

The Senate

---

Select Committee on  
Unconventional Gas Mining

---

Interim report

May 2016

© Commonwealth of Australia 2016

ISBN 978-1-76010-403-0

This work is licensed under the Creative Commons Attribution-Non-commercial-NoDerivs 3.0 Australia License.



The details of this licence are available on the Creative Commons website:  
<http://creativecommons.org/licenses/by-nc-nd/3.0/au/>

Printed by the Senate Printing Unit, Parliament House, Canberra.

# Members of the Committee

## Members

Senator Glenn Lazarus <b>Chair</b>	QLD GLT
Senator the Hon Joseph Ludwig, <b>Deputy Chair</b>	QLD ALP
Senator the Hon David Johnston	WA LP
from 23 February 2016	
Senator the Hon Matthew Canavan	QLD LP
to 23 February 2016	
Senator Joanna Lindgren	QLD LP
Senator Anne McEwen	SA ALP
Senator Larissa Waters	QLD AG

## Participating members

Senator Lee Rhiannon	NSW AG
Senator Nova Peris	NT ALP

## SECRETARIAT

Ms Toni Matulick, Secretary  
Dr Jon Bell, Principal Research Officer  
Ms Aleshia Westgate, Senior Research Officer  
Ms Annemieke Jongsma, Senior Research Officer  
Ms Ashlee Hill, Research Officer  
Mr Michael Perks, Administrative Officer  
Mr Antonios Vlachos, Administrative Officer

PO Box 6100  
Parliament House  
Canberra ACT 2600

T: +61 2 6277 3544

E: [gasmining.sen@aph.gov.au](mailto:gasmining.sen@aph.gov.au)

W: [http://www.aph.gov.au/Parliamentary\\_Business/Committees/Senate/Gasmining](http://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Gasmining)



# Table of Contents

<b>Members of the Committee.....</b>	<b>iii</b>
<b>Chapter 1.....</b>	<b>1</b>
<b>Introduction .....</b>	<b>1</b>
Conduct of the inquiry .....	1
Previous inquiries .....	2
Structure of the report.....	2
<b>Chapter 2.....</b>	<b>5</b>
<b>Background to unconventional gas mining.....</b>	<b>5</b>
Status of unconventional gas mining in Australia.....	5
Unconventional gas mining .....	6
Location and operation of unconventional gas mining in Australia .....	11
The unconventional gas mining industry as a job provider.....	17
<b>Chapter 3.....</b>	<b>21</b>
<b>Property, mineral and petroleum rights in Australia .....</b>	<b>21</b>
Property, mineral and petroleum rights .....	21
Land access issues .....	22
Land access negotiation.....	26
Legislative and regulatory framework .....	29
<b>Chapter 4.....</b>	<b>43</b>
<b>The health, social, business, agricultural, environmental landholder and economic impacts of unconventional gas mining.....</b>	<b>43</b>
The rights of landholders.....	45
Health.....	49

Impact on agriculture.....	56
Water resources .....	64
Social impact .....	68
<b>Chair's Additional Comments and Recommendations.....</b>	<b>71</b>
Community concerns.....	71
Impact of unconventional gas mining on the environment .....	72
Regulation of the unconventional gas mining industry.....	73
Concluding remarks.....	74
<b>Additional comments by Opposition Senators.....</b>	<b>79</b>
Introduction .....	79
Health.....	79
Environment .....	79
Land access.....	80
GasFields Commission Queensland.....	80
Opportunities for Northern Australia .....	81
Conclusion .....	81
<b>Additional comments by Senator Nova Peris OAM.....</b>	<b>1</b>
<b>Senator for the Northern Territory .....</b>	<b>1</b>
<b>Additional comments by Government Senators .....</b>	<b>85</b>
<b>Australian Greens' Additional Comments .....</b>	<b>87</b>
A potted parliamentary history of unconventional gas .....	87
Community sentiment .....	88
Looking forward.....	88
Fixing the system – banning mining donations.....	90
<b>Appendix 1 .....</b>	<b>93</b>
<b>Submissions .....</b>	<b>93</b>

<b>Additional Information .....</b>	<b>99</b>
<b>Appendix 2.....</b>	<b>103</b>
<b>Public hearings and witnesses .....</b>	<b>103</b>





# Chapter 1

## Introduction

1.1 On 12 November 2015, the Senate resolved to establish the Select Committee on Unconventional Gas Mining to inquire into and report on or before 30 June 2016 on matters relating to the following:

The adequacy of Australia's legislative, regulatory and policy framework for unconventional gas mining including coal seam gas (CSG) and shale gas mining, with reference to:

- (a) a national approach to the conduct of unconventional gas mining in Australia;
- (b) the health, social, business, agricultural, environmental, landholder and economic impacts of unconventional gas mining;
- (c) government and non-government services and assistance for those affected;
- (d) compensation and insurance arrangements;
- (e) compliance and penalty arrangements;
- (f) harmonisation of federal and state/territory government legislation, regulations and policies;
- (g) legislative and regulatory frameworks for unconventional gas mining in comparable overseas jurisdictions;
- (h) the unconventional gas industry in Australia as an energy provider;
- (i) the current royalty and taxation arrangements associated with unconventional gas mining; and
- (j) any related matter.<sup>1</sup>

### Conduct of the inquiry

1.2 The committee advertised the inquiry on its website, and wrote to organisations and individuals inviting submissions by 14 March 2016. The committee continued to accept submissions past the submissions closing date.

1.3 The committee has published 298 submissions, and has held three public hearings. A list of submitters to the inquiry is at Appendix 1.

1.4 The committee held public hearings in Dalby, Queensland, on 17 February 2016, in Narrabri, NSW, on 29 March 2016, and in Darwin, Northern Territory, on 12 April 2016. A list of the public hearings conducted and witnesses is at Appendix 2.

---

1 *Journals of the Senate* 126, pp 3378-3380.

1.5 The committee would like to thank all the organisations and individuals that have contributed to the inquiry. The committee would also like to acknowledge the work of the Parliamentary Library in assisting with background research.

### **Previous inquiries**

1.6 Unconventional gas mining, particularly coal seam gas (CSG) mining, has been examined as part of the following recent Commonwealth and state parliamentary inquiries:

- Victorian Legislative Council Environment and Planning Committee, which reported on 8 December 2015;<sup>2</sup>
- Senate Environment and Communications Committee Legislation Committee inquiry into the Landholders' Right to Refuse (Gas and Coal) Bill 2015, which tabled its report in September 2015;<sup>3</sup>
- Senate Select Committee into Certain Aspects of Queensland Government Administration related to Commonwealth Government Affairs, which tabled its final report in March 2015;<sup>4</sup>
- New South Wales Legislative Council General Purpose Standing Committee (No. 5) which released its final report on coal seam gas in March 2012;<sup>5</sup> and
- Senate Rural Affairs and Transport References Committee, Management of the Murray Darling Basin Interim report: the impact of mining coal seam gas on the management of the Murray Darling Basin, November 2011.<sup>6</sup>

### **Structure of the report**

1.7 This interim report sets out evidence received by the committee through submissions and public hearings conducted, and will address the majority of the terms

- 
- 2 Victorian Legislative Council Environment and Planning Committee, *Inquiry into unconventional gas in Victoria*, <http://www.parliament.vic.gov.au/epc/references-committee-inquiries/article/2633>.
  - 3 Senate Environment and Communications Committee Legislation Committee, *Landholders' Right to Refuse (Gas and Coal) Bill 2015*, September 2015, [http://www.aph.gov.au/Parliamentary\\_Business/Committees/Senate/Environment\\_and\\_Communications/Gas\\_and\\_Coal](http://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Environment_and_Communications/Gas_and_Coal).
  - 4 Senate Select Committee into Certain Aspects of Queensland Government Administration related to Commonwealth Government Affairs, *Report*, March 2015, [http://www.aph.gov.au/Parliamentary\\_Business/Committees/Senate/Certain\\_Aspects\\_of\\_Queensland\\_Government\\_Administration/Certain\\_Aspects\\_Qld\\_Admin/Report](http://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Certain_Aspects_of_Queensland_Government_Administration/Certain_Aspects_Qld_Admin/Report).
  - 5 New South Wales Legislative Council General Purpose Standing Committee (No. 5), *Final report – Coal seam gas*, May 2012, [http://www.parliament.nsw.gov.au/prod/parlment/committee.nsf/0/29AE48525CF8A7CCA2578E3001ABD1C?open&refnavid=CO4\\_2](http://www.parliament.nsw.gov.au/prod/parlment/committee.nsf/0/29AE48525CF8A7CCA2578E3001ABD1C?open&refnavid=CO4_2).
  - 6 Senate Rural Affairs and Transport References Committee, *Management of the Murray Darling Basin Interim report*, [http://www.aph.gov.au/Parliamentary\\_Business/Committees/Senate/Rural\\_and\\_Regional\\_Affairs\\_and\\_Transport/Completed%20inquiries/2012-13/mdb/interimreport/index](http://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Rural_and_Regional_Affairs_and_Transport/Completed%20inquiries/2012-13/mdb/interimreport/index).

---

of reference. The committee notes that it has not received significant evidence in relation to terms of reference (d), (e) and (i) and therefore has not reported on those terms of reference. The committee also notes that limited evidence was provided in relation to terms of reference (c) and (g), and on this basis has reported to a limited extent on these terms of reference.

1.8 The committee notes that this is an interim report and should it have the time to do so, will report on these matters in a future report.

1.9 Chapter 2 provides background information on unconventional gas mining and sets out:

- the status of unconventional gas mining in Australia;
- what unconventional gas mining is and where it occurs, including information on coal seam gas mining, shale and tight gas mining, hydraulic fracturing ('fracking') and underground coal gasification; and
- the unconventional gas mining industry as a job creator and employer.

1.10 Chapter 3 examines:

- the domestic regulatory framework for unconventional gas mining;
- harmonisation of federal and state/territory government legislation, regulations and policies; and
- some information on how unconventional gas mining is regulated in international jurisdictions.

1.11 Chapter 4 addresses term of reference (b), and will particularly set out evidence received relating to:

- landholders' rights in relation to unconventional gas mining;
- potential impacts on human health;
- the potential impact on agriculture, including supply chain integrity and domestic and export capacity;
- the potential impact on water quality and quantity; and
- the social impact of unconventional gas mining.



# Chapter 2

## Background to unconventional gas mining

2.1 This chapter will:

- set out the status of unconventional gas mining in Australia;
- explain what unconventional gas mining is and where it occurs, including information on coal seam gas mining, shale and tight gas mining, hydraulic fracturing ('fracking') and underground coal gasification; and
- discuss the unconventional gas mining industry as a job creator and employer.

### Status of unconventional gas mining in Australia

2.2 Unconventional gas mining, specifically, coal seam gas mining, is currently operational on a commercial production scale in Queensland and New South Wales. In Queensland, unconventional gas mining activity is underway in the Western Downs Region.

2.3 There is currently no commercial production of shale and tight gas in Australia.

2.4 On 4 February 2016, AGL announced that it expected to sell its natural gas assets in Queensland, cease production on the NSW Camden Gas Project in 2023, and not proceed with the planned NSW Gloucester Gas Project.<sup>1</sup>

2.5 Exploration for unconventional gas mining is currently under way in Queensland,<sup>2</sup> and South Australia, Western Australia and the Northern Territory, which have shale and tight gas exploration.<sup>3</sup>

2.6 An immediate ban on underground coal gasification, a process by which coal is transformed into synthesis gas in situ, was announced on 18 April 2016 by the Queensland Minister for Natural Resources and Energy.<sup>4</sup>

---

1 AGL, 'Review of gas assets and exit of gas exploration and production', *Media release*, <https://www.agl.com.au/about-agl/media-centre/article-list/2016/february/review-of-gas-assets-and-exit-of-gas-exploration-and-production> (accessed 21 April 2016).

2 Queensland Department of Natural Resources and Mines, *Deep gas and oil in Queensland*, <https://www.dnrm.qld.gov.au/our-department/policies-initiatives/mining-resources/resources-policies/deep-gas-oil/deep-gas-oil-qld> (accessed 21 April 2016).

3 Santos, *Shale gas*, <https://www.santos.com/what-we-do/production/natural-gas/shale-gas/> (accessed 7 January 2016); Northern Territory Department of Mines and Energy, *Submission 37*, p. 6.

4 Minister for State Development and Minister for Natural Resources and Mines The Honourable Anthony Lynham, Minister for Environment and Heritage Protection and Minister for National Parks and the Great Barrier Reef The Honourable Steven Miles, 'Underground coal gasification banned in Queensland', *Joint statement*, <http://statements.qld.gov.au/Statement/2016/4/18/underground-coal-gasification-banned-in-queensland> (accessed 19 April 2016).

## Unconventional gas mining

2.7 'Unconventional' resources are natural resources which require technology and investment greater than the industry standard in order to be recovered. Unconventional gas is found in complex geological systems, and includes coal seam gas (CSG), shale gas and tight gas. Unconventional gas resources include natural gas which is extracted from coal seams (coal seam gas/CSG) and from shale rock layers (shale gas).<sup>5</sup>

2.8 Natural gases like methane (CH<sub>4</sub>) are fossil fuels formed naturally in the earth from decayed organic material.<sup>6</sup> Methane makes up the majority of natural gas mixtures which are extracted by coal seam gas mining.

2.9 According to CSIRO, 'Australia has vast resources of unconventional gas', but it 'can be difficult to produce'.<sup>7</sup> CSIRO explained the difference between conventional and unconventional gas:

Conventional natural gas and CSG are chemically similar. CSG is almost pure methane; conventional gas is around 90 per cent methane with ethane, propane, butane and other hydrocarbons making up the remainder. The difference between CSG/shale gas and conventional gas is the type of geological rock they are found in.<sup>8</sup>

2.10 According to Geoscience Australia, at the current rate of production in Australia there is a gas reserve life of around 150 years, however, they note that production rates are likely to substantially increase.<sup>9</sup>

### *Coal seam gas (CSG)*

2.11 Gas from coal seams is typically extracted from depths of 300 to 1,000 metres and is a colourless, odourless mixture of gases, although the predominant gas is methane, making up 95-97 per cent of the mixture.<sup>10</sup>

---

5 Geoscience Australia, *Unconventional petroleum resources*, <http://www.ga.gov.au/scientific-topics/energy/resources/petroleum-resources/unconventional-resources> (accessed 3 November 2015).

6 Roger Beckman, *Guide to gas*, Australian Parliamentary Library Publication, [http://parlinfo.aph.gov.au/parlInfo/download/library/prspub/4133159/upload\\_binary/4133159.pdf;fileType=application%2Fpdf#search=%22guide%20to%20gas%22](http://parlinfo.aph.gov.au/parlInfo/download/library/prspub/4133159/upload_binary/4133159.pdf;fileType=application%2Fpdf#search=%22guide%20to%20gas%22) (accessed 24 November 2015).

7 CSIRO, *What is unconventional gas?*, <http://www.csiro.au/en/Research/Energy/Hydraulic-fracturing/What-is-unconventional-gas> (accessed 24 November 2015).

8 CSIRO, *What is unconventional gas?*, <http://www.csiro.au/en/Research/Energy/Hydraulic-fracturing/What-is-unconventional-gas> (accessed 24 November 2015).

9 Geoscience Australia, *Atlas of minerals resources, mines and processing centres*, [http://www.australianminesatlas.gov.au/education/fact\\_sheets/coal\\_seam\\_gas.html](http://www.australianminesatlas.gov.au/education/fact_sheets/coal_seam_gas.html) (accessed 7 January 2016).

10 CSIRO, *What is unconventional gas?*, <http://www.csiro.au/en/Research/Energy/Hydraulic-fracturing/What-is-unconventional-gas> (accessed 24 November 2015).

2.12 Coal seam gas (CSG) can be extracted vertically or horizontally to access as much of the gas reservoir as possible. In order to access coal seam gas, a well is drilled to a depth of 300 to 1,000 metres to reach a coal seam. The well is lined with cement and steel casings near the surface in order to protect groundwater from becoming contaminated. Water in the coal seam is pumped out in order to release stored gas, although if the water and gas do not flow freely, hydraulic fracturing may be used.<sup>11</sup>

### *Hydraulic fracturing*

2.13 Hydraulic fracturing requires a perforation to the well casing to allow access to the coal, after which water containing chemical additives (hydraulic fracturing fluid) is pumped at high pressure to open existing fractures called 'cleats'. A proppant (such as sand) is then added to the water, which keeps the fractures open, allowing gas to flow to the well and up to the surface. Once at the surface, the extracted gas is separated from the water and is processed for transportation and use. Chemicals and salts are removed from the water, and the water is then re-used or disposed of.<sup>12</sup>

2.14 The Department of Environment and Heritage Protection (QLD) set out the process for the disposal of hydraulic fracturing fluid:

After a reservoir rock formation has been fraced, fracing fluids mixed with groundwater (collectively known as fracc flowback water) are pumped out of the well. This water is stored in specially designed and constructed dams or above ground holding tanks. Fracc flowback water may be reused in subsequent fracing activities or treated to the appropriate environmental and human health standards for other uses.

After fracing has occurred, the quality and quantity of fracc flowback water must be monitored until one-and-a-half times (150 per cent) the amount of the fluid used in the fracc has been removed from the well. This is to ensure that all water used for the fracc is removed.

Comprehensive impact monitoring requirements for landholders (sic) bores can continue for up to five years after fracing has occurred.<sup>13</sup>

2.15 According to the industry sector, the fluid used to open fractures during the hydraulic fracturing process is made up of water (84 to 96 per cent), proppant (3 to 15 per cent), and chemical and toxic substances. CSIRO set out some commonly used additives in hydraulic fracturing fluid:

- guar gum (a food thickening agent) is used to create a gel that transports sand through the fracture

---

11 CSIRO, *What is unconventional gas?*, <http://www.csiro.au/en/Research/Energy/Hydraulic-fracturing/What-is-unconventional-gas> (accessed 24 November 2015).

12 CSIRO, *What is unconventional gas?*, <http://www.csiro.au/en/Research/Energy/Hydraulic-fracturing/What-is-unconventional-gas> (accessed 24 November 2015).

13 Department of Environment and Heritage Protection (QLD), *Disposal of fracing fluid*, <https://www.ehp.qld.gov.au/management/non-mining/disposal-fracing-fluid.html> (accessed 6 January 2016).

- bactericides, such as sodium hypochlorite (pool chlorine) and sodium hydroxide (used to make soap), are used to prevent bacterial growth that contaminates gas and restricts gas flow
- 'breakers', such as ammonium persulfate (used in hair bleach), that dissolve hydraulic fracturing gels so that they can transmit water and gas surfactants, such as ethanol and the cleaning agent orange oil, are used to increase fluid recovery from the fracture
- acids and alkalis, such as acetic acid (vinegar) and sodium carbonate (washing soda) to control the acid balance of the hydraulic fracturing fluid.<sup>14</sup>

2.16 The Queensland Government estimates that of the 5,000 conventional and domestic petroleum and gas wells currently in Queensland, around 400 wells (or eight per cent) have been fracked. They further estimate that 'as the industry expands, between 10 and 40 per cent of wells may be fracked'.<sup>15</sup>

2.17 The NSW Department of Industry, Energy and Resources states that horizontal drilling has emerged 'as an alternative to hydraulic fracturing and [is] increasingly used in NSW'.<sup>16</sup> Horizontal drilling was developed in the 1980s in the United States, and has enabled unconventional deposits to be reached more easily.<sup>17</sup> Once a vertical well has been drilled to the coal seam and lined with cement, smaller holes are drilled horizontally into the coal seam, removing the need for hydraulic fracturing.<sup>18</sup> Horizontal wells can extend several kilometres.

2.18 Coal seam gas has been used for energy in Australia since 1997. Currently, CSG production fields are located in the Bowen and Surat Basins in Queensland.

### *Shale gas*

2.19 Shale is a fine-grained rock made up of compressed deposits of mud, silt, clay and organic matter, and makes up more than half of the earth's sedimentary rock.

2.20 Shale has a low permeability, allowing fluid and gas to pass through it. Over time, the heat of burial causes the organic matter to transform into oil, and then into

---

14 CSIRO, *What is hydraulic fracturing?*, <http://www.csiro.au/en/Research/Energy/Hydraulic-fracturing/a-What-is-hydraulic-fracturing> (accessed 24 November 2015).

