

The Senate

Environment, Communications,
and the Arts
References Committee

The impacts of mining in the Murray Darling Basin

December 2009

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Chapter 1

1.1 On 12 August 2009, the Senate referred the following matter to the committee for inquiry and report by 26 October 2009 (subsequently extended to 4 December 2009):

- a) the potential impacts of current and projected mining operations on all environmental values in the Murray-Darling Basin and, in particular, the potential impacts upon surficial and groundwater flows and quality in the alluvial flood plains at its headwaters in the Namoi Valley and the Darling Downs catchments; and
- b) evaluation of the potential impacts in the context of the Murray-Darling Plan and agricultural productivity.

1.2 In these terms of reference, 'mining operations' includes all minerals exploration and all minerals extraction including exploration for and extraction of gas.

1.3 In accordance with its usual practice, the committee advertised details of the inquiry in *The Australian*, *Gunnedah Namoi Valley Independent*, the *Tamworth Northern Daily Leader* and the *Toowoomba Chronicle*. The committee also contacted a range of organisations and individuals, inviting submissions. The committee received submissions from 85 individuals and organisations, listed at Appendix 1. A list of tabled documents is at Appendix 3.

1.4 The committee held four public hearings, in Gunnedah on 28 September 2009, Oakey on 29 September 2009, and Canberra on 14 October 2009 and 19 November 2009. Details of these public hearings are shown at Appendix 2.

Background

1.5 This report will focus on the potential impacts of mining upon surficial and groundwater flows and quality in the alluvial flood plains at its headwaters in the Namoi valley and the Darling Downs catchments. The committee acknowledges other mining activity conducted in the Murray-Darling Basin (MDB), particularly mineral sand operations in the south of the MDB. However, based on the submissions it received, the committee judged that the primary matters of public concern are the impacts of coal mining and coal seam methane extraction in the Namoi Valley and Darling Downs catchments. The committee also heard evidence pertaining to the impact of mining on Australia's current and future food security. In accordance with standing order 25(13) the committee deferred to the Senate Select Committee on Agricultural and Related Industries on the issue of food security, which reported on its inquiry into food production in Australia on 26 November 2009.

Murray Darling Basin

1.6 The MDB is the catchment for the Murray and Darling rivers and their many tributaries. Extending from north of Roma in Queensland to Goolwa in South Australia, the MDB includes three-quarters of New South Wales (NSW) and half of Victoria. In total there are 23 river valleys in the MDB, covering over 1 million square kilometres, or 14% of Australia.¹ The MDB also contains important groundwater systems.

Agriculture

1.7 The MDB is Australia's most important agricultural area, producing over one-third of Australia's food supply, and is home to more than 2 million residents.² The MDB generates 39% of the national income derived from agricultural production and includes 65% of Australia's irrigated agricultural land.³ It produces 53% of Australian cereals grown for grain (including 100% of rice), 95% of oranges, and 54% of apples.⁴ The MDB supports 28% of the nation's cattle herd, 45% of sheep, and 62% of pigs.⁵

Coal Mining

1.8 There is a long history of mining in the MDB, with regionally significant gold, copper and coal mining operations. Ms Sue-Ern Tan of the New South Wales Minerals Council observed:

In the New South Wales portion of the great Murray-Darling Basin, there are seven major coal operations and nine major mineral operations, with coal mainly mined in the western coalfields, which are out near Mudgee, and...the growing development of the coalfields around here in the Gunnedah Basin. There are also major metallic deposits in the basin from Orange through to Broken Hill, Cobar and West Wyalong.⁶

1.9 There is natural gas production in the Narrabri area, used in local power generation.⁷ Mining operations currently account for around 0.26% of land use in the MDB.⁸

1 Murray-Darling Basin Authority, www.mdba.gov.au (accessed 31 August 2009).

2 Murray-Darling Basin Authority, www.mdba.gov.au (accessed 31 August 2009).

3 Murray-Darling Basin Authority, www.mdba.gov.au (accessed 31 August 2009).

4 Murray-Darling Basin Authority, www.mdba.gov.au (accessed 31 August 2009).

5 Murray-Darling Basin Authority, www.mdba.gov.au (accessed 31 August 2009).

6 *Committee Hansard*, 28 September 2009, p. 2.

7 NSW State Government, *Submission 34*, p. 2.

8 Minerals Council of Australia, *Submission 74*, p. 2.

1.10 Coal is a fossil fuel accounting for around 27 per cent of total world energy production.⁹ Black coal is Australia's largest single export commodity, accounting for around 16 per cent of Australian commodity trade.¹⁰ Australia is the world's fourth largest coal producer (behind China, the USA and India) and the largest exporter, supplying around 27 per cent of world coal trade, including over half of world metallurgical coal trade (used in steelmaking).¹¹

1.11 More than 70 per cent of Australia's metallurgical coal exports and more than 94 per cent of thermal coal exports (used in power generation) were exported to the Asian region in 2008.¹² Australia's reserves are sufficient to sustain current black coal production rates for nearly 100 years, with brown coal economic reserves are estimated to sustain current production for over 400 years.¹³ The most common methods of coal mining in Australia are open cut – typified by the removal of rock covering the coal seam – and longwall – characterised by extraction via a series of underground tunnels.¹⁴ Coal and coal seam gas deposits can both be found in the area around the north eastern rim of the MDB.

1.12 The value of NSW mineral production has been calculated at \$14 billion for 2007-08, of which coal accounted for over 70% of total production value.¹⁵ The minerals industry returns \$1.4 billion in royalties and taxes annually to the State Government's consolidated revenue.¹⁶ Land directly used by mining operations accounts for less than 0.1% of total land use in NSW.¹⁷ In the NSW MDB there are seven major coal operations and nine major mineral operations.¹⁸ Coal is mainly mined in the Western Coalfields near Mudgee and the growing development in the coal fields of the Gunnedah Basin.¹⁹

9 The Department of Resources, Energy and Tourism, www.ret.gov.au (accessed 14 October 2009).

10 The Department of Resources, Energy and Tourism, www.ret.gov.au (accessed 14 October 2009).

11 The Department of Resources, Energy and Tourism, www.ret.gov.au (accessed 14 October 2009).

12 The Department of Resources, Energy and Tourism, www.ret.gov.au (accessed 14 October 2009).

13 NSW Minerals Council, *Submission 63*, p. 2.

14 Geoscience Australia, http://www.australianminesatlas.gov.au/education/fact_sheets/coal.jsp#black_mining (accessed 14 October 2009).

15 NSW Minerals Council, *Submission 63*, p. 2.

16 NSW Minerals Council, *Submission 63*, p. 2.

17 NSW Minerals Council, *Submission 63*, p. 2.

18 NSW Minerals Council, *Submission 63*, p. 2.

19 NSW Minerals Council, *Submission 63*, p. 2.

1.13 In 2007-08, the Queensland resources sector is estimated to have directly and indirectly contributed to 20 percent of Queensland's total Gross State Product.²⁰ Queensland is the world's largest seaborne exporter of coal with shipments to 33 countries throughout the world in 2006-07.²¹ According to Department of Mines and Energy, Queensland exported 153.36 million tonnes of coal in 2006–07 with a total sales value of \$16.3 billion free-on-board.²² There is an estimated 6.4 billion tonnes of high-quality thermal coal identified in the Surat Basin, the area encompassing the Darling Downs, of southern Queensland.²³

Coal seam methane extraction

1.14 Coal seam methane is a form of natural gas. It occurs when coal is formed deep underground over millions of years of heating and compressing decomposing plant matter.²⁴ Over time, the gas becomes trapped in coal seams by water, typically 300-600 metres underground.²⁵ Coal seam methane usually has only small amounts of carbon dioxide and nitrogen. As such, it is considered a 'cleaner' gas that requires relatively little treatment before being used by industry and households.²⁶ Consequently, the Queensland Government is encouraging a transition from coal to gas as an effective mechanism to reduce greenhouse gas emissions.²⁷ The number of coal seam gas exploration wells drilled annually in Queensland increased from 10 in the early 1990s to a high of approximately 600 in 2007–08.^{28,29} Santos was planning around 23 exploratory drill holes for its project on the Liverpool Plains.³⁰

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- 20 Queensland Department of Mines and Energy, *Queensland's World-class Coals*, http://www.dme.qld.gov.au/zone_files/coal_files_pdf/wcc_nov_07_1.pdf (accessed 31 August 2009).
- 21 Queensland Department of Mines and Energy, *Queensland's World-class Coals*, http://www.dme.qld.gov.au/zone_files/coal_files_pdf/wcc_nov_07_1.pdf (accessed 31 August 2009).
- 22 Queensland Department of Mines and Energy, *Queensland's World-class Coals*, http://www.dme.qld.gov.au/zone_files/coal_files_pdf/wcc_nov_07_1.pdf (accessed 31 August 2009).
- 23 Queensland Department of Mines and Energy, *Queensland's World-class Coals*, http://www.dme.qld.gov.au/zone_files/coal_files_pdf/wcc_nov_07_1.pdf (accessed 31 August 2009).
- 24 Queensland Curtis LNG, *Coal Seam Gas Fact Sheet*, http://qclng.com.au/uploads/docs/qclng_csg_fs_WEB.pdf (accessed 31 August 2009).
- 25 Queensland Curtis LNG, *Coal Seam Gas Fact Sheet*, http://qclng.com.au/uploads/docs/qclng_csg_fs_WEB.pdf (accessed 31 August 2009).
- 26 Queensland Curtis LNG, *Coal Seam Gas Fact Sheet*, http://qclng.com.au/uploads/docs/qclng_csg_fs_WEB.pdf (accessed 31 August 2009).
- 27 Queensland Department of Mines and Energy, *Queensland's Coal Seam Gas Overview*, http://www.energy.qld.gov.au/zone_files/coal_files_pdf/new_csg_cc.pdf (accessed 31 August 2009).
- 28 CSIRO, *Submission 65*, p. 4.

Namoi Valley

1.15 The Namoi region is in north-eastern NSW and represents 3.8 percent of the area of the MDB.³¹ The region is based around the Namoi, Manilla and Peel Rivers and has a population of around 88,000 predominantly concentrated in the towns of Tamworth, Gunnedah, Boggabilla, Narrabri and Wee Waa.³² The majority of land in the Namoi region is used for cattle and sheep grazing while wheat, cotton and other broadacre crops are grown on the floodplains.

