for Compliance and Enforcement Systems for Water Resource Management.

In partnership with Basin states, the MDBA continued to develop arrangements for determining compliance with the long-term average sustainable diversion limits and the transition from compliance with the Cap on water diversions, to compliance with SDLs under the Basin Plan between now and 2019.

## Adjusting sustainable diversion limits

In their comments on the revised proposed Basin Plan, Basin ministers requested the MDBA work with Basin states to develop a mechanism that would allow adjustments to be made to SDLs, removing the need for the plan to be considered by parliament. Consistent with the ministers' comments, feedback from stakeholders and recommendations made by the House of Representatives Standing Committee on Regional Australia in its *Report into certain matters relating to the proposed Murray–Darling Basin Plan*, the MDBA has worked collaboratively with Basin states to develop an SDL adjustment mechanism for inclusion within the Basin Plan.

It is intended that such a mechanism would operate, under certain specific circumstances, by enabling SDLs to be adjusted. Provisions within the proposed Basin Plan will allow SDLs to be adjusted, provided suitable initiatives are brought forward and assessed as meeting the criteria for an SDL adjustment.

Under the adjustment mechanism, it will be possible to reduce the recovery of consumptive water for environmental uses (i.e. increase the SDL) where equivalent environmental outcomes can be achieved with less water, including environmental works and measures, rule changes and changed river operations.

The mechanism could also operate to increase the recovery of consumptive water for environmental use (i.e. reduce the SDL) where improved environmental outcomes can be achieved without worsening socioeconomic outcomes.

# Performance chart key performance indicators



Key performance indicators	PBS target	Results	
The proposed Basin Plan delivered to the minister and balances social, economic and environmental needs.	ONGOING	The proposed Basin Plan is a starting point for adaptive management.	
	YES	Water trading rules under the Basin Plan will assist in the efficient allocation of water across the Basin — ensuring that water reaches its highest value use will minimise social and economic impacts resulting from reduced water availability for irrigation.	
	YES	Best available socioeconomic analysis informed the proposed Basin Plan.	
	YES	Revised proposed Basin Plan submitted to Murray– Darling Basin Ministerial Council for comment following consideration of the many submissions received, including those from state governments, and the requirements of the Water Act.	
Stakeholders express the view that they have been able to participate in and provide meaningful input to development of the Basin Plan.	YES	Targeted consultation on water trading rules was undertaken with industry groups, irrigators and irrigation infrastructure operators.	
	YES	Extensive input into the development of the groundwater SDLs by the state groundwater management agencies since 2009, including through the establishment of jurisdictional expert panels.	
	YES	Statutory public consultation process was open to all stakeholders. Over 12,000 submissions on the proposed Basin Plan were received.	
	YES	A consultation report on the proposed Basin Plan was delivered in a timely manner and clearly addressed key concerns raised through the 20-week consultation process.	
	YES	Public meetings, round-table discussions and targeted stakeholder workshops were held.	
	YES	The legislative instrument now includes local engagement provisions to ensure meaningful consultation is captured.	
By the transitional water resource plan cessation date, state governments have an agreed protocol in place with the Authority to underpin future development of local water resource plans.	YES	Work has commenced on developing the Basin Plan implementation strategy.	
	YES	Handbook on water resource plan requirements in development.	
	YES	Accreditation processes for water resource plans are in development and will be included in the water resource plan handbook for practitioners.	

CH-1





#### **OBJECTIVE 2.0**

# RIVER AND ECOSYSTEM HEALTH

Through efficient and effective program management to protect, restore or improve the ecological health and resilience of the Basin's key environmental assets, water-dependent ecosystems and biodiversity.

THE LIVING MURRAY RIVER RESTORATION PROGRAM

MONITORING RIVER HEALTH

MANAGING SALINITY

RESTORING NATIVE FISH POPULATIONS

SUSTAINABLE RIVERS AUDIT

# Objective 2.0 RIVER AND ECOSYSTEM HEALTH

These deliverables are prospective and the MDBA measures its successes against them using a shorter term focus in keeping with the objectives of the MDBA's 2011–12 corporate plan.

A chart showing key performance indicators for these deliverables is included at the end of this chapter. **see further information on page 70** 

# **Budget Portfolio Statements — deliverables**

Deliverables	PBS target	Results
By 2015, no loss or degradation of ecosystem response outcomes.	ONGOING	Ongoing.
Within 5 to 20 years of the Basin Plan commencing, improvements in ecosystem response outcomes.	ONGOING	Ongoing.
Within 5 to 20 years of the Basin Plan commencing, water-dependent ecosystems will be more able to withstand short- and long-term changes in watering regimes resulting from a variable and changing climate.	ONGOING	Ongoing.
By 2015, use of Basin water resources will not be adversely affected by water quality, including salinity levels, and increased flexibility of water delivery will maximise river health outcomes.	ONGOING	The Basin Salinity Management Strategy target at Morgan, South Australia achieved and salinity registers in credit. Salinity levels throughout the Basin continue to be monitored, with 362,508 tonnes of salt removed from the rivers in 2011–12. Trials continue on delivery of environmental water and changes to operational rules to provide flexible water delivery to maximise river health outcomes.

## **Overview**

Planning, developing and managing the Basin's water, land and other natural resources are mainly carried out by the Murray–Darling Basin Authority's Environmental Management Division, supported by the MDBA's other operational divisions — Policy and Planning, Information and Compliance, and River Management.

We work with and on behalf of Basin states to implement key programs and policies designed to achieve a healthy working Basin that satisfies the needs of all users, including the environment.

We are directed by the Murray–Darling Basin Ministerial Council, which comprises environment ministers from each Basin state and the Australian Government, in the implementation of environmental resource management programs and policies.

We support, fund and coordinate the collection, analysis and reporting of data related to policyand decision-making about environmental programs and research. Our strategic partners include key research organisations such as CSIRO and the Murray–Darling Freshwater Research Centre.

We deliver environmental management functions, including specialised spatial information and data services, through the following initiatives and programs:

- The Living Murray
- River Murray Water Quality Monitoring Program
- South Eastern Australian Climate Initiative
- Sustainable Rivers Audit
- Native Fish Strategy.

## **Highlights**

- Increased water delivery flexibility to maximise river health by resolving various impediments to environmental watering of River Murray sites.
- Achieved ecological objectives at icon sites through the use of The Living Murray (TLM) environmental water.
- Delivered nearly 292 GL of environmental water to five of the six TLM icon sites.
- Published *The Living Murray annual environmental watering plan 2011–12.*
- Peak salinity at Morgan, South Australia remained below 800 EC in 2011–12.
- 'Murray–Darling Basin rivers: ecosystem health check, 2008–2010' (Sustainable Rivers Audit report 2) in production.



Figure 7. Location of The Living Murray icon sites

# THE LIVING MURRAY RIVER RESTORATION PROGRAM

The Living Murray (TLM) initiative is a joint federal government – Basin state government partnership, in which an environmental water portfolio is managed to meet ecological objectives for six highly valuable ecological and cultural sites in the Basin.

The Living Murray aims to improve environmental outcomes at six icon sites — Barmah–Millewa Forest; Gunbower–Koondrook–Perricoota Forest; Hattah Lakes; Chowilla Floodplain and Lindsay– Wallpolla Islands; Lower Lakes, the Coorong and Murray Mouth; and the River Murray Channel. These sites were chosen for their high ecological value — most are listed under the Convention on Wetlands of International Importance (the Ramsar Convention) — and for their cultural values to Aboriginal and other communities.

The MDBA coordinates TLM activities such as managing and delivering environmental water, constructing water management infrastructure, and developing and reviewing policy to implement TLM objectives effectively and efficiently. Further information about construction of TLM works is included in Chapter 4, 'River Murray operations assets'. **see page 105** 

## **TLM environmental watering**

During the millennium drought, TLM activity focused on recovering long-term environmental water entitlements to support the health of the River Murray System and the water delivered to sites was modest because little water had been allocated to the entitlements. However, two back-to-back La Niña episodes resulted in major flooding throughout the Basin, causing very high inflows to the River Murray in the late summer period, and increasing opportunities to deliver significant environmental health benefits.

Because of high inflows to the River Murray during 2011–12, we used environmental water to supplement natural flows and provide maximum environmental benefits — for example, floodplain inundation at Barmah–Millewa was extended by the use of environmental water. This changed our focus to delivering large volumes of environmental water.

We delivered nearly 292 GL of environmental water to Barmah–Millewa Forest, Gunbower Forest, Chowilla Floodplain, the River Murray Channel, and the Lower Lakes, Coorong and Murray Mouth. This water provided significant environmental benefits. Lowering salinity levels in the Lower Lakes was an additional benefit of environmental water delivery. Environmental water was not delivered to the Hattah Lakes and the Koondrook–Perricoota icon sites because construction works were underway at these sites.

The Living Murray environmental water achieved a number of ecological outcomes at icon sites:

- contributed to a successful colonial waterbird breeding event at Barmah–Millewa Forest (see case study 1, page 54, 'TLM environmental watering at Barmah–Millewa Forest')
- helped improve the health of river red gums (*Eucalyptus camaldulensis*) and other floodplain vegetation
- contributed to a successful breeding event for intermediate egrets (*Egretta intermedia*), increased available habitat for native fish and improved the health of fringing vegetation at Gunbower Forest
- improved the health of native vegetation such as river red gums, black box
   (*E. largiflorens*) and lignum (*Muehlenbeckia florulenta*) at Chowilla Floodplain
- facilitated the recovery and maintenance of vegetation at the Lower Lakes, Coorong and Murray Mouth icon site, which maintained habitat for native birds and frogs, including threatened species such as the southern bell frog (*Litoria raniformis*).

## **Environmental Watering Group**

The Environmental Watering Group is an MDBA – Basin state government partnership charged with coordinating water delivery to the six icon sites. In August 2011, the group published *The Living Murray annual environmental watering plan 2011–12*, a decision framework for using recovered TLM water for environmental actions across the River Murray System between 1 July 2011 and 30 June 2012. The framework allowed us to adjust decisions about environmental water to changing conditions throughout the 2011–12 water season.

The group also finalised environmental water management plans for floodplain icon sites. We applied adaptive management principles by incorporating group members' experiences in and lessons learned from previous environmental watering events.

The group's collective expertise in coordinating timely water delivery from a range of entitlements along with skilful management of the TLM water portfolio ensured icon sites received significant benefits from environmental watering throughout 2011–12.

## **TLM environmental monitoring**

By coordinating and implementing environmental monitoring throughout the River Murray System, the MDBA is able to determine whether TLM environmental objectives are being achieved.

Monitoring information is used to plan environmental watering and manage the icon sites. We also work with the Basin Plan Monitoring and Evaluation Program and River Operations Review to share knowledge and experience about monitoring implementation issues.









Top right and clockwise: Caspian terns (*Hydroprogne caspia*), Southern Lagoon, the Coorong. Reading a sign at the Coorong. Fishermen and pelicans at the Murray Mouth.

## CASE STUDY - 1

TLM environmental watering at Barmah–Millewa Forest

The Living Murray environmental watering at Barmah–Millewa Forest during 2011–12 is an excellent example of the benefits that result from enhancing and supplementing natural flows.

In August–September 2011, a colonial bird-breeding event began during a flooding event in the Barmah–Millewa Forest. Unfortunately by mid-October, River Murray water levels had fallen below the riverbank tops and there was a risk that water in the forest could drain back to the river before breeding was completed. Environmental water was used to supplement and maintain flow levels for a total of five months to ensure the bird-breeding event was successful. The prolonging of enhanced flows also built on environmental watering provided in 2010–11, boosting native fish spawning and benefiting wetland vegetation.

This was a coordinated effort: the 428.1 GL of environmental water used to sustain the forest inundation came from the New South Wales (15 GL) and Victorian (10 GL) entitlements, and from TLM (120 GL) and the Barmah–Millewa Environmental Water Account held at Hume Reservoir (283.1 GL).



River red gums, Murray River, Barmah-Millewa Forest.

We routinely liaise with the monitoring programs within the Commonwealth Environmental Water Holder and the Department of Sustainability, Environment, Water, Population and Communities.

Our main priority is providing the Environmental Watering Group and The Living Murray Committee with knowledge to enable adaptive management of TLM icon sites. This includes realtime information for managing watering and other events, and medium- to long-term information to evaluate progress towards the icon site ecological objectives.

During 2011–12, we successfully:

- collaborated with Basin states and relevant service providers to obtain information delivered from the River Murray System-scale monitoring subprogram
- monitored icon site condition, based on approved icon site condition monitoring plans and annual TLM monitoring opportunities
- delivered intervention and compliance monitoring information to support real-time environmental watering
- compiled monitoring data and stored it in coordinated MDBA databases.

Effective environmental watering needs well-designed and timely environmental monitoring information to enable icon site managers to decide where, when and how additional water will be delivered to icon sites. Monitoring information also gave us critical feedback about whether environmental watering was successful and environmental objectives were achieved.

This enables us to apply lessons learned in previous watering events and seasons to the planning of future watering events to maximise environmental benefits.

## **TLM environmental water policy**

During 2011–12, the MDBA worked on a range of policy issues related to the delivery of TLM water and through this work:

- scoped impediments to environmental water management and delivery under the Murray–Darling Basin Agreement as a project within stage 2 of the Basin Officials Committee's review of the agreement
- resolved policy, operational and accounting impediments to the environmental watering of various River Murray sites
- coordinated an independent review of the 2010–11 River Murray multi-site environmental watering trial
- used Australian Auditing and Assurance Standards Board performance auditing standards and Australian National Audit Office performance audit guidelines to ensure the rigour of the annual independent TLM implementation audit
- scoped development of a TLM schedule to the Murray–Darling Basin Agreement that will eventually replace three intergovernmental agreements and the TLM business plan, all of which currently comprise the TLM implementation framework, and will align TLM with the Basin Plan.

We also supported the design of the 2013–14 multi-site environmental water trial by developing a suite of evidence-based strategies to ensure that environmental water will be protected from consumptive diversion or re-regulation, and to mitigate the risk of unacceptable impacts on third parties.

## **TLM water management works**

The Living Murray water management works help improve water delivery flexibility because they enable more efficient regulation of river flows.

More information about the design and construction of TLM works and measures can be found in Chapter 4, 'River Murray operations assets'. **see page 105** ►

## **The Living Murray Indigenous Partnerships Project**

In 2011–12, The Living Murray Indigenous Partnerships Project (TLM IPP) explored ways to involve local Indigenous Australian communities in planning and managing icon sites, including protecting cultural heritage sites and participating in making decisions about environmental water management.

The project is vital to engaging Indigenous Australian communities and others in TLM issues. It benefits TLM planners and managers as well as Indigenous communities living along the river. The project's most significant achievement has been gaining Indigenous community support for the \$287 million-TLM works and measures program.

The project faces ongoing challenges to identify Indigenous Australian social, spiritual and customary objectives and to develop strategies for incorporating these objectives into environmental water management plans. To date, TLM has focused on protecting cultural heritage sites during the works and measures phase. As these works and measures are completed, icon site managers and Indigenous communities are collaborating to include Indigenous values in environmental water management plans.

The project is a joint federal – state program and has links with various departments, agencies and organisations, including the Murray Lower Darling Rivers Indigenous Nations, Working on Country (Chowilla SA), Yorta Yorta Nation Aboriginal Corporation (Barmah–Millewa Forest), Barkindji Maraura Elders Council (Chowilla NSW), North Central Catchment Management Authority (Gunbower) and the Ngarrindjeri Regional Authority (Lower Lakes, Coorong and Murray Mouth).

Our major achievements during the past year included:

- Barmah–Millewa Forest the Yorta Yorta Nation Aboriginal Corporation developed research data and tools to help identify Aboriginal objectives for icon site environmental management plans and strategies to achieve them.
- Chowilla Floodplain:
  - New South Wales the New South Wales Office of Water in consultation with the Barkindji Maraura Elders Council completed the *Report for Kulcurna Station Conservation Reserve: Cultural Heritage Management Plan.* The report assessed both Aboriginal and European historical heritage values within the reserve, to establish an appropriate management framework for the site.
  - South Australia collaborated with the South Australian Department for Water to
    organise tours of this icon site for Riverland women's and men's groups, including site
    inspections of works and measures.
  - New partnership between the Department for Water and the local Working on Country team has resulted in the team being trained in assessing river red gum health and mapping technology to help them better implement a scar-tree mapping project.

- Gunbower Forest:
  - Facilitated ongoing engagement between North Central Catchment Management Authority (NCCMA), Barapa Barapa and Yorta Yorta cultural heritage officers and local Indigenous networks in implementing TLM IPP, the Cultural Heritage Management Plan and lower landscape works.
  - Facilitated a NAIDOC Day celebration held by NCCMA and members of the Barapa Barapa nation.
  - Conducted cultural heritage induction training for Goulburn-Murray Water work crews.
- Lindsay, Mulcra and Wallpolla islands and Hattah Lakes icon sites:
  - Established two informal Indigenous steering committees to implement the Cultural Heritage Management Plan; the committees comprise Native Title claimants and/or applicants and registered Aboriginal Party applicants.
  - The Robinvale community welcomed the concept of use and occupancy mapping; over 5,000 places have now been mapped.
- Lower Lakes, the Coorong and Murray Mouth
  - Implementation of TLM Lower Lakes, the Coorong and Murray Mouth icon site by the South Australian Department for Water in collaboration with the Ngarrindjeri Regional Authority (NRA).
  - The NRA provided information about ecological targets and management options, and provided cultural knowledge about a range of issues.
  - The NRA and Department for Water icon site staff developed a cultural training package for TLM monitoring providers. The package focuses on heritage issues, the link between the Ngarrindjeri and Country, future research opportunities and an historical overview of Ngarrindjeri life in the lakes and the Coorong.

Community interest in and understanding of TLM and its goals have been furthered by increasing numbers of news articles, presentations, blogs, web updates, a major interpretive display at Mildura and the 'Murray Meander' charity event.

## **River Murray System-scale monitoring**

During 2011–12, the River Murray System, including TLM icon sites, was monitored for a number of environmental objectives. The tools used and the outcomes reached are described in this section.

### Floodplain tree-stand condition monitoring

In its fourth year of operation during 2011–12, the floodplain tree-stand condition monitoring project's field component was carried out successfully, with icon site tree-stand condition maps in preparation for publication in December 2012.

The monitoring work indicates tree condition status and response to the past two years of large flows in the River Murray System; it ties in with the icon site condition monitoring on-ground assessment of tree and stand condition.

## Waterbird aerial survey monitoring

Now in its fifth year of operation, the aerial survey monitoring of waterbirds at the River Murray System-scale showed satisfying results. The monitoring estimated nearly 200,000 waterbirds from 51 species or groups of species across all TLM icon sites — the third highest estimate in the five years the survey has been conducted (2007–11).

Breeding colonies included straw-necked ibis (*Threskiornis spinicollis*), Australian pelicans (*Pelecanus conspicillatus*) and pied cormorants (*Phalacrocorax varius*), which were concentrated in the Lower Lakes, Coorong and Murray Mouth icon site.

Australian white ibis (*Threskiornis molucca*) breeding colonies were located in the Chowilla– Lindsay–Wallpolla Islands wetland. Total numbers of waterbirds across the icon sites have increased from the widespread flooding in 2010, when many waterbird breeding events were spread thinly because of the large amount of habitat available.

#### Icon site condition monitoring

Icon site condition monitoring focused on fish, waterbirds and vegetation according to icon site ecological objectives. Work continued on refining icon site condition monitoring plans to ensure monitoring is appropriately designed and carried out.

We received valuable advice on improving the program from an independent review panel and were able to continue compiling icon site condition monitoring data for use in refining and improving monitoring arrangements and data management systems.

Condition monitoring showed a mixed picture of river red gum and understorey vegetation condition. During the millennium drought, large areas of river red gum forest across the icon sites declined in condition, with the only stands remaining in relatively good condition restricted to areas surrounding the river, along creek-lines and in wetlands that received environmental watering. However, condition monitoring over the past year shows that recent flooding has reinvigorated the health of river red gum and black box forest.

### Intervention monitoring (ecological response, compliance and risk monitoring)

Significant intervention and compliance monitoring projects were conducted during 2011–12 to support real-time environmental watering and improve our understanding of the icon site ecological processes.

Work included water measurement, risk and negative impact management and ecological response information. Examples of intervention monitoring projects and how we used the information from them to maximise ecological benefits to the icon sites include:

- Maintaining water levels although large unregulated flows during the year dwarfed the environmental watering component, TLM monitoring was critical to ensuring that water levels were maintained in key waterbird-breeding areas in the Barmah– Millewa Forest. Throughout the watering season, icon site staff and MDBA staff liaised to exchange real-time information to achieve this positive ecological outcome.
- Two years of unregulated flows have combined with planned environmental watering to enhance ecosystem recovery at TLM icon sites across a range of ecological indicators. For instance, for a second successive year significant flows connected the Coorong and Lower Lakes, promoting fish movement and breeding. Freshwater releases through the barrage fishways supported the movement of large numbers of fish (over 3 million fish sampled), including freshwater, estuarine, diadromous and marine species. Lampreys (*Mordacia mordax*) were sampled at the fishways for the first time since 2006.

Other intervention monitoring projects that were conducted or are still underway include:

- River Murray and Edward River fishways assessments
- monitoring of resnagging between Lake Hume and Yarrawonga
- flow monitoring on Mulcra Island
- groundwater monitoring on the Lindsay–Wallpolla Islands and Hattah Lakes
- surface water, groundwater, soil salinity and soil moisture at Chowilla Floodplain
- native fish movement tracking at Chowilla Floodplain.

# MONITORING RIVER HEALTH

## **River Murray Water Quality Monitoring Program**

Monitoring the quality of River Murray water is a statutory responsibility of the Murray–Darling Basin Agreement.

During 2011–12 sampling and analysis of physico–chemical parameters at the 36 River Murray Water Quality Monitoring Program sites were undertaken and an updated analysis of trends in this data is scheduled for 2012–13.

During 2011–12 we also continued biological monitoring of the Murray and Mitta Mitta rivers. Our detailed analysis of the 29-year record of Murray macroinvertebrate samples revealed continuing change in the structure of macroinvertebrate communities, generally towards more tolerant species, which indicates a general decline in the biological health of the system. This change may reflect increasing environmental stress arising from both land and water management actions.

We completed a detailed analysis of the full 11-year record of Mitta Mitta River macroinvertebrate samples. We found that faunal changes in the Mitta Mitta following construction of Dartmouth Dam have persisted, which highlights the ecological value of the unregulated tributary streams.

We completed an analysis of trends in phytoplankton populations along the River Murray, covering all data collected between 1980 and 2008. Our analysis revealed that substantial, consistent and statistically significant increases occurred in phytoplankton counts across almost all sites and taxa in the River Murray between 1994 and 2008, with the greatest changes occurring further upriver. We also found that while algal bloom frequency within the system as a whole did not change markedly over the study period, the length of individual algal blooms at upstream sites has increased over the past decade.

These analyses were reviewed by an independent consultancy firm during the year, which described the datasets as an outstanding environmental resource of international standing.

## Algae

In contrast to previous dry years, River Murray water use during 2011–12 was not limited by excessive algal growth.












All images: Chowilla Boat Creek Bridge. Construction of the bridge enabled the creek bed to be realigned to improve fish passage and connectivity between Chowilla and the River Murray. Higher flows and storage levels reduced algal growth and only medium alert levels were experienced. While 'amber' alerts occurred at many locations along the River Murray and its tributaries, these were not prolonged, being most persistent throughout late summer and early autumn along the Murray from Yarrawonga to the Darling Junction. For a short time 'red' level alerts were reported in some upper catchment storages, such as lakes Eppalock and Eildon.

### **Blackwater**

High inflows inundated many Basin floodplains during the year, causing a recurrence of blackwater in parts of the River Murray System, particularly downstream of Billabong Creek and in the Murrumbidgee River, where floodplains had higher stores of organic material.

Blackwater events are natural phenomena caused by the breakdown of leaf litter on inundated floodplains and rivers, which results in water discolouration that is sometimes accompanied by a decline of dissolved oxygen levels within the water column.

To track this blackwater event, the MDBA held weekly teleconferences with Basin state agencies, to collate all monitoring data collected by state agencies and review the event's progress and the adequacy of monitoring.

The state managing agencies found this central overview valuable, because it enabled them to make decisions about releasing environmental water to mitigate the event. Further information about this matter can be found in Chapter 4, 'River Murray operations assets'. **see page 135** 

Overall, the deoxygenation level in the River Murray was not as extensive or as prolonged as the levels experienced in the summer of 2010–11.

### **Acid sulfate soils**

Following release of the Basin-wide acid sulfate soils risk assessment summary report by the Murray–Darling Basin Ministerial Council in May 2011, the MDBA published 65 acid sulfate soil technical reports on the Basin Plan Knowledge and Information Directory, available at <www. mdba.gov.au/bpkid/>.

These reports detail acid sulfate soil conditions at almost 200 wetlands and river and creek systems throughout the Murray–Darling Basin. We presented our project outcomes at the 3rd National Acid Sulfate Soils Conference, held in Melbourne in March 2012.

Water quality impacts through rewetting of acid sulfate soils have persisted in several floodplains of the Lower Murray Reclaimed Irrigation Area since the return of higher water levels to the lower Murray. The MDBA is working with South Australian government agencies to understand the behaviour and impacts of acid drainage discharges, and to protect aquatic ecosystems, water supplies and recreational users.

### **Development referrals**

Clause 49 of the Murray–Darling Basin Agreement requires the Basin states to refer any development proposals that may significantly affect the quality of River Murray water to the MDBA for assessment. Approximately 70 proposals were referred to us during 2011–12 and we made representations where appropriate.

Following MDBA representations about a Victorian proposal to discharge waste to New South Wales, the MDBA's interstate Water Quality Advisory Panel agreed to expand its membership to include representatives of each state's environment protection authority.

# MANAGING SALINITY

# **Highlights**

- Peak salinity at Morgan, South Australia remained below 800 EC<sup>1</sup> (Table 1) despite the mobilisation of significant salt loads because of high river flows in 2011–12.
- All contracting governments (New South Wales, Victoria and South Australia) remained in net credit on the salinity registers (Table 2).
- Salt interception schemes diverted approximately 362,508 tonnes of salt from the River Murray System (see Table 5 on page 138).

Salinity has long been recognised as a significant problem in the Murray–Darling Basin. The Basin Salinity Management Strategy 2001–2015 was developed to limit the spread of salinity and its impacts on water quality, aquatic and terrestrial ecosystems, productive land, cultural heritage and infrastructure.

The strategy is managed by the MDBA on behalf of Basin state governments. The strategy aims to achieve agreed targets for in-river salinity and maintains a set of accounts (credit and debit systems) for in-river salinity impacts of new and past land and water management actions and decisions.

The targets for salinity and salt loads in the Murray and major tributary valleys are set to achieve a Basin salinity target of less than 800 EC for 95% of the time at Morgan, South Australia.

The MDBA's salinity expertise developed over the past 20 years contributed to Chapter 8 of the proposed Basin Plan, which deals with the Water Quality and Salinity Management Plan.

The plan sets out salinity targets, a salt-load target for the River Murray System and salinity operational targets, which will contribute to long-term salinity planning for water resource plans under the proposed Basin Plan. The salinity targets are the Murray–Darling Basin and the end-of-valley targets set out in the Murray–Darling Basin Agreement; they include the Basin salinity target of 800 EC for 95% of the time at Morgan, South Australia.

# Salt interception

A significant achievement of salinity management in the Basin had been the commissioning of strategically located salt interception schemes to divert hypersaline water from the River Murray System. Under the Basin Salinity Management Strategy program, a reduction of average salinity equivalent to 61 EC at Morgan, South Australia will be delivered when all salt interception schemes are commissioned.

In 2011–12, salt interception schemes diverted approximately 362,508 tonnes of salt from the River Murray. Chapter 4, 'River Murray operations assets', has a detailed performance report on salt interception activities during 2011–12. **see page 137** 

<sup>1</sup> EC is an electrical conductivity unit commonly used to indicate salt concentration or the salinity of water (1 EC=1 $\mu^{s/c}$ cm).

# Salinity registers

Under the Basin Salinity Management Strategy, actions that increase and decrease average river salinity are accounted as debits and credits which are recorded in a salinity register. For example, actions such as new irrigation developments may generate a debit on the register because in some areas they may increase salt loads to the River Murray. By comparison, actions such as commissioning salt interception schemes and improving irrigation practices may generate credits.

Each entry in the register is reviewed every five years. The review covers significant salinity impacts arising from recent actions (Register A) as well as from major historical land and water use decisions (Register B) in tributary valleys. Each year the Basin states inform the MDBA about reviews of existing register entries and new activities that have significant salinity effects.

The MDBA calculates the salinity cost of these activities and updates salinity registers for independent review by salinity auditors. In November 2011, the auditors confirmed that the contracting governments of New South Wales, Victoria and South Australia (the Australian Capital Territory and Queensland do not have significant salinity impacts) remained in net credit on the salinity register, Register A and in the balance of registers A and B (Table 2) as required by the strategy.

The outcomes of the independent salinity audit were reported to the MDBA and the Murray-Darling Basin Ministerial Council and were published by the MDBA.

Period	Time interval	Average	Median	95th percentile	Peak	% Time > 800 EC
1 year	Jul 2011- Jun 2012	287	290	397	456	0
5 years	Jul 2007– Jun 2012	411	408	683	768	0
10 years	Jul 2002– Jun 2012	411	391	662	768	0
25 years	Jul 1987– Jun 2012	499	469	788	1,087	4

### Table 1. Summary of salinity levels (EC) recorded at Morgan, South Australia

# **RESTORING NATIVE FISH POPULATIONS**

The Native Fish Strategy was approved in 2003 by the former Murray–Darling Basin Commission (now the Murray–Darling Basin Authority) as a 10–year plan to rehabilitate native fish populations in the Murray–Darling Basin; it contained long-term objectives regarding native fish populations.

Progress on activities undertaken under the umbrella of the Native Fish Strategy are described below and in Chapter 3, while progress on the sea-to-Hume fishways is detailed in Chapter 4 of this annual report. **see pages 89 and 111** 

# Alien species management

During 2011–12 the MDBA Native Fish Strategy Team conducted research projects on managing alien fish species (see case study 2 on tilapia), continued developing the Basin alien fish plan and continued working with the Invasive Animals Cooperative Research Centre. This included collaborating on two forums during 2012 — one on the state of knowledge about tilapia (held in Brisbane in May) and one on managing carp (*Cyprinos carpio*) (held in Melbourne in June).

Table 2.	Summarv	of the	2011	salinity	register

Actions	NSW (\$m/yr)	Vic (\$m/yr)	SA (\$m/yr)	Qld (\$m/yr)	ACT (\$m/yr)	Commonwealth contribution (EC)
Joint works and measures	2.712	2.712	0.840	0	0	33.1
State shared works and measures	0.191	0.191	0	0	0	0
State actions	2.656	2.151	2.632	tbd	tbd	1.0
Total Register A	5.559	5.054	3.472	tbd	tbd	34.1
Transfers to Register B	0.634	0.506	1.467	0	0	0
Total Register B*	0.411	-0.064	1.217	0	0	0
Balance — Registers A and B	5.970	4.990	4.689	0	0	34.1

\*Total includes transfers from Register A, green numbers indicate a credit entry; negative red number indicates a debit entry; tbd = to be determined

# **CASE STUDY - 2** Assessing tilapia risk

Mozambique tilapia (*Oreochromis mossambicus*) was illegally introduced into Queensland waters in the late 1970s and is now established in 17 of the 76 catchments throughout the state. Within many infected catchments, particularly in degraded habitats, tilapia dominate fish biomass and have degraded local fish communities and aquatic plants.

Tilapia have not yet been found within the Murray–Darling Basin; however, three of the 17 infected catchments border the Murray–Darling Basin and another is within close proximity. In 2011–12, the MDBA undertook a significant project in conjunction with the Department of Agriculture, Fisheries and Forestry (Qld) and the Department of Primary Industries (NSW) to assess the risk of tilapia moving into the Murray–Darling Basin and strategies to address that risk.

Recent post-flooding fish surveys have identified tilapia within 3 km from the upper Balonne–Condamine catchment in the upper Burnett River. Recent climate modelling under the project suggests that tilapia may be able to occupy up to 50% of the Murray– Darling Basin if they successfully invade.



Potential distribution of tilapia in the Murray–Darling Basin from modelling water temperature data. (Adapted from Hutchison et al., 2011)

# **Demonstrating a difference**

Demonstration reaches are large-scale river reaches or wetlands where a number of management interventions are applied to showcase the cumulative benefits of river rehabilitation on native fish populations.

Demonstration reaches are a key Native Fish Strategy initiative. Seven demonstration reaches currently operate across the Basin — Condamine River (Qld), Namoi River (NSW), Barwon–Darling rivers (NSW), upper Murrumbidgee (NSW/ACT), Ovens River (Vic), Hollands Creek (Vic) and Murray River at Katarapko (SA).

In 2011–12 funding was delivered to the demonstration reaches to enable progress to continue on a range of on-ground works, monitoring and evaluation, and community engagement activities.

We held a 'Managing demonstration reaches' workshop in Wangaratta, Victoria in May 2012, which brought together demonstration reach practitioners from across the Basin to share and enhance knowledge and to strengthen linkages.

During the year, the strategic review of the uptake of the Native Fish Strategy's demonstration reach concept was completed. The review included production of a compendium of information detailing progress to date in implementing demonstration reaches across the Murray–Darling Basin. The review also assessed the likelihood of demonstration reach projects meeting our original concept objectives, including an assessment of their long-term viability.

# Management lessons from the millennium drought

In September 2011, we held a 'Native fish emergency response' workshop in Adelaide, South Australia. The workshop captured recent experiences and summarised key management lessons following a decade of drought, bushfires and, more recently, extreme flood and poor water quality events.

The aim of the workshop was to find ways to reduce the risk of losing any of the Basin's native fish species because of future climate or environmental crises. The workshop resulted in the development of emergency native fish management guidelines for use in the Murray–Darling Basin.

# **Fish and irrigation offtakes**

Research by the MDBA and other organisations is increasingly finding that large numbers of native fish are being lost from rivers through water abstraction. This loss could be minimised by the use of fish-friendly infrastructure, such as fish screens that protect fish populations while maintaining irrigator entitlements.

The MDBA has continued to develop design criteria for irrigation intake screens that could be used in the Murray–Darling Basin's rivers.

# **Murray Cod Fisheries Management Group**

The Native Fish Strategy's success depends on engaging communities, interest groups and organisations in rehabilitating aquatic environments, managing alien fish species and developing programs, techniques and infrastructure to support the resurgence of native fish species throughout the Basin.

# **CASE STUDY - 3**

### Murray–Darling Basin River Management Review Work Program

Between January and July 2012, the MDBA worked with Basin state governments to develop the Murray–Darling Basin River Management Review Work Program. Using this work program, we will be able to:

- explore opportunities for works and measures to deliver improved environmental outcomes and minimise the required water recovery
- review physical and operational constraints and barriers and, where possible, remove these to allow the most effective and efficient environmental watering possible
- review the policy constraints and barriers and, where possible, remove these to allow effective and efficient delivery of environmental water
- undertake an adaptive management process, pursuing and using new knowledge to increase environmental benefits achievable from applying environmental water (including assessing whether we need to adjust sustainable diversion limits)
- explore opportunities for works and measures to improve outcomes or change water recovery requirements in the northern Basin and unregulated systems in particular
- ensure Basin states and communities are thoroughly engaged in the sustainable diversion limits review and comprehensively explore local ideas to improve outcomes or reduce the need for water recovery
- undertake a stocktake of existing projects and initiatives and assess them against obligations and commitments made for the river management review.

Currently still in production, the work program is designed to be collaborative and to capture activities and initiatives suggested by the MDBA, the Basin Officials Committee and Basin states; it will also suggest opportunities for new river management operations.



Brown's Creek, New South Wales provides habitat for a range of species, including frogs, toads, newts, caecilians, turtles, snakes and native fish.

We have strong links and partnerships with organisations and groups that manage aquatic initiatives and programs. One example of such a partnership is a Basin-wide management group that aims to improve interstate collaboration and research on enhancing conservation outcomes for Murray cod (*Maccullochella peelii*), a nationally threatened native species highly valued for recreational fishing.

# SUSTAINABLE RIVERS AUDIT

The Sustainable Rivers Audit (SRA) program of assessing Basin river health is run by the MDBA in partnership with the Basin states and an independent group of river ecologists, the Independent Sustainable Rivers Audit Group (ISRAG).

ISRAG reports every three years to the Murray–Darling Basin Ministerial Council on the health of the rivers of 23 Basin valleys, using biophysical data collected from specific locations by Basin states according to sampling protocols coordinated by the MDBA. The program uses ecological and environmental indicators, called themes, to assess the condition of key ecosystem components and to identify long-term trends in river ecosystem health. During the most recent assessment, the themes used were fish, macroinvertebrates, vegetation, hydrology and physical form.

The first SRA report, *Murray–Darling Basin rivers: ecosystem health check, 2004–2007*, was published in 2008; SRA report 2, which analyses river health between 2008 and 2010, is currently in production. Production of SRA report 2 during 2011–12 was delayed by technical difficulties in analysing the hydrology theme:

- first-time use of a spatial stream network layer to calculate hydrological stress indicators at the stream-reach level, allowing impact assessment of farm dams and land-clearing on smaller headwater streams and more comprehensive impact assessment of all network streams and rivers
- aggregating assessment results to valley and zone levels to provide an overall hydrology condition score required complex and time-consuming quality control checks.

The aggregation of scores across five themes also provided a challenge as the previous SRA had only three themes.

We conducted three workshops during the year, providing Basin jurisdictions with information about the draft SRA documents and the opportunity for feedback. The first workshop discussed the way the SRA report 2 would be released, including the need for providing summary information and for key messages to be clearly communicated. The comparison report addresses key messages in detail. The second workshop consulted with the states on the hydrology theme, the analysis methods and the significance of the hydrology stress scores. The third workshop focused on the expert rules method of integrating indicators into index scores and valley condition ratings.

Recommendations arising from the workshops are now being addressed by the MDBA with a view to public release in 2012–13.

During 2011–12, the Sustainable Rivers Audit continued collecting data on fish and macroinvertebrates. This will provide condition scores collected during a much wetter period, which will assist in looking at the Basin's recovery from drought.

# Performance chart key performance indicators



Key performance indicators	PBS target	Results
By 2015 state governments have an agreed protocol in place with the MDBA to underpin the future monitoring and evaluation of ecosystem response conditions.	ONGOING	Ongoing.
Assessment of the Environmental Watering Plan provides assurance of increased flexibility of water to maximise river health conditions.	YES	Chapter 7 of the proposed Basin Plan covers the Environmental Watering Plan, which is a flexible and adaptive plan to maximise effectiveness.
Assessment of the Water Quality and Salinity Monitoring Plan demonstrates capabilities to mitigate Basin water resources being adversely affected by water quality, including salinity.	YES	Chapter 8 of the proposed Basin Plan deals with the Water Quality and Salinity Management Plan.
Sustainable Rivers Audit data collated.	YES	The second SRA report, 'Murray– Darling Basin rivers: ecosystem health check, 2008–2010', is in production and will be published in 2012–13.
Timely delivery and dissemination of South Eastern Australian Climate Initiative (SEACI) Phase 2 final reports.	YES	Fifteen climate projections have been published. SEACI is discussed in Chapter 3, 'Knowledge into action'.
Salinity registers are independently audited and audit report provided to Ministerial Council by 31 March each year so that it is transparent whether states are in credit or debit.	YES	Achieved.
Construction of works and measures progressing to schedule and budget, allowing for uncontrolled events (floods).	ONGOING	Some delays caused by flooding over the past two years.
Detailed design of new works and measures completed on schedule and budget.	YES	Completed.