15 Department of Environment and Heritage Protection (QLD), *Fracking*, <https://www.ehp.qld.gov.au/management/non-mining/fracking.html> (accessed 6 January 2016).

16 NSW Department of Industry, *How is coal seam gas extracted?*, <http://www.resourcesandenergy.nsw.gov.au/landholders-and-community/coal-seam-gas/the-facts/how-is-coal-seam-gas-extracted> (accessed 6 January 2016).

17 Victorian Parliament, *Inquiry into onshore unconventional gas in Victoria - Final Report*, December 2015, p. 10.

18 NSW Department of Industry, *How is coal seam gas extracted?*, <http://www.resourcesandenergy.nsw.gov.au/landholders-and-community/coal-seam-gas/the-facts/how-is-coal-seam-gas-extracted> (accessed 6 January 2016).



---

natural gas (shale gas). Shale gas is mainly made up of methane, and is typically found at depths greater than 1,000 metres.<sup>19</sup>

2.21 Shale gas can travel to an overlying rock layer, such as sandstone, and form a reservoir, which can be exploited as conventional gas. However, the gas can be trapped in the shale, or be absorbed onto clay minerals and organic matter. Shale gas reservoirs require fracturing in order to allow the gas to flow.<sup>20</sup> Horizontal drilling is often used in the exploitation of shale gas to maximise the recovery of the gas.<sup>21</sup>

2.22 The process for shale gas production includes an exploration phase and a production phase:

The exploration phase of shale gas production involves drilling and fracturing vertical wells to verify the presence of gas, characterise it and determine whether it can be economically produced. The number of wells drilled in the exploration phase can range from two to 15 wells in a lease area. Up to 30 wells may be drilled to gain more data on the pressure and geology of the resource.

...

Once a shale formation is located by vertical drilling, the direction of the drill bit is changed to run horizontally to maximise the wells exposure to the reservoir.<sup>22</sup>

2.23 During the production phase, gas is 'recovered' from the wells:

Recovery of the gas from an individual well can range from 28-40 per cent of the total gas present...Historically the average well spacing for vertical wells is 400 metres while spacing between horizontal wells is a function of the shape of the induced fractures, but is often at least 800 metres. Operators aim to increase well spacing to reduce costs and environmental impacts.<sup>23</sup>

- 
- 19 CSIRO, *Shale gas production*, <http://research.csiro.au/oilandgas/wp-content/uploads/sites/49/2015/10/Shale-Gas-Production-2015.pdf> (accessed 24 November 2015).
- 20 CSIRO, *Shale gas production*, <http://research.csiro.au/oilandgas/wp-content/uploads/sites/49/2015/10/Shale-Gas-Production-2015.pdf> (accessed 24 November 2015).
- 21 Victorian Parliament, *Inquiry into onshore unconventional gas in Victoria - Final Report*, December 2015, p. 12.
- 22 CSIRO, *Shale gas production*, <http://research.csiro.au/oilandgas/wp-content/uploads/sites/49/2015/10/Shale-Gas-Production-2015.pdf> (accessed 24 November 2015).
- 23 CSIRO, *Shale gas production*, <http://research.csiro.au/oilandgas/wp-content/uploads/sites/49/2015/10/Shale-Gas-Production-2015.pdf> (accessed 24 November 2015).

### ***Underground coal gasification***

2.24 Underground coal gasification is a process by which coal is transformed into a gas. In this process, coal seams are partially burnt in situ to release a mixture of carbon monoxide and hydrogen, known as synthesis gas or 'syngas'.<sup>24</sup> Syngas can be used to generate electricity once at the surface and 'offers the potential to extract energy from coal seams that are too deep to mine economically'.<sup>25</sup>

2.25 Syngas refers to:

...a mixture primarily of hydrogen (H<sub>2</sub>) and carbon monoxide (CO) which may also contain significant but lower concentrations of methane (CH<sub>4</sub>) and carbon dioxide (CO<sub>2</sub>) as well as smaller amounts of impurities such as chlorides, Sulfur compounds, and heavier hydrocarbons.

...

Syngas is used as an intermediate in the industrial synthesis of ammonia and fertilizer...One of the uses of this syngas is as a fuel to manufacture steam or electricity. Another use is as a basic chemical building block for many petrochemical and refining processes.<sup>26</sup>

2.26 Underground coal gasification has occurred in Australia in three locations:

- Kingaroy, Queensland;
- Bloodwood Creek, near Dalby, Queensland; and
- near Chinchilla, Queensland.<sup>27</sup>

2.27 On 18 April 2016, the Queensland State Development Minister and Minister for Natural Resources and Mines, Dr Anthony Lynham, announced an immediate ban on underground coal gasification.<sup>28</sup> Dr Lynham said:

---

24 Linc Energy, *Overview of Underground Coal Gasification 01 UCG Series*, [http://www.lincenergy.com/data/info\\_sheets/Underground\\_Coal\\_Gasification.pdf](http://www.lincenergy.com/data/info_sheets/Underground_Coal_Gasification.pdf) (accessed 19 April 2016).

25 Roger Beckman, *Guide to gas*, Australian Parliamentary Library Publication, [http://parlinfo.aph.gov.au/parlInfo/download/library/prspub/4133159/upload\\_binary/4133159.pdf;fileType=application%2Fpdf#search=%22guide%20to%20gas%22](http://parlinfo.aph.gov.au/parlInfo/download/library/prspub/4133159/upload_binary/4133159.pdf;fileType=application%2Fpdf#search=%22guide%20to%20gas%22) (accessed 24 November 2015).

26 Abhishek Nandan, Nihal Anwar Siddiqui, Prasenjit Mondal, Kanishak Chaudhary, Rishi Pandey, 'Hazards Associated to Synthesis Gas and its Mitigation Measures', *Research J. Engineering and Tech.* 5(3): July - September, 2014, 144-146, p. 144.

27 Minister for State Development and Minister for Natural Resources and Mines The Honourable Anthony Lynham, Minister for Environment and Heritage Protection and Minister for National Parks and the Great Barrier Reef The Honourable Steven Miles, 'Underground coal gasification banned in Queensland', *Joint statement*, <http://statements.qld.gov.au/Statement/2016/4/18/underground-coal-gasification-banned-in-queensland> (accessed 19 April 2016).

We have looked at the evidence from the pilot-operation of UCG and we've considered the compatibility of the current technologies with Queensland's environment and our economic needs.

The potential risks to Queensland's environment and our valuable agricultural industries far outweigh any potential economic benefits...

The ban applies immediately as government policy, and I will introduce legislation to the Parliament by the end of the year to make it law.<sup>29</sup>

2.28 The ban was announced in response to serious environmental and health issues associated with the Chinchilla project.

2.29 On 10 June 2015, the Queensland Government commenced legal action against Linc Energy, alleging that their underground coal gasification plant had contaminated the soil around the Hopeland area of Queensland with carbon monoxide, hydrogen and hydrogen sulphide.<sup>30</sup>

2.30 Issues related to the health impacts associated with unconventional gas mining and evidence considered by the committee is discussed in Chapter 3.

## **Location and operation of unconventional gas mining in Australia**

### ***Coal seam gas mining***

2.31 Queensland and New South Wales are the only states with commercial production of coal seam gas, although exploration has occurred in other states. Unconventional gas has been mined in Queensland since 1996, and in New South Wales since 2001.

2.32 Australia's main reserves of coal seam gas are found on the eastern side of the country, in Queensland and New South Wales, with the two largest basins (the Surat Basin and the Bowen Basin) located in Queensland. The map below (Map 1) shows coal seam gas reserves and gas infrastructure.

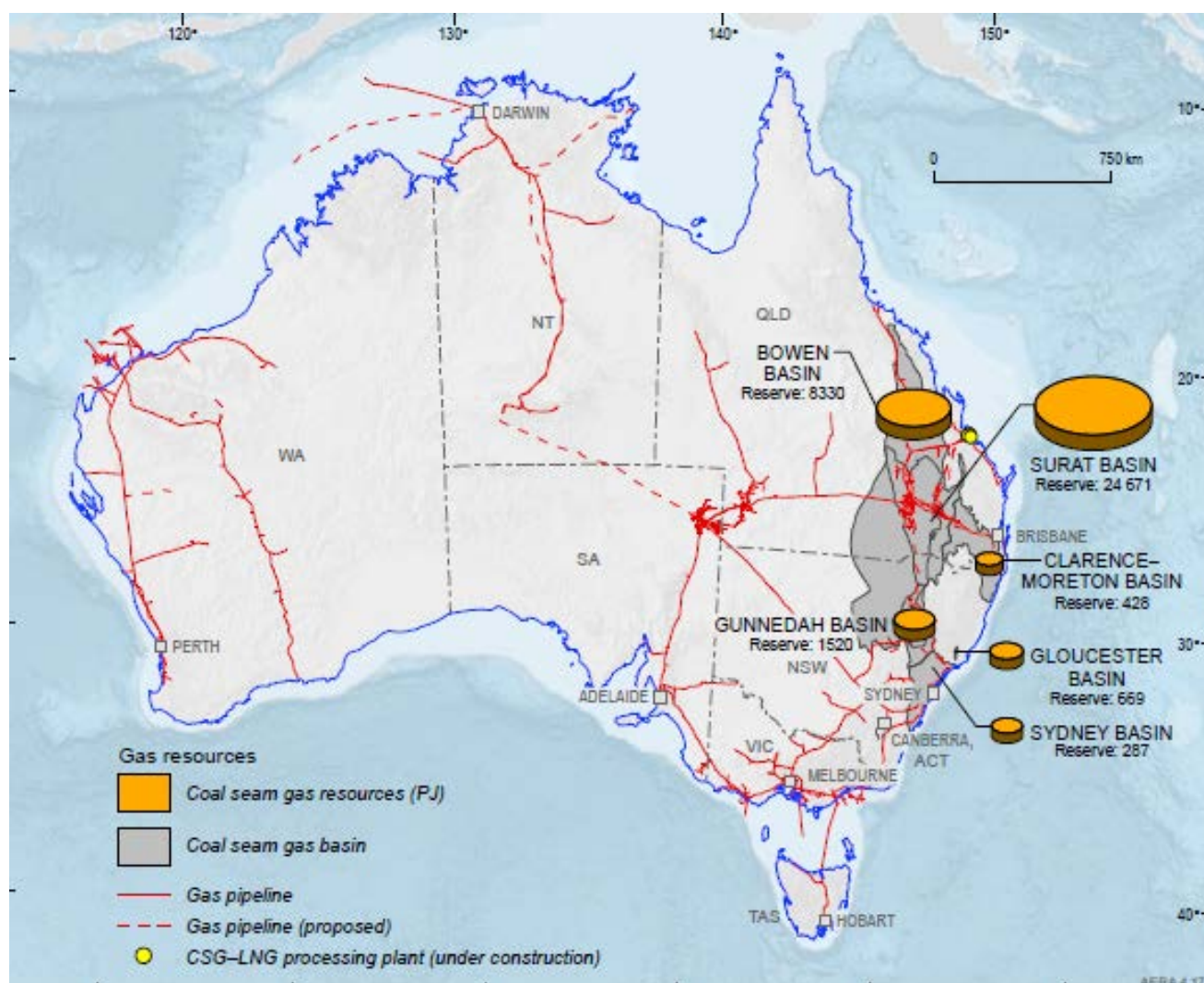
---

28 Minister for State Development and Minister for Natural Resources and Mines The Honourable Anthony Lynham, Minister for Environment and Heritage Protection and Minister for National Parks and the Great Barrier Reef The Honourable Steven Miles, 'Underground coal gasification banned in Queensland', *Joint statement*, <http://statements.qld.gov.au/Statement/2016/4/18/underground-coal-gasification-banned-in-queensland> (accessed 19 April 2016).

29 Minister for State Development and Minister for Natural Resources and Mines The Honourable Anthony Lynham, Minister for Environment and Heritage Protection and Minister for National Parks and the Great Barrier Reef The Honourable Steven Miles, 'Underground coal gasification banned in Queensland', *Joint statement*, <http://statements.qld.gov.au/Statement/2016/4/18/underground-coal-gasification-banned-in-queensland> (accessed 19 April 2016).

30 Queensland Department of Environment and Heritage Protection, *Legal action follows Hopeland soil investigations*, <https://www.ehp.qld.gov.au/mediareleases/2015-06-10-legal-action-hopeland-soil-investigations.html> (accessed 21 April 2016).

2.33 Smaller amounts are found on the Queensland-New South Wales border in the Clarence-Moreton Basin, and in New South Wales in the Gunnedah, Gloucester and Sydney Basins.



Map 1: Locations of coal seam gas reserves and gas infrastructure (Source: Australian Energy Resource Assessment, Second Edition, p. 97)

### *Queensland*

2.34 The Western Downs Region of Queensland, including Dalby, Tara and Chinchilla, has been at the centre of Queensland's power generation industry.

#### *Arrow Energy*

2.35 The Dalby area's main gas field is part of the Surat Gas Project, managed by Arrow Energy. Arrow Energy plans to expand its operations in the Surat Basin with 'a major coal seam gas (CSG) exploration, development and production project',

providing 'gas for both domestic and export markets', which will cover an area from Wandoan to Dalby, and down to the south-west of Millmerran.<sup>31</sup>

2.36 The expansion is projected to include around 6,500 coal seam gas wells, with produced gas expected to supply coal seam gas to a train on Curtis Island, and to domestic uses such as electricity generation at two power stations.<sup>32</sup>

2.37 Around 6,000 km of transportation pipelines will move the gas and water from the wells to treatment facilities.<sup>33</sup>

2.38 The project is expected to require around 7,500 production wells, with a peak rate of around 400 wells drilled per year. In addition, 18 production facilities will be constructed, requiring a range of gas pipelines, water pipeline, and generators.<sup>34</sup>

#### *Queensland Gas Company (QGC)*

2.39 QGC is a major producer of coal seam gas from the Surat and Bowen Basins in Queensland. QGC stated that in 2010, they produced around 20 per cent of Queensland's natural gas.<sup>35</sup>

2.40 QGC has constructed the Queensland Curtis LNG (QCLNG) coal seam gas liquefaction plant, on Curtis Island, off the coast of central Queensland. A 540km buried pipeline transports gas from the gas fields to Curtis Island, for export.

2.41 QGC's drilling operations are concentrated in the Western Downs, near Dalby, Chinchilla and Miles, with exploration work taking place in the Bowen Basin:

QGC expects to drill 6000 wells over more than 4500 sq km of tenements by 2030. These wells tap the Walloon Coal Measures about 300 to 800 metres underground.<sup>36</sup>

2.42 The Kenya gas plant is operated by QGC near Tara, Queensland, and draws gas from three gas fields known as 'Lauren', 'Codie' and 'Kate'.

2.43 QGC have stated that they 'do not operate on private land without landholder agreement'.<sup>37</sup>

---

31 Arrow Energy, *Surat Gas Project*, <https://www.arrowenergy.com.au/projects/surat-gas-project> (accessed 12 January 2016).

32 Arrow Energy, *Surat Gas Project*, <https://www.arrowenergy.com.au/projects/surat-gas-project> (accessed 12 January 2016).

33 Arrow Energy, *Surat Gas Project*, <https://www.arrowenergy.com.au/projects/surat-gas-project> (accessed 12 January 2016).

34 Arrow Energy, *Surat Gas Project Environmental Impact Statement – Executive Summary*, p. 3.

35 Mr Jim Knudsen, Senior Vice President, QGC, Address to Rural Press Club, July 2011, <http://www.qgc.com.au/media/142210/qgcruralpressclub.pdf> (accessed 11 February 2016).

36 QGC, *Where we work*, <http://www.qgc.com.au/qclng-project/where-we-work.aspx> (accessed 11 February 2016).

37 QGC, *Where we work*, <http://www.qgc.com.au/qclng-project/where-we-work.aspx> (accessed 11 February 2016).

### *Linc Energy*

2.44 Linc Energy established a Demonstration Facility near Chinchilla in Queensland in 1999 to demonstrate underground coal gasification and gas-to-liquids (GTL). As discussed above, underground coal gasification converts coal to a gas (sometimes called syngas or synthesis gas) where it lies under the ground.

2.45 In 2013, the facility entered the 'decommissioning stage'. According to Linc Energy, this stage is 'an important part of the process to demonstrate that the area can be effectively rehabilitated'.<sup>38</sup>

2.46 As noted above, underground coal gasification was banned in Queensland on 18 April 2016.

2.47 The committee notes that on 15 April 2016, Linc Energy announced that they had entered voluntary administration.<sup>39</sup>

2.48 As discussed above, the Queensland Government has commenced legal action against Linc Energy, alleging that the soil around the Hopeland area of Queensland has been contaminated with carbon monoxide, hydrogen and hydrogen sulphide as a result of underground coal gasification.<sup>40</sup>

### *New South Wales*

2.49 A report of the NSW Legislative Council Committee noted in 2012 that unconventional gas mining activity was increasing in New South Wales:

Technological advancements, including improved techniques to identify and drill for coal targets, have stimulated the emergence of the coal seam gas industry in New South Wales. However, industry activity has been mostly limited to exploration, with only a small number of coal seam gas projects given approval to commence production, including:

- Camden Gas Project (Stages 1 and 2) - AGL Energy Limited
- Gloucester Gas Project - AGL Energy Limited
- Narrabri Gas Project - Santos
- Richmond Valley Power Station and Casino Gas Project - Metgasco<sup>41</sup>

---

38 Linc Energy, *UGC in Australia*, [http://www.lincenergy.com/clean\\_energy\\_australia.php](http://www.lincenergy.com/clean_energy_australia.php) (accessed 11 February 2016).

39 Linc Energy, *Linc Energy enters into Voluntary Administration*, [http://lincenergy.listedcompany.com/newsroom/20160415\\_142826\\_BRE\\_VPRNW41R87KXGD92.1.pdf](http://lincenergy.listedcompany.com/newsroom/20160415_142826_BRE_VPRNW41R87KXGD92.1.pdf) (accessed 21 April 2016).

40 Queensland Department of Environment and Heritage Protection, *Legal action follows Hopeland soil investigations*, <https://www.ehp.qld.gov.au/mediareleases/2015-06-10-legal-action-hopeland-soil-investigations.html> (accessed 21 April 2016).

41 New South Wales Legislative Council General Purpose Standing Committee (No. 5), *Final report – Coal seam gas*, May 2012, p. 11, [http://www.parliament.nsw.gov.au/prod/parlment/committee.nsf/0/29AE48525CFAEA7CCA2578E3001ABD1C?open&refnavid=CO4\\_2](http://www.parliament.nsw.gov.au/prod/parlment/committee.nsf/0/29AE48525CFAEA7CCA2578E3001ABD1C?open&refnavid=CO4_2).

2.50 AGL announced on 4 February 2016 that it would not pursue the Gloucester Gas Project, and would cease production on the Camden Gas Project in 2023. Metgasco is continuing to seek the formal award of a production licence from the NSW Government for the Richmond Valley Power Station and Casino Gas Project.<sup>42</sup>

2.51 Currently, the two producers of coal seam gas in New South Wales are Santos and AGL, who run the Narrabri Gas Project and Camden Gas Project respectively.

2.52 The Narrabri Gas Project, operated by Santos, is producing small amounts (0.2 PJ) of coal bed methane which is being used to power the Wilga Park Power Station.<sup>43</sup> The AGL-owned Camden Gas Project is the largest producer of coal seam gas in New South Wales. In 2009, it produced 5.6 PJ and aimed to supply around six per cent of the New South Wales domestic gas market.

2.53 On 4 February 2016, AGL announced that it would divest itself of gas assets in New South Wales and that it would not be proceeding with the Gloucester Gas Project, north of Newcastle, where it had proposed more than 300 gas wells. AGL is reportedly planning to sell its natural gas assets in Queensland at Moranbah, Silver Springs and Spring Gully.<sup>44</sup>

2.54 AGL said that:

...following a review, [AGL] has taken a strategic decision that exploration and production of natural gas assets will no longer be a core business for the company due to the volatility of commodity prices and long development lead times.<sup>45</sup>

### ***Shale and tight gas mining***

2.55 Shale and tight gas resources are spread across the interior of Australia. The map below (See Map 2) shows locations of these gas reserves. There is currently no commercial production of shale or tight gas in Australia, although exploration has

---

42 Metgasco, *Quarterly activities report 30 June 2015*, <http://www.metgasco.com.au/asx-announcements/quarterly-activities-report-3> (accessed 26 April 2016). According to Metgasco, the production licence has not yet been issued owing to issues relating to native title.