1.16 The region has the highest level of groundwater development in NSW and one of the highest levels of groundwater extraction in the MDB at around 50 percent of current water use in the Namoi region and around 15 percent of the MDB total.³³

Liverpool Plains

1.17 The Liverpool Plains is an area of around 12,000 square kilometres in the upper Namoi Valley.³⁴ The region is renowned for the agricultural productivity of its alluvial floodplains. The Liverpool Plains has been at the centre of escalating tensions between local farmers and members of the coal mining industry – specifically BHP Billiton and Shenhua Watermark Coal Pty Ltd.³⁵ In 2006 BHP secured a coal exploration licence in the Liverpool Plains, for approximately \$100 million, while Shenhua also received a licence in 2008 for approximately \$300 million, with subsequent exploration revealing substantial coal deposits.³⁶ Local farmers are concerned that coal mining will pollute the underground aquifers and surface water flows that are vital to their livelihood.³⁷ They claim pollution could have potentially

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- 29 Queensland Department of Employment, Economic Development and Innovation, Queensland Mines and Energy, 'Petroleum & gas: production', www.dme.qld.gov.au/mines/production_1.cfm, (accessed 23 November 2009).
- 30 Liverpool Plains Shire Council, Mining Consultative Committee, minutes of meeting, 13 October 2009, p. 2.
- 31 CSIRO, *CSIRO Murray-Darling Basin Sustainable Yields Project – a report to the Australian Government*, www.clw.csiro.au/publications/waterforahealthycountry/mdbsy/pdf/Namoi-FactSheet.pdf (accessed 31 August 2009).
- 32 CSIRO, *CSIRO Murray-Darling Basin Sustainable Yields Project – a report to the Australian Government*, www.clw.csiro.au/publications/waterforahealthycountry/mdbsy/pdf/Namoi-FactSheet.pdf (accessed 31 August 2009).
- 33 CSIRO, *Water Availability in the Namoi*, www.csiro.au/files/files/phzr.pdf (accessed 31 August 2009).
- 34 Mr Timothy Duddy, Spokesperson, Caroon Coal Action Group, *Proof Committee Hansard*, 28 September 2009, p 16.
- 35 Australian Bureau of Statistics, *National Regional Profile: Liverpool Plains*, www.abs.gov.au (accessed 31 August 2009).
- 36 Four Corners, *The Good Earth*, www.abc.gov.au/4corners (accessed 25 August 2009).
- 37 Four Corners, *The Good Earth*, www.abc.gov.au/4corners (accessed 25 August 2009).

adverse impacts on one of Australia's most productive agricultural communities and, due to the proximity of the Namoi region to the MDB, the nation's key water system.³⁸

1.18 Shenhua estimate that there is approximately 500 million tonnes of inferred coal within the Watermark Exploration Licence, with a potential mine life of around 50 years in a possible open cut mine located in the ridge country of the Liverpool Plains.³⁹ Should a viable mine be identified and subject to all necessary environmental planning and mining approvals, Shenhua anticipates construction to begin in 2012 with mine production commencing in 2013.⁴⁰

1.19 Publicly, farmers have put pollution fears at the centre of their protest. However, as fifth and sixth generation land owners, there is also significant emotional attachment to the land and distress at the prospect of impacts on family properties.⁴¹

1.20 The committee undertook a tour of the Carroona region with members of the Carroona Coal Action Group and visited a coal seam methane exploration rig operated by Santos.

Darling Downs

1.21 The Darling Downs is situated in Southern Queensland, at the head of the MDB, along the NSW Queensland border. The Darling Downs is a farming region characterised by fertile soil similar to the Liverpool Plains. The committee heard evidence from representatives of several farming communities on the Darling Downs including from the Felton Valley, the Haystack Plains and the Jimbour Plains. The Darling Downs region has been historically dominated economically by agricultural production, with crop and livestock generating approximately 25% of Queensland's total production.⁴²

1.22 The Surat Basin⁴³, running beneath the Darling Downs, is a rich source of coal and coal seam methane gas. However, local farming communities, fearing the potentially adverse environmental impact of coal mining and associated industries on their prime agricultural land, have generated significant public profile for their protest against a proposed mine.⁴⁴

38 Carroona Coal Action Group, <http://www.ccag.org.au/> (accessed 31 August 2009).

39 Shenhua Watermark Coal Pty Ltd, *Submission 72*, p. 2.

40 Shenhua Watermark Coal Pty Ltd, *Submission 72*, p. 2.

41 Four Corners, *The Good Earth*, www.abc.gov.au/4corners (accessed 25 August 2009).

42 State Development Centre Toowoomba, *Darling Downs and Southwest Queensland - Energy infrastructure and resources*, <http://www.dalbychamber.com.au/docs/Qld%20Centre%20Of%20Enterprise%20-%20Darling%20Downs%204.pdf> (accessed 31 August 2009).

43 The southern end of the Surat Basin is also referred to as the Clarence-Moreton Basin.

44 Friends of Felton Inc, <http://www.friendsoffelton.blogspot.com/> (accessed 31 August 2009).

1.23 The potential for coal seam gas to reduce carbon emissions, combined with Darling Downs' proximity to pipeline infrastructure and ease of access to markets in Southern Queensland, has encouraged exploration and development of the coal seam gas resources in the Surat Basin.⁴⁵ The current level of coal seam gas production from the Bowen Basin and Surat Basin now supplies more than 80 per cent of Queensland's gas market.⁴⁶ The local agricultural industry is concerned about the potential for coal seam gas production to damage waterways and crop land.⁴⁷ They are also anxious about the treatment and disposal of salt produced during the coal seam gas extraction process.

1.24 The committee was given a tour with local residents of the proposed Ambre Energy mine and petrochemical site in the Felton region by the Friends of Felton, as well as visiting the town of Acland, which is in the process of being acquired and demolished or relocated in preparation for the expansion of an adjacent open-cut coal mine. The committee thanks the various individuals, groups, companies, and governments who assisted it in its work.

45 Councillor Ray Brown, Dalby Regional Council Mayor, Quoted in *Coal Mining*, <http://www.miningcoal.com.au/article/Surat-Basin-coal-booming-despite-Queensland-job-cuts/435005.aspx>, (accessed 4 September 2009).

46 Queensland Department of Mines and Energy, *Queensland's World-class Coals*, http://www.dme.qld.gov.au/zone_files/coal_files_pdf/wcc_nov_07_1.pdf (accessed 31 August 2009).

47 Friends of Felton Inc, <http://www.friendsoffelton.blogspot.com/> (accessed 31 August 2009).

Chapter 2

Water supply and quality

2.1 The committee received extensive evidence concerning the potential impacts of mining in the Namoi River Valley and the Darling Downs catchments. Generally, submitters and witnesses who opposed mining argued that it would damage water flow and quality, thus irreversibly damaging the livelihoods of farmers and associated rural industries and communities. Mining industry representatives insisted that much of the community concern was misplaced as the industry was heavily regulated to ensure maximum environmental protection.

2.2 While the potential impact of mining on water resources was contested by submitters and witnesses there was general consensus that the water resources available in the Liverpool Plains and the Darling Downs create uniquely productive agricultural land. The Australian Society of Soil Science Incorporated (ASSSI), the peak body for soil scientists in Australia, submission stated that the Vertosols¹ of the Darling Downs and Liverpool Plains are amongst the most productive cropping soils in Australia.² The ASSSI's submission further stated that:

The reasons for the outstanding productivity of the clay soils in these two areas are their (1) inherent chemical fertility, (2) high capacity to hold water after rain or irrigation (high plant available water capacity), (3) location in a zone providing good natural rainfall (600-800 mm/a) and (4) access to good quality groundwater for irrigation. There are few other areas in Queensland and NSW which have this combination of resource.³

2.3 The ASSSI position was echoed in a range of other evidence presented to the committee including Agforce, the peak body representing Queensland's beef, sheep and wool, and grains producers, who stated that:

Our prime agricultural lands cover a very large area of very deep alluvial soils. They are highly productive, they have an extremely high water-holding capacity and they make farming in this part of the world, where we have always had a very unreliable climate, reliable. Without these soils, we would not be in business.⁴

1 Vertosols are also often called cracking clay soils. They have a clay texture throughout the profile; display strong cracking when dry, and shrink and swell considerably during wetting and drying phases.

2 Australian Society of Soil Scientists Incorporated, *Submission 24*, p. 2.

3 Australian Society of Soil Scientists Incorporated, *Submission 24*, p. 3.

4 Cr Wayne Newton, Agforce, *Proof Committee Hansard*, 29 September 2009, p. 14.

2.4 The majority of submitters and witnesses opposed to mining in the Liverpool Plains and the Darling Downs stated that they were not anti-development or anti-mining. The National Farmers' Federation (NFF) submission argued that:

The agricultural and mining industries have co-existed in regional Australia, and both the agricultural and mining industries have continued to experience growth over recent years.⁵

2.5 This was echoed in evidence to the committee by the Friends of Felton Incorporated who stated:

We are at pains to say that we are not antidevelopment... but it really is the scale of this mine that scares us most.⁶

2.6 The Haystack Road Coal Committee acknowledged that mining was producing some benefits for the community and that many of the downsides were accepted with a degree of community goodwill, as people recognised that economic activity produced benefits.⁷ Their position, which reflected the views of many submitters and witnesses, is summarised by the following statement:

We understand the massive economic potential that is there that cannot be left untapped, but we do not believe it should be tapped at any cost.⁸

2.7 Community representatives were specifically concerned that there is lack of understanding about the fragility and interconnectivity of their water resources. Namoi Water, a peak water users group in the Namoi catchment area, stated:

The great concern in this community over the last three years is that the state government and the miners have walked up to this new development as if it is something that they have encountered before and something that they understand. They do not understand it. Answers to your questions here today again show those of us who work with this resource that these people do not understand what they are dealing with.⁹

5 National Farmers' Federation, *Submission 55*, p. 1.

6 Mr Ian Whan, Committee Member, Friends of Felton Inc, *Proof Committee Hansard*, 29 September 2009, p. 29.

7 Mr Jeffrey Bidstrup, Chair, Haystack Road Coal Committee, *Proof Committee Hansard*, 29 September 2009, p. 9.

8 Mr Jeffrey Bidstrup, Chair, Haystack Road Coal Committee, *Proof Committee Hansard*, 29 September 2009, p. 7.

9 Mr John Clements, Executive Officer, Namoi Water, *Proof Committee Hansard*, 28 September 2009, p. 16.

Water Flow

2.8 The key concern of many submitters and witnesses was the potential for mining to disrupt the complex connectivity and interdependence between surficial and groundwater resources.

2.9 The committee heard substantial evidence concerning the importance of underground aquifers to the regions' agricultural productivity. This evidence concluded that the ridges along the floodplain were important recharge areas for the aquifers. A farmer from the Liverpool Plains, Mrs Kirrily Blomfield, argued that:

...we must protect the ridges of the Liverpool Plains from mining as they are recharge areas for the aquifers which feed the Murray-Darling Basin; secondly, we must protect the ridges as they contain shallow aquifers which are critical for ridge country management and, in turn, the river system inflows.¹⁰

2.10 Mrs Blomfield cited a proposal to clear trees from her farm that was refused by the NSW Department of Land and Water Conservation on the grounds that the ridge areas were important recharge areas for underground aquifers.¹¹ Mrs Blomfield claimed that these same areas, whose aquifers are critical for grazing management, are being explored as potential mining sites.¹² This was supported by Namoi Water who stated:

...you cannot expect significant recharge areas to continue to be that when open-cut practices or longwall mining practices, which alter the landscape, go into these areas. An aquifer, an underground basin of water, is nothing if you cut off the recharge.¹³

2.11 A number of submitters expressed concern about the potential for mining to damage underground aquifers. The Australian Institute of Agricultural Science and Technology's submission argued that:

Open-cut coal mining of the cropped area is likely to destroy underlying shallow aquifers. Mining of surrounding intake areas could also reduce available water supplies. As indicated previously, the uniqueness of the Darling Downs and Liverpool Plains areas is the quality of the soils and the location with good natural rainfall for grain crops.¹⁴

2.12 Namoi Water supported this assessment:

10 Mrs Kirrily Blomfield, *Proof Committee Hansard*, 28 September 2009, p. 24.

11 Mrs Kirrily Blomfield, *Proof Committee Hansard*, 28 September 2009, p. 24.

12 Mrs Kirrily Blomfield, *Proof Committee Hansard*, 28 September 2009, p. 26.

13 Mr John Clements, Executive Officer, Namoi Water, *Proof Committee Hansard*, 28 September 2009, p. 21.

14 Australian Institute of Agricultural Science and Technology, *Submission 40*, p. 2.

You are talking about three-dimensional alteration of landscape. Miners actually drop the landscape by a metre to two metres, depending on the development. You may fracture; you may discompact. These are flowing streams underground. They are pools of water that aggregate and flow, sometimes through constrictions and sometimes quite broadly. You cannot alter the entire landscape and expect those flows to continue.¹⁵

2.13 The Friends of Felton further asserted that:

...it is well known and well documented that those basaltic hilltops are the recharge areas for the aquifers in the bottom of the valley. If you remove those hills where the coal is then suddenly you have part of the system that does not work anymore. You do not have anywhere where the water will infiltrate and underpin the productivity of the flats. There is a grave concern about the cycling of water in that system when it is so severely altered.¹⁶