### **OBJECTIVE 3.0**

# KNOWLEDGE

To establish the Murray–Darling Basin Authority as the authoritative information service for the Basin by providing communities, governments and industry with relevant information on the critical indicators, processes and characteristics of the Basin's natural resources for decision-making and action.

INFORMING JOINT DECISON-MAKING MEETING BASIN INFORMATION NEEDS STRATEGIC ALLIANCES TO MEET SHARED NEEDS

# Objective 3.0 KNOWLEDGE INTO ACTION

This chapter discusses the Murray–Darling Basin Authority's delivery of knowledge-based functions and operations throughout 2011–12, and our strategic relationships with Australian Government and state government agencies and industry groups ensure we have a strong knowledge base supported by robust reporting, monitoring and research capabilities that enable us to qualitatively measure our success in achieving required outcomes.

A chart showing key performance indicators for these deliverables is included at the end of this chapter. **see further information on page 94** 

# Portfolio Budget Statement — deliverables

Deliverables PBS target		Results
	YES	Consulted with Basin communities and industry groups on the implications of the Basin Plan.
Timely publication and communication of information about the Murray–Darling Basin in a	YES	Consulted with researchers, experts and Basin state representatives about the social and economic analysis used to inform development of the Basin Plan.
form that is accessible to communities, governments and industry to meet their information needs. Additional information about Basin communications, including publications, is in	YES	Publication of Basin Plan information on BPKID as it becomes available. This information includes items incorporated by reference in the legislative instrument as well as more broadly used items.
Chapter 1, Transboundary water management arrangements'.	YES	The MDBA published 81 publications during 2011–12, 31 of which related to the development of the proposed Basin Plan. Among these publications were technical documents and engagement and communications products designed to help people participate in the Basin Plan's development.
Enter into strategic alliances with Australian Government and state government agencies and/or industry to build a robust information infrastructure for the Basin to meet shared needs.	YES	Relationships established with state water management agencies and information conduits facilitated.

Deliverables	PBS target	Results		
Build the next generation of information products and services to support informing, engaging and educating all stakeholders about the resources of the Bacin	YES	Developed broad community engagement and education strategies relating to management of the Basin's water resources. Developed the foundation for building the next generation of information products for the MDBA by developing policies on metadata and internet protocols and information asset registration systems.		
	YES	We coordinated quarterly meetings of the Trade Working Group and Trade Operators Panel, and reported to the Basin Officials Committee about a number of interstate water market matters.		
To provide timely information to the Basin Officials Committee, the Murray- Darling Ministerial Council and Murray-Darling Basin Authority members to inform joint government decision- making on the Basin's natural resources and ecosystems.	YES	<ul> <li>Reports delivered to these governance bodies:</li> <li>Basin Salinity Management Strategy report (annual implementation strategy) for 2010–11 and associated documents.</li> <li>Environmental Works and Measures Program progress report.</li> <li>revised asset management plan.</li> <li>Commencement of the Schedule to Account for South Australia's Storage Right and the Schedule for Water Sharing.</li> <li>Environmental Watering Plan, salinity targets and alignment of state plans with the Basin Plan, including that SDLs are proposed to take effect from 2019</li> <li>Water audit monitoring report 2010–11.</li> <li>The Living Murray annual implementation and Audit of The Living Murray implementation 2010–11.</li> <li>Barmah Choke Study completed and report issued.</li> <li>We also provided a series of reports (e.g. on socioeconomic and interstate water market matters) to members of the Ministerial Council, Basin Officials Committee, Trade Working Group and Trade Operators Panel.</li> </ul>		
	YES	New water Cap arrangements for the NSW Border Rivers.		

# **Overview**

The Murray–Darling Basin Authority (MDBA), in partnership with other government and community organisations, provides information about the condition of the Murray–Darling Basin's water resources and water-dependent ecosystems.

Our role as an expertise-based agency is to provide the Murray–Darling Basin Ministerial Council, the Basin Officials Committee and the community with timely information to inform decision-making on the Basin's water resources and related ecosystems.

The MDBA publishes information about the Murray–Darling Basin in a form that is easily accessible by communities, governments and industry. We undertake research and investigations through strategic alliances with Australian Government and Basin state government agencies and industry bodies, enabling us to fill critical knowledge gaps and inform better decision-making in planning, policy and delivery of the best possible outcomes for the Basin and its communities.

To help us deliver the long-term objectives of the *Water Act 2007*<sup>1</sup>, we have strategically invested in innovative technologies to improve existing systems and methodologies, including managing and synthesising knowledge in formats that will meet education, policy and decision-making needs.

# Highlights

- Basin Plan Knowledge and Information Directory finalised collaborative head agreements with other federal agencies to improve access to externally held Basin Plan data.
- Established the Strategic Policy and Integration Advisory Group, as recommended by the Strategic Programs Review.
- Substantial Indigenous engagement on the Basin Plan, including publication of *A yarn on the river*, aimed at getting Indigenous Australians to participate in developing the proposed Basin Plan.
- Conducted the audit of the annual Cap on water diversions.
- Published the *Water audit monitoring report 2010–11*.
- Furthered community understanding of The Living Murray program by publishing a range of communications products.

# **INFORMING JOINT DECISION-MAKING**

The MDBA is responsible for providing the Murray–Darling Basin Ministerial Council and the Basin Officials Committee with advice and information that informs joint government decision-making about the Basin's water resources and related ecosystems.

During the past year the MDBA facilitated the work of these bodies by providing timely and accurate information about a range of matters, including:

- new water Cap arrangements for the NSW Border Rivers
- Basin Salinity Management Strategy (the annual implementation report)
- the revised asset management plan

<sup>1</sup> Unless otherwise indicated, all Acts referred to in this annual report are Commonwealth Acts.

- technical reports detailing the work completed during the Acid Sulfate Soils Risk Assessment project
- commencement of the Schedule to Account for South Australia's Storage Right and the Schedule for Water Sharing
- the Environmental Watering Plan, salinity targets and alignment of state plans with the Basin Plan, including that sustainable diversion limits are proposed to take effect from 2019.

We also provided a series of reports (e.g. on socioeconomic and interstate water market matters) to members of the Ministerial Council, the Basin Officials Committee, the Trade Working Group and Trade Operators Panel.

Appendix A of this report provides more details about these governance bodies and their outcomes for 2011–12. **see page 228** ►

# **Strategic Programs Review**

The Strategic Programs Review, conducted during 2010–11, made a number of recommendations. During 2011–12, the MDBA established the Strategic Policy and Integration Advisory Group to strengthen relationships and integration between the Basin states and the MDBA.

We developed a strategic framework, endorsed by the Basin Officials Committee, to advise the committee on policy issues; set an agreed high-level direction for joint federal–state programs; and articulated how strategic directions would be implemented through strategic and corporate planning cycles.

We also developed key performance indicators for inclusion in the MDBA corporate plan for 2012–13; further refined qualification and prioritisation criteria for assessing all potential future joint investment in joint program activity; developed new operating arrangements for the emergency measures subprogram, for managing underspends in joint subprograms; and developed a new organisational performance reporting framework for consideration by the Basin Officials Committee.

# MEETING BASIN INFORMATION NEEDS

To improve access to externally held data, collaborative head agreements have been finalised with Geoscience Australia and the Department of Sustainability, Environment, Water, Population and Communities. These agreements have encouraged collaboration on spatial data access and development of the national water market system.

Agreements with the Australian Bureau of Statistics and the Bureau of Meteorology are progressing well; these will provide effective avenues to report on the health of the Basin using data accessed through these agencies.

# **Basin Plan Knowledge and Information Directory**

Key data, information and documents used for the proposed Basin Plan have been made publicly available using the Basin Plan Knowledge and Information Directory portal. BPKID ensures there will be an enduring resource of information used for the Basin Plan.









Left page and clockwise: Fishing at the Murray Mouth. Fish ladder at Torrumbary Weir. A couple fishing from a boat on the River Murray. Fishing on the River Murray. Fish ladders, such as the image at top right, enable the passage of native fish along the River Murray by allowing them to negotiate their way past obstructions such as weirs and dams. There are over 2,000 information items available in BPKID relating to the development of the proposed Basin Plan, including on hydrology, ecology and social and economic information.

The MDBA is committed to openly sharing its knowledge and information in line with the application of open public sector information principles and licensing arrangements consistent with the Australian Governments Open Access and Licensing Framework. We are building on the base provided by BPKID to find better ways to make information about the Basin available.

# **Cap on water diversions**

The Cap on water diversions refers to a cap on diversions of surface water from the Murray– Darling Basin. Established in 1995 to limit future increases in such diversions, its creation was seen as an essential first step in establishing management systems to achieve healthy rivers and sustainable water use.

Once the Basin Plan comes into operation, the Cap will transition to sustainable diversion limits (SDLs). In partnership with Basin states, the MDBA has begun work on how this transition will be implemented between now and 2019.

The annual Cap target varies from year to year, depending on inflow and rainfall; the annual Cap target for each valley is calculated by an MDBA-approved Cap model. The MDBA manages the Cap's implementation in each Basin river valley as set by Schedule E to the Murray–Darling Basin Agreement.

### Cap audit 2010-11

Since 2007–08, MDBA has reported on environmental water in its annual water audit monitoring report; between then and now, cumulative Cap diversions Basin-wide have been about 7% below the cumulative Cap targets.

The key findings of the Independent Audit Group Cap audit for 2010–11 were:

- Diversions of 6,311 GL from the rivers in the Murray–Darling Basin were the fifth lowest since 1983–84.
- Diversions in all Cap valleys in New South Wales, Victoria, South Australia and Queensland where a Cap has been defined were within acceptable bounds for Cap management.

The Independent Audit Group's report was published in December 2011. Its companion publication, which updates the group's figures, is the *Water audit monitoring report 2010–11*, which found that in the Basin for the year under review:

- total environmental water available from entitlements was 1,846 GL
- total use of environmental allocations was 1,119 GL
- Cap adjustment for environmental use was 1,238 GL.

This report was published and distributed in May 2012.

### **Accreditation of Cap models**

Of the 23 Cap models, 16 have been audited and approved, and four are being audited. Of the remaining three models, the NSW Border Rivers Cap model is ready for submission and the Metro Adelaide Cap model is in an advanced stage of preparation. The Australian Capital Territory Cap model was delayed because of outstanding interpretive differences over the territory's Cap. Ongoing discussions are being held with the territory to resolve these differences and enable its Cap model to be submitted.

# **Delivering River Murray information**

The MDBA manages the River Murray System in cooperation with state authorities to ensure reliable water supplies for all users and the environment.

The MDBA supports the operation and maintenance of a number of hydrometric stations across the basin, predominantly in the Murray, lower Murray and lower Darling, to collect both water quality and quantity data.

Data and information is collated to underpin key operational responsibilities, including:

- sharing the waters of the River Murray System between New South Wales, Victoria and South Australia in accordance with the Murray–Darling Basin Agreement
- storing, managing and delivering water to meet consumptive and environmental needs
- operating salinity mitigation schemes
- enabling navigation and supporting recreation and tourism.

Information is used to direct releases from a number of structures along the River Murray each day, working closely with state agencies and constructing authorities (whose staff physically control the structures) to deliver consistent operations and reliable water supplies for all users in a fair and efficient way.

Our operational decisions take in a range of technical considerations such as flow requirements, salinity and water level changes, estimated evaporation, forecast rainfall and the water-carrying capacity of the River Murray at various locations.

We regulate the River Murray's flow to ensure that the supply of water is reliable, even during severe drought. During floods, our primary operations objective is protecting the safety of dams and other assets while maximising water availability when flooding recedes. Our other aims include limiting flood damage for downstream communities and increasing environmental benefits.

The MDBA shares information with our stakeholders in a number of ways:

- regular meetings with Basin state government authorities
- close liaison with the Bureau of Meteorology, particularly before and during floods
- online publication of various information resources, including River Murray System daily, weekly and periodical data (<www.mdba.gov.au/water>).

### **Daily updates**

Live river data, including current storage levels and flow data.

### Weekly updates

- Flow and salinity reports, issued every Tuesday, provide current and forecast flow and salinity levels in the River Murray System.
- Water storage reports, updated weekly, provide information about water in storage throughout the Murray–Darling Basin.
- River operations weekly reports, issued every Friday, summarise current weather, inflows and operations in the River Murray System.

## Periodically

- Media releases concerning topical issues are released as required.
- Water quality bulletins are issued when a water quality issue is current; they summarise River Murray System events and conditions.
- State shares in storage reports are issued monthly and provide water accounting for the River Murray System, including the volumes each state holds in storage.
- River Murray System Annual Operating Plan provides context for and describes how the river system may be operated under a number of assumed scenarios for the coming water year (1 June to 31 May). It is prepared and issued at the start of each water year and updated as required.

More information about River Murray System data reporting is in Chapter 4, 'River Murray operations assets'. **see page 120** ►

# **Modelling the Basin**

During 2011–12, we developed tools to improve access to computer modelling results. Our annual time-series data shows flows at over 300 Basin locations (including the 122 hydrologic indicator sites) for different Basin Plan scenarios and is available on the Basin Plan Knowledge and Information Directory.

As part of our broader Basin Plan engagement strategy, we hosted numerous technical meetings with Basin state officials to discuss and refine the method to determine an environmentally sustainable level of take. We also met with key stakeholder groups — such as community leaders, irrigator peak bodies, environmental non-government organisations, water user groups and members of the scientific community — on numerous occasions to discuss the method used to determine the environmentally sustainable level of take, to obtain feedback to refine it.

Continuous improvement was also made to the Murray suite of models and effort continued to develop the next generation of models through the eWater partnership.

More information about Basin modelling is in Chapter 1, 'Transboundary water management arrangements', and Chapter 4, 'River Murray operations assets'. **see pages 29 and 118** 

# **Geospatial services**

The MDBA provides spatial analysis and remote sensing capability to support a range of its programs.

In 2011–12, more than 164 mapping requests and 300 cartographic products were delivered for MDBA projects, including to support analysis and communication for the proposed Basin Plan. In addition, more than 55 mapping requests from external customers were met.

### **Remote sensing capability building**

The first phase of a pilot project on the application of remote sensing to estimate water quality parameters and to detect, understand and track water quality events such as algal blooms and blackwater events was completed. The project is a collaborative undertaking with Australian Government stakeholders, including CSIRO and Geoscience Australia, state partners and other interested organisations (e.g. the University of New South Wales).

### **Enterprise spatial information management**

During 2011–12, over 500 spatial data products were maintained and stored and upgrading of the MDBA enterprise spatial information systems and spatial tools to ESRI and VIO were completed.

The MDBA also worked with the Office of the Commonwealth Environmental Water Holder to develop a prototype shared database to store and retrieve information on Murray–Darling Basin environmental assets.

The key environmental assets project used a compilation of existing national and jurisdictional information to identify water-dependent ecosystems. Discussions are taking place with Basin states about future use of this database to maximise the value of this investment.

### **Cooperative Research Centre for Spatial Information**

In 2011–12, the MDBA became a partner in the Cooperative Research Centre for Spatial Information. This will expand opportunities for the MDBA to draw on best practice and to collaborate on common problems.

Throughout the year, we continued to acquire imagery data for environmental monitoring and evaluation purposes. The Geospatial Services Unit uses our membership of the Optical, Geospatial, Radar, Elevation Data and Services Panel to better align efforts by Australian Government agencies to procure remotely sensed imagery.

# **Enterprise Information Strategy**

The Enterprise Information Strategy 2009–12 is a major initiative that directly supports establishing the MDBA as the authoritative information service for the Murray–Darling Basin. The strategy improves the MDBA's information processing capabilities, allowing us to successfully deliver information functions required under the Water Act.

At the heart of the strategy is a powerful modelling environment — the computational resource environment — that simulates the impacts of various environmental scenarios on the Basin. The models produced by Computational Resource Environment (CoRE) were invaluable during the Basin Plan's development. **see further information on page 174** 

The strategy helped MDBA staff to improve their productivity through its fast search capability, standardised work platform and improved project management tools. Further improvements in 2012–13 will build on the work already done, as the Enterprise Information Strategy will conclude in December 2012.









### Top right and clockwise:

Aunty Joyce (Joycee) Hampton, a Nyampa Elder, reading *A yarn on the river*. Raised at Murrin Bridge Mission, she now lives at Wagga Wagga with her children and grandchildren. Aunty Joycee wants to see the Murrumbidgee River with lots of good quality water for fish habitat and for other recreation and cultural purposes. Three people gathering fish from the Brewarrina fish traps, and, across page, another shot of the Brewarrina fish traps just before sunset.

# **Communications**

### Media

Regional and metropolitan media are a vital source for information about the MDBA's work. By continuing to invest in working with the media, we are ensuring that our stakeholders are given the best possible access to all information about key Basin issues.

We further integrated the use of social media into our communications approach to ensure that we reached people who use it either exclusively or in combination with more conventional types of media.

During the year, the media outlets most interested in the preparation of the proposed Basin Plan were generally regional rural newspapers (e.g. *Sunraysia Daily, Area News*); regional Australian Broadcasting Corporation programs such as the state-based *Country Hour*; and the *Weekly Times* and *The Land*. Metropolitan newspapers such as *The Adelaide Advertiser*, *The Sydney Morning Herald* and *The Age* also ran regular stories, as did the national paper, *The Australian*.

### **Publications**

In 2011–12 MDBA published 81 branded publications, including 37 directly related to the development of the proposed Basin Plan. Most of these publications were technical documents — such as *The proposed "environmentally sustainable level of take" for surface water of the Murray–Darling Basin: method and outcomes* — that provide additional information about key elements of the proposed Basin Plan and support our aim of making the science behind the Basin Plan and our activities completely transparent and open to Basin stakeholders and other interested parties.

Accessible publications on the proposed Basin Plan were an important part of the MDBA's Basin Plan engagement and communications strategy. The Basin Plan publications were designed to increase public understanding of the Basin Plan's complex components and encourage people to participate in the 20-week consultation period that followed the release of the *Proposed Basin Plan — a draft for consultation*. For example, *A yarn on the river* was aimed at getting as many Indigenous Australians as possible to participate in developing the proposed Basin Plan.

The quality of MDBA's annual report for 2010–11 was independently recognised when it received a silver award at the Australasian Reporting Awards.

### Website

The MDBA website, <www.mdba.gov.au>, is one of our key communication vehicles and during 2011–12 its structure was streamlined to make its content more accessible to users.

By integrating all Basin Plan material into one main website, we gave stakeholders easier access to all information. The refreshed design now allows us to highlight news and specific reports on our homepage through an online slideshow.

During 2011–12, the MDBA website received around 33,600 visits per month (adjusted figures), almost 35% more than in 2010–11. Collectively, these visitors viewed about 144,900 pages per month (adjusted figures), almost twice the figure of the previous year. The increased use of our website by stakeholders is attributable to an increase in interest in the MDBA's work, particularly after the proposed Basin Plan was released in November 2011 and when the revised version was published in May 2012.

The most popular sections of the MDBA's website continue to be those that provide regular updates of information or data, such as the live river data pages and the River Operations weekly report.

A complete redesign and upgrade of our website is planned for the next financial year. As part of this, market research was conducted during 2011–12 to determine user needs and preferences as well as to understand stakeholders' broader preferences to engaging with the MDBA.

Research findings, including in-depth interviews, group discussions and an online survey, were reported along with stakeholder responses about their experiences and perspectives of our website. A key finding that emerged from this research is that the MDBA is seen as a key online source of information by stakeholders and engaged community members.

### **Social media**

In the lead up to the 20-week consultation phase on the proposed Basin Plan, we launched 'Free Flow', the MDBA blog (<freeflow.mdba.gov.au>), using it for open online conversations with the public and providing updates on the Basin Plan and MDBA activities.

Free Flow uses plain English and an informal tone to be as inclusive as possible. We have created an environment that enables people to have open and informed conversations — posting is open to everyone, no registration or sign-up is necessary and comments are posted immediately using a post-moderation approach.

We increased our use of Twitter during the past year, using it to answer stakeholders' questions and to address and correct inaccurate statements tweeted by others. We ramped up our use of the micro-blogging platform during the consultation period, using Twitter to provide live updates of public meetings — tweeting what people were saying as well as providing more general information such as dates and venues.

During the year our Twitter followers more than doubled, from 591 to almost 1,300; the blog was viewed 10,569 times during the consultation phase alone, and we posted 123 comments following the Basin Plan's launch in November 2011.

### **Education**

Initiatives aimed at educating the Australian community about the Basin's water resources and water-dependent ecosystems are delivered by a number of programs across the MDBA.

Our publications continued to be popular resources, supporting education and awareness programs in schools and at field days, community meetings and conferences. Publications that have been heavily requested for educational purposes include a revised map of the Murray–Darling Basin and posters featuring native and alien fish, frogs and reptiles and the River Murray System.

During the year MDBA began collaborating with Australia's national science centre, Questacon. In the weeks before and after World Water Day 2012 (22 March), a range of Murray–Darling Basin-specific objects were on display, while hands-on activities were run in the Q-Lab interactive discovery gallery. The Questacon Schmidt digital studio facilitated a digital link-up event with a primary school in regional New South Wales.

In 2011–12 selected MDBA staff members participated in the Scientists in Schools program, a national program that creates and supports long-term relationships between teachers and scientists through agreed projects and investigations.

# **CASE STUDY - 4**

### True tales of the trout cod: river histories of the Murray–Darling Basin

The *True tales of the trout cod: river histories of the Murray–Darling Basin* report uses stories of people's experiences of the Basin's waterways and fishing to contextualise the historical distribution, abundance and decline of native fish throughout the Basin.

The report has given the MDBA a unique opportunity to engage Basin stakeholders, whether they are scientists, landholders or government employees, by compiling old reports, newspaper accounts and oral histories into compelling historical stories.

Author Will Trueman has crafted a narrative about how things used to be and how they are now. His message about how much the rivers have changed is very clear when told through the decline in native fish, the loss of some fish populations altogether and the consequences of some well meant but poorly executed decisions.

Six river history films and catchment booklets were produced to support the report and can be viewed at <australianriverrestorationcentre.com.au/mdb/troutcod>.



Above: Trout cod (*Maccullochella macquariensis*). Image created by artist Marjorie Crosby-Fairall. Below: Murray cod (*Maccullochella peelii*).

### **Renewing our approach**

The 2010–11 review of the MDBA education program critically evaluated our past educational activities. During 2011–12 we used results from this review to help us develop a three-year MDBA education strategy, which will be finalised in 2012–13.

Establishing the MDBA education working group was a key step towards achieving a wholeof-organisation approach to delivering the education program, to ensure that our efforts are consistent, coordinated and efficiently delivered.

### The future managers of the Murray–Darling Basin

We are committed to ensuring that Australia has the science skills that will be needed in the future. We will participate in the 'Speed date a scientist' for the National Youth Science Forum in July 2012, to promote careers in water resource management. We will support the Primary Industry Centre for Science Education by providing work experience placements and the Kids teaching Kids week (to be held in August 2012).

### **Talking about native fish**

The MDBA continued engaging Basin communities in the continued survival of and increase in native fish species and numbers throughout 2011–12.

Native Fish Awareness Week was held in November 2011 with the theme of 'Habitat makes fish happen' — we held a number of events across the Basin including fishing competitions, fish-tagging, school education programs, tree planting and community meetings. For the first time, we used social media, including Facebook and Youtube, to promote events.

We interviewed members of the Basin's diverse communities — including Indigenous Australians and recreational and commercial fishers — as part of *Talking fish*, a collaborative project to collect information from people who hold a wealth of knowledge about local, historical and cultural changes to the Basin's native fish communities.

We launched the *Talking fish* series as part of our Native Fish Awareness Week activities, using collective Basin community knowledge to compile 12 booklets of stories, anecdotes and images about what the fishing used to be like across the Basin and to better understand how the status of native fish has changed over the years. Well received by interviewees and the general public, each booklet focuses on a different river reach within the Basin, generally ones linked to our Native Fish Strategy demonstration reaches (e.g. the Namoi River, upper Condamine River and Katarapko Creek).

We published the *True tales of the trout cod: river histories of the Murray–Darling Basin* series (see case study 4), and held the *Native fish forum — people, fish and flows* in Canberra in October 2011. This forum enabled researchers to discuss topics such as fish-friendly infrastructure, connecting with recreational fishers, alien fish management and new scientific findings on aquatic rehabilitation. The forum continued our commitment to informing members of the general public, scientists and river managers about latest findings in native fish research and the on-ground outcomes of programs designed to increase native fish numbers throughout the Basin's water resources.















Images bottom left and clockwise: Ascott cotton farm irrigation channel and machinery; Martin Mead, farm manager, showing the irrigation mechanism's pump and solar panel; temporary storage dam for irrigation water; Mr Mead showing the lateral mover irrigator control mechanism; water pump system at base of storage dam for pumping water into the irrigation channel.

# STRATEGIC ALLIANCES TO MEET SHARED NEEDS

# Science strategy development

During 2011–12, the MDBA began developing a science and knowledge strategy to identify a collaborative approach for addressing the scientific challenges of managing the Basin's water resource management. While the proposed Basin Plan draws on the best available scientific knowledge, the science and knowledge strategy will identify where improvements in the science can inform the implementation, adaptive management and future review of the plan.

In December 2011, the MDBA convened a workshop with researchers across economic, social and environmental disciplines to identify the science that would support an adaptive Basin Plan underpinned by the science and knowledge strategy. The workshop presented some of the knowledge needs emerging from the development of the proposed Basin Plan and sought feedback on approaches to collaborating with research providers such as universities and research institutions.

# **Murray–Darling Freshwater Research Centre**

The MDBA has supported the Murray–Darling Freshwater Research Centre (MDFRC) in undertaking freshwater monitoring and research, principally in the southern Murray–Darling Basin, since 1986.

During 2011–12, the MDFRC supported the monitoring of The Living Murray initiative and the biological monitoring of macroinvertebrate communities in the Murray and Mitta Mitta rivers.

The MDFRC also completed reviews of the complete record of biological monitoring in the River Murray (29 years of records) and the Mitta Mitta River (11 years of records), and completed an analysis of trends in phytoplankton populations along the Murray for the period 1980 to 2008. The MDFRC also contributed to monitoring the 2012 blackwater event in the southern Murray– Darling Basin, providing an overview report that noted that the most severe and prolonged hypoxic blackwater generation occurred in the Murrumbidgee River and Billabong Creek catchments. While this affected downstream reaches of the Edward and Murray rivers, the impacts were neither as severe nor as prolonged as in 2010–11.

The MDBA also funded the MDFRC to investigate the response of river and wetland floodplains to drought in the mid-Murray floodplain, and to scope approaches to investigate ecological resilience to complement the implementation of the Basin Plan's Environmental Watering Plan.

During 2011–12, the MDBA worked with the MDFRC and its partners to scope a new agreement and draft strategic plan to guide the research partnership into the future.

For more information on monitoring activities, see Chapter 2, 'River and ecosystem health. see page 59 ►

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### eWater Cooperative Research Centre

Throughout 2011–12, the MDBA maintained its strong support for the eWater Cooperative Research Centre. Through the eWater CRC, Australian Government and state government agencies and the private sector have collaborated to deliver the next-generation river modelling platform to support river operations and river planning. Testing of the river modelling platform has been successful and the MDBA is now moving into an adoption phase.

Modelling tools such as SOURCE are discussed further in Chapter 4, 'River Murray operations assets'. **see page 118** 

# MDB futures collaborative research network

In June 2012, the MDBA entered into a memorandum of understanding with the University of Canberra to support implementation of the MDB*futures* collaborative research network.

MDB *futures* is built on collaboration between cross-disciplinary research leaders across four Australian universities and partnership with key government agencies. It will grow research quality and capacity through multidisciplinary research collaboration between the University of Canberra and its partners. This research program spans environmental science, social and economic modelling, public policy, public health, and urban and regional planning.

# **Sponsorship**

Sponsorship provides the MDBA with opportunities to support worthwhile initiatives, increase public awareness of our work and research, and align ourselves with critical partners. Over the past year we supported a variety of conferences, workshops and events across many sectors, including environment, education, science and research, community, industry, government and the arts.

We also hosted numerous international delegations, community groups and leadership programs.

# **South Eastern Australian Climate Initiative**

The MDBA collaborated with CSIRO, the Bureau of Meteorology, the Department of Climate Change and Energy Efficiency and the Victorian Department of Sustainability and Environment to establish the South Eastern Australian Climate Initiative (SEACI). This initiative has produced 15 climate projections that extend out to 2030, using projected scenarios of local rainfall and potential evaporation to estimate changes in stream flow across the Murray-Darling Basin. These scenarios range from a 10% increase in stream flows to the extreme dry of a 30% reduction.

The adaptive management approach of the proposed Basin Plan will allow us to adjust to whichever of these scenarios eventuates over the coming years as all aspects of the plan will be reviewed periodically (as frequently as every five years for some components of the plan).

The work of SEACI and research produced by other agencies, organisations and initiatives are contributing significantly to climate change analysis as it relates to the adaptive management of the Basin and its resources under the proposed plan.

# Performance chart key performance indicators



Key performance indicators	PBS target	Results
Ministerial Council, Basin Officials Committee, Basin Communities Committee and the Authority report satisfaction with the timely delivery and quality of papers, reports and accounts.	YES	Numerous papers, reports and accounts presented for joint government decision-making purposes.
Recommendations arising from the Strategic Programs Review are implemented according to agreed schedule.	YES	Ongoing.
Formal agreements in place with state and Commonwealth partners to support enhanced data and information management infrastructure and delivery capabilities.	YES	Collaborative head agreements finalised with Geoscience Australia and the Department of Sustainability, Environment, Water, Population and Communities. These agreements encouraged development of collaboration on spatial data and of the national water market system. Agreements with the Australian Bureau of Statistics and the Bureau of Meteorology are progressing well.
Information architecture component of the Enterprise Information Strategy completed on schedule.	YES	Ongoing.
The Living Murray and salinity implementation reports published by end of March 2012.	YES	The Living Murray annual implementation and Audit of The Living Murray implementation 2010–11 published. Information about the salinity registers is in Chapter 2 of this report (page 64).
Basin water use audit report delivered on time and approved by the Authority.	YES	<i>Water audit monitoring report 2010–11</i> published on time.
Timely publication of River Murray Annual Operating Plan and Weekly Operations report.	YES	Achieved and ongoing.
Timely delivery of River Murray System data.	YES	Achieved and ongoing.
Support arrangements agreed with eWater Cooperative Research Centre.	YES	Continued strengthening relationships

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#### **OBJECTIVE 4.0**

# RIVER MURRAY OPERATIONS ASSETS

To equitably, efficiently and effectively manage, operate and sustain River Murray assets to deliver states' agreed water allocations and environmental outcomes in the River Murray System.

MAINTAINING AND IMPROVING ASSETS

IMPROVING THE PHYSICAL ASSETS BASE

DELIVERING WATER

SALT INTERCEPTION SCHEMES

#### **Objective 4.0**

# **RIVER MURRAY OPERATIONS ASSETS**

A chart showing key performance indicators for these deliverables is included at the end of this chapter. **see further information on page 141** 

# **Portfolio Budget Statement — deliverables**

Deliverables	PBS target	Results		
Each year according to schedule, planned and routine asset maintenance and improvement works will be undertaken.	YES	<ul> <li>Carried out annual assessments of all River Murray operations assets (all major locks, weirs and dams).</li> <li>Mitta Mitta channel improvements continued, targeting bank stabilisation, revegetation, willow control and stock exclusion.</li> </ul>		
Physical asset base is improved to achieve contemporary best practice standards.	YES	<ul> <li>Progressed detailed design to increase the spillway capacity of Dartmouth Dam to meet extreme floods.</li> <li>Continued barrage deck replacement program; replaced the Goolwa Lock control room; and improved access across Mundoo, Ewe and Tauwitchere islands.</li> <li>Completed construction of Hume Dam spillway southern junction improvement works, the Gunbower lower landscape works and the Edward River offtake fishway.</li> <li>Continued construction of Koondrook-Perricoota and Chowilla Floodplain inundation projects.</li> <li>Commenced construction of the Hattah Lakes works.</li> <li>Progressed possible construction of up to eight additional fishways at the Murray Mouth barrages.</li> <li>Completed designs for the Gunbower Forest – Hipwell Road works and for the repair of the Mulcra Island works.</li> </ul>		
Each year, state water shares delivered and accounted for transparently in accordance with objectives and outcomes set by the Basin Officials Committee.	YES	<ul> <li>Assessed the water resources of the River Murray System to determine the volume of water available to each Basin state.</li> <li>Directed daily operations of the River Murray System.</li> <li>Continued supporting the development of the SOURCE integrated modelling system to support future water resource planning.</li> <li>Maintained state water accounts in the River Murray System.</li> </ul>		
Salinity interception schemes established, operated and maintained to meet agreed operating rules.	YES	<ul> <li>Diverted approximately 362,508 tonnes of salt from the River Murray using joint and/or shared salt interception schemes.</li> <li>Completed construction of the Upper Darling salt interception scheme near Bourke, New South Wales.</li> <li>Progressed construction of the Murtho salt interception scheme in South Australia.</li> <li>Began rehabilitation of the Mildura-Merbein salt interception scheme.</li> <li>Commissioned stage 1 of the Pike River scheme.</li> </ul>		

# **Overview**

Following one of the strongest La Niña years on record in Australia in 2010–11, weaker La Niña conditions redeveloped in spring and summer of 2011–12. In late November 2011, heavy rainfall occurred across large areas of the northern Murray–Darling Basin, with the heaviest rainfall in the Gwydir River catchment and surrounding areas. This was followed by persistent rain in late January and early February, which triggered major flooding in several Barwon–Darling tributaries and the Darling River. For example, the peak flow of 237,000 ML/d at Bourke in March 2012 was the highest since the 500,000 ML/d recorded in March 1976.

In the southern Basin, 2011–12 was characterised by rainfall and inflow patterns that differed considerably from the long-term average. Most notable was a record rainfall event that occurred in late February and early March 2012 when, in a more typical year, the riverine system is drying out.

This exceptionally heavy rainfall event led to significant flooding in parts of southern New South Wales and northern Victoria, including the highest floods since 1974 at several locations along the Murrumbidgee River and Broken Creek on the River Murray. A large portion of inflows from this rainfall event was captured in Hume and Dartmouth reservoirs, which meant only minor flooding occurred at a few locations along the mid-sections of the River Murray.

The wet conditions over late summer increased inflows and subdued water demand, resulting in water storages in the River Murray System being at record high levels. At the end of June 2012 the total volume held in Dartmouth, Hume, Menindee Lakes and Lake Victoria was the highest since the commissioning of Dartmouth Reservoir in 1979.

Flow through the Murray Mouth has continued since September 2010, with an estimated volume in excess of 7,000 GL flowing to the Southern Ocean this water year.

The Murray–Darling Basin Authority (MDBA) continued to support the eWater Cooperative Research Centre in developing SOURCE software. A prototype model of the upper River Murray was refined and tested in 2011–12 and will be run in parallel with current operational spreadsheets during 2012–13.

# **Highlights**

- Forecasted the timing and magnitude of flow peaks and recessions along the River Murray System to assist with management of construction works.
- Decline of non-native aquatic weed *Egeria densa* in Lake Mulwala, to around 1% of the lake's volume in early 2012, following a four-year control program.
- Implemented blackwater dilution actions along sections of the River Murray and its tributaries (federal-state agency collaborations).
- Over 7,000 GL passed through the barrages to the Coorong and the Southern Ocean.
- South Australia received its full yearly entitlement of 1,850 GL for the first time since 2002–03.
- Salinity levels in Lake Albert declined from an average of 5,700 EC in July 2011 to less than 3,900 EC in June 2012.
- Completed construction of the Edward River offtake fishway, which had been delayed because of flood damage.
- Completed Gunbower lower landscape works, which will allow up to 2,000 ha
  of priority wetlands within the forest to be watered from Gunbower Creek and
  will extend the duration of natural flood events for environmental benefits.



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Clockwise from top right: Checking water quality in Bala Creek, near Euston in New South Wales. The creek connects the River Murray to Dry Lake and Lake Benanee. The stretch of the River Murray known as the Barmah Choke, a relatively narrow section of the river within the Barmah–Millewa Forest. Installing a cofferdam in preparation for the construction of the concrete buttress at the southern training wall at Hume Dam.

- Diverted approximately 362,508 tonnes of salt from the River Murray through the use of salt interception schemes.
- Completed construction of the Upper Darling salt interception scheme in New South Wales and commissioned stage 1 of the South Australian-funded Pike River scheme.
- Completed the Barmah Choke Study, which describes, models and compares operation, policy and structural river management options designed to alleviate operational challenges associated with the choke's channel capacity.

# MAINTAINING AND IMPROVING ASSETS

River Murray Operations assets, as shown at Schedule A and Appendix 2 of Schedule B of the Murray–Darling Basin Agreement, are jointly controlled by the Australian Government and the governments of New South Wales, Victoria and South Australia. The governments' control is exercised through the Murray–Darling Basin Ministerial Council. An asset agreement is in place between the four partner governments and the MDBA regarding management of River Murray Operations assets.

The MDBA mostly carries out its roles and responsibilities under the asset agreement and the Murray–Darling Basin Agreement through the New South Wales, Victorian and South Australian state constructing authorities, including:

- State Water Corporation (State Water NSW) (the NSW Office of Water also undertakes significant works relating to salt interception schemes, river improvement, hydrometric and water quality monitoring, and the environment)
- Goulburn–Murray Water (Victoria)
- South Australian Minister for the River Murray, including the operating agents South Australian Water Corporation (SA Water) and the South Australian Department for Water.

The MDBA's River Management Division oversees works associated with management of the assets. The Executive Director River Management has particular delegations under the Murray–Darling Basin Agreement and the asset agreement. A strong relationship has developed between the MDBA and state constructing authorities, ensuring that maintenance is proactive, decision-making is generally by consensus and issues are raised sufficiently early to enable quick resolution.

#### **Construction commencements and completions**

Construction of the Hume Dam spillway southern junction dam improvement works was completed during the year.

The contract for construction of the Hume Dam spillway southern training wall buttress stabilisation works was awarded. Site works have commenced, with the establishment of a concrete batch plant and construction of a major cofferdam to allow dewatering of the worksite.

It is disappointing that during the year almost no work was possible on the navigable pass upgrade and fishway construction at locks 2 and 4 and fishway construction at Lock 11. Contractors were asked to remobilise in January 2012 after about 15 months' suspension because of flooding in spring 2010. However, within one month of this notification being given, works had to be suspended again because of another unusually high summer rainfall event. At Lock 15, the weir upgrade and fishway construction suffered similar disruption, although a significant amount of work was done before the latest stand-down in March 2012. It is expected work will recommence at all these sites early in 2013.

Construction and refurbishment of salt interception schemes made good progress during the year with:

- practical completion of the Upper Darling salt interception scheme in New South Wales
- continued progress on construction of the Murtho scheme in South Australia
- commissioning of the Pike River Scheme (stage 1 funded by South Australia) during the year
- commencement of the rehabilitation of the Mildura–Merbein salt interception scheme.

