Senate Standing Committee on Environment and Communications
Legislation Committee
Answers to questions on notice
Sustainability, Environment, Water, Population and Communities portfolio
Budget Estimates, May 2012

Program: Division or Agency:	4: MDBA	**Question No:**	210
Topic:	MDBA – Spend on economic modelling		
Proof Hansard Page and Date	55 (23/5/12)		
or Written Question:			

Senator Joyce asked:

Senator: JOYCE: How much have you spent on modelling so far?

Dr Dickson: On which particular modelling?

Senator JOYCE: On all your modelling. How much has the MDBA spent on economic modelling so far?

Dr Dickson: I might have to take that on notice. When you say 'so far', from what point? From ever?

Senator JOYCE: Since the process of trying to develop a plan for the Murray-Darling Basin.

Mr Webster: I do not have that figure.

Dr Dickson: We will provide it to you on notice.

Answer:

Between May 2009 and May 2012 the Murray-Darling Basin Authority has spent $7,193,875.70 on social and economic research and analysis. This includes modelling of economic impacts; assessment of social impacts; community vulnerability assessments; impacts on indigenous communities; valuation of environmental benefits; peer reviews of the modelling undertaken; data collection; and workshops on economic modelling and valuation of environmental benefits.

Senate Standing Committee on Environment and Communications
Legislation Committee
Answers to questions on notice
Sustainability, Environment, Water, Population and Communities portfolio
Budget Estimates, May 2012

Program: Division or Agency:	4: MDBA	**Question No:**	211
Topic:	Qualifications of Dr Glyn Wittwer		
Proof Hansard Page and Date or Written Question:	56 (23/5/12)		

Senator Joyce asked:

Senator JOYCE: Who was the main person you were speaking to from Monash University?

Mr Webster: Dr Glyn Wittwer.

Senator JOYCE: Was he a 'climatition', a statistician or an econometrician?

Mr Webster: You could call him an econometrician. He was an economic modeller.

Senator JOYCE: His history has always been in academia? He is a very competent person with a long-term history in academia?

Senator Conroy: We would have to take that on notice. We can get you his CV if you like.

Answer:

Dr Wittwer is an experienced economic modeller. His CV is attached.

Curriculum vitae: Glyn Wittwer

Phone: 61 3 9905 5421
Fax: 61 3 9905 2426

Qualifications:

Ph.D., The University of Adelaide, 2000
B.Ec. (Hons.), The University of Adelaide, 1991
B.A., The University of Adelaide, 1989
Assoc. Dip. Radiological Technology, SAIT, 1979.

Experience in economics:

Current position: Senior Research Fellow, Centre of Policy Studies.
Post-doctoral Fellow and Ph.D. candidate, Centre for International Economic Studies, The University of Adelaide, 1998 to 2001.

Previous employment as economist at:
The South Australian Centre for Economic Studies, 1995 to 1998;
Bureau of Industry Economics, 1994 to 1995;
Industry Commission, 1992 to 1994;
ABARE, 1991 to 1992.

Areas of research interest
CGE modelling
Primary industries
Regional economics

Academic publications:

Qureshi, E.; Proctor, W., Young, M.D. and Wittwer, G. (2012), 'The economic impact of increased water demand in Australia: A computable general equilibrium analysis', *Economic Papers* 31(1):87-102.

Wittwer, G. (2011), "Confusing policy and catastrophe: buybacks and drought in the Murray-Darling Basin", *Economic Papers* 30(3): 289-295.

Anderson, K., Valenzuela, E. and Wittwer, G. (2011), "Wine export shocks and wine tax reform in Australia: Regional consequences using an economy-wide approach", *Economic Papers* 30(3): 386-399.

Wittwer, G. and Griffith, M. (2011), "Modelling drought and recovery in the southern Murray-Darling basin", *Australian Journal of Agricultural and Resource Economics*, 55(3): 342-359.

Dixon, P., Rimmer, M. and Wittwer, G. (2011), "Saving the Southern Murray-Darling Basin: the Economic Effects of a Buyback of Irrigation Water", *Economic Record*, 87(276): 153-168.

Wittwer, G. and Horridge, M. (2010), "Bringing Regional Detail to a CGE Model using Census Data", *Spatial Economic Analysis*, 5(2):229-255.

Wittwer, G. and Horridge, M. (2009), "A multi-regional representation of China's agricultural sectors", *China Agricultural Economic Review*, 1(4):420-434.

Wittwer, G. (2009), "The economic impacts of a new dam in South-east Queensland", *Australian Economic Review*, 42(1):12-23, March.

Horridge, M. and Wittwer, G. (2008), "SinoTERM, a multi-regional CGE model of China", *China Economic Review*, 19(4):628-634, December.

Horridge, M., Wittwer, G. and Wibowo, K. (2006), "Impact of the national rice import policy on the economy of West Java: simulation using CGE INDOTERM", (in Indonesian) *Jurnal Sosiohumaniora Padjadjaran University Research Institute*, 8(3): 224-239.

Horridge, M. and Wittwer, G. (2006), "The Impacts of Higher Energy Prices on Indonesia's and West Java's Economies using INDOTERM, a Multiregional Model of Indonesia", *Economic Journal, Faculty of Economics Padjadjaran University*, XXI(2):

Wittwer, G. and Rothfield, J. (2005), "Projecting the world wine market from 2003 to 2010", *Australasian Agribusiness Review*, 13, paper no. 21.

Wittwer, G., Vere, D., Jones, R. and Griffith, G. (2005), "Dynamic general equilibrium analysis of improved weed management in Australia's winter cropping systems", *Australian Journal of Agricultural and Resource Economics*, 49(4): 363-377, December.

Horridge, M, Madden, J. and Wittwer, G. (2005), "Using a highly disaggregated multi-regional single-country model to analyse the impacts of the 2002-03 drought on Australia", *Journal of Policy Modelling* 27(3):285-308, April.

Wittwer, G., McKirdy, S. and Wilson, R. (2005), "The regional economic impacts of a plant disease incursion using a general equilibrium approach", *Australian Journal of Agricultural and Resource Economics* 49(1): 75-89, March.

Dixon. P., Schreider, S. and Wittwer, G. (2005), "Combining engineering-based water models with a CGE model", chapter 2 in Productivity Commission, *Quantitative tools for microeconomic policy analysis*, Conference Proceedings, 17-18 November, 2004, Canberra.

Harrison, J., Horridge, M., Pearson, K. and Wittwer, G. (2004), "A practical method for explicitly modeling quotas and other complementarities", *Computational Economics* 23(4): 325-341, June.

Dixon, P. and Wittwer, G. (2004), "Forecasting the economic impact of an industrial stoppage using a dynamic, computable general equilibrium model", *Australian Journal of Labour Economics*, 7(1), pp. 31-43, March.

Anderson, K., D. Norman and G. Wittwer (2003), "Globalization of the world's wine markets", *The World Economy* 26(5): 659-87, May .

Zhao, X., Anderson, K. and Wittwer, G. (2003), "Who gains from Australian generic wine promotion and R&D?" *The Australian Journal of Agricultural and Resource Economics*, 47(2): 181-209.

Wittwer, G., Berger, N. and Anderson, K. (2003), "A model of the world's wine markets", *Economic Modelling*, 20(3): 487-506, May.

Adams, P., Horridge, M., Madden. J. and Wittwer, G. (2002), "Drought, regions and the Australian economy between 2001-02 and 2004-05", *Australian Bulletin of Labour*, 28(4): 231-246.

Wittwer, G. and Anderson, K. (2002), "Impact of tax reform on the Australian wine industry: a CGE analysis", *Australian Economic Papers*, 41(1): 69-81, March.

Wittwer, G. and Anderson, K. (2001), "Accounting for growth in the Australian wine industry, 1987 to 2003", *The Australian Economic Review*, 34(2): 179-89, June.

Wittwer, G. and Bright, M. (1997), "The effects of mining expansion on regional economies in Australia", *Australasian Journal of Regional Studies*, 3(1):71-84.

Books

Wittwer, G. (2012) (editor), *Economic Modeling of Water: The Australian CGE Experience*, Springer, Dordrecht, Netherlands (186 pages).

Book chapters

Wittwer, G. and Dixon, P. (2011), "The economic impact of the buyback program", in Langford, J., Briscoe, J. and Taylor, N. (editors), *The Australian Water Project – Crisis and opportunity: Lessons of Australian water reform*. CEDA and Uniwater, Melbourne.

Wittwer, G. (2012), "Practical Policy Analysis Using TERM", Chapter 1 in G. Wittwer (ed.), *Economic Modeling of Water, The Australian CGE Experience*, Springer, Dordrecht, Netherlands.

Wittwer, G. and Verikios, G. (2012), "Introducing Dynamics to TERM", Chapter 3 in G. Wittwer (ed.), *Economic Modeling of Water, The Australian CGE Experience*, Springer, Dordrecht, Netherlands.

Dixon, P., Rimmer, M. and Wittwer, G. (2012), "The Theory of TERM-H2O", Chapter 5 in G. Wittwer (ed.), *Economic Modeling of Water, The Australian CGE Experience*, Springer, Dordrecht, Netherlands.

Dixon, P., Rimmer, M. and Wittwer, G. (2012), "Buybacks to Restore the Southern Murray-Darling Basin", Chapter 6 in G. Wittwer (ed.), *Economic Modeling of Water, The Australian CGE Experience*, Springer, Dordrecht, Netherlands.

Wittwer, G. and Griffith, M. (2012), "The Economic Consequences of Prolonged Drought in the Southern Murray-Darling Basin", Chapter 7 in G. Wittwer (ed.), *Economic Modeling of Water, The Australian CGE Experience*, Springer, Dordrecht, Netherlands.

Wittwer, G. (2012), "Urban Water Supply: A Case Study of South-East Queensland", Chapter 8 in G. Wittwer (ed.), *Economic Modeling of Water, The Australian CGE Experience*, Springer, Dordrecht, Netherlands.

Wittwer, G. (2012), "Applying TERM-H2O to Other Countries", Chapter 9 in G. Wittwer (ed.), *Economic Modeling of Water, The Australian CGE Experience*, Springer, Dordrecht, Netherlands.

Anderson, K., Norman, D. and Wittwer, G. (2004), "Global Overview" Chapter 2 in *The World's Wine Markets: Globalization at Work*, edited by K. Anderson, London: Edward Elgar.

Stringer, R., Erwidodo and Wittwer, G. (2001), 'Effects of agricultural policy reform on Indonesia's food security', in Anderson, K., Stringer, R. and Erwidodo (editors), *Indonesia's Boom and Crisis in a Reforming World Economy: Effects on Agriculture, Trade and the Environment*.

Connolly, G., Wittwer, G. and Roper, H. (1994), 'Effects of changes in wool prices and wages on Japanese demand for wool', in Findlay, C. and Itoh, M. (editors), *Wool in Japan: Structural Change in the textile and clothing market*, Harper Educational, Sydney.

Book reviews

Review of *Collapse: How Societies Choose to Fail or Survive*, by J. Diamond. *Australian Journal of Agricultural and Resource Economics,* 50(1): 120-123, March 2006.

(with Xueyan Zhao) Review of *Private-Private Collaboration in Agricultural Research: New Institutional Arrangements and Economic Applications*, by K. Fugle and D. Schimmelpfennig (eds.) *Australian Journal of Agricultural and Resource Economics,,* 45(4): 652-654, December 2001.

Other refereed publications

Wittwer, G. and Connolly, G. (1992), 'Declining competitiveness of Japan's wool processing industry', *Agriculture and Resources Quarterly*, vol. 4, no. 1, pp. 53-65, March.

Unrefereed publications:

Wittwer, G. and Anderson, K. (2001), "How Increased EU Import Barriers and Reduced Retail Margins Affect the World Wine Market," *The Australian and New Zealand Wine Industry Journal*, 16(3):67-74, May/June.

Wittwer, G. and Anderson, K. (2001), "US Dollar Appreciation and the Spread of Pierce's Disease: Effects on the World Wine Market", *The Australian and New Zealand Wine Industry Journal*, 16 (2):70-75, March/April.

Anderson, K. and Wittwer, G. (1999), "More on Modeling the Impact of Tax Reform: How Unequal is the Proposed Wine 'Equalization' Tax'", *The Australian and New Zealand Wine Industry Journal*, 14(3):100-101, May/June.

Wittwer, G. and Anderson, K. (1998), "Impact of Tax Reform on Australia's Wine Industry", *The Australian Grapegrower and Winemaker*, 418:62-66, October.

Other working papers:

Wittwer, G. and Dixon, J. (2012), "Upgrading irrigation infrastructure in the Murray Darling Basin: is it worth it?" http://www.monash.edu.au/policy/elecpapr/g-228.htm, June.

Dixon, P., Rimmer, M. and Wittwer, G. (2010), "Modelling the Australian government's buyback scheme with a dynamic multi-regional model". *http://www.monash.edu.au/policy/elecpapr.htm* G-186, January (revised).

Xiao, J. and Wittwer, G. 2009. "Will an Appreciation of the Renminbi Rebalance the Global Economy? A Dynamic Financial CGE Analysis", http://ideas.repec.org/p/cop/wpaper/g-192.html G-192.

Wittwer, G. and Horridge, M. (2008), "Creating and managing an impossibly large CGE database that is up-to-date". *http://www.monash.edu.au/policy/elecpapr.htm* G-175, May.

Wittwer, G. (2008), "Will drought erode the competitiveness of Australia's wine industry?" . *http://www.monash.edu.au/policy/elecpapr.htm* G-173, March.

Wittwer, G. (2007), "The global wine market in the decade to 2015 with a focus on Australia and Chile". . *http://www.monash.edu.au/policy/elecpapr.htm* G-166, July.

Horridge, M. and Wittwer, G. (2006), "The Impacts of Higher Energy Prices on Indonesia's and West Java's Economies using INDOTERM, a Multiregional Model of Indonesia". Working Papers in Economics and Development Studies, Department of Economics, Padjadjaran University.

Wittwer, G., McKirdy, S. and Wilson, R. (2006), "Analysing a hypothetical Pierce's disease outbreak in South Australia using a dynamic CGE approach". . *http://www.monash.edu.au/policy/elecpapr.htm* G-162, September.

Projects undertaken at CoPS since November 2001

The impact of productivity growth in agricultural and food processing sectors on regions of Victoria – a dynamic CGE approach Prepared for Victoria's Department of Primary Industries, January 2012.

Economic consequences of not controlling locusts and fruit fly. Prepared for Victoria's Department of Primary Industries, December 2011.

Hypothetical foot and mouth scenarios in south-eastern Australia. Prepared for Victoria's Department of Primary Industries, December 2011.

The impact of productivity growth in agricultural sectors on regions of Victoria. Prepared for Victoria's Department of Primary Industries, November 2011.

Basin Plan CGE Modelling. Report prepared for MDBA, September 2011

Modelling the benefits of water trading. Prepared for Frontier Economics (for National Water Commission). August 2011.

Socio-economic assessment of sustainable diversion limit (SDL) scenarios at NSW SLA scale. Report prepared for NSW Office of Water, July 2011.

Independent Review of Dr Peter Coombes' Greater Melbourne Systems Model, Department of Sustainability and Environment. July 2011

The impacts of the Brisbane flood. Report prepared for Queensland Investment Corporation, January 2011.

MDB scenarios: buybacks and infrastructure upgrades. Report prepared for Marsden Jacobs, January 2011.

The regional economic impacts of Sustainable Diversion Limits. Report prepared for the Murray –Darling Basin Authority. November 2010.

Prescribed Sustainable Diversion Limits in northern Victoria. Prepared for Victoria's Department of Primary Industries. August 2010.

The economic impacts of a hypothetical Perth airport curfew. Prepared for SKM. August 2010.

Using CGE modelling to assess the economic impact associated with reduced irrigation water supply and increased water supply variability in Victoria. Prepared for Victoria's Department of Primary Industries. May 2010.

Fire brigades impact on economy. Deloitte Touch Tohmatsu. March 2010.

Water trading in the southern Murray-Darling basin. For Uniquest and SA government, February 2010.

Tourism scenario, Far North Queensland. For Marsden Jacob, December 2009.

Economic modelling of various scenarios affecting the dairy industry in the southern Murray-Darling basin (with Marnie Griffith). Allens Consulting, October 2009.

Modelling the economic impacts of upgrades to Webb Dock (with Marnie Griffith). Prepared for GHD Meyrick. October 2009.

The economic impacts of water trading in the southern Murray-Darling basin. Modelling prepared for Frontier Economics and the MDBC, August 2009.

Irrigation upgrades in Sunraysia. Prepared for Marsden Jacob. August 2009.

The short-run regional economic impacts local ports projects undertaken in Victoria since 2006-07. Prepared for SKM, June 2009.

Gambling tax scenarios. Prepared for Price Waterhouse Coopers. May 2009.

The economic impacts of the Commonwealth's buyback scheme on Victoria. Prepared for Victoria's Department of Primary Industries, April 2009.

Multi-country modeling of fuel switches by electricity generators. For Price Waterhouse Coopers, October 2008.

Expansion of glass manufacturing in Adelaide. For Price Waterhouse Coopers, August 2008.

Pulp and paper scenarios in rural Victoria. For Price Waterhouse Coopers, July 2008.

Modelling various water infrastructure projects in Victoria using a multi-regional CGE model. For Deloitte Touche Tohmatsu. May 2008

The economic impacts of various infrastructure projects in rural Victoria. For Price Waterhouse Coopers, April 2008.

The economic impacts of EBay. Allen Consulting, March 2008.

Trends in the WA economy. With J. Thomas, for WA Department of Water. June 2008.

Modelling various water infrastructure projects in Victoria using a multi-regional CGE model. For Deloittes, May 2008.

The economic effects of the Tillegra dam in the lower Hunter valley region. Report prepared for Connell Wagner, Brisbane office, March 2008.

Modelling of Traveston and Wyaralong dams to supplement south east Queensland's water supply. For Queensland Water Infrastructure, final results August 2007.

Modelling of water scarcity scenarios in south east Queensland. For Allens Consulting, Brisbane. August 2007.

The economic effects of expansion of irrigation infrastructure and dairy cattle production in Dorset, Northern Tasmania. Prepared for Dorset EDG. August 2007.

Modelling of various road building scenarios in Sydney and northern NSW. For Allens Consulting, Melbourne. August 2007.

Preparation of a multi-regional database using the 2001-02 ABS input-output table. Project undertaken with Mark Horridge for the Productivity Commission, June 2007.

Global wine market analysis – funded by GWRDC. Final report, June 2006.

Without water - modelling the water requirements of Australia with the population projected to 25 million. In conjunction with CSIRO, June 2006.

Economic contribution of TAFE. For Allens, Sydney/Canberra. May 2006.

Impacts of tropical cyclone Larry in Far North Queensland. With Damian Mullally of Geoscience Australia. April 2006

Impacts of a banana Moko outbreak. For Australian Banana Growers' Council. March 2006

Channel deepening in Port Phillip Bay. For Price Waterhouse Coopers. March 2006.

Disruption to utilities. For Geoscience Australia. July 2005.

Projecting Australia's water needs to 2030. For Water Services Association of Australia. March 2005.

The national and regional economic impacts of Optus' broadband roll-out. Prepared for Allens Consulting. June 2005.

The regional economic impacts of Thredbo snow resorts. Prepared for Allens Consulting. July 2005.

Modelling of economic impacts of hypothetical earthquake in Perth: for Geoscience Australia. April 2004.

Modelling regional impacts of water reforms. Prepared for Victoria's Department of Primary Industries and Department of Treasury and Finance, Productivity Commission and CSIRO, November 2003.

The use of a regional CGE model to assist in fund allocation in mining and associated sectors, prepared for Victoria's Department of Primary Industries, September 2003.

The local, statewide and national economic effects of specific disease outbreaks: dynamic CGE analysis, prepared for Plant Health Australia, August 2003.

The economic impacts of introducing broadband networks to Queensland, modelling undertaking for Allen Consulting, Sydney, August 2003. (with Peter Dixon)

The use of a regional CGE model to assist in fund allocation, prepared for Victoria's Department of Primary Industries, June 2003.

Water policy analysis, prepared for Victoria's Department of Primary Industries, May 2003.

Effects of a stoppage in the Victorian non-residential construction industry, prepared for Allen Consulting, Melbourne, February 2003. (with Peter Dixon)

The economic impacts of the Fusion project in New South Wales, modelling undertaking for Allen Consulting, Sydney, January 2003.

Economic impacts of the A380 airbus project, prepared for Allen Consulting, March 2002.

Database update and disaggregation of the Monash Multi-regional Forecasting (MMRF) model (undertaken mainly with Mark Horridge). This project, for primary industry groups from four different states, has developed a highly disaggregated 1996-97 database.

Relocation of Melbourne markets. For Allen Consulting. September 2002.

Conference papers

Wittwer, G. (2011), "Water buybacks and drought in the Murray-Darling Basin of Australia: confusing policy and catastrophe". Paper presented at 14th annual GTAP conference, Venice, June 16-18.

Wittwer, G. (2011), "Water purchases to save the Murray-Darling Basin". Paper presented at the 55th Australian Agricultural and Resource Economics Society conference, February 8-11, Melbourne.

Wittwer, G. and Griffith, M. (2010), "Closing the factory doors until better times: CGE modelling of drought using a theory of excess capacity". Paper presented at the 54th Australian Agricultural and Resource Economics Society conference, February 10-12, Adelaide.

Wittwer, G. and Horridge, M. (2008), "Creating and managing an impossibly large CGE database that is up-to-date". Paper presented at 11th annual GTAP conference, Helsinki, June 12-14.

Dixon, P., Rimmer, M. and Wittwer, G. (2007), "The 2006-07 drought in Australia: analysis in TERM-H2O". Paper presented at 36th annual Conference of Economists, Hobart, 24-26 September.

Horridge, M. and Wittwer, G. (2007). "Introducing SinoTERM, a model for analysing regional economic policy in China." Paper presented at the 4th Annual Conference of the Consortium for Western China Development Studies, Guiyang, Guizhou, China. *http://www.china-ces.org/ces_Publication/Papers.asp?SearchFlag=Yes*

Horridge, M. and Wittwer, G. (2007). "The economic impacts of a construction project using SinoTERM, a multi-regional CGE model of China." Paper presented at the Chinese Economists Society annual conference, Changsha, Hunan, China, July 28-30. *http://www.monash.edu.au/policy/elecpapr.htm* paper G-164.

Wittwer, G. and Horridge, M. (2007). "CGE modelling of the resources boom in Indonesia and Australia using TERM." Paper presented at the 51st annual conference of the Australian Agricultural and Resource Economics Society, Queenstown, New Zealand.

Wittwer, G. (2006). "Modelling future urban and rural water requirements in a CGE framework." Paper presented at the 50th annual conference of the Australian Agricultural and Resource Economics Society, Sydney.

Wittwer, G., McKirdy, S. and Wilson, R. (2005), "The regional economic impacts of a plant disease incursion using a general equilibrium approach", Paper presented at the 8th Conference on Global Economic Analysis, Lubeck, Germany, June 8-11, 2005.

Horridge, M., Madden, J. and Wittwer, G. (2003), "Using a highly disaggregated multi-regional single-country model to analyse the impacts of the 2002-03 Drought on Australia", Paper presented at the 6th Conference on Global Economic Analysis, Scheveningen, The Hague, The Netherlands, June 12-14.

Wittwer, G. and Stringer, R. (2002), "Modelling the impact of environmental policy reforms on water markets and irrigation use in Australia", Paper presented at the 5th Conference on Global Economic Analysis, Grand Hotel, Taipei, June 5-7.

Harrison, J., Horridge, M., Pearson K. and Wittwer, G. (2002), "A practical method for explicitly modelling quotas and other complementarities", Paper presented at the 5th Conference on Global Economic Analysis, Grand Hotel, Taipei, June 5-7.

Zhao, X., Anderson, K. and Wittwer, G. (2002), "Who Gains from Australian Generic Wine R & D and Promotion?", Paper presented at the Annual Conference of the Australian Agricultural and Resource Economics Society, Canberra, 13-15 February.

Stringer, R. and Wittwer, G. (2001), "Grapes, Wine and Water: Modelling Water Policy Reforms in Australia", Paper in the Proceedings of the 26th World Congress of the OIV, Adelaide, 11-18 October, Paris: Office International de la Vigne et du Vin, in CD-ROM and print versions.

Anderson, K. and Wittwer, G. (2001), "World Wine Market in 2005: Effects of Faster Asian Demand Growth", Paper in the Proceedings of the 26th World Congress of the OIV, Adelaide, 11-18 October, Paris: Office International de la Vigne et du Vin, in CD-ROM and print versions.

Wittwer, G., Berger, N. and Anderson, K. (2001), "Modelling the World Wine Market to 2005: Impacts of Structural and Policy Changes", Paper presented at the Annual Conference of the Australian Agricultural and Resource Economics Society, Adelaide, 23-25 January.