2.14 Submitters and witnesses were understandably anxious about the impact that possible aquifer destruction would have on their livelihoods. However, they also stressed that the aquifers were part of the greater Murray-Darling system and that disruption at the water source, in the ridge country of the Liverpool Plains and the Darling Downs, would have potentially adverse affects downstream.¹⁷

2.15 While submitters and witnesses were concerned about the impact of mining on underground aquifers there was also broad concern that mining activity would disrupt the contours of the land, consequently rerouting the flow of flood water and causing widespread erosion. The Jimbour Action Group outlined the impact that a disruption to the landscape by mining could cause:

...any change, even a very subtle change, such as a set of wheel tracks running down the hill at an angle or... fence lines and things like that, can change the direction of the flow of the water. When the direction is changed, it usually ends up being concentrated. When it gets concentrated, it flows quickly and that is when the damage happens. If you put a strip mine across this flood plain, you have to build a bank to dig a hole. I do not know how you get around that one. You would be diverting water on a huge scale compared to what is happening now.¹⁸

15 Mr John Clements, Executive Officer, Namoi Water, *Proof Committee Hansard*, 28 September 2009, p. 19.

16 Mrs Vicki Green, Member, Friends of Felton Inc, *Proof Committee Hansard*, 29 September 2009, p. 27.

17 Mr Jeffrey Bidstrup, Chair, Haystack Road Coal Committee, *Proof Committee Hansard*, 29 September 2009, p. 12.

18 Mr St John Kent, Member, Jimbour Action Group, *Proof Committee Hansard*, 29 September 2009, p. 35.

2.16 This evidence was supported by the Queensland Murray-Darling Committee Incorporated who argued that in the case of the Fitzroy River, levy banks erected to protect mine sites altered the flow of the floodplains. The Queensland Murray-Darling Committee Incorporated stated:

As the floods came down, that [levy banks] reduced the width of the floodplain. So, instead of the flood breaking out of a river and spreading out over two, three, four or up to seven kilometres in some places, it is then restricted down to two or three kilometres wide. So that volume of water now does not have a floodplain to flood across; it is restricted. In a number of cases those levy banks did not hold in the Fitzroy and those mines were flooded. There are some fairly spectacular photos of draglines being flooded and so forth. That had a couple of impacts. It was obviously pretty devastating for those mining operations, but it also meant that several of those mining operations were given approval by the state government to pump their mines back to being dry again. That has created a range of issues in terms of water quality in the Fitzroy River.¹⁹

2.17 The Fitzroy River example was referenced by a number of submitters and witnesses concerned about the potential for similar contamination of riparian systems to occur on the Liverpool Plains or the Darling Downs - with basin-wide impacts. Submitters and witnesses highlighted the damage caused to the Fitzroy River by contaminated water, discharged after mines were subject to extensive flooding, as an illustration of the potential impact that mining could have on the MDB and the lack of regulatory protection against such an incident occurring. The committee viewed the floodplain on its tour of the Caroon coal exploration site and heard anecdotal accounts that highlighted the threat posed to mining activity by the volume of water flowing through the area during a flood period.

2.18 A study commissioned by the Queensland government, in response to the flood incident on the Fitzroy, found that several of the regulatory mechanisms designed to ensure water quality were inconsistent and that there was insufficient data available to quantify the cumulative impacts of mining on water discharges.²⁰ The report recommended that the Queensland government:

1. Develop appropriate conditions in environmental authorities for mine water discharges;
2. Develop local water quality guidelines; and

19 Mr Geoff Penton, Chief Executive Officer, Queensland Murray-Darling Committee Inc, *Proof Committee Hansard*, 29 September 2009, p. 41.

20 Queensland government, *A study of the cumulative impacts on water quality of mining activities in the Fitzroy River Basin*, April 2009.
<http://www.fitzroyriver.qld.gov.au/cumulativeimpacts.html> (accessed 21 October 2009).

3. Develop a model for assessing cumulative impacts across the region.²¹

2.19 The Queensland government has also set up a Fitzroy River Water Quality Advisory Group to provide advice on the implementation of these recommendations.

2.20 The Queensland Resources Council, a member of the Fitzroy River Water Quality Advisory Group, provided evidence that the mining industry had been an active and responsible participant in the Queensland Government's response to the flood event on the Fitzroy River.²² This included contributing, through the Fitzroy Water Quality Advisory Group, to the development of new water discharge conditions.²³

Water Quality

2.21 The potential for coal mining and coal seam methane extraction to contaminate water resources was a major concern for many submitters and witnesses. The CCAG argued that its greatest concern was not a reduction in water quantity in underground aquifers but a reduction in quality.²⁴ Some submitters and witnesses also argued that drilling through shallow aquifers could result in contamination of water by drilling fluids and toxic water drawn from the coal seam. The Namoi Water Users Association stated that:

I just want to reinforce that agricultural drilling is to a maximum of 100 metres, and generally far less, and runs through potable water. Some of the very shallow water is saline and that is routinely cased off. The activities of miners and the gas exploration companies is that they do not run through potable water; they run through potable water and water that is not potable—water that is heavily contaminated and that, in some cases, has naturally occurring elements such as arsenic and other things that are quite noxious. So it is a very different activity.²⁵

2.22 Mrs Bridget Gallagher, a local farmer, expressed concern that oil and gas contaminants can include arsenic, lead, mercury and selenium and zinc.²⁶ Mrs

21 Queensland government, *A study of the cumulative impacts on water quality of mining activities in the Fitzroy River Basin*, April 2009.

<http://www.fitzroyriver.qld.gov.au/cumulativeimpacts.html> (accessed 21 October 2009).

22 Queensland Resource Council, *additional information*, 20 October 2009.

23 Queensland Resource Council, *additional information*, 20 October 2009.

24 Mr Timothy Duddy, Spokesperson, Caroon Coal Action Group, *Proof Committee Hansard*, 28 September 2009, p. 22.

25 Mr John Clements, Executive Officer, Namoi Water, *Proof Committee Hansard*, 28 September 2009, p. 20.

26 Mrs Bridget Gallagher, *Proof Committee Hansard*, 28 September 2009, p. 28.

Gallagher's concerns were raised by several other submitters and witnesses including the CCAG's Coal Seam Gas Subcommittee.²⁷

The committee also heard from witnesses concerned about the process of fracking - a method used to increase the flow of gas from the coal seam – and its potential impact on the water resource.²⁸

2.23 These claims were strongly refuted by Santos, a company with extensive experience extracting coal seam methane in Queensland and currently involved in exploration in NSW. Santos stated:

In the drilling of wells we use a water based fluid. We do not use any toxic chemicals—in fact they are certified as non toxic. So everything we use is benign to the environment. We ensure that all wells are case cemented and isolated through the various strata that we drill for the coal seams. In terms of fracking, the process of fracking or fracture stimulation is a method by which you propagate open the coal seam to enhance its ability to flow. You restrict that fracture to the coal seam itself, and in doing so you typically use a water based fluid with some polymers which are biodegradable and which put a prop head in the ground. A prop head can be some sort of sand prop head just to keep the fractures open as you propagate the coal open with the pressure. So there are no toxic chemicals used in terms of the subsurface.²⁹

2.24 A 2008 review found no published research on the health effects of fracking or the fluids used in the process.³⁰ Santos also indicated:

Claims that Santos intends to use an explosive fracking process, and that there is "...no control over the extent of the fracture..." are incorrect. In the event that fracking is absolutely necessary, the intention is to fracture the coal seam only, allowing gas to travel to the well and the surface. The fracture stimulation is designed to ensure that neighbouring rock is left intact.³¹

2.25 The CSIRO's submission contended that their research indicated that the effects of mining on groundwater are mine-site specific and depend on variables such as overburden geological, geotechnical and hydrogeological conditions, characteristics of aquifers and aquitards involved, and mining depth.³² The CSIRO stated:

27 Caroon Coal Action Group - Coal Seam Methane Subcommittee, *Submission 29*, p. 3.

28 Caroon Coal Action Group – Coal Seam Methane Subcommittee, *Submission 29*.

29 Mr Stephen Kelemen, Manager, Coal Seam Gas, Santos, *Proof Committee Hansard*, 29 September 2009, p. 53.

30 Roxana Witter *et al.*, 2008, Potential Exposure-Related Human Health Effects of Oil and Gas Development: A Literature Review (2003-2008), University of Colorado Denver School of Public Health.

31 Santos, *Submission 84*, p. 10.

32 CSIRO, *Submission 65*, p .5.

The environmental impacts of the operation primarily relate to the need for a supply of groundwater during operation and localised affects on the groundwater supply post operation. Modelling suggests that groundwater quality can be maintained within acceptable standards by the use of various operational techniques, such as, maintaining an underpressure in the extraction zone and carefully monitoring water volumes and quality.³³

2.26 The need to use case by case assessment when examining the environmental impacts of mining activity was a key contention of both the NSW Minerals Council and the Queensland Resources Council.³⁴

2.27 The committee also heard evidence concerning the disposal of the large quantities of salt accumulated during the coal seam methane extraction process. Water used in this process is often quite saline with Agforce estimating that, based on the annual water production figures supplied by the Queensland government and the Australian Petroleum Production and Exploration Association (APPEA), coal seam methane developments could yield approximately 50,000,000 tons of salt over 30 years.³⁵ The potential impact of large quantities of salt was raised by a number of witnesses including the Haystack Road Coal Committee who were specifically concerned about the risk of salt contaminating the MDB, and Agforce who argued that none of the companies involved in coal seam methane extraction appeared to have a plan for the disposal of salt.³⁶ Agforce stated:

This product is able to totally poison the agricultural ability of our farmland. It can totally destroy it. One only has to travel to parts of southern Australia to see the damage that salt can do... The immense size of this problem cannot be overstated. This whole industry should be renamed the 'salt mining industry'. We are going to see more salt produced from the Surat Basin in the next 30 years than probably the total amount of grain produced in the next 30 years. We have logistical problems in this state, in this region, moving grain. I do not know how they think they are going to move this anywhere. The industry and the government still have no plans for its disposal.

Salt cannot be burnt. Salt cannot be just flushed into the ocean; it is contaminated with a number of other products. It has to have a commercial use. I suggest that, if you land that much salt on the commercial market, there will not be any value; and the value of freight is going to far exceed

33 CSIRO, *Submission 65*, p. 5.

34 Ms Sue-Ern Tan, General Manager, Policy and Strategy, New South Wales Minerals Council, *Proof Committee Hansard*, 28 September 2009, p. 2; Mr Andrew Barger, Director, Industry Policy, Queensland Resources Council, *Proof Committee Hansard*, 29 September 2009, p. 58.

35 Cr Wayne Newton, Agforce, *additional information*, 29 September 2009.

36 Mr Jeffrey Bidstrup, Chair, Haystack Road Coal Committee, *Proof Committee Hansard*, 29 September 2009, p. 2; Cr Wayne Newton, Agforce, *Proof Committee Hansard*, 29 September 2009, p. 14.

what the salt is worth, anyway. We just do not see any plans for the salt. It is the biggest problem here.³⁷

2.28 The production of coal seam methane involves the extraction and treatment of large quantities of water found in coal seams between 200 and 1000 metres below the surface.³⁸ This water is typically saline, with water quality varying between regions and even between individual wells in the same region.³⁹ Water extracted from coal seams can be desalinated and used for agricultural purposes, for example irrigation.⁴⁰ The potential utility of this water was recognised by groups such as Agforce.⁴¹

2.29 The APPEA acknowledged that some regional areas of the MDB may be impacted more than others by water management issues associated with coal seam methane extraction. However, APPEA further stated that while there were unresolved issues concerning the disposal of salt, the water used could be recycled and put to a number of beneficial uses.⁴²

2.30 The committee put the question of salt disposal to Santos who stated that:

...[We have] not reached a final conclusion on that topic. We have made good progress on considering a range of options for salt management. Our immediate plan is to contain it in ponds, which will be of an approved design as passed by the government. We are looking at the reinjection of the salt water back into the coal seams from where it came. We are also looking at extracting commercial value from the salts to minimise their volume and to get a commercial return for the community. Any salt which cannot be disposed of in one of those processes may be contained in a correctly-designed hazardous waste landfill.⁴³

2.31 Santos further stated that removing salt from the region via truck or rail was commercially unviable:

Senator LUDLAM—We heard from earlier witnesses that there is not even the trucking and rail capacity to get wheat crops out of this part of the world, let alone very high tonnages of salt. Are you in discussion with some of those other sectors on potential future transport needs for the waste products?