The barrages deck replacement program progressed well during 2011–12, with the completion of the Ewe Island barrages and a start made on Tauwitchere. Completion of the whole Tauwitchere barrage deck replacement is planned to take about 10 more years, to benefit from the residual life of existing deck units due for replacement.

# **Operations Review**

The MDBA uses a long history of experience and learning to improve and develop current best practice for River Murray System operations.

The Operations Review program was established to identify and support 'smarter operations' for the River Murray System. We assess both past and present River Murray System operations against current and future requirements under the Basin Plan and the Murray–Darling Basin Agreement, work closely with river operators, The Living Murray initiative and Basin state partners to identify efficient and effective means to meet the multiple, and often competing, demands for River Murray water.

Many projects were completed or well underway during 2011-12:

- Developed a framework outlining a process for collating and documenting existing practices, new findings and key decisions about managing and operating the River Murray System. The framework addresses the Basin Officials Committee objective of codifying all matters under the Murray-Darling Basin Agreement that relate to determining and distributing the Basin states' water shares, and clarifies the roles and responsibilities of all parties to the agreement.
- Assisted in the Review of the Agreement Taskforce established under the Basin Officials Committee in defining and assessing parts of the agreement that require review.
- Assisted in preparing Chapter 10 of the Proposed Basin Plan a draft for consultation, which formalises a process for managing drought in the River Murray System by setting aside water specifically to meet critical human water needs and reserve volumes to deliver this water in times of severe water shortages.
- Completed the final stage of the Barmah Choke Study, which describes, models and compares operational, policy and structural river management options to alleviate operational challenges associated with the Barmah Choke channel capacity (see case study 5).

# **CASE STUDY - 5**

#### Barmah Choke Study

The Barmah Choke is a significant natural flow constriction in the River Murray System. It is a narrow stretch of the River Murray within the Barmah–Millewa Forest that restricts the amount of water that can be transferred downstream. During major floods, large volumes of water back up behind the choke, flooding the forest. This natural flooding of the river red gum forest is vital for the health of the forest and the floodplain.

However, the choke's limited capacity to allow transfer of large amounts of water creates several river management operational and policy challenges for the movement of water for urban irrigation and supply — chiefly, the incidence and magnitude of undesirable (generally unseasonal) flooding of the forest and possible shortfalls in supply and rationing of diversions.

The Barmah Choke Study, conducted by the MDBA in partnership with Basin state governments, explored a range of structural, policy and operational options to reduce challenges posed by the choke's physical constraints. After four phases of investigation, modelling and assessment over several years, the study was completed during 2011–12. A final report has been prepared by consultants SKM.

One of the study's key findings is that no single option represents a complete solution to these issues; rather a package of options will be required. The study also noted that these issues will persist under possible future scenarios of drier climate and an increased volume of water being managed for environmental purposes.

The study's results and outcomes indicate that:

- Incidence and magnitude of shortfalls in supply mostly could be eliminated through low-cost measures that could be readily developed and implemented, including use of inter-valley trade accounts and coordinated manipulation of mid-river weirs.
- The incidence and magnitude of undesirable unseasonal watering of the Barmah–Millewa Forest could be materially reduced with an investment of about \$10 million at the Edward River Escape from the Mulwala Canal. A reduction could also be achieved by lowering Lake Mulwala by 0.1 m over the unseasonal flooding period, but needs to be investigated further and is considered to be high risk because of likely social and economic impacts on the local community during summer.

Further information on the Barmah Choke Study, including the final report and next steps, is available on the MDBA website, <<a href="https://www.mdba.gov.au">www.mdba.gov.au</a>.



The still waters of the River Murray on a cloudy day south of Picnic Point in an area known as the Barmah Choke, Victoria.

 Formalised a process of continual learning associated with operating the River Murray System. This process captures and tests specific environmental actions proposed for achieving 'best practice' operation of the River Murray System (see case study 6).

These operating strategies are being further investigated to identify and understand any legal or policy barriers that must be resolved before they are implemented.

Figure 8 (page 107) shows what could be achieved using both of the upper Murray and Darling strategies. This example shows a coordinated release from Hume (Doctor's Point) and Menindee Lakes (Burtundy) to coincide with a peak flow from the Murrumbidgee that informs the timing of the Hume release. The resulting increase to the flow at the South Australian Border (Flow to SA) is 13,000 ML/d and would inundate a further 8,000 ha of floodplain between Lock 6 and the Lower Lakes.

While a flow of 80,000 ML/d at Wentworth would have occurred 52 times in 114 years of modelled records under natural (no-development) conditions, it occurs only 17 times in 114 years under the current level of development. The challenge for future river operators is to find ways to use environmental water to increase the frequency of such flows and, by doing so, reinstate a healthier watering regime for the floodplain.

# **Environmental Works and Measures Program**

The Environmental Works and Measures Program aims to improve the health of the River Murray System through infrastructure<sup>1</sup> that delivers and manages water for the six environmental icon sites of The Living Murray — Barmah–Millewa Forest; Gunbower–Koondrook–Perricoota Forest; Hattah Lakes; Chowilla Floodplain and Lindsay–Wallpolla Islands; Lower Lakes, the Coorong and Murray Mouth; and the River Murray Channel.

Further information on The Living Murray is in Chapter 2, 'River and ecosystem health'. see page 50 ►

Most of these icon sites are listed as significant wetlands under the Convention on Wetlands of International Importance (the Ramsar Convention), and they have high cultural value to Aboriginal people and other communities. Case study 7 (page 110) discusses the Koondrook–Perricoota Forest Flood Enhancement Project, which involved protecting the integrity of Aboriginal culture and heritage during construction stage of the project.

Overall, major works are proposed at four locations to assist in delivery of environmental water to environmentally significant areas within the icon sites.

#### **Construction progress**

The summer of 2011–12 was characterised by a series of floods that consolidated the ecological benefits of the 2010–11 flooding. The downside of this flooding was the continued major delays to the Environmental Works and Measures Program. Management of flood-related impacts has been a major focus of the program for 2011–12.

The flooding caused a number of contractual issues and increased costs for the program because of payments for standby and demobilisation. The state constructing authorities have been diligent in managing these costs and negotiating appropriate outcomes with the contractors.

<sup>1</sup> Infrastructure includes water-regulating structures, levee banks, water delivery channels, pumps, fishways and complementary works and measures.

### **CASE STUDY - 6** Experienced River Operators Workshop

A workshop was held in April 2012 in Canberra that brought together experienced river operators from across the rivers of the southern-connected Basin. The workshop investigated opportunities for changes to river management arrangements to more effectively and efficiently meet the needs both of consumptive users and the environment. The workshop focused on whether it is possible to increase overbank flows in the mid-to-lower Murray (between 50,000 ML/d and 80,000 ML/d at the South Australian border) to provide more interaction between the river and floodplain, to enhance floodplain health. Workshop participants were encouraged to embrace 'blue-sky' thinking and not be constrained by the current water-sharing, management or operating arrangements.

Background analysis revealed that to produce these target flows in the lower Murray, high flows entering the Murray from at least three of the major tributaries were essential, and that the timing and coordination of the flows was especially important. Noting these findings and considering travel times, a number of strategies were developed (see Table 3).



Raised Chowilla cofferdam, 2011–12.

Strategy	Details			
Upper Murray	Release from Hume triggered by high flow in the Murrumbidgee River at Wagga Wagga.			
Darling	Regulated release from Menindee Lakes triggered by flow at Euston and indicators of high flow from other tributaries.			
Lake Victoria	Extend or increase the peak into South Australia.			
Goulburn	Release from Eildon triggered by high flow at Wagga Wagga. Extend peak via release from Eildon.			
Murrumbidgee	Regulated release from Burrinjuck triggered by high flow at Yarrawonga and/or McCoys Bridge.			
Managing diversions	Delay diversions to National Channel and Waranga Basin during 'trigger' years until flow peak passes; supplement at a later time with environmental water.			

Table 3. Operational strategies developed at the Experienced River Operators Workshop

These operating strategies are being investigated further to identify and understand any legal or policy barriers that require resolution before implementation.



Figure 8. Example of preliminary modelling undertaken to inform the Experienced River Operators Workshop







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Top left and clockwise: Construction of the Chowilla environmental regulator foundation, showing the top of concrete support piles. Steel sheet-pile cofferdam at abutment showing preparation of formwork for the regulator piers and placement of backfill around the structure. Sheet-pile cofferdam protecting the works viewed from the inside (far left) and outside (right).

### **CASE STUDY - 7**

#### Koondrook-Perricoota Forest Flood Enhancement Project

Cultural heritage management on the Koondrook–Perricoota Forest Flood Enhancement Project is setting new standards for Indigenous engagement and construction practices in culturally sensitive areas of a large construction site.

A joint Indigenous group (JIG) comprising the traditional owners of the Barapa Barapa and Yorta Yorta nations together with the Moama Local Aboriginal Land Council (initially including Deniliquin Local Aboriginal Land Council) was formed to provide advice and recommendations to the Koondrook–Perricoota Forest Flood Enhancement Project on protecting the integrity of Aboriginal culture and heritage during the project's construction and developing employment opportunities.

The JIG provided considerable valuable advice to the project, helping develop a robust and practical Indigenous partnership agreement and a cultural heritage management plan. During 2011–12, this plan enabled the appropriate management of 13 burial sites and approximately 140 cultural sites and artefacts. The principal construction contractor and government agencies agree that cultural heritage management has been an outstanding success for the Koondrook–Perricoota Forest Flood Enhancement Project.

The Aboriginal Monitoring Team helped identify and respectfully manage 13 separate burial sites, which contain 17 individuals, within the project site. Consultation with traditional owners and elders, through a process agreed by the JIG, helped develop action planning for the burial sites. These plans varied from realigning designs to removing and repatriating of skeletal remains.

The Koondrook–Perricoota Forest Flood Enhancement Project provided opportunities for local Indigenous people, strategically identified through the JIG, to develop competencies and skill sets that not only may be used in this project but can also be transferred to future employment. These skills include senior first aid competency, construction industry white cards, TAFE-accredited certificates 3 and 4 in land and conservation management, and articulated dump truck certification.

Opportunities to be employed directly by the contractor have enabled Indigenous people to develop competencies in operating various plant. These new skill sets have led to three members of the cultural management team successfully being employed outside the project, and have provided meaningful employment experiences for many others.



Gunbower Creek and Gunbower Island.

Despite the challenges caused by the flooding, the Environmental Works and Measures Program made significant progress throughout the year, including:

- Construction continued at Koondrook–Perricoota Forest. This project is the largest Environmental Works and Measures Program project currently underway and is capable of watering more than 16,000 ha of forest. The project has a major cultural heritage component to minimise any adverse impact on cultural sites located on or near the works, including the clearing and stripping of land before construction of 40 km of levee banks. Construction is expected to be completed in late 2012. See case study 7 for more information.
- Completion of the Gunbower lower landscape works, which allows up to 2,000 ha
  of priority wetlands within Gunbower Forest to be watered from Gunbower
  Creek and enables the duration of natural flooding events to be extended.
- The detailed design and approvals process for the Hipwell Road project at Gunbower Forest was near completion by the end of 2011–12, with construction scheduled from late 2012 until the spring of 2013. The long construction period is because a key regulator will have to be built during the irrigation system shutdown early in winter 2013.
- Commencement of works at Hattah Lakes. These works have an eight-month construction period and are due for completion in September 2012. If construction continues on schedule, Hattah will be the first major site to complete construction.
- The detailed design and associated approvals for the Lindsay stage 1 works are well progressed. It is expected that the works will be constructed between November 2013 and June 2014, to minimise risks to the significant native fish population in Mullaroo Creek.
- Flooding in 2011 damaged the almost-complete works at Mulcra Island. The designs for the repairs have been completed, although investigations were hampered by ongoing high flows.

#### The sea-to-Hume fishway program

The sea-to-Hume fishway program is also part of the Environmental Works and Measures Program. The fishway program is re-establishing opportunities for fish migrations to over 2,000 km of the River Murray by installing 16 new fishways and modifying one existing fishway.

It is the first program anywhere in the world that allows fish passage for the majority of native species in a migrating fish community rather than focusing on only one or two species of economic or social significance.

Monitoring shows that millions of native fish are using the new fishways, passing as many as 10,000 per day, with high diversity (13 species) and a wide range of sizes (from 31 mm to 1,040 mm in length).

NSW State Water has been constructing fishways on barriers in the Edward–Wakool system. When complete, these fishways will complement the sea-to-Hume program and provide a comprehensive network of fish passage through this highly important river system. The Environmental Works and Measures Program is funding the Edward River offtake and Stevens Weir fishways.

We are progressing the possible construction of up to eight additional fishways at the Murray Mouth barrages as part of the Murray Futures Program. These fishways will provide enhanced connectivity between the Lower Lakes and the Coorong, allowing fish to move between the fresh and estuarine areas, which is important for the breeding cycles of a number of native fish species.

#### **CASE STUDY - 8** The big wet of 2010–12 — breaking a drought with heavy summer rain

Very wet conditions in 2010–11 and 2011–12 brought an abrupt end to many years of severe drought. While floods took a considerable toll on towns and properties, the high-flowing rivers also replenished water storages and rejuvenated wetland and floodplain ecosystems, outcomes generally welcomed by Basin communities that had endured the crippling impacts of drought on agriculture and the broader environment.

#### Summer floods, but low autumn and early winter rainfall

Climatologists have linked the high rainfall of 2010–12 with two La Niña events — an ocean–atmosphere phenomenon that often results in above-average rain for eastern and northern Australia. These events resulted in widespread heavy rain, with many rainfall records set across the Basin from October 2011 to March 2012, including widespread torrential rain in late February and early March 2012.

A notable characteristic of the millennium drought was reduced rainfall in the southern Basin during autumn and early winter. Despite the recent summer flooding, this trend has persisted. This is particularly concerning for water managers and users because autumn/early winter rainfall is important for wetting catchments so that there is a good rainfall-run-off response during the late winter and spring period, which is typically the wettest part of the year in the River Murray System. Traditionally most storage filling occurs in headwater reservoirs in late winter and spring. The continued reduction in catchment wetting at this time of year is changing system behaviours and human and environmental responses.

In 2012, rainfall during the autumn and early winter period has once again been well below average in the southern Basin (see figures 9 and 10, page 122). However, the extraordinary late February and early March rain event created such a large impact on river flows that inflows to the River Murray System during April and May were some of the highest ever recorded for this time of the year. The drought has broken, but in a way that highlights the shifts and extremes in the Basin's climate and hydrology.



Flooding at Forbes, New South Wales, 2011–12.

Flooding delayed completion of the sea-to-Hume program, with four fishways still under construction — Lock 2 (Waikerie), Lock 4 (Bookpurnong), Lock 11 (Mildura) and Lock 15 (Euston).

All fishways currently under construction and designs for the additional fishways at the barrages should be completed by June 2013.

The cultural heritage component of the project has reunited the local Aboriginal groups, built new relationships with the broader local community, and reconnected the local Indigenous people to country. Of particular note have been the presentations by elders of the local nations to schools and community organisations. Through the respectful management of the natural resource, the project has enabled the transfer of local cultural heritage knowledge from one generation to another, as well as across cultural groups in the community.

More information about managing native fish is in Chapter 2, 'River and ecosystem health'. see page 89 ►

# IMPROVING THE PHYSICAL ASSETS BASE

### **Managing assets**

The River Management Division undertook significant work on assets during 2011–12, despite some delays to construction caused by flooding.

#### **Hume Dam**

Several significant upgrades were commenced or completed at Hume Dam during 2011–12, while an assessment of the dam's flood-routing capacity was initiated.

The dam's main earthfill embankment was completed. A series of overlapping holes were drilled next to the spillway southern junction and backfilled with either filter sand or free-draining material as the drill casing was withdrawn. The first stage of the construction involved installing 300 mm-diameter filter columns. After this, 1,200 mm-diameter columns were installed, requiring the use of a much larger 160-tonne rig. More than 350 holes were drilled at depths of up to 42 m, and the total length of holes installed was more than 10,000 m.

The project received national recognition within the construction industry in October 2011 when the contractor, Advanced Foundation Solutions, won in its category (\$5 million to \$20 million) at the Civil Contractors Federation (National Earth Awards).

The contract for construction of the second improvement project at Hume Dam (a concrete buttress to increase the stability of the spillway southern training wall) was awarded. Work began in January 2012 and is expected to take up to two years to complete. The contractor has established a concrete batch plant on site and constructed a major cofferdam to allow dewatering of the worksite (see photograph on page 100).

An assessment of the dam's flood-routing capacity was carried out to determine whether it should be upgraded. Options for upgrading the spillway capacity were considered, and a recommendation has been made to raise the main embankment parapet wall by about 0.3 m and carry out minor modifications to other embankments at Hume.



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Top left and clockwise: Aerial view of the Chowilla regulator showing construction of regulator piers and abutment. Koondrook–Perricoota Forest: Construction of inlet regulator and fishway; Thule Creek regulator and temporary diversion channel; River Road Bridge over the inlet channel.

Further consideration and investigation of this option is progressing, taking into account:

- Australian National Committee on Large Dams guidelines
- the current move by the New South Wales Dams Safety Committee (the New South Wales dams regulator) towards a more risk-based strategy
- a change in operating strategy for extreme rainfall events to further increase flood-routing capacity in addition to the recommended structural upgrade works.

#### **Dartmouth Dam**

The annual dam safety inspection of Dartmouth Dam in May 2012 confirmed the dam is in good condition and performing as expected, although the need to increase spillway capacity to meet extreme floods was noted.

We place a high priority on ensuring all our dam assets comply with Australian National Committee on Large Dams guidelines. In 2011–12, a detailed design was prepared for the first stage of the spillway capacity upgrade and refurbishment of the dam crest at Dartmouth Dam. The design drawings have been issued to the project review panel for final review and endorsement. Construction of the upgrade requires the removal of part of the existing dam crest and so, to satisfy dam safety requirements, construction cannot be carried out until the storage falls to below half full. Funding for the construction of the upgrade is expected to depend on partner governments first addressing higher priority dam safety risks within their jurisdictions.

#### **Locks and weirs**

The operation and maintenance of locks and weirs of the past year was significantly affected by high flows, which persisted to the end of May 2012.

Major projects affected included:

- The navigable pass upgrade and the associated fishway construction at locks 2 and 4 remained on hold. Preparations to resume construction in January 2012 were interrupted by renewed flooding arising from the Darling and Murrumbidgee rivers. To complete construction, low flows are required for about nine months. Based on this timing, the works were deferred again until early 2013.
- Fishway construction at Lock 11 progressed before high flows from the Murrumbidgee resulted in work being suspended yet again. It is expected that work will resume in early 2013 and will take two months to complete.
- Lock 15 work resumed in January 2012 on the weir upgrade and fishway construction; three of the seven sluice bay piers were raised and construction of the fishway made good progress before the site had to be demobilised again in March 2012. The Denil fishway was made operable before the site was demobilised. It is expected that work will resume in January 2013 and will take about six months to complete.

In spite of the high flows, the lock chamber refurbishment program continued at Lock 8 where the asset's condition was better than expected, reducing the amount of work required before reinstatement. Just before the end of the year, preparatory work began at Lock 9 on lock chamber refurbishment.

#### **Barrages**

This year the deck replacement program moved on from Ewe Island to Tauwitchere Barrage, an ongoing program expected to take about 10 years to complete, enabling us to benefit from the residual life of existing decks currently due for replacement. Other works of note at the barrages include:

- the replacement of the control room at the Goolwa Lock
- the improvement of road access across Mundoo, Ewe and Tauwitchere islands.

SA Water and the MDBA had preliminary discussions with the South Australian Department of Environment, Water and Natural Resources to assist them implement a bilateral agreement with the Australian Government for up to eight additional fishways at the barrages.

#### **Mitta Mitta River channel improvements**

Erosion protection and repair works were continued, involving the transfer of large volumes of water from Dartmouth Dam to Hume Dam. These ongoing works will enable the Mitta Mitta River to sustain prolonged high flows into the future. While 2011–12 works focused on bank stabilisation, other works targeted broader environmental outcomes for the riparian zone; where possible, this was done through revegetation, willow control, stabilisation and stock exclusion.

#### Hume to Yarrawonga reach

Erosion control works comprising willow removal and the placement of log revetment and rock beaching restored a further 1.9 km of degraded river in 2011–12. Other works included fencing off 6.2 km of riverbank for revegetation and establishing 33,595 native plants. Work continued on developing a monitoring program to assess the effectiveness of the erosion control works. Delivering water efficiently and equitably will inform adaptive management and enhance the existing works program by improving understanding of geomorphic processes.

# Assessment of asset management

Each year senior MDBA staff inspect all River Murray operations assets, specifically to assess the operational performance of the assets. Assessment criteria include:

- condition of the assets
- operations and maintenance documentation
- occupational health and safety documentation and performance
- achievement of the works program set for the year
- expenditure against budget in meeting the program.

Senior MDBA asset managers informally assess asset performances throughout the year when visiting sites for various reasons, but each June and July all major locks, weirs and dams are formally inspected. The salt interception scheme structures are not included in this inspection.

Over the past five years Dartmouth Dam, Hume Dam, Yarrawonga Weir, Lake Victoria storage and the barrages have set the standard for asset operation and maintenance. During 2011–12, it was notable that although these sites have continued to improve, other sites are nearly all operating at this same high level. These improvements are not merely cosmetic (e.g. lawn maintenance and painting of locks) but, more importantly, include attention to detailed maintenance of mechanical items and lock refurbishment and barrage deck replacement programs.

With the gap between the best maintained structure and the worst now so close, we are near to achieving our aim of having a uniform high standard for our assets — we want to benchmark our asset maintenance against the performance of the top third of owners of comparable assets. Although we have not conducted formal benchmarking of our asset maintenance for some years, we consider our performance in asset maintenance is at the standard. More importantly, our lower asset performers are also lifting their levels to the industry standard.

#### **Senator Collings Trophy**

In 2011–12, staff of the barrages at the Murray Mouth were presented with the Senator Collings Trophy for the best maintained asset in 2010–11. The trophy is awarded to the team that has the most effectively maintained site on the River Murray. This was the third time in six years that the barrages team has been awarded the trophy, reflecting its consistently high standard of performance in a difficult estuarine environment.

# **Modelling the Basin**

The MDBA develops, operates and maintains river models and hydrographic data systems for river management, water sharing, salinity management and other water resources issues and projects.

Modelling is central to determining state water accounts and calculating state water shares through the water resources assessment.

During 2011–12, MDBA modelling supported river operations and long-established programs such as the Cap on water diversions (see page 80) and the Basin Salinity Management Strategy 2001–15, and informed the work of other programs and initiatives, including the Basin Plan and The Living Murray. During the year we continued to improve model capability and the tools used to analyse and present model results.

Our modelling considered some aspects of state water-sharing arrangements, including rights to airspace in storages and the Murray-Darling Basin Agreement's special accounting provisions.

We supported the Murray–Darling Basin Agreement Taskforce review and conducted studies into the Darling Water Savings Project and Lake Victoria operations.

#### **River Murray operations**

We use models to assist in River Murray operations, including providing probable future water availability and flows. We routinely use models to plan storage operations and prerelease targets, and to determine appropriate releases for storage airspace management.

Our modelled river flow outlooks were used extensively to refine plans for work under construction on the River Murray and to identify conditions required to begin construction programs currently under consideration.

During 2011–12, we provided modelling and analysis as part of the MDBA's relationship with Snowy Hydro Limited, including involvement in negotiating Snowy Water Licence amendments.

By the end of 2011–12, the Barmah Choke study was near-complete and a revised water resources assessment model was being trialled in the production environment.

As well as our specific studies, MDBA modellers continued to develop the MSM-Bigmod modelling suite and its associated tools.





A major focus of our model development was our continued support of the eWater Cooperative Research Centre in developing the SOURCE integrated modelling system (SOURCE IMS). Significant progress in testing the system's operations and planning functionality was made during the year, enabling:

- a better model representation of the River Murray System
- development and testing of an operations model upstream of Yarrawonga Weir; this model is currently being compared to existing operational tools
- building of a SOURCE IMS planning model representing the Murray and Lower Darling system (as modelled currently by MSM-Bigmod); testing of this model is going well.

We will continue our collaborative work with the Basin states on building new models to support water resource planning into the future.

#### **Basin Plan**

During 2011–12, the MDBA continued to support hydrological modelling used to develop the proposed Basin Plan. Our work included evaluating hydrological and environmental outcomes for different levels of water recovery, and resulted in three key reports:

- Water resource assessments for without development and baseline conditions: supporting information for the preparation of the Guide to the proposed Basin Plan
- Comparison of water course diversion estimates in the Guide to the proposed Basin Plan with other published estimates
- Hydrologic modelling to inform the proposed Basin Plan methods and results.

#### **The Living Murray**

Our hydrologic and hydraulic modelling informed operational strategies for construction works at The Living Murray (TLM) icon sites as well as a blackwater model for Koondrook–Perricoota Forrest. This blackwater model is currently being calibrated but potentially it could help prevent undesirable water quality issues, which would see its use extended to other major floodplain and wetland systems.

We also developed a Koondrook–Perricoota operations model that could be applied to river operations and used to plan TLM operations, including determining appropriate loss factors when accounting for environmental flows in transit.

More information on TLM is in Chapter 2, 'River and ecosystem health'. see page 50 ►

# **DELIVERING WATER**

# Agreed water shares delivered to states

The following key actions are undertaken to deliver agreed water shares in the River Murray System to the states, including in extreme conditions:

 regularly assess the water resources of the River Murray System to determine the volume of water available to each Basin state

- operate structures under the control of the MDBA and determine and review procedures for their efficient and effective operation
- establish, operate and maintain a system of continuous monitoring of the volumes of stored water and of flows in the River Murray and from its tributaries
- liaise with state and federal authorities on matters related to the River Murray System to provide an up-to-date and comprehensive flow of information.

#### **Rainfall and inflows**

Rainfall across most of the Basin was above average during 2011–12 (see Figure 9, page 122), although rainfall and inflow patterns at times differed considerably from the normal seasonal pattern. Most notably, record rainfall and system inflows in the southern Basin occurred during late summer and early autumn in 2012, a time when, in a more typical year, this part of the Basin is drying out. See case study 8 (page 112) for more information about the big wet of 2010–12.

Figure 10A shows the Basin's rainfall deciles from 1 January to 31 March 2012, for comparison with the rainfall deciles from 1 April to 30 June 2012 (Figure 10B).

Basin-wide above-average rainfall generated a total inflow to the River Murray System (including inflows to Menindee Lakes and excluding releases from the Snowy Mountains Scheme) of around 16,700 GL in 2011–12, putting the year in the wettest 17% of years (annual exceedance probability, or AEP, of 17%) [see Figure 11].

In the upper Murray catchment, average rainfall occurred in winter and spring, with the most significant rain event occurring over summer (from late February into early March), when parts of south-east Australia recorded their wettest seven-day period on record. Record seven-day totals included 525 mm at Mount Buffalo, 442 mm at Thredbo Village, 362 mm at Batlow, 354 mm at Falls Creek, 346 mm at Chiltern and 329 mm at Burrinjuck Dam.

This exceptionally heavy rainfall event led to major flooding in parts of southern New South Wales and northern Victoria, including the highest flood levels since 1974 at several locations along the Murrumbidgee River in New South Wales and along Broken Creek on the River Murray in Victoria. A large portion of inflows from this rainfall event was captured in the Hume and Dartmouth reservoirs, resulting in only minor flooding at a few locations along the mid-section of the River Murray. This was the fourth time in 18 months that the Dartmouth and Hume reservoirs prevented significant flooding downstream of Hume Dam.

River Murray System inflows (excluding the inflows to Menindee Lakes and releases from the Snowy Mountains Scheme) totalled 11,700 GL during the year (AEP of 26%), compared with the long-term median of 8,200 GL. However, the inflow pattern this year has differed considerably from the long-term average (Figure 12). Inflows in the spring were relatively low at about 2,270 GL (AEP of 71%), while the inflow over the autumn was extremely high, at about 4,360 GL (AEP of 1%).

The March inflow was the highest on record, double the previous record set in 2010–11, and the inflow in April was the second highest on record. While the period from mid-March to June 2012 was relatively dry, with below-average rainfall, above-average streamflows have persisted because of very wet catchment conditions.

In the upper Darling catchment, significant rainfall events occurred in late November 2011 and in late January – early February 2012. Record peak flows were observed along the Maranoa and Balonne rivers, with very high river levels also recorded along the Paroo, Warrego, Moonie, Weir, McIntyre, Gwydir and Namoi rivers. The large number of rivers flooding simultaneously resulted in major flooding in the Darling River at Bourke, New South Wales, where flow reached 237,000 ML/d in March 2012, the highest flow at Bourke since the 500,000 ML/d recorded in March 1976.



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Figure 11. Historical River Murray System annual inflows from July 1891 to June 2012 (modelled current conditions, including inflows to Menindee Lakes and excluding releases from the Snowy Mountains Scheme)



Figure 12. River Murray System daily inflows (excluding inflows to Menindee Lakes and releases from the Snowy Mountains Scheme) — recent years and long-term average

As a result, the Menindee Lakes began prerelease/flood operation on 14 December 2011, under the day-to-day management of the New South Wales Government, and continued for the remainder of the year. Total inflows to Menindee Lakes were 4,870 GL (AEP of 13%), more than five times the long-term median of 945 GL. At the end of June 2012, the lakes remained surcharged. The releases have provided a second consecutive year of much-needed water to floodplains along the lower Darling and Great Darling Anabranch as well as parts of the floodplains along the River Murray downstream of Wentworth.

#### **Active storage**

A second consecutive year of higher-than-average rainfall resulted in inflow conditions that pushed water storages in the River Murray System to very high levels at the end of June 2012. Total MDBA active storage has been well above the long-term average since December 2010 (see Figure 13, page 128).

Total MDBA active storage on 30 June 2012 was 7,945 GL, including about 1,438 GL in Menindee Lakes. This is the highest recorded end-of-June active storage since the construction of Dartmouth Reservoir in 1979.

	Storage	at end June 20	011 (GL) <sup>a</sup>	Storage at end June 2012 (GL) <sup>a</sup>		
Storage	NSW	Vic	Total	NSW	Vic	Total
Dartmouth Reservoir	1,186	1,304	2,490	1,664	1,692	3,355
Hume Reservoir	1,404	1,404	2,808	1,434	1,434	2,869
Lake Victoria	241	241	482	241	241	481
Menindee Lakes⁵	978	978	1,956	959	959	1,918
Total <sup>c</sup>	3,809	3,927	7,736	4,296	4,323	8,619

Table 4. Water shares for New South Wales and Victoria — end June 2011 and June 2012

a. Data relates to total storage.

b. Menindee Lakes releases at 30 June 2012 were being managed by NSW as part of flood operations. The MDBA may later call on water from Menindee Lakes when flood releases cease and downstream demands increase. The MDBA will cease to be able to call on water from Menindee Lakes when the storage volume next reduces to less than 480 GL.

c. Accounts are based on the best available data, which may contain some unverified operational data that could change in the future. Figures are rounded to the nearest gigalitre. At 30 June 2012, the following volumes are available for use in the Murray in 2012-13:

- about 180 GL of water in inter-valley trade accounts in the Murrumbidgee and Goulburn valleys
- 230 GL of River Murray Increased Flow environmental water (stored in the Snowy Mountains Scheme)
- 59 GL of water in the Upper States Drought Account.

Water shares for New South Wales and Victoria in MDBA storages at the beginning and end of 2011–12 are shown in Table 4.

# State water allocations, diversions and carryover

Murray Valley water allocations started higher in 2011–12 than in recent years.

South Australia started the year with a 100% allocation, the first time since 2002–03. The water sharing plan (WSP) for the NSW Murray and Lower Darling Regulated Rivers water sources recommenced in July 2011, having been suspended since 2006 because of the severe drought. The New South Wales high security allocation started at 97% and New South Wales general security access licence holders, while not receiving an initial allocation, had access to a carryover volume equivalent to 77% of entitlement.

In Victoria, high reliability water shares started with an allocation of 21% compared with starting allocations for the previous four years of zero. By mid-November 2011, allocations had increased to 100% for NSW high security and general security access licence holders and 100% for high reliability water shares in Victoria.

On the lower Darling River, both general and high security water holders had a 100% allocation for the entirety of 2011–12.

Despite allocations reaching 100% by mid-November, the total amount of water diverted by Basin states was relatively low, at about 3,300 GL, compared with other high-allocation years over the past 20 years when diversions ranged between 4,000 and 5,000 GL (see Figure 14, page 128). The unseasonably high rainfall in many irrigation areas meant that less irrigation was required to meet crop and pasture water requirements.

The New South Wales volume of carryover water this year was reduced markedly, to around 700 GL, down from 1,600 GL last year, caused mainly by the reintroduction of the WSP for the NSW Murray and Lower Darling Regulated Rivers water sources, which reduced the maximum allowable carryover from 100% (while the WSP was suspended) to 50 % of entitlement. In Victoria, the carryover into 2012–13 is about 1,400 GL, higher than last year's figure of 1,200 GL.

#### **Flow to South Australia**

This year was the first since 2002–03 that South Australia began the year with its full entitlement of 1,850 GL assured. Additional dilution flow has been delivered to South Australia since 1 August 2010, because the total volume of Hume and Dartmouth reservoirs exceeded 2,000 GL and the volume of Menindee Lakes exceeded the required monthly trigger volumes. Additional dilution flow is likely to continue well into 2012–13.











Top left and clockwise: The Great Darling Anabranch near Popiltah, midway between Menindee and the Murray, May 2012. River red gum that has endured incredibly adverse hydrological conditions on the foreshore of Lake Victoria for at least 80 years and has regrown. The bed of Lake Mulwala on 15 June 2011, showing exposed *Egeria densa*.



Figure 13. MDBA active storage, June 2000 to June 2012



Figure 14. State diversions, River Murray System: 1991–92 to 2011–12 Notes: 2011–12 figures are indicative only and may change as updated data becomes available. Diversions include the lower Darling and any inter-valley trade received by a state.

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Unregulated flow to South Australia began in September 2010 and continued until the start of November 2011. It recommenced briefly in late December continuing into early January 2012, before resuming in February and continuing for the remainder of the water year. Between October 2011 and March 2012, the flow to South Australia included more than 350 GL of environmental water.

The total annual flow across the South Australian border, including additional dilution flow, unregulated flow, environmental water and traded water, was about 10,200 GL (AEP probability of 20%) compared with 15,100 GL last year. The long-term median annual flow to South Australia is 5,200 GL.

#### The Murray component of the Snowy Mountains Scheme

The Snowy Scheme terms of operation are defined in the Snowy Water Licence, which sets a minimum release that must be achieved by the licensee (Snowy Hydro Limited) over the course of the Snowy water year, which runs from 1 May to 30 April.

The required annual release (RAR) volume may change throughout the course of the Snowy water year and Snowy Hydro Limited is free to release volumes in excess of the required release.

The Snowy Water Licence was amended in October 2011, to give MDBA partner governments the right to build a callable drought reserve in the Snowy Scheme and to remove Snowy Hydro Limited's obligation to make good previous reductions in the minimum release volume allowed as a result of low inflows to the Snowy Scheme.

Partner governments were also given the right to call River Murray Increased Flows from the Snowy Scheme under certain conditions, and Snowy Hydro Limited given the flexibility to make prereleases on the required release of subsequent years. Before October 2011, this flexibility was only available in drought sequences.

In 2011–12 the required annual release volume was 176 GL on 1 May 2011. This volume increased during the year, with a final obligation of 477 GL. The Snowy Hydro Limited released a total of 770 GL in 2011–12; the 293 GL released in excess of the RAR in 2011–12 reduces the RAR for 2012–13.

# **Operating the River Murray System**

System operations during 2011–12 were similar to those in 2010–11 and were mainly determined by high inflows rather than high demands for water. While operations still aimed to maximise water availability, the frequent high inflows meant that operations were concentrated on delivering environmental outcomes and safely passing high flows through storages without increasing peak flows.

#### **Upper Murray system**

At the start of 2011–12, storage was 2,444 GL in Dartmouth Reservoir (63% of capacity) and 2,812 GL at Hume Reservoir (94% of capacity). Storage in Dartmouth Reservoir increased to 87% capacity by June 2012.

Moderately wet conditions and the high initial storage in Hume Reservoir meant that water did not have to be transferred from Dartmouth to Hume Reservoir. Releases from Dartmouth Reservoir were held near to minimum (200 ML/d) for most of 2011–12, with some exceptions:

- four entitlement releases for power generation by AGL Hydro during June and August
- three short pulses of flow in December and January for water quality management in the Mitta Mitta River

 two periods during January and February when release was varied from between 200 ML/d and 300 ML/d to maintain the flow at Tallandoon at about 600 ML/d to assist access for local diversions.

At Hume Reservoir, the release to meet downstream demands over the irrigation season was relatively low because of high inflows from downstream tributaries and reduced demand across the irrigation areas following good rainfall. The release, for demand purposes, only exceeded 20,000 ML/d on one day in November and for one week in early January — at both times, this release included water for environmental purposes. The highest release was 25,000 ML/d, which occurred in August for four days as part of flood management when the reservoir was spilling as it approached full supply level.

Environmental and irrigation releases from October to February resulted in Hume Reservoir being drawn-down to 63% by late February 2012. However, the large rain event in February–March resulted in the storage regaining about 820 GL (27% capacity). During this event the peak daily inflow to Hume Reservoir was more than 120,000 ML/d, one of the highest daily inflows on record. The full capture of this event by storing it in Hume Reservoir prevented major flooding at Albury– Wodonga, in contrast with major flooding in neighbouring rivers and streams.

At 30 June 2012, the volume in storage at Hume Reservoir was 2,869 GL (95.5 % capacity) — effectively the reservoir was full — and spill release had begun in early June to provide limited airspace to reduce the risk of possible flooding.

#### **Mid-Murray**

Flood operations were undertaken at Yarrawonga Weir in August 2011, with high flows from Hume Reservoir and from the Kiewa and Ovens river catchments. The peak release was 52,500 ML/d on 22 August. In late February to early March, 2012, 264 mm of rain fell at Yarrawonga, causing very high local inflows as well as inflow from the Kiewa and Ovens river catchments. Releases were greater than 25,000 ML/d from 1 to 11 March, including a peak release of 62,100 ML/d (below minor flood level) on 7 March.

The Barmah Choke was not a major constraint on the delivery of water to downstream users during 2011–12. The rule preventing trade of allocations from above to below the choke has been relaxed since September 2007. We review the relaxation each fortnight, but it has remained uninterrupted.

Inflow from the Goulburn River totalled 1,875 GL for the year (AEP of 27%), measured at McCoys Bridge, with a peak inflow briefly reaching the minor flood level on 9 March 2012.

At Torrumbarry, the flow exceeded 25,000 ML/d for two periods between late July and early September, and for most of March, resulting in overbank flooding into the Gunbower and Koondrook–Perricoota forests. A peak flow of 33,300 ML/d was recorded on 28 August, with another peak of 30,800 ML/d on 23 and 24 March (minor flood level occurs at about 39,000 ML/d).