Wittwer, G. (2000), 'The sensitivity of wine industry outcomes to model assumptions in GST scenarios', School of Economics and Centre for International Economic Studies, University of Adelaide, Paper presented to the 44th Annual Conference of the Australian Agricultural and Resource Economics Society, Sydney, 23-25 January.

Wittwer, G. and Connolly, G. (1993), 'A reconsideration of export demand elasticities in ORANI', Paper prepared for 1993 Conference of Economists, Murdoch University, Western Australia, September 27-30.

Connolly, G., Wittwer, G. and Roper, H. (1991), 'An econometric model of the Japanese wool textile industry', ABARE paper presented at the Australian-Japan Research Centre workshop, September.

Other papers

Wittwer, G., *WAYANG: A General Equilibrium Model adapted for the Indonesian Economy*, (based on Horridge, Parmenter and Pearson 1998, ORANI-G: A General Equilibrium Model of the Australian Economy), Prepared for ACIAR project no. 9449, November 1999.

Wittwer, G., *The Australian wine industry during a period of boom and tax changes*, Ph.D. dissertation supervised by Professor Kym Anderson, The University of Adelaide, submitted July 2000.

Rothfield, J. and Wittwer, G. (2009), *The Global Wine Statistical Compendium, 1961-2006*. Published by Australian Wine and Brandy Corporation.
Wittwer, G. and Rothfield, J. (2007), *The Global Wine Statistical Compendium, 1961-2005*. Published by Australian Wine and Brandy Corporation.
Wittwer, G. and Rothfield, J. (2006), *The Global Wine Statistical Compendium, 1961-2004*. Published by Australian Wine and Brandy Corporation.

Wittwer, G. and Anderson, K. (2005), *The Global Wine Statistical Compendium*, Published by Australian Wine and Brandy Corporation.

Teaching

I am the coordinator of the annual Practical GE course run by the Centre of Policy Studies within Australia. I led the Practical GE course run in Changsha, Hunan, China in February 2006, a similar course in Sydney in September 2007 and at ANU in October 2008, and the WAYANG model training course in Jakarta, June 2002.

Refereeing

I have refereed articles for the following journals:

- Agricultural Economics
- Australasian Journal of Regional Studies
- Australasian Agribusiness Review
- Australian Economic Papers
- Australian Journal of Agricultural and Resource Economics
- Economic Papers
- Economic Record
- Environment and Development Economics
- European Review of Agricultural Economics
- Journal of Econometrics.
- International Journal of Revenue Management
- Plant Pathology.

Senate Standing Committee on Environment and Communications
Legislation Committee
Answers to questions on notice
Sustainability, Environment, Water, Population and Communities portfolio
Budget Estimates, May 2012

Program: Division or Agency:	MDBA	**Question No:**	212
Topic:	MDBA – legal advice from the Office of International Law		
Proof Hansard Page and Date	65 and 77		
or Written Question:	(23/5/12)		

Senator Joyce asked:

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Senator JOYCE: Did the MDBA receive legal advice from the Office of International Law?

Mr James: We received advice from the Office of International Law prior to last year's proposed basin plan being put out. We are getting advice from the Attorney-General's Department in relation to the plan that we are bringing out next week, but we have not received that yet.

Senator JOYCE: How many pages of legal advice was there?

Mr James: I would have to take that on notice.

...

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Senator JOYCE: Where did the instruction come to get that advice?

Mr James: Sorry, to get the advice from—

Senator JOYCE: Who?

Mr James: It was initiated within the authority.

Senator JOYCE: Who was the head of the authority at that point in time?

Mr James: Late last year; Dr Dickson would have been the chief executive.

Senator JOYCE: Did you seek that advice, Dr Dickson?

Dr Dickson: I do not think I signed the letter. It was just a standard requirement that we would have made, so it would have come from some part of the authority.

Senator JOYCE: From your legal department?

Dr Dickson: We would have to give you who it came from, who actually signed the letter requesting it, but I can get that on notice for you.

Answer:

The Murray-Darling Basin Authority (the Authority) received 17 pages of legal advice from the Office of International Law prior to the release of the proposed Basin Plan in November 2012.

The instructions to obtain that advice were given by the Authority's Principal Lawyer.

Senate Standing Committee on Environment and Communications
Legislation Committee
Answers to questions on notice
Sustainability, Environment, Water, Population and Communities portfolio
Budget Estimates, May 2012

Program: Division or Agency:	MDBA	**Question No:**	213
Topic:	Calculation of Baseline Diversion Limits		
Proof Hansard Page and Date	71		
or Written Question:	(23/5/12)		

Senator Xenophon asked:

Senator XENOPHON: Could I put this to Dr Dickson at the MDBA. In a recent committee hearing in Mildura I raised concerns in relation to the way baseline diversion limits have been calculated. These concerns have been flagged to me by various groups in the Riverland and irrigators including Central Irrigation Trust. It is their understanding that when a baseline cap was introduced in 1995 the levels in New South Wales and Victoria were based on the level of extraction due to a lack of metering. In contrast, with South Australian meters, a decision was made to cap usage at 90 per cent of entitlements, and at that time actual usage was about 82 per cent of entitlements. However, it has been put to me that in setting the baseline diversion limits it appears the authority has shifted the starting point to actual use as opposed to entitlements. Can the authority comment whether that concern is correct or not?

Dr Dickson: I might ask Dr McLeod to answer that question.

Dr McLeod: Both the cap and the baseline diversion limits are based on levels of use. There are different measures. Part of your question went to the way that use was being quantified, whether through meters or through estimation. Nonetheless, the cap in 1995 in New South Wales, Victoria and South Australia was about trying to estimate the 1993-94 levels of development being used, and likewise we are doing the same with baseline diversion limits. We are trying to look at the level of use that the current arrangements provide for.

In the case of South Australia, the baseline diversion limit reflects the settlement of a cap that allowed for increases in activation of the entitlement in South Australia from around 80 per cent to 90 per cent. That was a decision made at the time of the cap, which we have continued through the process of estimating the baseline diversion limit in South Australia.

Senator XENOPHON: Are you saying those concerns are not valid?

Dr McLeod: There appears to be misunderstanding in relation to that. We are happy to take on notice further advice in relation to that.

Answer:

The Murray-Darling Basin Authority (the Authority) has not shifted the starting point to actual use as opposed to entitlement in setting the Baseline Diversion Limit (BDL) for South Australia. The Cap in South Australia was set at 90 per cent utilisation of entitlement. In setting the BDL, the Authority has continued through with this assumption. Thus the BDL for South Australia is an estimate of use as has been the case the limit imposed under the Cap.

The availability or otherwise of metering influences the accuracy of the estimation only.

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Program: Division or Agency:	MDBA	**Question No:**	214
Topic:	Breakdown of 2,750 gigalitre target by catchment		
Proof Hansard Page and Date	79		
or Written Question:	(23/5/12)		

Senator Heffernan asked:

Senator HEFFERNAN: ...Can you provide to the committee the model and the make-up of the model for each valley with whatever—what does the 2,750 gigs consist of, how much of it is supplementary in your plan, how much is terminal, how much is high and how much is low?

Ms Swirepik: Yes, that information—

Senator Conroy: We will take it on notice and give you as much of that information as we can.

Answer:

The focus of Murray-Darling Basin Authority (the Authority) modelling has been to assess the environmental outcomes that can be achieved based on a specified reduction in diversions (2,400, 2,800 and 3,200 GL options modelled). In general, entitlements (excluding town water supply) were reduced on a pro-rata basis across each river system.

In the models (which are generally owned by the states), entitlements are often aggregated for irrigation districts or river reaches, so that it is only possible to provide the total reduction in use for these groups of entitlements. Because of this aggregation, it is not possible to precisely answer the question. The reduction in total water use modelled for various valleys is summarised in Table 1 of the Basin Plan modelling report.

Full details are available the Authority's website http://download.mdba.gov.au/proposed/Hydro_Modelling_Report.pdf.

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Program: Division or Agency:	MDBA	**Question No:**	215
Topic:	MDBA – Groundwater arrangements		
Proof Hansard Page and Date	81		
or Written Question:	(23/5/12)		

Senator Heffernan asked:

Senator HEFFERNAN: ...How we are going to avoid that in the new Murray-Darling Basin Plan? I think it is a fair dinkum question. The new Murray-Darling Basin plan says we are going to mine aquifers. You would agree with that, would you not?

Dr Dickson: No, I would not agree with that.

Senator HEFFERNAN: But the Wimmera and the Mallee, it says, will be mined.

...

Dr Dickson: What I might suggest is that we can provide you a question on notice after we have finalised the new revised plan on the groundwater arrangements in that plan.

Answer:

Of the 72 groundwater Sustainable Diversion Limit (SDL) areas in the revised draft Basin Plan (28 May 2012) there are two areas: South Australian Mallee and part of the Victorian Wimmera-Mallee: Sedimentary Plain, where the Murray-Darling Basin Authority (the Authority) has proposed that the groundwater be treated as a non-renewable or fossil resource. The two areas straddle the South Australian and Victorian border, where groundwater is the only reliable source of water for stock, domestic and productive uses. Each area has a State water resource plan that sets the extractive limit for the area.

The draft Basin Plan has adopted the extraction limits of the two State water resource plans as the SDLs for the two areas. At the current rate of use it is estimated that the groundwater resource will be depleted by approximately 15 per cent in 200 years. The extraction limits of the State water sharing plans have been set in consultation with the local communities and were assessed by the Authority not to have an impact on the productive base of the aquifer or lead to an increase in aquifer salinity.

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Program: Division or Agency:	MDBA	**Question No:**	216
Topic:	MDBA – Assessment of Murray mouth openness		
Proof Hansard Page and Date	82		
or Written Question:	(23/5/12)		

Senator Birmingham asked:

Senator BIRMINGHAM: That test of the mouth being open, what exactly does that mean? Is that the mouth being open without dredging? Is it the mouth being open 90 years in 100 years for the full 12-month period in each of those 90 years? What does that figure that the minister put mean?

...

Ms Swirepik: I am happy to put some on notice because there are a whole lot of different ways to assess mouth openness.

Answer:

The Murray-Darling Basin Authority's modelling and discussion of Murray mouth openness refers to the mouth being open through River Murray flows rather than dredging.

Mouth openness is often used as an indirect indicator for a range of environmental issues – like salt export from the basin, salinity or water levels in the Lower Lakes, and general water availability and environmental condition in the River Murray system. A closed mouth would suggest these attributes are in poor or declining condition. But mouth openness is most directly relevant as an indicator of environmental conditions in the Coorong. As the mouth closes, tidal exchange between the southern ocean and the Coorong diminishes, affecting water levels and salinity in the Coorong. In terms of tidal exchange, there is no 'tipping point' or threshold of mouth openness, but exchange progressively diminishes as the mouth opening reduces. A mouth depth of 2m is often used as an indicator of the mouth being 'functionally' open, and past dredging activities have sought to maintain this depth.

The geomorphology of the Murray mouth is complicated and so there is no precise flow that equates to the mouth being functionally open (to a depth of 2m). The extent to which the mouth is open depends on a range of factors including recent River Murray flows, wind/storm behaviour, and tidal patterns. Modelling undertaken by CSIRO and Flinders University indicates that a flow of about 2000 GL/y is sufficient to keep the mouth functionally open on average through the year, recognising that the extent to which it is open will change throughout the year depending on how that flow is delivered across the year, and storm and tidal behaviour.

The 2000 GL/y figure is therefore commonly used as a high-level indicator of mouth openness - when flows drop below about 2000 GL/y this indicates some dredging <u>may</u> be required to keep the mouth functionally open in that year.

On the basis of this indicator, under current water sharing arrangements modelling indicates the mouth would be constricted to the point that dredging may be needed in about 36 per cent of years.

With the Basin Plan in place modelling indicates that dredging may be needed in about 10 per cent of years. Under natural conditions modelling indicates the mouth would have become constricted in about 3 per cent of years, during extended dry periods, but never closed completely.

Whether dredging would actually occur in any year is a more complicated question to answer than indicated by the 2000GL/yr indicator. The need for dredging is considered when flows over the barrages drop below 2000ML/day. However before deploying a dredge, consideration would be given to the expected duration of flows below 2000ML/day, the season, the implications for reduced connectivity. Thus the number of days at 2000ML/d cannot be used directly as an indicator of the need to dredge the mouth and the estimate of 2000GL/yr is used as the high level indicator.

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Program: Division or Agency:	MDBA	**Question No:**	217
Topic:	MDBA – Water regulated flows		
Proof Hansard Page and Date	Written		
or Written Question:			

Senator Birmingham asked:

1. I refer to the draft Basin Plans requirement that for state developed water resource plans that the determination of actual take must be done using the best available method. How many state developed water resource plans do not currently use this method? Which ones?

2. Will the use of the best available method require and guarantee effective metering for all extractions? How is this enforced? What are the penalties for states and/or water users for non-compliance?

Answer:

1. The provisions for the determination of actual take in Chapter 9 of the draft Basin Plan is a requirement to use the best information that is available for any particular type of take. There are 182 interim or transitional water resource plans under the *Water Act 2007* that use varied methodology. The Murray-Darling Basin Authority (the Authority) is focussed on future plans.

2. The draft Basin Plan does not require any changes to the way water use is quantified, but does include provision to support maintaining and, if practicable, improving measurement. Enforcement powers and penalties for non-compliance are set out in the *Water Act 2007*. The Authority is developing a compliance strategy consistent with these provisions.

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Program: Division or Agency:	MDBA	**Question No:**	218
Topic:	MDBA – Merging the CEWH with MDBA		
Proof Hansard Page and Date	Written		
or Written Question:			

Senator Birmingham asked:

1. Has the MDBA been aware of or been involved in plans or discussions regarding merging the CEWH and MDBA?

Answer:

1. No.

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Program: Division or Agency:	4: MDBA	**Question No:**	219
Topic:	MDBA – Living Murray Initiative		
Proof Hansard Page and Date or Written Question:	Written		

Senator Birmingham asked:

1. Does the MDBA retain responsibility for water acquired under the Living Murray initiative?

Answer:

1. The Living Murray assets are controlled jointly by The Living Murray Governments for the purposes of The Living Murray (TLM) Initiative and the Murray-Darling Basin Authority (the Authority) acts as the agent to facilitate this coordination.

   The governments have signed a joint venture agreement which currently sets out ownership of the shares of the entire portfolio of TLM water. While the jurisdictions remain party to this agreement* the Authority coordinates the management and delivery of water on behalf of the joint governments for TLM Initiative. However the Authority delegate does this on advice of the governments party to the joint venture and so does not act unilaterally with regard to this responsibility.

* The agreement is the "*Living Murray Intergovernmental Agreement (IGA) on Addressing Water Allocation and Achieving Environmental Objectives in the Murray Darling Basin 2004."*

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Program: Division or Agency:	MDBA	**Question No:**	220
Topic:	MDBA – Environmental works and measures projects		
Proof Hansard Page and Date	Written		
or Written Question:			

Senator Birmingham asked:

1. What is the process for assessing environmental works and measures projects such as those identified in the National Partnership Agreement to offset the SDLs? What are the criteria used to assess such projects?

Answer:

1. The draft Basin Plan includes a proposal for a Sustainable Diversion Limit (SDL) review in 2015. At that point, the net effect of any works and measures projects, or river operational changes, could be assessed using modelling against the outcomes of the final Basin Plan, and an adjustment to SDLs could be proposed.

   The Murray-Darling Basin Authority (the Authority) has also been exploring an alternative approach whereby SDL adjustments could be made on the basis of a standardised method that is included within the Basin Plan.

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Program: Division or Agency:	MDBA	**Question No:**	221
Topic:	MDBA – Carp eradication		
Proof Hansard Page and Date	Written		
or Written Question:			

Senator Birmingham asked:

1. What progress has been made on eradication of the huge numbers of Carp presently in the system?

2. Please detail progress on the roll out of the carp traps at weirs.

3. I refer to QoN 119 from February's estimates. In light of the explosion of carp numbers in 2010-11 how do you explain the dramatic fall in the number of carp removed in 2011 compared to 2010?

Answer

1. As noted in the response to Question on Notice 119 from Additional Budget Estimates, February 2012, relevant Murray-Darling Basin states are responsible for fisheries managements within their jurisdictional areas, including the control of carp. However, the Murray-Darling Basin Authority (the Authority) is directly involved with the state jurisdictions in carp removal at several weirs along the Murray River.

   Through the *Native Fish Strategy,* the Authority has also made significant investments in research and management actions to deal with carp, Gambusia and other alien fish present in the Basin.

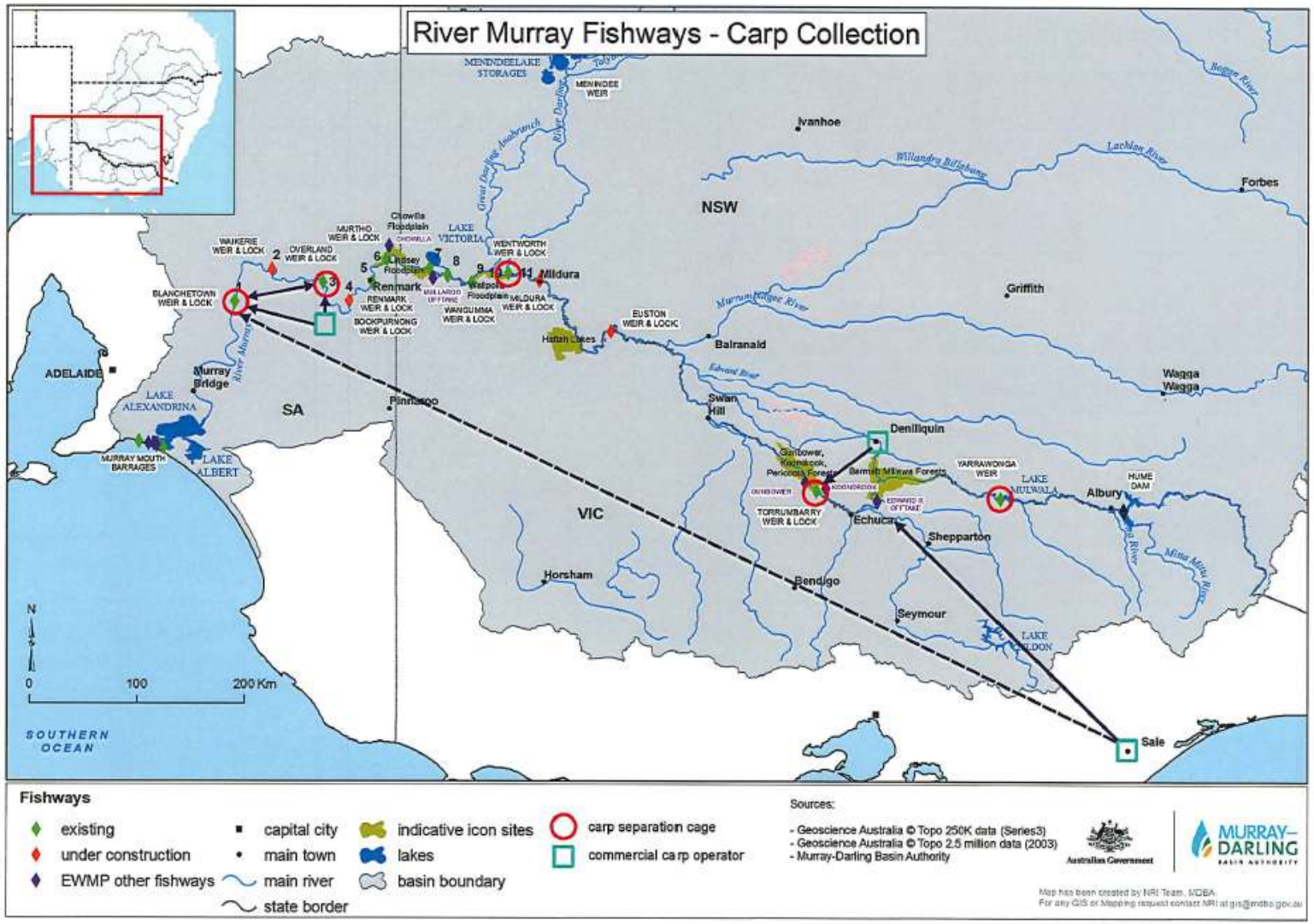
   The Authority has also been a major funding partner to the Invasive Animals Cooperative Research Centre (IA CRC) and this collaboration explored a range of options to deal with carp. The IA CRC has a portfolio of research projects including identification of carp 'hot spots' in the Murray-Darling Basin and the development of innovative technology such as Koi Herpes Virus as a biological control for carp and genetic technology that may allow breeding of 'Daughterless carp' to reduce the reproductive success of carp.

   The IA CRC recently hosted a workshop (Melbourne June 19-21) with support from the Authority to determine how recent carp management work adds to the ability to manage carp in Australia.

2. Along the River Murray, carp separation cages have been installed on Authority structures at Locks 1, 3, 10 and Torrumbarry Weir. Carp are separated at Yarrawonga Weir from a monitoring cage (refer map at **Attachment A**). The Lock 10 cage is not currently in operation as no system to dispose of the harvested carp is in place. State agencies are directly responsible for traps in other Murray-Darling Basin rivers.

3. Generally all figures in Tables 1 to 4 in the response to Question 119 from Additional Estimates February 2012 suggest an increase over time in the numbers of carp harvested. For example carp harvesting at Lock 1 has increased to 91,000kg in 2010 and 105,000kg in 2011 (even when the carp cage had to be removed due to high water levels). The Senator may be referring to part of Table 4 “Fish Sampling by weir staff”, where the number of carp sampled decreased from 28,197 with 209 trap days to 7,606 with 166 trap days. Catch success can be influenced by a number of factors, including the number of operating days, operation of the weir, changes to sampling procedure, water temperature, flow/flood and debris.

ATTACHMENT A



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Program: Division or Agency:	MDBA	**Question No:**	222
Topic:	MDBA – Potential fraud investigation		
Proof Hansard Page and Date	Written		
or Written Question:			

Senator Birmingham asked:

1. Has the potential fraud investigation referred to in Answer 173 been resolved? Was the potential fraud by a water user or staff member?

Answer:

1. The matter is still under investigation and it is therefore not appropriate to provide further details at this stage.

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Program: Division or Agency:	MDBA	**Question No:**	223
Topic:	MDBA – Communication in setting SDLs		
Proof Hansard Page and Date	Written		
or Written Question:			

Senator Birmingham asked:

1. Please detail the dates and manner of all communication between the Minister and MDBA regarding the setting of groundwater SDLs between the release of the proposed Basin Plan for public consultation and the release of the latest version to the Ministerial Council. Please provide copies of all such written communication.

Answer:

1. The Murray-Darling Basin Authority (the Authority) briefed the Minister for Sustainability, Environment, Water, Population and Communities, the Hon Tony Burke MP, on all aspects of the Basin Plan, including groundwater, in advance of the release of the draft Basin Plan for public consultation (28 November 2011). The Minister received a specific briefing on groundwater from the Authority on 19 March 2012 (**Attached**) on the groundwater Sustainable Diversion Limits in the draft Basin Plan (28 November 2011).

MURRAY-DARLING BASIN AUTHORITY

Minister: for information **Ref: B12/535**

The draft Murray – Darling Basin Plan – Groundwater

Timing: routine – The consultation period on the draft Murray - Basin Plan finishes on 16 April 2012

Recommendation/s:	
Note this brief.	Noted / Please discuss
Minister:	Date:
Comments:	

Key Points:

- Sustainable Diversion Limits (SDLs) for groundwater in the draft Basin Plan are based either on well known hydrologic models or by applying a conservative risk assessment methodology developed by CSIRO and peer-reviewed.
- Between the Guide and the draft Plan, the MDBA revised the total proposed groundwater SDL from 2,095 GL to 4,340 GL. This was mainly based on our assessment of new information provided by states, including a view that in some cases the assessments in the Guide were overly conservative. We intend to consider the appropriateness of our groundwater risk assessments in light of scientific submissions on the draft Basin Plan.
- Further work on groundwater will inform the 2015 review of SDLs ahead of the SDL implementation in 2019.
- Criticism in the media that additional groundwater SDLs will offset the reduction in surface water SDLs is misinformed. We have properly factored the degree of aquifer connectivity into our work.

Issues:

- Groundwater management presents particular challenges:
    - Aquifers are difficult to define; they have variable geology and levels of connectivity with each other and with surface water. This means that water is stored and transmitted through aquifers at varying rates. In some aquifers, groundwater takes thousands of years to move a few kilometres. In others, movement is much faster.

- Groundwater has variable quality, and is often brackish or saline.
- It is expensive to access, with most infrastructure (bores, pumps) being in private ownership, remote, and difficult to regulate.
- Groundwater often requires local management rules, such as keeping bores a minimum distance apart, to prevent 3rd party impacts. Trading of groundwater licences is therefore complex.