Mr Davidge—No, we are not. We would not consider transporting salt as a commercially viable opportunity for the management of salt.

37 Cr Wayne Newton, Agforce, *Proof Committee Hansard*, 29 September 2009, p. 15.

38 Santos Ltd, *Submission 84*, pp 4–8.

39 Santos Ltd, *Submission 84*, p. 8.

40 Santos Ltd, *Submission 84*, p. 5.

41 Cr Wayne Newton, Agforce, *Proof Committee Hansard*, 29 September 2009, p. 15.

42 Australian Petroleum Production and Exploration Association, *Submission 57*, p. 2.

43 Mr Shaun Davidge, Manager, Water Strategies, Santos, *Proof Committee Hansard*, 29 September 2009, p. 52.

Senator LUDLAM—So there is no real prospect of railing or trucking it out?

Mr Davidge—No.⁴⁴

2.32 Due to the increasing quantities of coal seam gas water, produced through the coal seam methane extraction process, and concern about the potential for environmental damage, the Queensland government recently released a Coal Seam Gas Water Policy.⁴⁵ The policy tightened regulatory requirements around the treatment and disposal of coal seam gas water.⁴⁶ The Queensland government also released a related discussion paper in May 2009 for stakeholder consultation and is currently assessing submissions.⁴⁷

Water Usage

2.33 The committee also heard evidence outlining the importance of available water supply to agricultural production in the Liverpool Plains and the Darling Downs.

2.34 The committee acknowledges that on a regional or state-wide scale agriculture consumes a significantly larger proportion of available water resources than mining, as demonstrated by evidence from the NSW Minerals Council that mining operations consume just over one percent of the states water usage relative to the 70 percent used by the agricultural industry.⁴⁸ Nevertheless, evidence provided to the committee suggested that mining or associated industries can have a significant impact on local water availability if significant quantities of water are required for their operations.

2.35 The Friends of Felton Incorporated raised specific concerns about the potential for the proposed Ambre Energy mine and adjacent petrochemical plant to consume scarce water resources. The Friends of Felton Incorporated stated:

The company intends to mine this coal and then put it through a petrochemical plant to produce liquid fuel. That is a process which requires a large amount of water... There are 586 registered water bores within a 10 kilometre radius of the mine site... There is no free water in that area.⁴⁹

44 Mr Shaun Davidge, Manager, Water Strategies, Santos, Committee Hansard, 29 September 2009, pp 57–58.

45 Queensland government, <http://www.dip.qld.gov.au/growth-strategies/queensland-coal-seam-gas-water-management-policy.html> (accessed 21 October 2009).

46 Queensland government, <http://www.dip.qld.gov.au/growth-strategies/queensland-coal-seam-gas-water-management-policy.html> (accessed 21 October 2009).

47 Queensland government, <http://www.dip.qld.gov.au/growth-strategies/management-of-coal-seam-gas-water.html> (accessed 21 October 2009).

48 Ms Sue-Ern Tan, General Manager, Policy and Strategy, New South Wales Minerals Council, *Proof Committee Hansard*, 28 September 2009, p. 2.

49 Mrs Vicki Green, Member, Friends of Felton Inc, *Proof Committee Hansard*, 29 September 2009, p. 26.

One aspect is the threat to underground water from the mining pits. We are very concerned...that digging a mining pit in this area will lead to potential drainage of our local bores and contamination. The other aspect is the water demand for the company's petrochemical plant.⁵⁰

Cumulative impacts

2.36 As outlined above, the committee heard evidence about the potential impacts of mining on specific areas of the Liverpool Plains and the Darling Downs. The need to regulate mining activity on a location-specific basis was reinforced by evidence from the NSW Minerals Council and the Queensland Resources Council. However, the committee also heard substantive evidence concerning the need to investigate the cumulative impact of mining across the region and the MDB.

2.37 The CSIRO submission argued that there has been relatively little assessment of the cumulative impacts of mining on the MDB:

The impacts of mining tend to be studied on a case by case, region by region or operation by operation basis. The results are initially encapsulated in Environmental Impact Assessments which are available at initiation for both existing and known projected mining operations. Additionally, many of the mine operators in the Murray Darling Basin will be producing annual sustainability reports utilising the Global Reporting Initiative reporting framework which will provide minesite data on environmental values... These sustainability reports represent a valuable source of information on the potential and actual impacts of individual mining operations. However, there has been relatively little quantitative assessment of the cumulative impacts represented by these data.⁵¹

2.38 Further, the CSIRO stated:

The key issues in terms of cumulative impact will centre around how individual operations combine over time and over a large region to affect: water availability and variability; impacts on biodiversity; land and groundwater contamination; local and regional dewatering.⁵²

2.39 The Queensland Murray Darling Committee Incorporated, whose work primarily looks broadly at water usage across the region, argued that the Fitzroy River disaster provides an example of the need to assess the cumulative impacts of mining on water resources,⁵³ while Agforce asserted that the cumulative impacts of mining activity in the Surat Basin was unappreciated and a presented a major policy problem:

50 Mr Robert McCreath, President, Friends of Felton Inc, *Proof Committee Hansard*, 29 September 2009, p. 26.

51 CSIRO, *Submission 65*, pp 5–6.

52 CSIRO, *Submission 65*, p. 6.

53 Mr Geoff Penton, Chief Executive Officer, Queensland Murray-Darling Committee Inc, *Proof Committee Hansard*, 29 September 2009, p. 41.

In the next three to five years we are going to see 36,000 wells drilled. That is just in the next three to five years. This development will keep occurring for probably the next 30 years.⁵⁴

2.40 When questioned about potential cumulative impacts, the NSW Minerals Council responded that:

Ultimately, the government does [look at the cumulative impact], but the way that the operations assess those cumulative impacts—I will use noise and dust as an example—the background levels that they need to use in their environmental assessments take into account the existing surrounding noise levels or dust levels. So in that way the levels that exist from other operations are taken into account. That is the way the cumulative impacts get taken into account.⁵⁵

2.41 Namoi Water argued that the cumulative impact was the key feature of this debate. They asserted that answers to the committee's questions by mining industry representatives - regarding cumulative impacts - had focused on dust and noise, things they have 'dealt with before'.⁵⁶ However, Namoi Water reinforced their position that this was a three dimensional landscape and that there was no understanding of the cumulative impact on this type of landscape. In Namoi Water's view, the main problem was not polluted discharge from a discrete mine site but the alteration of the entire landscape with associated cumulative impacts that have the potential to flow thousands of kilometres through the Murray-Darling system.⁵⁷ Namoi Water concluded that:

... [this] is why we are here today. There is no other reason. The Water Management Act 2000, the Commonwealth Water Act 2007 and the National Water Initiative are all entirely deficient in terms of recognising and picking up the issue of mining and its impacts on water...It is something new; it has not been contemplated by the legislation. Effectively, the breakdown point is right there. There is no cross-referral. The water management acts and processes of which I have outlined a few are skilful in terms of water management acts but are not able to be linked through any legislative process to the mining act.⁵⁸

54 Cr Wayne Newton, Agforce, *Proof Committee Hansard*, 29 September 2009, p. 13.

55 Ms Rachelle McDonald, Director, Environment and Community, New South Wales Minerals Council, *Proof Committee Hansard*, 28 September 2009, p. 8.

56 Mr John Clements, Executive Officer, Namoi Water, *Proof Committee Hansard*, 28 September 2009, p. 19.

57 Mr John Clements, Executive Officer, Namoi Water, *Proof Committee Hansard*, 28 September 2009, p. 21.

58 Mr John Clements, Executive Officer, Namoi Water, *Proof Committee Hansard*, 28 September 2009, pp 19–21.

Chapter 3

Rehabilitation, regulation, and planning

Rehabilitation

3.1 Rehabilitation is a key aspect of mining industry regulation. Submitters and witnesses opposed to mining in the Liverpool Plains and the Darling Downs claimed that existing rehabilitation methods are inadequate. Generally, those opposed to mining could not see any circumstances where mining and agriculture could coexist due to their lack of faith in existing rehabilitation measures. When asked if there were any circumstances in which she would support mining in the region, Mrs Blomfield stated:

In the case of open-cut mining I would say no, because of what I have just explained about the contaminants. If we knew there was an absolute guarantee that, in the case of the longwall mining, no water would be lost from any sort of aquifer then maybe, but I cannot see how that guarantee could be given.¹

3.2 The ASSSI submission argued that the Australian mining industry had developed the technology to successfully rehabilitate diverse landscapes.² However, their submission did acknowledge that rehabilitated open-cut mines in Queensland and NSW were, in most cases, returned to a state for grazing or forestry rather than cropping.³ The ASSSI argued that there are currently no examples from Australia where soils of the type typically found on the Liverpool Plains and the Darling Downs have been successfully reinstated.⁴ While there were examples from the United States of America and Germany of the rehabilitation of agricultural land, these soils had a much lower clay content (around 35%) than the Liverpool Plains and the Darling Downs (around 70%).⁵ The ASSSI stated that:

If the community, industry and government believe that mining should proceed in the Darling Downs and Liverpool Plains, but that the land should be returned to its original productivity following mining, then experience from both Germany and the USA shows clearly that the entire depth of the soils need to be conserved and replaced (particularly to retain the plant available water capacity). [The] Vertosols of the Darling Downs and Liverpool Plains...are commonly 1.0 – 2.0 m deep...⁶

1 Mrs Kirrily Blomfield, *Proof Committee Hansard*, 28 September 2009, p. 23.

2 Australian Society of Soil Scientists Incorporated, *Submission 24*, p. 4.

3 Australian Society of Soil Scientists Incorporated, *Submission 24*, p. 4.

4 Australian Society of Soil Scientists Incorporated, *Submission 24*, p. 4.

5 Australian Society of Soil Scientists Incorporated, *Submission 24*, p. 4.

6 Australian Society of Soil Scientists Incorporated, *Submission 24*, p. 4.

3.3 The ASSSI further argued that:

In order to return the soil close to its original state (and cropping potential), the entire soil profile would have to be cut into layers of the order of 25-30 cm which would have to be stockpiled separately and then replaced, in order, after mining. Mixing of the soil profile would result in depression of crop yields due to the increased salinity and ESP in the upper layers. Additionally, the stockpiling of soil, which would be necessitated because of the restraints of the mining process, would result in organic matter breakdown in the surface layer and in the dispersion and erosion of the subsoil layers.⁷

3.4 The ASSSI submission concluded that the potential impacts of mining on the cropping soils of the Liverpool Plains and Darling Downs and surrounds would include a reduction in the yield potential of the reinstated soil, loss or reduction of underground water supplies and dust impacts on surrounding crops.⁸

3.5 The ASSSI's position was echoed by the Sustainable Minerals Council who argued that Australia has only very limited experience in the rehabilitation of agricultural soils.⁹ The Sustainable Minerals Council further stated:

To ensure a successful re-use of rehabilitated land for agriculture, the re-building of (mined) soils has to be well understood and tested. Thorough and detailed rehabilitation research programs will be required to demonstrate that mining prime agricultural land is only a temporary cessation to agricultural production and that disturbed landscapes and soils can be re-constructed to pre-mine capability and productivity.¹⁰

3.6 The Friends of Felton confirmed their scepticism about the possibility of returning stored topsoil to its former cropping capacity by stating their understanding that Felton's soil types could not be rehabilitated through the storage and relaying of topsoil.¹¹ The Friends of Felton stated that:

The fact of the matter is that they are completely removing a hill. The topsoil on that is very complex and can vary every 15 centimetres. They have talked about taking the soil off, stockpiling it and returning it in layers, as it was when they removed it. Evidence suggests that as soon as you remove that soil it will lose its structure. It will lose its inherent nature, so

7 Australian Society of Soil Scientists Incorporated, *Submission 24*, p. 4.

8 Australian Society of Soil Scientists Incorporated, *Submission 24*, p. 4.

9 Sustainable Minerals Council, *Submission 32*, p. 4.

10 Sustainable Minerals Council, *Submission 32*, p. 4.

11 Mrs Vicki Green, Member, Friends of Felton Inc, *Proof Committee Hansard*, 29 September 2009, p. 30.

when it is put back it will not return immediately. It will take significant years, if it happens at all.¹²

3.7 The Queensland Murray-Darling Committee supported this assessment and confirmed they were also sceptical about the potential for quality soils to be rehabilitated to a croppable status.¹³ The Queensland Murray-Darling Committee concluded that:

In order for a company to put 60 to 80 centimetres minimum back as topsoil to grow crops would be no mean feat to achieve. It is certainly not something we have observed anywhere around here or in Australia that we have heard of... If you stockpiled a pile of topsoil for 10 years, most of it would be anaerobic. It would lose its biology and structure. To put that back is quite a difficult job. At the moment all that is required to be put back is quite a shallow rehab job, and those are being done; there is no doubt about that. But certainly restoring land to croppable status is not being done.¹⁴

3.8 While the committee heard substantive evidence expressing doubt that an open cut mine site could be returned to cropping land, it also heard that longwall mining could severely affect the floodplain. The Jimbour Action Group stated:

The Central Queensland experience will tell you that that is not successful either. Because of the slumping effect that occurs as they go through, the roof collapses, the ground slumps down, and you have got a hole again. You will have taken something that is a billiard table and turned it into hills and valleys, which we currently do not have, and created significant erosion problems. Because of the nature of our soils, if water flows at more than 0.3 metres a second—to be technical—it dissolves and washes away, straight into the river and all the way to Adelaide, if you believe the rhetoric.¹⁵

3.9 In recognition of the value of floodplain soils to agriculture, the Shenhua submission stated that any mining on the Shenhua Watermark project would be located on the ridge country and not on the black soils.¹⁶ The Queensland Resource Council stated that commencing mining in the absence of accurate information was the worst possible outcome for landholders, government and resource companies alike:

12 Mrs Vicki Green, Member, Friends of Felton Inc, *Proof Committee Hansard*, 29 September 2009, p. 30.

13 Mr Geoff Penton, Chief Executive Officer, Queensland Murray-Darling Committee Inc, *Proof Committee Hansard*, 29 September 2009, p. 41.

14 Mr Geoff Penton, Chief Executive Officer, Queensland Murray-Darling Committee Inc, *Proof Committee Hansard*, 29 September 2009, p. 41.

15 Mr St John Kent, Member, Jimbour Action Group, *Proof Committee Hansard*, 29 September 2009, p. 35.

16 Shenhua Watermark Pty Ltd, *Submission 72*, p. 1.

If you have already started your operations and suddenly think, ‘Hang on, this topsoil just keeps going and going and going,’ that is an atrocious outcome because, from the company and the landholder’s point of view, you have set up a legislative responsibility to fix something that maybe you cannot. You are effectively signing a sort of blank cheque. The reason that the QRC [Queensland Resources Council] agrees with what we have heard from a lot of the individual submissions that you have had today for a rigorous planning process is that at the front end you need to get that science, that information, on the table so that you can see where the productive land is, you can do it in an objective way and companies can then factor that in to the EIS [environmental impact statement] process.¹⁷

3.10 The interconnection between groundwater aquifers and floodplain agriculture concerned many submitters.¹⁸ They suggested that avoiding mining of the floodplains would not provide adequate protection.

There is a concern, which others will speak to, about the caveats on how much the restriction is to be applied on the black soil plains. It is current technology. We have a bit of a question about what that means. With the area that is still identified, it is unknown as to whether or not that is a significant recharge area. Government maps such as the one I have here suggest that it is. Again, you cannot expect significant recharge areas to continue to be that when open-cut practices or longwall mining practices, which alter the landscape, go into these areas. An aquifer, an underground basin of water, is nothing if you cut off the recharge.¹⁹

3.11 The committee heard evidence that the rehabilitation of groundwater resources was a major concern for many submitters and witnesses. The National Farmers Federation (NFF) submission stated:

Experience has shown that mining operations can have significant impacts on ground and surface water, which go on to impact catchments and impair resource quality. The experience of the agricultural industries in dealing with ground water salinity and the significant risk that this issue still poses in many agricultural regions shows that once any damage is done to ground water systems, the opportunity to turn the situation around is difficult, costly and comes at an ongoing price as a consequence of productivity decline.²⁰

17 Mr Andrew Barger, Director, Industry Policy, Queensland Resources Council, *Proof Committee Hansard*, 29 September 2009, p. 58.

18 See for example Mrs Kirrily Blomfield, *Committee Hansard*, 28 September 2008, pp 24–25 and Mrs Vicki Green, Member, Friends of Felton, *Committee Hansard*, 29 September 2009, p. 27.

19 Mr John Clements, Executive Officer, Namoi Water, *Committee Hansard*, 28 September 2009, p. 21.

20 National Farmers Federation, *Submission 55*, p. 2.

3.12 Evidence presented to the committee provided anecdotal examples of the linkages between aquifers and the tributary rivers of the MDB.²¹ However, numerous submitters identified a lack of scientific data and evidence regarding the interconnectivity of water resources.²²

3.13 The committee understands that rehabilitation of complex soil profiles, such as exist on the Liverpool Plains, presents significant technical challenges. The committee believes that assessing the viability of groundwater rehabilitation may be limited by a lack of understanding of the interconnectivity of water resources in the region.

Regulation

3.14 The regulation of mining and the extent of water resource protection were key features of evidence presented to the committee. There are three ways in which mining can impact on water in the Murray Darling Basin:

- consumption of water (eg. In processing of ore)
- dewatering of mines and subsequent disposal of wastewater (which can be highly saline); and
- aquifer interference (that is, where mining activities damage or destroy groundwater systems).²³

3.15 While mining is primarily regulated by the state governments, the management of water in the Murray Darling Basin is achieved through a range of state and Commonwealth instruments, and intergovernmental agreements. Water is regulated through the Commonwealth's *Water Act 2007* (the Water Act), the 2004 Intergovernmental Agreement on a National Water Initiative (NWI), and existing state water resource plans. State governments have a range of mining and planning legislation that governs the approval of exploration and mining, and the consideration of specific development proposals.

The role of the Commonwealth

3.16 Mining, like all activities in the Murray Darling Basin, will operate under the Basin Plan (currently being prepared) and existing transitional water plans.²⁴

21 Mrs Kirrily Blomfield, *Committee Hansard*, 28 September 2008, pp 24–25.

22 Mr John Clements, Executive Officer, Namoi Water, *Committee Hansard*, 28 September 2009, pp 18–19 & 21; Mr Jeff Bidstrup, Chair, Haystack Road Coal Committee, *Committee Hansard*, 29 September 2009, p. 7.

23 DEWHA, *Submission 35*, p. 1.

24 Dr Tony McLeod, General Manager, Murray-Darling Basin Authority, *Proof Committee Hansard*, 14 October 2009, p. 5.

The Basin Plan

3.17 The Commonwealth *Water Act 2007* has created new governance arrangements for the waters of the Murray–Darling Basin by legislating objectives of both the 2004 NWI and the 2008 Intergovernmental Agreement on Murray–Darling Basin Reform.²⁵ Under the Act, the Commonwealth Minister, on the advice of the Murray–Darling Basin Authority (MDBA), is responsible for setting the framework for Basin-wide planning and management of water resources across the Basin, through the Basin Plan.²⁶ The Act requires the MDBA to develop and oversee the plan, in consultation with the Basin states. The first Basin Plan is scheduled to commence in 2011.²⁷ The plan is legally enforceable and intended to be 'a strategic plan for the integrated and sustainable management of water resources in the Murray–Darling Basin'.²⁸ During the initial years of operation, there will also be transitional water plans that operate as exceptions to the Basin Plan.²⁹

3.18 The *Water Act 2007* specifies some of the main functions of the Basin Plan, including:

- Setting and enforcing environmentally sustainable limits on the quantities of surface water and groundwater that may be taken from Basin water resources;
- Setting Basin-wide environmental objectives, and water quality and salinity objectives;
- Identifying risks to Basin water resources and strategies to manage those risks;
- Developing efficient water trading regimes across the Basin;
- Setting requirements that must be met by state water resource plans, and
- Improving water security for all uses of Basin water resources.³⁰

3.19 Whilst the Commonwealth will have oversight of and responsibility for the Basin Plan, the Basin states and territories will be responsible for the preparation of

25 Department of Environment, Water, Heritage and the Arts, *Submission 35*, p. 2.

26 Murray–Darling Basin Authority, *How the Basin Plan will affect us all*, available: http://www.mdba.gov.au/basin_plan (accessed 24 November 2009).

27 Murray–Darling Basin Authority, *The Basin Plan*, available: http://www.mdba.gov.au/basin_plan (accessed 24 November 2009).

28 Murray–Darling Basin Authority, *The Basin Plan*, available: http://www.mdba.gov.au/basin_plan (accessed 24 November 2009).

29 Dr Tony McLeod, General Manager, Murray–Darling Basin Authority, *Committee Hansard*, 14 October 2009, p. 4.

30 Murray–Darling Basin Authority, *About the Basin Plan*, available: http://www.mdba.gov.au/basin_plan/concept-statement/about-the-basin-plan (accessed 24 November 2009).

new water resource plans as current state water resource plans expire.³¹ Existing state water resource plans are due to expire in New South Wales, Queensland, South Australia and the ACT in 2014, and in Victoria in 2019.³² Each new water resource plan will need to comply with requirements detailed in the Basin Plan and be approved by the responsible Commonwealth minister.³³

Key elements of the Basin Plan

3.20 Two of the key elements central to the Basin Plan will be the definition of sustainable diversion limits (SDLs) and the development of a water quality and salinity management plan.³⁴

3.21 There is currently a limit ("the cap") placed on the amount of surface water which can be taken for consumptive use in the Basin. The cap is currently set at a level based on historic use and not on sustainable use. Further, the existing cap does not limit the use of groundwater, the consumption of which has grown significantly in the context of the introduction of the surface water cap. Under the Basin Plan, the cap will be replaced by SDLs.³⁵

3.22 SDLs are limits placed on the quantities of both surface- and groundwater that can be taken from Basin water resources. They will be set by the Murray-Darling Basin Authority at a level deemed to be environmentally sustainable, defined as 'the level at which water in the Basin can be taken from a water resource without compromising key environmental assets, key ecosystem functions, key environmental outcomes or the productive base of the water resource'.³⁶

3.23 The Basin Plan will include a water quality and salinity management plan which will seek to improve water quality and reduce salinity impacts across the

31 Murray-Darling Basin Authority, *How the Basin Plan will affect us all*, available: http://www.mdba.gov.au/basin_plan (accessed 24 November 2009).

32 Department of Environment, Water, Heritage and the Arts, *Submission 35*, p. 2.

33 Murray-Darling Basin Authority, *The Basin Plan*, available: http://www.mdba.gov.au/basin_plan and *How the Basin Plan will affect us all*, available: http://www.mdba.gov.au/basin_plan (accessed 24 November 2009).

34 Murray-Darling Basin Authority, *Key elements of the Basin Plan*, available: http://www.mdba.gov.au/basin_plan/concept-statement/key-elements (accessed 24 November 2009).