The Murrumbidgee catchment experienced major flooding during March and April 2012. The peak flow on the Murrumbidgee River at Wagga Wagga was about 440,000 ML/d on 6 March, the highest flow since the record flood in 1974 when flow at Wagga peaked above 490,000 ML/d. The March 2012 flood was greatly attenuated as it travelled downstream — at Balranald, the Murrumbidgee River only reached minor flood level for around 10 days, with a peak of 29,500 ML/d on 25 April. Total inflow from the Murrumbidgee River during the water year was in excess of 2,400 GL (AEP of 10%).

At Euston, the flow was greater than 29,000 ML/d from late July to late September 2011 and again from mid-March to mid-May 2012. The peak flow during the year was 40,200 ML/d on 18 September (minor flood level occurs at about 88,000 ML/d).

Downstream of the confluence of the Murray and Darling rivers, the flow at Wentworth averaged 29,100 ML/d during the water year. The flow was above 10,000 ML/d throughout the year, except for a short period during November 2011, with a peak flow of 58,400 ML/d from 4 to 7 May 2012 (minor flood level occurs at about 87,000 ML/d).

#### **Lake Victoria**

Operations at Lake Victoria throughout 2011–12 were consistent with the Lake Victoria Operating Strategy. In mid-July 2011, the lake was filled to 25.78 m Australian height datum (AHD); at this time, sufficient water was in transit upstream to allow operations to draw the lake down to minimise time spent at high lake levels and to provide a small boost to the South Australia flow, taking it to about 34,000 ML/d.

In August 2011, the lake level was raised and lowered, and in the second half of September it was raised to 26.1 m AHD (84% capacity) as conditions became drier. During the second half of October and early in November, the lake increased to 100% capacity (27 m AHD) and remained close to full until early December. The lake was then drawn-down to around 26 m AHD (83% capacity) by early January 2012, where it remained until early February.

In February, projected high inflows permitted the lake level to be lowered for the remainder of the season. However, during March the lake level was temporarily increased when higher river flows were mitigated to assist downstream construction works. The flow to South Australia peaked at around 60,000 ML/d during April, including some water released from Lake Victoria to draw the lake down to 24.1 m AHD (52% capacity), which provided an opportunity to conduct a lakebed survey for Aboriginal cultural heritage material. Refilling of the lake began in early June 2012; at the end of the month, Lake Victoria was at 71% capacity and sufficient flows were in transit to enable its rate of filling to be slowed.

The operation of Lake Victoria during 2011–12 provided favourable hydrological conditions for the continued growth of many juvenile spiny sedge (*Cyperus gymnocaulos*) plants that had propagated in 2010–11. As well, we observed modest development of new spiny sedge bulbils following drawdown over recent months. However, many river red gum (*Eucalyptus camaldulensis*) seedlings present on the foreshore last year did not survive the summer inundation. River red gums fared better at higher elevations where inundation did not last as long.

#### Menindee Lakes, lower Darling River and the Great Darling Anabranch

Total inflows to Menindee Lakes between July 2011 and June 2012 were about 5,000 GL (AEP of 13%) compared with the long-term median annual inflow of about 945 GL. The high inflows were caused by two major rainfall events in northern New South Wales and southern Queensland.

The first event occurred in late November 2011, when heavy rainfall triggered large flows in the Gwydir and Border rivers and the Namoi catchment. These large flows caused a peak flow in the Darling River at Bourke of 73,000 ML/d and a peak inflow to Menindee Lakes of around 36,000 ML/d.

The second event, in late January and early February 2012, generated high flows in the Namoi, Gwydir, Moonie and the Balonne–Culgoa–Bokhara river systems. The Darling River experienced major flooding from this event, with a peak flow at Bourke of around 240,000 ML/d (major flooding) and a peak inflow to the Menindee Lakes of near 60,000 ML/d. The NSW Office of Water has overseen the daily flood operations at the lakes since 14 December 2011. At the end of June 2012, Menindee Lakes were still surcharged, storing 1,918 GL (111% capacity).



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Top right and clockwise: Successful recruitment of spiny sedge bulbils on the eastern foreshore of Lake Victoria helps stabilise and limit erosion. Spiny sedge plants around Lake Victoria respond well to this year's environmental and hydrological conditions. Plants reproduce via bulbils and seeds, maximising their chances of successful recruitment. Ongoing releases through the barrages have maintained flows into the Coorong and out the Murray Mouth.

Releases from the lakes, measured at Weir 32, were pulsed by the NSW Office of Water and varied between 200 ML/d and 1,000 ML/d from July to December 2011. The pulses were aimed at encouraging water oxygenation in the lower Darling to reduce the likelihood of fish kills. From December, the release was increased to pass floodwater; by mid-April 2012, the release reached close to 36,000 ML/d. Releases along the lower Darling River were gradually reduced to 500 ML/d throughout April, May and June to minimise potential riverbank damage.

The past year was the second consecutive year of substantial flows to the Great Darling Anabranch. Flows passed into the anabranch from late December 2011 until the end of May 2012, rejuvenating riparian and aquatic ecosystems and connectivity for fish passage through to the River Murray. Return flows to the River Murray began around the end of April and are likely to continue for some months.

#### Lower Lakes and barrage operation in South Australia

Releases through the barrages continued throughout the year. However, these releases were restricted during short periods when downstream water levels in the Coorong exceeded upstream water levels in Lake Alexandrina because of high tides and/or storms. It is estimated that in excess of 7,000 GL of water flowed to the Southern Ocean during 2011–12, compared with the estimated long-term average of 4,900 GL. The peak release from the barrages was about 76 GL/d in late May 2012.

In winter and spring 2011, water releases through the barrages were managed to 'actively' vary the level of Lake Alexandrina from between 0.55 m and 0.85 m AHD, to export salt from Lake Albert. Improving water quality in Lake Albert continues to be problematic because of its single narrow connection to Lake Alexandrina. Passive water exchange between the lakes is primarily driven by wind seiche that causes changes in the lakes' water levels which forces water through the narrows. By actively varying the water level in Lake Alexandrina, we aimed to replace higher salinity water from Lake Albert with fresher water, reducing Lake Albert's salinity level.

Overall, the operation of the lakes in 2011–12 to improve salinity levels in Lake Albert was largely successful. While salinity levels fluctuated over the year, the overall trend was downwards, with Lake Albert's salinity levels being reduced from an average of 5,700 EC in July 2011 to less than 3,900 EC in June 2012.

Commonwealth environmental water was used during late spring and early summer 2011 to permit higher releases through the barrages. These higher releases provided fish passage and delivered nutrients to the Coorong's mudflats; they also improved the Coorong's salinity level and helped its environment recover (particularly the important native submerged plant *Ruppia tuberosa*). Lake levels were lowered in December to maximise flow to the Coorong to maintain water levels during this period of high irrigation demand.

From late summer, flows from the barrages increased because of flood flows from the Darling River and later from the upper Murray and Murrumbidgee catchments. In autumn and winter 2012, management of the lakes focused again on improving the salinity levels in Lake Albert by actively cycling water levels.

## **Delivering environmental water**

During 2011–12, MDBA River Operations assisted with the delivery of environmental water held by the Basin states, The Living Murray and the Commonwealth Environmental Water Holder, to target a range of environmental outcomes. Our assistance included coordinating the entry of environmental water from tributaries into the River Murray System.

About 424 GL of environmental water was released from Hume Reservoir between mid-October 2011 and early February 2012. These releases were timed to maintain water levels in key colonial waterbird breeding areas and other wetlands in the Barmah–Millewa Forest during periods of lower flows. The releases also provided small flow pulses in the river to assist fish migration and spawning along the length of the River Murray. A large portion of this flow also contributed to higher flows into South Australia, including the Coorong, over spring.

Over 350 GL of environmental water was provided across the South Australian border over summer to stimulate and maintain fish breeding and recruitment, particularly of large-bodied native species, throughout the lower River Murray channel. The higher flow also provided higher releases through the barrages to improve salinity levels in the Coorong and to support keeping the Murray Mouth open.

Extensive flooding along Broken Creek, Murrumbidgee River and Billabong Creek and within the Koondrook–Perricoota and Gunbower forests this year caused parts of the river system to be affected by blackwater. However, these events were much less severe than the blackwater events that occurred last year when the drought first broke.

Blackwater events occur naturally when organic matter is washed from floodplains into rivers by floods. This matter breaks down and the river water becomes discoloured and, at times, deoxygenated, resulting in fish kills. The 2011–12 River Murray blackwater event caused a small number of observed fish deaths but also provided nutrients for the river system, which will promote the growth of many aquatic organisms.

Australian government and New South Wales and Victorian government agencies collaborated with the MDBA in implementing blackwater dilution actions along the River Murray and its associated streams. In some cases using Murray Irrigation Limited infrastructure and the provision of specific flow rates at key locations enabled the dilution of blackwater as it returned to the river from the floodplain.

River Operations helped construct environmental works such as fishways and regulators by adjusting flows and weir-pool levels where feasible. Our forecasts of the timing and magnitude of flood peaks and recessions enabled state constructing authorities and their construction contractors to make more informed river management decisions.

At Yarrawonga Weir (Lake Mulwala), the lake level during winter 2011 was held to around 2.5 m to 3 m below full supply level, to help control the non-native aquatic weed 'dense waterweed' (*Egeria densa*) that had recolonised some shallower parts of the lake (see photograph on page 126). We have successfully undertaken this operation several times in recent years. The lake was refilled by early August 2011, and monitoring in March 2012 found that the abundance and distribution of dense waterweed was the lowest since monitoring began in 2008. The weed now occupies about 1% of the volume of the lake, compared to around 60% in June 2008.

See case study 9 (page 136) for more information about the dense waterweed control program and its outcome.

#### **CASE STUDY - 9**

Managing the aquatic weed Egeria densa in Lake Mulwala

The construction of dams and weirs and the regulation of rivers have reduced instream variability and provided more stable growing conditions favoured by aquatic weeds. Lake Mulwala, the body of water formed as a result of Yarrawonga Weir, has been invaded by the non-native aquatic weed *Egeria densa*, commonly known as dense waterweed.

Dense waterweed is an escapee from the aquarium trade and has bloomed in the relatively stable growing conditions within Yarrawonga Weir. The plant forms dense clumps underwater and by June 2008 had expanded to occupy approximately 60% of the volume of Lake Mulwala. This high density had a significant adverse impact on the local ecosystem and was seriously affecting recreational activities such as swimming, boating and fishing, as well as power station and fishway operation at Yarrawonga Weir.

The MDBA, Goulburn–Murray Water and the Victorian Department of Primary Industries have jointly undertaken a control program over the past four years to reduce the weed's density in Lake Mulwala. This program involved lowering the weir-pool level over winter to kill the plant by exposing it to frost. Partial drawdowns in winter 2008 followed by a full drawdown below the depth of maximum colonisation in winter 2009 and again in winter 2011 have been very successful in controlling the weed. Monitoring in March 2012 observed that the abundance and distribution of dense waterweed had been reduced to approximately 1% of the volume of the lake, the lowest it has been since monitoring began before the winter 2008 drawdown.

While dense waterweed will never be eradicated from Lake Mulwala, management involving further drawdowns will help control this weed.



Lake Mulwala at Drain Lane.

# SALT INTERCEPTION SCHEMES

The River Murray salt interception schemes are a significant component of the Basin Salinity Management Strategy 2001–2015. By intercepting saline groundwater and drainage inflows before they reach the River Murray or its tributaries, these schemes are helping us achieve and maintain agreed salinity levels in the River Murray. In addition the schemes are operated to maximise environmental benefits to the Basin.

The 18 current salt interception schemes (including five state-owned schemes) represent a significant achievement under the Basin Salinity Management Strategy. Figure 15 shows the locations of these schemes.

More information about the Basin Salinity Management Scheme and salt interception is in Chapter 2, 'River and ecosystem health'. **see page 63** ►

## **Highlights**

- Diverted approximately 362,508 tonnes of salt from the River Murray using the joint and/or shared funded salt interception schemes.
- Completed construction of the Upper Darling salt interception scheme in New South Wales.
- Commissioned stage 1 of the South Australian-funded Pike River scheme.
- Progressed construction of the Murtho scheme in South Australia.
- Began rehabilitation of the Mildura-Merbein salt interception scheme.



Figure 15. Salt interception schemes: Murray–Darling Basin, 2011–12 Note: Noora (icon no. 5) is a drainage basin scheme rather than a salt interception scheme.

Salt interception scheme	Volume pumped	Salt load diverted	Average salinity	Target achieved	Power consumption kWh
	(ML)	(Tonnes)	(EC units)	(Percentage of time)	Totals
Pyramid Creek	1,018	25,456	39,177	70	139,059
Barr Creek	1,672	8,484	5,931	100	35,853
Mildura– Merbein (under construction)	0	0	0	0	0
Mallee Cliffs	1,514	49,337	50,150	96	485,700
Buronga	2,659	73,649	42,615	99	469,952
Pike River	281	17,305	68,525	N/A	79,181
Bookpurnong	228	5,541	35,018	97	84,407
Loxton	400	3,621	15,405	96	191,110
Woolpunda	5,520.8	113,420	32,218	96	4,465,612
Waikerie	3,522	61,867	30,652	97	1,311,710

	Table 5. Joint	t/shared salt in	iterception schem	e performance	reporting,	2011-12
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Salt interception scheme	Volume pumped	Salt load diverted	Average salinity	Target achieved	Power consumption kWh
	(ML)	(Tonnes)	(EC units)	(Percentage of time)	Totals
Rufus River					
Line 1	9	48	9,933	100	1,498
Line 2	17	649	54,917	100	2,676
Line 3	17	1,136	73,500	100	4,838
Line 4	0	0	43,000	100	497
Minor pump station	95	1,459	25,500	99	9,336
Major pump station	63	535	60,757	100	340
Total groundwater diversion	201	3,827	-	-	19,185
Total salt pumped during the year	17,016	362,508	-	-	-

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## Construction

Construction of the Upper Darling salt interception scheme near Bourke, New South Wales is now complete. However, the scheme's commissioning was delayed because of significant flooding in the Darling River.

Although construction of stage 1 of the Pike River salt interception scheme was completed in 2010–11, it was not commissioned until mid 2011–12.

Continued River Murray flooding delayed completion of a number of floodplain components at the Murtho salt interception scheme in South Australia. All switchboards, headworks and pumps have now been received and are progressively being installed. It is anticipated that pumps will be installed as part of the scheme commissioning process early in 2012–13. Work has now begun on constructing the relift pumping station at the Disher Creek Basin, and we now expect that, subject to any further flooding, this scheme will be completed by mid 2012–13.

We began rehabilitating the Mildura–Merbein salt interception scheme in northern Victoria during 2011–12. A detailed design was finalised for the first phase of borefield development and the drilling program for additional monitoring and production bores has begun. As no agreement has yet been reached by partner governments on the disposal location, the collection mains connecting all proposed production bores will be designed to provide maximum flexibility.

#### **Operations and maintenance**

During the past year, operation and maintenance of existing salt interception scheme assets continued to focus on minimising running costs. By careful monitoring, it was possible to maintain target groundwater levels while scheduling pumping times to coincide with periods of lower power tariffs.

A number of production bores on the River Murray floodplain were shut down during the year because of floodwater inundation. Most bores were restarted by the end of the year.

Following the extensive flows in northern Victoria in mid 2010–11, all Pyramid Creek scheme pumps were removed, checked and reinstalled, with a significant number of flood-damaged cluster switchboards being replaced. By mid 2011–12, the scheme was 80% operational, and all repair work was completed by the end of the financial year.

# **Performance chart — key performance indicators**

Key performance indicators	PBS target	Results
River Murray System operated and maintained consistent with the published annual operating plan.	YES	Achieved. The River Murray System was maintained and operated consistent with the annual operating plan for the 2011–12 water year.
Asset maintenance activities carried out within agreed schedule.	YES	Ongoing. Flooding caused some delays to the agreed schedule.
Asset register fully maintained annually.	YES	Achieved.
Asset revaluations undertaken by independent specialists every three years (by mid-July) and adjusted by River Murray Water Office in interim years.	YES	Asset revaluation by SMEC Ltd completed by July 2012.
Monthly water accounts, as required by states, delivered within set specifications.	YES	Achieved. State shares in storage reports issued monthly throughout 2011–12.
State shares of available water (for domestic consumption and economic use) delivered as per requirements.	YES	Achieved as required under the Murray–Darling Basin Agreement.
Monthly water resource assessments, as required by states, delivered on time.	YES	Achieved.
Salinity schemes fully functioning and delivering electrical conductivity benefits in accordance with register entries.	YES	Achieved. Peak salinity at Morgan, South Australia remained below 800 EC (see Chapter 2, page 63) despite mobilisation of significant salt loads because of high river flows in 2011–12.



# MANAGEMENT AND ACCOUNTABILITY

#### OVERVIEW

OUR PEOPLE

OUR WORKFORCE

WORK HEALTH AND SAFETY

OUR PLANNING AND FINANCES

OUR INFORMATION RESOURCES

# **OVERVIEW**

During 2011–12 the Murray–Darling Basin Authority (MDBA) continued strengthening its corporate governance framework and our agency workplace culture by:

- improving our corporate policies and procedures
- reviewing our performance reporting
- updating key risk management, fraud control and business continuity plans
- implementing changes driven by the Work Health and Safety Act 2011<sup>1</sup> and the enterprise agreement 2011–14.

Our corporate governance performance was recognised when:

- the MDBA achieved its best result in Comcover's Risk Management Benchmarking Survey since 2009, when we began participating in the survey; this has resulted in our Comcover premium being discounted by 6.5%
- the MDBA's 2010–11 annual report received a silver Australasian Reporting Award.

Our communications — media interaction, online initiatives, information provision and community and stakeholder engagement activities — continued at a high level throughout the year as we worked towards publication of the proposed Basin Plan and the subsequent public consultation period.

## **Main activities**

- Updated policies, procedures and guidelines to ensure compliance with the new Work Health and Safety Act and its associated codes.
- Effectively operated internal senior management committees.
- Developed and implemented leadership programs to Executive Level 1 and 2 employees.
- The Information Stewards Team provided a coordination forum for integrating MDBA 's data and knowledge assets. It progressed foundational governance standards in intellectual property and metadata for MDBA.
- Established the new Employee Consultative Committee under the MDBA 2011–14 Enterprise Agreement, to facilitate communication, consultation and cooperation with employees on matters affecting the workplace and the agreement's operation.
- Continued oversight by the MDBA Audit Committee of the internal audit program, external audits, compliance, risk management, fraud control, business continuity and disaster recovery plans and implementation of recommendations.
- Worked closely with Basin states through the Strategic Policy and Integration Advisory Group to implement recommendations made by the Strategic Programs Review, which was completed in 2010–11.

<sup>1</sup> Unless otherwise indicated, all Acts referred to in this annual report are Commonwealth Acts.

## Senior management committees

A range of senior management committees continued to operate during the year to provide advice and assurance to the Chief Executive and to manage cross-agency aspects of MDBA business. The committees and their activities during the year are described below.

#### **Executive Committee**

The MDBA's Executive Committee is chaired by the Chief Executive. Its membership comprises the executive directors of MDBA's five divisions (Policy and Planning, Information and Compliance, Environmental Management, River Management and Corporate Services) and the General Manager Communications and Engagement. The Executive Committee is the main forum in which cross-agency issues on policy and corporate governance are discussed.

During 2011–12, this forum was critical in developing the proposed Basin Plan, ensuring that we met statutory requirements and put our stakeholder engagement strategies into practice. The forum also provided a way for high-level decisions to be made on strategic direction, risks and positioning, and the safeguarding and enabling necessary for the MDBA to achieve our business outcomes.

#### **Business Managers Committee**

The Business Managers Committee met 19 times during 2011–12 to consider, plan and coordinate cross-divisional issues and communications to carry out MDBA business. The committee comprises all general managers and directors who report directly to executive directors.

In May 2012 it was decided that the committee would continue to function primarily as an email group, providing a forum for exchanging and seeking views on corporate policies, but would convene as needed. The committee continued to operate in this way into the new financial year.

Standing items on the committee's agenda up to May 2012 included reports from the Executive Committee, the MDBA's People, Planning and Performance section, monthly financial reports, updates on the internal communications strategy and progress on development of the Basin Plan.

The committee addressed a number of significant matters during 2011–12, including:

- reviews of internal policies and procedures
- Information Publication Scheme
- Blueprint for Reform of Australian Government Administration
- information communication technology (ICT) issues
- international engagement activities
- impact of flooding on the MDBA budget
- input consideration of the MDBA's future direction and its consequences for the organisation's structure.

#### **Information Management Committee**

The Information Management Committee is a subcommittee of the Executive Committee and provides advice on and strategic direction for the management of the MDBA's ICT needs; it also discusses and endorses all projects with ICT components or impacts.

The committee is chaired by the Executive Director Information and Compliance Division; its members are the MDBA Chief Information Officer, two senior executive service officers with significant ICT interests, and a member of the Information Stewards Team (IST). Membership is reviewed every two years. The committee met six times during 2011–12.

During 2011–12, the committee mainly continued its oversight of a suite of 23 projects in the Enterprise Information Strategy, which is nearing completion. The committee formed closer bonds with the ICT and IST teams to ensure the MDBA's information assets are managed appropriately and that we support an integrated approach to our information holdings.

#### **Health and Safety Committee**

The Health and Safety Committee is a subcommittee of the Executive Committee. Before 1 January 2012, it operated under the *Occupational Health and Safety Act 1991*; since then, it has operated under the *Work Health and Safety Act 2011*.

The committee meets quarterly to oversee work health and safety matters across the MDBA. The committee chair during 2011–12 was the General Manager Policy and Coordination, Policy and Planning Division.

Committee members include health and safety representatives from the MDBA's designated work groups; a representative from the Employee Consultative Committee; the Director People, Planning and Performance; the Chief Emergency Warden; and the Work Health and Safety Coordinator.

The committee met three times in 2011–12 to consider health and safety issues including:

- new work health and safety legislation and codes that came into operation on 1 January 2012
- policies, procedures and guidelines to facilitate compliance and enhance processes for improving awareness of health and safety issues
- workplace inspections and workplace incident and injury reports to ensure health and safety
- reports from first aid officers, emergency wardens and harassment contact officers
- accommodation issues with work health and safety implications.

#### **Employee Consultative Committee**

The Employee Consultative Committee was established under the MDBA Enterprise Agreement 2011–14. The committee comprises an elected employee representative from each division, three elected employee organisation representatives (from the Association of Professional Engineers, Scientists and Managers, Australia; the Community and Public Sector Union; and the Media Entertainment and Arts Alliance), the Chief Executive and two other management representatives.

The committee met four times during the year to communicate, consult and cooperate with employees on matters affecting the workplace and the operation of the Enterprise Agreement. The Employee Consultative Committee provides a forum for:

- staff consultation and input into the decision-making process relating to changes in existing policies, guidelines or procedures or the development of new policies, guidelines or procedures referred to in the Enterprise Agreement
- consultation and agreement before the Chief Executive begins a formal variation process under the Fair Work Act 2009 for changes in any current conditions or entitlements included in the Enterprise Agreement

 provision of advice to the Chief Executive on matters arising from the operation of the Enterprise Agreement.

During the year, the committee reviewed MDBA policies, staff accommodation and the organisational restructure.

#### **Audit Committee**

The Audit Committee reports to the Chief Executive. The committee has an independent chair, while its membership comprises the Executive Director River Management Division (as deputy chair), the executive directors of the Corporate Services and Environmental Management divisions, and the General Manager Water Planning, Policy and Planning Division.

The committee provides independent assurance and assistance to the Chief Executive on the integrity of the MDBA's financial data and processes; its risk, control and compliance framework; and its external accountability responsibilities. In particular, the committee ensures that the MDBA:

- has a sound internal control framework that is supported by effective identification and business risk management procedures
- has an appropriate fraud control plan and procedures
- has appropriate disaster recovery and business continuity arrangements
- has reliable financial and management reporting systems
- finalises and appropriately approves its financial statements
- complies with applicable laws, regulations and government policies
- maintains an effective and efficient audit service.

The committee met four times during 2011–12. It considered the MDBA's 2010–11 financial statements, the Australian National Audit Office financial audit report and the outcome of the MDBA's 2010–11 Certificate of Compliance. It also monitored implementation of risk management, fraud control, business continuity and disaster recovery, and internal audit work plans. Updates were provided to each meeting from the MDBA's internal auditors, KPMG, and external auditors, the Australian National Audit Office (ANAO).

The committee also approved the internal audit work plan and considered internal audit reports. During 2011–12 the internal audit program focused on a mix of performance and compliance audits. The committee monitored implementation of the internal and external audit report recommendations throughout the year.

The sections on risk management, Comcover, fraud control, business continuity and ICT disaster recovery illustrate the wide range of work carried out by the Audit Committee.

## **Risk management**

Effective risk management is a key component of the MDBA's planning and review systems. The Audit Committee monitors key risks and development of risk management policies and procedures.

The MDBA Risk Management Plan 2011–12 was prepared in 2011 following a detailed organisational risk assessment and update of the previous plan. The plan focuses on risks that affect the achievement of key corporate objectives and most, if not all, MDBA functions and processes.

The risk management plan identified 20 enterprise risks, one of which was rated as a high residual risk while 15 were rated as significant and four were rated as moderate. The Audit Committee considered the risk management plan and implementation of associated treatments in all its 2011–12 meetings and will continue to monitor risk management in all future meetings. A presentation on The Living Murray environmental water risk management was considered at the committee's January 2012 meeting.

In 2011–12, risk management, including fraud risk management and Australian Public Service values, was included in new staff inductions.

Development of the Risk Management Plan for 2012–13 began in June 2012.

#### Comcover

The MDBA's insurable risks are identified as part of Comcover's insurance renewal process and will be reassessed annually.

During 2011–12, the MDBA again took part in the annual Comcover Risk Management Benchmarking Survey. The survey included 138 Australian Government agencies (83% of Comcover's insurance portfolio), and the MDBA achieved its best result since it began participating in the survey in 2009 — 8.1 out of 10 in 2012 compared to 4.6 in 2009.

As a result, our 2012–13 Comcover premium was discounted by 6.5%. Comcover assessed the MDBA's overall risk performance as 'structured' in its maturity level, with our greatest strengths being in our integration, positive risk culture and risk management policy and objectives.

The MDBA is covered by Comcare for risks associated with injury to employees.

## **Fraud control**

Fraud control is integral to the MDBA's governance framework. During 2011, the MDBA, assisted by its internal auditors, KPMG, conducted comprehensive fraud risk assessments and updated our Fraud Control Plan for 2011–13.

We also have in place appropriate fraud prevention, detection, investigation, reporting and data collection procedures and processes that meet our specific needs and comply with the new Commonwealth fraud control guidelines. In 2011–12, MDBA analysed our compliance with the guidelines and with the ANAO's *Better Practice Guide on Fraud Control in Australian Government Entities*, which, like the guidelines, was published in March 2011.

At all its meetings during 2011–12, the Audit Committee monitored implementation of the MDBA's fraud control plan and the associated treatments and actions.

All MDBA employees with financial delegations are required to address their compliance with the fraud control guidelines during the quarterly Certificate of Compliance process and to report any known instances of fraud or potential fraud-related occurrences.

Our fraud policy is included in the online induction process for new employees, as well as on our intranet and external website and in our contracts. Targeted fraud awareness training was also undertaken in 2011, including informing employees about Australian Public Service values and the APS Code of Conduct.

During 2011–12, we developed a comprehensive conflict of interest policy for all employees and committee members, which replaced a number of fragmented policies for specific groups. The new policy is available on the intranet.

#### **Fraud investigations**

An investigation into one case of potential fraud from 2010–11 continued throughout 2011–12.

# Business continuity and information communication technology disaster recovery plans

In 2011–12, we reviewed and updated our business continuity, pandemic business continuity and ICT disaster recovery plans and emergency procedures, following testing of these plans and procedures in 2010. This work included incorporating requirements for a new office lease to accommodate the River Management Division.

The MDBA business continuity plan describes arrangements to ensure the continuity of our key services after a significant, unexpected and disruptive incident (such as a fire). The plan also describes our management structure; staff roles and responsibilities; activation criteria; procedures for continuing core business activities and managing recovery from emergencies, disasters and other disruptive events; and maintenance procedures.

The MDBA ICT disaster recovery plan provides recovery procedures to address the potential loss of critical ICT resources (e.g. hardware, data and voice network equipment, and critical business data and systems).

Our internal auditors, KPMG, reviewed our business continuity documents in 2011; the ensuing recommendations are being incorporated into an updated suite of documents, underpinned by an updated business impact analysis.

The Audit Committee reviews and monitors these plans.

## **Internal audit**

Internal audit services during 2011–12 were provided by KPMG. The Internal Audit Plan 2011–12 was developed after the MDBA's strategic risks were considered and following discussions with senior managers; the plan provides a balance between compliance and performance audits.

Internal audits and reviews finalised during the year covered:

- MDBA records management
- business continuity and ICT disaster recovery management plans and documentation
- state natural resource management agency contracts
- budgeting and contract payments for state constructing authorities
- human resources management information system.

No serious breaches were found in the audits.

Two audits began in 2011-12 — the water trade performance audit and the procurement and contract management audit — and will be finalised in 2012-13.

The internal auditors also worked with the MDBA to develop our 2011–13 fraud control plan, and began work on the 2012–13 risk management plan. The internal auditors also carried out a security risk assessment to better position the MDBA for the new security compliance framework that will come online in 2012–13.

At its quarterly meetings the Audit Committee continued to monitor implementation of internal audit report recommendations through status reports.

### **Certificate of Compliance**

The MDBA online Certificate of Compliance system is a cornerstone of our wider corporate governance model. The system enables the Chief Executive to report on MDBA compliance with the Australian Government's financial management framework to the Minister for Sustainability, Environment, Water, Population and Communities (the Commonwealth Minister for Water) and the Minister for Finance and Deregulation by 15 October each year.

Compliance performance is assessed against the:

- Financial Management and Accountability Act 1997
- Financial Management and Accountability Regulations 1997
- Financial Management and Accountability (Finance Minister to Chief Executives) Delegation 2007 (No. 2) as amended from time to time
- Australian Government's foreign exchange risk management requirements
- legal and financial requirements for the management of special accounts
- Australian Government's financial management policies.

All staff holding financial delegations, including senior executives, are required to complete regular compliance assessments.

During 2011–12, the MDBA identified 62 items of non-compliance. A review of compliance results indicated that most matters did not entail significant risk.

#### Secretariat services

During 2011–12 the Secretariat Team provided quality secretariat support for a total of 50 meetings, including of the Murray–Darling Basin Authority, the Legislative and Governance Forum on the Murray–Darling Basin (which convenes as the Murray–Darling Basin Ministerial Council when making decisions under the *Water Act 2007* and Murray–Darling Basin Agreement), the Basin Officials Committee, the Basin Community Committee and various other high-level committees.

The Secretariat provided logistical, operational and technical support to ensure meetings were well governed and productive. The team produced and controlled the quality of meeting agenda; compiled meeting papers, minutes, decision registers and reports for each committee; and distributed committee papers and responses to out-of-session requests in a timely way.

The team also processed claims and entitlements for the committee chairs and individual members, and ensured each member was aware of their obligations and responsibilities under legislation and Australian Government guidelines.

In undertaking its work, the team has built and nurtured strong relationships within the Authority and with Australian Government and Basin state government agencies and regional community committees.

Appendix A (page 228) provides a summary of committee meetings and their participants.

## **External scrutiny**

#### **Auditor-General reports**

In addition to the annual financial compliance audit, the ANAO undertook a performance audit of the MDBA relating to confidentiality-in-government contracts against the requirements of the Senate Order for Departmental and Agency Contracts (June 2001).

The MDBA also actively reviews all cross-agency reports issued by the Auditor-General, including any better practice statements or guides. Where these reports are assessed as having relevance to MDBA operations, we evaluate our policies and/or procedures with a view to possibly implementing report recommendations.

The Audit Committee also oversees any implementation of these recommendations (see page 147).

#### **Commonwealth Ombudsman**

The Commonwealth Ombudsman made no formal reports relating to MDBA during 2011–12.

#### **Parliamentary committees**

On 29 May 2012, the Hon Tony Burke, the Commonwealth Minister for Water, asked the House of Representatives Standing Committee on Regional Australia to inquire into and report on certain matters relating to the proposed Murray–Darling Basin Plan. The inquiry's terms of reference were:

- progress to date in water recovery towards bridging the gap by 2019 through both irrigation infrastructure investments and water purchase
- the potential role that new environmental works and measures projects could play in partially offsetting sustainable diversion limit reductions under the Basin Plan, focusing particularly on prospective project proposals identified by state governments and community interests
- the groundwater sustainable diversion limits for the Basin in the revised proposed Basin Plan.

The committee tabled its report — *Report into certain matters relating to the proposed Murray–Darling Basin Plan* — on 6 July 2012; at the time of compiling this annual report, the Australian Government had not responded to the committee's findings.

The Senate Standing Committee on Rural and Regional Affairs and Transport inquiry into the management of the Murray–Darling Basin is underway; it has been granted an extension of time for reporting to the Australian Parliament, from 30 November 2011 until 12 September 2012.

# Judicial decisions and decisions of administrative tribunals

No judicial decisions or decisions of administrative tribunals relating to the MDBA were made during 2011–12.

## **Privacy**

During 2011–12 the MDBA updated its privacy policies and procedures, including our internet privacy notice, available on our website, <www.mdba.gov.au>. We treat personal information in accordance with the *Privacy Act 1988*, including its information privacy principles.

The MDBA registered with the Office of the Australian Information Commissioner as a partner in Privacy Awareness Week 2012, which ran from 29 April to 5 May 2012. The slogan of 'Good privacy = Good public service' reminded government agencies to be aware of their responsibilities under the Privacy Act to protect the personal information they collect and handle. Privacy Awareness Week also encouraged individuals to exercise their privacy rights and to take steps to ensure their personal information is handled appropriately.

### **Legal services**

The MDBA's legal services are provided mainly through an in-house legal team, although we also use legal services provided by a legal panel established by the Department of Broadband, Communications and the Digital Economy. Since 1 June 2012, we have been able to access the Legal Services Multi-use List established by the Attorney-General's Department.

During 2011–12, internal demand for legal services continued to be associated with preparing the proposed Basin Plan. The Australian Government Solicitor was engaged to assist us with drafting services.

Important MDBA initiatives relating to legal services during the past year included:

- contributing to the development of regulations under the Water Act and reviews required by the Murray–Darling Basin Agreement
- providing high-level legal services as part of developing the proposed Basin Plan and its associated documentation
- assisting in the implementation of the Work Health and Safety Act
- updating our contract and procurement templates
- assisting with the implementation of Creative Commons licensing
- training MDBA staff on privacy and freedom of information obligations
- advising all MDBA divisions about program delivery and legislative obligations
- implementing business management systems for obtaining legal services from both internal and external legal service providers to ensure compliance with the Legal Services Directions 2005.

### Freedom of information

During 2011–12, MDBA received 22 freedom of information requests.

The *Freedom of Information Act 1982* gives individuals the right to view documents held by Australian Government ministers and agencies, with some exceptions.

Under the Freedom of Information Act, the MDBA must publish a range of information on our website as part of the Information Publication Scheme. This information includes our structure, functions, appointments, annual reports and consultation arrangements, and contact details for our freedom of information officer. Information routinely released following freedom of information requests and provided to parliament is published online. Our IPS agency plan outlines our approach to the scheme and what we include in our IPS entry and publish online.

#### **Documents we hold**

The MDBA holds the following types of documents:

- representations to the Commonwealth Minister for Water and to the MDBA on various aspects of government activity
- working files, including correspondence, analysis and advice
- internal administrative records, such as personnel files, staffing and financial records and office procedures
- submissions and comments from the public and stakeholders
- papers relating to new and amending legislation, drafting instructions and draft legislation
- briefing papers and submissions prepared for the Commonwealth Minister for Water
- documents relating to meetings and committees (such as agenda, minutes and reports)
- copies of questions asked in parliament, together with related replies
- tender documents
- government (including agency) policy statements, communiqués, guidelines and media releases
- contracts
- educational materials
- reports on research, water audits and MDBA activities.

#### How to lodge a freedom of information request

Your request must:

- be in writing
- state that the request is an application for the purposes of the Freedom of Information Act
- provide information about the document(s) to assist us to process your request
- provide an address for reply.

Please note charges may apply.

#### **More information**

For more information, contact the MDBA's freedom of information officer in one of the following ways:

Mail	FOI Officer Murray–Darling Basin Authority GPO Box 1801 Canberra ACT 2601	
Email	foildmdba.gov.au	
Phone	(02) 6279 0429	
Fax	(02) 6248 8053	

## **Directions under section 175 of the Water Act**

No directions were given by the Commonwealth Minister for Water under s. 175 of the Water Act.

## Advice to government

The MDBA advises the Commonwealth Minister for Water through briefings and uses the ministerial workflow system of the Department of Sustainability, Environment, Water, Population and Communities to ensure the minister receives timely advice.

Table 6 sets out the volume of advice provided to the minister during 2011–12 compared to the previous year.

Type of advice	2010-11	2011–12
Ministerial correspondence	6	0
Briefs	34	32
Question time briefs	10	0
Senate Estimates questions on notice	45	199

Table 6. Volume of ministerial advice, 2011–12

## **OUR PEOPLE**

## **Highlights**

- Implemented the Murray–Darling Basin Authority's 2011–14 Enterprise Agreement.
- Improved MDBA human resources policies and procedures.
- Implemented the MDBA's inaugural cadetship program.
- Ongoing delivery of selection advisory committee training to 90 employees.
- Established a non-ongoing employment register.
- Commenced development of a streamlined electronic recruitment system.
- Implemented a new MDBA-specific online induction program.
- Implemented a major organisational restructure.
- Implemented a leadership program to executive level (EL) 1 and 2 employees to build a strong leadership cohort across the MDBA.
- Implemented measures to ensure the MDBA complies with the new work health and safety framework.

## Learning and development

The MDBA is committed to the continuous development of its employees.

In the interests of streamlining processes and improving recruitment outcomes, the MDBA has implemented selection advisory committee training. It is mandatory for selection committee chairs and at least one other member of a committee to have completed the training.

More than 28% of the MDBA workforce used the Australian Public Service Commission for learning and development, with the trend towards report writing, influencing skills, strategic thinking skills, team management, leadership and career development. Information technology skills development continues to be embraced, with at least 10% of MDBA employees undertaking training in either generic office packages such as Excel and Microsoft Word or packages specific to their roles.

During 2011–12 the MDBA established a customised online induction module that provides:

- information about the MDBA to assist new employees to orientate themselves
- refresher training in work health and safety, diversity and bullying and harassment training for all employees.

We also support employees undertaking tertiary studies — during 2011–12, 30 employees undertook approved study, including three employees studying for doctorates and two employees studying to gain Certified Practising Accountant certification. We also helped three employees access Australian Capital Territory Government funding through the Productivity Placements Program to undertake diplomas in project management, and nine others to access Australian Government funding to begin certificates in business administration and frontline management.

#### Leadership

During 2012, two cohorts of EL 1 and EL 2 employees participated in our Leadership Development Program. The three-month program combines structured learning in a series of facilitated workshops with experiential learning in the form of on-the-job projects applicable to the MDBA's operational needs. Key objectives of the program are:

- build a strong leadership cohort across the organisation with the flexibility to support a matrix workforce structure
- recognise and develop talented executive level staff for succession to senior executive service (SES) positions within the MDBA.