- In the Basin Plan, the MDBA has defined 79 SDL areas, based on hydrogeology and state planning boundaries (Attachment A), including 3 deep groundwater areas (Attachment B). Across the Basin these aquifers range from highly connected to surface water (alluvial systems) to non-connected systems.
- The methods used to determine the preliminary groundwater sustainable diversion limits (SDLs) were developed through a CSIRO led project that was peer reviewed by four groundwater experts and considered the risks to surface water resources, other groundwater users, groundwater dependent ecosystems and groundwater quality. The MDBA then carried out a further seven assessments to determine the proposed groundwater SDLs (Attachment C).
- Between the release of the Guide to the Basin Plan and the proposed Basin Plan, the MDBA revised a number of the groundwater assessments. This led to a change in the total proposed groundwater SDL from 2,095 GL/y in the Guide to 4,340 GL/y in the draft Basin Plan
- There are 4 main reasons for changes in the groundwater SDLs between the Guide and the draft Basin Plan (Attachment D).
    - 300GL was from increases in the Baseline Diversion Limits (BDLs), which represent the current understanding of the limits on groundwater use under existing water management arrangements. In many cases, states have provided additional detail about the entitlements and local management rules that set the limits placed on groundwater users. The Authority views this change as improving the quantification of existing arrangements, rather than a change in impact, as these arrangement are already in place.
    - 150GL of the increase was due to a decision to adopt limits already set in the groundwater reduction program being run by NSW and partly funded by the Commonwealth. This will allow the full effects of the reduction program to be completed and the outcomes determined before any further review of the areas is considered.
    - A further 300GL of the increase was due to the inclusion of new deep groundwater resources that had previously been excluded. The deep groundwater resources are the Gunnedah-Oxley Basin, the Oaklands Basin and the South Australian Mallee. The Gunnedah-Oxley Basin is the main Basin water resource from which coal seam gas could be extracted from.
    - A further 1500GL of the increase was due to a reassessment of unassigned water availability based on new information from states. Unassigned water is additional groundwater that can be sustainably taken above the current level of use. The revised unassigned groundwater assessment (Attachment C) has been applied in 33 groundwater SDL areas. Much of this resource is expected to be brackish to saline.

- Given the level of public concern over groundwater SDLs, we intend to consider the appropriateness of our groundwater risk assessments in light of scientific submissions on the draft Basin Plan. This is particularly the case in the areas of unassigned groundwater where much of the recent increase was made.

Stakeholder criticism

- The Wentworth Group has asserted that the 2,750 GL of surface water that is proposed to be recovered for environmental use, will be absorbed by 2,600 GL of extra groundwater that is being made available for consumptive use. This is not correct. There has been no change to the assessment of highly connected systems where the SDL has been capped at the BDL. The small change in SDL proposed for these highly connected groundwater areas (39 GL) reflects a more accurate BDL. The majority of the groundwater SDL increase (1500 GL) is in aquifers with very low connectivity. The 2,600 GL/y put forward by the Wentworth Group represents the difference between the total groundwater BDL in the Guide to the total groundwater SDL in the draft Basin Plan. The actual change in total groundwater SDLs from the guide to the draft Basin Plan is 2,245 GL/y.

- There are other claims that the increase in groundwater SDLs is to assist the coal seam gas industry. The Basin Plan does not deal with the allocation of water resources to a particular sector or users, this is a responsibility that states continue to have. Any potential for coal seam gas activity is restricted to the Gunnedah-Oxley Basin

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23 / 03 /2012

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ATTACHMENTS

A: Map of groundwater SDL areas

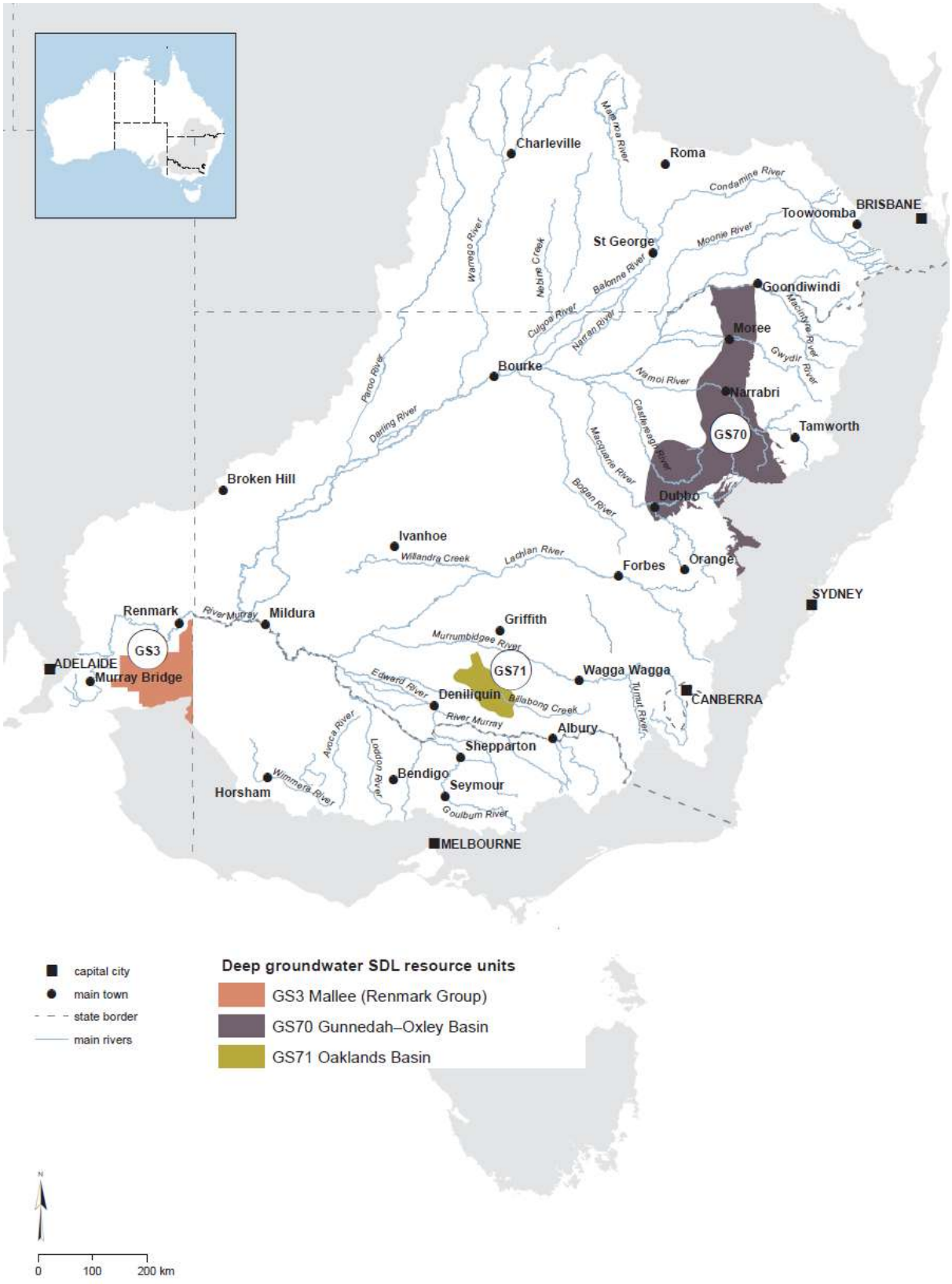
B: Map of aquifer types

C: Groundwater SDL determination and assessment method

D: Groundwater SDL change from the Guide to the proposed Basin Plan

Groundwater SDL areas

Deep groundwater SDL areas



Groundwater SDL determination and assessment method

Summary

The Basin wide groundwater storage is approximately 10,130,000 GL with an annual Basin wide recharge of approximately 23,500 GL. The baseline diversion limit or current allowable extraction of 2,352 GL/y represents 0.02% of the groundwater storage and 10% of annual recharge. The proposed SDL of 4,340 GL/y represents 0.04% of the groundwater storage and 18% of annual recharge.

Groundwater SDL determination

To determine the sustainable diversion limits the MDBA established 79 SDL areas based on hydrogeology and state planning boundaries.

The next step was to determine the preliminary volume of groundwater that could be extracted in a groundwater SDL area (preliminary groundwater SDL). This was managed by using:

- numerical groundwater models (13 SDL areas); or
- a recharge risk assessment method developed for the Basin Plan.

Numerical Groundwater models

The Authority found that within the Murray-Darling Basin there were a limited number of numerical groundwater models available to inform the determination of groundwater SDLs. In contrast to surface water, where numerical models were available for the majority of surface water catchments in the Basin, there were only 11 numerical groundwater models available that cover 13 SDL areas. Groundwater take in the 13 SDL areas is 74% of the annual average Basin wide groundwater take.

The 11 numerical groundwater models focus on the higher use alluvial groundwater systems in NSW, Victoria and Queensland. These models were developed or modified for the CSIRO Murray–Darling Basin Sustainable Yields Project in 2008 and all of the NSW numerical models were originally developed and calibrated by the New South Wales Office of Water or its predecessors. The models cover all or parts of the following groundwater areas:

- Upper Condamine Alluvium (Qld)
- Lower Namoi Alluvium (NSW)
- Lower Macquarie Alluvium (NSW)
- Lower Lachlan Alluvium (NSW)
- Lower Murrumbidgee Alluvium (NSW)
- Lower Gwydir Alluvium (NSW)
- Upper Namoi Alluvium (NSW)
- Upper Macquarie Alluvium (NSW)
- Upper Lachlan Alluvium (NSW)
- Mid-Murrumbidgee Alluvium (NSW)
- Southern Riverine Plains (NSW & Vic) including:
    - Lower Murray Alluvium(NSW)
    - Ovens-Kiewa Sedimentary Plain(Vic)
    - Victorian Riverine Sedimentary Plain(Vic)

Groundwater Risk Assessment Method (RRAM)

The groundwater recharge risk assessment methodology (RRAM) was developed to determine the potential volume of groundwater that could be extracted in the 66 groundwater SDL areas where numerical groundwater models were unavailable.

There are 3 steps to determine the potential volume of groundwater that could be extracted in each individual SDL area:

1. Determine the volume of recharge for the SDL area using a groundwater recharge model.

2. Using risk assessment determine the percentage of recharge that could be used without compromising the following environmental characteristics:

    a. groundwater dependent ecosystems;
    b. surface water flows;
    c. the ability to sustainably use groundwater into the future; and
    d. water quality in terms of salinity.

    The four environmental characteristics represent the environmentally sustainable level of take characteristics under the *Water Act 2007 (Cth)*.

    The higher the risk that groundwater extraction represents to compromising one of the environmental characteristics, the lower the percentage of recharge that could be used:

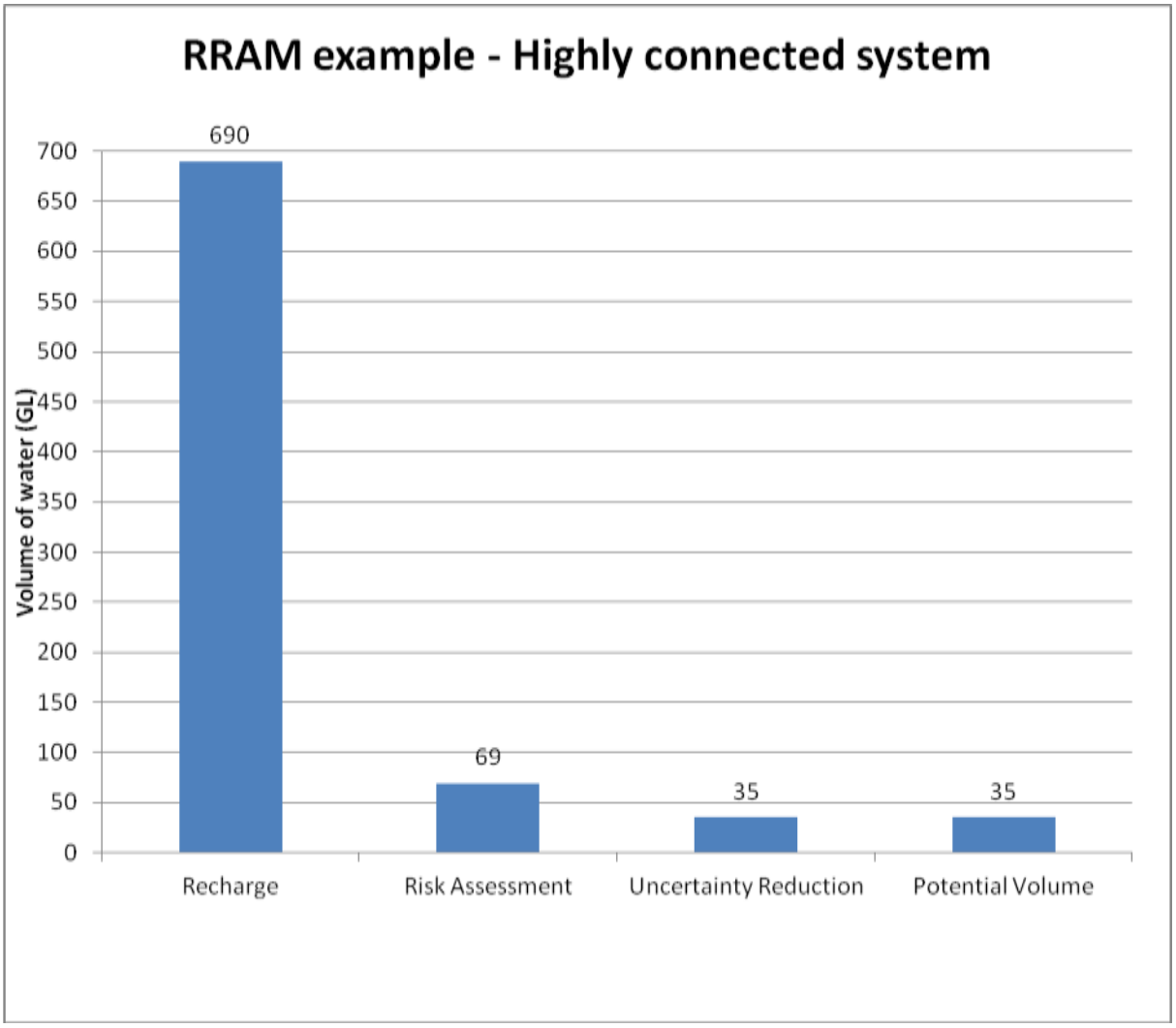
    a. High risk – 10% of recharge
    b. Medium risk – 50% of recharge
    c. Low risk – 70% of recharge

3. Further modify the volume of recharge that could be used based on the uncertainty associated with the understanding of the groundwater system. In particular the level of information and data that is available in each SDL area. Areas with numerical groundwater models are considered to have low uncertainty levels and thus no further reduction is applied at this step.

    In all other SDL areas a further reduction of 50 or 25% is applied based on risk to the environmental characteristics mentioned in step 2 (above) as follows:

Risk to environmental characteristics	Volume of recharge reduction
High	50%
Medium	50%
Low	25%

The following chart displays a graphical representation of the RRAM.


RRAM example - Highly connected system
Volume of water (GL)
700
650
600
550
500
450
400
350
300
250
200
150
100
50
0
690
69
35
35
Recharge
Risk Assessment
Uncertainty Reduction
Potential Volume

MDBA Groundwater Assessment

After determining the preliminary volume of groundwater that could be extracted in a groundwater SDL area the Authority then carried out seven further assessments for each SDL area described in this attachment.

The seven assessments arranged by the MDBA's understanding and management of the level of interaction with surface water are:

- Highly connected (SDL set at BDL for 23 SDL areas)
- Existing reduction programs (SDL set at program limit for 7 SDL areas)
- Proposed reduction (SDL set at the preliminary extraction limit for 2 SDL areas)
- Existing management arrangements (SDL set at the existing limit for 10 SDL areas)
- Unassigned groundwater (where more water than currently available for use could be taken sustainably):
    - areas with high risk to surface water resources (SDL set at fraction of the preliminary extraction limit, the average is 4% of recharge for 13 SDL areas)
    - areas with low risk to surface water resources, SDL set at a fraction of the preliminary extraction limit, the average is 30% of recharge for 20 SDL areas)
- Deep groundwater (SDL assessed against risks for 2 SDL areas)
- Non-renewable groundwater (SDL set at the existing limit for 2 SDL areas)

Note that deep and non-renewable groundwater systems are not connected to surface water resources.

Highly Connected (Map 1)

For the Basin Plan groundwater systems were considered highly connected if in the current state, groundwater discharge provides base flow to the unregulated river reach and groundwater extraction is likely to result in stream flow depletion.

Groundwater systems were considered to have a medium connection if the rivers in the SDL resource unit are regulated and highly connected to the groundwater system (i.e. >50% of the groundwater pumped would have contributed to stream flow within 50 years).

In the 23 areas with a high or medium connection the SDL was set at the BDL to ensure that surface water base flows are not compromised.

Existing reduction program (Map 2)

The Achieving Sustainable Groundwater Entitlements program (ASGE) was announced in 2005. The program, funded by the Commonwealth and NSW governments, was introduced to achieve the sustainable use of groundwater resources in 7 alluvial groundwater systems in NSW:

- Lower Gwydir;
- Lower Macquarie;
- Lower Murray;
- Lower Murrumbidgee;
- Lower Namoi;
- Lower Lachlan; and
- Upper Namoi.

For the draft Basin Plan the Authority adopted the current NSW plan limits for all the ASGE areas to allow the reduction program to be completed and the outcomes determined before any further changes to the SDL are considered.

Additionally, the Authority considered that reduction program should be allowed to be completed due to the:

- additional uncertainties associated with modelling groundwater systems that are undergoing a reduction program;
- large groundwater storages (a minimum of 200 years at current levels of use); and
- low risk of depleting the volume of stored groundwater stored which also suggests that the overall risk to the resource is relatively low for the period before the first review of the Basin Plan

Proposed reduction (Map 2)

Under the proposed Basin Plan the Authority has assessed two SDL areas using numerical groundwater models as having a higher BDL than SDL: the Victorian Riverine Sedimentary Plain and the Upper Condamine Alluvium. In both cases, the relevant state is managing groundwater extraction to ensure that water users have continued access to the resource.

The MDBA is providing advice to the Department of Sustainability, Environment, Water Population and Communities regarding the technical issues associated with Bridging the Gap in the two areas.

Existing management arrangements

There are 13 SDL areas where the Authority has decided to adopt an existing or proposed transitional or interim water resource plan limit as the SDL.

Prior to adopting the state extraction limit the Authority assessed the plan extraction limit against the preliminary limit to determine if the plan limit reflected an environmentally sustainable level of take. The assessment considered if the state extraction limit and the science underpinning it represents the most up to date scientific knowledge (i.e. a more thorough assessment than RRAM, while also being consistent with the Water Act 2007).

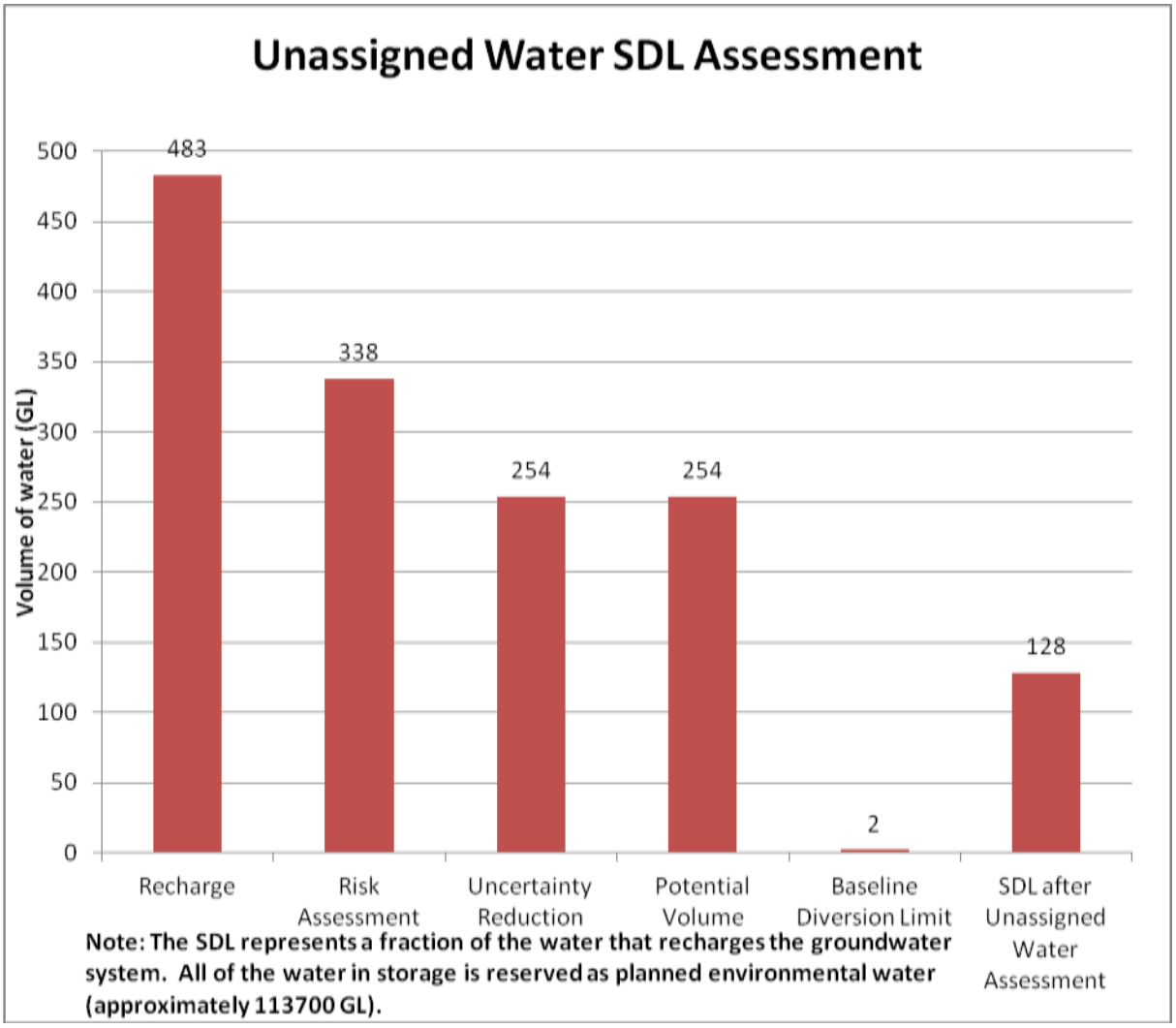
This assessment acknowledges that there are areas in the Basin where the Basin states have invested considerable resources into understanding the groundwater system and their assessments of sustainability are more appropriate than the RRAM in these cases.

Unassigned groundwater (Map 3)

Across the Basin there are SDL areas with low levels of development, and in these systems there is the potential to increase groundwater extraction without compromising ESLT characteristics. SDL resource units with this potential have been termed unassigned water areas, with the unassigned water defined as the sustainable volume of water available for extraction above the BDL.

In many cases these systems have low levels of development as the groundwater can be difficult to access, or is of poor quality, and are subsequently not suitable for agricultural production. In unassigned water areas there may be water suitable for S&D or mining activities. In some situations, the taking of saline groundwater can be a beneficial use as it may reduce the volume of saline water which enters the rivers.

The unassigned water assessment reduces the risks associated with further development of the groundwater resource by decreasing the preliminary groundwater SDL by 50% of the available water above the BDL to determine the final SDL. The following chart demonstrates the unassigned water assessment.



There are 13 large fractured rock SDL areas that were assessed as being highly connected in the Guide. The connectivity to surface water in these systems relies on faults and fractures in the geological strata and this results in variable connections to surface water. For these 13 areas the Authority reassessed the level of connectivity and determined that there was a low level of connectivity. Subsequently the unassigned groundwater assessment was used in these areas.

Four of the 13 areas are part of the Lachlan Fold Belt geological formation, where it has been determined that the level of connectivity is particularly low and the unassigned water assessment would be modified so that SDL would be set at the preliminary groundwater SDL.