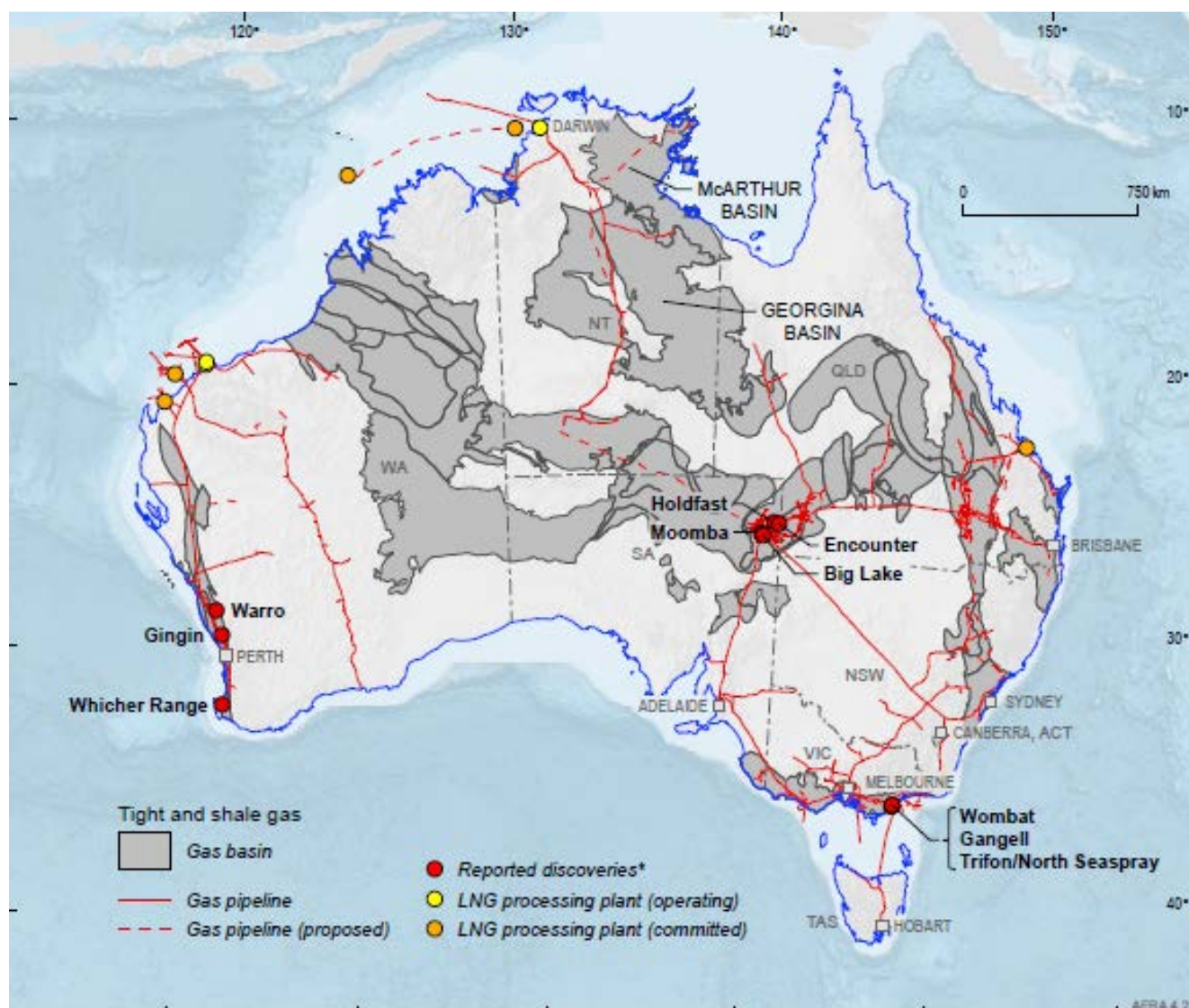
43 New South Wales Legislative Council General Purpose Standing Committee (No. 5), *Final report – Coal seam gas*, May 2012, p. 11, [http://www.parliament.nsw.gov.au/prod/parlment/committee.nsf/0/29AE48525CF8EA7CCA2578E3001ABD1C?open&refnavid=CO4\\_2](http://www.parliament.nsw.gov.au/prod/parlment/committee.nsf/0/29AE48525CF8EA7CCA2578E3001ABD1C?open&refnavid=CO4_2).

44 AGL, 'Review of gas assets and exit of gas exploration and production', *Media release*, <https://www.agl.com.au/about-agl/media-centre/article-list/2016/february/review-of-gas-assets-and-exit-of-gas-exploration-and-production> (accessed 21 April 2016).

45 AGL, 'Review of gas assets and exit of gas exploration and production', *Media release*, <https://www.agl.com.au/about-agl/media-centre/article-list/2016/february/review-of-gas-assets-and-exit-of-gas-exploration-and-production> (accessed 21 April 2016).

occurred and in 2012 Santos announced the successful extraction of shale gas from the Cooper Basin in South Australia.<sup>46</sup>

2.56 The Australian Energy Resource Assessment, produced by Geoscience Australia, reviews 'factors likely to influence the use of Australia's energy resources to 2035'. The most recent assessment, published in 2014, notes that Australia currently has no reserves of tight gas, although sources have been identified in the Cooper, Gippsland and Perth Basins. Resources of tight gas in 'established conventional gas-producing basins are located relatively close to infrastructure and are currently being considered for commercial production'.<sup>47</sup>



Map 2: Locations of shale and tight gas resources (Source: Australian Energy Resource Assessment, Second Edition, p. 97)

46 Victorian Parliament, *Inquiry into onshore unconventional gas in Victoria - Final Report*, December 2015, p. 26. See also: Santos, *Shale gas*, <https://www.santos.com/what-we-do/production/natural-gas/shale-gas/> (accessed 7 January 2016).

47 Australian Energy Resource Assessment, Second Edition, p. 98.



## The unconventional gas mining industry as a job provider

2.57 In February 2014, the Australian Petroleum Production and Exploration Association (APPEA) claimed that the liquefied natural gas (LNG) industry had created 100,000 jobs across the Australian economy.<sup>48</sup>

2.58 However, this figure was disputed by The Australia Institute who said that:

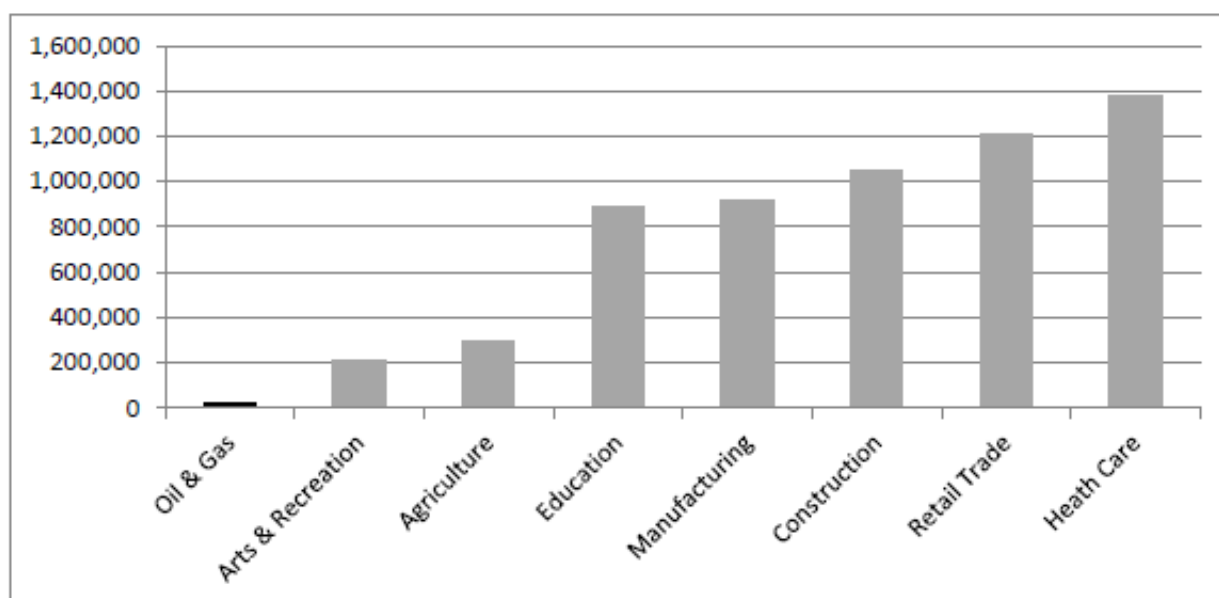
[t]he CSG industry clearly does create some jobs. But the number of people it employs is far lower than many of the industry's exaggerated claims suggest.<sup>49</sup>

2.59 The Australia Institute noted that the Australian Bureau of Statistics (ABS) does not draw a distinction between oil and gas mining, but instead provides a combined employment figure.<sup>50</sup>

2.60 According to the ABS, in May 2015 there were 27,500 people employed full time in oil and gas extraction.<sup>51</sup>

2.61 The Australia Institute provided the following table of employment in Australia by selected industry. In August 2013, that figure was 20,700 people.<sup>52</sup>

**Figure 1: Employment in Australia by selected industry**



Source: ABS (2013a) 6291.0.55.003 - Labour Force.

48 APPEA, *Policy reform would deliver big dividends*, <http://www.appea.com.au/2014/02/policy-reform-will-deliver-big-dividends/> (accessed 5 April 2016).

49 The Australia Institute, *Frack the future*, pp ix-x.

50 The Australia Institute, *Frack the future*, p. ix.

51 ABS, 6291.0.55.003 Labour Force, Australia, Detailed, Quarterly.

52 The Australia Institute, *Frack the future*, p. x.

2.62 Although specific employment data for coal seam gas mining is not available from the ABS, APPEA provide data on the coal seam gas industry by quarter. APPEA's fourth quarter 2015 statistics set out the following data for employment in the coal seam gas industry:<sup>53</sup>

Employment		No. added in last half	No. at half year end
Direct Employees	number	-1,489	3,981
Contractor Employees	number	-7,699	9,095
Total	number	-9,188	13,076

2.63 The Northern Territory Department of Mines and Energy (DME) submitted that the unconventional gas mining industry would provide employment opportunities in the Northern Territory:

At some stage, a workforce will be required to enable this industry to grow, and the majority of the people living in the remote regions of the NT are Indigenous. While the work in the next few years in the sector will be seasonal and intermittent in nature, job opportunities will exist in this period leading up to more sustained employment opportunities, as the industry moves into the development and production phases.<sup>54</sup>

2.64 APPEA and the major gas companies have submitted that the unconventional gas mining industry is a strong job creator and offers employment opportunities in regional and remote locations.<sup>55</sup>

2.65 Further, the DME note that although employment is generally a corporate consideration, there is a legislative requirement to consider Indigenous employment:

...when a petroleum title is granted on Aboriginal Land Rights (NT) Act 1976 (ALRA) affected land, Indigenous employment is incorporated in the terms and conditions of the access agreements.<sup>56</sup>

2.66 Santos submitted that they have developed voluntary land agreements with Traditional Owners, and have worked towards employment of Indigenous people:

Santos has specific programs, managed in-house, to create employment resulting from our projects and supports programs that focus on school retention and participation in education and training.<sup>57</sup>

---

53 APPEA, *CSG Industry data 2015*, [http://www.appea.com.au/wp-content/uploads/2016/03/Q4-2015-Total-CSG-Industry-Data\\_FINAL.pdf](http://www.appea.com.au/wp-content/uploads/2016/03/Q4-2015-Total-CSG-Industry-Data_FINAL.pdf) (accessed 5 April 2016). In the fourth quarter of 2014, the total number of people employed in the CSG industry was 29,000, APPEA, *CSG industry data 2014*, [http://www.appea.com.au/wp-content/uploads/2015/05/Q4-2014-Total-CSG-Industry-Data\\_Final.pdf](http://www.appea.com.au/wp-content/uploads/2015/05/Q4-2014-Total-CSG-Industry-Data_Final.pdf) (accessed 5 April 2016).

54 Northern Territory Department of Energy and Mines, *Submission 37*, p. 6.

55 APPEA, *Submission*, p. 4.

56 Northern Territory Department of Energy and Mines, *Submission 37*, p. 7.

---

2.67 Santos highlighted one particular example of engagement with Indigenous people:

As part of its commitment to Aboriginal participation, Santos engaged a local Aboriginal owned and operated earthmoving business, Rusca Bros Mining Pty Ltd, to prepare the access road and lease pad for an exploration hole drilled the McArthur Basin.

Rusca had an impressive record for Aboriginal employment, but on this project increased its workforce through employment of local Traditional Owners.<sup>58</sup>

2.68 The Lock the Gate Alliance Northern Territory raised concerns over the sustainability of the jobs created:

Employment opportunities in the gas industry are limited. Almost all gas industry jobs are for the construction phase only. Ongoing local employment opportunities are minimal with the majority of skilled workers fly-in-fly-out.<sup>59</sup>

2.69 Mr Eddie Mason, a traditional owner of the Bulachani clan and member of Protect Arnhem Land, submitted that:

My people have training in health, trades and education. We have walls covered in certificates and yet we are not given a chance to get a job on our country, as the Government keeps flying people in.<sup>60</sup>

---

57 Santos, *Submission 57*, p. 26.

58 Santos, *Submission 57*, p. 26.

59 The Lock the Gate Alliance Northern Territory, *Submission*, p. 6.

60 Protect Arnhem Land, *Submission*, p. 2.



# Chapter 3

## Property, mineral and petroleum rights in Australia

3.1 In this chapter, property, mineral and petroleum rights in Australia are examined, and the committee sets out information on land access issues and land access negotiation.

3.2 The committee sets out some of the first-hand experiences of landowners facing these issues in the next chapter.

3.3 In addition, this chapter sets out the legislative and regulatory framework for unconventional gas mining activity in Australia, and provides some information on the international experience of unconventional gas mining.

### Property, mineral and petroleum rights

3.4 Land in Australia is usually classified in one of the following ways:

Freehold land (including forms of freehold land tenure that are held by traditional owner groups including Aboriginal and Torres Strait Islander land)

Non-freehold land or Crown land, which may either be leased or licensed.<sup>1</sup>

3.5 Irrespective of whether land is freehold or not, the mineral and petroleum resources on the land will continue to belong to the Crown. The acquisition of rights to minerals and petroleum is located in separate legislative frameworks for each state and territory.

3.6 In general terms, landowners are owners of the surface of the land and have no automatic right to the minerals and petroleum, including unconventional gas, which may be on the land. They do not receive any royalties and cannot refuse access to holders of petroleum exploration or mining permits, licences or leases.<sup>2</sup> Should landholders refuse access, the resource companies involved can force access and enter negotiations for damage to their property or livelihood associated with the property.

3.7 The relevant state and territory legislation, codes and frameworks provide initially for exploration of the resource and then if applicable, approval for further grant of mining or minerals production leases or licences. The state and territory

---

1 Australian Government, *Land Tenure – What is land tenure?*, <http://www.austrade.gov.au/land-tenure/Land-tenure/about-land-tenure> (accessed 28 April 2016).

2 With respect to Aboriginal freehold land in the Northern Territory, traditional Aboriginal owners generally have the right to refuse land access and use proposals, including for mineral and petroleum exploration. Australian Government, *Land Tenure – What is land tenure?*, <http://www.austrade.gov.au/land-tenure/Land-tenure/about-land-tenure> (accessed 28 April 2016).

legislation also 'provides for the payment of royalties to the State and to compensate the owners or occupiers of the land'.<sup>3</sup>

### *Native title*

3.8 Native title can be held exclusively or in conjunction with other types of land tenure, however applications for use of land deemed to be under native title must comply with the statutory process set out in the *Native Title Act 1993* (NTA).<sup>4</sup>

3.9 A registered native title claim gives a party to that claim certain procedural rights when it comes to allowing applications to mine, explore or prospect for minerals on areas covered by the claim. These include:

- an indigenous land use agreement (ILUA); or
- the 'right to negotiate' with applicants to form a future acts agreement.<sup>5</sup>

3.10 It is important to note that in addition to the NTA, access to land in the states and territories may also be subject to state and territory specific native title, land rights and aboriginal heritage legislation. Sites of significance to Aboriginal and Torres Strait Islander peoples are given protection under federal and various state and territory laws on all land tenure types in Australia.<sup>6</sup>

### **Land access issues**

3.11 The states and territories retain mineral rights and may permit companies to extract resources. State and territory governments have attempted to address land access issues in varying ways.<sup>7</sup>

3.12 The process for access to land by resource companies will differ between the states and territories,<sup>8</sup> but the following process which applies in Queensland provides an example of the steps involved in establishing a land access agreement:

---

3 Australian Government, *Land Tenure- mining, mineral and petroleum rights*, <http://www.austrade.gov.au/land-tenure/Land-tenure/mining-and-mineral-exploration-leases> (accessed 28 April 2016); Australian Government, *Land Tenure – What is land tenure?*, <http://www.austrade.gov.au/land-tenure/Land-tenure/about-land-tenure> (accessed 28 April 2016).

4 Australian Government, *Land Tenure- mining, mineral and petroleum rights*, <http://www.austrade.gov.au/land-tenure/Land-tenure/mining-and-mineral-exploration-leases> (accessed 28 April 2016); Australian Government, *Land Tenure – What is land tenure?*, <http://www.austrade.gov.au/land-tenure/Land-tenure/about-land-tenure> (accessed 28 April 2016).

5 This is usually managed by the National Native Title Tribunal.

6 For example see the Native Title (New South Wales) Act 1994 (NSW); *Aboriginal Land Rights Act 1983* (NSW); *Aboriginal Cultural Heritage Act 2003*; *Northern Territory Aboriginal Sacred Sites Act 1989*; *Aboriginal Affairs Planning Authority Act 1972*; *Aboriginal Heritage Act 1972*; *Aboriginal Heritage Act 1988*; Australian Government, *Land Tenure- mining, mineral and petroleum rights*, <http://www.austrade.gov.au/land-tenure/Land-tenure/mining-and-mineral-exploration-leases> (accessed 28 April 2016).

7 Environment and Communications Legislation Committee, *Landholders' Right to Refuse (Gas and Coal) Bill*, September 2015, p.18.

- in Queensland, the right to explore for and extract CSG (tenure), is granted under the *Petroleum and Gas (Production and Safety) Act 2004* (PAG Act). This grant is called a Petroleum Authority and can be in the form of a lease, licence or authority to prospect. The CSG company party to the tenure is called the 'tenement holder';<sup>9</sup>
- before any access or activity can occur, all CSG related Petroleum Authorities require an Environmental Authority which sets out the environmental conditions that a CSG company must comply with;
- Environmental Authorities are issued by the Department of Environment and Heritage Protection (EHP) under the *Environmental Protection Act 1994* (Qld) (EP Act).<sup>10</sup>
- the PAG Act governs the interactions between landholders and CSG companies and provides for landholders to be compensated for 'the diminution in value and disturbance resulting from CSG activities on their land'.<sup>11</sup> This compensation is articulated in the form of a Conduct and Compensation Agreement (CCA), the content of which is negotiated between the CSG company and the landowner. Under the PAG Act all parties must use 'all reasonable endeavours' to negotiate a CCA.<sup>12</sup>
- All CCAs should indicate:
  - how and when the tenement holder can enter the land in question;
  - how the CSG company's activities must be carried out; and
  - the compensation or any future compensation the CSG company is to provide.<sup>13</sup>

3.13 The committee considers that this example not only highlights the lack of power and support landholders feel in relation to land access, it also indicates the overall level of complexity associated with land access involving unconventional gas mining.

3.14 The following table sets out a comparison of protections for access to private land for exploration across all states and territories:

---

8 See Table 2.

9 p&e law, *Submission 246*, p. 2.