Over the next two to three years, all EL employees will participate in the program, which offers:

- EL 1 employees the opportunity to prepare for future leadership within the MDBA by shaping their strategic thought and leadership style.
- EL 2 employees the opportunity to improve their own leadership capacity by exploring, as individuals and in cross-divisional groups, the concepts, values and strategic challenges of leadership with a view to driving cultural change throughout the organisation.

The MDBA also focused on SES leadership development, with a number of SES participating in leadership programs, including learning groups that bring together SES from agencies similar in size and nature to share ideas and issues.

#### **Coaching program**

Executive coaching, as well as being offered as a standalone activity, is an integral part of the Leadership Development Program. Coaching is offered primarily to EL 1 and EL 2 employees as a way to improve leadership capability and team management and to enhance effectiveness.

The Employee Coaching Program has been strengthened by engaging a panel of providers comprising 19 organisations and over 50 specialised coaches. Building long-term relationships with coaching professionals gives MDBA employees an opportunity to gain guidance to enhance individual effectiveness, team management and leadership skills.

### **Performance management**

The MDBA's performance management framework — emphasising feedback, appraisal and development — provides biannual performance management reviews, learning needs analysis and a focus on career development.

Our electronic performance management and development scheme, which is moving us away from a paper-based performance management and development scheme, continues to evolve.

In 2011–12, the MDBA conducted information sessions on performance management and workplace policies. Two workshops for staff were conducted on 'having difficult conversations', and were aimed at:

- assisting employees and supervisors to conduct effective performance reviews
- facilitating performance management planning.

## **OUR WORKFORCE**

## Workforce planning

Throughout 2011–12 the MDBA's Human Resources Team worked with line managers to better understand operational workforce issues and implement Workforce Strategic Plan actions. Our activities will ensure that the MDBA has the right workforce and effective development strategies to achieve business outcomes and deliver on the MDBA Corporate Plan priorities.

To add to the suite of workforce frameworks already in use to help managers clarify their workforce needs, a new succession-planning tool is being developed. We are also committed in the MDBA Enterprise Agreement 2011–14 to clearly define professional job streams within the MDBA, and to link them to the capability framework and work level standards. Work is progressing on this project, including extensive consultations with the Australian Public Service Commission to ensure alignment with employment classifications using the Australian and New Zealand Standard Classification of Occupations.

Over the past year, we have:

- embedded the cadetship program as part of our recruitment strategy
- introduced online functionality to our exit survey to improve data collection and retention
- commenced development of a mature age strategy.

## Australia Day achievement awards

The Australia Day Achievement Awards are a way for the MDBA to recognise the contribution of individuals and teams for outstanding performance on special projects or in performance of individual core duties.

Awards were presented at an all-staff get together to celebrate Australia Day in January 2012. This year 23 nominations were received — 18 individual nominations and five team nominations. Individual recipients were Erin Russell, Lorraine Haalebos and Jahid Mahedi, while four teams received awards:

- Environmental hydrology
- Basin Plan modelling
- Records management
- Engagement.

Building a culture in which our employees are valued, recognised and rewarded for outstanding performance is critical for the MDBA to attract and retain the best staff. By improving staff satisfaction, we increase staff motivation and encourage managers to provide continual informal feedback and recognition of employee performance.

### Annual report photographic competition

The cover image of the *Murray–Darling Basin annual report for 2011–12* and a number of images that appear elsewhere in the publication were taken by MDBA staff. We selected these images by running a competition — a people's choice competition — to find the photographs that a majority of staff felt best represented the work of the agency.

The competition ran for two weeks; photographs were displayed on the MDBA intranet and staff voted for their preferred images. The winning image, which is featured on the cover of and throughout this annual report, was selected from among 54 others submitted to the competition; one of three highly ranked images, it was taken by Brayden Dykes of the Communications Team.

# Determining senior executive service employee remuneration

The MDBA had 14 SES employees at 30 June 2011. Rates of pay for SES employees are set by the MDBA Chief Executive after consultation with individual employees and in accordance with the agency's SES remuneration policy. All SES employees are covered by s. 24(1) Determinations.

### **Performance pay**

Senior executive service and non-SES MDBA employees are not eligible for performance pay. However, a non-SES employee at the top or penultimate increment point in their salary range may be eligible for a one-off bonus as a result of a superior performance rating.

# Individual non-senior executive service terms and conditions

Where appropriate, special terms and conditions of employment are provided to non-SES employees through individual flexibility agreements.

## **Enterprise agreement**

The current enterprise agreement — the Murray–Darling Basin Authority Enterprise Agreement 2011–14 — came into effect on 24 August 2011 and has a nominal expiry date of 30 June 2014. The new agreement was negotiated under the Fair Work Act and the Australian Government Bargaining Framework that came into effect in January 2011.

The purpose of the enterprise agreement is to enable all parties to work together to achieve the objectives of the MDBA Corporate Plan. Under the enterprise agreement, employees received access to enhanced provisions and entitlements and a 4% salary increase in August 2011, with further increases — 3% (July 2012) and 2% (July 2013) — payable during the life of the agreement.

The MDBA participated in Australian Public Service Commission enterprise bargaining evaluation focus groups. Feedback from these focus groups assisted the commission to evaluate enterprise bargaining in the Australian Public Service (APS) in 2011.

## **Staffing profile**

The following tables summarise MDBA staffing statistics for 2011–12.





Note: The Chair and the four members of the Authority are not included in this table.

SALARY RANGE BY CLASSIFICATION (\$)					
41,221–44,862	77,785–85,611				
Aps 1	Aps 6				
47,467–51,657	93,154–102,481				
Aps 2	EL 1				
54,593–59,309	108,362-127,708				
APS 3	EL 2				
60,970–66,236	181,682-205,393				
Aps 4	ses 1				
68,457–75,342	212,945-251,796				
APS 5	ses 2				

Table 8. Salary range for MDBA employees as at 30 June 2012

Note: Salary rates as at 30 June 2012.

Table 9. Salary range for MDBA non-SES employees on individual flexibility arrangements as at 30 June 2012



CLASSIFICATION	GENDER S	SUBTOTAL	TOTAL
APS 1	4 Female	0 Male	4
APS 2	3 Female	0 Male	3
APS 3	7 Female	3 Male	10
APS 4	19 Female	5 Male	24
APS 5	32 Female	11 Male	43
APS 6	48 Female	32 Male	80
EL 1	50 Female	46 <sub>Male</sub>	96
EL 2	15 Female	44 Male	59
SES	4 Female	10 <sub>Male</sub>	14
CE	1 Female	0 Male	1
TOTAL	183	151	334

Table 10. MDBA employees by job classification and gender as at 30 June 2012

Note: The Chair and the four members of the Authority are not included in this table.

TOTAL OF ONGOING AND NON-ONGOING EMPLOYEES BY AGE PROFILE						
	Under 25 years	25-34 years	35-44 years	45-54 years	55-64 years	65 +
ONGOING	11	74	96	74	42	2
NON- ONGOING	1	13	9	9	2	1
TOTAL	12	87	105	83	44	3

Table 11. Age profile of MDBA employees as at 30 June 2012

Table 12.	MDBA	employees b	y equal	. employment	opportunity	group as a	t 30 June 2012
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MDBA EMPLOYEES BY EQUAL EMPLOYMENT OPPORTUNITY GROUP						
	Female	Non-English speaking background	Indigenous	People with a disability		
ONGOING	159	59	0	9		
NON- ONGOING	24	11	0	2		
TOTAL	183 (55%)	70 (21%)	0 (0%)	11 (3%)		
Volunteered personal data	100%	96%	96%	95%		

## Recruitment

In 2011–12, the MDBA advertised 55 positions externally — including two SES positions, graduates, cadets and rolling recruitment exercises — attracting 848 candidates. We advertised 36 internal expressions of interest.

Our rolling recruitment strategy continued throughout the year. Designed to attract job candidates with our required technical knowledge and skills, the strategy resulted in 15 positions being filled. The ongoing rolling recruitment process enables us to assess and shortlist suitable potential staff quickly and streamline the recruitment process.

The MDBA maintains and extensively accesses a merit list of candidates found highly suitable at various levels, generated from recruitment actions across the agency. The use of this merit list has reduced administrative processes.

In late 2011, we ran a bulk recruitment round for generic APS 5 level positions. The recruitment round attracted 33 applications and to date we have employed 10 people from the merit list.

During 2011–12, 90 employees attended our comprehensive recruitment and selection training program for selection advisory committee members; feedback and evaluation of the program was generally positive, and the program will continue during 2012–13.

We refined online short-listing and application assessment processes to improve efficiency and enable a shorter turnaround from closing date to offers of employment, with time taken to fill a vacancy at 45 or fewer days during 2011–12.

We introduced an online induction program to ensure that new employees are given a structured, blended induction that provides clear and consistent information about the MDBA and its culture. Feedback received about the program has been positive.

At the end of December 2011, we established a non-ongoing register of over 600 candidates, from which we have since employed 20 staff. The register has proven to be a significantly more cost-effective way to access quality non-ongoing candidates rather than using recruitment agencies.

We are currently implementing eRecruit to streamline current processes by using electronic workflows. Automated report functionality will:

- reduce the need to maintain data outside the system
- enable more detailed and accurate management reports
- help monitor and further improve the recruitment process
- improve the quality of external reporting data.

#### **Graduate program**

In 2011–12, we recruited seven graduates from a variety of backgrounds to our graduate program, including one who transitioned from the cadetship program. The graduate recruitment program continues to gain a solid reputation in the graduate space.

Graduates complete placements in three different MDBA areas and undertake a comprehensive development program — the Small Agencies Graduate Development Program — through the Australian Public Service Commission. This training is designed to equip graduates with the skills and knowledge they will need to make a meaningful contribution to the MDBA and APS.

Graduates are supported in their professional development by a mentoring program and additional training sourced from various professional bodies and training providers. Recruitment for the 2013 graduate intake is currently underway, with 333 applications for up to eight places commencing in January 2013. Two graduates will be advanced through the cadet broadband and will be selected from the current group of cadets, who are due to finish their studies in 2012.

#### **Cadet and trainee programs**

The MDBA cadetship program, implemented to better balance the MDBA's demographic and classification profile, was introduced in 2010–11.

In June 2012, we finalised recruitment for the 2012–13 cadetship program, with three new cadets joining the MDBA. We advertised the program through local Australian Capital Territory universities' job-boards and a targeted student email campaign. We attracted 20 high-quality candidates for the three positions.

## **Diversity**

The MDBA continues to support workplace diversity through its Workforce Diversity Program and Indigenous Employment Strategy.

The MDBA enterprise agreement 2011–14 introduces and reinforces terms and conditions that value and capitalise on employee diversity. Creating a more productive and fulfilling workplace will enable us to attract, develop and retain high-quality employees in a competitive employment environment.

During 2011–12, we participated in the APSC's Pathways entry-level recruitment programs — the Indigenous Graduate Program and Indigenous Cadetship Program — to help improve Indigenous Australian representation within the MDBA. We remain committed to increasing Indigenous employment representation.

The MDBA continues to work in partnership with 31 Indigenous nations throughout the Murray– Darling Basin. More information about these partnerships can be found throughout this annual report, but see particularly 'Traditional owners' (page 26), 'The Living Murray Indigenous Partnerships Project' (page 56) and case study 7 (page 110).

## Disability

The MDBA's disability strategy and action plan identifies strategies and supports measures that assist people with disability to access our programs, policies and information. Where possible and appropriate, we focus on objectives established by the Management Advisory Committee report, *Employment of people with disability in the APS*, and integrate Commonwealth Disability Strategy principles in our corporate processes.

Our disability action plan for 2011–12 successfully gave effect to five broad principles — equity, inclusion, participation, access and accountability. It is significant that the percentage of our staff who identified themselves as having a disability increased to 3%.

The MDBA complies with the Australian Government accessibility requirements for online publishing and in recruitment processes; we support use of assistive furniture and other equipment to help staff carry out their duties.

## WORK HEALTH AND SAFETY

# Executive commitment, work health and safety structure and oversight

The Murray–Darling Basin Authority (MDBA) recognises its obligations under the Work Health and Safety Act and related regulations, codes and standards.

Under the Work Health and Safety Act, the MDBA comprises 'two persons conducting a business or undertaking' (PCBU) — the six-member Murray-Darling Basin Authority (the Authority), established under s. 171 of the Water Act; and the Commonwealth, represented by the MDBA, which was established under s. 206 of the Water Act.

Officers' and workers' awareness of their work health and safety responsibilities was improved during 2011–12 in various ways — presentations; issuing meeting papers; producing work health and safety induction material for MDBA committees; producing risk assessments and emergency information for meetings of the Authority and its committees; developing and distributing appropriate policies, procedures and information; conducting training and information sessions; and establishing an online WHS training package.

We developed appropriate processes for inducting contractors and visitors about WHS responsibilities, updated all procurement and contracting documentation, and contacted organisations that carried out MDBA-funded work under agreements that began before 1 January 2012 and continued after that date.

All parties to the MDBA's enterprise agreement 2011–14 are committed to the safe operation of all equipment, safe working practices and a healthy work environment for all employees under applicable Work Health and Safety Act obligations.

The MDBA Health and Safety Management Arrangements (HSMAs), setting out how we manage work health and safety, have been rewritten to align with the new WHS framework.

The MDBA HSMAs are developed in consultation with the Health and Safety Committee and our Employee Consultative Committee, all MDBA employees, other workers (where reasonably practicable) and the Executive. Once approved by the Chief Executive, the HSMAs are made available to all MDBA workers either on our intranet or by request.

## **Effective communication and consultation**

All MDBA officers and other managers are responsible for consulting and cooperating with workers on workplace health and safety.

Work health and safety awareness, training, communication, consultation and coordination are undertaken through:

- email, intranet, posters and signs as required
- mandatory induction and training courses, and MDBA-wide information sessions
- appropriate forums, in particular the Health and Safety Committee
- consultations with health and safety representatives in each work group
- procedures to consult with PCBUs that share responsibility for workers with the MDBA.

The Health and Safety Committee is consulted before new WHS policies, guidelines or procedures are implemented or existing arrangements are changed. The committee also considers workplace relations issues relating to WHS, emergency management, protective security, accommodation and amenities.

#### Initiatives ensuring workers' health and safety

The MDBA actively promotes the health, safety and welfare at work of our workers by:

- undertaking comprehensive inspections of office workplaces with responsible managers
- ensuring home workplace inspections are carried out by qualified providers before home-based work applications are approved
- offering influenza vaccinations to all employees
- developing safety posters for the workplace
- developing and reviewing internal policies and procedures, to ensure currency and to address any new or emerging hazards
- offering workstation assessments to all employees
- developing WHS induction for new employees, contractors and visitors, and members of the Authority and MDBA committees
- promoting the use of the Employee Assistance Program
- placing a high priority on early intervention, encouraging staff to report any symptoms early to prevent development of chronic injury or illness
- reviewing and regularly updating WHS information on our intranet
- recognising, respecting and valuing the importance of individual differences in the workplace
- fostering an inclusive work environment free from discrimination and harassment by establishing a network of trained harassment contact officers
- supporting paid training for harassment contact officers, first aid officers, health and safety representatives, emergency wardens and staff involved in WHS and rehabilitation management.

#### Health and safety outcomes achieved as a result of initiatives

A 2010–11 independent audit of the MDBA showed a high level of compliance with the then applicable occupational health and safety requirements; a further audit will be undertaken in the coming year to determine our compliance with the new WHS framework.

Workplace inspections in designated work groups and walk-arounds of new accommodation by trained health and safety representatives provided comprehensive understanding and follow-up of existing and emerging WHS issues. Almost all issues identified in MDBA workplace inspections were fixed during 2011–12.

This proactive WHS approach ensured that workstation assessments were provided to employees when requested. Such prompt assessments help to ensure that workers are not injured because of poorly set up workstations, inadequate or inappropriate equipment and environments, or inappropriate work practices (e.g. not taking rest breaks).

By providing information and training about the new WHS requirements, we have ensured greater worker awareness of the new WHS framework and responsibilities.

#### Work health and safety statistics

Table 13 compares work health and safety statistics for 2010–11 and 2011–12.

Table 13. Work health and safety s	statistics, 2010–11 and 2011–12
------------------------------------	---------------------------------

	2011-12	2010–11
Internal reports on workplace hazards and incidents	59*	24
Lost time caused by incident and injury not reported to Comcare	2 staff days	10.5 staff days
Lost time caused by incident and injury reported to Comcare	17 staff days	4 staff days
Incidents reported to Comcare	5 a rate of 16.7 incidents per 1,000 full-time equivalent employees	2 a rate of 6.6 incidents per 1,000 full-time equivalent employees
Lost time because of rehabilitation cases	47.47 staff days — equates to 31.81 weeks per 1,000 full-time equivalent employees	91.47 staff days — equates to 42.9 weeks per 1,000 full-time equivalent employees

\* The increase is largely attributable to the opening of a new office for one MDBA division, extensive refurbishment of the main MDBA office and a high volume of repetitive keying tasks throughout the agency.

#### **Comcare investigations conducted or notices issued**

Comcare did not conduct any investigations or issue any notices to the MDBA under the *Occupational Health and Safety Act 1991* during 2011 or the Work Health and Safety Act during 2012.

#### **Comcare premiums**

During 2010–11, MDBA had five claims with Comcare, with a total cost of \$124,407.76. The average cost of claims was \$24,881.55 with a claim frequency of \$804 per \$1 million-payroll. In 2011–12, the Comcare premium was \$385,445 (after the mid-financial year adjustment), the rate increasing to 1.38% from 0.99% in 2010–11.

#### Accident and dangerous occurrence statistics

Section 68 of the Occupational Health and Safety Act required certain incidents to be notified to Comcare within specific timeframes but s. 35 of the Work Health and Safety Act requires immediate reporting of notifiable incidents to Comcare. The following table details MDBA incidents notified in 2011–12.





# OUR PLANNING AND FINANCES

## **Main activities**

- Restructured agency planning and reporting approaches to better enable strategic plan goals and objectives to be achieved and aligned with the MDBA's new organisational structure.
- Worked closely with the Basin states to implement Strategic Programs Review recommendations, focusing on developing the agreed Joint Programs Strategic Framework and joint investment qualifications and prioritisation criteria.
- Further refined key policies, guidance and business processes and incorporated recent amendments to the *Financial Management* and Accountability Act 1997 and its associated regulations.
- Continued enhancement of electronic reporting systems, including online Certificate of Compliance data collection and reporting to increase operational efficiencies.
- Progressed implementation of key conceptual frameworks (e.g. budgetary control) to further strengthen financial management and accountabilities.

## **Business planning**

#### Strategic plan and restructure

In 2011–12, the MDBA developed a new strategic plan and undertook an organisation restructure to better deliver our new strategic goals and strengthen agency efficiency and effectiveness.

The strategic plan is the final element in our strategic framework. It establishes a crucial foundation for our corporate planning processes by informing our business plan and budget, our corporate plan, Portfolio Budget Statements and work plans. Our vision, mission and strategic goals were the key drivers in restructuring the agency.

The new organisational structure was implemented on 1 December 2011, and places the MDBA in a stronger position to deliver on our work program over the next few years, by bringing together similar functions and integrating business across the agency. **see organisational structure on page 16** 

It also enabled us to strengthen our policy and coordination functions, build the capacity of the Eco-hydrology and the Economic and Social Policy Analysis teams, and mainstream and deepen our engagement capacity across all divisions.

#### **Corporate plan**

The MDBA Corporate Plan for 2011–12 to 2014–15 is the agency's official business planning document. The plan is given to the Commonwealth Minister for Water each year, and includes the Basin Plan component agreed by the six-member Murray–Darling Basin Authority, along with the component of the plan approved by the Murray–Darling Basin Ministerial Council for Murray–Darling Basin Agreement functions.

The corporate plan outlines the MDBA's planned activities and budget for four financial years, as they relate to its functions under the Water Act and the Murray–Darling Basin Agreement.

## **Strategic Programs Review**

The Murray–Darling Basin Ministerial Council Strategic Programs Review was undertaken by SKM Pty Ltd and completed in 2010–11. In 2011–12 we made significant progress in implementing recommendations arising from the review, including:

- establishment of the Strategic Programs Implementation Advisory Group
- development of the Joint Programs Strategic Framework
- development of qualification and prioritisation criteria for assessing programs for joint investment
- improvement of performance reporting mechanisms.

In 2011–12 we clarified and set in place an agreed strategic direction consistent with the objectives and aspirations of joint funding partners and Basin Plan directions. This will both improve the operation of the joint programs and strengthen their capacity to deliver desired results by implementing agreed program management standards.

### **Performance reporting**

Performance reporting during 2011–12 included:

- monthly financial reporting provided to the MDBA Executive
- quarterly workforce statistics and project management reports provided to the Executive, with monthly reports provided to business managers
- quarterly financial and non-financial performance against the MDBA Corporate Plan provided to the Basin Officials Committee
- quarterly reports provided to the Audit Committee on implementing the risk management, fraud control, business continuity and disaster recovery plans, and internal and external audit reports.
During 2011–12, we began a project to strengthen our financial and non-financial performance reporting system, as recommended by the Strategic Programs Review. These improvements include, but are not limited to, improving the design of:

- quantitative and qualitative key performance measures and identifying targets to provide clearer indication of progress towards the MDBA's strategic goals
- performance reports to provide more relevant financial and non-financial performance information to enhance decision-making.

# **Project management framework**

During 2011–12, we focused mainly on further embedding the use of the project management framework supported by the Project Registration and Reporting System, which delivers enhanced capability for program and project support and reporting.

We implemented recommendations made by the 2009–10 post-implementation review of the project management framework, which saw the framework enhanced by:

- improved categorisation and processes relating to projects, programs and jurisdictional project coordination
- renewed focus on basic project management skills training for project staff
- increasingly customised data capture, reporting and workflow capabilities according to project type, in line with Executive requirements and user needs.

Individual mentoring and internal group training sessions about the project management framework helped improve the consistent management of over 70 minor and major MDBA projects. By including Leadership Development Program projects in the project management framework, we re-emphasised to management the continuing need to apply project management methodology across the agency.

# **Financial management**

We continued to enhance the MDBA's reporting, monitoring and evaluation systems, as part of our commitment to driving improved information, management and efficiencies and maintaining a robust internal control framework.

During 2011–12, we focused on the internal budgetary control framework and on enhancing our overall policies, procedures and guidance.

We also undertook a rigorous internal review of how the agency satisfied s. 83 matters under the *Commonwealth of Australia Constitution Act 1900* (Imperial).

While adhering to the Department of Finance and Deregulation's financial framework, we also sought, wherever possible, to implement better practice, having close regard to the various reporting and other announcements by the ANAO.

Aside from ongoing investment in various business applications, in 2012–13 we will continue to invest in our employees' skills to ensure our Executive, managers and other staff members continue to meet the stringent financial management requirements expected of them.

# **Financial performance**

## **Revenues**

The MDBA received \$52.8 million in Appropriations from the Australian Government during 2011–12.

This sum included \$38.7 million for Basin Plan functions. Other revenues included \$10.7 million in interest from funds held in MDBA's Special Account (see 'Funding operating deficits', page 3).

A further appropriation of \$3.3 million was received to continue the Hume Dam improvement program, along with \$10 million in additional funding from Basin states going towards the total estimated cost for this project of \$40 million.

# **Expenditures**

The MDBA's total expenditure for 2011–12 was \$199.512 million as compared to \$218.588 million in 2010–11. Table 15 outlines the main features of our financial performance.

# Table 15. MDBA financial performance, 2011–12

Murray-Darling Basin Authority		2010–11 Actuals \$'000	2011–12 Actuals \$'000	2011–12 Variance \$'000
bartmental	Revenue	175,687	172,170	(3,517)
and total dep	Expenses	218,588	199,512	(19,076)
Outcome 1	Surplus (deficit)	(42,901)	(27,342)	15,559

# **Financial position**

The MDBA's net equity position reduced in 2011–12 by \$27.3 million, to \$155.3 million. This reduction was caused by an operating deficit of \$27.3 million, funded from existing cash resources. The operating deficit and reduction in cash resources reflects planned activity to complete Environmental Works and Measures Program projects. **see further information on page 105** 

# Assets and asset management

The MDBA's financial and non-financial assets at the end of 2011–12 were \$202.1 million and \$5.7 million, respectively. Our financial assets consist of cash and cash equivalents, trade and other receivables. Our non-financial assets consist of ICT infrastructure and office fit-out and equipment.

# **Liabilities**

Liabilities administered directly by the MDBA at the end of 2011–12 amounted to \$52.6 million. Our liabilities mainly consist of amounts owing to suppliers and provisions for employee entitlements.

# **Total equity**

The MDBA ended the year with total equity of \$155.3 million (see Table 16), consisting mainly of cash resources, minor fixed assets offset by trade and employee liabilities.

Table 16. MDBA equity at end of 2011–12

Measurement	2010–11 \$'000	2011–12 \$'000
Assets	227,653	207,879
Liabilities	45,039	52,607
Total equity	182,614	155,272

# **Discretionary grant programs**

The MDBA did not make any discretionary grants during 2011–12.

# Managed assets: joint ventures

The MDBA is the appointed manager for the following classes of assets:

- River Murray Operations assets
- water entitlements under The Living Murray (TLM) program.

The assets are controlled through two unincorporated joint ventures established to hold jurisdictional assets previously held by the Murray–Darling Basin Commission. The joint ventures were established through two agreements between partner governments:

- Asset Agreement for River Murray Operations Assets (RMO joint venture agreement).
- Further Agreement on Addressing Water Overallocation and Achieving Environmental Objectives in the Murray–Darling Basin — Control and Management of Living Murray Assets (LMI joint venture agreement).

At 30 June 2012, the RMO joint venture held net assets of \$2.5 billion. The LMI joint venture held net assets of \$498 million, comprising gross investment in water recovery measures of \$695.4 million and an impairment loss of \$197.4 million.

Under the RMO joint venture agreement, each jurisdiction controls its share of River Murray Operations assets through its representatives on the Murray–Darling Basin Ministerial Council and the Basin Officials Committee. The Basin states acknowledge that the MDBA manages RMO assets on their behalf.

Under the LMI joint venture agreement, TLM partner governments jointly control TLM assets. These governments acknowledge that TLM assets are not under MDBA control but that the MDBA is responsible for managing them.

# **Procurement activities**

# **Purchasing and procurement**

The MDBA conducted procurement activities in 2011–12 in accordance with the Commonwealth procurement guidelines.

We follow a devolved procurement framework that places responsibility for procurement with the appropriate financial delegate. To support these delegates, we established Chief Executive's Instructions for procurement and we provide ongoing training to financial delegates. The MDBA's Procurement and Contracts Unit provides advice and assistance to line areas conducting procurements, which ensures our compliance with relevant Commonwealth procurement guidelines instructions, policies and procedures. The unit also advises MDBA staff on probity and on maintaining standard tender and contract templates.

# Performance against core purchasing policies

The MDBA complied with the mandatory procurement procedures of the Commonwealth procurement guidelines throughout 2011–12.

We advertised tender opportunities through the AusTender website, <www.tenders.gov.au>. Documentation, including a facility for tender submission, is available on our website, <www. mdba.gov.au>.

Our procurement plan for 2011–12 was published on the AusTender site in June 2011 and will be updated as required in the coming year.

# Reporting

All contracts with a value of \$10,000 or more were reported on AusTender in 2011–12. The MDBA met requirements to report on the Senate Order on Government Agency Contracts for the calendar year 2011 and the financial year 2011–12.

All contracts with a value of \$100,000 or more are listed on our website, <www.mdba.gov.au/about/tenders>.

We satisfied the requirement to report to the Department of Finance and Deregulation on authorisations to spend public money under regulation 10 of the Financial Management and Accountability Regulations 1997.

# **Consultancy services**

The MDBA procures consultancy services in accordance with the Commonwealth procurement guidelines and the Chief Executive's Instructions. We select consultants using the value-for-money principle.

# **Expenditure on consultancy contracts**

During 2011–12, we entered into 112 new consultancy contracts, involving total actual expenditure of \$3.4 million. In addition to new contracts, 28 ongoing consultancy contracts were active during the year, with a total actual expenditure of \$4.8 million.

Details of contracts let by MDBA in 2011–12 to the value of \$10,000 or more are available on the AusTender website, <www.tenders.gov.au>, or from MDBA as a PDF file.

The list of consultancy contracts let in 2011–12 to the value of \$100,000 or more is on our website, <www.mdba.gov.au/about/corporate\_documents/contract-listings>.

If you cannot access this list, please contact the MDBA and we will provide it to you in a suitable alternative format. You can contact us via our website, <www.mdba.gov.au/contact>, or in the following ways:

Physical address	Level 4, 51 Allara Street, Canberra, Australian Capital Territory				
Mail	GPO Box 1801, Canberra ACT 2601				
Phone	(02) 6279 0100 within Australia	+61 2 6279 0100 overseas			
Fax	(02) 6248 8053 within Australia	+61 2 6248 8053 overseas			

Information on expenditure on contracts and consultancies is also available on the AusTender website.

# **Exempt contracts**

During 2011–12, no standing offers or contracts in excess of \$10,000 (GST inclusive) were exempted by the Chief Executive from publication on AusTender under the Freedom of Information Act.

# **Access by the Auditor-General**

The MDBA's consultancy agreements comply with Australian National Audit Office requirements. The standard long-form consultancy agreement allows for ANAO access; the short-form agreement does not include a specific provision allowing ANAO access, but does provide for an MDBA nominee to conduct audits of those contracts. Other agreements may include a requirement for ANAO access depending on the nature of the services.

# Accommodation

The MDBA has two offices in Canberra — our main office at 51 Allara Street, Canberra and a new, smaller office at 40 Allara Street. The combined premises are managed to meet the MDBA's existing and foreseeable accommodation needs.

# **OUR INFORMATION RESOURCES**

# **Main activities**

- Developed a standardised platform to reduce costs of maintaining the ICT environment.
- Continued integration of applications and automation of processes with the development of an integrated platform incorporating workflows, intranet and collaboration, to be completed in December 2012.
- Continued implementing the Enterprise Information Strategy, a three-year program to upgrade the MDBA's ICT environment, to be completed in December 2012.

# Information communication technology

During 2011–12, the ICT Team continued implementing the Enterprise Information Strategy, a three-year suite of projects that will be completed in December 2012. These projects were needed to upgrade the ICT environment to enable the MDBA to meet its objectives effectively and efficiently. More information about the strategy is in Chapter 3, 'Knowledge into action'. **see page 83** ►

We participated in several whole-of-government initiatives in 2011–12, including the consolidation of government gateways, a project led by the Australian Government Information Management Office (AGIMO). This project migrated the MDBA internet connection and gateway services to a shared environment hosted by the Department of Human Services. This change provides improved performance and redundancy to the MDBA internet connection along with savings by reducing software, hardware and staffing costs associated with hosting these services in-house.

In 2010–11, we developed a high-speed multi-threaded modelling environment capable of processing the detailed models required to support the proposed Basin Plan. In 2011–12, we built on this platform (known as the Computational Resource Environment, or CoRE) by integrating many of our existing modelling platforms into it.

The Information Stewards Team, which consists of business representatives from across the MDBA, continued to work with the ICT Team to develop strategies for managing information within the organisation and the release of information to the public, in line with AGIMO's Open Government agenda.

The MDBA's intranet site, Billabong, was restructured to ensure that information was readily available and relevant to staff. This change was complemented by an improved search engine to provide greater productivity for staff, by allowing them to find information quickly and effectively.

The first steps were also taken towards developing a more effective internet, with market research undertaken to determine what the general public wants from the MDBA internet. This valuable research will inform the development of an improved internet site in late 2012.

Security continued to be an important focus in 2011–12. The new gateway service provides greater security for the MDBA, and allows the infrastructure section to concentrate on greater internal controls, such as monitoring.

# **Records management**

During 2011–12, we completed implementing our new business classification scheme, which determines how records are organised within our records management system and enables faster retrieval of documents to support business decisions.

Our TRIM records management system was upgraded to the latest version, positioning us to be able to integrate TRIM with our other workflows and tools. Improved records management training has allowed us to increase the number of records captured in TRIM, ensuring that information can be located when required to support business decisions. Improved technology integration over the coming year will significantly simplify the way staff interact with the records management system.

The MDBA inherited a significant amount of uncatalogued legacy records from the Murray–Darling Basin Commission. During 2011–12, we completed the enormous task of cataloguing all these records, enabling the creation of an accurate historical record of Murray–Darling Basin decisions.

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# FINANCIALS

STATEMENT BY CHIEF EXECUTIVE AND CHIEF FINANCE OFFICER

INDEPENDENT AUDITOR'S REPORT

MDBA STATEMENT OF COMPREHENSIVE INCOME

MDBA BALANCE SHEET

MDBA STATEMENT OF CHANGES IN EQUITY

MDBA CASH FLOW STATEMENT

MDBA SCHEDULE OF COMMITMENTS

MDBA SCHEDULE OF CONTINGENCIES

MDBA NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

### MURRAY-DARLING BASIN AUTHORITY

### STATEMENT BY THE CHIEF EXECUTIVE AND CHIEF FINANCIAL OFFICER

In our opinion, the attached financial statements for the year ended 30 June 2012 are based on properly maintained financial records and give a true and fair view of the matters required by the Finance Minister's Orders made under the Financial Management and Accountability Act 1997, as amended.

Signed Rlandola Dela.

Rhondda Dickson Chief Executive

2 November 2012

g Kungenie Signed ....

George Knezevic Chief Finance Officer

November 2012



### INDEPENDENT AUDITOR'S REPORT

To the Minister for Sustainability, Environment, Water, Population and Communities

I have audited the accompanying financial statements of Murray-Darling Basin Authority for the year ended 30 June 2012, which comprise: a Statement by the Chief Executive and Chief Financial Officer; Statement of Comprehensive Income; Balance Sheet; Statement of Changan in Equity; Cash Flow Statement; Schedule of Commitments; Schedule of Contingencies; and Notes comproving a Summary of Significant Accounting Policies and other explanatory information.

### Chief Executive's Responsibility for the Financial Statements

The Chief Executive of the Murray Darling Basin Authority is responsible for the preparation of the financial attenuents that give a true and fair view in accoulance with the Finance Minister's Orders made under the Financial Monagement and Accountability Act 1997, including the Australian Accounting Standards, and for such internal control as is receasary to enable the preparation of the financial attenments that give a true and fair view and are free from material ministatement, whether due to fraud or error.

### Auditor's Responsibility

My responsibility is to express an opinion on the financial statements based on my audit. I have conducted my audit in accordance with the Australian National Audit Office Auditing Standards, which incorporate the Australian Auditing Standards. These auditing standards require that I comply with relevant ethical requirements relating to audit engagements and plan and perform the solit to obtain reasonable assurance about whether the financial statements are five from material ministrument.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgement, including the assessment of the risks of material misstatement of the financial statements, whether due to finand or error. In making those risk assessments, the auditor coexiders internal control relevant to the Marray-Darling Basin Authority's preparation of the financial statements that give a true and fair view in order to design addit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Marray-Darling Basin Authority's internal control. An audit also includes evaluating the appropriateness of the accounting policies used and the reasonableness of accounting estimates made by the Chief Executive of the Marray-Darling Basin Authority, as well as evaluating the overall presentation of the financial statements.

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I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my audit opinion.

### Independence

In conducting my audit, I have followed the independence requirements of the Australian National Audit Office, which incorporate the requirements of the Australian accounting profession.

### Opinian

in my opinion, the financial statements of the Murray-Darling Basin Authority;

- (a) have been prepared in accordance with the Finance Minister's Orders made under the Financial Management and Accountability Act 1997, including the Australian Accounting Standards; and
- (b) give a use and fair view of the mattern required by the Finance Minister's Orders including the Murray-Durling Basin Authority's financial position as at 20 June 2012 and of its financial performance and code flows for the year then ended.

Australian National Audit Office

Non Jon

Executive Director

Delegate of the Auditor-General

Canberra 2 November 2012

# Statement of Comprehensive Income for the period ended 30 June 2012

		2012	2011
	Notes	\$'000	\$'000
EXPENSES	Notoo	<b>\$ 000</b>	<b>\$</b> 000
Employee benefits	3A	35,838	32,576
Suppliers	<u>3B</u>	161,617	182,645
Depreciation and amortisation	3C	2,049	1,741
Finance costs	<u>3D</u>	32	26
Write-down and impairment of assets	<u>3E</u>	58	-
Total expenses	_	199,594	216,988
LESS:			
OWN-SOURCE INCOME			
Own-source revenue			
Contributions from jurisdictions	<u>4A</u>	116,662	95,521
Other revenue	<u>4B</u>	2,619	4,425
Total own-source revenue	_	119,281	99,946
Gains			
Sale of assets	<u>4C</u>	6	17
Other gains	<u>4D</u>	55	58
Total gains	_	61	75
Total own-source income		119,342	100,021
Net cost of services		(80,252)	(116,967)
Revenue from Government	<u>4E</u>	52,828	75,666
Share of surplus/deficit of associates and joint ventures accounted for			
using the equity method	<u>3F</u>	82	(1,600)
Deficit attributable to the Australian Government	_	(27,342)	(42,901)
Total comprehensive loss attributable to the Australian	-		
Government	_	(27,342)	(42,901)

The above statement should be read in conjunction with the accompanying notes.

### Balance Sheet

as at 30 June 2012

	Notos	2012	2011 \$'000
ASSETS	Notes	\$ 000	\$ 000
Financial Assets			
Cash and cash equivalents	54	3,721	1 642
Trade and other receivables	5B	197,955	219 167
Investments accounted for using the equity method	5C	459	377
Total financial assets		202,135	221,186
Non-Financial Assets			
Land and buildings	<u>6A,C</u>	2,544	2,175
Property, plant and equipment	<u>6B,C</u>	639	862
Intangibles	<u>6D,E</u>	2,312	2,077
Other non-financial assets	<u>6F</u>	249	1,353
Total non-financial assets	_	5,744	6,467
Total assets	-	207,879	227,653
LIABILITIES			
Payables			
Suppliers	<u>7A</u>	37,493	32,079
Other payables	<u>7B</u>	5,489	5,119
Total payables	—	42,982	37,198
Provisions			
Employee provisions	<u>8A</u>	9,027	7,275
Other provisions	<u>8B</u>	598	566
Total provisions		9,625	7,841
		52,607	45,039
Net assets	_	155,272	182,614
EQUITY			
Parent Entity Interest			
Contributed equity		(11,199)	(11,199)
Reserves		87	87
Retained surplus (accumulated deficit)		166,384	193,726
Total parent entity interest	_	155,272	182,614
Total equity	_	155,272	182,614

The above statement should be read in conjunction with the accompanying notes.

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# Statement of Changes in Equity for the period ended 30 June 2012

			Asset revalua	ition	Contribu	uted		
	Retained ea	rnings	surplus		equity/ca	ıpital	Total e	quity
	2012	2011	2012	2011	2012	2011	2012	2011
	\$`000	\$,000	\$`000	\$,000	\$`000	\$,000	\$`000	\$,000
Opening balance								
Balance carried forward from previous period	193,726	236,627	87	87	(11,199)	(11,199)	182,614	225,515
Adjusted opening balance	193,726	236,627	87	87	(11,199)	(11,199)	182,614	225,515
Comprehensive income								
Other comprehensive income	'		•	•	•	'	•	•
Deficit for the period	(27,342)	(42,901) 🗙	****	88888	88888	8888	(27,342)	(42,901)
Total comprehensive income	(27,342)	(42,901)	•	•	•	•	(27,342)	(42,901)
Closing balance attributable to the Australian Government	166,384	193,726	87	87	(11,199)	(11,199)	155,272	182,614

The above statement should be read in conjunction with the accompanying notes.