35 Murray-Darling Basin Authority, *Key elements of the Basin Plan*, available: http://www.mdba.gov.au/basin_plan/concept-statement/key-elements (accessed 24 November 2009).

36 Murray-Darling Basin Authority, *Key elements of the Basin Plan*, available: http://www.mdba.gov.au/basin_plan/concept-statement/key-elements (accessed 24 November 2009).

Basin.³⁷ The management plan will identify the main causes of poor water quality in the Basin and set water quality and salinity objectives and targets.³⁸

3.24 Water quality targets may include pH, temperature, dissolved oxygen, turbidity, sediment load, soluble organic carbon, heavy metals, various nutrients and blue-green algae levels.³⁹ A salinity target may specify the level of salinity to be achieved at a particular point on a river for a specified percentage of time.⁴⁰

The Commonwealth's role and the impacts of mining

3.25 Evidence presented by the MDBA intimated that the Basin Plan is likely to focus primarily on establishing a sustainable level of water extraction from the MDB system.⁴¹ The National Water Commission (NWC) submission conceded that due to the relatively low level of water use by mining in the MDB (around 1 % relative to the 68% used by agriculture), extraction and water use by mining operations was not considered in recent CSIRO reports.⁴²

3.26 The NWC submission stated that policy relating to mining is largely beyond the scope of the National Water Initiative (NWI). The NWC submission stated:

Clause 34 of the NWI states that the Parties agree that there may be special circumstances facing the minerals and petroleum sectors that will need to be addressed by policies and measures beyond the scope of the NWI Agreement. In this context, the Parties note that specific project proposals will be assessed according to environmental, economic and social considerations, and that factors specific to resource development projects, such as isolation, relatively short duration and water quality issues, and obligations to remediate and offset impacts, may require specific management arrangements outside the scope of the Agreement.⁴³

37 Murray-Darling Basin Authority, *Key elements of the Basin Plan*, available: http://www.mdba.gov.au/basin_plan/concept-statement/key-elements (accessed 24 November 2009).

38 Murray-Darling Basin Authority, *Key elements of the Basin Plan*, available: http://www.mdba.gov.au/basin_plan/concept-statement/key-elements (accessed 24 November 2009).

39 Murray-Darling Basin Authority, *Key elements of the Basin Plan*, available: http://www.mdba.gov.au/basin_plan/concept-statement/key-elements (accessed 24 November 2009).

40 Murray-Darling Basin Authority, *Key elements of the Basin Plan*, available: http://www.mdba.gov.au/basin_plan/concept-statement/key-elements (accessed 24 November 2009).

41 Dr Les Roberts, Executive Director, Murray-Darling Basin Authority, *Proof Committee Hansard*, 14 October 2009, p. 3.

42 National Water Commission, *Submission 33*, p. 4.

43 National Water Commission, *Submission 33*, p. 2.

3.27 As the Commonwealth's submission noted, an impact on water consumption within the Basin is only one of the impacts on water that mining may have. It may also present wastewater disposal issues, or may interfere with groundwater aquifers.⁴⁴ The Commonwealth currently has powers, defined in the *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act) to regulate mining activity that is likely to have a significant impact on a matter of national environmental significance.⁴⁵ Matters of national environmental significance, as outlined in the EPBC Act, include: listed threatened species and ecological communities; listed migratory species; wetlands of international importance; Commonwealth marine areas; World Heritage properties; National Heritage places; and nuclear actions.⁴⁶

3.28 The NWC agreed that if mining activities in the Basin were unregulated they had the potential to impact surface and groundwater systems in the MDB.⁴⁷ However, the NWC's submission did note that there were state regulatory mechanisms in place to ensure environmental protection.⁴⁸ The committee recognises that, historically, primary responsibility for regulating the impact of mining on the environment, including water resources, lies with the relevant state governments.

The role of the states

3.29 The NSW government submission emphasised that state government ownership of minerals confers exclusive rights to allocate resources and collect royalties resulting from their exploitation, making the people of NSW direct stakeholders in the continued success of mining in NSW.⁴⁹ The NSW government submission further stated that under the NSW *Mining Act 1992*, the government is obligated to ensure an appropriate return to the State from mineral resources.⁵⁰ The NSW government submission reiterated the enormous benefits (around \$174 million in royalties from mining in the MDB alone in 2008/09) delivered by mining that helped build infrastructure across NSW.⁵¹

3.30 The NSW government submission contended there is a strong regulatory framework that ensures that the impact of mining activities on the environment, agriculture and water resources is minimal.⁵² These regulations are outlined in a number of NSW government acts including the *Environmental Planning and*

44 Department of Environment, Water, Heritage and the Arts, *Submission 35*, p. 1.

45 Department of Environment, Water, Heritage and the Arts, *Submission 35*, p. 2.

46 Department of Environment, Water, Heritage and the Arts, *Submission 35*, p. 2.

47 National Water Commission, *Submission 33*, p. 6.

48 National Water Commission, *Submission 33*, p. 6.

49 NSW Department of Industry and Investment, *Submission 34*, p. 1.

50 NSW Department of Industry and Investment, *Submission 34*, p. 1.

51 NSW Department of Industry and Investment, *Submission 34*, p. 3.

52 NSW Department of Industry and Investment, *Submission 34*, p. 5.

*Assessment Act 1979; Mining Act 1992; Petroleum (Onshore) Act 1991; Protection of the Environment Operations Act 1997; Water Management Act 2000; and Water Act 1912.*⁵³ The NSW government submission intimated that the current mining operations in the Liverpool Plains comply with the regulatory arrangements established by these acts.

3.31 This position was strongly advocated in evidence to the committee from mining industry representatives who argued that the existing regulatory framework was rigorous and extensive. The NSW Minerals Council stated that they firmly believed that the existing regulatory framework more than adequately addresses the concerns raised by the inquiry.⁵⁴ The NSW Minerals Council argued that:

This [regulatory] framework allows for the evaluation and assessment of the potential impacts of any mining project, including impacts on the environment. Water-sharing plans and sustainable yield projects also specifically address the sustainable management of water resources that are so critical to our major primary industries of mining and agriculture. The New South Wales minerals industry, a leader in water management, is committed to working with landowners and other key stakeholders to ensure the best outcomes from developing the rich natural resources, both agriculture and mining related, in mining areas, including in the Namoi catchment.⁵⁵

3.32 The Queensland government submission, which echoed the views of the NSW government, stated that they had developed a thorough and transparent process that gave a voice to all interests including the local community, industry groups, the mining industry and environmental groups.⁵⁶ The Queensland government submission further stated that water management is a condition attached to every mining lease and that this includes the reduction of runoff and contamination.⁵⁷ However, understanding of the impact of coal seam methane extraction on water connectivity was not well understood due to the emerging nature of the industry.⁵⁸ The Queensland government submission pointed to the Commonwealth-funded coal seam gas water feasibility study as an example of an initiative designed to fill this gap in existing knowledge.⁵⁹

53 NSW Department of Industry and Investment, *Submission 34*, p. 7.

54 Ms Sue-Ern Tan, General Manager, Policy and Strategy, New South Wales Minerals Council, *Proof Committee Hansard*, 28 September 2009, p. 2.

55 Ms Sue-Ern Tan, General Manager, Policy and Strategy, New South Wales Minerals Council, *Proof Committee Hansard*, 28 September 2009, p. 2.

56 Queensland government, *Submission 73*, p. 2.

57 Queensland government, *Submission 73*, p. 3.

58 Queensland government, *Submission 73*, p. 4.

59 Queensland government, *Submission 73*, p. 4.

3.33 In Queensland, mining operations of the type examined by this inquiry are governed by a number of state acts including the *Mineral Resources Act 1989*; *Water Act 2000*; *Environmental Protection Act 1994*; *Petroleum and Gas (Production and Safety) Act 2004*; and *Nature Conservation Act 1992*.

3.34 The Queensland Resources Council submission argued that resource developments in the state were required to meet strict environmental licence conditions.⁶⁰ The Queensland Resources Council further stated that:

Both the EIS [environmental impact statement] and the development of a company's environmental operating requirements, called an environmental authority, have multiple regulatory requirements and processes in relation to public consultation, objection and appeal rights. In the case of mining, this provides substantial opportunity for community input into what a mine's rehabilitation should deliver. In short, the resources sector in Queensland operates under a strict multistage approvals process, including leading environmental safeguards to identify and recover the resources which belong to the population of the state. This government's accountabilities through its legislation, industry development policies and regulatory framework can achieve this potential.⁶¹

3.35 The NWC's submission stated that the regulatory regimes in all MDB states have been designed to require that proposals for major changes in land use, such as mining, will pass through detailed planning processes, including environmental impact assessments, at both the local and regional level.⁶²

3.36 As outlined by the NSW Minerals Council, concerns raised by community members about the viability of rehabilitation were primarily a matter for state government legislation:

We [the coal industry] do[es] not own the resources; the people of New South Wales own the coal and other mineral resources. We are merely acting on behalf of them in developing those resources and we return our payments back to the government by way of royalties—that is, over \$1.4 billion alone for this year. That is a lot of money that the people of New South Wales get back in consolidated state revenue.⁶³

3.37 The NSW Minerals Council further stated that:

The [state] government has chosen to put those areas up for exploration tender and obviously two of our members are interested in looking at it. It is

60 Mr Gregory Lane, Deputy Chief Executive, Industry Policy, Queensland Resources Council, *Proof Committee Hansard*, 29 September 2009, p. 48.

61 Mr Gregory Lane, Deputy Chief Executive, Industry Policy, Queensland Resources Council, *Proof Committee Hansard*, 29 September 2009, p. 48.

62 National Water Commission, *Submission 33*, p. 6.

63 Ms Sue-Ern Tan, General Manager, Policy and Strategy, New South Wales Minerals Council, *Proof Committee Hansard*, 28 September 2009, p. 7.

then up to the government to make the final decision about whether or not any mining operation should go ahead, taking into consideration everything, including the potential environmental impacts, the economic and social contribution of mining and a whole list of other factors as set up in the legislation here in New South Wales.⁶⁴

3.38 Mining industry representatives also pointed to the regulatory requirement for exploration and mining operations to lodge rehabilitation bonds to be held by the NSW Government.⁶⁵

3.39 The NSW Minerals Council and mining company submissions, including submissions by Shenhua and BHP, further emphasised that a licence to explore is not a licence to mine. They argued that there is a misconception within the community that mining operations will automatically follow exploration.⁶⁶ Mining industry representatives further stated that in order to proceed from an exploration licence to a mining operation a rigorous environmental assessment process must be completed.

3.40 While the committee acknowledges that this position does reflect the current regulations it also recognises that, in an overwhelming number of instances, mining operations do proceed when exploration has discovered commercially profitable resources.

3.41 The NSW government informed the committee that the combined \$400 million paid by Shenhua and BHP Billiton for exploration licenses in the Liverpool Plains was the highest amount ever to be paid for exploration permits in that state.⁶⁷ Mr Brad Mullard did, however, seek to reassure the committee that a mining permit was not a foregone conclusion despite the record price paid for the exploration licenses:

Senator WILLIAMS—So it is the highest. Wouldn't it be just natural that when a company puts in \$300 million, such as Shenhua does, to tender for the exploration rights they would expect to be mining at the end of it?

Mr Mullard—The conditions of the tender made it very clear that there would be no guarantee of approval of mining, that they would need to meet all of the normal government approvals processes. So we were not providing any assurance that at the end of the day they would be granted a mining lease. That was an absolute requirement and it was made very clear

64 Ms Sue-Ern Tan, General Manager, Policy and Strategy, New South Wales Minerals Council, *Proof Committee Hansard*, 28 September 2009, p. 6.

65 Ms Sue-Ern Tan, General Manager, Policy and Strategy, New South Wales Minerals Council, *Proof Committee Hansard*, 28 September 2009, p. 9.