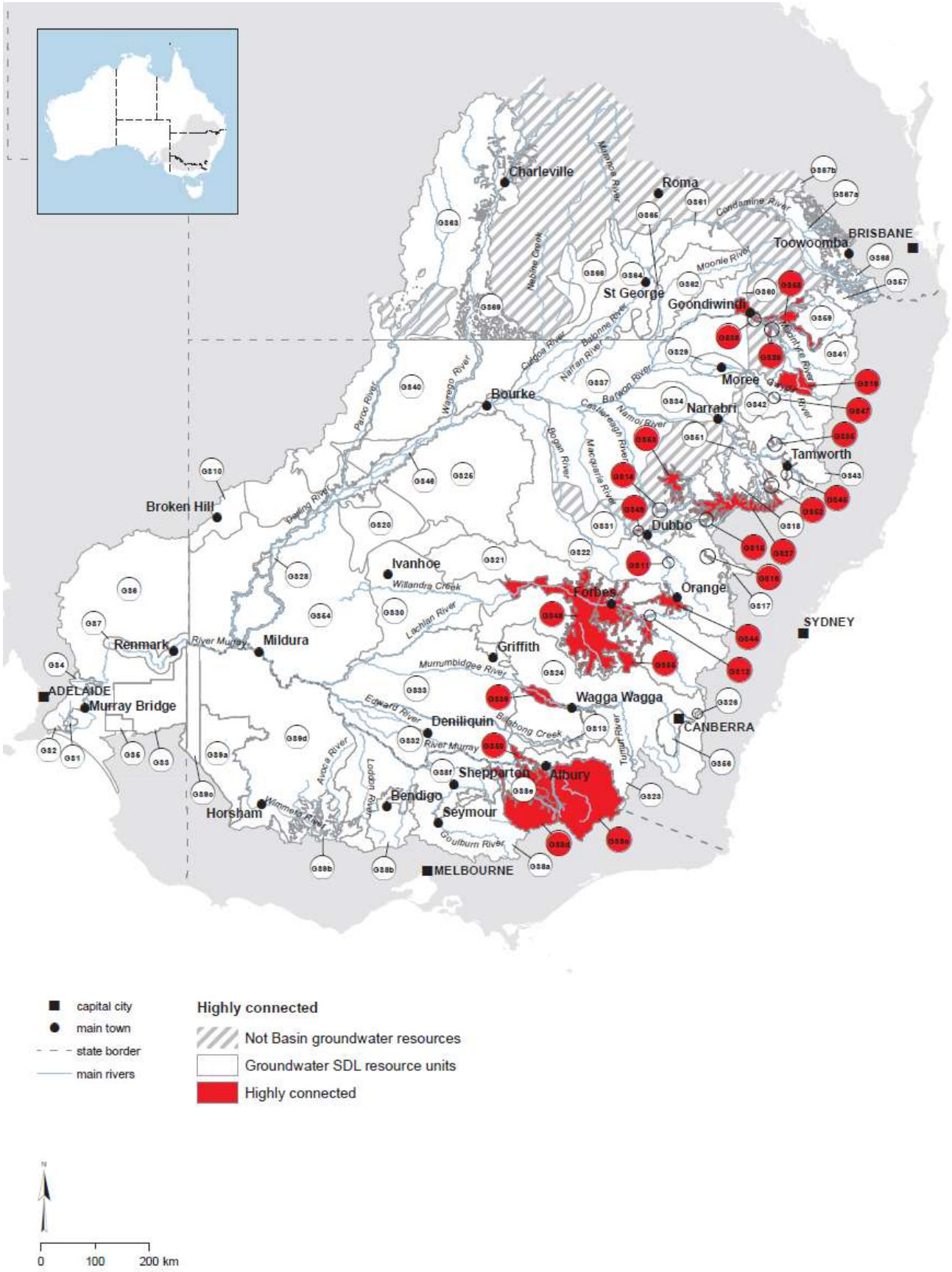
Deep and non-renewable groundwater systems

Deep and non-renewable groundwater systems are not connected to surface water resources.

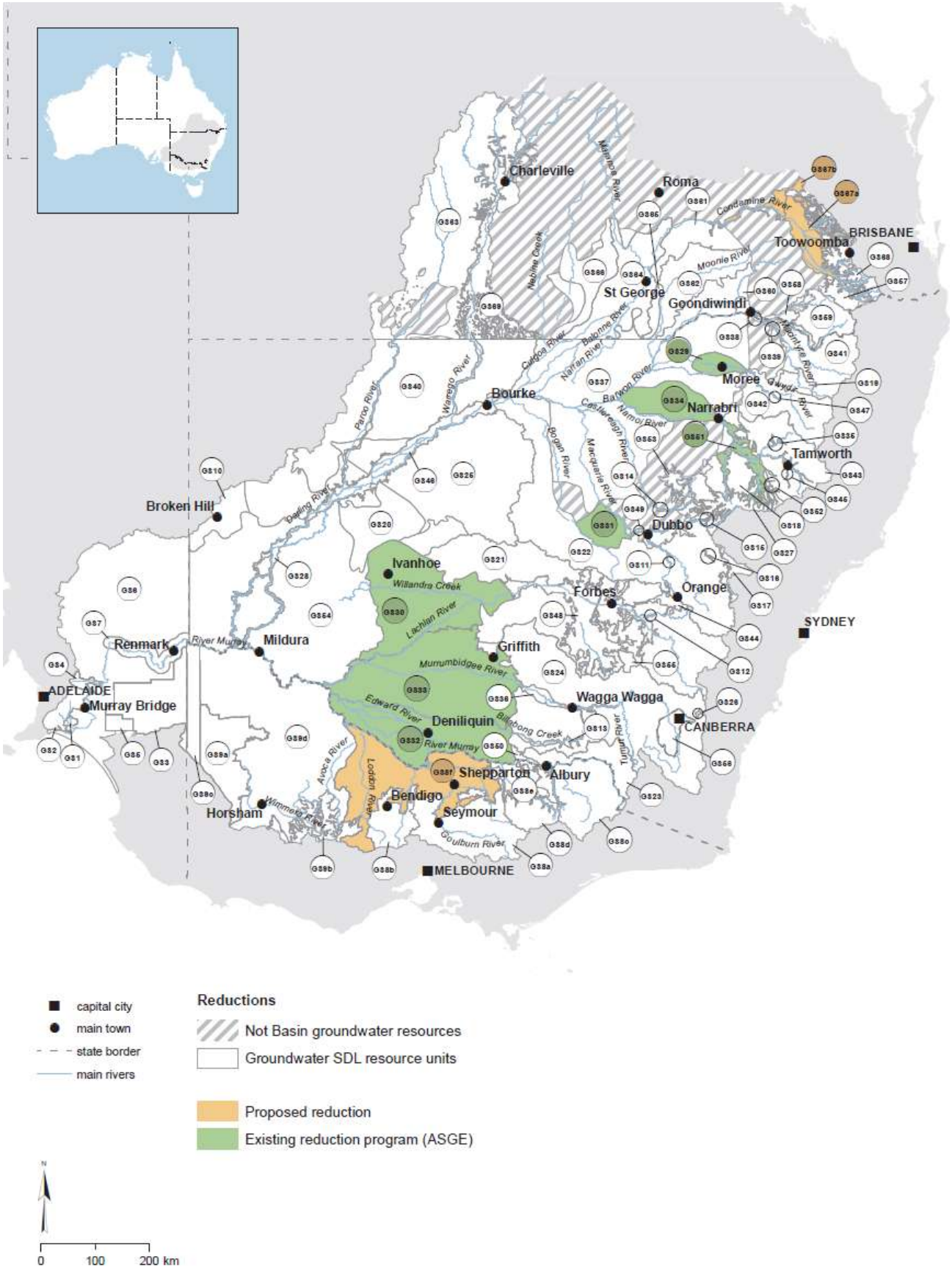
Deep groundwater resources are described as the groundwater resources below those currently accessed for productive use and S&D needs. In general, they occur deeper than 200m below the land surface. Interest in groundwater extraction has now extended to a number of the deep groundwater resources that, under the Water Act 2007, are considered Murray-Darling Basin water resources.

A non-renewable groundwater resource is one which received recharge during a different climatic period (e.g. several thousand years ago), and is now a semi-confined or confined aquifer receiving negligible recharge. Non-renewable groundwater can have a very large storage which, to a certain point, can be extracted with minimal environmental consequences. Determinations on current extraction regimes under existing water resource plans are based on an acceptable rate of decline of the non-renewable groundwater resource.

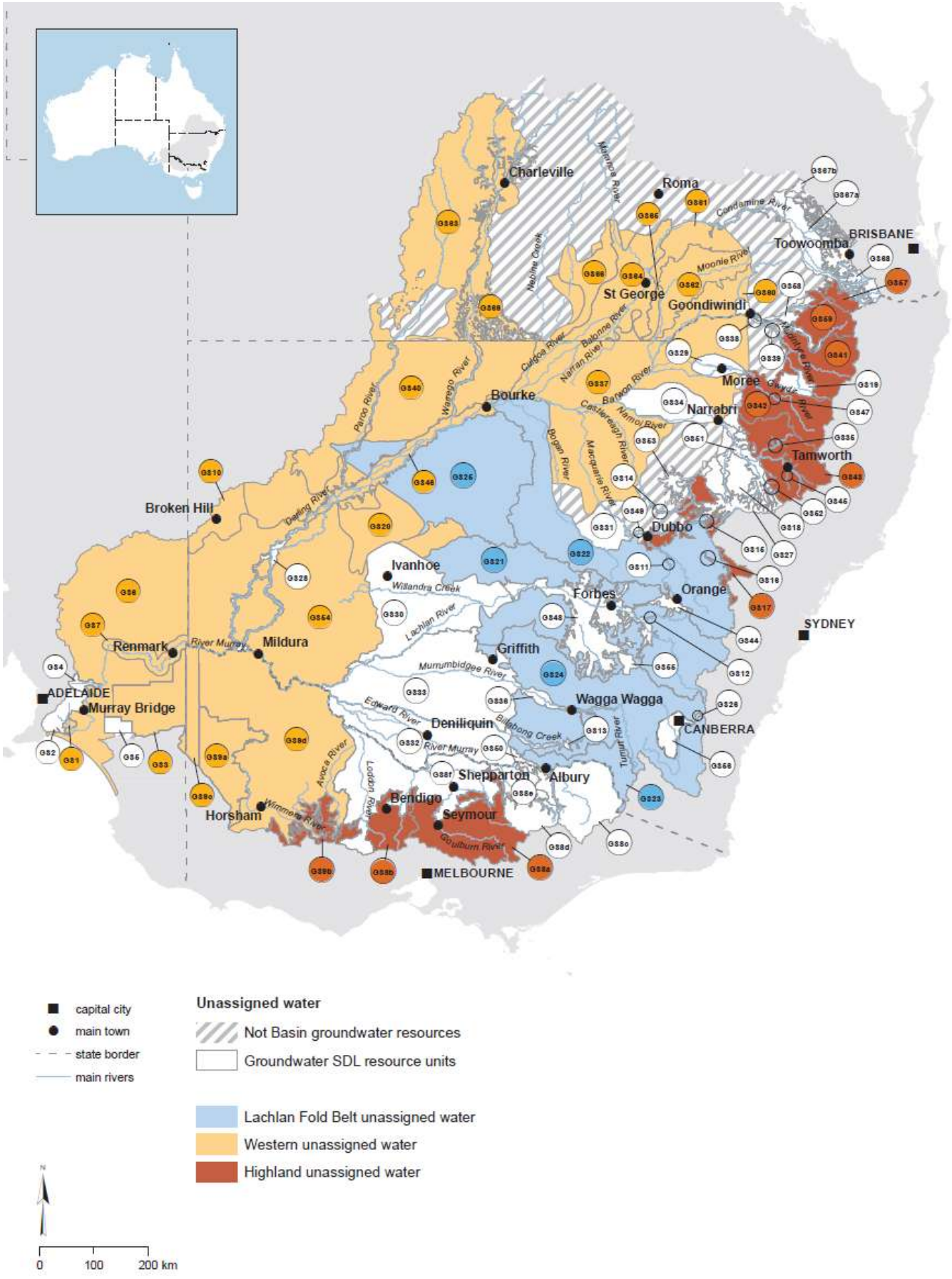
Map 1 Connected groundwater systems



Map 2 Existing reduction program and groundwater areas with a reduction



Map 3 Unassigned groundwater areas



Groundwater SDL change from the Guide to the proposed Basin Plan

The total SDL put forward for discussion in the Guide to the proposed Basin Plan in October 2010 was 2,095 GL/y compared to 4,340 GL/y in the draft Basin Plan.

The Authority considers the proposed SDLs represents a sustainable level of extraction in terms of the risks associated with groundwater take across the Basin.

The 4 main reasons for the change in the groundwater SDLs between the Guide and the draft Basin are:

1. Change in the Baseline Diversion Limit (300 GL)
2. Adoption of the existing Achieving Sustainable Groundwater Entitlements reduction program in NSW (150 GL)
3. Inclusion of deep groundwater resources (300 GL)
4. Change in Unassigned water policy (1500 GL)

A description of each of these changes (including maps to show where there is an impact) is provided within this attachment.

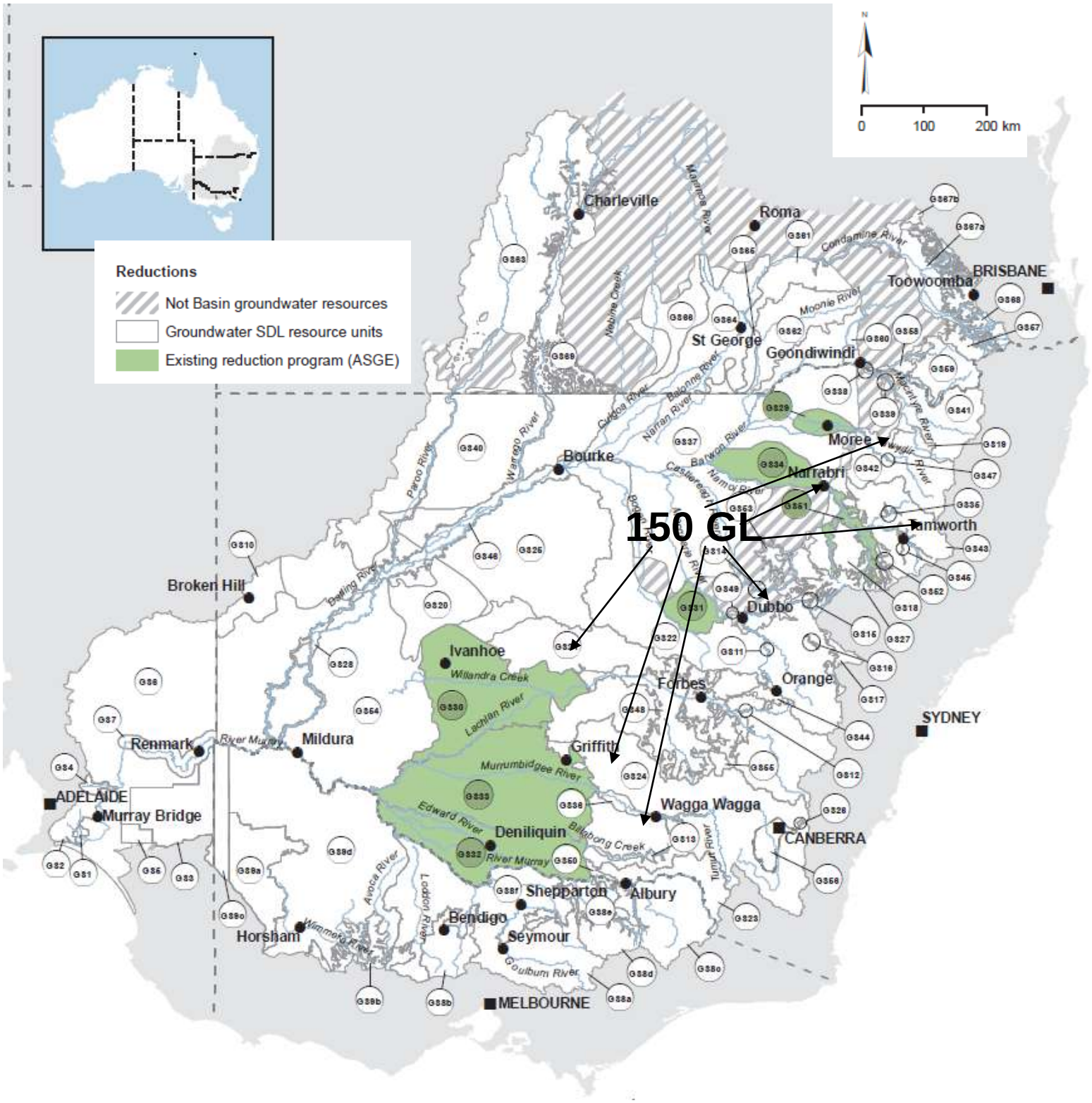
Change in the Baseline Diversion Limit

- The Baseline Diversion Limit **(**BDL) in the Guide was 1,787 GL/y, and represented the data that was available and the policy approach at the time. Following the Guide, the state governments took a greater interest in the information being used for the Basin Plan and this heightened engagement resulted in changes to the BDL.
- The BDL in the Guide was based on the plan limit or current use if there was no plan. In many areas, groundwater use is not measured and current use was estimated at 60% of entitlement.
- Since the Guide, every state government has provided updated figures to better represent the baseline. This has resulted in the majority SDL areas having a change to the BDL due to better information.
- The BDL in the draft Basin Plan is 2,353 GL/y, which is a more accurate representation of the baseline.
- The BDL policy has also changed since the Guide. The BDL is now based on
    - the plan limit; or
    - where there is no plan, entitlement along with the effect of any rules managing extraction; unless
    - the plan limit is above entitlement, and then the BDL is set at the entitlement.
- The changes to the policy are considered to provide a more accurate approach to setting the baseline.
- The BDL is used to set the SDL for many SDL areas (e.g. SDLs in highly connected areas are set at the BDL) and therefore the updated BDL resulted in changes to the SDL. There has been no change to the assessment of highly connected systems where the SDL has been capped at the BDL. The small change in SDL proposed for these highly connected groundwater areas (39 GL) reflects a more accurate BDL. Most importantly, the impact has been capped at the current baseline, ensuring no further impacts on surface water resources.

Adoption of the existing Achieving Sustainable Groundwater Entitlements (ASGE) reduction program in NSW (150 GL)

- This joint NSW and Commonwealth program includes staged reduction of entitlements continuing until 2017.
- The MDBA adopted the current NSW plan limits for all the ASGE areas to allow the reduction program to be completed and the outcomes determined before any further changes to the SDL are considered. Additionally, the Authority considered that reduction program should be allowed to be completed due to the:
    - additional uncertainties associated with modelling groundwater systems that are undergoing a reduction program;
    - large groundwater storages (a minimum of 200 years at current levels of use); and
    - low risk of depleting the volume of stored groundwater stored which also suggests that the overall risk to the resource is relatively low for the period before the first review of the Basin Plan
- The MDBA previously proposed further reductions in extraction limits in: Lower Lachlan, Upper and Lower Namoi and Lower Macquarie.

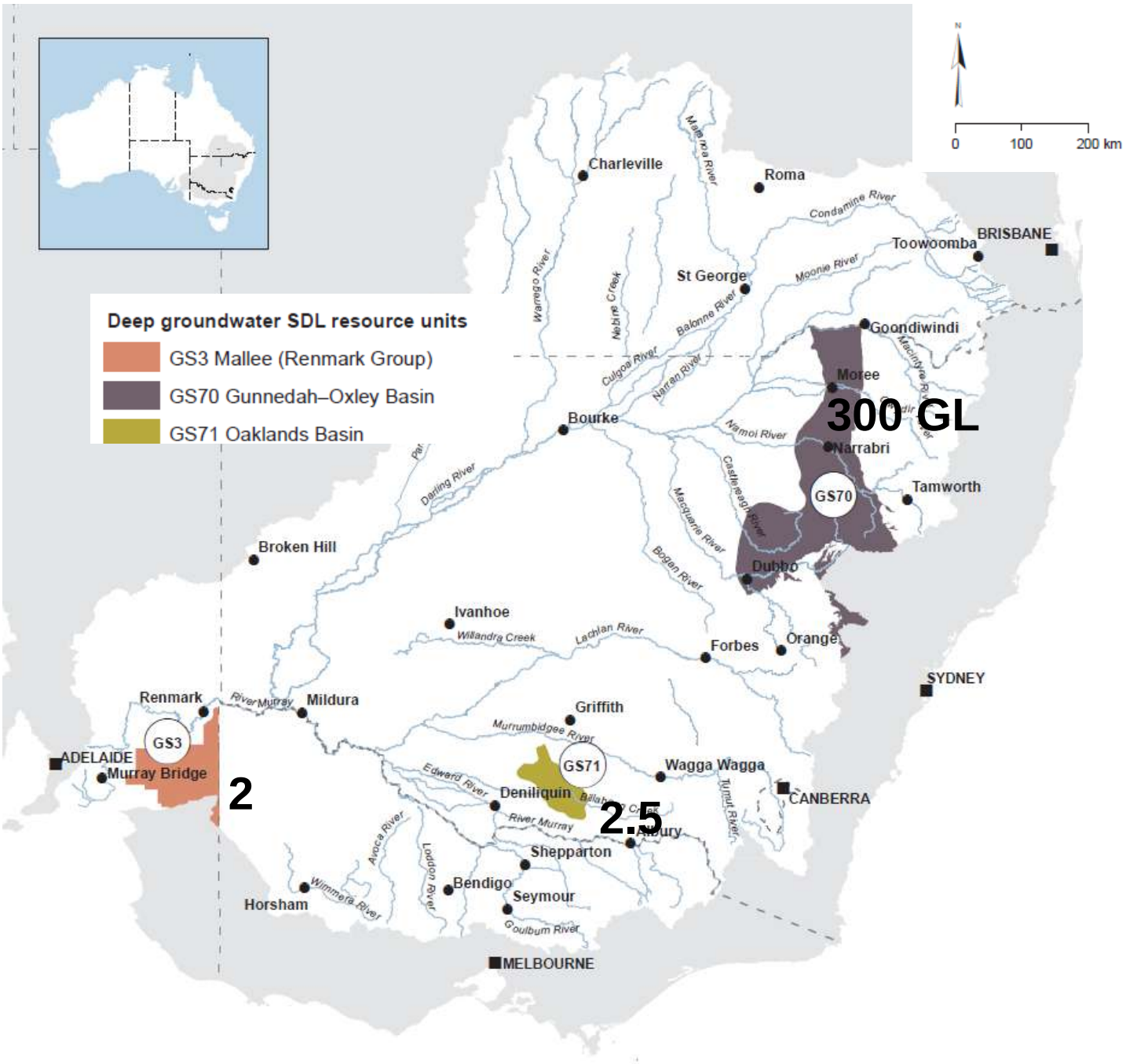
Areas where the adoption of the ASGE program has resulted in a change of 150 GL in the proposed SDL



Inclusion of deep groundwater resources

- Deep groundwater resources were not included in the Guide due to a lack of time to consider them. The Mallee (Renmark Group), Gunnedah-Oxley Basin and Oaklands Basin deep groundwater resources have now been included in the draft Basin Plan. Including these resources in the Basin Plan ensures that there is an enforceable limit on take and water resource plans. This is especially important as much of this water could be used for coal seam gas mining.
- The SDLs have been determined by assessing whether extraction limits proposed by the states meet an environmentally sustainable level of take as required by the *Water Act 2007*.
- The Gunnedah-Oxley Basin in NSW is the only SDL area where there is coal seam gas exploration. When setting the SDL for the Gunnedah-Oxley Basin, the Authority took on board all the information available and made a judgement about the proposed extraction limit. The proposed SDL of 300 GL/y is considered to be sustainable with the volume of water stored in this aquifer is 17,000 times larger than the proposed SDL of 300 GL/y.
- The majority of coal seam gas development is in the Great Artesian Basin (GAB), which the *Water Act 2007* excludes from being included in the Basin Plan.