### Cash Flow Statement

for the period ended 30 June 2012

		2012	2011
	Notes	\$'000	\$'000
OPERATING ACTIVITIES			
Cash received			
Appropriations		75,213	116,568
Contributions from Jurisdictions		116,662	95,599
Net GST received		13,816	20,647
Other		4,899	6,100
Total cash received	_	210,590	238,914
Cash used			
Employees		33,950	33,164
Suppliers		172,080	205,211
Total cash used		206,030	238,375
Net cash from operating activities	9	4,560	539
INVESTING ACTIVITIES			
Cash received			
Proceeds from sales of property, plant and equipment		28	109
Total cash received	_	28	109
Cash used			
Purchase of property, plant and equipment		1,025	1,011
Purchase of Computer Software		1,484	816
Payment to Joint Ventures		-	500
Total cash used		2,509	2,327
Net cash used by investing activities	_	(2,481)	(2,218)
Net increase in cash held	_	2,079	(1,679)
Cash and cash equivalents at the beginning of the reporting period		1,642	3,321
Cash and cash equivalents at the end of the reporting period	<u>5A</u>	3,721	1,642

The above statement should be read in conjunction with the accompanying notes.

### Schedule of Commitments

as at 30 June 2012

	2012	2011
BY TYPE	\$'000	\$'000
Commitments receivable		
Net GST recoverable on commitments	(2,009)	(2,309)
Total commitments receivable	(2,009)	(2,309)
Commitments payable		
Capital commitments		
Property, plant and equipment	164	140
Total capital commitments	164	140
Other commitments		
Operating leases	11,950	13,917
Other	10,044	13,222
Total other commitments	21,994	27,139
Total commitments payable	22,158	27,279
Net commitments by type	20,149	24,970
BY MATURITY		
Commitments receivable		
Operating lease income		
One year or less	(918)	(1,092)
From one to five years	(1,091)	(1,217)
Total operating lease income	(2,009)	(2,309)
Total commitments receivable	(2,009)	(2,309)
Commitments payable		
Capital commitments		
One year or less	164	140
Total capital commitments	164	140
Operating lease commitments		
One year or less	2,325	2,159
From one to five years	9,625	11,758
Total operating lease commitments	11,950	13,917
Other Commitments		
One year or less	7,964	11,479
From one to five years	2,080	1,743
Total other commitments	10,044	13,222
Total commitments payable	22,158	27,279
Net commitments by maturity	20,149	24,970

Note: Commitments are GST inclusive where relevant.

The nature of capital commitments are purchase of softwares The nature of other commitments are payable to suppliers

The MDBA in its capacity as a lessee held the following:

# Leases and licences for office accommodation Canberra, ACT

Commencing on 1 January 2007 a 10 year and 3 months lease was initiated in respect of premises at 51 Allara Street. Lease payments are subject to fixed annual increases of 3.5% on review date (January each year). A market review was completed and no increase was applied from 1 January 2012. Annual increases of 3.5% will re-commence on 1 January 2013.

Commencing on 1 May 2011 a 5 year and 11 months lease was initiated in respect of premises at 40 Allara Street. Lease payments are subject to fixed annual increases of 4% on review date (May each year).

### Eastwood, SA

Commencing on 20 June 2011 a 12 month lease was initiated in respect of premises at 213 Greenhill Road. A new lease agreement has now been entered into to extend the arrangement till 20 December 2012.

### Albury, NSW

Commencing on 1 September 2008 a 3 year licence was initiated in respect of premises at Charles Sturt University. Licence payments are fixed for the term of the lease. This licence arrangement has been extended on a month-to-month basis while a new lease arrangement is being negotiated. The leases for 51 Allara Street was originally authorised by the Murray-Darling Basin Commission. The liability for the unexpended portion of the lease has transitioned on 15 December 2008 to the MDBA in accordance with the transition provisions of the *Water Act 2007*.

Operating leases and licences held by the MDBA are effectively non-cancellable.

### Schedule of Contingencies

as at 30 June 2012

	2012	2011
	\$'000	\$'000
Contingent liabilities		
Claims for damages or costs	3,600	
Total contingent liabilities	3,600	
Net contingent (liabilities)	(3,600)	

Details of each class of contingent liabilities and contingent assets listed above are disclosed in Note 20, along with information on significant remote contingencies and contingencies that cannot be quantified.

During 2011-12, the MDBA gave no financial guarantee.

The above schedule should be read in conjunction with the accompanying notes.

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### Note 1: Summary of Significant Accounting Policies

### 1.1 Objectives of the Murray-Darling Basin Authority

The Murray-Darling Basin Authority (the Authority) is an Australian Government controlled entity established by the *Water Act 2007*. It is a not-for-profit entity. The principal objective of the Authority is to manage the Basin's water resources in the national interest so that there may be an equitable and sustainable use of the Basin's resources.

The Authority is structured to meet the following outcomes:

**Outcome 1:** Equitable and sustainable use of the Murray-Darling Basin by governments and the community including through the development and implementation of a Basin Plan, operation of the River Murray system, shared natural resource management programs, research, information and advice.

The continued existence of the Authority in its present form and with its present programs is dependent on:

- funding contributions from Basin jurisdictions towards meeting the cost of Murray-Darling Basin Agreement functions; and
- Government policy and on continuing funding by Parliament for the Authority's administration and programs relating to the Basin Plan and Murray-Darling Basin Agreement functions.

Authority activities contributing toward these outcomes are classified as departmental; the Authority does not manage any administered activities. Departmental activities involve the use of assets, liabilities, income and expenses controlled or incurred by the Authority in its own right.

### 1.2 Basis of Preparation of the Financial Statements

The financial statements are general-purpose financial statements and are required by section 49 of the Financial Management and Accountability Act 1997.

The financial statements have been prepared in accordance with:

- a) Finance Minister's Orders (FMOs) for reporting periods ending on or after 1 July 2011; and
- b) Australian Accounting Standards and Interpretations issued by the Australian Accounting Standards Board (AASB) that apply for the reporting period.

The financial statements have been prepared on an accrual basis and in accordance with the historical cost convention, except for certain assets and liabilities at fair value. Except where stated, no allowance is made for the effect of changing prices on the results or the financial position.

The financial statements are presented in Australian dollars and values are rounded to the nearest thousand dollars unless otherwise specified.

Unless an alternative treatment is specifically required by an accounting standard or the FMOs, assets and liabilities are recognised in the balance sheet when and only when it is probable that future economic benefits will flow to the Authority, or a future sacrifice of economic benefits will be required and the amounts of the assets or liabilities can be reliably measured. However, assets and liabilities arising under executor contracts are not recognised unless required by an accounting standard. Liabilities and assets that are unrecognised are reported in the schedule of commitments or the schedule of contingencies.

Unless alternative treatment is specifically required by an accounting standard, income and expenses are recognised in the Statement of Comprehensive Income when and only when the flow, consumption or loss of economic benefits has occurred and can be reliably measured.

### 1.3 Significant Accounting Judgements and Estimates

In the process of applying the accounting policies listed in this note, the Authority has not made any significant judgements that will have a significant impact on the amounts recorded in the financial statements.

Further, there are no accounting assumptions and estimates that have been identified that have a significant risk of causing a material adjustment to the carrying amounts of assets and liabilities within the next reporting period.

### 1.4 New Australian Accounting Standards

### Adoption of New Australian Accounting Standard Requirements

No accounting standard has been adopted earlier than the application date as stated in the standard.

There were no changes, including new standards, revised standards, and interpretations and amending standards issued prior to the sign-off date, which were applicable to the current reporting period and had an impact on presentation and/or disclosure.

Other changes, including new standards, revised standards, interpretations and amending standards that were issued prior to the sign-off date and are applicable to the current reporting period did not have a financial impact, and are not expected to have a future financial impact on the entity.

### Future Australian Accounting Standard Requirements

The following new standards/revised standards/interpretations/amending standards were issued by the Australian Accounting Standards Board prior to the sign-off date, which are expected to have a financial impact on the entity for future reporting periods:

No accounting standard has been adopted earlier than the application date as stated in the standard.

All new or revised standards and interpretations issued prior to the signing of the Statement by the Chief Executive and Chief Finance Officer that were applicable to the current reporting period had no material financial impact and are not expected to have a future material financial impact on the Authority.

### Finance Minister Orders

Finance Minister Orders for Financial Reporting (FMOs) apply to all reporting entities covered by section 49 of the *Financial Management and Accountability Act 1997* and form part of the financial reporting framework for Australian Government entities. Amendments to the FMOs issued prior to the sign-off date, which were applicable to the current reporting period and had an impact on presentation and disclosure on the Authority during 2011-12, included changes to:

- *Director/ Executive Remuneration,* which had the effect of clarifying various disclosure requirements for Tables A and B, including that Table B be prepared on a cash basis;
- Schedule of Asset Additions, which was replaced by the requirement to disclose asset additions by type;
- Net Cash Appropriation Arrangements, where the disclosure format was amended; and,
- Special Account, where disclosures have been amended, including the requirement to disclose reduction transfers to the OPA.

### 1.5 Revenue

Revenue from the sale of goods is recognised when:

- a) the risks and rewards of ownership have been transferred to the buyer;
- b) the entity retains no managerial involvement or effective control over the goods;
- c) the revenue and transaction costs incurred can be reliably measured; and
- d) it is probable that the economic benefits associated with the transaction will flow to the entity.

Revenue from rendering of services is recognised by reference to the stage of completion of contracts at the reporting date. The revenue is recognised when:

- a) the amount of revenue, stage of completion and transaction costs incurred can be reliably measured; and
- b) the probable economic benefits associated with the transaction will flow to the entity.

The stage of completion of contracts at the reporting date is determined by reference to the proportion that costs incurred to date bear to the estimated total costs of the transaction.

Receivables for goods and services, which have 30 day terms, are recognised at the nominal amounts due less any impairment allowance account. Collectability of debts is reviewed at end of the reporting period. Allowances are made when collectability of the debt is no longer probable.

Interest revenue is recognised using the effective interest method as set out in AASB 139 'Financial Instruments: Recognition and Measurement'.

### **Revenue from Government**

Amounts appropriated for departmental appropriations for the year (adjusted for any formal additions and reductions) are recognised as Revenue from Government when the entity gains control of the appropriation, except for certain amounts that relate to activities that are reciprocal in nature, in which case revenue is recognised only when it has been earned. Appropriations receivable are recognised at their nominal amounts.

### **Contributions from Jurisdictions**

The Authority receives contributions from jurisdictions based on an agreed Contributions Model (the Model). The Model, which has been carried forward from the Authority's predecessor agency, the Murray-Darling Basin Commission, is based on a number of different requirements including specific provisions under the Murray-Darling Basin Agreement. Historical funding commitments using 2006-07 as a base year are being maintained in real terms through to 2013-14, at which time the jurisdictions and the Australian Government will be subject to substantive review. Costs are indexed using a weighting of construction cost and consumer price indices. Also refer to Note 2.

### 1.6 Gains

### **Resources Received Free of Charge**

Resources received free of charge are recognised as gains when, and only when, a fair value can be reliably determined and the services would have been purchased if they had not been donated. Use of those resources is recognised as an expense.

Resources received free of charge are recorded as either revenue or gains depending on their nature.

Contributions of assets at no cost of acquisition or for nominal consideration are recognised as gains at their fair value when the asset qualifies for recognition, unless received from another Government entity as a consequence of a restructuring of administrative arrangements (refer to Note 1.7).

### Sale of Assets

Gains from disposal of assets are recognised when control of the asset has passed to the buyer.

### 1.7 Transactions with the Government as Owner

### Equity Injections

Amounts appropriated which are designated as 'equity injections' for a year (less any formal reductions) and Departmental Capital Budgets (DCBs) are recognised directly in contributed equity in that year.

### Economic dependency

The continued existence of the Authority in its present form and with its present programs is dependent on Government policy and on continuing funding from by the Commonwealth and the State Governments of New South Wales, Victoria and South Australia for the Authority's administration and programs.

### Other Distributions to Owners

The FMOs require that distributions to owners be debited to contributed equity unless it is in the nature of a dividend. No such distributions were made during 2011-12.

### 1.8 Employee Benefits

Liabilities for 'short-term employee benefits' (as defined in AASB 119 *Employee Benefits*) and termination benefits due within twelve months of the end of reporting period are measured at their nominal amounts.

The nominal amount is calculated with regard to the rates expected to be paid on settlement of the liability.

Other long-term employee benefits are measured as net total of the present value of the defined benefit obligation at the end of the reporting period of plan assets (if any) out of which the obligations are to be settled directly.

### Leave

The liability for employee benefits includes provision for annual leave and long service leave. No provision has been made for sick leave as all sick leave is non-vesting and the average sick leave taken in future years by employees of the Authority is estimated to be less than the annual entitlement for sick leave.

The leave liabilities are calculated on the basis of employees' remuneration at the estimated salary rates that will be applied at the time the leave is taken, including the Authority's employer superannuation contribution rates to the extent that the leave is likely to be taken during service rather than paid out on termination.

The liability for long service leave has been determined by short-hand method prescribed by FMO division 43.71G. The liability for long service leave is recognised and measured at the present value of the estimated future cash flows to be made in respect of all employees at 30 June 2012. The estimate of the present value of the liability takes into account attrition rates and pay increases through promotion and inflation.

### Superannuation

The Authority's staffs are members of the Commonwealth Superannuation Scheme (CSS), the Public Sector Superannuation Scheme (PSS) or the PSS accumulation plan (PSSap).

The CSS and PSS are defined benefit schemes for the Australian Government. The PSSap is a defined contribution scheme.

The liability for defined benefits is recognised in the financial statements of the Australian Government and is settled by the Australian Government in due course. This liability is reported in the Department of Finance and Deregulation's administered schedules and notes.

The Authority makes employer contributions to the employees' superannuation scheme at rates determined by an actuary to be sufficient to meet the current cost to the Government of the superannuation entitlements of the Authority's employees. The Authority accounts for the contributions as if they were contributions to defined contribution plans.

The liability for superannuation recognised as at 30 June represents outstanding contributions for the final fortnight of the year.

The Authority also contributes to a number of complying funds to discharge the Authority's liability in regard to individual employees and the *Superannuation Guarantee (Administration) Act 1992* as well as to facilitate the salary sacrifice options of employees.

### 1.9 Leases

A distinction is made between finance leases and operating leases. Finance leases effectively transfer from the lessor to the lessee substantially all the risks and rewards incidental to ownership of leased assets. An operating lease is a lease that is not a finance lease. In operating leases, the lessor effectively retains substantially all such risks and benefits.

Where an asset is acquired by means of a finance lease, the asset is capitalised at either the fair value of the lease property or, if lower, the present value of minimum lease payments at the inception of the contract and a liability is recognised at the same time and for the same amount.

The discount rate used is the interest rate implicit in the lease. Leased assets are amortised over the period of the lease. Lease payments are allocated between the principal component and the interest expense.

Operating lease payments are expensed on a straight-line basis which is representative of the pattern of benefits derived from the leased assets.

### 1.10 Borrowing costs

All borrowing costs are expensed as incurred.

### 1.11 Cash

Cash is recognised at its nominal amount. Cash and cash equivalents include:

- a) cash on hand;
- b) demand deposits in bank accounts with an original maturity of 3 months or less that are readily convertible to known amounts of cash and subject to insignificant risk of changes in value;
- c) cash held by outsiders; and
- d) cash in special accounts.

### 1.12 Financial Assets

The Authority classifies its financial assets in the loans and receivables.

The classification depends on the nature and purpose of the financial assets and is determined at the time of initial recognition. Financial assets are recognised and derecognised upon trade date.

### Effective Interest Method

The effective interest method is a method of calculating the amortised cost of a financial asset and of allocating interest income over the relevant period. The effective interest rate is the rate that exactly discounts estimated future cash receipt through the expected life of the financial asset, or, where appropriate, a shorter period.

Income is recognised on an effective interest rate basis except for financial assets that are recognised at fair value throug profit or loss.

### Loans and Receivables

Trade receivables, loans and other receivables that have fixed or determinable payments that are not quoted in an activ market are classified as 'loans and receivables'. Loans and receivables are measured at amortised cost using the effectiv interest method less impairment. Interest is recognised by applying the effective interest rate.

### Impairment of Financial Assets

Financial assets are assessed for impairment at the end of each reporting period.

The Authority has not recognised any impairment of financial assets during 2011-12.

### 1.13 Investments in Associates

The Authority held no investments in Associates at 30 June 2012 or during 2011-12.

Any investment by the Authority in Associates would otherwise be accounted for using the equity method.

Under the equity method, investments in the associates would be carried in the Authority's balance sheet at cost as adjuste for post-acquisition changes in the Authority's share of net assets of the associates. Goodwill relating to an associate woul be included in the carrying amount of the investment. After the application of the equity method, the Authority woul determine whether it is necessary to recognise any impairment loss with respect to the net investment in associates.

### 1.14 Jointly Controlled Entities

Interests in jointly controlled entities in which the Authority is a venturer (and so has joint control) are accounted for usin the equity method (refer Note 1.13).

The Authority participated in a number of joint ventures during 2011-12.

### Cooperative Research Centres (CRCs)

A CRC is a research initiative of the Commonwealth Government established to pursue specific areas of research. *A* common deliverable of a CRC will be the creation of specific intellectual property, which may have commercial value CRC participants will also often have a significant focus on research (e.g. CSIRO, universities and/or private sector bodies).

The funding of a CRC is usually coordinated through a central agent who is appointed generally from one of the joir venturers. The share of operating gain in these joint ventures during 2011-12 totalled \$0.082 million (refer Note 3F).

In 2011-12, the Authority contributed both cash and/or in-kind support for the following CRCs:

- Invasive Animals
- eWater (refer also Note 2).

### Other joint ventures

In addition to the CRCs, the Authority is also a joint venture partner in Murray-Darling Freshwater Research Centre (refe Note 2)

### 1.15 Financial Liabilities

Financial liabilities are recognised and derecognised upon 'trade date'.

### **Other Financial Liabilities**

Other financial liabilities, including borrowings, are initially measured at fair value, net of transaction costs. These liabilities are subsequently measured at amortised cost using the effective interest method, with interest expense recognised on an effective yield basis.

The effective interest method is a method of calculating the amortised cost of a financial liability and of allocating interest expense over the relevant period. The effective interest rate is the rate that exactly discounts estimated future cash payments through the expected life of the financial liability, or, where appropriate, a shorter period.

Supplier and other payables are recognised at amortised cost. Liabilities are recognised to the extent that the goods or services have been received (and irrespective of having been invoiced).

### 1.16 Contingent Liabilities and Contingent Assets

Contingent liabilities and contingent assets are not recognised in the balance sheet, but are reported in the relevant schedules and notes. They may arise from uncertainty as to the existence of a liability or asset or represent an asset or liability in respect of which the amount cannot be reliably measured. Contingent assets are disclosed when settlement is probable but not virtually certain and contingent liabilities are disclosed when settlement is greater than remote.

### 1.17 Acquisition of Assets

Assets are recorded at cost on acquisition except as stated below. The cost of acquisition includes the fair value of assets transferred in exchange and liabilities undertaken. Financial assets are initially measured at their fair value plus transaction costs where appropriate.

Assets acquired at no cost, or for nominal consideration, are initially recognised as assets and income at their fair value at the date of acquisition, unless acquired as a consequence of restructuring of administrative arrangements. In the latter case, assets are initially recognised as contributions by owners at the amounts at which they were recognised in the transferor's accounts immediately prior to the restructuring.

### 1.18 Property, Plant and Equipment

### Asset Recognition Threshold

Purchases of property, plant and equipment are recognised initially at cost in the balance sheet, except for purchases costing less than \$2,000, which are expensed in the year of acquisition (other than where they form part of a group of similar items which are significant in total).

The initial cost of an asset includes an estimate of the cost of dismantling and removing the item and restoring the site on which it is located. This is particularly relevant to 'make good' provisions in property leases taken up by the entity where there exists an obligation to restore the property to its original condition.

These costs are included in the value of the Authority's leasehold improvements with a corresponding provision for the 'make good' recognised.

### Revaluations

Following initial recognition at cost, property, plant and equipment are carried at fair value less subsequent accumulated depreciation and accumulated impairment losses. Valuations are conducted with sufficient frequency to ensure that the carrying amounts of assets do not differ materially from the assets' fair values as at the reporting date. The regularity of independent valuations depends upon the volatility of movements in market values for the relevant assets.

Revaluation adjustments are made on a class basis, where applicable. Any revaluation increment is credited to equity under the heading of asset revaluation reserve, except to the extent that it reverses a previous revaluation decrement of the same asset class that was previously recognised in the surplus/deficit. Revaluation decrements for a class of assets are recognised directly in the surplus/deficit, except to the extent that they reversed a previous revaluation increment for that class.

Any accumulated depreciation as at the revaluation date is eliminated against the gross carrying amount of the asset and the asset was restated to the revalued amount.

### Depreciation

Depreciable property, plant and equipment assets are written-off to their estimated residual values over their estimated useful lives to the Authority using, in all cases, the straight-line method of depreciation. Depreciation rates (useful lives), residual values and methods are reviewed at each reporting date and necessary adjustments are recognised in the current, or current and future reporting periods, as appropriate.

Depreciation rates applying to each class of depreciable asset are based on the following useful lives:

	201	2011-12		2010-11	
	Years	% pa	Years	% pa	
Motor Vehicles	2-3	33-57	2-3	33-57	
Computers and IT equipment	3-13	8-33	3-13	8-33	
Office Equipment	2-13	8-57	2-13	8-57	
Furniture, Fixtures and Fittings	3-20	5-20	3-20	5-20	
Leasehold Improvement	6-10	11-15	6-10	11-15	
Software	3	33	3	33	

There were no changes to the rates used from the previous financial year.

Leasehold improvements are depreciated on a straight-line basis over the lesser of the estimated useful life of the improvement or the unexpired period of the lease.

All heritage and cultural assets have indefinite useful lives and are not depreciated.

The Authority does not hold heritage or cultural assets that are material in amount.

### Impairment

All assets were assessed for impairment at 30 June 2012. Where indications of impairment exist, the asset's recoverable amount is estimated and an impairment adjustment made if the asset's recoverable amount is less than its carrying amount.

The recoverable amount of an asset is the higher of its fair value less costs to sell and its value in use. Value in use is the present value of the future cash flows expected to be derived from the asset. Where the future economic benefit of an asset is not primarily dependent on the asset's ability to generate future cash flows, and the asset would be replaced if the Authority were deprived of the asset, its value in use is taken to be its depreciated replacement cost.

### Derecognition

An item of property, plant and equipment is derecognised upon disposal or when no further future economic benefits are expected from its use or disposal.

### 1.19 Investment Properties

The Authority does not hold any investment properties.

It does, however, receive economic benefits in the form of cottage rents, which form part of the revenues of the MDBA (refer Note 4). The assets which deliver these rents are jointly controlled by the jurisdictions and the Commonwealth, but have been assigned to the Authority.

Where an investment property is acquired at no cost or for nominal cost, its cost is deemed to be its fair value as at the date of acquisition.

Investment properties are derecognised either when they have been disposed of or when the investment property is permanently withdrawn form use and no future economic benefit is expected from its disposal. Any gains or losses on disposal of an investment property are recognised in profit or loss in the year of disposal.

### 1.20 Intangibles

The Authority's intangibles comprise internally developed software for internal use. These assets are carried at cost less accumulated amortisation and accumulated impairment losses.

Software is amortised on a straight-line basis over its anticipated useful life. The useful lives of the Authority's software are for 3 years.

All software assets were assessed for indications of impairment as at 30 June 2012.

### 1.21 Inventories

The Authority does not hold any material inventories.

### 1.22 Taxation

The entity is exempt from all forms of taxation except Fringe Benefits Tax (FBT) and the Goods and Services Tax (GST).

Revenues, expenses and assets are recognised net of GST except:

- a) where the amount of GST incurred is not recoverable from the Australian Taxation Office; and;
- b) for receivables and payables.

# Note 2: Events After the Reporting Period

### Departmental

No events have occurred after reporting date that should be brought to account or noted in the 2012 financial statements.

Note 3: Expenses		
	2012	2011
	\$'000	\$'000
Note 3A: Employee Benefits		
Wages and salaries	25,870	24,183
Superannuation:		
Defined contribution plans	2,581	2,264
Defined benefit plans	2,430	2,174
Leave and other entitlements	4,957	3,952
Separation and redundancies	25.939	22 576
Total employee benefits	35,838	32,370
Note 3B: Suppliers		
Expenditure by State Constructing Authorities *	118 591	129 190
Water Entitlements		2 219
Water Licence Fee	2 531	2,219
Consultants	19 643	35 867
Communication & IT services	1 623	2 347
Other employment expenses	1,441	1 458
Committee expenses	1.948	2.085
Other provision of goods & services	13.784	5.018
Total goods and services	159,561	180,682
Goods and services are made up of:		
Provision of goods – related entities	-	62
Provision of goods – external parties	351	819
Rendering of services – related entities	7,933	6,855
Rendering of services – external parties	151,277	172,946
Total goods and services	159,501	180,082
Other supplier expenses		
Operating lease rentals – external parties:		
Minimum lease payments	1,711	1,684
Workers compensation expenses	345	279
Total other supplier expenses	2,056	1,963
Total supplier expenses	161,617	182,645
Note 3C: Depreciation and Amortisation		
Depreciation:		
Property, plant and equipment	396	412
Buildings	404	292
Total depreciation	800	704
A		
Amorusauon: Intancibles	1 240	1.037
Total amortisation	1 249	1,037
Total depreciation and amortisation	2.049	1,037
-		.,
Note 3D: Finance Costs		
Unwinding of discount	32	26
Total finance costs	32	26
Note 3E: Write-Down and Impairment of Assets		
Asset write-downs and impairments from:		
Impairment of property, plant and equipment	58	-
Total write-down and impairment of assets	58	-
Note 3F: Share of deficit in the joint ventures accounted for using		
the equity method		
Share of deficit in the joint ventures accounted for using the equity		(1 - 600)
method Tatal athen superson	82	(1,600)
rotai otner expenses	82	(1,600)

\* Includes \$7.9 million (2010-11 \$11.4 million) in expenses incurred relating to unavoidable third party contractual commitments brought about by the extraordinary flooding conditions experienced during 2011-12 and not otherwise recoverable through the MDBA's existing insurance cover with Comcover.

# Note 4: Income

	2012	2011
OWN-SOURCE REVENUE	\$'000	\$'000
Note 4A: Contributions from Jurisdictions		
Australian Government	18,737	(78)
New South Wales	35,054	34,227
Victoria	33,224	32,437
South Australia	28,346	27,667
Queensland	1,012	986
Australian Capital Territory	289	282
Total Contributions from Jurisdictions	116,662	95,521
Note 4B: Other Revenue		
Hydropower generation	415	857
Contribtion by State - Salinity program	1,391	2,410
Land and cottage rents	544	707
Other	269	451
Total fees and fines	2,619	4,425
GAINS		
Note 4C: Sale of Assets		
Property, plant and equipment:		
Proceeds from sale	29	107
Carrying value of assets sold	(23)	(90)
Net gain from sale of assets	6	17
Note 4D: Other Gains		
Resources received free of charge	55	58
Total other gains	55	58
C C		
REVENUE FROM GOVERNMENT		
Note 4E: Revenue from Government		
Appropriations:		
Departmental appropriations	52,828	75,666
Total revenue from Government	52,828	75,666

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Note 5: Financial Assets		
	2012	2011
	\$'000	\$'000
Note 5A: Cash and Cash Equivalents		
Cash on hand or on deposit	3,721	1,642
Total cash and cash equivalents	3,721	1,642
Note 5B: Trade and Other Receivables		
Goods and Services:		
Goods and services - related entities	53	74
Goods and services - external parties	121	1,346
Total receivables for goods and services	174	1,420
Appropriations receivable:		
For existing programs	192.735	215.120
Total appropriations receivable	192,735	215,120
Other receivables:		
GST receivable from the Australian Taxation Office	4.202	1.975
Other	844	652
Total other receivables	5.046	2.627
Total trade and other receivables (gross)	197,955	219,167
Total trade and other receivables (net)	197,955	219,167
Receivables are expected to be recovered in:		
No more than 12 months	197,955	219.167
More than 12 months	-	-
Total trade and other receivables (net)	197,955	219,167
Receivables are aged as follows:		
Not overdue	197.845	219.107
Overdue by:	· · · ·	.,
0 to 30 days	-	-
31 to 60 days	-	17
61 to 90 days	17	-
More than 90 days	93	43
Total receivables (gross)	197,955	219,167

Credit terms for goods and services were within 30 days (2011: 30 days).

	2012	2011
	\$'000	\$'000
Note 5C: Investments Accounted for Using the Equity Method		
Investments in jointly controlled entities:		
Ewater Co-operative Research Centre	-	-
Invasive Native Animals Co-operative Research Centre	133	191
Murray-Darling Freshwater Research Centre	326	186
Total equity accounted investments	459	377
Investments in equity accounted investments are expected to be recovered in:		
No more than 12 months	-	-
More than 12 months	459	377
Total equity accounted investments	459	377

### Details of investments accounted for using the equity method

			)wnership	
	Principal	2012	2011	
Name of entity	activity	%	%	
Jointly controlled entities:				
Ewater Co-operative Research Centre		4.40%	4.83%	
Invasive Native Animals Co-operative Research Centre		15.90%	21.02%	
Murray-Darling Freshwater Research Centre		33.33%	15.90%	

### Summarised financial information of jointly controlled entities:

	2012	2011
	\$'000	\$'000
Balance sheet:		
Current assets	4,653	6,745
Non-current assets	1,064	2,275
Current liabilities	3,597	5,613
Non-current liabilities	307	1,307
Statement of comprehensive income:		
Income	18,926	23,536
Expense	20,382	22,321
Net surplus/(deficit)	(1,456)	1,215
Share of jointly controlled entities' net deficit:		
Share of net deficit before tax	(269)	(55)
Income tax expense	-	-
Share of jointly controlled entities' net deficit after tax	(269)	(55)

Dividends received from jointly controlled entities \$0 (2011: \$0).

Note 6: Non-Financial Assets		
	2012	2011
	\$'000	\$'000
Note 6A: Land and Buildings		
Leasehold improvements:		
Fair value	3,240	2,467
Accumulated depreciation	(696)	(292)
Total leasehold improvements	2,544	2,175
Total land and buildings	2,544	2,175

No indicators of impairment were found for Leasehold improvements.

No Leasehold improvements were expected to be sold or disposed of within the next 12 months.

Note 6B: Property, Plant and Equipment		
Other property, plant and equipment:		
Fair value	1,379	1,250
Accumulated depreciation	(740)	(388)
Total other property, plant and equipment	639	862
Total property, plant and equipment	639	862

No indicators of impairment were found for property, plant and equipment.

No property, plant or equipment is expected to be sold or disposed of within the next 12 months.

### Note 6C: Reconciliation of the Opening and Closing Balances of Property, Plant and Equipment 2012

	Buildings S'000	Total land and buildings \$'000	Other property, plant & equipment \$'000	Total \$'000
As at 1 July 2011				
Gross book value	2,467	2,467	1,250	3,717
Accumulated depreciation and impairment	(292)	(292)	(388)	(680)
Net book value 1 July 2011	2,175	2,175	862	3,037
Additions:				
By purchase	773	773	253	1,026
Impairments recognised in the operating result	-	-	(57)	(57)
Depreciation expense	(404)	(404)	(396)	(800)
Disposals:				
Other	-	-	(23)	(23)
Net book value 30 June 2012	2,544	2,544	639	3,183
Net book value as of 30 June 2012 represented by:				
Gross book value	3,240	3,240	1,379	4,063
Accumulated depreciation and impairment	(696)	(696)	(740)	(880)
Net book value 30 June 2012	2,544	2,544	639	3,183

1. Land, buildings and other property, plant and equipment that met the definition of a heritage and cultural item were disclosed in the heritage and cultural asset class.

### Note 6C (Cont'd): Reconciliation of the Opening and Closing Balances of Property, Plant and Equipment 2011

		C	Other property,	
		Total land	equipment	
	Buildings ar	nd buildings		Total
	\$'000	\$'000	\$'000	\$'000
As at 1 July 2010				
Gross book value	1,395	1,395	888	2,283
Accumulated depreciation and impairment	-	-	(3)	(3)
Net book value 1 July 2010	1,395	1,395	885	2,280
Additions:				
By purchase	532	532	479	1,011
By Purchase other	540	540		540
Depreciation expense	(292)	(292)	(412)	(704)
Disposals:				-
Other		-	(90)	(90)
Net book value 30 June 2011	2,175	2,175	862	3,037
Net book value as of 30 June 2011 represented by:				
Gross book value	2,467	2,467	1,250	3,717
Accumulated depreciation and impairment	(292)	(292)	(388)	(680)
Net book value 30 June 2011	2,175	2,175	862	3,037

1. Land, buildings and other property, plant and equipment that met the definition of a heritage and cultural item were disclosed in the heritage and cultural asset class.

	2012	2011
Note 6D. Intengibles	\$'000	\$'000
Computer software:		
Internally developed - in progress	193	-
Internally developed - in use	1,586	1,439
Purchased	3,506	2,362
Accumulated amortisation	(2,973)	(1,724)
Total computer software	2,312	2,077

No indicators of impairment were found for intangible assets.

No intangibles are expected to be sold or disposed of within the next 12 months.
#### Note 6E: Reconciliation of the Opening and Closing Balances of Intangibles 2012

	Computer		
	software	Computer	
	internally	software	
	developed	purchased	Total
	\$'000	\$'000	\$'000
As at 1 July 2011			
Gross book value	3,371	430	3,801
Accumulated amortisation and impairment	(1,455)	(269)	(1,724)
Net book value 1 July 2011	1,916	161	2,077
Additions:			
By purchase or internally developed	794	690	1,484
Amortisation	(1,124)	(125)	(1,249)
Net book value 30 June 2012	1,586	726	2,312
Net book value as of 30 June 2012 represented by:			
Gross book value	4,165	1,120	5,285
Accumulated amortisation and impairment	(2,579)	(394)	(2,973)
Net book value 30 June 2012	1 586	726	2 312

#### Note 6E (Cont'd): Reconciliation of the Opening and Closing Balances of Intangibles 2011

		Computer		
		software	Computer	
		internally	software	
		developed	purchased	Total
		\$'000	\$'000	\$'000
As at 1 July 2010				
Gross book value		2,631	354	2,985
Accumulated amortisation and impairment		(558)	(129)	(687)
Net book value 1 July 2010		2,073	225	2,298
Additions:				
By purchase or internally developed		740	76	816
Amortisation		(897)	(140)	(1,037)
Net book value 30 June 2011		1,916	161	2,077
Net book value as of 30 June 2011 represented by:				
Gross book value		3 371	430	3 801
Accumulated amortisation and impairment		(1.455)	(269)	(1.724)
Net book value 30 June 2011		1,916	161	2,077
	2012	2011		
	\$'000	\$'000		
Note 6F: Other Non-Financial Assets				
Prepayments	249	710		
Advance to Joint Ventures	-	500		
Other	-	143		
Total other non-financial assets	249	1,353		
Total other non-financial assets - are expected to be recovered in:				
No more than 12 months	211	1,353		
More than 12 months	38	-		
Total other non-financial assets	249	1,353		

No indicators of impairment were found for other non-financial assets.

#### Note 7: Payables

	2012	2011
	\$'000	\$'000
Note 7A: Suppliers		
Trade creditors and accruals	37,394	31,953
Operating lease rentals	99	126
Total suppliers payables	37,493	32,079
Suppliers payables expected to be settled within 12 months:		
Related entities	1,033	1,038
External parties	36,460	31,041
Total	37,493	32,079
Total suppliers payables	37,493	32,079
Settlement was usually made within 30 days.		
Note 7B: Other Payables		
Wages and salaries	852	661
Superannuation	135	104
Lease incentive	831	931
Revenue Received in Advance	3,671	3,423
Total other payables	5,489	5,119
Total other payables are expected to be settled in:		
No more than 12 months	5,489	5,119
Total other payables	5,489	5,119

#### Note 8: Provisions

	2012	2011
	\$'000	\$'000
Note 8A: Employee Provisions		
Leave	9,027	7,275
Total employee provisions	9,027	7,275
Employee provisions are expected to be settled in:		
No more than 12 months	2,724	1,700
More than 12 months	6,303	5,575
Total employee provisions	9,027	7,275
Note 8B: Other Provisions		
Provision for restoration obligations	598	566
Total other provisions	598	566
Other provisions are expected to be settled in:		
More than 12 months	598	566
Total other provisions	598	566
	Provision for	
	restoration	Total
	\$'000	\$'000
Carrying amount 1 July 2011	566	-
Additional provisions made	-	540
Unwinding of discount or change in discount rate	32	26
Closing balance 2012	598	566

The entity currently has 2 (2011: 2) agreements for the leasing of premises which have provisions requiring the entity to restore the premises to their original condition at the conclusion of the lease. The entity has made a provision to reflect the present value of this obligation.

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Note 9: Cash Flow Reconciliation		
	2012 \$'000	2011 \$'000
Reconciliation of cash and cash equivalents as per Balance Sheet to Cash Flow Statement		
Cash and cash equivalents as per:		
Cash flow statement	3,721	1,642
Balance sheet	3,721	1,642
Difference		
Reconciliation of net cost of services to net cash from operating activities:		
Net cost of services	(80.252)	(116 967)
Add revenue from Government	52.828	75.666
Less share of deficit in joint venture	82	(1,600)
Adjustments for non-cash items		
Depreciation / amortisation	2,049	1,741
Net write down of non-financial assets	58	-
Gain on disposal of assets	(6)	(17)
Changes in assets / liabilities		
(Increase) / decrease in net receivables	21,212	42,430
(Increase) / decrease in share in joint ventures	(82)	142
(Increase) / decrease in prepayments	1,104	(618)
Increase / (decrease) in employee provisions	1,752	683
Increase / (decrease) in supplier payables	5,414	(4,853)
Increase / (decrease) in other payable	369	3,366
Increase / (decrease) in other provisions	32	566
Net cash from (used by) operating activities	4,560	539

#### Note 10: Senior Executive Remuneration

#### Note 10A: Senior Executive Remuneration Expenses for the Reporting Period

	2012	20
	\$	
Short-term employee benefits:		
Salary	2,456,905	2,403,73
Annual leave accrued	79,315	185,64
Motor vehicle allowances	63,575	188,94
Other allowances	37,296	35,48
Total short-term employee benefits	2,637,091	2,813,81
Post-employment benefits:		
Superannuation	644,705	455,32
Total post-employment benefits	644,705	455,32
Other long-term benefits:		
Long-service leave	236,110	85,85
Total other long-term benefits	236,110	85,85
Termination benefits		200,87
Total employment benefits	3,517,906	3,555,86

#### Notes:

1. Note 10A is prepared on an accrual basis (therefore the performance bonus expenses disclosed above may differ from the cash 'Bonus paid' in Note 10B).

2. Note 10A excludes acting arrangements and part-year service where total remuneration expensed for a senic executive was less than \$150,000.