10 p&e law, *Submission 246*, p. 2.

11 p&e law, *Submission 246*, p. 2.

12 It is not lawful to simply 'lock the gate' and refuse to negotiate as there is no right to refuse access for CSG development. However, if agreement on the terms of a CCA and compensation is not reached, the CSG company can apply to the Land Court, p&e law, *Submission 246*, p. 2.

13 This can be monetary or non-monetary. p&e law, *Submission 246*, p. 2.

Protection	NSW	Vic	Qld	WA	SA	Tas
Land access arrangement agreed to with landholder before the explorer can access land	Yes	Yes	Yes	Yes	No <sub>1</sub>	No <sub>2</sub>
Compensation available to land holder for loss or damage arising from exploration activity	Yes	Yes	Yes	Yes	Yes	Yes
Compensation for legal costs incurred by land holders in negotiating access agreements	Yes	No <sub>3</sub>	Yes	Yes	Yes	No <sub>3</sub>
Compensation for other costs associated with negotiating access agreements	No	No <sub>3</sub>	Yes <sub>4</sub>	Yes <sub>5</sub>	Yes <sub>6</sub>	No <sub>3</sub>
Exploration prohibited within specific distances of buildings and other improvements	Yes	Yes	Yes	Yes	Yes	Yes
Landholder veto over exploration on agricultural land	No	No <sub>7</sub>	No	Yes <sub>8</sub>	Yes <sub>9</sub>	No

**Table 2:** Comparison of state protections for access to private land for exploration<sup>14</sup>

Note: The Northern Territory is not included as most private land is restricted to cities and towns. Outside of the urban areas, around half of all land is Aboriginal land and the other half is Crown land under pastoral lease.

1. Authorisation to enter private land can be provided through the written consent of the land holder or by serving the land holder a statutory form (Notice of entry on land) under the *Mining Act 1971* (SA).
2. No formal agreement is required between the landholder and the explorer before exploration commences. However, where exploration involves ground disturbance, officers from the Department of Infrastructure, Energy and Resources are generally involved in the oversight of exploration activities to ensure that these activities adhere to the work plan.
3. Although there is no specific reference to compensation for legal, or other, costs incurred by land holders in negotiations with explorers, the legislation does not 'rule out' the provision of such compensation.
4. The Queensland Land Access Code provides for the compensation of reasonable accounting and land valuation costs incurred by the landholder.
5. The *Mining Act 1978* (WA) provides for reasonable legal or other costs of negotiation for private land under cultivation.
6. The South Australian guidelines make specific reference to compensation for legal costs and the *Mining Act 1971* (SA) provides for the reasonable costs incurred by the landholder in connection with negotiations.

---

14 Productivity Commission, *Mineral and Energy Resource Exploration, Report no. 65*, September 2013, p. 121.



7. The Minister can have agricultural land excised from the licence where the economic benefit of continuing to use that land for agricultural purposes is greater than the work proposed in the licence.
8. This applies to mineral tenements, but not to oil and gas tenements.
9. Exploration on cultivated land requires landholder consent. Where agreement cannot be reached, the explorer has the option of seeking a determination through the courts.

*Source: Productivity Commission, Mineral and Energy Resource Exploration, Report no. 65, September 2013, p. 121.*

3.15 The committee notes that this table is based on 2013 data, however, the committee is of the view that it strongly illustrates the fact that landholders are subject to a different set of rules across the states and territories when it comes to land access.

3.16 The committee notes that efforts have been made to deliver more uniformity at a Commonwealth, state and territory level through codes and frameworks to clarify process, rights and responsibilities in relation to land use, access and compensation.

3.17 In Queensland, for example, the Land Access Code was introduced in 2010 and sets out the mandatory conditions that all resource companies conducting exploration and development activities in Queensland must comply with in order to meet legislative requirements. It was released in conjunction with the Land Access Framework (LAF) which has the aim of

...balancing the interests of landholders and resource authority holders, through a particular focus on compensation arrangements and the need for good communication and relationships. The framework specifically introduced requirements for:

- Providing landholders with entry notices for 'preliminary activities'
- Negotiating a CCA before accessing private land to undertake 'advanced activities'
- A statutory graduated negotiation and dispute resolution process for CCAs, with the Land Court being the last resort
- Compensating landholders for reasonable and necessary accounting, legal or valuation costs incurred in negotiating or preparing a CCA.<sup>15</sup>

3.18 At a Commonwealth level, the then Standing Council of Energy and Resources, now the COAG Energy Council, endorsed the Multiple Land Use Framework (MLUF) in 2013.<sup>16</sup> The MLUF sought to provide a consistent approach to land use development and planning across all jurisdictions and was:

---

15 Land Access Implementation Committee, *Land Access Implementation Committee Report*, 30 August 2013, p. 7, [https://www.dnrm.qld.gov.au/\\_data/assets/pdf\\_file/0003/193089/land-access-implementation-committee-report.pdf](https://www.dnrm.qld.gov.au/_data/assets/pdf_file/0003/193089/land-access-implementation-committee-report.pdf) (accessed 28 April 2016).

16 Multiple land use is where land is used for different purposes simultaneously and sustainably with a view to maximise the benefits for all Australians. Standing Council on Energy and Resources (SCER), *The Multiple Land Use Framework*, pp. 2, 6, <http://www.scer.gov.au/sites/prod.energycouncil/files/publications/documents/Multiple%20Land%20Use%20Framework%20-%20Dec%202013.pdf> (accessed 27 April 2016).

...designed to operate within established regulatory and policy frameworks relating to land ownership, usage and access. The principles and components will not alter existing land rights assigned under Crown land, freehold, native title and pastoral leases. However, the framework may influence the way in which rights and obligations related to land tenure are imposed on users by State and Territory Governments.<sup>17</sup>

3.19 However, the committee heard from many submitters that despite the existence of codes and frameworks many landowners felt powerless, downtrodden and as if they do not have sufficient control over their land. This issue is discussed in more detail later in the report.

### **Land access negotiation**

3.20 The committee noted that a key issue with state and territory access and compensation arrangements is that they do not address the imbalance in bargaining power nor the often competing interests between the individual landowner and the energy company. This concern was stated in the submission from p&e law which indicated that:

If as a consequence of negotiations under the PAG Act no agreement is reached, CSG companies can take court action to determine the terms upon which they can enter land and conduct advanced activities. A landholder is compelled to allow access. In other areas of law relating to contracts a person entering into a contract as a result of "compulsion" can have the contract set aside.

Individual landowners have other business demands and interests and they do not include the need to be aware of current and potential obligations of the CSG companies. They do not have immediate easy access to those documents, even through internet searching, and those documents, where they are known, are often not readily provided following request to the mining companies. There is no legal obligation, for example, to provide documents to landholders disclosing the likely noise impacts from CSG mining, despite there being a requirement to undertake modelling of the potential noise impacts on landowners!<sup>18</sup>

3.21 The National Farmers' Federation (NFF) also indicated that:

...land access agreements may be the only time where landholders can actually seek to positively influence the process, and receive some protections and assurances from the mineral and petroleum industries.

However, it is worthwhile noting that farmers may be overwhelmed, confused and under stress...<sup>19</sup>

---

17 Standing Council on Energy and Resources (SCER), *The Multiple Land Use Framework*, p. 6, <http://www.scer.gov.au/sites/prod.energycouncil/files/publications/documents/Multiple%20Land%20Use%20Framework%20-%20Dec%202013.pdf> (accessed 27 April 2016).

18 p&e law, *Submission 246*, p. 3.

19 National Farmer's Federation (NFF), *Submission 171*, p. 3.

3.22 The concerns raised by these and other submitters in relation to negotiating land access, land use and compensation matters as related to unconventional gas mining, were consistent throughout the inquiry. Many stories of emotional distress perceived to be a result of the forced, expensive and stressful nature of the negotiations and interactions with various energy companies were conveyed to the committee.<sup>20</sup>

3.23 While the committee heard that there were many examples of uneasy, acrimonious and irreconcilable relationships between landholders and energy companies, AgForce submitted that, in their view, relationships had improved:

...the operating landscape for Queensland landholders dealing with CSG has greatly improved during this time. We would also acknowledge the significant and necessary improvements in the approach by resource companies to negotiations and dealings with landholders, from a heavy-handed, legal-rights enforcement approach to a greater understanding of the need for long-term, mutually-beneficial relationships with landholders.<sup>21</sup>

3.24 Santos advised the committee that they conduct unconventional gas mining operations in six onshore basins in Australia and are proud of their reputation with landholders.<sup>22</sup>

3.25 The committee noted a number of suggestions which may assist in overcoming some of the continuing issues between landholders and energy companies. The NFF suggested that land access agreements 'should be activities based, and subject to renegotiation should the schedule of activities change'.<sup>23</sup> They also suggested that agreements should include as a minimum:

- Appropriate recompense for the full range of costs including those associated with the preparation of agreements, the use of assets and access;
- Clear agreements with landholders regarding the disposal and acquisition of any exploration/extraction licence;
- Mining practices including complying with drilling legislation, and the use of chemicals;
- Biosecurity arrangements;
- OH&S requirements;
- Rehabilitation of land;
- Appropriate insurance and bond arrangements;

---

20 For more details see Chapter 4.

21 AgForce, *Submission 235*, p. 2.

22 Santos Limited, *Submission 57*, p. 4.

23 National Farmer's Federation (NFF), *Submission 171*, p. 3.

- Clear specification of responsibility for, and insurance arrangements to cover, accidental damage to mining infrastructure as a result of farming operations;
- Provisions for insurance to protect farming land from accidental damage caused by mining processes and infrastructure;
- Arrangements for normal agricultural operations;
- Any and all conduct whilst operating within the landscape; and
- Protocols regarding notification prior to access.<sup>24</sup>

3.26 A large number of submitters, including p&e law, advocated for legislative change to provide landholders with 'the right to refuse CSG mining on their land'.<sup>25</sup> The committee noted a large number of suggestions by landholders that they be given the urgent right to refuse mining on their land, avoiding the need for them to enter into any forced agreements with energy companies. Many also advocated for the creation of a statutory obligation for energy companies 'to recommend to landholders that they seek independent advice prior to entering agreements',<sup>26</sup> whether that comprises legal advice or otherwise.

3.27 AgForce also made a number of suggestions in relation to improving outcomes for landholders when dealing with resource companies. While these suggestions are based on the Queensland experience, the committee considers that they have wider application:

- A review of the existing 'Make Good' framework and greater transparency regarding the outcome of negotiations and bore assessment/investigations. This has been agreed to by the State Government and the Department of Environment and Heritage Protection are undertaking a review of the 'make good' framework in 2016;
- Ability for landholders to seek and be reimbursed for independent hydrogeological advice as part of the 'make good' process;
- Greater consistency of groundwater legislation and regulations between resource sectors (mining and gas) and avoidance and then proactive mitigation of residual impacts;
- Greater consistency between companies, and fairness and transparency of Conduct and Compensation Agreements (CCAs);
- Greater 'front-loading' of technical studies prior to project development including potential impacts to water supplies and users (ground and surface), confirmation of available alternative groundwater supplies for 'make good' negotiations and direct analysis of impacts to agricultural and grazing lands;

---

24 National Farmer's Federation (NFF), *Submission 171*, p. 3.

25 p&e law, *Submission 246*, p. 12.

26 p&e law, *Submission 246*, p. 12.

- 
- Continued support and funding to provide factual and independent information and support to landholders; and
  - Implementation of an independent ombudsmen to act as an adjudicator in disputes between resource companies and landholders to avoid Land Court proceedings.<sup>27</sup>

3.28 The committee considers that although energy companies and governments may consider that the legislative and regulatory frameworks governing unconventional gas are adequate,<sup>28</sup> the committee has found that the majority of submitters and witnesses to this inquiry do not agree.<sup>29</sup> The committee has considered evidence from many witnesses and submitters who have made strong calls for a right to say no to unconventional gas mining on their land.<sup>30</sup>

3.29 The committee notes that a private senator's bill, the Landholders' Right to Refuse (Gas and Coal) Bill 2015, was considered by the Senate Economics Environment and Communications References Committee in September 2015. This bill sought to place a ban on hydraulic fracturing, and to provide landholders with the right to say no to gas and coal activities on their land. While a majority report did not recommend that the bill be passed, it should be noted that the bill was supported by the Australian Greens and Senator Glenn Lazarus. Further, the committee considers that it provides a useful example of a legislative proposal to strengthen the rights of individual land holders.

3.30 Many landowners advised the committee of their difficult and stressful dealings with resource companies. They advised that they had been bullied, harassed, intimidated and pressured into accepting compensation arrangements because they were not able to refuse resource companies access to their land. Landholders also stated that resource companies threatened them by telling them that if they did not allow companies onto their land, they would be taken to the Land Court.

### **Legislative and regulatory framework**

3.31 In this section, the legislative and regulatory framework for unconventional gas mining activity in Australia will be set out, along with:

- information provided on regulation at the Commonwealth, state and territory levels;
- the program of harmonisation of regulation, and international experiences of unconventional gas mining; and
- the international experience of unconventional gas mining regulation.

---

27 Agforce, *Submission 235*, p. 3.

28 Santos Limited, *Submission 57*, p. 3.

29 See for example: Gasfield Free Seaspray, *Submission 34*; Ms Ellen Garcia and Mr Alan Jamison, *Submission 271*.

30 Ms Ellen Garcia and Mr Alan Jamison, *Submission 271*, p. 6

### *Commonwealth*

3.32 Regulation of unconventional gas mining is largely the responsibility of the states and territories. The Commonwealth's role is limited in its application and relates only to aspects of environmental and industrial chemical regulation. The committee notes that Australia lacks a national strategy or approach to the conduct of the unconventional gas mining industry.

3.33 The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) regulates coal seam gas mining where it may have a significant impact on water resources.<sup>31</sup> The Commonwealth Department of the Environment also has oversight of the resource development approval process through the administration of the EPBC Act.

3.34 The EPBC Act established the Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development (IESC) as a statutory committee in 2012. The IESC provides:

- Expert scientific advice on coal seam gas and large coal mining proposals as requested by the Australian Government and state government regulators.

This advice is provided to enable the regulator's decisions about coal seam gas and large coal mining developments to be informed by the best available science about the potential water related impacts associated with those developments.

- Advice to the Australian Government on bioregional assessments, other research projects and research priorities.<sup>32</sup>

3.35 The Commonwealth works with the states and territories through the Council of Australian Governments (COAG) Energy Council (formerly the Standing Council of Energy and Resources (SCER)) in order to enable 'collaboration on developing an integrated and coherent national energy policy'.<sup>33</sup> This Council states that through it, respective Commonwealth, state and territory ministers 'are working together to bring scientific and regulatory expertise to support the responsible development of unconventional gas supplies' to meet increasing gas demand.<sup>34</sup>

3.36 Under the National Partnership Agreement on Coal Seam Gas and Large Coal Mining Developments signed in March 2012, the Commonwealth and the states and territories agreed to 'strengthen the regulation of coal seam gas and large coal mining

---

31 *Environment Protection and Biodiversity Conservation Act 1999 (Cth)*, s24D, s24E.

32 Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development (IESC), *The IESC*, <http://www.iesc.environment.gov.au/iesc> (accessed 27 April 2016).

33 COAG Energy Council, <http://www.scer.gov.au/> (accessed 28 April 2016).

34 COAG Energy Council, *Gas Supply*, <http://www.scer.gov.au/australian-gas-markets-3/gas-supply> (accessed 28 April 2016).

development by ensuring that future decisions are informed by substantially improved science and independent expert advice'.<sup>35</sup>

3.37 The Domestic Gas Strategy, released by the Minister for Industry, Science and Innovation in April 2015, sets out the Commonwealth's role in relation to unconventional gas mining and the Commonwealth's expectations of the state and territory governments and industry in facilitating the responsible development of unconventional gas resources.<sup>36</sup>

#### *Domestic Gas Strategy*

3.38 The Australian Government submission to this inquiry states that the Domestic Gas Strategy reflects the Australian Government's commitment to balancing competing land uses, as identified in the principles articulated in the *Agricultural Competitiveness White Paper*, which include:

- access to agricultural land should only be done with the farmer's agreement, and that should they agree, they should be fairly compensated;
- there must be no long term damage to water resources used for agriculture and local communities; and
- prime agricultural land and quality water resources must not be compromised for future generations.<sup>37</sup>

#### *Commonwealth – the 'water trigger'*

3.39 The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) regulates coal seam gas mining only to the extent that it may have a significant impact on water resources.<sup>38</sup> The EPBC Act also sets out that the Minister for the Environment must obtain advice from the IESC if the minister believes that water resources or a matter of national environmental significance will be adversely affected.<sup>39</sup>

3.40 The EPBC Act was amended in June 2013 to 'provide that water resources are a matter of national environmental significance, in relation to coal seam gas and large coal mining development'.<sup>40</sup> This provision is known as the 'water trigger' and requires

35 *National Partnership Agreement on Coal Seam Gas and Large Coal Mining Developments*, 2012, p. 3, [http://www.federalfinancialrelations.gov.au/content/npa/environment/csg\\_and\\_lcnd/NP.pdf](http://www.federalfinancialrelations.gov.au/content/npa/environment/csg_and_lcnd/NP.pdf) (accessed 28 April 2016).

36 Department of Industry Innovation and Science, *Unconventional gas*, <http://www.industry.gov.au/Energy/EnergyMarkets/Pages/UnconventionalGas.aspx> (accessed 28 January 2016).

37 Australian Government, *Submission 123*, p. 6.

38 *Environment Protection and Biodiversity Conservation Act 1999 (Cth)*, s24D, s24E.

39 *Environment Protection and Biodiversity Conservation Act 1999 (Cth)*, s131AB.

40 Department of Industry Innovation and Science, *Unconventional gas*, <http://www.industry.gov.au/Energy/EnergyMarkets/Pages/UnconventionalGas.aspx#> (accessed 27 April 2016)

any CSG development that is likely to have a significant impact on a water resource, to be 'comprehensively assessed at a national level'.<sup>41</sup>

3.41 It also allows the Minister for the Environment to set conditions as part of the project approval process, to ensure that 'any impacts from these projects on a water resource are acceptable'. In doing so, the Minister is required to seek the advice of the IESC.<sup>42</sup>

3.42 The EPBC Act allows the Commonwealth to enter into a 'bilateral agreement' with a state or territory in relation to environmental assessments.<sup>43</sup> Under these agreements, the assessment process is accredited and undertaken by the state or territory government regulator. The responsible Commonwealth Minister and relevant state or territory delegate then make separate decisions on the approval of developments.

3.43 The Commonwealth government, in its submission, states that this approach delivers a 'nationally comprehensive' approach to assessing and conditioning projects that are likely to have a significant impact on water.<sup>44</sup>

3.44 As at 15 January 2016, a number of coal seam gas developments in New South Wales and Queensland were, or had been assessed under the EPBC Act with seven coal seam gas developments having been determined to be a 'controlled action' under the water trigger of the EPBC Act.<sup>45</sup>

3.45 Of these seven developments, three were approved, three are undergoing assessment and one was withdrawn. The IESC has provided advice on four of these developments, and the IESC will advise on the remaining three projects before decision.<sup>46</sup>

3.46 The Australian Government advised the committee that since the introduction of the water trigger, the Minister for the Environment has set a number of water resource related conditions for the approval of CSG developments. These have included:

- more extensive baseline monitoring;
- further research characterising relevant groundwater resources;
- best practice monitoring and management for both water quality and quantity;
- the review and updating of numerical groundwater models;

---

41 Australian Government, *Submission 123*, p. 6.

42 Australian Government, *Submission 123*, p. 6.

43 Bilateral agreements under the EPBC Act also exist in terms of 'approvals' as well as 'assessments' but under the current legislation any approvals in relation to the 'water trigger' cannot be included in the scope of an 'approval' bilateral agreement.