Areas where the inclusion of deep groundwater resources has resulted in a change of ~300 GL in the proposed SDL



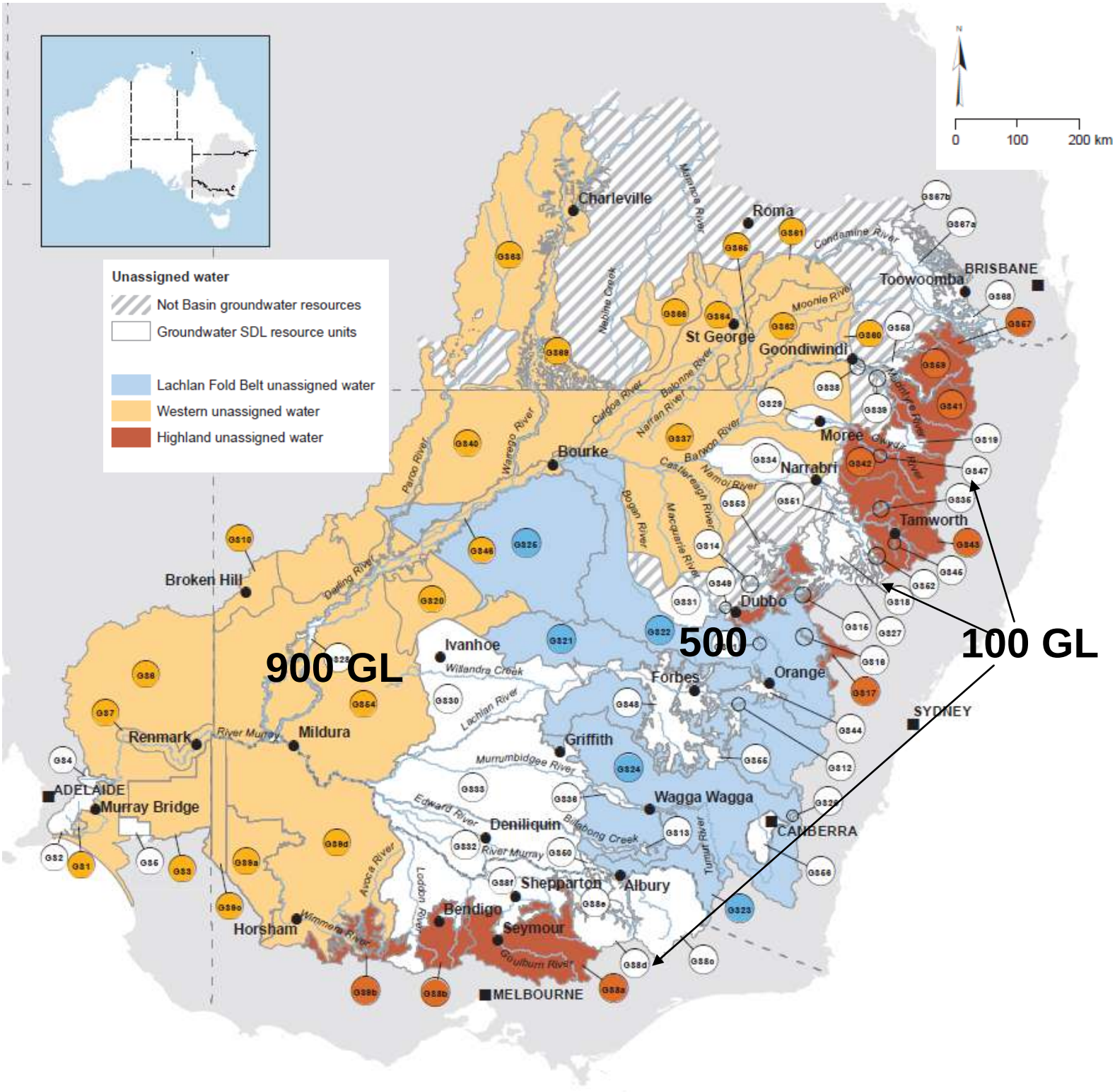
Change in Unassigned water assessment

- This is where the majority of the change from the proposal in the Guide has occurred.
- Prior to the release of the proposed Basin Plan the MDBA modified the unassigned groundwater assessment in response to views expressed by the state governments that the Guide unassigned groundwater assessment was overly conservative.
- The previous assessment ensured that all but two of the unassigned groundwater areas had an SDL of less than 50 GL/y. This was based on the method developed at that time.
- There are 33 SDL areas that to which the unassigned water assessment has been applied. The methodology is described in more detail in Attachment C.

Map explanation

- The light brown SDL areas represent the unassigned groundwater areas in which the majority of the change has occurred (900 GL). These areas are generally fractured or porous rock located in the far west and north of the Basin where the groundwater is mostly saline and difficult to access. All of these unassigned groundwater areas have been assessed as having a low level of connectivity to surface water resources.
- The dark brown SDL areas were assessed as being highly connected in the Guide. The connection of groundwater to surface water in these systems relies on faults and fractures in the geological strata and this results in these connections being highly variable. For these areas the MDBA reassessed the level of connectivity and determined that there were low levels of connection with surface water. Subsequently the unassigned groundwater assessment was used in these areas, with the dark brown areas representing 100 GL of the overall change between the Guide and draft Basin Plan.
- The five blue areas on the map are part of the Lachlan Fold Belt geological formation and they were also assessed as being highly connected in the Guide. The Lachlan Fold Belt lies under several surface water catchments and some other shallow aquifers; it spans the width of the Basin from Cooma to Bourke. Again the connection of groundwater to surface water in these systems relies on faults and fractures in the geological strata and this results in these connections being highly variable. After further assessment and consultation it has been determined that the level of connectivity for the Lachlan Fold Belt areas is particularly low. For these areas the unassigned water assessment has been modified to set the SDL at the preliminary groundwater SDL and represents 500 GL of the overall change between the Guide and draft Basin Plan.

Areas where the Change in Unassigned water assessment has resulted in a change of 1500 GL in the proposed SDL



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Program: Division or Agency:	4: MDBA	**Question No:**	224
Topic:	MDBA – Management of water quality		
Proof Hansard Page and Date or Written Question:	Written		

Senator Heffernan asked:

In light of the pending introduction of the Globally Binding Mercury Instrument by the UNEP the revised MDB draft does not mention the water quality issues relating to mercury and arsenic pollution for the Murray River Ramsar zones and the Murray Darling Basin in general.

45.64% of New South Wales and 40.38% of Victoria have been subject to historical gold mining activity it is disappointing that this globally critical toxic metal pollution issue has not even been mentioned in the revised MDB plan. This lack of recognition will have a significant impact on all of the Murray Darling Basin farming communities once the globally binding mercury instrument comes into force.

The revised draft does not mention sedimentation issues resulting from logging activities in the great dividing range in both Victoria and NSW. The bulk of the mercury and often times arsenic pollution that flows into the Murray River RAMSAR Zones comes from historical gold mining areas in Victoria and in particular the Upper Goulburn river historical gold mining area and the Ovens Valley historical gold mining areas:

1. Documents identifying this toxic metal pollution issue have been available from VicEPA since the early to mid 1980's. Is the Murray Darling Basin Authority aware of this issue, if yes, what policies/programmes are in place to address this issue?

2. Can you provide an estimation of costs for this major toxic metal pollution issue to be addressed in a further revision of the Murray Darling Basin plan and the timetable for this work to take place.

Answer:

1. The draft Basin Plan provides water quality target values for heavy metals, including mercury and arsenic (column 11 of Schedule 9). The target values apply to water dependent aquatic ecosystems and are directly referenced in the Australian and New Zealand Guidelines for fresh and marine water quality, developed under the National Water Quality Management Strategy. These Guidelines are the nationally agreed authoritative guide for setting water quality objectives. The draft Basin Plan also indentifies causes of elevated levels of suspended matter, which include poor soil conversation practices and the failure to prevent soil erosion (Schedule 8).

   The water quality in the Ovens and upper Goulburn Rivers is generally good, but some tributaries have high turbidity levels and the State has documented that there is a recognised risk of heavy metal pollution when contaminated soils associated with old gold mining areas are eroded.

A provision of the Basin Plan may not directly regulate land use, the management of land or the control of pollution (Section 22 (10) of the *Water Act 2007*). Soil conservation, land management and mine site rehabilitation remain within the jurisdiction of State governments. However, matters relevant to water quality can be addressed through the requirements set by the draft Basin Plan for the states' water resource plans.

The framework set out in the draft Basin Plan is for water quality management plans to be prepared as a component of the water resource plans. These plans will specify measures to be undertaken in a water resource plan area that will contribute to the achievement of the water quality objectives given in the Basin Plan. The measures must be prepared having regard to the causes of water quality degradation (for example, soil erosion), the relevant water quality targets (for example, turbidity, salinity, heavy metals etcetera) and to the current and future risks to the condition of the water resources of the water resource plan area.

2. Estimating the costs of addressing heavy metal pollution is a matter for states to consider when developing their water quality management component of their water resource plans, in particular the cost of management measures or actions they are proposing.

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Program: Division or Agency: MDBA **Question No:** 225

Topic: MDBA – Modelled annual inflows

Proof Hansard Page and Date Written

or Written Question:

Senator Joyce asked:

1. Can you please provide the Committee the modelled annual inflows into the Murray-Darling for every year since 1895?

Answer:

1. This annual time series represents the total inflows to the Murray-Darling Basin as modelled for Without Development conditions. Other adjustments not modelled annually and un-modelled inflows are not included.

Year	GL/Yr	Year	GL/Yr	Year	GL/Yr	Year	GL/Yr	Year	GL/Yr
1895	18066	1926	20259	1951	42225	1976	28713	2001	13567
1896	13170	1927	23808	1952	46778	1977	17859	2002	7293
1897	21467	1928	17102	1953	29042	1978	31367	2003	20139
1898	17800	1929	11848	1954	45965	1979	13754	2004	14254
1899	21309	1930	42593	1955	108187	1980	17918	2005	17916
1900	24992	1931	34846	1956	61829	1981	33292	2006	4632
1901	14927	1932	18059	1957	13778	1982	25258	2007	15636
1902	11853	1933	26234	1958	36509	1983	45403	2008	8833
1903	32614	1934	32666	1959	19003	1984	30437		
1904	21092	1935	18684	1960	31727	1985	17340		
1905	25428	1936	24355	1961	26381	1986	29846		
1906	33086	1937	10938	1962	25860	1987	28067		
1907	18007	1938	17699	1963	23534	1988	41700		
1908	17243	1939	27442	1964	30561	1989	45589		
1909	37201	1940	18830	1965	12262	1990	40945		
1910	29655	1941	15533	1966	23495	1991	25493		
1911	15018	1942	32071	1967	16883	1992	28358		
1912	25750	1943	16689	1968	24248	1993	31691		
1913	15020	1944	11974	1969	27667	1994	13962		
1914	6906	1945	17373	1970	62830	1995	42356		
1915	24315	1946	19992	1971	25732	1996	38300		
1916	60039	1947	33745	1972	24405	1997	11685		
1917	56772	1948	17821	1973	65012	1998	50822		
1918	17682	1949	52727	1974	46822	1999	20755		
1919	11784	1950	85957	1975	62714	2000	38809		
1920	58231								
1921	40602								
1922	18219								
1923	30477								
1924	31347								
1925	26744								

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Program: Division or Agency:	MDBA	**Question No:**	226
Topic:	MDBA – Advisory Committee on Social, Economic and Environmental Sciences		
Proof Hansard Page and Date	Written		

or Written Question:

Senator Joyce asked:

1. Why is the MDBA only establishing the Advisory Committee on Social, Economic and Environmental Sciences after the basin plan has been in effect finalised?
2. What will this advisory committee do?
3. Has the MDBA appointed members to this committee? If so who are they?
4. How much will members of this committee be paid?
5. I refer you to a decision of the MDBA at a meeting on 1 March 2011 not to establish a Social and Economics references committee despite previously approaching a number of experts to join such a committee. Why is it necessary to create such a committee now when it wasn't in March last year?

Answer:

1. The Advisory Committee on Social, Economic and Environmental Sciences (the Committee) is being established to provide advice on the implementation of the Basin Plan.
2. The Committee will provide the Murray-Darling Basin Authority (the Authority) with expert guidance on the social, economic and environmental sciences needed for the future.
3. No.
4. Committee members will be remunerated at a rate of $1,058 per day for the Chair and $873 per day for members and travel allowances consistent with the Remuneration Tribunals Determination 2004/03: Official Travel by Office Holders.
5. The Committee does not have the same objectives as the previously proposed Social and Economic Reference Committee.

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Program: Division or Agency:	MDBA	**Question No:**	227
Topic:	MDBA – Contribution of environmental works and measures to SDLs		
Proof Hansard Page and Date	Written		

or Written Question:

Senator Joyce asked:

1. How can the benefits of environmental works and measures contribute towards the 2750 GL SDL under the current draft basin plan?

Answer:

1. The 2015 review proposed in the revised draft Basin Plan would provide an opportunity for the Murray-Darling Basin Authority (the Authority) to consider optimisation of the social, economic and environmental outcomes, including water savings and improved environmental outcomes resulting from environmental works and measures. If any of these works and measures result in a change to the volume of water needed to meet environmental outcomes, the Authority would propose an amendment to the Basin Plan to change the 2,750 GL reduction amount.

   The Authority is working with jurisdictions to facilitate development of a mechanism that could allow for the adjustment of Sustainable Diversion Limits resulting from such works and measures without requiring a formal amendment to the Plan.

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Program: Division or Agency:	MDBA	**Question No:**	228
Topic:	MDBA – Water savings		
Proof Hansard Page and Date	Written		
or Written Question:			

Senator Joyce asked:

1. Is there any ability under the current draft basin plan to account for the water savings that might arise from the draft basin plan?

Answer:

1. Yes, if the water savings are from any of the forms of take which are included in the descriptions of the baseline diversion limit. For example, water savings resulting from improvements in irrigation efficiency could contribute to meeting the 2,750 GL reduction amount.

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Program: Division or Agency:	4: MDBA	**Question No:**	229
Topic:	MDBA – Living Murray Initiative		
Proof Hansard Page and Date or Written Question:	Written		

Senator Joyce asked:

I refer you to your answer to question no. 171 from additional estimates in February on the Living Murray Initiative, where you state that:

"Further work is required to determine how they might be used in conjunction with the additional water available to the environment under the Basin Plan, and what contribution they might make towards achieving the environmental outcomes of the Basin Plan."

1. Has the MDBA progressed this work and how might the Living Murray Initiative projects contribute towards achieving environmental outcomes?

Answer:

1. The Living Murray works and measures will provide environmental benefits complementary to those provided by environmental watering under the Basin Plan. For example, the works will enable watering opportunities for areas of wetland and floodplain during dry periods when it is not possible to provide overbank flows to the broader floodplain. This will provide vital drought refuge habitat for many plant and animal species. The works will also enable some parts of the floodplain to be maintained in better condition than would otherwise be possible, providing areas of locally high biodiversity and productivity. These outcomes will contribute to achieving Basin Plan objectives and were considered by the Murray-Darling Basin Authority in its work determining the Environmentally Sustainable Level of Take.

   Many of The Living Murray works are still being built and operating strategies to maximise environmental outcomes will take some time to develop, with experience gained through actual operation once construction is completed. Similarly, environmental watering under the Basin Plan will involve adaptive management and consequently the nature of environmental watering actions, including linkages with The Living Murray works, will vary year-by-year.

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Program: Division or Agency:	MDBA	**Question No:**	230
Topic:	MDBA – Long-term watering plans		
Proof Hansard Page and Date	Written		
or Written Question:			

Senator Joyce asked:

I refer you to your answer to question no. 160 from additional estimates in February where you stated that:

"It is possible that new information or efficiencies not currently identified could result in state LTPs identifying that less environmental water is required in their region. If so, the Authority would take this into consideration in the Sustainable diversion Limit review (2015) and environmental watering plan review (2017)."

1. Would this change require changes to the legislative instrument which would need to go through Parliament again?

Answer:

1. Yes. Any amendments to the Basin Plan, as currently drafted, would need to follow the provisions of the *Water Act 2007* (Commonwealth) and be tabled in both houses of the Parliament.

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Program: Division or Agency:	4: MDBA	**Question No:**	231
Topic:	MDBA – Legal advice		
Proof Hansard Page and Date or Written Question:	Written		

Senator Joyce asked:

1. Has the MDBA received specific legal advice on how whether the draft basin plan complies with the Water Act? If so, who undertook this advice, when was it provided and how many pages of advice did it amount to?

Answer:

1. Yes, advice on the current draft Basin Plan was provided by the Australian Government Solicitor on 23 May 2012, totalling 14 pages.

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Program: Division or Agency:	MDBA	**Question No:**	232
Topic:	MDBA – Hume Dam and Lake Mulwala		
Proof Hansard Page and Date	Written		
or Written Question:			

Senator Joyce asked:

1. Can you please provide an update on negotiations to purchase easements between Hume Dam and Lake Mulwala? When does the expect these negotiations to conclude?

2. Can I confirm that the current draft basin plan only calls for maximum flows of 25,000 ML per day between Hume Dam and Lake Mulwala?

Answer:

1. The Murray-Darling Basin Authority (the Authority) is currently negotiating to acquire flood easements for two landholdings adjacent to the River Murray between Hume Dam and Lake Mulwala. These flood easements, for flows up to 25,000 ML/day, are being 'negotiated by agreement'. Finalisation of these two easements will bring the total number of 25,000 ML/day flood easements to 79 for this reach of the River Murray. The Authority continues to work with relevant landholders as well as Commonwealth and State Government agencies to expedite negotiations.

2. The model used for Basin Plan modelling includes a channel capacity constraint of 25,000 ML/d between Hume Dam and Albury (Doctor's Point). This means that the model would indeed limit the releases for environmental flow, so that the channel capacity constraint of 25,000 ML/d is not exceeded.

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Program: Division or Agency:	MDBA	**Question No:**	233
Topic:	MDBA – Easements for environmental watering purposes		
Proof Hansard Page and Date	Written		
or Written Question:			

Senator Joyce asked:

1. Can the MDBA please provide a list of all of the areas where they are currently seeking or negotiating to purchase additional easements for environmental watering purposes? How much land is the MDBA seeking access to?

Answer:

Gunbower Forest Flooding Enhancement Works

Goulburn-Murray Water, in its role as the Victorian State Constructing Authority for the Murray-Darling Basin Authority (the Authority), is currently negotiating to acquire flood easements for parts of nine landholdings adjacent to the Gunbower Forest as part of the Gunbower Forest Flooding Enhancement Works. Acquisition of the flood easements is being progressed on a voluntary basis and the total area of the nine flood easements is approximately 56 hectares.

Koondrook-Perricoota Flooding Enhancement Works

As part of the Koondrook-Perricoota Flooding Enhancement Works, investigations are currently underway to mitigate potential flooding of freehold land. The number of potentially impacted landholdings is four and the potential area of inundation is in the order of 200 hectares.

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Program: Division or Agency:	MDBA	**Question No:**	234
Topic:	MDBA – Indigenous Employment Strategy		
Proof Hansard Page and Date	Written		
or Written Question:			

Senator Joyce asked:

1. How much has the MDBA spent on its Indigenous Employment Strategy? Have you employed any Indigenous people yet?

Answer:

1. The Murray-Darling Basin Authority (the Authority) Indigenous Employment Strategy 2011 was developed by an Indigenous APS employee.

   The Authority provided funding in the amount of $64,312 for the employment of 15 Indigenous facilitators on a casual basis during the proposed Basin Plan 20 week consultation period.

   The Authority has also provided funding for the employment of Indigenous people through the Authority partner Government programs and in 2011-2012 contributed $799,310 to 'The Living Murray Indigenous Partnerships Program' (TLM). TLM employed Indigenous Facilitators at Lower Lakes Coorong Murray-Mouth (Department for Water South Australia); Chowilla (New South Wales Office of Water); Lindsay – Wallpolla and Hattah Lakes (Mallee Catchment Management Authority, Victoria); and Barmah-Millewa (Department Sustainability and Environment, Victoria). In addition, funding was available for an Indigenous Facilitator at Chowilla (South Australia), however, this position has not yet been filled.

   Lake Victoria operations support five Indigenous identified, full-time positions. These positions are based on an APS 6 salary and are generally non-ongoing. An additional 15 casual Indigenous positions are made available for cultural heritage monitoring throughout the year. Operation of the Lake also provides periodic casual employment to Elders Council members with up to 20 members involved in up to five meetings per year.

   The Environmental Works and Measures Program employs Indigenous people in pre-construction and construction activities. At Hattah Lakes one full-time position is supported and additional casual monitors are employed as required. The Koondrook-Perricoota Forest Flood Enhancement Project has employed up to 55 Indigenous people in casual positions. Sitting fees are also provided for cultural heritage advisory groups representing the Traditional Owners and Local Aboriginal Land Councils.

   The Authority also currently supports approximately five full-time positions at Menindee Lakes to manage operations, maintenance and cultural heritage management functions. Between 2002 and 2012, the Authority supported employment of six casual positions to conduct cultural heritage survey work at the Murray Mouth.

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Program: Division or Agency:	MDBA	**Question No:**	235
Topic:	MDBA – Potential fraud investigation		
Proof Hansard Page and Date	Written		
or Written Question:			

Senator Joyce asked:

1. In your 2010-11 annual report you refer to one “potential fraud” being under investigation. Can you provide details on what this investigation covers and has the investigation concluded? What has been the outcome of the investigations?

Answer:

1. The matter is still under investigation and it is therefore not appropriate to provide further details at this stage.

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Program: Division or Agency:	MDBA	**Question No:**	236
Topic:	MDBA – Compliance audits		
Proof Hansard Page and Date	Written		
or Written Question:			

Senator Joyce asked:

On p. 170 of the 2010-11 annual report you say that:

"The compliance audits found a strong and positive attitude to internal control, but identified actions needed to ensure improved compliance."

1. What were the actions identified and how you are going in implementing them?

Answer:

1. As further mentioned on p170 of the 2010-11 annual report no serious control breaches were identified.

   The actions identified in the recommendations of the compliance audits related to practice and process improvements, for example implementing processes to ensure contractual arrangements are formally executed prior to contract commencement and ensuring security positions are consistently identified and defined. Almost all recommendations have been implemented. The remaining actions are expected to be completed in the near future. As mentioned in the report, progress with each internal audit recommendation is monitored by the Audit Committee until the actions in the recommendation have been completed.

Senate Standing Committee on Environment and Communications
Legislation Committee
Answers to questions on notice
Sustainability, Environment, Water, Population and Communities portfolio
Budget Estimates, May 2012

Program: Division or Agency:	MDBA	**Question No:**	237
Topic:	MDBA – Basin Plan spend		
Proof Hansard Page and Date	Written		
or Written Question:			

Senator Joyce asked:

1. How much has the Authority spent on the Basin plan to date?
2. How much does the Authority expect to spend on the Basin plan over the next financial year?

Answer:

1. Since commencement of operations in September 2008, through to 30 April 2012, the Murray-Darling Basin Authority (the Authority) has spent $91.180 million on Basin Planning activities inclusive of Basin Plan share of overheads. This expenditure includes costs associated with the 31 community information sessions that were held after the release of the Guide to the Basin Plan, and for the 175 meetings that were held after the release of the draft Basin Plan during the formal 20 week consultation period.
2. The Authority expects to spend approximately $38 million on Basin Plan activities (including contributing to the overheads of the Authority) in 2012-13 which includes funds for further consultation.

Senate Standing Committee on Environment and Communications
Legislation Committee
Answers to questions on notice
Sustainability, Environment, Water, Population and Communities portfolio
Budget Estimates, May 2012

Program: Division or Agency:	4: MDBA	**Question No:**	238
Topic:	MDBA – Staff working on the Basin Plan		
Proof Hansard Page and Date or Written Question:	Written		

Senator Joyce asked:

1. How many staff does the Authority have working on the Basin plan?

Answer:

1. As at 21 May 2012, 150.5 employees were working on Basin Planning activities which includes staff involved in the community engagement process.

Senate Standing Committee on Environment and Communications
Legislation Committee
Answers to questions on notice
Sustainability, Environment, Water, Population and Communities portfolio
Budget Estimates, May 2012

Program: Division or Agency:	MDBA	**Question No:**	239
Topic:	MDBA – Briefings provided to the Minister and Prime Minister		
Proof Hansard Page and Date	Written		

or Written Question:

Senator Joyce asked:

1. Could you please provide the Committee with a list of the briefings the MDBA has given to the Minister for Water or his staff, and the Prime Minister, or her staff, since 18 October 2011?

Answer:

1. The Murray-Darling Basin Authority (the Authority) has provided a total of 14 written briefs to the office of the Minister for Sustainability, Environment, Water, Population and Communities (the Minister) since 18 October 2011. Details are as follows:

- Draft Murray-Darling Basin Authority Annual Report 2010-11.
- MDBA - Release of Report - Benefits and Costs of the Proposed Basin Plan.
- MDBA Release of CSIRO Led Science Review and Supporting Documentation.
- Outcomes From Murray-Darling Basin Authority Meetings 36 - 26 October, 37 – 3 November, 38 - 14 and 16 November, 39 - 17 November and 40 - 2 December 2011.
- Murray-Darling Basin Authority Members' Current Conflict of Interest Declarations.
- Outcomes from Murray-Darling Basin Authority Meeting 41 – 3 February 2012.
- Approval for the Murray-Darling Basin Authority to Incur Revised Operating Deficits in 2011-12, 2012-13, 2013-14 and 2014-15.
- Publication of Water Audit Monitoring Report 2010-11.
- The Draft Murray-Darling Basin Plan – Groundwater.
- Murray-Darling Basin Authority Member’s Updated Conflict of Interest Declaration.
- Release of Final Report of the CSIRO Project: The Multiple Benefits of the Basin Plan.
- Murray-Darling Basin Authority Member’s Updated Conflict of Interest Declaration.
- Endorsement of the Draft Minutes from the Legislative and Governance Forum on the Murray-Darling Basin Meeting 1 – 4 November 2011.

- Revised Timing for Approval for the Murray-Darling Basin Authority to Incur a Revised Operating Deficit in 2012-13, 2013-14 and 2014-15.

The Minister for Sustainability, Environment, Water, Population and Communities is responsible for briefing other ministers including the Prime Minister on Murray-Darling Basin issues.

Senate Standing Committee on Environment and Communications
Legislation Committee
Answers to questions on notice
Sustainability, Environment, Water, Population and Communities portfolio
Budget Estimates, May 2012

Program: Division or Agency:	MDBA	**Question No:**	240
Topic:	MDBA – Records of decisions made		
Proof Hansard Page and Date	Written		
or Written Question:			

Senator Joyce asked:

1. Could the Authority please provide this Committee with all the decisions it has made since 30 January 2012 in accordance with Section 198 of the Water Act which requires the Authority to keep records of all of its decisions?