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	Senior	Reportable	Contributed	Reportable		
Average annual reportable remuneration <sup>1</sup>	Executives	salary <sup>2</sup>	superannuation <sup>3</sup>	allowances <sup>4</sup>	Bonus paid <sup>5</sup>	Total
	No.	÷	÷	÷	\$	÷
Total remuneration (including part-time arrangements):						
less than \$150,000	3	39,435	17,814	•		57,249
\$180,000 to \$209,999	3	170,465	29,482	•		199,947
\$210,000 to \$239,999	4	164,539	55,949	•	ı	220,488
\$240,000 to \$269,999	7	229,071	34,115	192		263,378
\$270,000 to \$299,999	7	224,939	61,429	•		286,368
\$360,000 to \$389,999	1	249,563	118,029	•	ı	367,592
Total	15					
			2011			
	Senior	Reportable	Contributed	Reportable		
Average annual reportable remuneration <sup>1</sup>	Executives	salary <sup>2</sup>	superannuation <sup>3</sup>	allo wances <sup>4</sup>	Bonus paid <sup>5</sup>	Total
	No.	\$	\$	\$	\$	\$
Total remuneration (including part-time arrangements):						
less than \$150,000	2	54,357	12,755	'	I	67,112
\$150,000 to \$179,999	2	140,538	21,822	'	ı	162,360
\$180,000 to \$209,999	4	162,923	30,073			192,996
\$210,000 to \$239,999	2	176,970	35,664	'		212,634
\$240,000 to \$269,999	4	216,310	40,355	'		256,665
\$360,000 to \$389,999	1	294,029	77,074	404		371,507

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1. This table reports substantive senior executives who received remun	reration during the report	ing period. Each ro	w is an averaged figure	based on headcoun	t for individuals in	the band.
<ol> <li>Reportable salary' includes the following:         <ul> <li>a) gross payments (less any bonuses paid, which are separated out ar             b) reportable fringe benefits (at the net amount prior to 'grossing up'             c) exempt foreign employment income.</li> </ul> </li> </ol>	nd disclosed in the 'bonus to account for tax benefi	s paid' column); (ts); and				
<ol> <li>The 'contributed superannuation' amount is the average actual super including any salary sacrificed amounts, as per the individuals' payslip 4. "Renortable allowances' are the average actual allowances maid as no</li> </ol>	annuation contributions F s. r the 'total allowances' lir	paid to senior execut ne on individuals' na	ives in that reportable re vment summaries	smuneration band d	luring the reporting	period,
A reportance another are true trues to the another part are true trues to the true true true true true true trues are true true true true true true true tr	tring period in that report regime the entity during the trives including superanni uperannuation, which is it	able remuneration b able remuneration b ne financial year. uation, motor vehicl reported in the 'contr	and. The 'bonus paid' w e and expense payment ibuted superannuation'	ithin a particular ba fringe benefits. Sal column.	ınd may vary betwee lary sacrifice benefi	sn financial ts are
Note 10C: Other Highly Paid Staff			2012			
Average annual reportable remuneration'	Staff No.	Reportable salary² \$	Contributed superannuation <sup>3</sup>	Reportable allowances <sup>4</sup> \$	Bonus paid <sup>5</sup> \$	Total \$
Total remuneration (including part-time arrangements): st 50.000 to \$170.000	v	133 153	31 154	577		164 870
\$180,000 to \$209,999	94	138,200	48,297	727		187,224
\$210,000 to \$239,999 Total	11	166,545	48,360	700		215,605
			2011			
		Reportable	Contributed	Reportable		
Average annual reportable remuneration <sup>1</sup>	Staff No.	salary² \$	superannuation <sup>3</sup>	allowances <sup>4</sup>	Bonus paid <sup>5</sup> \$	Tota
Total remuneration (including part-time arrangements):	4					
\$150,000 to \$179,999	∞ (	122,406	37,745	83	•	160,234
\$1 SU, UUU to \$209,999	7	145,300	39,109		1	184,409
Total	10					

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### Notes:

- 1. This table reports staff:
- a) who were employed by the entity during the reporting period;
   b) whose reportable remuneration was \$150,000 or more for the financial period; and
  - c) were not required to be disclosed in Tables A, B or director disclosures.

Each row is an averaged figure based on headcount for individuals in the band.

- 2. 'Reportable salary' includes the following:
- a) gross payments (less any bonuses paid, which are separated out and disclosed in the 'bonus paid' column);
  - b) reportable fringe benefits (at the net amount prior to 'grossing up' to account for tax benefits); and
    - c) exempt foreign employment income.

3. The 'contributed superannuation' amount is the average actual superannuation contributions paid to senior executives in that reportable remuneration band during the reporting period. including any salary sacrificed amounts, as per the individuals' payslips..

4. Reportable allowances' are the average actual allowances paid as per the 'total allowances' line on individuals' payment summaries.

5. Bonus paid' represents average actual bonuses paid during the reporting period in that reportable remuneration band. The "bonus paid' within a particular band may vary between financial years due to various factors such as individuals commencing with or leaving the entity during the financial year.

6. Various salary sacrifice arrangements were available to other highly paid staff including superannuation, motor vehicle and expense payment fringe benefits. Salary sacrifice benefits are reported in the 'reportable salary' column, excluding salary sacrificed superannuation, which is reported in the 'contributed superannuation' column.

Note 11: Remuneration of Auditors		
	2012	2011
	\$'000	\$'000
Financial statement audit services were provided free of charge to the entity by the Australian National Audit Office (ANAO).		
Fair value of the services provided		
Financial statement audit services	55	55
Other services	39	38
Total	94	93
<b>Other Services provided by ANAO and paid by the Authority.</b> Australian National Audit Office - Living Murray Initiative Joint Venture		
Special Purpose Financial Statements	18	18
Australian National Audit Office - River Murray Operations Joint Venture Special Purpose Financial Statements	21	20

No other services were provided by the auditors.

Note 12: Financial Instruments		
	2012	2011
	\$'000	\$'000
Note 12A: Categories of Financial Instruments		
Financial Assets		
Loans and receivables:		
Cash and cash equivalents	3,721	1,642
Trade and other receivables	174	1,420
Accrued debtors	844	652
Carrying amount of financial assets	4,739	3,714
Financial Liabilities		
At amortised cost:		
Trade creditors and accruals	37,394	31,953
Revenue Received in Advance	3,671	3,423
Carrying amount of financial liabilities	41,065	35,376

#### Note 12B: Fair Value of Financial Instruments

All financial instruments are held at fair value.

#### Note 12C: Credit Risk

Credit risk represents the loss that would be recognised if counterparties failed to perform as contracted. The maximum credit risk on financial assets of which the Authority recognised is exposed is the carrying amount net of any impairment loss as indicated in the balance sheet. Due to the nature of the majority of the Authority's receivables are from Government Agencies, such risk is considered by the Authority to be low. MDBA holds no collateral to mitigate against credit risk.

The following table illustrates the entity's gross exposure to	credit risk, excluding any collateral	or credit enh
	2012	2011
	000.\$	\$'000
Financial assets		
Cash and cash equivalents	3,721	1,642
Trade and other receivables	174	1,420
Accrued debtors	844	652
Total	4,739	3,714
Financial liabilities		
Trade creditors and accruals	37,394	31,953
Revenue Received in Advance	3,671	3,423
Total	41,065	35,376

ments.

In relation to the MDBA's gross credit risk and the financial effect in respect of the amount that best represents the maximum exposure to credit risk. There is no collateral held by MDBA.

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	Not past N	ot past due	Past due or	Past due or
	impaired no	or impaired	impaired	impaired
	2012	2011	2012	2011
	\$.000	\$'000	\$-000	\$'000
Cash and cash equivalents	3,721	1,642	•	1
Trade and other receivables	174	1,420	•	'
Accrued debtors	844	652	•	
Total	4,739	3,714	•	

# Ageing of financial assets that were past due but not impaired for 2012

4.730	50	17	•	4.629	Total
844				844	Accrued debtors
174	93	17	•	29	Trade and other receivables
3,721	•	•	•	3,721	Cash and cash equivalents
\$'000	\$:000	\$'000	\$1000	\$:000	
Total	days	days	days	days	
	+06	61 to 90	<b>31 to 60</b>	0 to 30	

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	0 to 30	31 to 60	61 to 90	+06	
	days	days	days	days	Total
	\$'000	\$'000	\$'000	\$'000	\$'000
Cash and cash equivalents	1,642	•	•		1,642
Trade and other receivables	1,360	17		43	1,420
Accrued debtors	652	•			652
Total	3,654	17		43	3,714

## Note 12D: Liquidity Risk

payments as they fall due. In addition, the MDBA has policies in place to ensure timely payment are made when due and has no past experience of default. MDBA has no MDBA is appropriated funding from the Australian Government and jurisdictions and the MDBA manages its budgeted funds to ensure it has adequate funds to meet derivative financial liabilities in both the current and prior year

# Maturities for non-derivative financial liabilities 2012

41,065				41,065		otal
3,671	•	•		3,671		Revenue Received in Advance
37,394	•		•	37,394		Trade creditors and accruals
\$:000	000.\$	\$1000	\$,000	\$'000	\$.000	
Total	years	years	years	year	demand	
	× ک	2 to 5	1 to 2	within 1	On	

# Maturities for non-derivative financial liabilities 2011

	On	within 1	1 to 2	2 to 5	> 5	
	demand	year	years	years	years	Total
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
Trade creditors and accruals		31,953	•	•	•	31,953
Revenue Received in Advance		3,423	-	-	-	3,423
otal	-	35,376	-	-	-	35,376

The entity had no derivative financial liabilities in either 2012 or 2011

## Note 12E: Market Risk

The Authority holds basic financial instruments that do not expose the Authority to certain market risks. The Authority is not exposed to 'Currency risk' or 'Other past due' financial risks.

The Authority does not have any interest bearing liabilities at the period end.

#### Note 13: Financial Assets Reconciliation

		2012	2011
		\$'000	\$'000
Financial assets	Notes		
Total financial assets as per balance sheet		202,135	221,186
Less: non-financial instrument components:			
GST receivable from the Australian Taxation Office	5B	4,202	1,975
Investments accounted for using the equity method	5C	459	377
Appropriations receivable	5B	192,735	215,120
Total non-financial instrument components		4,739	3,714
Total financial assets as per financial instruments note		4,739	3,714

## Note 14: Appropriations

# Table A: Annual Appropriations ('Recoverable GST exclusive')

			2	012 Appropriations				Appropriation	
	Ą	ppropriation Act		I	MA Act			applied in 2012	
	Annual	A ppropriations						(current and	
	Appropriation	reduced <sup>1</sup>	$AFM^{2}$	Section 30	Section 31	Section 32	Total appropriation	prior years)	Variance
	000.\$	000.\$	\$:000	\$:000	000.\$	\$:000	\$:000	000.\$	\$:000
DEPARTMENTAL									
Ordinary annual services	52,828	•	•	•	•	-	52,828	52,828	-
Total departmental	52,828		•			•	52,828	52,828	•

#### Notes:

1. Appropriations reduced under *Appropriation Acts* (Nos. 1, 3&5) 2011-12: sections 10, 11, and 12 and under *Appropriation Acts* (Nos. 2, 4&6) 2011-12: sections 12,13, and 14. Departmental appropriations do not lapse at financial year-end. However, the responsible Minister may decide that part or all of a departmental appropriation is not required and request the Finance Minister to reduce that appropriation in the appropriation is effected by the Finance Minister's determination and is disallowable by Parliament.

				2011 Appropriations					
	7	Appropriation Act		[	FMA Act			Appropriation applied in 2011	
	Annual	Appropriations						(current and	
	Appropriation	reduced <sup>1</sup>	AFM <sup>2</sup>	Section 30	Section 31	Section 32	Total appropriation	prior years)	Variance
	\$,000	000.\$	\$:000	\$:000	\$,000	\$:000	\$:000	\$,000	\$:000
DEPARTMENTAL									
Ordinary annual services	75,666		-			-	75,666	75,666	-
Total departmental	75,666		'				75,666	75,666	-

#### Notes:

1. Appropriations reduced under Appropriation Acts (Nos. 1 & 3) 2010-11: sections 10, 11, 12 and 15 and under Appropriation Acts (Nos. 2&4) 2010-11: sections 12, 13, 14 and 17. Departmental appropriations do not lapse at financial year-end. However, the responsible Minister may decide that part or all of a departmental appropriation is not required and request the Finance Minister to reduce that appropriation. The reduction in the appropriation is effected by the Finance Minister's determination and is disallowable by Parliament.

#### Note 15: Special Accounts and FMA Act Section 39

#### Note 15A: Special Accounts (Recoverable GST exclusive)

	Departmental - Darling Basin Spec	Departmental - Murray- Darling Basin Special Accourt	
	2012	201	
	\$'000	\$'0(	
Balance brought forward from previous period	216,762	259,34	
Increases:			
Appropriation credited to special account	52,828	75,66	
Contribution from Jurisdictions	116,662	95,59	
Other receipts	4,405	6,20	
Total increases	173,895	177,47	
Available for payments	390,657	436,81	
Decreases:			
Departmental			
Payments made to employees	33,950	33,16	
Payments made to suppliers	160,251	186,89	
Total departmental decreases	194,201	220,05	
Total decreases	194,201	220,05	
Total balance carried to the next period	196,456	216,76	

#### **Departmental - Murray Darling Special Account**

Appropriation: Financial Management and Accountability Act 1997 section 21 Establishing Instrument: *Water Act 2007* s 209

Purpose:

i) in payment or discharge of the costs, expenses and other obligations incurred by the Authority in the performance of the Authority's functions;

ii) in payment of any remuneration and allowances payable to any person under the Water Act 2007; and iii) meeting the expenses of administering the Account.

Special Account in 2010-11 financial statements was disclosed on GST inclusive basis, the comparatives (2011) have been changed to disclose the special account on GST exclusive basis, particularly:

i) 'Balance brought forward from previous period' of \$259,343K is made up of:

- Appropriations receivable at 30 June 2010: \$256,022K; and

- Cash on hand at 30 June 2010: \$3,321K

ii) payments made to suppliers \$186,891K is made up of:

- Cash used (net of GST received) for 'Operating Activities' \$184,564; and

- Cash used for 'Investing Activities' \$2,327

Note 16: Compensation and Debt Relief		
Departmental	2012 \$	2011 \$
No 'Act of Grace' expenses were incurred during the reporting period (2010-11: Nil expenses).	<u> </u>	
No payments were made under s73 of the Public Service Act 1999 during the reporting period (2010-11: Nil payments).	<u> </u>	
No waivers of amounts owing to the Australian Government were made pursuant to subsection 34(1) of the Financial Management and Accountability Act 1997 (2010-11: Nil waivers).		
No payments were provided under the Compensation for Detriment caused by Defective Administration (CDDA) Scheme during the reporting period (2010-11: Nil payments).	<u> </u>	<u> </u>
No ex-gratia payments were provided for during the reporting period (2010-11: Nil payments).	<u> </u>	
No payments were provided in special circumstances relating to APS employment pursuant to section 73 of the Public Service Act 1999 (PS Act) during the reporting period (2010-11: Nil payments).	<u> </u>	

#### Note 17: Reporting of Outcomes

#### Note 17A: Net Cost of Outcome Delivery

	Outco	Outcome 1		al
	2012	2011	2012	2011
	\$'000	\$'000	\$'000	\$'000
Departmental				
Expenses	(199,594)	(216,988)	(199,594)	(216,988)
Own-source income	119,342	100,021	119,342	100,021
Net cost/(contribution) of outcome delivery	(80,252)	(116,967)	(80,252)	(116,967)

#### Note 17B: Major Classes of Departmental Expense, Income, Assets and Liabilities by Outcome

	Outcor	ne 1	Tots	
	2012	2011	2012	2011
	\$2012	\$2011	\$2012	\$'000
Expenses	3 000	\$ 000	\$ 000	\$ 000
Employee benefits	35.838	32,576	35.838	32,576
Supplier	161.617	182,645	161.617	182,645
Depreciation and amortisation	2,049	1,741	2,049	1,741
Finance costs	32	26	32	26
Write-down and impairment of assets	58	-	58	-
Total	199,594	216,988	199,594	216,988
Income				
Revenue from government	52,828	75,666	52,828	75,666
Own-source income	119,281	99,946	119,281	99,946
Gains	61	75	61	75
Share of surplus/deficit of associates and joint				
ventures accounted for using the equity				
method	82	(1,600)	82	(1,600)
Total	172,252	174,087	172,252	174,087
Assets				
Financial Assets	202,135	221,186	202,135	221,186
Non Financial Assets	5,744	6,467	5,744	6,467
Total	207,879	227,653	207,879	227,653
Liabilities				
Payables	42,982	37,198	42,982	37,198
Provisions	9,625	7,841	9,625	7,841
Total	52,607	45,039	52,607	45,039

Outcomes 1 is described in Note 1.1. Net costs shown included intra-government costs that were eliminated in calculating the actual Budget Outcome. Refer to Outcome 1 Resourcing Table on page [page no.] Resourcing Table on page [page no.] of this Annual Report.

#### Note 18: Net Cash Appropriation Arrangements

	2012	2011
	2012	2011
	\$'000	\$'000
Total comprehensive loss less depreciation/amortisation expenses		
previously funded through revenue appropriations <sup>1</sup>	(27,342)	(42,901)
Plus: depreciation/amortisation expenses previously funded through revenue		
appropriation	_	
Total comprehensive loss - as per the Statement of Comprehensive		
Total comprehensive loss as per the Statement of comprehensive	(0= 0.10)	(12 001)
Income	(27,342)	(42,901)

1. From 2010-11, the Government introduced net cash appropriation arrangements, where revenue appropriations for depreciation/amortisation expenses ceased. Entities now receive a separate capital budget provided through equity appropriations. Capital budgets are to be appropriated in the period when cash payment for capital expenditure is required.

#### Note 19: Compliance with Statutory Conditions for Payments from the Consolidated Revenue Fund

Section 83 of the Constitution provides that no amount may be paid out of the Consolidated Revenue Fund except under an appropriation made by law. The Department of Finance and Deregulation (DoFD) provided information to all agencies in 2011 regarding the need for risk assessments in relation to compliance with statutory conditions on payments from special appropriations, including special accounts.

During 2011-12, the Authority undertook a formal risk assessment of not complying with statutory conditions on such payments. The review involved:

• identifying each applicable special appropriation and/or special account;

• determining the risk of non-compliance by assessing the statutory conditions and the extent to which existing payment systems and processes satisfy those conditions; and,

• obtaining legal advice to resolve questions of potential non-compliance.

The Authority identified one appropriation involving statutory conditions for payment, comprising of one special account: Murray-Darling Basin Special Account.

As at 30 June 2012 this work had been completed in respect of all receipts and payments through the MDB Special Account. The work conducted to date has not identified any issues of compliance with Section 83.

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#### Note 20: Contingent Assets and Liabilities

	Claims fo	or			
	damages or	damages or costs		Total	
	2012	2011	2012	2011	
	\$'000	\$'000	\$'000	\$'000	
Contingent liabilities					
Balance from previous period	-	-	-	-	
New	3,600	-	3,600	-	
Re-measurement	-	-	-	-	
Liabilities recognised	-	-	-	-	
Obligations expired	-	-	-	-	
Total contingent liabilities	3,600	-	3,600	-	
Net contingent liabilities	(3,600)	-	(3,600)	-	

#### Quantifiable Contingencies

#### Flood Loss Claims:

The following contingent liabilities were estimated at 30 June 2012 and are reported against the relevant SCA:

	\$'000	No. of Claims
State Water (New South Wales)	3,600	Not specified

#### Environmental water flows

The MDBA has received a letter claiming damages as a consequence of environmental water flows. The MDBA has denied any liability and will vigorously defend itself in terms of any potential costs arising from this matter.

#### Unquantifiable Contingencies

In addition, to the above matters there are a number of unquantifiable contingencies where it is not possible to estimate the amounts of any eventual payments.

These pertain to the former Murray-Darling Basin Commission (the Commission); under Section 239F of the Water Act 2007 the liabilities of the Commission became liabilities of the Authority.

This included any liability, duty or obligation, whether contingent or prospective; but does not include a liability, duty or obligation imposed by:

• an Act; or

- · regulations or other subordinate legislation made under an Act; or
- the Murray-Darling Basin Act 1992 of New South Wales; or
- the Murray-Darling Basin Act 1993 of Victoria; or
- the Murray-Darling Basin Act 1996 of Queensland; or
- the Murray-Darling Basin Act 1993 of South Australia; or
- the former MDB Agreement.

#### Native Title Claims

In 2003, the former Commission became a party to a Native Title Determination Application. It is not possible to estimate any liabilities arising out of this matter.

#### Significant Remote Contingencies

The Authority had no significant remote contingencies.

#### Note 21: Economic Dependency

The continued operation of the Authority in its present form and with its present functions is dependent on government policy and on continuing funding by the Commonwealth and the State Governments of New South Wales, Victoria and South Australia.

On 12 June 2012, the New South Wales Department of Trade and Investment, Regional Infrastructure and Services announced its intention to reduce its contribution to the Authority by \$19.8 million. The impact of this decision is expected to be material to the way in which the Authority delivers its joint programs from 2012-13. Any major cuts in specific funding sources will necessitate replacement revenue in order for the Authority to maintain a comparative level of operations and investment into future years. These financial statements have been prepared in accordance with FMOs and contemplates continuation of the Authority as a 'going concern'.

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### APPENDIXES

MDBA GOVERNANCE

AGENCY RESOURCE STATEMENT AND RESOURCES FOR OUTCOME 1

ADVERTISING AND MARKET RESEARCH

ECOLOGICALLY SUSTAINABLE DEVELOPMENT AND

ENVIRONMENTAL PERFORMANCE

MDBA PUBLICATIONS

ERRATUM

#### Appendix A MDBA GOVERNANCE

Governance of the Murray–Darling Basin Authority (MDBA) is carried out by:

- the Commonwealth Minister for Water, currently the Minister for Sustainability, Environment, Water, Population and Communities, Senator the Hon Tony Burke
- the six-member Murray–Darling Basin Authority
- the Murray–Darling Basin Ministerial Council
- the Basin Officials Committee
- the Basin Community Committee (BCC).

The relationships between these governance bodies is described in Figure A.1.

Figure A.1 MDBA governance structure and relationships



#### **Murray–Darling Basin Authority**

The role and membership of the six-member Murray–Darling Basin Authority (the Authority) is described in the preliminary chapter of this annual report. **see further information on page 12** ►

The Authority's 2011–12 meetings and their outcomes are described in this appendix.

#### **Farewells**

During the year the Authority farewelled Rob Freeman who resigned as Chief Executive and Authority member on 30 September 2011.

#### **Meetings and outcomes**

The Authority held 22 meetings during 2011–12, with a number of significant outcomes, including:

- Developed the proposed Basin Plan for public release on 28 November 2011.
   Authority members closely examined and deliberated the details of the proposed Basin Plan chapter by chapter and associated documents during their development.
- Established a science review panel to review The proposed "environmentally sustainable level of take" for surface water of the Murray-Darling Basin: method and outcomes.
- Commissioned and published a number of social and economic analyses, including into:
- the multiple benefits of the Basin Plan (a CSIRO project)
- modelling of the aggregate costs of the proposed Basin Plan
- modelling of local costs and community vulnerability
- synthesis of commissioned studies and other relevant reports.
- Established an extensive stakeholder engagement strategy to undertake consultation to assist in the development of the proposed Basin Plan.
- Released on 28 November 2011 the Proposed Basin Plan a draft for consultation and its associated publications:
  - · Plain English summary of the proposed Basin Plan
  - · Delivering a healthy working basin about the draft Basin Plan
  - The draft Basin Plan: catchment by catchment
- Launched the 20-week formal public consultation period on 28 November 2011; this included:
  - over 170 stakeholder engagement meetings held, many of which were attended by the Authority Chair and members
  - Receipt of almost 12,000 submissions on the proposed Basin Plan, and timely publication of non-confidential submissions.
- Analysed all submissions and incorporated over 300 amendments to proposed Basin Plan.
- Produced *The proposed Basin Plan a revised draft*, published on 28 May 2012 and presented to the Murray–Darling Basin Ministerial Council with associated documents:
  - · Proposed Basin Plan consultation report
  - The socioeconomic implications of the proposed Basin Plan
  - Guideline for the method to determine priorities for applying environmental water.

- Commenced establishment of MDBA advisory committees, to give effect to localism as outlined in proposed Basin Plan.
- Considered and endorsed the commencement of a research project to identify and quantify cultural flows, to enable Aboriginal values to be incorporated into water management in Australia. This project will be overseen by the Australian Cultural Flows Research Steering Committee.
- Extended the appointments of current Basin Community Committee members to the end of December 2012.

#### Legislative and Governance Forum on the Murray–Darling Basin

In February 2011 the Council of Australian Governments established new arrangements for ministerial councils that support COAG's work. As part of these arrangements the Murray–Darling Basin Ministerial Council was re-established as the Legislative and Governance Forum on the Murray–Darling Basin.

Membership of the Legislative and Governance Forum on the Murray–Darling Basin includes the Commonwealth Minister for Water, who chairs the forum, and one minister from each Basin state:

- The Hon Tony Burke (Commonwealth Minister for Water)
- The Hon Katrina Hodgkinson (New South Wales)
- The Hon Peter Walsh (Victoria)
- The Hon Paul Caica (South Australia)
- The Hon Andrew Cripps (Queensland)
- Mr Simon Corbell (Australian Capital Territory).

When exercising powers and functions under the Murray–Darling Basin Agreement and the *Water Act 2007*<sup>1</sup>, these ministers convene as the Murray–Darling Basin Ministerial Council.

The Ministerial Council makes policy for and decisions about matters set out in the Murray–Darling Basin Agreement (e.g. state water shares and funding and delivery of environmental management programs). The MDBA is required to produce an annual corporate plan relating to these matters for the council's approval.

The Ministerial Council also has a policy and decision-making role in regard to issues relating to critical human needs as provided for in the Act, which also provides for a complementary role for the Basin Plan in this regard. It may also seek advice from and direct the Basin Officials Committee (see page 232) on its functions and powers under the Murray–Darling Basin Agreement.

The council's role includes advising the MDBA on its preparation of the proposed Basin Plan. The revised draft of the proposed Basin Plan was given to the Ministerial Council on 28 May 2012; council will provide its views on the revised plan to the Commonwealth Minister for Water in the latter half of 2012.

Communiqués are released following each meeting of the Murray–Darling Basin Ministerial Council and are published on the MDBA website, <www.mdba.gov.au>.

More information about the Legislative and Governance Forum on the Murray–Darling Basin is in Chapter 3, 'Knowledge into action'. **see page 23**►

<sup>1</sup> Unless otherwise indicated, all Acts referred to in this annual report are Commonwealth Acts.

#### **Meetings and outcomes**

In 2011–12 the Legislative and Governance Forum on the Murray–Darling Basin held two meetings, resulting in a number of significant outcomes.

In relation to joint government programs, ministers:

- approved amendments to the MDBA 2011–12 corporate plan
- approved new water Cap arrangements for the NSW Border Rivers
- approved most of the new generation of environmental water management plans
- approved the listing of an additional 1 GL of South Australian water listed on The Living Murray environmental water register
- agreed to the development of a work program to enhance dam operation and water resource management skills in all Basin states
- received advice from the MDBA on the 2011–12 outlook for water availability
- received an update on progress of stage 2 of the Murray–Darling Basin Agreement review
- endorsed the revised asset management plan
- approved the commencement of the Schedule to Account for South Australia's Storage Right and the Schedule for Water Sharing
- approved the Basin Salinity Management Strategy's annual implementation report
- noted publication of The Living Murray annual implementation report 2010–11 and Audit of The Living Murray implementation 2010–11.

In relation to the Basin Plan, ministers:

- were briefed on 4 November 2011 by the Authority Chair on the Authority's deliberations when preparing the proposed Basin Plan; matters discussed included environmental watering requirements, sustainable diversion limits (SDLs), scientific and socioeconomic input and advice, and the role of localism and adaptive management
- noted the importance of localism in environmental watering programs and requested that the Authority consider strengthening the draft legislative instrument and other mechanisms in the proposed Basin Plan to use existing state frameworks and community-based networks to assist in managing Commonwealth environmental water before releasing the proposed Basin Plan
- discussed the proposed pathway for implementing the Basin Plan
- considered Authority advice on the Environmental Watering Plan, salinity targets and alignment of state plans with the Basin Plan, including that SDLs are proposed to take effect from 2019
- received reports from the Basin Community Committee chair about community consultation on the proposed Basin Plan
- discussed its feedback to the MDBA about the proposed Basin Plan
- noted the need to develop a work program to assess the potential for new and revised river management arrangements that will more effectively and efficiently meet the needs of both consumptive users and the environment.
- acknowledged the importance of a common and agreed set of Cap factors throughout the Basin, as a way to clarify for entitlement holders the amount of water recovered for the environment.

#### **Basin Officials Committee**

The Basin Officials Committee facilitates cooperation and coordination between the Australian Government, the MDBA and the Basin states in the management of the Basin's water resources.

The committee provides advice to the Murray–Darling Basin Ministerial Council and carries out its policy and decisions on matters such as state water shares and the funding and delivery of environmental management programs.

The committee has high-level decision-making responsibilities for river operations, including setting MDBA objectives and outcomes for River Murray operations.

The committee also advised the Authority about engaging the Basin states in preparing the proposed plan.

Committee members are officials from the six Basin state governments, with the Australian Government committee member as chair. The Authority's Chair and the MDBA Chief Executive are non-voting members of the committee.

Chair	Members
Dr David Parker	Mr David Harriss (New South Wales) Dr Jane Doolan (Victoria) [19 September 2011] Mr Scott Ashby (South Australia) Ms Debbie Best (Queensland) Mr David Papps (Australian Capital Territory)

#### **Meetings and outcomes**

The Basin Officials Committee held eight meetings during 2011–12, and achieved the following significant outcomes:

- noted progress on implementation of the Strategic Programs Review
- considered various amendments to the MDBA corporate plan for 2011–12, and considered the draft MDBA corporate plan for 2012–13 and three out-years
- noted the Cap proposal for the NSW Border Rivers
- agreed to recommend that the Ministerial Council approve the commencement of the Schedule to Account for South Australia's Storage Right and the Schedule for Water Sharing for 1 September 2011
- discussed the objectives and outcomes document relating to River Murray System operations for the 2011–12 water year
- endorsed the revised asset management plan
- considered a paper on enhancing skills in dam operation and water resource management
- received a briefing on the South Eastern Australian Climate Initiative (phase 2).

#### **Reviews**

- Agreed to the terms of reference proposed for stage 2 of the Murray–Darling Basin Agreement review and received regular updates on the review's progress.
- received regular updates on the River Murray System Operations Review.

#### Reports

- Received a report on the recommendations from the Barmah Choke Study.
- Considered the Basin Salinity Management Strategy reporting package for 2010–11.
- Received a report on the progress of the Environmental Works and Measures Program.
- Endorsed a report regarding water sharing in the River Murray System.

In regard to environmental watering:

- considered a review of the 2010–11 multi-site environmental watering trial
- endorsed the River Murray multi-site watering work program
- noted the draft 'The Living Murray annual environmental watering plan 2011–12'
- considered and endorsed a multi-site environmental watering proposal for 2012–13
- endorsed the MDBA providing draft environmental watering plans to the Ministerial Council for approval.

In regard to river management:

- considered a paper on optimising river management
- agreed the MDBA should prepare a paper for consideration by ministers that identifies possibilities for improving river management through works and measures, covering thirdparty impacts, socioeconomic implications and other issues
- noted the update on the development of a work plan for the Murray–Darling Basin River Management Review
- received a report on the Senior Experienced River Operators Workshop held to consider options for improved river management to meet contemporary water needs of both consumptive users and the environment
- received a presentation on the rapid assessment of easements and the public versus private land and the need for further work to be considered as part of developing the Murray-Darling Basin River Management Review work program.

In regard to the proposed Basin Plan:

- received updates on the development of the proposed Basin Plan, including regular reports from the Basin Plan Working Group
- received a briefing from the Authority on SDLs and a proposed approach to verifying the contribution of works and measures to bridging the gap between current and sustainable diversion limits, and agreed that the MDBA, in consultation with Basin partner governments, should develop high-level principles for use when determining when an SDL offset may be appropriate
- convened a workshop in understanding the interrelationship of work being undertaken by the Basin Plan Working Group, Basin Strategy Working Group and the Review of the Murray– Darling Basin Agreement.

#### **Basin Community Committee**

The 14-member Basin Community Committee advises the MDBA about the performance of its functions, including:

- engaging the community in the preparation of each draft of the proposed Basin Plan
- community matters relating to the Basin water resources
- matters referred to the committee by the Authority.

The committee's role relates to water and other natural resources of the Murray-Darling Basin.

The committee advises the Murray–Darling Basin Ministerial Council abouts its functions under the Murray–Darling Basin Agreement, such as delivery of environmental management programs.

The Basin Community Committee liaises with the wider Basin community, including by convening regional meetings with Basin stakeholders (e.g. during the development of the the proposed Basin Plan) and carrying out other communication activities to help provide advice to the Authority and the Murray–Darling Basin Ministerial Council.

Chair	Members		
Ms Joan Burns	Ms Danielle Anderson Mr Henry Jones Ms Cheryl Buchanan Ms Sarah Nicholas Professor Ian Falconer A0 Mr Jeff Parish OAM Mr Rory Treweeke	Ms Mary-Lou Gittins Mr Russell Pell Mr Les Gordon Ms Kathryn Ridge Dr Arlene Harriss-Buchan Dr Guy Roth	

#### **Meetings and outcomes**

The Basin Community Committee held 10 meetings during 2011–12 and achieved the following significant outcomes:

- advised and assisted MDBA Engagement with coordinating and carrying out community meetings as part of the 20-week consultation period on the proposed Basin Plan
- attended community meetings during the consultation period
- provided written advice to the MDBA on the proposed Basin Plan
- received briefings and presentations on policy and technical issues relating to the proposed Basin Plan, such as principles for determining SDLs, risks assessment framework, water resource plans, modelling scenarios and baseline diversion limits.

The Basin Community Committee also advised the MDBA on:

- two communication tools *Delivering a healthy working basin* and the *Draft Basin Plan: what it means for your catchmen*t
- the draft legislative instrument
- localism
- groundwater
- SDLs and the baseline diversion limits
- the monitoring and evaluation framework.

#### **Appendix B**

#### AGENCY RESOURCE STATEMENT AND RESOURCES FOR OUTCOME 1

The annual report must include an agency resource statement table providing information about the various funding sources that the agency may draw upon during the year.

The agency resource statement has been designed to allow agencies to reconcile the final usage of all resources in cash terms, by declaring the actual available appropriation for 2011–12 (including carried forward cash balances and further adjustments such as s. 32 transfers under the *Financial Management and Accountability Act 1997* and advances to the Finance Minister) and comparing this to the actual payments made.

Additionally, for departmental appropriations and special accounts, information about any remaining balance that will be carried over to the next financial year must also be reported.

	Actual		
	available	Payments	Balance
	appropriation	made	remaining
	for 2011–12	2011-12	2011-12
	\$'000	\$'000	\$'000
	(a)	(b)	(a)–(b)
Ordinary Annual Services			
Departmental appropriation <sup>1</sup>	52,828	52,828	-
Total	52,828	52,828	-
Administered expenses			
Outcome	-	-	-
Total	-	_	
Total ordinary annual services	52,828	52,828	
Other services			
Administered expenses			
Specific payments to states,			
ACT, NT and local government			
Outcome	-	-	
Total	-	-	
New administered expenses			
Outcome		-	
Total	_	_	

Table B.1 MDBA agency resource statement, 2011–12

Departmental non-operating			
Equity injections		_	
Total	_		
Administered non-operating			
Administered Assets and Liabilities	-		
Payments to CAC Act bodies —	-		
non-operating			
Total			
Total other services	_	_	
Total available annual appropriations and payments			
Special appropriations			
Special appropriations limited			
by criteria/entitlement			
Special Appropriation Act			
Special Appropriation Act			
Special appropriations limited			
by amount			
Special Appropriation Act			
Total special appropriations		^	
Special Accounts	216,762		
Opening balance	F2 020		
Appropriation receipts	52,828		
other agencies			
Non appropriation requirts to	-		
Special Accounts <sup>2</sup>	121 047		
Payments made	121,007	19/ 201	
	390 657	194,201	
Total recoursing and navments		2/7 029	
Totat resourcing and payments	443,403	247,027	
Less appropriations drawn from annual or special appropriations above and credited to special accounts and/or CAC Act bodies through annual appropriations	(52,828)	(52,828)	
Total net resourcing and payments	390,657	194,201	196,456
iotat net resourcing una payments	0,0,007	1,4,201	170,400

Notes

<sup>1</sup> Includes:	
Appropriation for Basin Plan activities	\$38,749
Interest equivalency	\$10,746
Commonwealth share of contribution for restoration of Hume Dam southern training wall	\$ 3,333
Total	\$52, 828
<sup>2</sup> Includes:	
Jurisdiction contribution to Murray–Darling Basin Agreement functions	\$106,662
Jurisdiction contribution for restoration of Hume Dam southern training wall	\$ 10,000
Other miscellaneous receipts	\$ 4,405
Total	\$121,067

#### Expenses for Outcome 1

Outcome 1: Equitable and sustainable use of the Murray–Darling Basin by governments and the community including through development and implementation of a Basin plan, operation of the River Murray System, shared natural resource management	Budget 2011-12 \$'000	Actual 2011–12 \$'000	Variation 2011–12 \$'000
programs, research, information and advice.	(a)	(b)	(a)–(b)
Program 1.1: Equitable and sustainable use of the Murray–Darling Basin			
Departmental appropriation	52,828	52,828	-
Special Accounts	238,121	146,766	91,355
Total for Program 1.1	290,949	199,594	91,355
Outcome 1 Totals by appropriation type			
Departmental appropriation <sup>1</sup>	52,828	52,828	-
Special Accounts	238,121	146,766	91,355
Total expenses for Outcome 1	290,949	199,594	91,355
	2010-11	2011-12	
	295	295	

#### Appendix C ADVERTISING AND MARKET RESEARCH

This table of expenditure for 2011–12 is presented in accordance with the reporting requirements in s. 311A of the *Commonwealth Electoral Act 1918*. Expenditure was in the media advertising category only.

Media advertising		
Agency	Purpose	\$ excl GST
Adcorp	Public notices — proposed Basin Plan	70,050
Attorney-General's Department	Gazettal of proposed Basin Plan	520.00
Adcorp	s. 203 Committee	5,883
Various	Other advertising	7,400
Hall & Partners Open Mind	Market research	76,570
Total		160,423

#### **Appendix D**

### ECOLOGICALLY SUSTAINABLE DEVELOPMENT AND ENVIRONMENTAL PERFORMANCE

The Murray–Darling Basin Authority (MDBA) is an integral part of the Australian Government's Water for the Future program, which has four priorities:

- taking action on climate change
- supporting healthy rivers
- using water wisely
- securing our water supplies.

The MDBA is responsible for planning the integrated management of the water resources of the Murray–Darling Basin, a responsibility reflected in MDBA's outcome in the 2011–12 Portfolio Budget Statements:

Equitable and sustainable use of the Murray–Darling Basin by governments and the community including through development and implementation of a Basin Plan, operation of the River Murray System, shared natural resource management programs, research, information and advice.