66 Ms Sue-Ern Tan, General Manager, Policy and Strategy, New South Wales Minerals Council, *Proof Committee Hansard*, 28 September 2009, p. 9.

67 Mr Brad Mullard, Executive Director, Mineral Resources Branch, Industry and Investment NSW, *Proof Committee Hansard*, 19 November 2009, pp 18–19.

that in granting the exploration licence the government was in no way implying that mining approval would be given at the end.⁶⁸

A need for reform?

3.42 The committee recognises that management of water resources in the Murray Darling Basin is undergoing significant reform designed to ensure the sustainability of land uses in the region. There are aspects of the Basin Plan that will be positive in this regard, such as the inclusion of groundwater in Sustainable Diversion Limits. However, it was not clear to the committee that the existing framework for managing impacts of new developments in the Basin is adequate.

3.43 The adequacy of environmental protections guaranteed by existing regulations was questioned by a number of submitters and witnesses to the inquiry. The NFF submission expressed significant concerns over the adequacy of the regulatory processes that support the evaluation and operation and mining development. The NFF have sought greater clarity in regulations concerning access to land.⁶⁹ A number of other submitters and witnesses were concerned about the independence of environmental assessments, arguing that they were often self assessments by mining companies.

3.44 The Friends of Felton stated:

I think the mines tend to do their own monitoring. A common complaint is that the results tend to be averaged over a monthly period, so you can have a couple of really windy days with terrible dust levels and then a few calm days after that and, as long as the average is under the maximum limit, the EPA does nothing. There have to be changes there, I would say.⁷⁰

3.45 A number of witnesses also expressed reservations about the independence of governments that receive large amounts of mining royalties from the mining industry. The Haystack Road Coal Committee also expressed concern that independence was lacking in the Tarong Energy project:

The government owns Tarong and the government has been suggesting to Tarong that they need to sell Haystack Road for a mine. So we do not have a great deal of confidence that the government is this time going to pick up \$400 million for Haystack Road and then tell whoever buys it, 'You cannot mine it because it is prime country.'⁷¹

68 Mr Brad Mullard, Executive Director, Mineral Resources Branch, Industry and Investment NSW, *Proof Committee Hansard*, 19 November 2009, p. 19.

69 National Farmers Federation, *Submission 55*, p. 2.

70 Mr Robert McCreath, President, Friends of Felton Inc, *Proof Committee Hansard*, 29 September 2009, p. 28.

71 Mr Jeffrey Bidstrup, Chair, Haystack Road Coal Committee, *Proof Committee Hansard*, 29 September 2009, p. 11.

3.46 Such examples illustrate the range of regulatory shortfalls perceived by submitters and witnesses. However, the most pertinent complaint made by submitters and witnesses to this inquiry is the level of protection afforded to water resources, including recharge areas, in the MDB. Many submitters and witnesses argued that in the absence of detailed knowledge concerning the interconnectivity of groundwater systems with the MDB and the potential impacts mining could have on these water resources, the government should reconsider its decision to grant Mineral Exploration Licences in these areas. Namoi Water argued:

...the area should not have been released. I think the state department is negligent in releasing exploration licences in rectangles and then expecting the miners to go out and have a guess at what level of risk they are willing to undertake. That is what the government is asking the miners to do. That leaves landholders and communities in great uncertainty.⁷²

3.47 There are some signs that actions are being taken to address these concerns. There is some activity underway at a Commonwealth level to examine the impact of mining on the MDB. This includes:

- a) A \$2 million multi-jurisdictional NWC commissioned project titled: Potential Local and Cumulative effects of mining on Groundwater Resources – and the development of tools to aid prediction and minimisation of cumulative impacts;
- b) A \$1.5 million contribution by the Commonwealth to the joint study into surface and groundwater resources of the Namoi Catchment in NSW; and
- c) Up to \$5 million, subject to due diligence, for a feasibility study to analyse opportunities, risks and practicability of the use of coal seam gas water in parts of the Queensland MDB.⁷³

3.48 Section 255A of the Water Act also seeks to recognise the relationship between surface floodplain water and underground aquifers, specifically in the context of mining activity. Section 255A states:

255A Mitigation of unintended diversions

Prior to licences being granted for subsidence mining operations on floodplains that have underlying groundwater systems forming part of the Murray-Darling system inflows, an independent expert study must be undertaken to determine the impacts of the proposed mining operations on the connectivity of groundwater systems, surface water and groundwater flows and water quality.

3.49 What section 255A also highlights, however, is the lack of scientific knowledge that is hampering effective planning of developments in the basin.

72 Mr John Clements, Executive Officer, Namoi Water, *Proof Committee Hansard*, 28 September 2009, p. 19.

73 Department of Environment, Water, Heritage and the Arts, *Submission 35*, p. 3.

A lack of knowledge

3.50 Submitters and witnesses raised serious reservations about the viability of mining in an area where water resources sustain agricultural livelihoods. However, the committee found it difficult to substantiate the anecdotal evidence without concrete scientific analysis of the damage mining could potentially have on individual sites, the region and the broader MDB. Based on the limited evidence presented to the inquiry, it is possible that existing mining operations in the Liverpool Plains and the Darling Downs are largely compliant with the current regulatory framework. However, a lack of scientific knowledge can make it hard to know whether this compliance is complete, or whether it is actually protecting water resources and water quality within the Basin.

3.51 Evidence presented by the Department of Environment, Water, Heritage and the Arts (DEWHA) supported the view that there is currently a lack of adequate scientific knowledge around the groundwater management issues.⁷⁴ DEWHA stated:

The sites and data that we hold about water resources nationally and in the basin are much more comprehensive for surface water than for groundwater. Therefore, in the absence of a comprehensive information set about groundwater resources, when issues do come up they tend to have to be the subject of special purpose studies of this nature....‘Do we know enough about groundwater?’ I think the short answer is that there is a lot more to learn to bring our knowledge up to the level we have with surface water resources.⁷⁵

3.52 The Namoi Catchment Water Study is a study, partially funded by the Commonwealth:

into surface and groundwater resources of the Namoi Catchment in NSW. The study is intended to provide high quality information to help identify the risks associated with mining on water resources in the region, and to inform the NSW Government's decision-making processes.⁷⁶

3.53 The Namoi water study has been endorsed by mining companies, industry peak bodies and local community groups with funding provided by jointly by the Commonwealth and industry.⁷⁷ The study will look at the entire Namoi catchment area of which the Caroon Coal Project is one part.⁷⁸ Industry representatives and

74 Mr Tony Slatyer, First Assistant Secretary, Water Reform Division, Department of Environment, Water, Heritage and the Arts, *Proof Committee Hansard*, 14 October 2009, p. 24.

75 Mr Tony Slatyer, First Assistant Secretary, Water Reform Division, Department of Environment, Water, Heritage and the Arts, *Proof Committee Hansard*, 14 October 2009, p. 24.

76 DEWHA, *Submission 35*, p. 3.

77 Ms Sue-Ern Tan, General Manager, Policy and Strategy, New South Wales Minerals Council, *Proof Committee Hansard*, 28 September 2009, p. 5.

78 Ms Sue-Ern Tan, General Manager, Policy and Strategy, New South Wales Minerals Council, *Proof Committee Hansard*, 28 September 2009, p. 9.

Shenhua Watermark have further stated that information gathered during the exploration phase will be fed into the study.⁷⁹ The Shenhua submission stated:

Shenhua Watermark is committed to the success of the Namoi Water Study. All data produced as part of the Watermark Project will be presented for inclusion in the Study. Shenhua has committed funds to the study, an amount which has not yet been determined. Project Director for the Watermark Project, Joe Clayton, will also sit on the SAG [stakeholder advisory group] committee.⁸⁰

3.54 The NSW government has indicated that it would not be matching the funds contributed by the Commonwealth government to the joint water study in the Namoi Catchment. In an answer to a question without notice in the New South Wales Legislative Council, former minister the Hon. Ian Macdonald stated:

I am not writing out any cheque in relation to this matter. The Government has decided, following discussions with Mr Peters and the department on this matter, that it would not be matching the funds provided by the Commonwealth. Just because the Commonwealth has put up \$1.5 million for this or any other project does not mean that we should have to follow suit. However, my understanding from discussions in the committee is that adequate funds will be available for that water study.⁸¹

3.55 The committee is concerned that the NSW government appeared unwilling to fund important water studies, and does not appear to have given an undertaking to wait for the results of the Namoi water study before issuing further licences. The committee urges relevant state governments to play their part in expediting research so that the results can inform assessment and planning approval processes.

3.56 The committee believes that there is an important and increasing role for regional planning and for the Commonwealth in light of increasing evidence of impacts on water resources that cross jurisdictions within the Murray Darling Basin.

Stronger regional planning

3.57 During the current inquiry, there was support from a range of stakeholders for planning processes that operate at a regional level and take account of the cumulative effects of developments. A regional approach to planning was proposed by the Minerals Council of Australia during a previous inquiry by this committee, into the operation of the *Environment Protection and Biodiversity Conservation Act 1999*. At a public hearing on 9 December 2008 for that inquiry, the Minerals Council of Australia made the following comment:

We therefore consider that a more appropriate role for the Commonwealth would be in strategic bioregional planning, pre-emptive of development

79 Shenhua Watermark Pty Ltd, *Submission 72*, p. 5.

80 Shenhua Watermark Pty Ltd, *Submission 72*, p. 1.

81 New South Wales Legislative Council, *Hansard*, 27 October 2009, p. 18674.

pressure and across larger time frames. Individual projects would then be approved by states and territories, which would have responsibility to ensure that the project fits within the remit of the bioregional plan. The Commonwealth's role would then be to assess, list, monitor and report on ecological entities of national significance, to develop regional plans that cross-cut natural resource portfolios—for example, biodiversity, water, minerals and socioeconomic values—and audit states and developers on the subsequent implementation and compliance with these plans and approval conditions.⁸²

3.58 The chair of the Haystack Road Coal Committee drew attention to this proposal and supported it, suggesting it was a practical step that could better inform the debate on mining in the Murray Darling Basin.⁸³ Friends of Felton wanted a regional planning process that would involve land zoning to restrict the areas where mining could be undertaken.⁸⁴

3.59 The committee received evidence that the cumulative impact of mining is not currently being adequately monitored, making adequate regional planning impossible. Agforce stated that:

...the death by a thousand cuts or the cumulative impact that we are constantly referring to is at no point in time actually monitored, measured or verified by anyone other than the resource companies themselves. As mentioned by my colleague earlier, at this point in time the state government has the capacity to require that monitoring to be done under two specific sections of the petroleum and gas act. But until very recent times, regardless of the fact that some of these sites have been operational for several years now, that information has not been made available to the government, nor has the government actually chased it. So the overall knowledge about what that cumulative impact is, regardless of an action plan if there is an impact, is null and void at this point in time because it does not exist.⁸⁵

3.60 This view was echoed by the Minerals Council of Australia in December 2008:

Currently, we have a number of disparate processes that are occurring across the landscape. When mining companies are going for project approval they are looking at a small area of land and potentially going through six layers of processes to get access to that portion of land. A

82 Ms Melanie Stutsel, Director, Environment and Social Policy, Minerals Council of Australia, Inquiry into the operation of the *Environment Protection and Biodiversity Conservation Act 1999*, *Committee Hansard*, 9 December 2008, p. 3.