44 Australian Government, *Submission 123*, p. 6

45 Australian Government, *Submission 123*, p. 6

46 Australian Government, *Submission 123*, p. 6.



- 
- developing and implementing management actions to manage risk in stages so that changes or modifications can take new information into account; and
  - the identification of thresholds and limits relevant to the project's impacts on groundwater and surface water, including requirements to stop activity where limits have been reached.<sup>47</sup>

3.47 An EPBC Amendment Bill was put before the Australian Parliament in 2014 which sought to expand the scope of 'approval bilateral agreements' to enable the water trigger to be included. In the face of community opposition, this section of the amendment was removed in 2015, however proposed provisions to strengthen the role of the IESC were retained.<sup>48</sup>

3.48 The water trigger is currently being independently reviewed, as is required under section 25 of the *EPBC Amendment Act 2013*. Mr Stephen Hunter was appointed as the independent reviewer, and his report is expected to be tabled in the Australian Parliament in May 2016.

#### *Industrial Chemicals (Notification and Assessment) Act 1989*

3.49 Chemicals that are used for commercial purposes, including those used for CSG drilling or hydraulic fracturing are required to be registered with the National Industrial Chemicals Notification and Assessment Scheme (NICNAS).

3.50 NICNAS was established in July 1990 as part of the *Industrial Chemicals (Notification and Assessment) Act 1989* (ICNA Act) and is administered by the Department of Health.<sup>49</sup>

3.51 In June 2012, the Australian Government commissioned NICNAS to lead the National Assessment of Chemicals Associated with Coal Seam Gas Extraction in Australia. The assessment is informed by advice from the interim IESC, and uses a whole-of-government approach to bring together the expertise of a number of Australian Government agencies to 'maximise effort and use existing scientific analyses'. Project partners are NICNAS, the Department of the Environment, CSIRO and Geoscience Australia.<sup>50</sup>

3.52 The assessment is due to report in 2016.

#### *States and territories*

3.53 As noted above, responsibility for the legislation and regulation surrounding unconventional gas mining and the issue of relevant licences largely rests with the

---

47 Australian Government, *Submission 123*, p. 7.

48 This bill lapsed upon prorogation.

49 NICNAS, *About Us*, <https://www.nicnas.gov.au/about-nicnas/about-us> (accessed 27 April 2016).

50 NICNAS, *National Assessment of Chemicals Associated with Coal Seam Gas Extraction in Australia*, <https://www.nicnas.gov.au/communications/issues/fracking-hydraulic-fracturing-coal-seam-gas-extraction/faqs> (accessed 27 April 2016).

state and territory governments.<sup>51</sup> Similarly, monitoring of environmental impacts is conducted by the relevant state and territory government. The committee notes feedback from many submitters that despite regulation surrounding the conduct of unconventional gas mining, landholders consider compliance activities by governments to be insufficient.

3.54 The following table sets out the primary legislation which governs the extraction of coal seam gas in the states and territories. It should be noted, however, that in addition to the listed legislation, states and territories have environmental, local planning, land rights, water, heritage, workplace and public health and safety related legislation, regulations and policy that may also apply to unconventional gas projects.

---

51 Geoscience Australia, *Atlas of minerals resources, mines and processing centres*, [http://www.australianminesatlas.gov.au/education/fact\\_sheets/coal\\_seam\\_gas.html](http://www.australianminesatlas.gov.au/education/fact_sheets/coal_seam_gas.html) (accessed 7 January 2016).

State or territory	Primary legislation	Responsible Minister
Victoria <sub>1</sub>	Licensing for exploration and production of coal seam gas is regulated under the <i>Mineral Resources Sustainable Development Act 1990</i> (VIC), while licensing for the exploration and production of shale and tight gas is regulated under the <i>Petroleum Act 1998</i> (VIC). <sup>52</sup>	Minister for Energy and Resources
Queensland	<i>Environmental Protection Act 1994</i> (QLD), the <i>Petroleum Act 1923</i> (QLD), the <i>Petroleum and Gas (Production and Safety) Act 2004</i> (QLD), the <i>Water Act 2000</i> (QLD) and the <i>Water Supply (Safety and Reliability) Act 2008</i> (QLD). <sup>53</sup>	Minister for Natural Resources and Mines
New South Wales	NSW Gas Plan, <i>Petroleum (Onshore) Act 1991</i> (NSW) and the <i>Environmental Planning and Assessment Act 1979</i> (NSW) <sup>54</sup>	Minister for Resources and Energy
South Australia	All oil and gas exploration and production activities are regulated through the <i>Petroleum and Geothermal Energy Act 2000</i> (PGE Act) (SA)	Minister for State Development
Western Australia	<i>Petroleum and Geothermal Energy Resources Act 1967</i> (WA), <i>Petroleum Pipelines Act 1969</i> (WA)	Minister for Mines and Petroleum
Tasmania <sub>2</sub>	<i>Mineral Resources Development Act 1995</i> (TAS)	Minister for State Growth
Northern Territory	<i>Petroleum Act 1984</i> (NT)	Minister of Mines and Energy

Table 1: Legislation governing the extraction of coal seam gas in states and territories

1. In Victoria there is currently a moratorium on hydraulic fracturing, exploration drilling and new exploration licences for all onshore gas. A ban on the addition of BTEX chemicals in hydraulic fracturing has also been legislated.

2. In Tasmania there is currently a moratorium on the practice of fracking.

3.55 Many submitters highlighted what they felt were significant deficiencies and inadequacies in the state and territory environmental assessment and approval processes for current and future unconventional gas mining projects. The Lock the

52 Additional regulation is listed at Appendix 4 of the Victorian Legislative Council Environment and Planning Committee, *Inquiry into unconventional gas in Victoria*, <http://www.parliament.vic.gov.au/epc/references-committee-inquiries/article/2633> (accessed 8 December 2015).

53 In Queensland and New South Wales, methane produced during coal mining (coal mine methane, or CMM) is subject to mineral resources legislation, while coal seam gas is subject to petroleum resources legislation.

Gate Alliance summarised a number of issues in their assessment of state and territory legislation, regulation and policy, noting that:

...the roll out of the unconventional gas industry across Australia has taken place within a regulatory environment that is grossly inadequate to the task of managing this geographically dispersed and spatially intensive industry and the new and often experimental processes and methods it employs.

Across the country, the current State legislation under which the [unconventional] gas industry is operating often fails to address a whole range of factors and governments are playing policy catch up as this industry is rolled out without proper consideration of the possible or likely impacts.<sup>54</sup>

3.56 The Environmental Defenders Offices of Australia also claimed there were significant deficiencies in legislation relating to unconventional gas development in New South Wales, Queensland, Tasmania and the Northern Territory, largely in relation to environmental assessment processes, consent for mining developments and land use.<sup>55</sup>

3.57 The Municipal Association of Victoria submitted that:

There is concern that the current regulatory framework may not be adequate to ensure protection of the natural environment, local communities, rural industries and private property rights. Regulators may not have the capacity to properly oversee the operations of industry.<sup>56</sup>

3.58 The Northern Territory Government submitted that in the Northern Territory, the Energy Directorate currently undertakes compliance monitoring. However, if industry activity increased in the Northern Territory, the Energy Directorate would be unable to continue to undertake this work:

In the Territory, the oil and gas industry is still in its infancy and so for low level activity, the above compliance monitoring tasks, although very intensive, are manageable. However, Compliance Monitoring by the Energy Directorate will be unsustainable with the increased levels of activity that are expected to continue in the NT. The allocation of compliance monitoring responsibilities will need to be addressed in the Energy Directorate's legislation review that will include the future release of new Petroleum Resource Management Regulations (PRMR).<sup>57</sup>

#### *Waste disposal in Queensland – an example of complexity*

3.59 The complexity associated with regulating unconventional gas mining was drawn to the attention of the committee via the Queensland Parliament's estimates process. On 21 August 2015, the Agriculture and Environment Committee questioned

---

54 The Lock the Gate Alliance, *Submission 146*, p. 6.

55 Environmental Defenders Offices of Australia, *Submission 56*.

56 Municipal Association of Victoria, *Submission 112*, p. 6.

57 Northern Territory Department of Energy and Mines, *Submission 37*, p. 9.

---

the Department of Environment and Heritage Protection on the issue of land spraying.<sup>58</sup>

3.60 Mr Stephen Bennett, the Queensland Member for Burnett, drew attention to the fact that resource companies are able to dispose of waste materials on land that is owned by them. The Director-General of the Department advised that this was an activity that was regulated by a beneficial use agreement, and that resource companies had to have approval to dispose of waste material arising from unconventional gas mining activities.<sup>59</sup>

3.61 The committee notes that this is yet another example of the high level of regulation that is required of unconventional gas mining activities. The committee is also concerned to ensure that high regulatory standards are in place, and that the states and territories are appropriately resourced to ensure that waste material is not being inappropriately disposed of, even if it is on land that is owned by resource companies. The committee also notes feedback from submitters that self-regulation by resources companies gives rise to significant opportunities for unreported noncompliance.

### ***Harmonisation***

3.62 In 2013 the Standing Council of Energy and Resources (SCER), now known as the COAG Energy Council, endorsed the National Harmonised Regulatory Framework for Natural Gas from Coal Seams (the Framework) which:

...delivers on a commitment by Australian governments to put in place a suite of leading practice principles, provide guidance to regulators in managing development of CSG and ensure regulatory regimes are robust, consistent and transparent across all Australian jurisdictions. The Framework focuses on four key operational areas of CSG, which cover the lifecycle of development: well integrity, water management and monitoring, hydraulic fracturing and chemical use.<sup>60</sup>

3.63 Under the Framework, each state and territory is required to report to the COAG Energy Council on their implementation of the Framework. They are to provide plans for harmonising legislation related to CSG and other unconventional gas sources for the forthcoming year and provide updates on achievements and challenges

---

58 Unconventional gas mining creates waste products, for which the disposal and management is regulated by the Queensland Department of Environment and Heritage Protection.

59 Agricultural and Environment Committee, Queensland Parliament, *Environment, Heritage Protection, National Parks and the Great Barrier Reef - Estimates transcript of evidence*, 21 August 2015, p. 68.

60 COAG Energy Council, *National Harmonised Regulatory Framework for Natural Gas from Coal Seams*, December 2015, p. 1.  
<http://www.scer.gov.au/sites/prod.energycouncil/files/publications/documents/CSG-Framework-annual-update.pdf> (accessed 27 April 2016).

they have encountered in their efforts to harmonise regulations in the previous 12 months.<sup>61</sup>

3.64 The Domestic Gas Strategy places a renewed emphasis on utilising the Framework to remove 'unnecessary regulatory impediments' and streamline 'regulation across governments' with the gas market.<sup>62</sup>

3.65 A number of submitters to the inquiry emphasised the need for harmonisation of the legislative and regulatory frameworks for unconventional gas mining across Australian jurisdictions.

3.66 Doctors for the Environment Australia argued that the inconsistencies between state and territories needs to be resolved:

...a national approach is essential to reduce the extensive risks associated with unconventional gas mining. The most (self-)evident reason for this is that sets of unconventional gas operations may take place in regions overlying, and therefore threatening, precious aquifers, aquifers that do not recognise state borders. Here we face the actual, absurd situation in which two (or more!) states may take different approaches to exploration and mining licensing, different approaches to aquifer management, different approaches to the approved use of toxic chemicals, different approaches to waste-water management and different Air Quality requirements. We emphasise, this absurd situation almost exists currently: Victoria has an unconventional gas activity moratorium, South Australia does not, yet SA may come to approve unconventional gas activity in the South East of SA extracting gas in relation to the same aquifer that Victoria is protecting.<sup>63</sup>

3.67 Many submitters felt that harmonisation would not only benefit stakeholders through providing consistency in process and standards but also enable a degree of flexibility between jurisdictions. The Northern Land Council (NLC) noted that:

Harmonisation of jurisdictional regulatory frameworks across Australia would provide the benefit of holding companies and State and Territory Government to a common standard of practice.<sup>64</sup>

3.68 NTSCorp concurred, noting that they would support:

...the development of a comprehensive policy to establish best practice and a harmonised framework of federal and state/territory legislation in relation to unconventional mining and CSG proposals.<sup>65</sup>

---

61 COAG Energy Council, *National Harmonised Regulatory Framework for Natural Gas from Coal Seams*, December 2015, p. 1.

<http://www.scer.gov.au/sites/prod.energycouncil/files/publications/documents/CSG-Framework-annual-update.pdf> (accessed 27 April 2016).

62 Department of Industry and Science, *Domestic Gas Strategy*, 2015, p. 2  
<http://industry.gov.au/energy/energymarkets/documents/domestic-gas-strategy.pdf> (accessed 27 April 2016).

63 Doctors for the Environment, *Submission 116*, p. 4.

64 Northern Land Council (NLC), *Submission 273*, p. 11.

---

3.69 A number of submissions to the inquiry acknowledged the formulation of the Framework, with the Northern Land Council stating that improving collaboration between the Commonwealth and the states and territories under the Framework:

...commits each State and Territory to collaborate on improving their information resources, and sharing knowledge on scientific, technical and regulatory issues without surrendering their right to determine how they use this shared capacity while navigating what is already a complex policy landscape.<sup>66</sup>

3.70 However the Environmental Defenders Offices of Australia were critical of the Framework, and submitted the view that it is aspirational in nature and does not apply to all forms of unconventional gas development.<sup>67</sup>

3.71 The committee notes that not all submitters were in favour of national regulation, with the Chamber of Minerals and Energy of Western Australia (CME) advocating that:

Given the regulatory framework already in place in Western Australia to ensure safe practises around unconventional gas extraction, CME considers the Select Committee's Inquiry unnecessary and requests the Inquiry, in developing recommendations, to prevent duplication in the regulatory requirements across jurisdictions.<sup>68</sup>

3.72 Although the committee acknowledges the efforts of the Commonwealth and the states and territories to work towards harmonisation through the COAG Energy Council, the committee considers that the work of the Council is not well known, and that it needs to take steps to implement the national harmonisation framework in a more timely manner.

3.73 In addition, the committee is concerned that the goal of reducing what are described in the Domestic Gas Strategy as 'unnecessary regulatory impediments',<sup>69</sup> will expose landholders and the community to reduced standards that do not adequately protect human and animal health and the environment.

### ***International experience of regulating unconventional gas mining***

3.74 The committee notes that unconventional gas mining in a variety of forms—shale, tight and coal seam gas extraction—is being carried out in a number of overseas jurisdictions including Canada, the United States of America, Russia, the United Kingdom (not including Scotland and Wales), New Zealand, China, and in some countries within the European Union.

---

65 NTSCorp, *Submission 290*, p. 3.

66 Northern Land Council (NLC), *Submission 273*, p.12.

67 Environmental Defenders Offices of Australia, *Submission 56*, p. 9.

68 Chamber of Minerals and Energy of Western Australia, *Submission 221*, p. 2.

69 Department of Industry and Science, *Domestic Gas Strategy*, 2015, p. 2  
<http://industry.gov.au/energy/energymarkets/documents/domestic-gas-strategy.pdf> (accessed 27 April 2016).

3.75 The committee also notes that there are a number of other countries, provinces and territories that have put in place moratoria on unconventional oil and gas mining including Scotland, Wales, a number of provinces and territories in Canada (New Brunswick, Quebec, Nova Scotia)<sup>70</sup> and countries in Europe such as France, Germany, Ireland, the Netherlands, Bulgaria, the Czech Republic and Luxembourg.<sup>71</sup> In many cases, these moratoria are in place due to one or more of the following concerns about unconventional gas mining:

- environmental impacts;
- public health impacts;
- level and adequacy of planning guidance; and
- level and adequacy of ongoing regulation.

3.76 Where unconventional gas mining is in operation overseas, the regulatory and legislative frameworks operate across federal, state and local jurisdictions. In countries with a federal system, there have been calls for harmonisation and consistency in the regulation of unconventional gas.<sup>72</sup>

3.77 The committee notes that as individual overseas countries have differing parliamentary and legal systems and varying environmental and geological characteristics, overseas legislative and regulatory frameworks for unconventional gas exploration and production are not always directly comparable to the Australian situation. However, the committee has observed that the regulatory schemes across a variety of international jurisdictions do have commonalities, including land access, water management, greenhouse and fugitive emissions and the use of hazardous chemicals.

3.78 A number of submissions made reference to the experiences and practices of overseas jurisdictions. The Northern Territory Department of Mines and Energy (DME) submitted that they had assessed the practices of Alberta, Canada, and Oklahoma, Illinois, Colorado, Texas and North Dakota in the United States of America. The DME has also assessed the State Review of Oil and Natural Gas

---

70 See, for example: D. Sherwood, 'Canada's New Brunswick province bans fracking, plans study', Reuters Canada, 26 March 2015, <http://ca.reuters.com/article/domesticNews/idCAKBN0MM2OZ20150326> (accessed 28 April 2016).

71 For a summary relating to fracking in Europe, see, for example: L. Herringshaw, 'Whatever happened to the great European fracking boom?', *The Conversation*, 11 March 2015, <http://theconversation.com/whatever-happened-to-the-great-european-fracking-boom-38550> (accessed 28 April 2016).

72 See, for example, J Freeman, 'The Wise Way to Regulation Gas Drilling', *The New York Times*, 5 July 2012, [http://www.nytimes.com/2012/07/06/opinion/the-wise-way-to-regulate-hydraulic-fracturing.html?\\_r=3](http://www.nytimes.com/2012/07/06/opinion/the-wise-way-to-regulate-hydraulic-fracturing.html?_r=3) (accessed 27 April 2016); IEA, *Golden Rules for a Golden Age of Gas, World Energy Outlook Special Report on Unconventional Gas (IEA Golden Rules)*, 2012, p. 105, [http://dpl/Books/2012/WEO2012\\_GoldenRulesReport.pdf](http://dpl/Books/2012/WEO2012_GoldenRulesReport.pdf) (accessed 28 April 2016).



---

Environmental Regulations and the guidelines developed by the Interstate Oil and Gas Compact Commission.<sup>73</sup>

3.79 The Australian Government submitted that in developing the recent COAG Energy Council's Domestic Gas Strategy and the Gas Supply Strategy, knowledge and experience was drawn from both domestic and international sources, including the United States of America.<sup>74</sup>

3.80 The Environmental Defenders Offices of Australia drew attention to leading practices in overseas jurisdictions, stating that their research had shown that:

Better practices do exist and are currently being implemented in other jurisdictions. We concluded that adapting a number of these practices and incorporating them into Australian laws, subject to local need and conditions, would be appropriate.<sup>75</sup>

3.81 The committee has considered a set of respected international principles formulated by the International Energy Agency (IEA) in its report, *Golden Rules for a Golden Age of Gas* (IEA Golden Rules), published in 2012.

3.82 The IEA Golden Rules can be summarised as follows, and provide a useful overview of the factors that should be considered in designing regulations for unconventional gas activities:<sup>76</sup>

- measure, disclose and engage: establish baselines for key environmental indicators, measure and disclose operational data, minimise disruption during operations, and integrate engagement with local communities into every phase of the development;
- watch where you drill: choose sites carefully, being mindful of the local community;
- isolate wells and prevent leaks: put into place robust rules on well design, construction, cementing and integrity testing, prevent and contain any surface spills and leaks, and ensure that waste fluids and solids are properly disposed of;
- treat water responsibly: reduce freshwater use, reuse or recycle where possible, store and dispose of water safely, and minimise use of chemical additives;
- eliminate venting, minimise flaring and other emissions;
- be ready to think big: consider the cumulative and regional effects of multiple drilling, production and delivery activities on the environment; and

---

73 Northern Territory Government's Department of Mines and Energy, *Submission 37*, p. 10.

74 Australian Government, *Submission 123*, p. 18.

75 Environmental Defenders Offices of Australia, *Submission 56*, p. 11.

76 IEA, *Golden Rules for a Golden Age of Gas, World Energy Outlook Special Report on Unconventional Gas (IEA Golden Rules)*, 2012, [http://dpl/Books/2012/WEO2012\\_GoldenRulesReport.pdf](http://dpl/Books/2012/WEO2012_GoldenRulesReport.pdf) (accessed 28 April 2016).

- ensure a consistently high level of environmental performance.<sup>77</sup>

3.83 The committee notes that these 'Golden Rules' have not been referred to by any government, mining or regulatory body in evidence to this inquiry, however the committee considers that these principles offer useful guidance to legislators, policy-makers, regulators and operators to inform the design and implementation of legislation, regulations and policy to more adequately address the environmental and social impacts of unconventional gas mining.