Ecologically sustainable development is the core of MDBA activities and business. Section 21(4)(a) of the *Water Act 2007* requires that when exercising its powers to perform functions relating to the Basin Plan, the MDBA must consider the following ecologically sustainable development principles:

- decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations
- if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation
- the principle of intergenerational equity that the present generation should ensure that the health, biodiversity and productivity of the environment is maintained or enhanced for the benefit of future generations
- the conservation of biodiversity and ecological integrity should be a fundamental consideration in decision-making
- improved valuation, pricing and incentive mechanisms should be promoted.

### Our contributions to ecologically sustainable development through our policies and programs

The goals and objectives referred to below are from the *Murray–Darling Basin Authority corporate* plan 2012–13 to 2015–16.

#### Strategic goal 1: Integrated water management

To improve water security and access through transparent, statutory Basin-wide planning arrangements for transboundary water management.

Key elements of this goal include the following broad actions:

- Implement a whole-of-Basin water trading regime.
- Develop and draft the Basin Plan legislative instrument and plain English summary, supported by relevant policy advice and information communication (ICT) products.
- Accreditation of state-based water resource plans for water resource plan areas.
- Develop the Basin Plan groundwater and surface water planning provisions to support the long-term availability of Basin water resources.
- Establish sustainable diversion limits and Murray–Darling Basin Agreement review frameworks and schedules (where required by the Water Act) to ensure ongoing effectiveness of water management regimes and improved alignment of the agreement and Basin Plan functions, roles and responsibilities.
- Implement Basin Plan compliance and assurance assessment and reporting strategies.

#### Strategic goal 2: River and ecosystem health

To protect, restore or improve the ecological health and resilience of the Basin's key environmental assets, water-dependent ecosystems and biodiversity.

Key elements of this goal include the following broad actions:

- Strengthen the scientific basis for and methodology behind the environmentally sustainable level of take.
- Contribute to the finalisation of the Basin Plan through technical evaluation of environmental water modelling and policy.
- Undertake climate, hydrologic, eco-hydrologic and water quality modelling required to develop the mandatory content of the Basin Plan.
- Develop environmental watering priorities and provide support to jurisdictions in implementing the agreed policies and plans.
- Facilitate implementation of the Water Quality and Salinity Management Plan.

These actions are consistent with the requirements of the Water Act in implementing and managing the Basin Plan.
#### Strategic goal 3: Knowledge into action

To develop authoritative information, monitoring and research, in partnership with governments, scientists and communities, to underpin decision-making and adaptive management.

Key elements of this goal include the following broad actions:

- Provide advisory and administrative support to the Murray–Darling Basin Chair and secretariat support services to the Murray–Darling Basin Authority, Basin Community Committee and other MDBA committees as required.
- Engage with Indigenous nations in the development of the Basin Plan and management of Indigenous partnerships associated with delivery of Indigenous-related Basin Plan content.
- Implement an engagement and communications strategy related to delivering the Basin Plan.
- Undertake science and research knowledge-based projects, including social and economic quantitative analysis to support implementation and ongoing management of the Basin Plan.
- Develop and maintain a daily modelling platform and Basin water planning models to underpin water resource planning and water-sharing arrangements across the Basin.
- Develop, implement and manage data and information repositories, tools, processes and standards for storing and delivering Basin water resource information to governments, industry and communities.

#### Strategic goal 4: River Murray Asset Management

To equitably, efficiently and effectively manage, operate and sustain the River Murray and assets to deliver states' water allocations and environmental outcomes in the River Murray System, and to equitably, efficiently and effectively manage the portfolio of water entitlements of The Living Murray joint venture.

Key elements of this goal include the following broad actions:

- Ongoing evaluation and determination of the minimum volumes of water required from the River Murray System by each state for critical human water needs as defined in the Basin Plan.
- Define the reserve of water required to ensure that conveyance water can be provided during dry periods to enable delivery of critical human water needs to each state.
- Provide technical guidelines to help implementation of critical human water needs policy associated with the Basin Plan.
- Ensure that schedules F, G and H of the Murray–Darling Basin Agreement are reviewed for consistency with the Basin Plan, as required under clause 152 of the agreement, and identify amendments required.

## Our contribution to ecologically sustainable development through internal operations

In our internal operations, the MDBA follows the principles of ecologically sustainable development, as reflected in the following examples:

- operating a paper, plastic and organic waste recycling program
- continued use of 100% recycled or partially recycled stock for all print publications
- minimising paper use by setting printers to double-sided printing
- recycling printer cartridges
- using recycled paper products in all bathrooms
- using water-saving flushes in all bathrooms to reduce water consumption
- using power-efficient centralised multifunction devices instead of distributed desktop printing
- implementing server virtualisation to reduce power usage
- turning off computers automatically overnight to save power
- monitoring desktop computer power usage so that the success of power-saving initiatives can be measured
- operating lighting through movement sensors in all work spaces, so that lights are switched off when areas are not in use
- purchasing energy-saving whitegoods and ICT equipment
- careful planning of print runs, which has significantly reduced excess stock
- publishing only in electronic format unless a need for print copies is identified.

We continue to look at further opportunities in our internal operations and in our premises to further minimise our impact on the environment.

## Appendix E MDBA PUBLICATIONS

Title of publication	Publication number
Delivering a healthy working Basin — about the draft Basin Plan	65/10
The potential for Mozambique tilapia to invade the Murray–Darling Basin and the likely impacts	153/11
Small fish, big problem — Gambusia Forum 2011	154/11
The Living Murray story	157/11
Namoi: Talking fish — making connections with the rivers of the Murray–Darling Basin	158/11
Katarapko: Talking fish — making connections with the rivers of the Murray–Darling Basin	159/11
Goulburn: Talking fish — making connections with the rivers of the Murray–Darling Basin	160/11
Upper Murrumbidgee: Talking fish — making connections with the rivers of the Murray–Darling Basin	161/11
Murray: Talking Fish — making connections with the rivers of the Murray–Darling Basin	162/11
Darling and the Great Anabranch: Talking fish — making connections with the rivers of the Murray–Darling Basin	163/11
Ovens: Talking fish — making connections with the rivers of the Murray–Darling Basin	164/11
Paroo: Talking Fish — making connections with the rivers of the Murray–Darling Basin	165/11
Upper Condamine: Talking fish — making connections with the rivers of the Murray–Darling Basin	166/11
Upper Darling, Bourke to Brewarrina: Talking fish — making connections with the rivers of the Murray–Darling Basin	167/11
Coorong and the Lower Lakes: Talking fish — making connections with the rivers of the Murray–Darling Basin	168/11
Culgoa–Balonne: Talking fish — making connections with the rivers of the Murray–Darling Basin	169/11
The Living Murray annual environmental watering plan 2011–12	170/11
Plain English summary of the proposed Basin Plan — including explanatory notes	173/11
The draft Basin Plan: catchment by catchment	191/11
Proposed Basin Plan	192/11

Title of publication	Publication number
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Lake Victoria annual report 2010–11	214/11
Review of Cap implementation 2010–11	216/11
Murray–Darling Basin Authority annual report 2010–11	218/11
Barmah–Millewa Forest: Environmental water management plan 2011	219/11
Chowilla Floodplain: Environmental water management plan 2011	220/11
Gunbower Forest: Environmental water management plan 2011	221/11
Hattah Lakes: Environmental water management plan 2011	222/11
Koondrook–Perricoota: Environmental water management plan 2011	223/11
Lindsay–Wallpolla Islands: Environmental water management plan 2011	224/11
River management — challenges and opportunities	225/11
The proposed 'environmentally sustainable level of take' for surface water of the Murray–Darling Basin: methods and outcomes	226/11
A yarn on the river — getting Aboriginal voices into the Basin Plan	227/11
True tales of the trout cod: River histories of the Murray–Darling Basin (Goulburn River Catchment booklet)	*02/12
True tales of the trout cod: River histories of the Murray–Darling Basin (Mitta Mitta Catchment booklet)	*03/12
True tales of the trout cod: River histories of the Murray–Darling Basin (Lachlan River Catchment booklet)	*04/12
True tales of the trout cod: River histories of the Murray–Darling Basin (Upper Murray River Catchment booklet)	*05/12
True tales of the trout cod: River histories of the Murray–Darling Basin (Ovens River Catchment booklet)	*06/12
True tales of the trout cod: River histories of the Murray–Darling Basin (Murrumbidgee River Catchment booklet)	*07/12
The Living Murray environmental watering in 2010–11	*08/12

\* Indicates year that production of publication began.

Title of publication	Publication number
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Hydrologic modelling to inform the proposed Basin Plan — methods and results	*17/12
Lake Tutchewop groundwater interaction investigation (3 volumes)	*18/12
Assessment of environmental water requirements for the proposed Basin Plan: Barwon–Darling River (in-channel flows)	*19/12
The MDB regional and Basin plans: Indigenous water and land data	*20/12
Assessment of environmental water requirements for the proposed Basin Plan: Gunbower–Koondrook–Perricoota Forest	*22/12
Assessment of environmental water requirements for the proposed Basin Plan: Hattah Lakes	*23/12
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Assessment of environmental water requirements for the proposed Basin Plan: Booligal Wetlands	*37/12

\* Indicates year that production of publication began.

Title of publication	Publication number
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Murray–Darling Basin map	Poster

\* Indicates year that production of publication began.

#### Appendix F

## **ERRATUM**

The Murray–Darling Basin Authority annual report 2010–11 contained the following error:

Page 116 — the description of the Native Fish Strategy should have read 'as a 10-year plan to rehabilitate native fish populations'.

We apologise for any inconvenience.





# ENDMATTER

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## **ABBREVIATIONS AND ACRONYMS**

AEP	annual exceedance probability
AHD	Australian height datum
ANAO	Australian National Audit Office
APS	Australian Public Service
CoRE	Computational Resource Environment
CRC	cooperative research centre
CSIRO	Commonwealth Scientific and Industrial Research Organisation
EC	electrical conductivity unit
EL	executive level
FOI	freedom of information
GL	gigalitre
HSMAs	Health and Safety Management Arrangements
ICT	information communication technology
IPS	Information Publication Scheme
IST	Information Stewards Team
ISRAG	Independent Sustainable Rivers Audit Group
JIG	joint Indigenous group
MDBA <sup>1</sup> /the Authority <sup>2</sup>	Murray–Darling Basin Authority — 1: the agency; 2: the six-member Authority
MDBC	Murray–Darling Basin Commission
MDFRC	Murray–Darling Freshwater Research Centre
mg/L	milligrams per litre
ML	megalitre
ML/d	megalitre per day
Ministerial Council	Murray–Darling Basin Ministerial Council
NCCMA	North Central Catchment Management Authority
NRA	Ngarrindjeri Regional Authority
PAES	Portfolio Additional Estimates Statements
PBS	Portfolio Budget Statements

PCBU person conducting a business or undertaking

- **RAR** required annual release
- RMO River Murray Operations
- SDL sustainable diversion limit
- SES senior executive service
- **SRA** Sustainable Rivers Audit
- TLM The Living Murray
- **TLM IPP** The Living Murray Indigenous Partnerships Program
  - **WoC** Working on Country

## **GLOSSARY**

Soils formed naturally when sulfate-rich water (e.g. saline groundwater or sea water) mixes with sediments containing iron oxides and organic matter. Under waterlogged, anaerobic (oxygen-free) conditions, bacteria convert sulfates to sulfides, which can form sulfidic sediments. When these sediments are exposed to oxygen, such as during drought conditions, chemical reactions may lead to the generation of sulfuric acid.
The process of change or conversion into an acid.
The difference between the capacity of a reservoir and the volume of water currently in storage.
A sudden increase in the number of algae in a water body, to levels that cause visible discolouration of the water.
The water to which the holder of an access licence is entitled from time to time under licence, as recorded in the water allocation account for the licence. Under New South Wales' <i>Water Management Act 2000</i> , water allocations in that state are called 'available water determinations'.
A branch of a river that leaves the main stream and rejoins it downstream.
An ecosystem that is in or depends on water.
The ACCC promotes competition and fair trade in the marketplace to benefit consumers, businesses and the community. It also regulates national infrastructure services. Its primary responsibility is to ensure that individuals and businesses comply with the Commonwealth competition, fair trading and consumer protection laws. It has a role in enforcing the Water Market Rules 2009 and the Water Charge (Termination Fees) Rules 2009. In this, the ACCC intends to use a cooperative approach, including working with irrigation infrastructure operators to achieve compliance. However, when necessary, it is prepared to use remedies available to it under the <i>Water Act 2007</i> .
In 1971 the mean sea level for 1966–68 was assigned the value of zero on the Australian height datum at 30 tide gauges around the coast of the Australian continent. The resulting datum surface, with minor modifications in two metropolitan areas, was termed the Australian height datum and was adopted by the National Mapping Council of Australia as the datum to which all vertical

Australian National Committee on Large Dams	The Australian National Committee on Large Dams Incorporated is an incorporated voluntary association of organisations and individual professionals with an interest in dams in Australia. The committee's technical working groups produce, for example, guidelines on design, management and risk assessment of dams.
Bankfull	The maximum amount of discharge that a stream channel can carry without overflowing. Bankfull flows are an important trigger for fish breeding in the Murray–Darling Basin.
Barmah Choke	A narrow section of the River Murray that constrains the volume of water that can pass during major floods. During floods, large volumes of water are temporarily banked up behind the Barmah Choke, which floods the Barmah–Millewa Forest wetland system.
Barrages	Five low and wide weirs built at the Murray Mouth in South Australia to reduce the amount of sea water flowing in and out of the mouth due to tidal movement. The barrages also help to control the water level in the Lower Lakes and River Murray below Lock 1 (Blanchetown, South Australia).
Baseline	Conditions regarded as a reference point for the purpose of comparison. In the Basin Plan, the baseline is defined by a number of elements, including the time under consideration; climate characteristics; each jurisdiction's policies, water management rules, entitlement systems and operating rules; the configuration and specification of water resource models; and the mix and location of various water uses and water sources.
Basin Community Committee	The Basin Community Committee advises the Murray–Darling Basin Authority about the performance of its functions, including engaging the community in the preparation of each draft Basin Plan; community matters relating to the Basin water resources; and matters referred to the committee by MDBA.
Basin Officials Committee	A committee set up to facilitate cooperation and coordination between the Commonwealth, the Murray–Darling Basin Authority and the Basin states in funding works and managing the Basin's water and other natural resources.
Basin Plan	A plan for the integrated management of the water resources of the Murray–Darling Basin, to be adopted by the Commonwealth Minister for Water under s. 44 of the Water Act.
Basin Salinity Management Strategy	A 15-year plan for communities and governments in cooperating to control salinity in the Murray–Darling Basin. The strategy establishes targets for the river salinity in each major tributary valley and across the Murray–Darling system. The strategy was agreed by the Murray–Darling Basin Ministerial Council on 17 September 2001.
Basin state agencies	Under the Water Act, a person or entity appointed or established by, or on behalf of, a Basin state. For a more detailed definition, see s. 4 of the Water Act.

Basin states	For the purposes of the Basin Plan, the Basin states are defined in the Water Act as New South Wales, Victoria, Queensland, South Australia and the Australian Capital Territory.
Basin water resources	According to s. 4 of the Water Act, Basin water resources are within or beneath the Murray–Darling Basin, but do not include water resources within or beneath the Murray–Darling Basin that are prescribed by the regulations, or groundwater that forms part of the Great Artesian Basin.
Biodiversity	The variety of species of plants, animals and microorganisms, their genes and the ecosystems they comprise, often considered in relation to a particular area.
Blue-green algae	A group of photosynthetic bacteria more correctly referred to as 'cyanobacteria'.
Borefield	A deep hole of small diameter bored to the aquifer of an artesian basin, through which water rises under hydrostatic pressure.
Bureau of Meteorology	Under the Water Act, the Bureau of Meteorology has a water information role — compiling and delivering Australia's water information — to accurately monitor, assess and forecast water availability, condition and use.
Cap (the Cap on diversions)	A limit, implemented in 1997, on the volume of surface water that can be diverted from rivers for consumptive use. Under the draft Basin Plan, the Cap will be replaced by long-term average sustainable diversion limits.
Carryover	A way to manage water resources and allocations that allows irrigators to take a portion of unused water from one season into the new irrigation season.
Catchment	The area of land drained by a river and its tributaries.
Channel	Of a watercourse, a natural or artificial streamflow with definite bed and banks to confine and conduct water. Of a landform, the bed of a watercourse that commonly is barren of vegetation and is formed of modern alluvium (deposited during relatively recent geologic time).
Climate change	A significant change in usual climatic conditions, especially those thought to be caused by global warming.
Commonwealth Environmental Water Holder	The official who manages the environmental water entitlements held by the Australian Government. Under the Water Act, this official is responsible for using these entitlements to protect and restore the environmental assets of the Murray–Darling Basin, or assets outside the Basin where water is held by the Australian Government for that area.

Community (human)	A human community can be conceptualised in a range of ways:
	<ol> <li>Community of place (people living in a given geographical area).</li> </ol>
	2. Community of interest (people who share a common interest, such as an industry).
	3. Community of identity (e.g. the Indigenous community).
	Some experts propose that a meaningful unit of analysis is the 'social catchment', which describes communities with a distinct identity and coherence, and cuts across the concepts of place, interest and identity. In developing the Basin Plan, the MDBA considered communities from all the above perspectives.
Community (ecological unit)	An ecological unit composed of a group of organisms or a population of different species occupying a particular area, usually interacting with each other and with their environment.
Connectivity	Connections between natural habitats, such as a river channel and adjacent wetland areas. Connectivity is a measure or indicator of whether a water body (river, wetland, floodplain) has water connections or flow connections to another body.
Consumptive use	Use of water for irrigation, industry, urban, stock and domestic use, or for other private consumptive purpose.
Convention on Wetlands of International Importance	See 'Ramsar Convention'.
Conveyance water	The water required to ensure sufficient flow in a river to physically deliver water for critical human water needs without it evaporating or seeping into the riverbed. Under the Water Act, 'conveyance water' is water in the River Murray System required to deliver water to meet critical human water needs as far downstream as Wellington in South Australia.
Cooperative research centres	Cooperative research centres are key bodies for Australian scientific research across a range of sectors to enhance Australia's industrial, commercial and economic growth.
Critical human water needs	Under s. 86A(2) of the Water Act, 'critical human water needs' is the minimum amount of water required to meet core requirements of communities dependent on Basin water resources. The definition also includes non-human requirements that, if not met, would cause prohibitively high social, economic or national security costs.
CSIRO	CSIRO is Australia's national science agency. Water for a Healthy Country is one of CSIRO's national research flagships. CSIRO's Land and Water Division takes part in a wide range of research relevant to the Murray–Darling Basin.

Cultural flows (or cultural water flows)	These are water entitlements legally and beneficially owned by the Indigenous Australian nations of the Murray–Darling Basin. Such water entitlements are of sufficient and adequate quantity and quality to improve the spiritual, cultural, environmental, social and economic conditions of Indigenous Australians.
Cyanobacteria	A group of photosynthetic bacteria (see 'Blue-green algae').
Demonstration reach	A demonstration reach is a section of river where a number of management actions, such as provision of fish passage, resnagging and management of alien species, are carried out. The purpose of such a reach is to demonstrate to the community the benefits from rehabilitating native fish habitat and populations using an adaptive management framework.
Dewatering	Lowering of the water level at a particular location.
Discharge	Flow of groundwater from a saturated zone to the earth's surface; flow of surface water out of a defined catchment.
Diurnal	Any pattern that recurs daily, such as a cycle of daily temperature change or oxygen levels in water.
Diversion	A structure in a river or canal that diverts water to another watercourse; a turning aside or alteration of the natural course of a flow of water; or the transfer of water from a water source by a canal, pipe, well or other conduit to a watercourse or to the land (as in the case of an irrigation system).
Diversion limit compliance method	The method to determine compliance with a long-term annual diversion limit. Under s. 22 (1), item 8 of the Water Act, it is mandatory content of the Basin Plan.
Drawdown	The lowering of the water level in a weir pool.
Dredging	The mechanical removal of mud and other material to deepen a waterway.
Drought refuge	An area that a species can retreat to during times of drought; for instance, a permanent pool that remains when a river dries out during droughts.
Ecologically sustainable development	Using, conserving and enhancing the community's resources so that the ecological processes on which life depends are maintained and the total quality of life, now and in the future, can be increased.
Ecology	The study of the interrelationships of living things to one another and to the environment.
Ecosystem	A dynamic complex of plant, animal and microorganism communities and the non-living environment, interacting as a functional unit.
Electrical conductivity	A unit commonly used to indicate water salinity. One unit of electrical conductivity equals one microsiemen per centimetre, measured at 25 °C.

Entitlement (or water entitlement)	The volume of water authorised to be taken and used by an irrigator or water authority, including bulk entitlements, environmental entitlements, water rights, sales water and surface-water and groundwater licences.
Entitlement holder	An irrigator or water authority.
Environmental asset	A key environmental asset for the purposes of the Basin Plan is a water-dependent ecosystem that meets one or more criteria outlined in the Water Act. Environmental assets include water-dependent ecosystems, ecosystem services and sites of ecological significance.
Environmental connectivity	Environmental connectivity consists of links between water- dependent ecosystems that allow migration, colonisation and reproduction of species. These connections also enable nutrients and carbon to be transported throughout the system to support the healthy functioning and biodiversity of rivers, floodplains and wetlands. Hydrological and ecological links are between upstream and downstream sections of river (longitudinal connectivity), and between rivers and their floodplains (lateral connectivity).
Environmental flow	Any river flow pattern provided with the intention of maintaining or improving river health.
Environmental outcome	An outcome (usually of a project) that benefits the ecological health of the river system.
Environmental water	Water used to achieve environmental outcomes, including benefits to ecosystem functions, biodiversity, water quality and water resource health.
Environmental water requirements	The amount of water needed to meet an ecological or environmental objective.
Environmental Watering Plan	A plan to restore and sustain the wetlands and other environmental assets of the Basin and to protect biodiversity dependent on the Basin water resources.
Environmental Works and Measures Program	A program to deliver works and measures to improve the health of the River Murray System by making the best use of available water, optimising the benefits of any water recovered in the future, and considering other policy interventions.
Environmentally sustainable level of take	The level of water extraction from a particular system that if exceeded would compromise key environmental assets or ecosystem functions and the productive base of the resource.
Ephemeral stream	A stream that flows only in direct response to precipitation, usually for a short time, and stops flowing during dry seasons. Most dry washes in more arid regions may be classified as ephemeral streams.
ePMDS	An electronic performance management and development scheme.

Farm dam	Small dams (usually of <5 ML storage capacity) designed to capture run-off from rainfall events. While most farm dams are located on farms, the term includes dams on other types of properties, such as public or urban land.
Fish passage	The capacity for fish to travel upstream and downstream; weirs and dams obstruct the passage of fish within streams, and structures such as fishways are built to restore fish passage by enabling fish to pass.
Fishway	A structure that provides fish with passage past an obstruction in a stream.
Floodplain	Any normally dry land area susceptible to inundation by water from any natural source.
Flow	The movement of water; the rate of water discharged from a source, given in volume with respect to time.
Flow event	A single event of flow in a river; sometimes required to achieve one or more environmental targets. A series of flow events comprises a flow history.
Flow regime	The characteristic pattern of a river's flow quantity, timing and variability.
Flow variability	When applied to the Murray–Darling Basin, refers to the combined variability of the magnitude (size in height and volume), the duration (the time the flow lasts) and the frequency (how often a flow occurs).
Geoscience Australia	Geoscience Australia is an Australian Government agency that provides geoscientific information to facilitate informed decisions on exploitation of resources, environmental management and safety of critical infrastructure.
GL	A gigalitre; 1 billion litres.
Groundwater	Water occurring naturally below ground level (in an aquifer or otherwise).
Groundwater connectivity	Surface-water and groundwater systems are not separate resources but components of one system. Their connectivity is a dynamic relationship that fluctuates both seasonally and over the long term in response to climatic variations and the delayed impact of groundwater extractions. Where the connection is strong, groundwater extraction may directly affect surface-water streamflow by inducing leakage to groundwater, or intercepting stream base flow over short and long timeframes. Similarly, surface-water extraction and management regimes may affect the availability of groundwater.
Habitat	The natural environment or place where living things exist and grow.
Held environmental water	Water available under an access, delivery or irrigation right that is held to achieve environmental outcomes.

High flow	A persistent increase in seasonal base flow that remains within the channel; high flows do not fill the channel to 'bankfull'.
Hydrologic year	See 'Water year'.
lcon sites	Six locations chosen for The Living Murray program because of their regional, national and international ecological value, and the concurrence that they are at risk and require improved water flow regimes. The sites are Barmah–Millewa Forest; Gunbower– Koondrook–Perricoota Forest; Hattah Lakes; Chowilla Floodplain and the Lindsay–Wallpolla islands; Murray Mouth, Coorong and Lower Lakes; and the River Murray Channel.
Inflow	The source of the water that flows into a specific body of water; for a lake, inflow could be a stream or river, and inflow for a stream or river could be rain.
Key environmental asset	An environmental feature deemed 'key' for the purposes of the Basin Plan because it meets at least one of five criteria set by MDBA.
Lock	A rectangular chamber with gates at either end, allowing vessels to move from one water level to another.
Long-term Cap equivalent	An average that takes into account the different characteristics and reliability of water entitlements and allocations in New South Wales, Victoria and South Australia. This creates a common unit of measure, allowing equitable comparison of a broad range of water recovery measures.
Loss	Water lost from a river system that is not available to other users (e.g. water loss caused by evaporation and seepage).
Low flow	A continuous flow through a water channel that either maintains the flow above a cease-to-flow condition or provides habitat as a change from high flow.
Macroinvertebrate	An animal without a backbone that is large enough to be seen without magnification.
Main channel	Many rivers of the Murray–Darling Basin have a large number of channels, particularly in their lower reaches; however, they usually have a main channel, which is the one given the name of the river.
Median	The single middle value in a range of values. If there is an even number of values (therefore two middle values), the median is the average of the two middle values.
mg/L	Milligrams per litre.
ML	A megalitre; 1 million litres.
ML/d	Megalitres per day.
Modelling	The application of a mathematical process or simulation framework (e.g. a mathematical or econometric model) to describe various phenomena and analyse the effects of changes in some characteristics on others.

Monitoring and Evaluation Program	A program to monitor and evaluate the effectiveness of the draft Basin Plan as required by the Water Act. This program must set out the principles to be applied and the framework to be used for monitoring and evaluation, including the requirements for reporting.
Murray Lower Darling Rivers Indigenous Nations	A confederation of 10 Indigenous Australian nations in the southern part of the Basin, comprising representatives of the Wiradjuri, Yorta Yorta, Taungurung, Wamba Wamba, Wadi Wadi, Mutti Mutti, Latji Latji, Ngarrindjeri, Barapa Barapa and Wergaia peoples.
Murray-Darling Basin	The entire tract of land drained by the Murray and Darling rivers, covering parts of Queensland, New South Wales, Victoria and South Australia and the whole of the Australian Capital Territory.
Murray–Darling Basin Commission	The Murray–Darling Basin Commission was the executive arm of the Murray–Darling Basin Ministerial Council, set up under the Murray–Darling Basin Agreement in 1992. The functions of the Commission were subsumed by the Murray–Darling Basin Authority in 2008.
Murray–Darling Basin Ministerial Council	The Murray–Darling Basin Ministerial Council has an advisory role in the preparation of the Basin Plan, and policy and decision- making roles for matters such as state water shares, critical human water needs, and the funding and delivery of natural resource management programs. The Ministerial Council is chaired by the Commonwealth Minister for Water and includes one minister from each Basin state.
National Water Commission	The organisation responsible for driving progress towards the sustainable management and use of Australia's water resources under the National Water Initiative.
Native Fish Strategy	This strategy aims to ensure that the Murray–Darling Basin sustains viable fish populations and communities throughout its rivers. The strategy's goal is to rehabilitate native fish communities to 60% of their estimated pre-European settlement levels within 50 years.
Natural flow	Water movement past a specified point on a natural stream from a drainage area for which there have been no effects caused by stream diversion, storage, import, export, return flow, or change in consumptive use caused by human-controlled modification to land use.
Natural resource management	The management of natural resources such as land, water, soil, plants and animals, with a particular focus on how management affects the quality of life for both present and future generations.

Northern Murray–Darling Basin Aboriginal Nations	A confederation of 21 Aboriginal nations in the northern part of the Basin, comprising representatives of the Barkindji, Barunggam, Bidjara, Bigambul, Budjiti, Euahlayi, Gamilaroi, Githabul, Gunggari, Jarowair, Gwamu (Kooma), Kunja, Kwiambul, Malangapa, Mandandanji, Mardigan, Murrawarri, Ngemba, Ngiyampaa, Wailwan and Wakka Wakka peoples.
Nutrient	An element or compound essential to life, which sustains individual organisms and ecosystems; the portion of any element or compound in the soil that can be readily absorbed and assimilated to nourish growing plants.
Offtake	A location where water is diverted from an open water supply system for consumptive use.
Ramsar Convention	The Convention on Wetlands of International Importance is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources.
Recharge	The process of replenishing an aquifer, usually from rainfall or losses from surface-water bodies such as rivers and lakes.
Reference condition	The condition of a river, as assessed by an audit, relative to how it would have been had it not been changed.
Regulated	A water system in which water is stored or flow levels are controlled through the use of structures such as dams and weirs.
Regulated flow	A controlled flow rate resulting from the influence of a regulating structure such as a dam or weir.
Regulation	The artificial manipulation of the flow of a body of water.
Resnagging	A program to reinstate snags or instream woody habitats used by native fish to shelter from currents and predators, and as feeding and spawning sites and nurseries for juvenile fish.
Risk allocation	When there are reductions to the volume or change to the reliability of an entitlement holder's water allocation from the Basin Plan, the risks are shared between individual entitlement holders and governments according to a formula in the Water Act that recognises climate change and other natural events, new knowledge and changes in government policy.
River health	Status of a river system based on water quality, ecology and biodiversity.
Riverine	Relating to, formed by or resembling a river, including tributaries, streams, brooks and so on; pertaining to or formed by a river; situated or living along the banks of a river.
Run-off	Flow of surface water from a given area resulting from the effects of rainwater.
Saline	Water that contains a significant concentration of dissolved salts, predominantly sodium chloride.

Salinity	The concentration of dissolved salts in groundwater or river water, usually expressed in electrical conductivity units or milligrams of dissolved solids per litre.
Salinity register	A salinity-based accounting system that underpins the Basin Salinity Management Strategy, providing an accounting record of Basin state actions that affect river salinity.
Salt interception scheme	Large-scale groundwater pumping and drainage projects that intercept saline groundwater inflowing to rivers, and dispose of the saline waters by evaporation and aquifer storage at more distant locations.
Salt load	The amount of salt carried in rivers, streams, groundwater or surface run-off in a given time.
Schedule for Water Sharing	Water-sharing arrangements that replace the 'normal' arrangements of the Murray–Darling Basin Agreement to deliver water to meet critical human water needs when water availability is so low that the normal arrangements cease to be appropriate. The schedule sets out how state and territory water entitlements are determined, delivered and accounted for during tiers 2 and 3 (see s. 135(6)(a) of the agreement), and during the transition to and from tiers 2 and 3.
Seiche	As wind blows across Lake Alexandrina (or any enclosed body of water), it imparts kinetic energy through frictional drag to the top layer of water, causing water to 'pile up' on the leeward side. Eventually the wind can no longer maintain the elevated water level and the water collapses, forming a wave that may then pulse from one side of the water body to the other, parallel to the wind. This phenomenon is known as 'seiching'.
Spatial	Usually refers to area or distance.
Spatial data	Any data that can be mapped.
Surface water	Includes water in a watercourse, lake or wetland, and any water flowing over or lying on the land after having precipitated naturally or after having risen to the surface naturally from underground (see s. 4 of the Water Act).
Surface-water diversion	Changing the natural flow of surface water to another location by artificial means, such as dams or pipelines.
Sustainable diversion limit	The maximum long-term annual average quantities of water that can be taken, on a sustainable basis, from the Basin water resources as a whole, and the water resources, or particular parts of the water resources, of each water resource plan area.
Sustainable Rivers Audit	A program designed to determine the ecological condition and health of river valleys in the Murray–Darling Basin, to give a better insight into the variability of river health indicators over time and to trigger changes to natural resource management.
Take	The removal of water from, or the reduction in flow of water in or into, a water resource.

The Living Murray program	A partnership of the Australian Government and the governments of New South Wales, Victoria, South Australia and the Australian Capital Territory, aimed at achieving a healthy, working River Murray System.
Threatened species	Species or ecological communities considered threatened with extinction as defined by the <i>Environment Protection and</i> <i>Biodiversity Conservation Act 1999</i> or relevant jurisdictional legislation.
Water accounting	A systematic process of identifying, recognising, quantifying, reporting and assuring information about water, the rights or other claims to water, and the obligations against water. Water accounting applies Australian Water Accounting Standards.
Water allocation	The specific volume allocated to the holders of water entitlements in a given season, often quoted as a percentage of the volume of each entitlement. For example, a 20% allocation in a particular season allows a water user with a 100 ML entitlement to take 20 ML of water.
Water-dependent ecosystems	Ecological communities that depend on periodic or sustained inundation, waterlogging or significant inputs of surface water or groundwater for their ecological integrity.
Water entitlement	Water users in the Basin hold legal entitlement, or licence, to a share of the available water. The entitlement usually specifies size (or volume) of the share; the source of the water (e.g. river, catchment or aquifer); and the category (which can be a combination of priority and purpose).
Water for the Future	An initiative to prepare Australia for a future with less water. It has four key priorities — taking action on climate change, using water wisely, securing water supplies, and supporting healthy rivers and wetlands.
Water market rules	Rules that apply to irrigation infrastructure operators holding group water entitlements on behalf of their members, which are designed to ensure that members can separate their portion of the group-held entitlement into a separate entitlement held by the individual. Water market rules are required under the Water Act, but are not within the Basin Plan. These rules are made by the Commonwealth Minister for Water.
Water quality	The condition of water and its suitability for different purposes. Water quality refers to a combination of physical, chemical and biological characteristics of water in the context of the value or use for which the water body is being recognised.
Water Quality and Salinity Management Plan	A plan to protect and enhance water quality in the Basin for environmental, social, economic and cultural uses. It will be included in the Basin Plan.
Water quality components	Salinity, turbidity, total nitrogen content and total phosphorous content.

Water recovery	Implementation of measures that result in water being made available under The Living Murray.
Water recovery registers	Water recovery measures are approved and monitored using a system of staged registers — the developmental register, the eligible measures register and the environmental water register.
Water-regulating structure	An object (e.g. a bar or gate) fitted to regulate water flow or depth.
Water resource	Of groundwater, water that occurs naturally beneath the ground level (whether in an aquifer or otherwise), or water that has been pumped, diverted or released to an aquifer for the purpose of being stored there. Murray–Darling Basin groundwater resources exclude groundwater in the Great Artesian Basin.
	Of surface water, includes water in a watercourse, lake or wetland, and any water flowing over or lying on land after having precipitated naturally, or after having risen to the surface naturally from beneath the ground level.
Water resource plan	A plan that provides for the management of the water resources of a water resource plan area, recognised under provisions of the Water Act.
Water resource plans	Statutory management plans developed for particular surface- water and groundwater systems, currently known by different names throughout the Murray–Darling Basin (e.g. 'water sharing plans' in New South Wales and 'water allocation plans' in South Australia).
Water trading rules	A set of overarching consistent rules enabling market participants to buy, sell and transfer tradeable water rights.
Water year (or hydrologic year)	A continuous 12-month period starting from July, or any other month as prescribed under the water regulation or a resource operations plan, but usually selected to begin and end during a relatively dry season. The water year is used as a basis for processing streamflow and other hydrologic data.
Weir	A dam in a river to stop and raise the water (to conduct it to a mill, form a fishpond or the like).
Wetland	Areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres. An area that is periodically inundated or saturated by surface water or groundwater on an annual or seasonal basis that displays hydric soils and that typically supports, or is capable of supporting, hydrophytic vegetation.

## LIST OF REQUIREMENTS

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8(3) & A.4		Letter of transmittal	Mandatory	iii
A.5		Table of contents	Mandatory	vii
A.5		Index	Mandatory	272
A.5		Glossary	Mandatory	254
A.5		Contact officer(s)	Mandatory	inside front cover
A.5		Internet home page address and Internet address for report	Mandatory	inside front cover
9		Review by Chief Executive MD	BA	
9(1)		Review by Chief Executive MDBA	Mandatory	Х
9(2)		Summary of significant issues and developments	Suggested	viii
9(2)		Overview of department's performance and financial results	Suggested	x, 2
9(2)		Outlook for following year	Suggested	x,2
9(3)		Significant issues and developments — portfolio	Portfolio departments — suggested	n/a
10		Departmental overview		
10(1)		Role and functions	Mandatory	v, 8
10(1)		Organisational structure	Mandatory	16
10(1)		Outcome and program structure	Mandatory	10, 20, 44, 48, 70, 74, 94, 98, 141
10(2)		Where outcome and program structures differ from Portfolio Budget Statements/Portfolio Additional Estimates Statements (PBS/PAES) or other portfolio statements accompanying any other additional Appropriation Bills (other portfolio statements), details of variation and reasons for change	Mandatory	n/a

\* The reference is to the location of the item — for example, 'A.4' refers to the fourth item in Attachment A of the Department of Prime Minister and Cabinet's *Requirements for annual reports* (issued 28 June 2012

Ref*	Part of report	Description	Requirement	Page
10(3)		Portfolio structure	Portfolio departments — mandatory	n/a
11		Report on perfromance		
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11(2)		Actual performance in relation to deliverables and key performance indicators set out in PBS/PAES or other portfolio statements	Mandatory	20, 44, 48, 70, 74, 94, 98, 141
11(2)		Where performance targets differ from the PBS/PAES, details of both former and new targets, and reasons for the change	Mandatory	20, 44, 48, 70, 74, 94, 98, 141
11(2)		Narrative discussion and analysis of performance	Mandatory	20–175
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11(3)		Significant changes in nature of principal functions/services	Suggested	n/a
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11(4)		Social inclusion outcomes	lf applicable, mandatory	163
11(5)		Performance against service charter customer service standards, complaints data, and the department's response to complaints	lf applicable, mandatory	n/a
11(6)		Discussion and analysis of the department's financial performance	Mandatory	2, 177
11(7)		Discussion of any significant changes from the prior year, from budget or anticipated to have a significant impact on future operations.	Mandatory	2, 177
11(8)		Agency resource statement and summary resource tables by outcomes	Mandatory	235

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		Corporate governance		
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12(3)		Approach adopted to identifying areas of significant financial or operational risk	Suggested	1, 144, 147–150, 168
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12(7)		Statistics on staffing	Mandatory	158-61
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12(12)	Purchasing	Assessment of purchasing against core policies and principles	Mandatory	171–73
12[13]- [24]	Consultants	The annual report must include a summary statement detailing the number of new consultancy services contracts let during the year; the total actual expenditure on all new consultancy contracts let during the year (inclusive of GST); the number of ongoing consultancy contracts active in the reporting year; and the total actual expenditure in the reporting year on the ongoing consultancy contracts (inclusive of GST). The annual report must include a statement noting that information on contracts and consultancies is available through the AusTender website.	Mandatory	172-73
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