Answer:

1. The Murray-Darling Basin Authority has made no Out-of-Session decisions since 30 January 2012.

Senate Standing Committee on Environment and Communications
Legislation Committee
Answers to questions on notice
Sustainability, Environment, Water, Population and Communities portfolio
Budget Estimates, May 2012

Program: Division or Agency:	MDBA	**Question No:**	241
Topic:	MDBA – Meeting minutes		
Proof Hansard Page and Date	Written		
or Written Question:			

Senator Joyce asked:

1. Could you please provide the minutes to any of the meetings the Authority has held since 2 December 2011?

Answer:

1. Confirmed meeting minutes, including decisions, which are appropriate to release are provided as follows:

   - Meeting 41 – 3 February 2012, **Attachment A**;
   - Meeting 42 – 6 March 2012, **Attachment B**; and
   - Meeting 43 – 11 April 2012, **Attachment C**.

   The meeting minutes contain material disclosing matters in the nature of, or relating to, deliberation that has taken place, in the course of, or for the purposes of, the deliberative processes involved in the functions of the Authority and, accordingly, this material has been omitted.

Attachment A – Authority Meeting 41 – 3 February 2012 – Canberra

Agenda Item 1: Opening of Meeting and Apologies

1. The Chair **opened** the meeting at 10.15 am. There were no apologies.

Agenda Item 2: Adoption of Draft Agenda

2. The Murray–Darling Basin Authority **adopted** the agenda for meeting 41.

Conflict of Interest

3. No member declared any conflict of interest, actual or apparent, in relation to any items on the agenda.

Agenda Item 3: Confirmation of Notes of MDBA Planning Workshop 2 and Minutes of Meetings 36, 37, 38, 39 and 40.

4. The Murray–Darling Basin Authority **confirmed** the notes of MDBA Planning Workshop 2 (12 and 17 October 2011) and minutes of Meetings 36 (26 October 2011), 37 (3 November 2011), 38 (14 and 16 November 2011), 39 (17 November 2011) and 40 (2 December 2011).

Agenda Item 4: Matters Arising from the Minutes, Including Actions

5. Members **noted** the matters arising from the Minutes and Actions List. The Chair **stated** that members do not believe management of Authority decisions through an Actions List should occur in a separate agenda paper. In future, the reporting of any outstanding items from previous meetings is to be included in the agenda as part of the Chief Executive's report.

Agenda Item 5: Chair's Report

6. The Chair **stated** that he had updated members on his activities prior to the meeting and any other comments he may have would be covered as part of other agenda items.

Agenda Item 6: Chief Executive's Report

7. The Chief Executive **stated** that the MDBA's strategic planning process had been completed. The new Strategic Plan brought together the role for the MDBA and key objectives for the future to 2015. The Strategic Plan will be made publicly available on the MDBA website. The Chief Executive **tabled** a *Statement of Strategic Intent and Outcomes of Executive Workshop (November 2011*).

8. The Chief Executive **highlighted** the need for the Authority to prepare a Regulation Impact Statement (RIS) and that this was currently being drafted. The Chair **requested** information on the exact timing and process of the RIS in relation to completion of the Basin Plan [see also agenda item 8.8].

9. Members **noted** the Chief Executive's report, and **congratulated** the Office on the recent publication *A Yarn on the river: Getting Aboriginal voices into the Basin Plan*.

Agenda Item 7: Briefing by Commonwealth Environmental Water Holder

10. The Murray-Darling Basin Authority **noted** the presentation.

Agenda Item 8: Basin Plan

Agenda Item 8.1: Engagement Update

11. Ms Katrina Maguire, General Manager, Engagement Strategy, **drew** members' attention to the list of key engagement activities since release of the proposed Basin Plan.

12. The Murray-Darling Basin Authority:
    (a) **noted** the update on engagement activities since release of the proposed Basin Plan;
    (b) **noted** the key issues raised at recent meetings;
    (c) **endorsed** the next stage of proposed engagement activities, with the exception of the science forum which was requested to be postponed;
    (d) **agreed** to inform the General Manager Engagement Strategy about attendance at any stakeholder initiated engagement activities for incorporation in the Authority's public consultation meeting schedule.

13. The Chair **thanked** Authority officers for the very fine effort that they had extended on engagement activities since release of the proposed Basin Plan in late November 2011.

Agenda Item 8.2: Communications Update

14. Ms Christine Ellis, Senior Adviser, Media, supplemented her written report **by stating** that the use of a wide variety of conventional and internet-based media avenues had worked very well, and that media interactions had been, overall, very positive. The MDBA had provided assistance for Indigenous groups to prepare submissions by placing independent contractors in communities to assist them with drafting.

15. Ms Ellis **advised** she would contact members individually after the meeting to determine their preference for further media strategies to promote the Authority's messages and counter misinformation.

16. The Murray-Darling Basin Authority **noted** the report on media and communications.

17. Authority members **agreed** to put the results of the three imminent technical reports on the Authority website when they became available, accompanied by a statement that it was not new information but simply more detailed data in support of information that was already public.

Agenda Item 8.3: Update on Public Submissions

18. A/g Executive Director, Policy and Planning, Mr Russell James, outlined highlights of the update on public submissions and emphasised that it was still early in the submission process. Most of the submissions received so far were small, or campaign letters, with the larger submissions expected closer to the end of the 20-week consultation period. The issues raised in submissions would be transferred to a section 43 report. Members **noted** the update on public submissions to the proposed Basin Plan, and **stated** that a regular update on the number of submissions received was preferable to the detailed fortnightly reports previously provided.

Agenda Item 8.4: Update on Science and Knowledge Strategy

19. The Murray-Darling Basin Authority **noted** the update on the development of the Science and Knowledge Strategy and the Science and Research Advisory Committee.

Agenda Item 8.5: CSIRO Multiple Benefits of the Basin Plan Project

20. The Chair **stated** that any input from Authority members to the report should be focused on assisting production of the RIS.

Agenda Item 8.6: Proposed Advisory Committees to Support the Basin Plan

21. The Murray-Darling Basin Authority **noted** that establishment of the Science and Research Advisory Committee, pursuant to section 203 of the *Water Act 2007* (Cwth), was agreed in the out-of-session Authority paper 13 on 24 November 2011. The Chief Executive **requested** the inclusion of the word 'economic' in the committee's final title.

Agenda Item 8.9: Strategic Discussions

22. The Chair **stated** that strategic discussions had already taken place through other agenda items.

Agenda Item 9: Basin Community Committee Membership

23. Executive Director, Corporate Services, Mr Frank Nicholas, briefed Authority members on the selection process for the second terms of membership of the Basin Community Committee (BCC).

24. The Murray-Darling Basin Authority **noted** that pursuant to section 202 (5) of the *Water Act 2007*, it needed to nominate an Authority member as a member of the BCC, and **agreed** to continue the practice of nominating an Authority member to attend on a rotating basis, determined by availability, prior to each BCC meeting.

25. On the basis that another three-year term for the BCC would coincide with the 2015 review of the Basin Plan, Authority members **agreed** to a two-year period of appointment for the second term of the BCC.

Agenda Item 10: Other MDBA Activities

Agenda Item 10.1: River Murray Update

26. The Murray–Darling Basin Authority **noted** the River Murray update, in particular, current water resource availability, key River Murray system management issues, and progress with the assets management program.

Agenda Item 10.2: Environmental Management Update

27. The Murray–Darling Basin Authority **noted** key developments and issues within the Environmental Management Division.

Agenda Item 11: Other Business—Responsibility for Office OH&S

28. The Chair **stated** that he had asked the Executive Director, Corporate Services to investigate the implications stemming from the Australian Government's new occupational health and safety (OH&S) legislation (*Work Health and Safety Act 2011*) which came into effect on 1 January 2012. Mr Nicholas reported that there were a number of changes that impacted on the MDBA, the most significant of which was that responsibility for work health and safety was now vested in "officers" rather than an employer entity.

Agenda Item 12: Next Meeting

29. Members **noted** the meeting dates for 2012 and **agreed** to meet on Tuesday 6 March 2012 in Canberra.

Meeting Close

The Chair **closed** the meeting at 4.15 pm.

Attachment B – Authority Meeting 42 – 6 March 2012 – Canberra

Agenda Item 1: Opening of meeting, disclosure of interests and apologies

1. The Chair **opened** the meeting at 10.40am and outlined the program for the day. There were no apologies.

Agenda Item 2: Adoption of draft agenda

2. **The Murray–Darling Basin Authority adopted the agenda for meeting 42.**

Conflict of Interest

3. No member declared any conflict of interest, actual or apparent, in relation to any items on the agenda.

Agenda Item 3: Confirmation of minutes of meeting 41

4. **The Murray–Darling Basin Authority confirmed the minutes of meeting 41 (3 February 2012) as amended.**

Agenda Item 4: Chair's report

5. The Chair stated that some of his activities would be covered under other agenda items but he wished to **report** his:

   (a) observations on the briefings, public meetings and roundtables held in the Southern Basin in Cobram, Kerang and Swan Hill.

Agenda Item 5: Chief Executive's report

6. The Chief Executive outlined the main elements of her new format report, adding that this continued to be a period of intense activity for much of the organisation with staff involved in engagement activities through to flood management and the river operations review. Executive Directors provided updates or responded to questions from members as required. When asked about scheduling briefings for members on matters of interest, both the Chief Executive and Chair confirmed this was already occurring at upcoming meetings and will be more fully accommodated after the consultation period when the demands on technical staff were reduced. Members were encouraged to nominate items.

Agenda Item 6: Basin Plan

Agenda Item 6.1: Engagement update

7. The General Manager, Engagement Strategy, Ms Katrina Maguire, reported on the ongoing heavy calendar of engagement activities and the challenges experienced in arranging those events. Local councils are being consulted in flood affected areas to ensure it is appropriate and logistically possible for meetings to proceed. Ms Maguire stressed the importance of having details of members' participation at any engagement activities in the MDBA's records to facilitate reporting at forums such as the recent Senate Additional Estimates hearings. Ms Maguire also sought members' advice on priorities for engagement in the final weeks of the public comment period.

8. The Chair commented that Engagement Strategy Branch had been very effective in ensuring that Basin communities felt that every effort has been made to include them in

the consultation process. This immense effort was again acknowledged with a request that thanks be passed on to the staff involved.

9. **The Murray-Darling Basin Authority:**

   (a) **noted the update on engagement activities held during February and early March 2012**

   (b) **agreed two of the priorities for engagement in the final weeks of the public comment period are to focus on smaller more targeted activities with non-government organisations, specialist and peak groups and to keep in dialogue with the science community to assist in the development of the Science and Knowledge Strategy, and**

   (c) **discussed engagement and communications needs to support the publishing of the proposed Basin Plan consultation report [see agenda item 6.6].**

Agenda Item 6.2: Communications update

10. The Senior Advisor Media, Ms Christine Ellis, stepped members through the key points of this paper.

11. **The Murray-Darling Basin Authority noted the report on media and communication activities.**

Agenda Item 6.3: Regulation Impact Statement update

12. Mr Tony Webster, General Manager, Social and Economic Policy Analysis outlined the required content, process and timetable for preparation of the Regulation Impact Statement (RIS).

13. **The Murray-Darling Basin Authority noted the update on the Regulation Impact Statement.**

Agenda Item 6.4: 2015 SDL review work program

14. The A/g Executive Director, Policy and Planning, Mr Russell James, explained that Mr Jeff Hillan was recently appointed Senior Director, SDL Review and is responsible for developing and progressing a work program to deliver the proposed 2015 review of sustainable diversion limits (SDLs).

Agenda Item 6.5: Basin Plan Working Group

15. **The Murray-Darling Basin Authority noted:**

   (a) **the verbal report on the recent activities of the Basin Plan Working Group.**

Agenda Item 7: Basin Community Committee update

16. Ms Diana Gibbs reported on her attendance at day 1 of Basin Community Committee (BCC) meeting 24 – 28 February 2012 and on her observations on the operation of the committee.

17. The Murray-Darling Basin Authority**:**

   (a) **noted the verbal report on Basin Community Committee (BCC) meeting 24 - 28 February 2012 given by Authority member Ms Diana Gibbs**

(b) **agreed to include an item on 'governance and structures' in the agenda for Authority meeting 43 to allow further discussion on the roles of the BCC and the proposed advisory committees**

(c) **noted the status of the selection process for the second term of the Basin Community Committee membership**

(d) **endorsed proceeding out of session with the selection process for the second term BCC membership if all nominations are received by 16 March 2012**

(e) **endorsed the Chief Executive extending the term of appointment for current members for 3 months if nominations from Victoria and NSW have not been received by 16 March 2012, and**

(f) **agreed, given the passage of time, applicants for BCC membership be sent an acknowledgement advising the selection process has been delayed.**

Agenda Item 8: MDBA Draft Corporate Plan 2012-2013 to 15-16

18. **The Murray-Darling Basin Authority, pursuant to section 213A of the *Water Act 2007*, noted the draft MDBA Corporate Plan 2012-13 to 15-16.**

Agenda Item 9: Other Business

Agenda Item 9.1: Queensland floods inquiry update

19. The Executive Director, River Management, Mr David Dreverman, supplemented the paper with advice that the Queensland Floods Commission of Inquiry final report is now expected on 16 March.

20. **The Murray-Darling Basin Authority noted:**

(a) **the update on the Queensland Floods Commission of Inquiry.**

Agenda Item 9.2: Amendments to the Murray-Darling Basin Agreement (Cl 60(1) – Authority approval of certain tenders

21. **The Murray-Darling Basin Authority determined that the amount of $2 million set out in Clause 60(1) of the Murray-Darling Basin Agreement as the value above which all works constructed under the Agreement must be let by tender, be increased to $3.2 million.**

Agenda Item 10: Next Meeting

22. **The Murray-Darling Basin Authority agreed to meet at a location that could allow Authority meeting 43 to take place on the previously agreed date of 3 April 2012.**

Meeting Close

The Chair **closed** the meeting at 4.30 pm.

Attachment C – Authority Meeting 43 – 11 April 2012 – Canberra

Agenda Item 1: Opening of meeting, disclosure of interests and apologies

1. The Chair opened the meeting at 2.35 pm. There were no apologies.

Agenda Item 2: Adoption of draft agenda

2. The Murray–Darling Basin Authority **adopted** the agenda for meeting 43.

Conflict of Interest

3. No member declared any conflict of interest, actual or apparent, in relation to any items on the agenda.

Agenda Item 3: Confirmation of minutes of meeting 42

4. The Chair **advised** members he had cleared the minutes of Authority meeting 42 (6 March 2012) and **requested** they be confirmed.

Agenda Item 4: Chair's report

5. With the approach of the end of the public consultation period on 16 April 2012 the Chair, on behalf of members, thanked the Chief Executive and MDBA staff for their sustained efforts during a particularly intense and prolonged period of consultation. He also thanked members for the significant commitment and invaluable on-the-ground knowledge they provided.

Agenda Item 5: Chief Executive's report

6. During discussion under this item members were advised that any comments on the draft 2011 Sustainable Rivers Audit Report should focus on readability and be provided at the earliest opportunity due to the timeframe for its consideration by other governance bodies. Consideration was also given to how to progress the selection of a chair for the Advisory Committee on Social, Economic and Environmental Sciences and the development of the science and knowledge strategy.

Agenda Item 6: Basin Plan

Agenda Item 6.1: Engagement update

7. The General Manager, Engagement Strategy, Ms Katrina Maguire, reported on recent engagement activities and those to conclude the public consultation period. Engagement branch has reminded the stakeholders on its email distribution list about the closing date for submissions and advised that the Authority's focus must now turn to the analysis of those submissions. Some six stakeholders who had requested submission extensions were each advised to submit what they can by the closing date and that subsequent material may be considered where possible. No large high profile stakeholder submissions had been received as at the date of this meeting. Ms Maguire advised that she and the Senior Advisor Media are turning their attention to communications and engagement requirements in advance of and after publication of the section 43 submission summary report.

8. **The Murray-Darling Basin Authority noted:**

   (a) **the update on engagement activities during March and April 2012.**

Agenda Item 6.2: Communications update

9. The Authority discussed possible communications strategies for the upcoming submission analysis and Basin Plan revision and implementation periods. The Senior Advisor Media, Ms Christine Ellis, advised that while the media has been reporting on the MDBA's current engagement activities, the number of submissions received and the consultation period closing date, their interest most recently has been directed at the timelines and processes for the revised Plan. She also informed members about media activities since preparation of the agenda paper, including the publication on 5 April of the Multiple Benefits of the Basin Plan Project final report on the CSIRO website and a Sky News public debate in Adelaide on the evening of 12 April involving Minister Burke, Liberal Senator Simon Birmingham and Green's Senator Sarah Hanson-Young.

10. **The Murray-Darling Basin Authority noted the report on media and communication activities.**

Agenda Item 6.3: Basin Plan Working Group

11. **The Murray-Darling Basin Authority noted:**

    (a) **the outcomes of the Basin Plan Working Group (BPWG) Workshop on the Water Quality and Salinity Management Plan (14 March 2012) and BPWG Meeting 15 (29 March 2012).**

Agenda Item 7: Other Business

12. There were no other items of business.

Agenda Item 8: Next Meeting

13. The Murray-Darling Basin Authority **agreed** to meet in Canberra on 1 May 2012.

Meeting Close

The Chair closed the meeting at 6.15 pm.

Senate Standing Committee on Environment and Communications
Legislation Committee
Answers to questions on notice
Sustainability, Environment, Water, Population and Communities portfolio
Budget Estimates, May 2012

Program: Division or Agency:	MDBA	**Question No:**	242
Topic:	MDBA – Implementation of the Murray-Darling Basin Plan		
Proof Hansard Page and Date	Written		
or Written Question:			

Senator Joyce asked:

1. What communications has the MDBA had since the release of the Guide with state and federal governments regarding the timetable for implementation of the Plan? Please provide lists of and copies of all relevant correspondence and meetings.

Answer:

1. Since the release of the Guide to the Basin Plan on 8 October 2010 the Murray-Darling Basin Authority (the Authority) has held multiple bilateral and multilateral meetings with State agencies covering a range of technical issues.

   In June 2011, the Basin Plan Working Group (BPWG) was established by the Authority as a mechanism to engage effectively with the Basin states during the development of the draft Basin Plan, including proposed implementation arrangements.

   The BPWG is chaired by the Authority with representation from all Basin states and the Department of Sustainability, Environment, Water, Population and Communities. Implementation arrangements were specifically discussed at BPWG meetings on: 27 June 2011; 15 July 2011; 11 August 2011; 1 September 2011; 21 September 2011; 2 February 2012; 26 April 2012; and 10 May 2012.

   The Murray-Darling Basin Ministerial Council considered a paper on implementation arrangements prepared by the Authority at its meeting in November 2011.

   The Authority Chair, the Hon Craig Knowles, wrote to Basin State Ministers on components of Basin Plan development including the pathway for implementing the Basin Plan (copy of letters attached).

   The Basin Officials Committee has been briefed by the Authority on timelines for implementation of the Basin Plan on a number of occasions including their meetings on 8 December 2011 and 24 May 2012.

Australian Government

MURRAY–DARLING BASIN AUTHORITY

Craig Knowles
Chair

TRIM Ref: D11/26505

Hon Peter Walsh MLA
Minister for Water
GPO Box 4440
Melbourne Victoria 3001

Dear Minister Walsh

Thank you for your letter of 26 July 2011 following up on our discussion about the draft Basin Plan. In addition to my initial response dated 10 August 2011, please find below further information addressing some of the matters you have raised.

I appreciate your acknowledgement of the Authority's new approach to involving the states in developing the Basin Plan, including through the Basin Plan Working Group. I also note your statement that you are receptive to a delay in the release of the draft Basin Plan, to allow more time to work through the issues you raise in your letter.

I note your primary concern is about the social and economic impacts that the proposed sustainable diversion limits (SDLs) could have on Victorian communities. The Authority has commissioned a number of studies examining the potential impact of the draft Basin Plan on communities and their economies. Whilst it is evident from these studies that the costs to the Basin may be small overall, the impacts of the proposed reductions will not be distributed evenly across the Basin.

The Authority is working to identify opportunities to address the impacts on communities. This may include how environmental water is acquired and delivered, approaches to environmental works and measures, river operations and river management, and water markets and trading. The work taking place through the Basin Strategy Working Group being convened by the Department of Sustainability, Environment, Water, Population and Communities on broader approaches to supporting communities in the Basin is also critical to this discussion, as is the time allowed for adjustment by the pathway for implementing the Basin Plan from 2012 to 2019. As you will recall, the timeframe for commencing of various elements of the Basin Plan was discussed at the 19 August Ministerial Forum, and further work on the transitional pathway for implementing the Basin Plan will be progressed through that Forum.

I note your concerns about the process for managing the unassigned downstream component of the SDLs. The objective of shared reductions is to provide more flexibility in recovering water. This will help to reduce social and economic impacts, as water will be sold from areas where it has a lower economic value.

In relation to your request that the Department of Sustainability and the Environment (DSE) be provided with the opportunity to fully understand the methodology underpinning the Authority's approach to determining the SDLs, I agree this is important. To this end, the Authority is preparing a suite of reports on the assessment of environmental water requirements, and the modelling and associated science base for the proposed sustainable

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diversion limits (SDLs). These reports are being progressively provided to states for consultation as they are available.

With regards to the proposed recovery targets for the Victorian Riverine Sedimentary Plain groundwater system, Authority staff met DSE on 19 August 2011 to discuss this and other issues including the arrangements for the boundaries of the Authority's groundwater resource units. The outcomes of this meeting included a way forward on the boundary issues and agreement to follow up on the Sedimentary Plain issue in the near future.

I look forward to working constructively with you in the coming months as we finalise the draft Basin Plan.

Yours sincerely

Craig Knowles
Chair

9 / 9 /2011

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Australian Government

MURRAY–DARLING BASIN AUTHORITY

Craig Knowles
Chair

TRIM Ref: D11/26504

Hon Katrina Hodgkinson MP
NSW Minister for Primary Industry
NSW Minister for Small Business
Level 30, Governor Macquarie Tower
1 Farrer Place
Sydney NSW 2000

Dear Minister Hodgkinson

In addition to my response to you on 10 August 2011, please find below further information addressing some of the matters raised in the letter dated 20 July 2011 from Commissioner David Harriss, and in our meeting of 18 July 2011 concerning the draft Basin Plan.

I agree it is important that the methodology for determining environmental water requirements and sustainable diversion limits (SDLs) be clearly explained. To this end, the Authority is preparing a suite of reports on the assessment of environmental water requirements, and the modelling and associated science base for the proposed SDLs. These reports are being progressively provided to states for consultation as they are completed.

I understand the Authority provided a paper to jurisdictions at a workshop on 6 May 2011 which gives background on the studies used and the methodologies applied in estimating impacts of interception activities for the Guide. The paper also provided information on more recent studies that may assist in improving the estimation of the impact of interception activities for the draft Basin Plan. The Authority is currently undertaking further work to improve interception estimations and I would welcome any input you may have regarding estimating the impact of interception activities.

I note your concerns about the process for applying SDL reductions. The objective of shared reductions is to provide more flexibility in recovering water. This will help to reduce the social and economic impact, as water will be sold from areas where it has a lower economic value.

With regards to your specific concerns about groundwater, the Authority has now received additional information from NSW regarding the NSW Porous and Fractured Rock groundwater systems. Following discussions at officer level, the NSW proposal is now under consideration by Authority staff.

In relation to the timing for commencement of the Basin Plan, following discussions at the Ministerial Forum on 19 August 2011, further work on the transitional pathway for implementing the Basin Plan is now underway and will be progressed through the Basin Plan Working Group. A key objective of the pathway will be to smooth the adjustment process and market impacts through progressive implementation of reforms over the period from commencement of the Basin Plan until 2019, and to provide certainty of process and outcomes for water users and the wider public.

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The Authority is considering a number of changes to the Environmental Water Management Plan as a result of feedback received from jurisdictions. In particular, the targets by which to measure progress towards the objectives are being reconsidered, along with changes to the management framework for environmental water to simplify and limit the obligations for long-term planning and promote opportunities for adaptive management. This includes linking long-term plans to priority assets and functions, and moving some content from the proposed legislative instrument to accompanying guidelines. These matters are still under active consideration by the Authority and proposed changes will be provided to the Basin Plan Working Group in the near future.

The water quality objectives and targets proposed in the draft Basin Plan have been developed following procedures endorsed by jurisdictions through the National Water Quality Management Strategy. These objectives and targets are being refined and I appreciate the specific advice recently received from NSW on a better way to provide for targets for raw water. Some other aspects of water quality targets are being discussed and developed through the Basin Plan Working Group. Through this process, I am confident that a set of water quality objectives and targets can be agreed that are realistic, achievable and meet the requirements of the Water Act and the States. Changes proposed to the water resource plan requirements will also allow for alternative, state developed targets in place of the targets in the Basin Plan.

With respect to the relationship between SDLs and environmental works and measures, the issue of assessing the impact of works and measures on SDLs is currently the subject of discussions involving all jurisdictions, including via a recent full day workshop on 31 August 2011.

Finally, I note your view regarding more time to allow the inter-jurisdictional Basin Plan Working Group to work through these issues before the draft Basin Plan is released. As you know, the Authority has extended the release date of the Basin Plan and I look forward to working constructively with you in the coming months to finalise the draft Basin Plan.