83 Mr Jeffrey Bidstrup, Chair, Haystack Road Coal Committee, *Proof Committee Hansard*, 29 September 2009, p. 6.

84 Mr Ian Whan, Friends of Felton, *Committee Hansard*, 29 September 2009, p. 32.

85 Mr Drew Wagner, Senior Policy Officer, Agforce, *Proof Committee Hansard*, 29 September 2009, p. 20.

neighbouring operation may be occurring that is perhaps a non-mining project. Currently, there is no process for actually looking at what the cumulative impact on the landscape is of those two disparate processes. There are two layers of silos—the silos of the individual projects themselves, often occurring in parallel with each other but not being considered as a combined entity and there are also a number of silos at the different layers of biodiversity, management and protection.⁸⁶

3.61 The Queensland Murray Darling Committee was likewise concerned that the cumulative effect of mining be assessed, to assess 'what the overall footprint of the industry may be'.⁸⁷ In Gunnedah, the committee heard similar concerns from Namoi Water, which was concerned about the lack of a planning process that considered water at a landscape scale.⁸⁸

3.62 Section 255A of the Commonwealth's Water Act, mentioned earlier, represents significant recognition of the need to plan development based on a holistic understanding of the links between groundwater systems and water flows in the Murray Darling Basin. The committee was however unable to determine if Section 255A covers interconnected underground water resources located in ridge country above floodplains, and not just the floodplains themselves. The committee also notes that this section of the Act does not seek to place a prohibition on the licensing of mining should the expert studies result in negative findings. Section 255A as it stands has the potential to ensure the discovery of potential negative impacts of a mining development on the Basin, yet the section triggers no mechanism that will prevent that impact.

3.63 Beyond such specific provisions, the committee believes that regional planning mechanisms would provide a more robust knowledge base from which to assess the viability of mining in a particular area and ensure that there is adequate knowledge of the potential risks to national water resources.

3.64 There also needs to be greater inter-government coordination and increased understanding of the cumulative impact of mining in the MDB. While case-by-case assessments are important, the committee believes that aggregating knowledge about a region and its water resource will enable a more thorough understanding of the cumulative impacts of mining in the MDB.

86 Ms Melanie Stutsel, Director, Environment and Social Policy, Minerals Council of Australia, Inquiry into the operation of the *Environment Protection and Biodiversity Conservation Act 1999*, *Committee Hansard*, 9 December 2008, p. 4.

87 Mr Geoff Penton, Chief Executive Officer, Queensland Murray Darling Committee, *Committee Hansard*, 29 September 2009, p. 38.

88 Mr John Clements, Executive Officer, Namoi Water, *Committee Hansard*, 28 September 2009, p. 16.

3.65 The committee suggests that the Namoi Catchment Water Study is an example of a regional planning process that is consistent with the proposal made by the Minerals Council of Australia and supported by other stakeholders. As such it deserves the support of all governments.

Recommendation 1

3.66 The committee recommends that all governments support the Namoi Catchment Water Study and not take further decisions in relation to the licensing of mining and extractive industries in the Namoi catchment until that study is completed and publicly released.

Recommendation 2

3.67 The committee recommends that, as a matter of priority and preferably prior to the release of future Mineral Exploration Licences, state governments establish regional water plans in areas potentially subject to mining or extractive industry operations.

Recommendation 3

3.68 The committee recommends that the Commonwealth Government:

- **investigate the scope of Section 255A of the *Water Act 2007* to determine whether it applies to groundwater resources located in ridge country. If this is not the case, the committee recommends that the Commonwealth Government amend Section 255A to include groundwater resources on all land types.**
- **Work with the states to ensure the prohibition of the licensing of mining or extractive industries in the event that a study conducted under section 255A indicates that development would have adverse impacts on groundwater resources and the environment.**

Recommendation 4

3.69 The committee, noting extensive planning and research already being undertaken including the National Water Initiative, the Basin Plan, regional water plans and other studies currently underway,

- **Urges all governments to maximise use of information and data gleaned from planning and research activities to ensure that coordinated analysis of regional water plans takes place, so as to better understand the cumulative impacts of mining in the Murray-Darling Basin; and**

- **Recommends that the Commonwealth Government works to ensure the prevention of new mines or extractive industries in the Murray Darling Basin if their impacts on water resources are inconsistent with the Basin Plan.**

Senator Simon Birmingham
Chair

Australian Greens Additional Comments

The Australian Greens welcome this report, which clearly validates the warnings raised by Darling Downs and Surat Basin communities at the epicentre of the conflict between resource extraction and farming.

The section titled '*A need for reform?*' is focused on the urgency of regulatory reform. Overall, what the committee learned in this inquiry is that tightening the regulations on a case by case basis – while essential – does not address the question of whether the short term benefits of coal mining on productive farmland outweigh the long-term costs of compromised land, damaged aquifers and reduced food security.

The Australian Greens believe that leaving the determination of such issues to Environmental Impact Assessments undertaken by State Governments is manifestly unsustainable and will in short order lead to the irreversible destruction of some of Australia's prime farming country.

The case for direct Commonwealth intervention is clearly made in the majority report, but the recommendations fail to reflect this fact. The Australian Greens believe that it is appropriate for the Commonwealth to apply a threshold test under the *Water Act 2007* to determine whether or not mining or resource extraction should be prohibited in a given area.

The Commonwealth reserves the right to assess and, if necessary, block development projects if their impacts on matters of national environmental significance breach legislative thresholds. It is the view of the Australian Greens that similar tests must apply in the case of irreversible damage to water resources or destruction of prime farmland. Arguments as to the constitutional ambiguity of the Commonwealth's powers to apply such a test should be a spur to clarification, rather than a deflection of the Federal Government's responsibilities in this regard.

We therefore propose the following recommendations as a complement to those in the majority report:

- 1. The constitutional heads of power under which the Commonwealth Government may intervene directly to prevent mining and extractive industries in prime farmland should be clarified as a matter of urgency.**
- 2. Amend the Water Act 2007 to prohibit the licensing of mining and extractive industries where they will have adverse impacts on groundwater resources and the environment.**

The Australian Greens would like to record our thanks to the community groups who gave evidence during the committee's hearings in Gunnedah and Oakey.

Senator Scott Ludlam
Australian Greens Senator for Western Australia

Appendix 1

Submissions

1. Ms Valerie Somerville
2. Friends of Felton Inc
3. Mrs Judith Bolin
4. Mr Alan Ellis
5. Mr Ian Cox
6. Mr Nigel Cox
7. Mr R David Corbett
8. Mrs Janet Cox
9. Mrs Janelle Cox
10. Mr Michael Bretherick
11. Mr Bernie Caffery
12. Mr Craig Cox
13. Cambooya Landcare Group Inc
14. Mrs Heather Ranclaud
15. Dr Louise Bidstrup
16. Mr Murray Boshammer
17. Ms Coralyn Ellis
18. Mr Alexander Biddulph
19. Ms Sarah Moles
20. Mr Wade Bidstrup
21. Ms Peta Craig
22. Mrs Marilyn Bidstrup
23. Mr Peter Curtis

24. Australian Society of Soil Science Inc
25. FutureFoodQld
26. Mr Nevin Olm
27. Ms Tammy Johnston
28. Queensland Murray-Darling Committee Inc
29. Caroon Coal Action Group – Coal Seam Methane Subcommittee
30. Jimbour Action Group
31. Narrabri Shire Council
32. Sustainable Minerals Institute
33. National Water Commission
34. Department of Industry and Investment, NSW Government
35. Department of the Environment, Water, Heritage and the Arts
36. Brigalow-Jimbour Floodplains Group Inc
37. Mr Scott Cooper
38. Number not used
39. Mrs Vicki Green
40. Australian Institute of Agricultural Science and Technology
41. Mr David Baker
42. Ms Sue Willis
43. Mr Jeff Taylor
44. Ms Nicola Chirlian
45. Ms Kirrily Blomfield
46. Ms Carol Mackerras
47. Number not used
48. Ms Catriona Simson
49. Mr Marcus Kuhn

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50. Mr Brendan Taylor
 51. Mr Peter Parnwell
 52. Mr Justin Honner
 53. Agforce Queensland
 54. Mrs Avriel Tyson
 55. National Farmers' Federation
 56. Carroona Coal Action Group
 57. Australian Petroleum Production and Exploration Association
 58. Queensland Resources Council
 59. Ms Bridget Gallagher
 60. Mr John Cleary
 61. Haystack Road Coal Committee
 62. Mr Gordon Hildred
 63. NSW Minerals Council
 64. Queensland Farmers' Federation
 65. CSIRO
 66. Ms Paola Cassoni
 67. Mr George Tlaskal
 68. Confidential
 69. Organic Federation of Australia
 70. New Acland Coal Pty Ltd
 71. Growcom
 72. Shenhua Watermark Coal Pty Limited
 73. Queensland Government
 74. Minerals Council of Australia
 75. Biological Farmers of Australia Ltd

- 76. Dr Pauline Roberts
- 77. Mr A J Pickard
- 78. Kialla Pure Foods
- 79. Confidential
- 80. Confidential
- 81. Coolabunia-Taabinga Concerned Residents
- 82. Environment and Property Protection Association
- 83. Mr Ian Hayllor
- 84. Santos Limited
- 85. Mr Richard and Mrs Jan Thallon

Appendix 2

Public hearings

Monday, 28 September 2009 – Gunnedah, New South Wales

New South Wales Minerals Council

Ms Sue-Ern Tan, General Manager, Policy and Strategy

Ms Rachelle McDonald, Director, Environment and Community

Namoi Water

Mr John Clements, Executive Officer

Caroona Coal Action Group

Mr Timothy Duddy, Spokesman

Mrs Rosemary Nankivell, Chair, Coal Seam Methane Subcommittee

Mrs Kirrily Blomfield (Private capacity)

Mrs Bridget Gallagher (Private capacity)

Tuesday, 29 September – Oakey, Queensland

Haystack Road Coal Committee

Mr Jeffrey Bidstrup, Chair

Agforce Queensland

Mr Drew Wagner, Senior Policy Officer

Mr Wayne Newton, Councillor

Friends of Felton Inc

Mr Robert McCreath, President

Mrs Vicki Green, Member

Mr Ian Whan, Committee Member

Jimbour Action Group

Mr St John Kent, Member

Queensland Murray-Darling Committee

Mr Geoff Penton, Chief Executive Officer

Father Gary Harch, Vice-Chair

Mrs Elizabeth Todd, Policy and Planning Project Support Officer

Queensland Resources Council

Mr Greg Lane, Deputy Chief Executive

Mr Andrew Barger, Director, Industry Policy

Santos

Mr Stephen Kelemen, Manager, CSG

Mr Samuel James, Senior Adviser, Public Affairs

Mr Shaun Davidge, Manager, Water Strategies

Wednesday, 14 October 2009 – Canberra, ACT

Murray-Darling Basin Authority

Mr Les Roberts, Executive Director, Basin Plan Division

Dr Tony McLeod, General Manager, Basin Plan Division

Department of the Environment, Water, Heritage and the Arts

Mr Tony Slatyer, First Assistant Secretary, Water Reform Division

Mr Russell James, Assistant Secretary, Water Resources Branch

Thursday, 19 November 2009 – Canberra, ACT

Department of Industry and Investment, NSW

Mr Brad Mullard, Executive Director, Mineral Resources Branch

Ms Elise Newberry, Director, Environmental Sustainability Unit

Appendix 3

Tabled documents, additional information received and answers to questions taken on notice

Tabled documents

Warrah Creek Geological Map, tabled by Mrs Bridget Gallagher (from public hearing, Gunnedah, 28 September 2009)

Map showing Haystack Road Coal Resource Area and statement, tabled by the Haystack Road Coal Committee (from public hearing, Oakey, 29 September 2009)

Charts – Targets & Aquifers, Corehole – surface casing, Corehole – intermediate casing, Santos is developing food-growing irrigation projects using Associated Water, Beef production + 400 tonnes beef/yr from irrigated leucaena/grass forages, tabled by Santos (from public hearing, Oakey, 29 September 2009)

Additional information

BHP Billiton's opening statement to the Senate Select Committee on Agriculture and Related Industries Inquiry into Food Production in Australia, 18 September 2009

Total volume of salt likely to be produced in the Surat Basin, Mr Wayne Newton, Agforce Queensland

Fitzroy Basin experience – Ecological values are being eroded, Haystack Road Coal Committee

Answers to questions taken on notice

New South Wales Minerals Council Ltd (from public hearing, Gunnedah, 28 September 2009)