---

77 IEA, *Golden Rules for a Golden Age of Gas, World Energy Outlook Special Report on Unconventional Gas (IEA Golden Rules)*, 2012, p. 13-14, [http://dpl/Books/2012/WEO2012\\_GoldenRulesReport.pdf](http://dpl/Books/2012/WEO2012_GoldenRulesReport.pdf) (accessed 28 April 2016).

## **Chapter 4**

### **The health, social, business, agricultural, environmental landholder and economic impacts of unconventional gas mining**

4.1 In this chapter, the committee sets out the evidence received in relation to term of reference (b):

(b) the health, social, business, agricultural, environmental, landholder and economic impacts of unconventional gas mining.

4.2 The main focus of this chapter is the evidence received by the committee from landowners and community members relating to their experiences with the unconventional gas mining industry.

4.3 The committee heard from landowners and community members about their first-hand experiences with gas mining companies, and heard that unconventional gas mining had placed significant strain on their ability to conduct their business and agricultural operations, and had affected their lives.

4.4 This chapter will discuss evidence received by the committee relating to:

- the rights of landholders;
- health;
- agriculture, including domestic and export capacity, supply chain integrity and production capacity;
- water resources, including issues of water quality and quantity; and
- the social impact of the unconventional gas mining industry.

4.5 The committee received submissions and heard evidence at public hearings from members of communities across Australia raising concerns at the potential impacts of the unconventional gas mining industry on many facets of life.

#### ***Baseline testing***

4.6 A consistent theme of submissions and evidence heard at public hearings was that, without baseline testing, it was challenging to undertake investigation of the potential effects of unconventional gas mining.

4.7 Numerous submitters drew the lack of baseline evidence to the committee's attention.<sup>1</sup> For example, Mr Gary and Mrs Kerry Ladbrook submitted that landowners may face challenges in commissioning baseline data for their own property:

The covering of costs for the landowner to engage experts required when assessing required drilling depths, access & equipping costs and ensuring an adequate baseline data is retained after drilling are essential to protect landowner water security rights.

The cost of an independent expert assessment is not inexpensive, and is a cost most landowners can ill afford.<sup>2</sup>

4.8 The Australian Dairy Industry Council submitted that:

We are not satisfied that adequate baseline data yet exists nationally on which to base a reliable monitoring reporting and compliance system. Establishing robust independent baseline data is a role for the government not mining companies. Once baseline data is established, the regulation should support transparent project monitoring where information is shared with landholders and communities.<sup>3</sup>

---

1 Dr Pauline Roberts, *Submission 1*; Dr Geralyn McCarron, *Submission 12*; National Toxics Network, *Submission 15*; Dr Wayne Somerville, *Submission 16*; Ms Kylie Haeusler, *Submission 30*; Rushbrook, *Submission 71*; Mr Damien O'Sullivan, *Submission 80*; Mr Avon Rayner, *Submission 88*; Ms Christine Dixon, *Submission 102*, p. 1; Ms Jane Judd, *Submission 103*; Cotton Australia, *Submission 104*; Ms Patricia McAuliffe, *Submission 113*; Dr Samantha Phelan, *Submission 120*; Australian Ethical Investments, *Submission 127*; Darling Downs Environment Council, *Submission 128*; Frack Free Tas, *Submission 140*; Friends of the Earth, *Submission 141*; Gold Coast and Hinterland Environment Council Association Inc, *Submission 142*; Ms Heather Drayton, *Submission 145*; Lock the Gate Alliance, *Submission 146*; Ms Heather Gibbons, *Submission 147*; Mr Hugh Nicholson, *Submission 149*; International Association of Hydrogeologists, *Submission 151*; Ms Jasmine Scheidler, *Submission 153*; Mr John Coverdale, *Submission 155*; Ms Lynne Deweaver, *Submission 164*; Ms Nanette Nicholson, *Submission 170*; OzEnvironmental, *Submission 173*; Mr Philip Armit, *Submission 174*; Ryde - Hunter's Hill Flora and Fauna Preservation Society, *Submission 177*; Ms Rosemarie Thomasson, *Submission 179*; RDPO, *Submission 180*; Ms Shirley Doyle, *Submission 183*; *Submission 184*; Mr Tony and Mrs Stephanie Meggitt, *Submission 185*; Dr Steve Robinson, *Submission 188*; Mr Tony Pickard, *Submission 190*; Mr David Paull, *Submission 200*; Mr Leigh Evans, *Submission 201*; Mrs Shay Dougall, *Submission 203*; No Fracking WAY, *Submission 218*; Mr Brian Feeney, *Submission 236*; Ms Michelle Agius, *Submission 239*; Mrs Dianne Hoy, *Submission 241*; Stop Coal Seam Gas Blue Mountains, *Submission 242*; Mr Fergus and Mrs Deborah O'Connor, *Submission 243*; p&e Law, *Submission 246*; Western Downs Alliance, *Submission 247*; Ms Sarah Ciesiolka, *Submission 250*; Lock the Gate Alliance NT, *Submission 251*; Gasfield Free Bairnsdale, *Submission 254*; Ms Debbie Carruthers, *Submission 255*; Ms Gillian Laland, *Submission 256*; Groundwater Solutions International, *Submission 257*; Interbeing, *Submission 258*; Dr Jo McCubbin, *Submission 260*; Limestone Coast Protection Alliance Inc., *Submission 263*; Mr Mark Rich, *Submission 265*; Ms Patricia Kahler, *Submission 268*; Ms Elena Garcia and Mr Alan Jamison, *Submission 271*.

2 Mr Gary and Mrs Kerry Ladbrook, *Submission 29*, p. 6.

3 Australian Dairy Industry Council, *Submission 46*, p. 8.

4.9 The Centre for Coal Seam Gas, University of Queensland, identified baseline testing as an important step in the process of unconventional gas mining activity:

Ensure that a comprehensive range of predevelopment data and trend line data is gathered before commencement of large field developments in relation to issues perceived to be important.<sup>4</sup>

4.10 It was also noted that there are existing data sources which could be of significance:

[R]esearchers at UQ have found that there are often important, under-used, pre-existing records from resource exploration (oil, gas and mining), which contain data that can help to establish trends and baselines that could be highly relevant to water quality, emissions, and natural occurrences of hydrocarbons.<sup>5</sup>

4.11 Further, the Centre for Coal Seam Gas recommended the creation of data repositories and portals:

Establish high quality data management infrastructure and systems that can hold historical, baseline, production, and monitoring data and facilitate the interrogation of this data. It is important that government facilitates sharing of data as well as providing access to researchers.<sup>6</sup>

4.12 This issue will be further discussed throughout this chapter.

### **The rights of landholders**

4.13 In Australia, mineral rights are reserved to the Crown. Austrade set out that:

The acquisition of rights to minerals stems from separate legislative frameworks in each State. These frameworks provide initially for exploration of the resource, and consist of the grant by the Crown in the form of exploration permits, licences or leases. Exploration permits, leases or licences permit works to be undertaken to determine the likely existence of minerals or resources. Actual mining is subject to a further grant of mining or minerals production leases or licences. The legislation also provides for the payment of royalties to the State and to compensate the owners or occupiers of the surface land.<sup>7</sup>

4.14 The committee heard that in areas with unconventional gas mining activity, there is significant tension between landowners and unconventional gas mining companies, particularly around access to land and the right to refuse access. For example, the Wilderness Society Newcastle submitted that the lack of a right to refuse

---

4 Centre for Coal Seam Gas, University of Queensland, *Submission 98*, p. 4.

5 Centre for Coal Seam Gas, University of Queensland, *Submission 98*, p. 4.

6 Centre for Coal Seam Gas, University of Queensland, *Submission 98*, p. 5.

7 Austrade, *Mining, minerals and petroleum rights*, <http://www.austrade.gov.au/land-tenure/Land-tenure/mining-and-mineral-exploration-leases> (accessed 26 April 2016).

access 'has created an unbalanced and socially destructive dynamic, causing lasting harm to individuals, businesses and communities'.<sup>8</sup>

4.15 The Lock the Gate Alliance submitted that landholders in areas experiencing unconventional gas mining activity had 'a sense of injustice that they do not have the right to refuse access to companies for UG [unconventional gas] activities'.<sup>9</sup>

4.16 Ms Sarah Ciesiolka submitted that the lack of a right to refuse access had created 'an uneven and unbalanced playing field and is a testament that the current system is broken'.<sup>10</sup>

4.17 No Fracking WAY submitted that the lack of a right to refuse access created uncertainty for landowners and had impacted their ability to plan development or activity.<sup>11</sup>

4.18 Ms Naomi Hogan, from the Lock the Gate Alliance NT, noted that surveys seeking views on fracking had been conducted in the Northern Territory. Ms Hogan told the committee:

I think the gas field-free survey really demonstrates that community members, because they are not given the right to say no, are having to go to other means to try and have some sort of say in this process. They are feeling very disempowered, which is why people are talking amongst themselves, talking to their neighbours and wanting to declare their own communities gas field free.<sup>12</sup>

4.19 A number of submitters expressed the very strong view that landowners should be given the right to refuse access to their land for unconventional gas mining.<sup>13</sup>

### ***Co-existence: the Multiple Land Use Framework***

4.20 The Multiple Land Use Framework (MLUF) was developed by the COAG Standing Council on Energy and Resources to 'address challenges arising from competing land use, land access and land use change' in the energy and mineral resources sector, and 'is intended to be used where land access and land use conflict has the potential, real or perceived, to arise'.<sup>14</sup>

---

8 The Wilderness Society Newcastle, *Submission 53*, p. 5.

9 Lock the Gate Alliance, *Submission 146*, p. 19.

10 Ms Sarah Ciesiolka, *Submission 250*, p. 6.

11 No Fracking WAY, *Submission 218*, p. 3.

12 Ms Naomi Hogan, Coordinator, Lock the Gate Alliance Northern Territory, *Committee Hansard*, 12 April 2016, p. 25.

13 See, for example, Bass Coast Shire Council, *Submission 65*, p. 2; Rushbrook, *Submission 71*, p. 1; Ms Margaret Scheidler, *Submission 75*, p. 1; Ms Lucy Daley, *Submission 161*, p. 1; p&e Law, *Submission 246*, p. 12; Lock the Gate Alliance NT, *Submission 251*, p. 4; Limestone Coast Protection Alliance Inc., *Submission 263*, p. 102; Mr Stuart Box, *Submission 269*, p. 2;

14 COAG Standing Council on Energy and Resources, *Multiple Land Use Framework*, <http://scer.govspace.gov.au/files/2013/12/Endorsed-MLUF.pdf> (accessed 19 April 2016).

---

4.21 The Australian Government submitted that:

The COAG Energy Council's Multiple Land Use Framework (MLUF) supports a balanced approach to multiple and sequential land access, including negotiating access arrangements in good faith. It focuses on the overall principle that to maximise the social and economic benefit, land should not be put to a single use purpose without considering other potential uses. Each jurisdiction implements the MLUF in a way which allows it to operate most effectively alongside existing regulation and land rights.<sup>15</sup>

4.22 The committee heard from energy companies that co-existence was a successful model. For example, Santos submitted that:

Importantly, our activities have been undertaken in successful co-existence with the agricultural sector. Santos is proud of its reputation with its landholders. For GLNG alone, we have more than 920 agreements with more than 350 landholders for long-term gas infrastructure alongside their farming businesses. Many hundreds more agreements have been signed for activities such as exploration and pipeline easements. The results demonstrate co-existence. Independent surveys of Santos landholders, conducted by respected consultancy Nielsen, have shown that 92% would welcome Santos back onto their property.<sup>16</sup>

4.23 Origin Energy also submitted that, in their view, co-existence was successful:

We strive to ensure that multiple land uses can occur at one time. We consult with our landholders to make sure that our activities complement their existing business and we work with them to achieve their business goals. Of our first 100 landholders for the Australia Pacific LNG project with gas infrastructure on their land, 100% of them are still using their land for farming and grazing purposes.<sup>17</sup>

4.24 The Queensland Government submitted that co-existence had been successful in that state:

Queensland's prosperity has been based on the long-term cooperative co-existence of landholders and resource companies, underpinned by laws that balance the interests of both parties.<sup>18</sup>

4.25 However, the committee heard that many local residents in unconventional gas mining areas were extremely dissatisfied with 'co-existence'.<sup>19</sup> Numerous submitters and witnesses told the committee that there is an imbalance of power between local landholders and the energy companies, with landholders unable to

---

15 Australian Government, *Submission 123*, p. 15.

16 Santos, *Submission 57*, p. 4.

17 Origin Energy, *Submission 172*, p. 2.

18 Queensland Government, *Submission 217*, p. 6.

19 Ms Jenny Chester, *Submission 18*, p. 1; Gasfield Free Seaspray, *Submission 34*; Mr Fergus and Mrs Deborah O'Connor, *Submission 243*, p. 4.

refuse access to their land. Mr Allan and Mrs Narelle Nothdurft submitted the view that in practice, co-existence meant compensation.<sup>20</sup>

4.26 Dr Geralyn McCarron submitted that, in her view, co-existence 'in the Tara/Chinchilla gas fields effectively means living within an immense gas processing plant'.<sup>21</sup> Further, Dr McCarron submitted that:

Decision makers need to understand that healthy co-existence with unconventional gas is a myth. Healthy communities cannot thrive in the middle of an unconventional gas field. The choice to be made is between pre-existing industries such as agriculture or gas. It is a choice between healthy food production or gas. It is a choice between the long-term safety of the water supply or gas. It is a choice between tourism or gas.<sup>22</sup>

4.27 The committee heard that the effects of unconventional gas mining were not limited to those landholders with gas wells on their property, but that close neighbours could be directly affected as well. For example, at the public hearing in Dalby, Queensland, Mr Joe Hill and Mr John Jenkyn spoke of their experiences of unconventional gas mining despite not having gas wells on their land. Mr Hill told the committee that a dam across the road from his property had burst, flooding his property with CSG treated water, and Mr Jenkyn told the committee that there were 'something like 700 [gas wells] within a 17 kilometre radius of me', and noted that the closest gas well was around 500 metres from his house.<sup>23</sup>

4.28 Gasfield Free Seaspray submitted that:

The legal right of farmers to veto mining access does not at all address the position that neighbours will be placed in if access is given. At the very least mining access into any location needs to be a community decision, social licence needs to be sought and given.<sup>24</sup>

### ***Queensland***

4.29 Queensland's current regime for land access and compensation was introduced by the Queensland Government in 2010, and aims to balance the interests of the agricultural and resources sectors.<sup>25</sup>

4.30 The Environmental Defenders Office Northern Queensland (EDO NQ) submitted that the main features of the current Queensland regime are that:

---

20 Mr Allan and Mrs Narelle Nothdurft, *Submission 28*, p. 2; Ms Annette Hutchins, *Submission 84*, p. 5.

21 Dr Geralyn McCarron, *Submission 12*, p. 8.

22 Dr Geralyn McCarron, *Submission 12*, pp 37-38.

23 Mr Joe Hill, *Committee Hansard*, 17 February 2016, p. 2; Mr John Jenkyn, *Committee Hansard*, 17 February 2016, p. 25.

24 Gasfield Free Seaspray, *Submission 34*, p. 16.

25 Queensland Government, *Submission 217*, p. 11.



- 
- a landholder has no prima facie right to deny a mining or petroleum tenement holder access to their land;
  - preliminary activities may be conducted after the issuing of a notice of entry to a landholder by the tenement holder;
  - a landholder has a right to compensation for advanced activities, and a conduct and compensation agreement must be negotiated; and
  - the Land Court may make a final determination if the negotiation is unsuccessful.<sup>26</sup>

4.31 The EDO NQ submitted the view that:

The process of compensation negotiation is skewed heavily against landowners. The lack of veto power means that there appears to be little incentive for tenement holders to seriously negotiate given that they are essentially guaranteed mining rights. This is partly corrected for by sections in the Mineral and Resources Act (MRA) and Petroleum and Gas Act (P&G Act) which oblige tenement holders to negotiate in good faith.<sup>27</sup>

4.32 The committee heard from landowners in Queensland that the lack of power to refuse entry had caused significant strain and frustration. For example, Ms Erica Bates submitted that:

I learned that I could not stop Arrow [Energy] coming onto my land, and the feeling of helplessness was immense and devastating. We had just invested everything in purchasing and moving to our new farm...and everything we dreamed of was now at risk.<sup>28</sup>

## Health

4.33 The committee received numerous submissions and heard evidence from residents of the Western Downs Region of Queensland, concerned that the unconventional gas mining industry in their area had adversely affected their health.

4.34 The committee heard that local residents of the Western Downs Region had experienced, and continue to experience, headaches and migraines, nosebleeds, fatigue, nausea, skin and eye irritations, and rashes.<sup>29</sup> These symptoms have been reported to Queensland Health and have been investigated through the studies set out below.

4.35 Dr McCarron submitted that there had been no baseline testing and no health impact assessments conducted 'prior to the Coal Seam Gas production licences being

---

26 Environmental Defenders Office Northern Queensland, *Submission 44 Attachment 2*, p. 1.

27 Environmental Defenders Office Northern Queensland, *Submission 44 Attachment 2*, p. 2.

28 Ms Erica Bates, *Submission 279*, p. 1.

29 See, for example, Mr and Mrs Allan and Narelle Nothdurft, *Submission 28*; Ms Kylie Haeusler, *Submission 30*, p. 7; Mr Hugh Nicholson, *Submission 149*, p. 1; Mrs Shay Dougall, *Submission 203*, p. 5; Ms Sandra Bamerry, *Submission 248*; Bender Family, *Submission 274*.

issued in Queensland, and in Queensland comprehensive health studies have still not been done'.<sup>30</sup>

4.36 The Knitting Nannas Against Gas submitted that:

A number of water samples from different tanks has shown dangerous levels of toxic chemicals in the past 2 years, but as there were no baseline studies conducted prior to unconventional gas exploration, there is no link between contamination in the water and the industry. The same scenario is applicable to air quality.<sup>31</sup>

***Previous studies of the potential health effects of unconventional gas mining in Queensland***

4.37 Several studies have been conducted or commissioned by Queensland Health since 2012, and an independent study was conducted by a Brisbane-based GP.

***Darling Downs Public Health Unit***

4.38 In January 2013, the Darling Downs Public Health Unit released the *Investigation into the health complaints relating to Coal Seam Gas Activity from residents residing within the Wieambilla Estates, Tara, Queensland*. The study was conducted after a rise in the number of health complaints in that region from July 2012.

4.39 The study examined the symptoms reported to Queensland Health's Health Contact Centre (commonly referred to as '13HEALTH') between 4 July 2012 and 12 November 2012, which included:

---

30 Dr Geralyn McCarron, *Submission 12*, p. 2.

31 Knitting Nannas Against Gas, *Submission 27*, p. 2.

Symptoms	Number of people reporting symptom
Headaches	34
Sore, itchy eyes	18
Nose bleeds	14
Skin rashes	11
Nausea	8
Pins and needles	7
Nasal congestion	6
Metallic taste	5
Depression	5
Diarrhoea	<5
Respiratory symptoms	<5
Anxiety/ stress	<5
Blackouts	<5

32

4.40 The study found that 'no substantive evidence was available to support these allegations that the health complaints were due to CSG activities' and noted that the symptoms reported were difficult to link with one particular cause.<sup>33</sup>

4.41 However, the study did note the mental health of the community:

A new concept 'Solastalgia' has been used to describe the distress that is produced by environmental change impacting on people while they are directly connected to their home environment. These negative effects can be exacerbated by a sense of lack of control over the unfolding change process.

It is the perception of the author that Solastalgia is contributing significantly to the ill health of this community.<sup>34</sup>

#### *Queensland Government Department of Health*

4.42 In March 2013, a study was released by the Queensland Health called *Coal seam gas in the Tara region: Summary risk assessment of health complaints and environmental monitoring data*.<sup>35</sup> This study drew on the report conducted by the

32 Darling Downs Public Health Unit, *Investigation into the health complaints relating to Coal Seam Gas Activity from residents residing within the Wieambilla Estates, Tara, Queensland*, p. 9.