Yours sincerely

Craig Knowles
Chair

/ /2011

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Australian Government

MURRAY–DARLING BASIN AUTHORITY

Craig Knowles
Chair

TRIM Ref: D11/26502

Hon Paul Caica MP
Minister for the River Murray
GPO Box 1047
Adelaide SA 5001

Dear Minister Caica

In addition to my response to you on 10 August 2011, please find below further information addressing some of the matters you raised in your letter dated 27 July 2011 concerning the draft Basin Plan.

I note your views on the importance of using the best available science and agree it is important the Authority provide as much information as possible about the science underpinning the draft Basin Plan. To this end, the Authority is preparing a suite of reports on the assessment of environmental water requirements, and the modelling and associated science base for the proposed sustainable diversion limits (SDLs). These reports are being progressively provided to states for consultation as they are completed.

As you are aware, water purchases and the realisation of water savings through infrastructure improvements are the primary mechanisms for transitioning to the SDLs. The Commonwealth Government's commitment to "bridge the gap", through purchasing water entitlements from willing sellers, means that irrigation communities, that have invested in improving water management practices and water use efficiency, are likely to place a higher value on their water and therefore be less likely to sell their entitlements. Water savings that can be achieved through investing in irrigation infrastructure will also contribute to "bridging the gap".

On the other hand, if smarter ways to deliver environmental outcomes using environmental works and measures are developed, these projects could result in an increase to an SDL. The process for assessing how environmental works and measures impact on SDLs is currently the subject of discussion with states.

Regarding your request for more information on how the Authority has calculated the amount of water that has been already recovered from South Australia, I understand detailed information on this matter was provided to South Australian officials on 9 August 2011, and that ongoing discussions are continuing through the Basin Officials Committee regarding the long term diversion limit equivalent factors used to convert entitlement volumes to the long term average volume recovered.

I appreciate the importance of salinity targets in the reach of the River Murray between Wellington and Lock 1, given the State's dependence on sourcing water for human needs from the River Murray. The current draft Water Quality and Salinity Management Plan proposes raw water targets that would apply at Tailem Bend, Murray Bridge, Mannum and Swan Reach, all being water treatment and pumping locations, and irrigation salinity targets that would apply at Jervois and Mypolonga. In addition, the draft Basin Plan

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proposes a 'no deterioration' objective for water quality and salinity operating targets that would apply at Murray Bridge. Water quality targets are currently under consideration through the Basin Plan Working Group. I am confident a set of water quality objectives and targets will be set through the Basin Plan, which meet the requirements established by the Water Act, state objectives, and are realistic and achievable.

In relation to community involvement, I note your intention to build on existing structures and networks. The Authority is committed to engaging communities effectively during the development and implementation of the Basin Plan and would like to involve your expert staff in this process. I recognise that communities across the Basin are diverse and a 'one size fits all' approach will not work. I appreciate your advice regarding the South Australia's community-based Natural Resources Management (NRM) system and the role the NRM Boards could play in engaging communities. Authority staff will work with state agencies to involve the community.

I look forward to working constructively with you in the coming months as we finalise the draft Basin Plan.

Yours sincerely

Craig Knowles
Chair

/2011

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Australian Government

MURRAY–DARLING BASIN AUTHORITY

Craig Knowles
Chair

TRIM Ref: D11/26503

Hon Rachel Nolan MP
Minister for Natural Resources
GPO Box 661
Brisbane QLD 4000

Dear Minister Nolan

As a follow up to my response to you on 10 August 2011, please find below further information addressing some of the matters you raised in your letter dated 3 August 2011 concerning the draft Basin Plan.

I appreciate the support you have expressed for the Murray-Darling Basin reform process, and for the Authority's decision to delay the release of the draft Basin Plan to allow more time to work through key issues with the jurisdictions.

I note your primary concern relates to the proposed sustainable diversion limit (SDL) for the Condamine-Balonne and the potential social and economic impacts this may have. I acknowledge that the proposed reduction in the Condamine-Balonne is significant and that it is important the Authority provides a sound scientific basis for its proposal. To this end, the Authority is preparing a suite of reports on the assessment of environmental water requirements, and the modelling and associated science base for the proposed sustainable diversion limits (SDLs), which . The reports are being progressively provided to states for consultation as they are available. These issues are still under active consideration by the Authority, and I understand that ongoing discussions are taking place at the officer level.

With regard to your concerns about the social and economic impacts of the draft Basin Plan, the Authority has commissioned a number of studies examining the potential impact of the draft Basin Plan on communities and their economies. The Authority recognises that impacts of the proposed reductions will not be distributed evenly across the Basin and is working to identify opportunities to address the impacts on communities. These opportunities may include how environmental water is acquired and delivered, approaches to environmental works and measures, river operations and river management, and water markets and trading.

The work taking place through the Basin Strategy Working Group, being convened by the Department of Sustainability, Environment, Water, Population and Communities to consider broader approaches to supporting communities in the Basin, is also critical to this discussion, as is the time allowed for adjustment by the pathway for implementing Basin Plan from 2012 to 2019. You will recall the timeframe for commencing the elements of the Basin Plan was discussed at the 19 August Ministerial Forum, and that further work on the transitional pathway will be progressed through that Forum.

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I note your concerns regarding the level of prescription in the draft Basin Plan and what might best sit in supporting instruments or guidelines. I agree this is an important issue and one that is being considered by the Basin Plan Working Group. I understand that the Working Group has agreed to a set of principles for deciding the level of detail that should be in the Basin Plan, as a precursor to moving some material from the statutory Plan to a non-statutory companion document.

I would like to take the opportunity to respond to the letter of 17 June from the then Minister, the Honourable Kate Jones, concerning Queensland's approach to localism. I welcome the advice on Queensland's approach to engaging at the local and regional level and have asked Authority staff to work closely with Queensland officers to develop a strong program for local engagement.

I look forward to working constructively with Queensland in the coming months as we finalise the draft Basin Plan.

Yours sincerely

Craig Knowles
Chair

19/9/2011

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Senate Standing Committee on Environment and Communications
Legislation Committee
Answers to questions on notice
Sustainability, Environment, Water, Population and Communities portfolio
Budget Estimates, May 2012

Program: Division or Agency:	MDBA	**Question No:**	243
Topic:	MDBA – Salinity Audit and Basin Salinity Management Strategy		
Proof Hansard Page and Date	Written		
or Written Question:			

Senator Joyce asked:

I refer you to Question no. 107 from additional estimates in February. In the answer to that question the MDBA states that:

"These salt load export estimates do not include the future increase in salt mobilisation estimated by the Salinity Audit (Murray-Darling Basin Commission, 1999), nor the uptake of Basin Salinity Management Strategy salinity credits. When these are included it is expected that the recovery of 2,750 GL proposed in the Basin Plan will be sufficient to meet the salinity export target of 2 million tonnes of salt per year from the basin."

1. How much salt load export will occur on an annual basis from the Salinity Audit and the Basin Salinity Management Strategy?

Answer:

1. The Salinity Audit (Murray-Darling Basin Commission, 1999) estimated future increases in river salinity resulting from delayed accession of salt due to past development activities (land clearing, irrigation etcetera) in all catchments of the Basin. These estimates were based on the best available information at the time. Ongoing investigations indicate that the 1999 Salinity Audit may have overestimated the delayed salt loads to the river. As such, the Murray-Darling Basin Authority does not have modelled information to support the question in relation to the 1999 findings as they are no longer considered to be the best available information. The best current estimates of expected increases in delayed salt loads to the river are derived from various technical investigations and included as debits in the Basin Salinity Management Strategy (BSMS) which is independently audited each year.

   Under the BSMS, the contracting governments cannot take up all salinity credits generated though interventions to reduce salt loads to the river such as salt interception schemes and improved land management practices as they must offset the debits from delayed salt loads to maintain a net balance of credits and debits.

   How much salt load will occur on an annual basis from the delayed salt loads to the river and the uptake of BSMS salinity credits can best be determined by balancing the salinity credits and debits and estimating the salt load export to the sea.

   Based on a 2,800 GL scenario, the modelled salt load export to the sea would be approximately 2.16 million tonnes per year when the BSMS salinity credits and debits are in balance.

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Sustainability, Environment, Water, Population and Communities portfolio
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Program: Division or Agency:	4: MDBA	**Question No:**	244
Topic:	MDBA – Salinity target		
Proof Hansard Page and Date or Written Question:	Written		

Senator Joyce asked:

I refer you to Question no. 107 from additional estimates in February. In the answer to that question the MDBA states that:

"Salinity was modelled under the post Basin Plan flow regimes including at Milang. This analysis indicates that under Basin Plan conditions a salinity target of 600mg/L at Milang would be achieved 99 per cent of the time."

1. How often would the target of 600mg/L be met under the 2,400 GL modelling?

Answer:

1. Independent modelling of salinity was undertaken by the Murray-Darling Basin Authority under the 2,400 GL scenario and the results provided to the Basin jurisdictions through the Basin Plan Working Group in March 2012. The modelling indicates that the salinity target of 600 mg/L at Milang would be met 96 per cent of the time (days) under the 2,400 GL scenario when modelled over the Basin Salinity Management Strategy benchmark period (1975 – 2000).

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Program: Division or Agency:	MDBA	**Question No:**	245
Topic:	MDBA – South Eastern Australian Climate Initiative		
Proof Hansard Page and Date	Written		
or Written Question:			

Senator Joyce asked:

1. Is Phase 2 of the South Eastern Australian Climate Initiative still on track to be completed by the end of June?

Answer:

1. Phase II of the South Eastern Australian Climate Initiative will be completed by September 2012. The completion date has been extended to enable the preparation of a program report that synthesises the finding of Phase II. The technical/science work program was completed in June 2012.

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Program: Division or Agency:	4: MDBA	**Question No:**	246
Topic:	MDBA – Distribution of the Sustainable Rivers Audit report		
Proof Hansard Page and Date or Written Question:	Written		

Senator Joyce asked:

1. Has the MDBA distributed the Sustainable Rivers Audit report to the Natural Resource Management Committee, the Basin Officials Committee or any other committees? Is the Sustainable Rivers Audit report still on track to be submitted to a Ministerial Council meeting in June?

Answer:

1. The Sustainable Rivers Audit (SRA) Report is not yet complete. A draft of the SRA Report was distributed to the Natural Resource Management Committee and the Basin Officials Committee (BOC). The BOC discussed the report at BOC meeting 16 of 3 May 2012. The committee requested further information on the SRA scoring system and the use of expert rules. A BOC workshop was held in June to clarify these issues. As a result of the workshop, the Independent Sustainable Rivers Audit Group and the Murray-Darling Basin Authority are making a series of technical changes to ensure there is clarity on how the river health scores are derived.

Senate Standing Committee on Environment and Communications
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Program: Division or Agency:	MDBA	**Question No:**	247
Topic:	MDBA – Allocation under the Living Murray Initiative		
Proof Hansard Page and Date	Written		
or Written Question:			

Senator Joyce asked:

1. How much of the 402 GL allocated under the Living Murray Initiative is expected to be used in 2011-12? Has any water allocated not been able to be used or carried over under the Living Murray Initiative for 2010-11 and 2011-12? If so how much water has not been used or carried over?

Answer:

1. In 2010-11, most sites received extensive inundation due to the combination of high inflows and the delivery of 319 GL of environmental water. At the end of 2010-11, 88 GL remained on the Living Murray (TLM) portfolio which was carried over to enable a large watering action to be undertaken in spring 2011. A five per cent evaporation loss charged by Victoria, which is standard practice, reduced the volume carried over to 85 GL.

   In the 2011-12 water year, 430 GL has become available in the TLM portfolio. This volume includes the 85 GL carried over from 2010-2011. To date, 291 GL has been delivered to TLM icon sites during 2011-2012. Due to the high volume of unregulated flows throughout the Murray and Darling systems, additional environmental water has not been required at icon sites. Some icon sites have also needed to remain dry during 2011-12 to allow the construction of large-scale environmental works.

   The remaining 139 GL on the TLM portfolio will be carried over to 2012-13 allowing a large multi site watering action in spring 2012 when TLM may not necessarily have allocations against entitlements accruing from that water year. Restrictions on the volume of allocation that can be carried over on New South Wales entitlements will mean that a total of 107 GL will be available on the TLM portfolio at the beginning of 2012-13.

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Program: Division or Agency:	MDBA	**Question No:**	248
Topic:	MDBA – Cap models for SA and ACT		
Proof Hansard Page and Date	Written		
or Written Question:			

Senator Joyce asked:

1. When does the MDBA expect that cap models for South Australia and the ACT might be concluded? Will it be before the finalisation of the Basin Plan?

Answer:

1. The South Australian Metro-Adelaide Cap model and the ACT Cap model are expected in February 2013 and December 2012 respectively. The Basin plan is expected to be finalised later in 2012.

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Budget Estimates, May 2012

Program: Division or Agency:	MDBA	**Question No:**	249
Topic:	MDBA – Groundwater SDLs		
Proof Hansard Page and Date	Written		
or Written Question:			

Senator Rhiannon asked:

1. Did you receive correspondence from the NSW Government asking you to increase groundwater SDLs in order to supply water to the mining industry?

2. Did you increase the groundwater SDLs proposals from those in the Guide in keeping with their request?

3. Did you receive correspondence from any other parties asking for more groundwater for the mining industry?

4. As relates to any mining related decisions in NSW, what publicly available, peer reviewed science do you have to rule out connectivity between the groundwater units from which you propose to increase SDLs and surface water in the MDB?

Answer:

1. Yes. The Murray-Darling Basin Authority (the Authority) received two letters from the New South Wales (NSW) Office of Water (28 July 2011 and 22 September 2011), which outlines their concerns regarding Sustainable Diversion Limits (SDLs) in some NSW groundwater areas and refer, in part, to water requirements for mining.

2. No. The Authority used the information provided by NSW as one of the inputs to its determinations of the groundwater SDLs.

3. No. The Authority has not received any correspondence from other parties asking for more groundwater for the mining industry.

4. An assessment of the risk of groundwater extraction on surface water resources (connectivity) was a key element in determining the SDLs for all groundwater units in the Basin Plan. The Authority used numerical groundwater models and a risk assessment method that has been peer reviewed to determine the SDLs. The report from this review can be found at: http://www.mdba.gov.au/services/publications/peer_review_appendix_e.

   The SDL assessment does not consider what the water would be used for, as this is a matter for the relevant Basin states to determine.

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Budget Estimates, May 2012

Program: Division or Agency:	4: MDBA	**Question No:**	250
Topic:	MDBA – Lachlan alluvium		
Proof Hansard Page and Date or Written Question:	Written		

Senator Rhiannon asked:

1. For alluvial aquifers that are known to be highly connected to surface water for which you propose increases in SDLs, such as the Lachlan Alluviums, what modelling have you done of the impact of increased groundwater extraction on surface water?

2. For the Lachlan Alluvium, a system that is widely recognised as being over-used, can you explain why you have changed the proposed SDL from a reduction of 57GL in the Guide to the Plan to an increase of 26GL in the draft Plan?

Answer:

1. This question was responded to in Question on Notice Number 125 (Additional Estimates, February 2012). The answer provided was:

   Detailed numerical groundwater modelling that considered groundwater - surface water interaction was carried out in 13 alluvial aquifers including the Lachlan Alluvium. In non-modelled Sustainable Diversion Limit (SDL) areas the Murray-Darling Basin Authority (the Authority) used a recharge risk assessment methodology that considered groundwater- surface water interaction.

   Further information on the Authority's assessment of groundwater - surface water interaction is on page 19 of "*The proposed Groundwater Baseline and Sustainable Diversion Limits: methods report*" which is available on the Authority's website at http://download.mdba.gov.au/proposed/Proposed-BP-GW-BDL-SDL.pdf.

2. This question was responded to in Question on Notice Number 126 (Additional Estimates, February 2012). The answer provided was:

   In the draft Basin Plan, the Lachlan Alluvium has been divided into two Sustainable Diversion Limit (SDL) areas: the Upper Lachlan Alluvium; and the Lower Lachlan Alluvium.

Upper Lachlan Alluvium

The SDL for the Upper Lachlan Alluvium SDL area in the Guide to the Basin Plan was 63.0 GL/y. Additional information, including the reports and outputs from a new numerical groundwater model and updated entitlement and stock and domestic use data, was supplied by NSW and assessed by the Authority after October 2010. The information provided a better understanding of the Upper Lachlan Alluvium than was available at the release of the Guide. The SDL has been set at 94.1 GL/y, which is the current Baseline Diversion Limit (BDL), as it is the Authority's assessment that any further extraction above the BDL would have an additional impact on surface water resources.

Lower Lachlan Alluvium

The Lower Lachlan Alluvium is one of seven NSW alluvial aquifers that is part of the Achieving Sustainable Groundwater Entitlements program (ASGE). The program, funded by the Commonwealth and NSW governments, was introduced to achieve the sustainable use of groundwater resources in seven alluvial aquifers in NSW. For the draft Basin Plan, the Authority adopted the current NSW plan limits for all the ASGE areas to allow the reduction program to be completed and the outcomes determined before any further changes to the SDL are considered.

The Authority considered that the reduction program should be allowed to be completed given:

- the additional uncertainties associated with modelling groundwater systems that are undergoing a reduction program;
- the large groundwater storages (a minimum of 200 years at current levels of use); and
- the low risk of depleting the volume of stored groundwater stored (and hence overall risk to the resource) for the period until the first review of the Basin Plan.

The BDL revision between the Guide and the draft Basin Plan in the Lower Lachlan Alluvium is due to the inclusion of stock and domestic water supply that was not included in the Guide – see table below.

Lachlan Alluvium BDLs and SDLs

SDL area	**Guide BDL (GL/y**	**Guide SDL (GL/y)**	**Draft Basin Plan BDL (GL/y)**	**Draft Basin Plan SDL (GL/y)**
Upper Lachlan Alluvium	77.1	63.0	94.1	94.1
Lower Lachlan Alluvium	108.0	64.8	117.0	117.0

Further information on the development of the proposed SDL for these areas in the draft Basin Plan is available on page 19 (Upper Lachlan) and page 22 (Lower Lachlan) of the *Proposed Groundwater Baseline and Sustainable Diversion Limits: methods report* available at http://download.mdba.gov.au/proposed/Proposed-BP-GW-BDL-SDL.pdf.

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Program: Division or Agency:	MDBA	**Question No:**	251
Topic:	MDBA – Barwon-Darling River System		
Proof Hansard Page and Date	Written		

or Written Question:

Senator Rhiannon asked:

1. Can you explain why the draft Basin Plan offers only a 10.4% cut to diversions in the Barwon-Darling system, despite the fact that there has been a 78-fold increase in diversions in the last 50 years and that average outflows to the Murray are now less than half the volume under natural conditions?

2. Given that there are far fewer system constraints in the northern system and that it is a major source of inflows to the Lower Murray and South Australia, why is the environmental flow target for the Barwon-Darling so incredibly weak?

3. Do you acknowledge that the Barwon-Darling will become even more important in a changing climate with flows from the southern system predicted to reduce far more severely than the northern system?

4. Why then does the draft Basin Plan fail the northern system so markedly?

Answer:

1. The proposed reductions to diversions in the Barwon-Darling system have been informed by detailed hydrologic modelling, and careful consideration of socio-economic impacts. The modelling of without development and baseline scenarios enabled the Murray-Darling Basin Authority (the Authority) to take into account the increase in diversions in the northern Basin over the past 50 years. The reductions in the northern Basin do not include any specific water recovery to meet environmental water requirements for the River Murray and Lower Darling (downstream of the Menindee Lakes) over and above that required to meet the environmental water requirements in the northern Basin. This approach recognises that there is limited ability to manage flows from the northern Basin due to the more ephemeral nature of the rivers in the northern basin and the high level of natural losses due to floodplain inundation and evaporation. In the modelling, increased water that flows to Menindee Lakes as a result of water recovery in the northern Basin is used to contribute to environmental water requirements downstream of the Lakes.

   For the surface water systems north of Menindee Lakes, referred to as the northern Basin in the Basin Plan, the Sustainable Diversion Limit (SDL) is 2,539 GL/year which reflects a reduction of 390 GL/year in this part of the Murray-Darling Basin. The reduction in the northern Basin equates to 14.2 per cent of the Basin wide reduction (2,750 GL/year).

2. The hydrology of the northern Basin is fundamentally different to hydrology of the southern Basin. The geography of the northern Basin presents a range of water management challenges including long travel times, high levels of natural losses and limited connectivity between rivers in some locations. As noted previously this limits the ability to achieve environmental outcomes in the southern Basin by placing reductions on use in the north. The long-term annual average outflows under without-development conditions of the Barwon-Darling (including all tributaries) at Wentworth are 17 per cent while 83 per cent of inflows are sourced from the Murray system. The relative contributions of the Barwon-Darling system, while important, are not the major source of inflows to the Lower Murray. The environmental water requirements in the northern Basin are not weak and have been designed to service the environmental assets and ecological functions identified throughout in the northern Basin.

3. The Authority believes that under a changing climate it will be vitally important to ensure water planning arrangements in all regions of the Murray-Darling Basin incorporate the risk of climate change on water availability. The Authority is of the view that the risk of climate change has been appropriately incorporated in the draft Basin Plan framework and SDLs.

4. The draft Basin Plan does not fail the northern Basin. The Authority's judgment is that water recovery in the northern Basin is targeted not only to meeting the environmental needs of the region itself but also to the overall Basin outcomes to the extent the physical and operational constraints allow. The Authority considers the environmental flow target and the associated reductions in diversions in the Barwon-Darling are based on robust science and reflect an Environmentally Sustainable Level of Take (ESLT). The 2011 CSIRO-led science review also gives the Authority confidence that the science underpinning this work is robust. The Authority also recognises the unique issues associated with the northern Basin and is establishing a Northern Basin Advisory Committee to specifically deal with such issues and will continue to work with Basin states and the community.

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Program: Division or Agency:	MDBA	**Question No:**	252
Topic:	MDBA – Exclusion of the ACT		
Proof Hansard Page and Date	Written		
or Written Question:			

Senator Xenophon asked:

1. Why has the ACT been excluded from any cuts in the Proposed Basin Plan, when it wasn't excluded in the Guide to the Proposed Basin Plan?

Answer:

1. The proposed reductions in diversions for the Australian Capital Territory (ACT) in the 2010 Guide to the Proposed Basin Plan (the Guide) were based on an end-of-system flow analysis for the Murrumbidgee, and by applying equal percentage reductions in baseline diversions to all Sustainable Diversion Limit (SDL) areas in the Murrumbidgee region, that is, the Murrumbidgee and the ACT. The reductions in the Guide did not necessarily relate to ACT's contribution to the overall environmental stress of the Murrumbidgee and the Murray-Darling Basin.

   The decision to not propose reductions in diversions for the ACT in the Proposed Basin Plan was based on consideration that water use in the ACT is mainly for urban purposes.

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Program: Division or Agency:	4: MDBA	**Question No:**	253
Topic:	MDBA – Advisory Committee on Social, Economic and Environmental Sciences		
Proof Hansard Page and Date or Written Question:	Written		

Senator Hanson-Young asked:

Regarding the Advisory Committee on Social, Economic and Environmental Sciences:

1. What are the terms of reference for this panel?
2. How is it planned that it will operate?
3. What are its powers?
4. How will the Advisory Committee differ from the testing committee?

Answer:

1. The terms of reference for the Advisory Committee on Social, Economic and Environmental Sciences (ACSEES) is to provide advice on:

- The development and implementation of the Murray-Darling Basin Authority's (the Authority) science and knowledge strategy;
- Science and knowledge priorities to support the Authority in the implementation of the Basin Plan and related programs including, but not limited to:
    - guidance on how to progress the recommendations from the CSIRO review of the hydrological and environmental science bases of the environmentally sustainable level of take;
    - guidance on how to progress matters arising from the social and economic synthesis report;
    - guidance on any recommendations arising from the current research project on cultural flows; and
    - guidance on adaptive management, monitoring and evaluation.
- The communication of science related matters with Basin stakeholders and to the broader community; and
- Any other research and analysis activities undertaken by the Authority where requested.

2. The committee will consist of up to eight members and will meet four times a year on strategic items pertinent to its terms of reference.

3. It will be an advisory committee to the Authority. It has no decision making powers.

4. The ACSEES will support the implementation of the Basin Pan. It will ensure the Authority receives expert guidance on the environmental, social and economic sciences needed for the future. It will contribute to future reviews of the Basin Plan. The testing committee was established for a limited time to provide advice to the Authority to assist with preparation of the draft Basin Plan; it did not specifically provide advice on science issues.

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Program: Division or Agency:	MDBA	**Question No:**	254
Topic:	MDBA – Meetings of the testing committee		
Proof Hansard Page and Date	Written		
or Written Question:			

Senator Hanson-Young asked:

1. How many times has the testing committee met (which involved Jeff Angel, Jennifer Westacott, Peter Cosier and others) since April 2011?

Answer:

1. The Basin Plan Testing Committee has met seven times from 8 April – 17 August 2011.

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Program: Division or Agency:	MDBA	**Question No:**	255
Topic:	MDBA – Water quality monitoring in the Lower Lakes and Coorong		
Proof Hansard Page and Date or Written Question:	Written		

Senator Hanson-Young asked:

1. Can the MDBA please outline how many water quality monitoring sites are currently installed in the lower lakes and Coorong, and also how many monitoring indicators there were in those places every year for the past decade? Does the Department intend to fund the installation of further monitoring sites in order to ensure water quality and salinity targets can be met?

2. Has the MDBA had any discussions or negotiations with local government or state government in regard to improving the barrages?

Answer:

1. The Murray-Darling Basin Authority (the Authority) funds the sampling and analysis of a range of water quality parameters from two sites in the Lower Lakes, as well as the automatic recording of salinity and temperature at a further 27 sites in the area, as follows:

- Lake Alexandrina at Milang (A4260524) – measuring pH, turbidity, salinity, temperature and colour, at weekly intervals since July 1978.

- Lake Alexandrina at Goolwa (A4261034) - measuring pH, turbidity, salinity, temperature, colour, oxidised nitrogen, total kjeldahl nitrogen, total phosphorus, filterable reactive phosphorus, silica and soluble organic carbon, at weekly intervals since July 2007.

- A network of 37 continuous gauging sites across the area, 27 of which record salinity and temperature using automated probes. This network is installed, operated and maintained by the South Australian Government, funded by the Authority and the 27 measurement sites are considered sufficient for ongoing operation.

  The continuous gauging network has trebled over the last decade, particularly in response to drought management and including maintenance of the connectivity between the Coorong and the ocean. Whilst the network is under constant review, no formal agreement has been reached on the need for funding for any further gauges.

2. The Authority (and its predecessor, the Murray-Darling Basin Commission) has been working with SA Department for Water (and its predecessors) and SA Water on various improvements to facilitate barrage operations over the past decade. During that time considerable improvements have been implemented including:

- 33 tainter gates (12 at Ewe Island, 21 at Tauwitchere) have been fitted with hydraulic powered, remote control function,
- the remaining 218 gates at these two barrages have been fitted with lift and latch mechanisms and a new crane has been purchased which makes opening and closing of these gates considerably safer and quicker,
- six hydraulically operated, vertical axis spindle gates have been fitted to Mundoo Barrage which significantly enhances capacity to respond rapidly to potential reverse flow conditions.

Further improvements to fine tune functionality are being discussed between SA Department for Water, SA Water and the Authority.

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Program: Division or Agency:	MDBA	**Question No:**	256
Topic:	MDBA – Flooding resulting from enacting environmental watering plans		
Proof Hansard Page and Date	Written		
or Written Question:			

Senator McKenzie asked:

1. Who is ultimately liable for damages cause by flooding to private property as a result of an error in enacting environmental watering plans?

Answer:

1. The draft Basin Plan includes an Environmental Watering Plan which provides processes to coordinate the planning, prioritisation and use of environmental water through preparation of various planning documents, including Basin annual environmental watering priorities. The draft Basin Plan does not provide authority for any particular flooding. Any liability associated with a particular incident would need to be assessed based on the facts and circumstances of the case.

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Program: Division or Agency:	6.1: CEWO	**Question No:**	257
Topic:	CEWO – Commonwealth Environmental Water trades		
Proof Hansard Page and Date or Written Question:	Written		

Senator McKenzie asked:

1. CEW have release a paper on trade, "Commonwealth Environmental Water – Trading Arrangements, Discussion Paper." Page 10-11 of that paper states the probability of trade of the CEW being traded under a number of climate scenarios which range from very dry to very wet. The paper says the most likely time allocations would be traded is at the start of a dry period provided there is sufficient water is available to meet minimum environmental requirements for the next few years. How much water would be required to be in store to meet minimum environmental requirements for the next few years after the start of a dry period? Can you describe how this would be determined?

2. Can you describe how the decision would be made to sell Commonwealth Environmental water during a dry period?

Answer:

1. This question has been answered by the Commonwealth Environmental Water Office (CEWO). Trade of water by the Commonwealth Environmental Water Holder will occur within the framework established by the *Water Act 2007*, the Basin Plan and the Environmental Watering Plan as identified below.

   The revised draft of the Basin Plan requires the Murray-Darling Basin Authority (the Authority) to prepare a Basin-wide environmental watering strategy and develop basin-wide annual environmental watering priorities. There is also a requirement that Basin states prepare long-term environmental watering plans for individual water resource plan areas. These documents will identify key environmental assets and ecosystem functions and their environmental water requirements. Environmental watering requirements are not the same every year but rather will vary according to seasonal and operational considerations. In the planning and delivery of environmental water the Authority, Basin states and the Commonwealth Environmental Water Office must have regard to the views of local communities.

2. The Commonwealth Environmental Water Holder must act consistently with the *Water Act 2007*, the Environmental Watering Plan and the Basin-wide environmental watering strategy. The Commonwealth Environmental Water Holder must have regard to the Basin-wide annual environmental watering priorities when deciding to either use water in the current year, carryover the water for future use, or trade water to enhance capacity to meet future requirements.

The decision making process to sell Commonwealth environmental water would include consideration of four main steps:

- **Consider Basin wide annual environmental watering priorities** identified by the Authority, and where possible environmental water requirements in future years based on long term environmental watering plans.
- **Assess total water availability**: Water availability includes carryover from the previous year and allocations. In determining how much water is available for use, it is important to understand the characteristics of that water, including where it is located and where it can be delivered given any constraints (for example; channel capacity, transmission losses, trading limitations, other water users).
- **Determine watering actions for the year**: In developing a list of watering actions to meet Basin wide annual priorities it is important that it is flexible enough to consider changing seasonal and operational conditions.
- **Identify trade opportunities** to enhance capacity to meet environmental objectives. This would involve comparing water availability with watering requirements. Options may include selling water allocations in one area and purchasing in another to meet a priority, or selling allocations and using the proceeds to meet future environmental requirements when use of water may be of more benefit.

The discussion paper, 'Commonwealth Environmental Water – Trading Arrangements', was released on 7 November 2011. The paper sought stakeholder views on the trading of Commonwealth environmental water. Responses to the discussion paper were received up until 11 May 2012. Issues raised will inform a position paper on Commonwealth environmental water trading arrangements which is intended for release later in 2012.

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Program: Division or Agency:	MDBA	**Question No:**	258
Topic:	MDBA – Bridging the Gap Program		
Proof Hansard Page and Date	Written		
or Written Question:			

Senator McKenzie asked:

1. The draft Basin Plan does not explicitly lock in the Commonwealth's commitment to 'Bridge the Gap' program. Will the Basin States be left to deal with the SDLs on their own and risk non-compliance to the plan if 'Bridging the Gap' program fails?

Answer:

1. The Australian Government has committed to bridge the gap through water-saving infrastructure and water purchases from voluntary sellers. The draft Basin Plan was prepared based on this commitment. Already more than half of the proposed reduction has been recovered. The August 2012 draft of the Basin Plan includes a provision whereby states will have a reasonable excuse for non-compliance with the SDLs for circumstances beyond the Basin State's control (for example where, for reasons beyond the Basin State's control, the Commonwealth has not achieved the water recovery target that it has set for itself in relation to the SDL resource unit).

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Program: Division or Agency:	MDBA	**Question No:**	259
Topic:	MDBA – Water quality and salinity targets		
Proof Hansard Page and Date	Written		
or Written Question:			

Senator McKenzie asked:

1. Could you explicitly state whether the water quality and salinity targets as presented in Chapter 8 of the Draft Basin Plan are 'mandatory' or 'aspirational'?

Answer:

1. Chapter 8 of the draft Basin Plan states that the Murray-Darling Basin Authority, the Basin Officials Committee, agencies of Basin States and the Commonwealth Environmental Water Holder must 'have regard' to certain water quality targets. This places a positive obligation on these bodies to consider the water quality targets when making decisions related to the management of water flows, or in the instance of the Commonwealth Environmental Water Holder, when making decisions on the use of environmental water but meeting these targets is not mandatory.

   This is made clear in Section 8.10 of the draft Basin Plan, that states that failure to achieve a target does not in itself mean that a person has acted inconsistently with the water quality and salinity management plan.

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Program: Division or Agency:	4: MDBA	**Question No:**	260
Topic:	MDBA – Costs and impacts of the draft Murray-Darling Basin Plan		
Proof Hansard Page and Date or Written Question:	Written		

Senator McKenzie asked:

1. The MDBA has not prepared its regulation impact statement on the costs and impacts of the draft Plan. When will its RIS be completed?

2. With the introduction of the *proposed Basin Plan* it is expected that the State Governments will incur increased costs through implementation of the Basin Plan and more onerous regulatory and management frameworks. Will the Government recommit to the 2008 undertaking for there to be no-net costs as a consequence of reforms?

Answer:

1. A Regulation Impact Statement (RIS) needs to accompany the Basin Plan when it is tabled in Parliament. The Murray-Darling Basin Authority is preparing a RIS to meet this requirement.

2. The Australian Government remains committed to the 'no net costs' provisions of the 2008 Intergovernmental Agreement on Murray-Darling Basin Reform.

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Program: Division or Agency:	MDBA	**Question No:**	261
Topic:	MDBA – Environmental works and measures – Victorian Government proposals		
Proof Hansard Page and Date	Written		
or Written Question:			

Senator McKenzie asked:

1. The proposed 2,750GL of water to be taken out of irrigation communities will have significant economic impacts on these communities, particularly smaller, more irrigation dependant farming communities. How is the MDBA incorporating the proposals put forward by the Victorian Government to undertake environmental works and measures to use water more efficiently, which would require less water and reduce the economic impact on communities?

Answer:

1. The Murray-Darling Basin Authority (the Authority) is keen to facilitate the identification of environmental works and measures that can use water more efficiently and responsibility for approving and funding these projects rests with Basin governments. The revised draft Basin Plan proposes a 2015 review of Sustainable Diversion Limits (SDLs) to capture the benefits of any such projects. Any adjustment to SDLs as a result would need to be given effect through an amendment to the Basin Plan. The Authority has also been exploring an alternative approach whereby SDL adjustments could be made on the basis of a standardised method that is included in the Basin Plan.

   As noted in its transmittal letter to ministers of the Ministerial Council of 28 May 2012, the Authority sought the consideration and advice of Ministerial Council on a workable SDL adjustment mechanism and has investigated several options (copy of letter at **Attachment A**).

   The development of such a mechanism was requested by the Murray-Darling Basin Ministerial Council in their comments on the revised draft Basin Plan under Section 43A (4) of the *Water Act 2007*.

Australian Government

MURRAY–DARLING BASIN AUTHORITY

Craig Knowles
Chair

TRIM Ref: D12/19876

The Hon Tony Burke MP
Chair, Murray-Darling Basin Ministerial Council
c/- Parliament House
CANBERRA ACT 2600

Dear Minister

I am writing pursuant to s43A of the Water Act 2007 (Cwth) to provide the Ministerial Council with a revised version of the proposed Basin Plan, following amendments made by the Authority in light of the recent 20 week public submission process and associated consultations with state officials and the community.

As you may be aware, s43A(4) of the Act provides that the Ministerial Council be given six weeks (ie. until 9 July 2012) to provide any written comments to the Authority on the proposed Basin Plan, and to indicate whether one or more of its members disagree with one or both of the following issues (and the nature of the disagreement):

- the long term sustainable diversion limits (SDLs) proposed in the proposed Basin Plan;
- any other aspect of the proposed Basin Plan in relation to which the Minister may give a direction under subparagraph 44(3)(b)(ii).

To assist the Council with its deliberations, please find the following documents enclosed:

- a revised version of the proposed Basin Plan
- a report prepared under s43(11) of the Act summarising the public submissions received and the broad changes made by the Authority to the proposed Basin Plan in light of those submissions
- a report prepared under s43A(3) of the Act containing the Authority's advice to the Ministerial Council on the likely socio-economic implications of any reductions in the long term average sustainable diversion limits proposed in the proposed Basin Plan.

I am sure you will agree that the above documents represent a large body of work. They contain changes arising out of the consultation process which, we believe, further improves the proposed Basin Plan released last November.

I wish to record the Authority's appreciation for the input of the many individuals and agencies who made submissions about the Plan. I would also like to thank the contribution made by state officials over the past 12 months via the Basin Plan Working Group in refining aspects of the Plan.

In coming to its view about the content of the proposed Basin Plan, the Authority has weighed up the many and varied submissions it received, including those from state governments, with the

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requirements of the Act. While the Authority is very satisfied with this new version of the proposed Basin Plan, we are also conscious of two specific issues for which a number of alternate approaches were advocated in some of the submissions from state governments. As these two issues – downstream apportionment and an SDL adjustment mechanism – have potential policy and financial implications for governments, the Authority would particularly appreciate the consideration and advice of the Council on these issues during this six week comment period. A short description of the issues is below:

1. Downstream apportionment: a number of submissions asked that for reasons of improved certainty, the downstream portion of the proposed SDL reduction be attributed to specific upstream catchments. The Authority's view is that the ability to recover water from a range of upstream catchments in order to achieve the SDLs is an important market based mechanism founded in NWI principles that will minimise the overall economic costs of the Basin Plan. However, the Authority recognises that an agreed apportionment mechanism could improve certainty for some stakeholders, and we would welcome the Council's advice on a workable approach to this issue.

2. SDL adjustment mechanism: a number of submissions raised concerns over the amendment process needed to capture any outcomes associated with the proposed 2015 SDL review, and sought the inclusion within the Plan of an SDL adjustment mechanism that could capture those outcomes without needing an amendment to the Plan. Such outcomes could include the benefits arising from work underway by governments to improve river operating rules, new infrastructure to water key sites more efficiently, and addressing some of the key physical constraints to achieving environmental flows.

The Authority is open to a workable SDL adjustment mechanism, and has investigated several options. Starting from the proposed 2750GL reduction, such a mechanism could operate on the basis of:

- allowing for a decrease in SDLs only if the social and economic outcomes are at least equivalent (or better than) those proposed in the final Plan; or
- allowing for an increase in SDLs only if the environmental outcomes are at least equivalent (or better than) those proposed in the final Plan.

For example, if an SDL adjustment mechanism were in place, it would be possible to increase the reduction in surface water SDLs to, say, the 3200GL reduction as modeled in the Authority's sensitivity analysis, on the basis that additional water for the environment was sourced only from further investments in more efficient infrastructure, and key constraints were removed in order to realize the benefits from additional environmental water.

Similarly, the mechanism could operate so as to reduce the SDL reduction to, say, the 2400GL reduction as modeled in the Authority's sensitivity analysis, on the basis that investment in works and measures enabled the achievement of environmental outcomes with less water.

The Authority would appreciate advice from the Council as to the desirability of such a mechanism, and would be pleased to provide governments with technical advice in the

development of a workable approach, and the risks and benefits compared with the Authority's proposed 2015 review.

I would appreciate advice of the Council on the proposed Basin Plan, including the above two specific issues, by 9 July 2012. As usual, the Authority would be pleased to offer technical briefings or advice to Ministers on any aspects of the proposed Basin Plan.

Yours sincerely

The Hon. Craig Knowles
Chair

28/05/2012

CC:
The Hon. Andrew Cripps MP, Minister for Natural Resources and Mines (QLD)
The Hon. Katrina Hodgkinson MP, Minister for Primary Industries (NSW)
Mr Simon Corbell MLA, Minister for the Environment and Sustainable Development (ACT)
The Hon. Peter Walsh MP, Minister for Water, Agriculture and Food Security (VIC)
The Hon. Paul Caica MP, Minister for Water and the River Murray (SA)

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Program: Division or Agency:	MDBA	**Question No:**	262
Topic:	MDBA – Benefits of opening the Murray mouth		
Proof Hansard Page and Date	Written		
or Written Question:			

Senator McKenzie asked:

1. The 400 GL difference in reductions from 2,800 GL to 2,400 GL per year results in only a 3% decrease in the time the Murray Mouth is open. The reductions of this volume could produce significant economic benefits for communities and yet produce little difference to the period the Murray mouth is open. Can you explain and quantify the environmental benefit in keeping the Murray Mouth open for a further 3% of the time using 400 GL of water?

Answer:

1. The environmental benefits of the 400 GL difference in reductions from 2,800 GL per year to 2,400 GL per year are not limited to improving outcomes at the Murray Mouth. The additional 400 GL will provide numerous environmental benefits, particularly for the River Murray floodplain downstream of the Murrumbidgee River junction.

   In addition, sensitivity analysis conducted by the Murray-Darling Basin Authority showed a number of key ecological targets and objectives of the draft Basin Plan might not be achievable with a 2,400 GL reduction scenario compared with the 2,800 GL and 3,200 GL reduction scenarios. Specifically, the ability to maintain the resilience of lower elevation parts of the lower River Murray floodplain and associated wetlands during dry periods is likely to be compromised. As an example analysis indicates the 2,400 GL/y option provides very limited ability to reduce the length of dry periods to within the resilience period of wetland plants, lignum and river red gum at Hattah Lakes and the Riverland.

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Program: Division or Agency:	MDBA	**Question No:**	263
Topic:	MDBA – Downstream shared reductions		
Proof Hansard Page and Date	Written		
or Written Question:			

Senator McKenzie asked:

1. Will the downstream shared reductions of 971GL in the Southern Basin be allocated on a pro-rata basis to each State and each catchment? If this is unknown, when will the decision be made? Can you explain the criteria that the MDBA will use to make this decision?

Answer:

1. The revised draft Basin Plan put to Ministers on 28 May 2012 incorporates a market based approach to the 'shared reduction'. This approach ensures there is flexibility in where environmental water can be recovered, to enable recovery at the least economic cost and to allow market forces to operate. This approach also allows governments undertaking water recovery to consider both how environmental water needs are best met and system constraints that could limit where water can be recovered to meet these needs.

   In its transmittal letter of 28 May 2012, the Murray-Darling Basin Authority invited the Murray-Darling Basin Ministerial Council to put forward its advice on a workable mechanism to allocate the shared downstream reduction.

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Program: Division or Agency:	4: MDBA	**Question No:**	264
Topic:	MDBA – Effect of the 2010-2012 wet period in the Murray-Darling Basin on salinity		
Proof Hansard Page and Date or Written Question:	Written		

Senator McKenzie asked:

1. Could you explain what effect the 2010-2012 wet period in the Murray-Darling Basin has had on salinity levels in;

   a. The Southern Coorong

   b. Lake Alexandria

   c. Lake Albert

Answer:

1. High river flows resulting from the 2010-2012 wet period started reaching the Lower Murray in the second half of the 2010 calendar year. While the salinity levels in the Lower Murray system fluctuates depending on the flow conditions, the 2010-2012 wet periods caused an overall reduction in salinity. The recorded salinity levels at specific monitoring locations are given below which shows the change in salinity levels:

   a. The Southern Coorong (Parnka Point) – Salinity levels changed from 141,133 Electrical Conductivity-units (EC) (or µS/cm) on 6 July 2010 to 33,128 EC-units on 13 June 2012.

   b. Lake Alexandrina (Milang) – Salinity levels changed from 4,560 EC-units on 9 July 2010 to 480 EC-units on 13 June 2012.

   c. Lake Albert (Meningie) – Salinity levels changed from 13,671 EC-units on 29 July 2010 to 4,540 EC-units on 13 June 2012.

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Program: Division or Agency:	MDBA	**Question No:**	265
Topic:	MDBA – Ewe Island barrage		
Proof Hansard Page and Date	Written		
or Written Question:			

Senator McKenzie asked:

1. Could you list the number of major seawater intrusions that have occurred at Ewe Island Barrage in the period Jan 2011 to date and quantifying the peak salinity?

2. Also in regard to the Ewe Island Barrages seawater intrusions, is there telemetry available that shows how far salt water penetrated into Lake Alexandria at this time? If telemetry is available could you provide it? Were any of these seawater intrusions associated with higher than average outflows (i.e. flood water)?

Answer:

1. Ewe Island Barrage has not been operated in the period since January 2011, to prevent sea water incursions into Lake Alexandrina, unlike Mundoo and Goolwa Barrages which have been. This has been a deliberate decision to facilitate fish passage between Lake Alexandrina and the Coorong. There have been multiple occasions during which salinity spikes are evident on the plot for gauge A4261206 which is immediately upstream of Ewe Island Barrage over the past 12 months. Salinity peaked at 39,000 EC in July 2011 but dissipated on each occasion quickly and with no residual impact.

   Further upstream, near Point Macleay (gauge A4261156); there is evidence of salinity spikes to about 1,800 EC in July 2011 above a base salinity at that time of about 1,000 EC. However, since October 2011, salinity at Point Macleay is effectively where the Ewe Island/Tauwitchere Channel opens into Lake Alexandrina basin. Point Macleay has been less than 700 EC and at times less than 300 EC.

   On the western side of Lake Alexandrina at Milang (gauge A4260524), there was a salinity spike in June 2011 to about 1,000 EC but since that time salinity has varied between about 400 EC and 800 EC.

   Whilst there may be short term salinity spikes immediately upstream of Ewe Island Barrage, there is no evidence of major impact in Lake Alexandrina basin as any salt coming through the barrage is flushed out within days, if not hours.

2. The South Australian Government's website, WaterConnect (www.waterconnect.sa.gov.au) provides access to a full range of water data.

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Program: Division or Agency:	MDBA	**Question No:**	266
Topic:	MDBA – Murray-Darling Basin Plan's target salinity levels for the Lower Lakes		
Proof Hansard Page and Date	Written		

or Written Question:

Senator McKenzie asked:

1. Broadly speaking, if the Basin Plan's target salinity levels for the lower lakes is significantly exceeded and the MDBA does not hold sufficient reserves of Commonwealth Environmental water to provide dilution flows;

   a. List all others sources of water, if any, that are available to the MDBA for dilution flows.

   b. Explain what river operational changes that could be invoked to help alleviate the problem.

Answer:

1. Independent modelling of salinity was undertaken by the Murray-Darling Basin Authority (the Authority) and the results provided to the Basin jurisdictions through the Basin Plan Working Group in March 2012, indicates that the salinity target in the Lower Lakes at Milang of 600 mg/L would be achieved 99 per cent of time under Basin Plan 2,800 GL flow scenario when modelled over the Basin Salinity Management Strategy benchmark period (1975-2000).

   Sources of environmental water, aside from the Commonwealth Environmental Water, to provide dilution flows include:

   a. Under the Living Murray (TLM) Intergovernmental Agreement (IGA) Basin governments have recovered water which is used to achieve environmental outcomes at six icon sites including the Murray River, the Lower Lakes, Coorong and Murray Mouth. While the Authority can implement watering activities in the Murray using TLM water, the Authority delegate does this on the advice of the governments' party to the IGA. In certain situations the joint governments may choose to utilise TLM water to provide dilution flows. The decision to use TLM water for dilution flows would be made on a case by case basis depending on the environmental risks and benefits associated with each action.

   b. In the absence of Commonwealth and TLM water for dilution flows, the Authority has the option of using operational changes. The operational changes that could be made to help reduce salinity levels in the Lower Lakes include:

- operating Lake Victoria to reduce salinity peaks in the river;
- system wide operational options including, replacing releases of water from Menindee Lakes with releases of water from Hume Dam (water held in Hume Dam is typically less salty than water held in Menindee Lakes and thus releasing water from Hume Dam may help dilute salinity levels downstream and eventually in the Lower Lakes);
- manipulation of lake levels in the Lower Lakes in order to improve exchange of water between Lake Alexandrina and Lake Albert to mitigate Lake Albert salinities; and
- the management of weir pool levels in order to minimise saline intrusions to the Murray River.

Before making such operational changes the potential impacts of these changes on State Water entitlements would need to be assessed and, if material, a determination would need to be sought from the Basin Officials Committee for such an operation. The operation of the Salt Interception Schemes is also managed to reduce salt water accessions to the river but typically these would be operated regardless of the salt peaks in the river.

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Program: Division or Agency:	MDBA	**Question No:**	267
Topic:	MDBA – Development of regional sustainability plans		
Proof Hansard Page and Date	Written		
or Written Question:			

Senator McKenzie asked:

1. In considering the development of the MDBP and its impact on communities, have you drawn upon the expertise available elsewhere in SEWPAC in relation to the development of regional sustainability plans?

Answer:

1. The Murray-Darling Basin Authority (the Authority) has taken account of community impacts of the Basin Plan by considering a wide range of information from multiple sources. This includes;

- extensive consultation with communities;
- economic modelling and analyses of impacts on irrigated agricultural production and regional economies; and
- extensive analyses of community vulnerability and adaptive capacity through the development of community vulnerability indexes.

In undertaking these analyses the Authority consulted regularly with a wide range of stakeholders, including the Department of Sustainability, Environment, Water, Population and Communities and the Department of Regional Australia, Local Government, Arts and Sport, to ensure that appropriate matters relating to regional sustainability and community vulnerability were taken into account.