33 Darling Downs Public Health Unit, *Investigation into the health complaints relating to Coal Seam Gas Activity from residents residing within the Wieambilla Estates, Tara, Queensland*.

34 Darling Downs Public Health Unit, *Investigation into the health complaints relating to Coal Seam Gas Activity from residents residing within the Wieambilla Estates, Tara, Queensland*, p. 17.

35 Queensland Government Department of Health, *Coal seam gas in the Tara region: Summary risk assessment of health complaints and environmental monitoring data*, March 2013.

Darling Downs Public Health Unit and a clinical investigation conducted by Dr Keith Adam in 2012.

4.43 Dr Keith Adam visited Tara over two days in October 2012, and spoke with residents. Dr Adam set out that the most common symptoms reported were:

- headaches, which began around 2005-06;
- nausea and vomiting;
- nosebleeds of varying severity;
- nose, throat and eye irritation;
- rashes and sores, redness and cracking of the skin;
- pins and needles in hands and feet.<sup>36</sup>

4.44 The study concluded that:

Based on the clinical and environmental monitoring data available for this summary risk assessment, a clear link can not be drawn between the health complaints by some residents in the Tara region and impacts of the local CSG industry on air, water or soil within the community. The available evidence does not support the concern among some residents that excessive exposure to emissions from the CSG activities is the cause of the symptoms they have reported.<sup>37</sup>

4.45 The National Toxics Network submitted that in their view, the report was:

... cursory and included little clinical investigation. The report concluded that it was unable to determine whether any of the health effects reported by the community were clearly linked to exposure to CSG pollutants. This was not a surprising finding and but one that is common in cases of chronic chemical exposures and suspected health effects, especially when no baseline health or environmental data was available.<sup>38</sup>

*Dr GERALYN McCARRON*

4.46 Dr GERALYN McCARRON, a Brisbane based GP, surveyed the health of 113 residents from the Tara rural residential estates and surrounding areas, and reported that:

The pattern reported was outside the scope of what would be expected for a small rural community. In all age groups there were reported increases in cough, chest tightness, rashes, difficulty sleeping, joint pains, muscle pains and spasms, nausea and vomiting. Approximately one third of the people over 6 years of age were reported to have spontaneous nose bleeds, and

---

36 Dr Keith Adam, 'Appendix 2 - Health Effects of Coal Seam Gas – Tara', *Coal seam gas in the Tara region: Summary risk assessment of health complaints and environmental monitoring data*, March 2013, p. 1.

37 Queensland Government Department of Health, *Coal seam gas in the Tara region: Summary risk assessment of health complaints and environmental monitoring data*, March 2013, p. 13.

38 National Toxics Network, *Submission 15 Attachment 1*, p. 20.

almost three quarters were reported to have skin irritation. Over half of children were reported to have eye irritation.

A range of symptoms were reported which can sometimes be related to neurotoxicity (damage to the nervous system), including severe fatigue, weakness, headaches, numbness and paraesthesia (abnormal sensations such as pins and needles, burning or tingling).<sup>39</sup>

4.47 Dr McCarron's survey asked participants about their experiences before and after unconventional gas mining began in their area. The results of the study for those surveyed, aged between 6 and 82, were that:

- 72 per cent of surveyed residents reported skin irritations after the arrival of unconventional gas mining;
- 60 per cent reported eye irritations;
- 32 per cent reported spontaneous nosebleeds;
- 87 per cent reported mild headaches;
- 55 per cent reported severe headaches;
- 64 per cent reported severe fatigue; and
- 42 per cent reporting tingling, numbness and pins and needles.<sup>40</sup>

4.48 Dr McCarron submitted that the study conducted by Queensland Health relied on industry data and limited clinical data, and was not comprehensive. Dr McCarron also noted that the clinical investigation conducted by Dr Adam was poorly advertised and also relied on limited data.<sup>41</sup> Further, Dr McCarron advised the committee of the existence of cancer clusters among residents living with coal seam gas mining, as well as a lack of access to medical assistance.

### ***Testing of soil around Hopeland, Queensland***

4.49 The Queensland Department of Environment and Heritage Protection (EHP) is currently investigating soil gas contaminants in the Hopeland area, between Chinchilla and Dalby:

In February 2015, a whole-of-government response was triggered when the Department of Environment and Heritage Protection (EHP) detected gases, including carbon monoxide, hydrogen and hydrogen sulphide, during testing on private property in the Hopeland area. This testing was in relation to ongoing investigations into Linc Energy's trial underground coal gasification operation at Chinchilla. The gases were detected at depths below ground from two to six metres.<sup>42</sup>

---

39 Dr GERALYN McCARRON, *Submission 12 Attachment 2*, p. 1.

40 Dr GERALYN McCARRON, *Submission 12 Attachment 2*.

41 Dr GERALYN McCARRON, *Submission 12*, p. 5 and p. 21.

42 Queensland Department of Environment and Heritage Protection, *Hopeland area testing update Issue 5*, August 2015, <https://www.ehp.qld.gov.au/management/hopeland.html> (accessed 21 April 2016).

4.50 EHP set out that 'the gases are associated with combustion processes and are not associated with coal seam gas development'.<sup>43</sup> The investigation is ongoing.

4.51 Also in February 2015, EHP established an excavation caution zone for the Hopeland locality which sets out that 'caution should be exercised during activities that may encounter hazardous gas contaminants, such as excavations or trenching works below depths of two metres or more from the surface'.<sup>44</sup>

4.52 Carbon monoxide, hydrogen and hydrogen sulphide are associated with the process of underground coal gasification. According to the National Pollutant Inventory, low level exposure to carbon monoxide can cause

...headache, dizziness, light-headedness and fatigue. Exposure to higher concentrations (400 parts per million) of carbon monoxide can cause sleepiness, hallucinations, convulsions, collapse, loss of consciousness and death. It can also cause personality and memory changes, mental confusion and loss of vision.<sup>45</sup>

4.53 Low level exposure to carbon monoxide can cause headaches, light-headedness and fatigue, and can cause mental confusion.<sup>46</sup> Low level exposure to hydrogen sulphide can cause eye, nose and throat irritations, headaches, dizziness and nausea.<sup>47</sup>

4.54 The committee sought information from Queensland Health about whether testing for carbon monoxide, hydrogen and hydrogen sulphide had been undertaken in conjunction with the environmental testing conducted by EHP.

### ***Access to healthcare***

4.55 Key issues raised by submitters and witnesses related to the potential impact of unconventional gas mining on physical and mental health, and frustration at difficulties in obtaining healthcare. The committee heard from submitters and witnesses from the Western Downs Region of Queensland that obtaining access to healthcare was difficult, could involve long periods of travel time, and was inadequate or inappropriate for their needs. Further, many residents informed the committee that they were regularly denied medical attention when they advised medical practitioners that they believed they were suffering from unconventional gas related illness. They attended local general practitioners and hospitals only to be told that they would need

---

43 Queensland Department of Environment and Heritage Protection, *Hopeland area testing update*, <https://www.ehp.qld.gov.au/management/hopeland.html> (accessed 21 April 2016).

44 Queensland Department of Environment and Heritage Protection, *Hopeland area testing update*, <https://www.ehp.qld.gov.au/management/hopeland.html> (accessed 21 April 2016).

45 National Pollutant Inventory, *Carbon monoxide*, <http://www.npi.gov.au/resource/carbon-monoxide-0> (accessed 21 April 2015).

46 National Pollutant Inventory, *Carbon monoxide*, <http://www.npi.gov.au/resource/carbon-monoxide-0> (accessed 21 April 2015).

47 National Pollutant Inventory, *Hydrogen sulphide*, <http://www.npi.gov.au/resource/hydrogen-sulfide> (accessed 21 April 2015).

---

to contact 13HEALTH. When they contacted 13HEALTH they were told to contact local general practitioners and hospitals.

4.56 For example, Mrs Narelle Nothdurft told the committee that it had been difficult to obtain healthcare:

We have tried going to the doctors with the children. I have a letter here...from Dalby Medical Centre saying that we would not be allowed to go to their centre because it now relates to CSG and to please call 13HEALTH. I ring 13HEALTH and they say please go to your doctor. I go to the doctor and they please ring 13HEALTH. It goes around and around.<sup>48</sup>

4.57 Similarly, Mr John Jenkyn told the committee that the 13HEALTH number and doctors at the hospital had continually referred him to each other, and set out that:

I say to them, 'Every time I send you a complaint, that's another 20 minutes that I'm not doing what I'm supposed to be doing as a father'...If it is a CSG related issue, you must ring the 13HEALTH number. So I ring them and they tell me, 'John, you've got to get to a hospital immediately.' So you go in to see the doctor at the hospital and the GP will say to you, 'But it's a CSG related issue. You must ring 13HEALTH.' You say, 'But I've rung them; that's why I'm here,' and they say, 'Well, there's nothing I can do. You must go back and ring 13HEALTH.' So we keep going around in that terrible loop that way.<sup>49</sup>

4.58 Dr Marion Carey, from Doctors for the Environment Australia, outlined some of the difficulties around providing medical testing relating to unconventional gas mining:

Some chemical exposures can be tested for but some are much more difficult to test for. As we know, there are numerous problems with chemicals. There are different chemicals used in different places, in different wells and at different times. One of the big problems is the transparency around the chemicals. If we do not even have any information about what chemicals are used in a particular well, it is very difficult for a doctor to order appropriate testing, even if that testing is available, without knowing what people have been exposed to.<sup>50</sup>

4.59 Dr Carey raised concerns over a lack of information on what chemicals are used in unconventional gas mining:

In order to be able to do a risk assessment, you need to know about the hazard—the thing you are being exposed to and that you are worried about. In this case, it is a chemical or a range of chemicals. So you need the toxicity information about that. As we have said in our submission, the vast majority of chemicals that are used have not been assessed for safety. So

---

48 Mrs Narelle Nothdurft, *Committee Hansard*, 17 February 2016, p. 16.

49 Mr John Jenkyn, *Committee Hansard*, 17 February 2016, p. 23.

50 Dr Marion Carey, Coordinator, Unconventional Gas Special Interest Group, Doctors for the Environment Australia, *Committee Hansard*, 12 April 2016, p. 37.

there is very little information and, for some of them, we do not even know what they are because they are commercial in confidence.<sup>51</sup>

4.60 Dr Carey also outlined the type of testing which, in her view, should be carried out in order to assess the health of those living alongside unconventional gas mining:

It is very important to have that environmental monitoring because, from that, we can start to see whether things are bio-indicated in humans. Sometimes when people are exposed to something it does not necessarily cause a harmful effect. But sometimes it does. And sometimes there can be something in their blood or urine that can be measured, depending on what the chemical is. But the early starting point is really to get that environmental information, which in many cases has not been required. We absolutely have to have information about what chemicals are going to be used.<sup>52</sup>

### **Impact on agriculture**

4.61 Australia's agricultural industry could be affected by unconventional gas mining activity in several ways. This section sets out key issues relating to unconventional gas mining and the agricultural industry, with regard to:

- domestic and export capacity;
- supply chain integrity; and
- production capacity, with areas of concern relating to:
  - land allocated for unconventional gas mining rather than agriculture; and
  - amount of time spent by landholders undertaking administrative work relating to unconventional gas mining.

4.62 The view of the Australian Dairy Industry Council regarding unconventional gas mining is that:

The Australian dairy industry must continue to operate and prosper without unconventional gas mining activity compromising the natural resources upon which the industry relies and without loss to industry reputation or market access.<sup>53</sup>

4.63 It was also submitted that agriculture was central to Australia's supply of food:

The Australian agriculture sector plays a crucial role in sustainably supplying food and fibre to domestic and international markets. The place

---

51 Dr Marion Carey, Coordinator, Unconventional Gas Special Interest Group, Doctors for the Environment Australia, *Committee Hansard*, 12 April 2016, p. 37.

52 Dr Marion Carey, Coordinator, Unconventional Gas Special Interest Group, Doctors for the Environment Australia, *Committee Hansard*, 12 April 2016, p. 38.

53 Australian Dairy Industry Council, *Submission 46*, p. 3.



of agriculture as a core pillar of the Australian economy is recognised by Federal and state governments.<sup>54</sup>

4.64 The Australian Wine Industry submitted that:

The Australian wine industry does not believe that unconventional gas mining can coexist within or near the wine growing regions of Australia, because it:

- is incompatible with viticulture, winemaking and wine tourism,
- threatens the brand and reputation of the internationally recognised wine brands of specific regions and Australia more generally,
- presents an unacceptable risk to scarce water and land resources, and
- appears to be inadequately regulated.<sup>55</sup>

4.65 Cotton Australia noted that there are a variety of views among cotton growers on unconventional gas mining, with some growers supportive of unconventional gas mining, some against it, and some unsure. Cotton Australia indicated that as an organisation, they are not opposed to coal seam gas mining.<sup>56</sup>

4.66 AgForce submitted that supporting landholders to manage 'the rapid development and expansion of the coal seam gas (CSG) industry' across regional Queensland has been 'a key organisational priority'.<sup>57</sup>

4.67 AgForce set out the role of their CSG Landholders' Project:

In response to our member's needs and following changes in 2010 to Queensland's land access laws, AgForce Queensland through AgForce Projects (the independent extension and delivery arm of AgForce Queensland) received Queensland Government funding to develop and implement a project to disseminate and provide factual information and independent support to landholders dealing with the CSG industry via local on ground workshops.<sup>58</sup>

4.68 Further, it was noted that annual surveys of landholders have been carried out as part of the CSG Landholders' Project, finding that common concerns relate to:

- potential cumulative groundwater impacts;
- potential impacts of CSG on their individual groundwater supplies/bore;
- weed and biosecurity risks on property from CSG; and

---

54 Australian Dairy Industry Council, *Submission 46*, p. 3.

55 Australian Wine Industry, *Submission 87*, p. 3.

56 Cotton Australia, *Submission 104*, pp 1-2.

57 AgForce, *Submission 235*, p. 1.

58 AgForce, *Submission 235*, p. 1.

- time taken away from their property/business to negotiate agreements and/or manage CSG activities.<sup>59</sup>

### ***Production capacity***

4.69 In this section, two aspects of the potential impact of unconventional gas mining on agriculture will be discussed:

- cropping and livestock land allocated to unconventional gas mining rather than agricultural production; and
- the amount of time spent by landholders undertaking administrative work relating to unconventional gas mining rather than agriculture.

### *Allocation of land to unconventional gas mining*

4.70 Submitters and witnesses highlighted the impact that coal seam gas infrastructure may have on the productive capacity of their land by reallocating agricultural land to unconventional gas mining.<sup>60</sup>

4.71 For example, the Australian Dairy Industry Council submitted that the dairy industry has specific requirements relating to infrastructure and routine:

Dairy production has specific infrastructure requirements and relies upon seasonal and daily routines, unique to the management of each farm, being conducted without disruption. Farmers' ability to operate their farms, have ongoing access to their farm assets, and have options to develop and grow their business must not be compromised by unconventional gas mining operations either on their own land or in the local area.<sup>61</sup>

4.72 In Queensland, the *Regional Planning Interests Act 2014* (QLD) restricts resource activity in an area of regional interest, where the activity is not exempt or where a regional interests development approval as not been granted. There are four areas of regional interest which set out the priority land use for that area:

- priority agricultural area;
- priority living area;
- strategic environmental area; and
- strategic cropping area.<sup>62</sup>

4.73 The Bender Family suggested that a review 'be undertaken on the percentage of prime agricultural land held within Queensland (5.87%) that is NOT protected by

---

59 AgForce, *Submission 235*, p. 2.

60 Ms Stina Foster, *Submission 6*; Dr GERALYN McCARRON, *Submission 12 Attachment 1*.

61 Australian Dairy Industry Council, *Submission 46*, p. 4.

62 Queensland Government, *Submission 217*, p. 10. Strategic cropping areas are determined by the state.

the Strategic Cropping Laws', and estimated that 'only 1.5% of prime agricultural land will be protected from mining/CSG activities'.<sup>63</sup>

4.74 Rabobank outlined concerns over concurrent coal seam gas and agricultural activity in a submission to the Senate Standing Committee on Rural Affairs and Transport References Committee's inquiry into the management of the Murray-Darling Basin in 2011. Rabobank submitted that 'CSG activities could constrain the productive capacity of agricultural land by impacting groundwater supply and quality, affecting infrastructure, and de-intensifying production systems'.<sup>64</sup>

4.75 Further, Rabobank submitted that they held concerns around:

- flow level and quality/contamination of hydro-geological systems;
- space required for roads, wellheads and connection pipes on agricultural land; and
- above-ground infrastructure on agricultural land potentially limiting agricultural production.<sup>65</sup>

4.76 A related concern was that the nature of the heavy black soil, or vertosol, in inland Queensland, is particularly unsuitable to the disruption of gas pipelines and unconventional gas mining infrastructure. This soil is of agricultural importance, and is a clay soil with shrink/swell properties, and can be self-mulching.<sup>66</sup>

*Time spent by landholders – administrative burden*

4.77 The amount of time spent by affected landholders reading and responding to unconventional gas mining documents, and in negotiations, was raised by a number of submitters and witnesses.<sup>67</sup>

4.78 The committee considers that there is no greater example of the administrative burden felt by those living in unconventional gas mining areas than the experience of the Bender Family in Queensland.

4.79 The Bender Family submitted that

To be really honest, it is impossible to determine the tangible magnitude of the time required to deal and manage the volume of correspondence that

---

63 Bender Family, *Submission 274*, p. 18.

64 Rabobank, *Submission 371* to the Senate Standing Committee on Rural Affairs and Transport References Committee inquiry into the management of the Murray-Darling Basin, 2011, p. 2.

65 Rabobank, *Submission 371* to the Senate Standing Committee on Rural Affairs and Transport References Committee inquiry into the management of the Murray-Darling Basin, 2011, p. 2. Rabobank expressed the view that 'given careful management and due consideration of each industry's needs, the agriculture and energy production should be able to co-exist'.

66 Australian Soil Classification, *Vertosols [VE]*, [http://www.clw.csiro.au/aclep/asc\\_re\\_on\\_line\\_V2/ve/vertosols.htm](http://www.clw.csiro.au/aclep/asc_re_on_line_V2/ve/vertosols.htm) (accessed 10 March 2016).

67 See, for example, Dr Pauline Roberts, *Submission 1*; Ms Annette Hutchins, *Submission 84*; Mr Herbert Bamerry, *Submission 148*, p. 2.

pertains to this industry while running an intensive farming operation 24/7. This is an area where the resource industry requires serious education.

...

It would be estimated to consume at a minimum 2 full days per week. However, in reality this industry is on the forefront of your mind 24/7.<sup>68</sup>

4.80 The committee heard that the Bender Family had needed to create and maintain a meticulous filing system to manage their interaction with the resources industry. Ms Helen Bender told the committee that her family had accumulated 21 folders of documents relating to their interaction with unconventional gas mining companies in a ten year period.<sup>69</sup>

4.81 Ms Bender highlighted the burden put on landowners who have had to dedicate significant amounts of time to learning and understanding unconventional gas mining legislation and their rights as landowners, showing the committee her father's copy of the Petroleum and Gas Act, noting '[h]e had to learn this himself'.<sup>70</sup>

4.82 The Bender Family submitted that:

...the volume of correspondence and stress that this industry places on a landholder requires serious reforms across the Land Access Framework, legislation and providing the landholder with an avenue to go to for genuine assistance.<sup>71</sup>

4.83 A number of other submitters highlighted the amount of time spent on interacting and managing contact with the resources industry. For example, Mr Gary and Mrs Kerry Ladbrook submitted that:

Time spent (not including reading/responses to 5 Draft EIS & 6 Environmental Impact Statements that directly impacted us) was well in excess of 3000 hours each in a 20 month period with further ongoing time impacts occurring on a weekly if not daily basis. It is the equivalent to losing two days per week away from your business which is unacceptable unless compensated properly throughout the process.

We had between 2012 & 2014 six Draft Environmental Impact Statements (approx 400-500 A4 pages in size) to respond to individually and 5 Environmental Impact Statements (400 plus pages in size) to read & respond where required.<sup>72</sup>

4.84 Ms Annette Hutchins submitted that the time spent by local residents on unconventional gas mining administration was harming productivity:

---

68 Bender Family, *Submission 274*, p. 18.

69 Ms Helen Bender, *Committee Hansard*, 17 February 2016, p. 8.

70 Ms Helen Bender, *Committee Hansard*, 17 February 2016, p. 14.

71 Bender Family, *Submission 274*, p. 14.

72 Mr Gary and Mrs Kerry Ladbrook, *Submission 29*, p. 3.

There is financial distress caused by trying to deal with the impacts of CSG and mining companies legally and continually having to monitor activities taken on their land and changes to regulations and legislation, reading EIS, writing submissions, attending meetings, etc....Taking time out of their working day which impacts on productivity, finances and personal lives.<sup>73</sup>

4.85 Cotton Australia submitted that they had worked towards an understanding of unconventional gas mining development, but acknowledged that cotton growers may not have similar time and resources:

Through our involvement on the PAG Cotton Australia has improved its understanding of requirements for gas field development, and the differences involved in moving from the exploratory to production stages. This has been a long term process which has involved ongoing interactions with petroleum companies, extensive reading of literature based on limited local experience, and engagement with locals impacted by development.

Growers often do not have the time available to build this familiarity, and so when approached by extractive industry companies often commence negotiations with a limited understanding of what is involved.<sup>74</sup>

4.86 Similarly, p&e Law explained that:

Landowners do not have access to employees with expertise in the matters to be addressed by the reports. They do not have the time to keep monitoring the changes. They frequently do not have the financial capacity to pay for the expertise needed to be properly and fully informed.<sup>75</sup>

4.87 The committee notes that community members have expended a significant amount of energy in monitoring and recording the activities of unconventional gas mining. In particular, the committee has seen and published forty short video recordings made by Mr Tony Pickard of unconventional gas mining infrastructure around the Bibblewindi site in NSW.

### ***Domestic and export capacity***

4.88 The potential impact of unconventional gas mining on the capacity of agricultural land to produce food for domestic consumption was raised by submitters. For example, CSG Free Maffra & Districts submitted that 'we need to protect every square metre of arable land for food production'.<sup>76</sup>

4.89 The Bass Coast Shire Council expressed the view that '[t]he uncertainty and risks involved with unconventional gas exploration and mining activities cannot be sufficiently mitigated to protect the agricultural land in the Shire'.<sup>77</sup>

---

73 Ms Annette Hutchins, *Submission 84*, p. 5.

74 Cotton Australia, *Submission 104*, pp 4-5.

75 p&e law, *Submission 246*, p. 3.

76 CSG Free Maffra & Districts, *Submission 105*, p. 1.

77 Bass Coast Shire Council, *Submission 65*, p. 2.

4.90 Mr Max Mudford, a farmer from NSW, told the committee that

The meat—the lamb, beef, chicken and fish—that turns up on your plate was our product; not mine alone, but our product as a nation, delivered onto your plate. The coal seam gas industry and the government are asking us to step aside so they can drill a hole here and forget about production of food but get into a gas system that destroys the water that we need on this planet to survive.<sup>78</sup>

#### *Supply chain integrity*

4.91 Submitters raised concerns over the potential for contamination of livestock or produce by chemicals used during unconventional gas mining.<sup>79</sup> Further, the committee also notes concerns raised by landholders of the impact of unconventional gas mining on local livestock and pets, including loss of hair, blindness, an increase in the number of stillborn animals, premature death, unusual behaviour and a variety of illnesses.

4.92 Friends of the Earth Australia raised concerns over the 'ongoing issues of insurance arrangements with landholders should there be issues with unconventional gas mining infrastructure in the long term', and submitted that:

Questions have also arisen regarding the burden of responsibility and insurance should a contamination incident impede a farmer's ability to sell produce. Under Australian law, it is a criminal offence to sell food that you know is unsafe. Unconventional gas mining operations that involve large volumes of toxic chemicals and run the risk of surface and ground water contamination could create pathways of exposure of crops and animals to chemicals.<sup>80</sup>

4.93 Further, submitters raised concerns regarding their ability to secure insurance for their businesses when they advised insurance companies that they had unconventional gas mining on their land.

4.94 Ms Sarah Ciesiolka submitted that:

We approached our insurance company to mitigate the risk and safeguard our assets but were told that there is no policy available in Australia that

---

78 Mr Max Mudford, *Committee Hansard*, 29 March 2016, p. 49.

79 Dr Geralyn McCarron, *Submission 12*; Mr Richard Deem, *Submission 21*; Ms Frances Winfield, *Submission 22*, pp 1-2; Ms Lorraine Stern, *Submission 24*; Mr David and Mrs Julie Boulton, *Submission 35*, p. 4; Ms Dianna Flint, *Submission 50*; Mr Trevor Flint, *Submission 51*; Ms Annette Dean, *Submission 68*; Ms Louise Somerville, *Submission 70*; Ms Annette Hutchins, *Submission 84*; Mr Brett Lancaster, *Submission 94*; Ms Patricia McAuliffe, *Submission 102*; Protect Arnhem Land, *Submission 115*; Ms Sharlene Henderson, *Submission 118*; Ms Diane Lawton, *Submission 132*; Ms Heather Gibbons, *Submission 147*; Midwest and Gascoyne Alliance, *Submission 232*; Interbeing, *Submission 258*; Limestone Coast Protection Alliance, *Submission 263*; Ms Stacey O'Brien, *Submission 270*.

80 Friends of the Earth Australia, *Submission 141*, p. 13.

---

will do so. Our insurer advised that our farm business, water resources and/or product are considered "uninsurable" against CSG contamination.<sup>81</sup>

4.95 Further, Ms Ciesiolka wrote that:

Being unable to obtain insurance leaves food producers like myself at grave risk, questioning what consequences there may be for food products sold into the future, and whether we may ultimately incur a legal or financial liability. Detection of contaminants would also mean that we would be immediately suspended from current and future market participation for our product. Our signed contracts for supply all include clauses related to contamination of the shipment and, as per the terms of those documents, we know that our supply chain partners would hold us liable for any product contamination caused by CSG activities within our wider region, essentially leaving us to bear the ultimate burden in the event of contamination of the food chain.<sup>82</sup>

4.96 Submitters told the committee they were concerned that unconventional gas mining activity had an adverse effect on the health of their animals, including livestock and pets.<sup>83</sup>

4.97 The Australian Dairy Industry Council submitted that:

The health and wellbeing of people and animals is crucial for the Australian dairy industry. The unconventional gas mining industry exposes the dairy industry to a range of risks that could compromise achievement of high quality safe dairy products...The dairy industry faces commercial risks if consumer confidence is affected by impacts or potential impacts of unconventional gas mining. The reputation of the Australian dairy industry needs to be protected and promoted in order for the industry to prosper and grow.<sup>84</sup>

4.98 The National Livestock Production Assurance (LPA) was introduced in 2004 to be the 'Australian livestock industry's on-farm food safety program' and is overseen by the LPA Advisory Council, which is made up of representatives of peak industry bodies.<sup>85</sup>

4.99 The LPA National Vendor Declaration (LPA NVD) provides for the recording of stock movement and guarantees the food safety status of animals.<sup>86</sup>

---

81 Ms Sarah Ciesiolka, *Submission 250*, p. 5.

82 Ms Sarah Ciesiolka, *Submission 250*, p. 5.

83 See, for example, Bender Family, *Submission 274*.

84 Australian Dairy Industry Council, *Submission 46*, p. 3.

85 Meat and Livestock Australia, *About LPA*, <http://www.mla.com.au/Meat-safety-and-traceability/Livestock-Production-Assurance/About-LPA> (accessed 11 March 2016).

86 Meat and Livestock Australia, *About LPA*, <http://www.mla.com.au/Meat-safety-and-traceability/Livestock-Production-Assurance/About-LPA> (accessed 11 March 2016).

4.100 Safemeat, a partnership between the red meat and livestock industry and state and federal governments, set out that beef producers are ultimately responsible for the assessment of risks:

...producers are responsible for undertaking a property risk assessment to ensure they are aware of any potential areas of contamination, and take appropriate management steps to avoid the risks (this could include excluding stock from risk areas if necessary). Where circumstances change, it is the producer's responsibility to update the property risk assessment.<sup>87</sup>

4.101 Safemeat note their risk management measures:

In the event that any concerns are raised by environment protection agencies, or state agriculture departments, SAFEMEAT has a range of measures which it could initiate to monitor livestock which may have been exposed to such risks (measures include traceability systems, residue monitoring programs and assignment of statuses).<sup>88</sup>

4.102 Ms Gillian Laland wrote that:

...when you sign an NVD you are providing the buyer with a guarantee relating to the food safety status of the animals they are purchasing. Farmers who sign National Vendor Declarations for livestock that may have been contaminated by contact with CSG waste are likely to be liable for any harm incurred.<sup>89</sup>

4.103 Ms Heather Gibbons submitted the view that:

The National Vendors' Declaration form is meant to keep our food chain safe. Is it? eg. the crops and animals, which are exposed to chemical contaminants in the gasfields of Queensland. Are the forms filled in? Is there a 'heads in the sand' attitude? Do we wait for the problem to blow up in our faces in the future with food being tested for contamination? I believe the potential to lose our export markets is huge.<sup>90</sup>

## Water resources

4.104 The impact of the unconventional gas mining industry on agriculture has generally been assessed with regard to water usage, and the impact on the quantity and quality of water available to landowners.

4.105 During the coal seam gas mining process, drilled wells are 'de-watered' as water is withdrawn from the subterranean aquifer to help the gas flow more freely.

---

87 Safemeat, *Coal Seam Gas Production and Implications for Livestock*, <http://safemeat.com.au/announcements/coal-seam-gas-production-and-implications-for-livestock> (accessed 2 March 2016).

88 Safemeat, *Coal Seam Gas Production and Implications for Livestock*, <http://safemeat.com.au/announcements/coal-seam-gas-production-and-implications-for-livestock> (accessed 2 March 2016).

89 Ms Gillian Laland, *Submission 256*, p. 13.

90 Ms Heather Gibbons, *Submission 147*, p. 33.



---

The largest volume of water produced is during the early stages of coal seam gas recovery.<sup>91</sup>

4.106 The water brought up from the well requires treatment before it can be reused or disposed of:

Water of suitable quality can be used for town water, aquaculture, recharging aquifers, wetlands, recreational lakes or at mining operations and power stations, and recent practice has been for poor quality water to be contained in storage ponds.<sup>92</sup>

4.107 Hydraulic fracturing (fracking) requires water, a mix of chemicals and a proppant (generally sand) to be pumped into the well. The recovery of coal seam gas through fracking can use between 0.2 and 1ML per well (a megalitre, or ML, is one million litres), and the recovery of shale gas through hydraulic fracturing can use 15 – 25 ML.<sup>93</sup>

### ***Water quality and quantity***

4.108 Submitters to the inquiry and witnesses who appeared at the committee's public hearing in Dalby told the committee that they were concerned over the amount of water being used in coal seam gas mining in their area, and the effect it may have on their ability to maintain their agricultural operations.<sup>94</sup> Many submitters advised the committee that their bores have been depleted and that the remaining water had been contaminated after noting that their water had changed colour and developed an unusual taste and smell. As a result, many landholders advised the committee that they no longer used the groundwater for fear of toxins and dangerous chemicals.

### ***Baseline testing***

4.109 Submitters highlighted the lack of baseline data available for water resources. For example, Dr Gavin Mudd submitted that:

Another approach to identifying the source of contaminants and distinguishing water origins is the use of environmental isotopes. This means that all aquifers which could be impacted by CSG activities need to include such a complete chemical suite in their baseline studies and ongoing monitoring. Baseline data is especially crucial in establishing trigger levels for intervention and determining contamination levels and sources.<sup>95</sup>

---

91 Department of Environment and Heritage Protection (QLD), *Fracking*, <http://www.ehp.qld.gov.au/management/non-mining/csg-water.html> (accessed 8 January 2016).

92 Michael Roarty, *The development of Australia's coal seam gas resources*, Parliamentary Library Background Note, July 2011, p. 5.

93 Victorian Legislative Council Environment and Planning Committee, *Inquiry into unconventional gas in Victoria*, p. 52, <http://www.parliament.vic.gov.au/epc/references-committee-inquiries/article/2633> (accessed 8 December 2015).

94 Reverend Graham Slaughter, *Submission 20*, p. 6; Mr Joe Hill, *Submission 26*, p. 2.

95 Dr Gavin Mudd, *Submission 45 Attachment 1*, p. 4.

4.110 The Centre for Coal Seam Gas submitted that baseline testing of groundwater could be of significance to monitoring effects of unconventional gas mining activity:

...10-20 year trends in groundwater levels and groundwater chemistry can represent a touchstone in assessing effects of extraction of groundwater associated with unconventional gas development and pre-existing uses for agriculture. Such trends are also needed to monitor and assess effects on biodiversity, environmental and public health, and socioeconomic conditions.<sup>96</sup>

4.111 The Australian Dairy Industry Council submitted that sustainable groundwater and surface water reserves were very important to the dairy industry, and argued that:

An assessment and monitoring system needs to provide independently verified baseline data and on-going monitoring data to transparently identify potential cumulative impacts of unconventional gas mining in a regional context, with any impacts remedied.<sup>97</sup>

### *Great Artesian Basin*

4.112 Submitters have raised concerns over the impact of unconventional gas mining on the quality and quantity of groundwater sourced from the Great Artesian Basin (GAB).<sup>98</sup>

4.113 Ms Anne Kennedy in her evidence to the committee at the Narrabri public hearing stated her concerns:

Australia is the driest inhabited continent on earth, and we have one incredible resource: our Great Artesian Basin. The governments can forget about gold, uranium, coal or gas. The single greatest resource we have is our groundwater. Vast areas of Australia would be uninhabitable without it. We literally could not live out there without our groundwater. This is not just a fight to save our water and our farms and our communities; this is actually about the future of agriculture and the future of Australia. I am not exaggerating one iota when I say that. We will not be able to live out here without water, and this coal seam gas industry will destroy our water.<sup>99</sup>

4.114 In September 2015, Santos stated that water extracted for the Narrabri Gas Project will not be drawn from the GAB. Dr Richard Cresswell, a former CSIRO hydrogeologist, stated:

They [the waters] are not Great Artesian Basin waters, they are from the Gunnedah Basin, beneath the GAB and it is isolated from the GAB by some very fine grain sediments which do not allow water to go up or down between those two basins...

---

96 Centre for Coal Seam Gas, University of Queensland, *Submission 98*, p. 4.

97 Australian Dairy Industry Council, *Submission 46*, p. 3.

98 Dr Pauline Roberts, *Submission 1*; Dr Geralyn McCarron, *Submission 12, Attachment 2*; Ms Jenny Chester, *Submission 18*; Reverend Graham Slaughter, *Submission 20*; Ms Lorraine Stern, *Submission 24*.

99 Ms Anne Kennedy, *Committee Hansard*, 29 March 2016, p. 20.

A farmer's water would not be impacted by any of the drilling that goes through the Great Artesian Basin to get to the gas.<sup>100</sup>

4.115 Santos set out that routine baseline testing is carried out in Narrabri, NSW:

In Narrabri in New South Wales, Santos has used the best available science to build an understanding of the potential effect our operations may have on local water. This includes routine baseline monitoring of over 100 groundwater locations across the Narrabri region and historical monitoring at more than 100 landholder bores.<sup>101</sup>

*Contamination of groundwater*

4.116 The recovery of coal seam gas requires the drilling of wells through geological layers, including groundwater layers. Water produced during unconventional gas mining contains very high levels of salt.

4.117 Submitters told the committee of their concerns that their groundwater had been contaminated through unconventional gas mining practices. For example, Mr Joe Hill told the committee that a dam across the road from his property had burst, flooding his property with CSG treated water. Mr Hill provided the committee with a letter from the Queensland Department of Environment and Heritage Protection which outlined that as the farm dam sites on Mr Hill's property which were affected by the burst dam 'are not classed as waters, there has been no evidence of non-compliance with this condition of the BUA [Beneficial Use Agreement]'.<sup>102</sup> In the letter, EHP further set out that the CSG water was:

...fit for the purpose intended in the beneficial use approval and that it posed no greater risk than what is acceptable for any other irrigation project, to the extent that it complied with the conditions of the BUA.<sup>103</sup>

4.118 At the Dalby public hearing, Mr and Mrs Boyle told the committee that a valve in above-ground infrastructure on their property had leaked, spilling 120,000 litres of CSG water onto their property.<sup>104</sup>

4.119 Ms Anne Kennedy in her evidence to the committee at the Narrabri public hearing expressed her concerns about contamination of groundwater in the Great Artesian Basin:

If they contaminate it, it is all over. You cannot decontaminate an aquifer. Once they have fractured it, it can never be repaired. Once it is

---

100 Santos, *The Santos Narrabri Gas Project will not impact the Great Artesian Basin*, <https://narrabrigasproject.com.au/2015/09/the-santos-narrabri-gas-project-will-not-impact-the-great-artesian-basin/> (accessed 4 March 2015).

101 Santos, *Submission 57*, p. 24.

102 Letter from Queensland Department of Environment and Heritage Protection to Mr Joe Hill, 2 April 2015, Additional information.

103 Letter from Queensland Department of Environment and Heritage Protection to Mr Joe Hill, 2 April 2015, Additional information.

104 Mr Lindsay Boyle, *Committee Hansard*, 17 February 2016, p. 28.

contaminated, it is poisoned...Once we lose our water, we will no longer exist out there. We have very, very productive black soil plains, but it is black soil. It is fertile soil, and it is rich. But you cannot run water, even if it does rain, for dams. We have nothing but our Great Artesian Basin, and that is a vast area out there.<sup>105</sup>

## **Social impact**

4.120 The committee heard that divisions within communities have been caused by the unconventional gas mining industry, and that unconventional gas mining activity had a significant social impact.<sup>106</sup>

4.121 Mrs Shay Dougall submitted that:

The social impact of the industry has been devastating. It has divided extended families, it has resulted in many marriage break ups, it has changed the very fabric of the community with many locals leaving and socioeconomic disadvantaged groups being sent to the community due to the devastating economic downturn.<sup>107</sup>

4.122 Mr and Mrs Gary and Kerry Ladbrook submitted that there had been an 'exodus of families' as gas mining companies bought out properties in the community.<sup>108</sup>

4.123 Reverend Graham Slaughter submitted that in his view, divisions had been created in communities:

Sadly, confidentiality clauses and the dilemma of whether to fight the company or to give in has pitted rural families against each other. Instead of neighbours being a lifeline in times of trouble and a social support of friendship and loyalty, mining companies have successfully and deliberately divided and conquered through tactics which include bullying, manipulation and threats of legal action ensuring that in many instances, battlelines of conflict and mistrust are drawn...<sup>109</sup>

4.124 The Lock the Gate Alliance submitted that proposed and current unconventional gas mining activity had led to a range of impacts on the mental and emotional wellbeing of landholders.<sup>110</sup> The Lock the Gate Alliance further submitted that landholders and affected communities felt a 'a sense of powerlessness, betrayal and frustration' at the imposition of the industry in their lives.<sup>111</sup>

---

105 Ms Anne Kennedy, *Committee Hansard*, 29 March 2016, p. 22.

106 See, for example, Ms Jane Stevenson, *Submission 197*; *Submission 249*.

107 Mrs Shay Dougall, *Submission 103*, p. 8.

108 Mr Gary and Mrs Kerry Ladbrook, *Submission 29*, p. 8.

109 Reverend Graham Slaughter, *Submission 20*, p. 5.

110 Lock the Gate Alliance, *Submission 146*, p. 19.

111 Lock the Gate Alliance, *Submission 146*, p. 20.

### ***Lack of communication/information***

4.125 The committee heard there was insufficient communication between gas mining companies and landholders and insufficient information provided, which has led to uncertainty for residents about the potential impact of unconventional gas mining.

4.126 One key issue raised by submitters and witnesses was the frustration experienced by landholders and residents in obtaining relevant information. For example, Mrs Narelle Nothdurft told the committee that although testing was conducted on the noise level on their property (by the Queensland Department of Environment and Heritage Protection (EHP)) it had been difficult to gain access to the report:

On noise monitoring, we got EHP to come and do the noise monitoring on our place. It has now taken us over six months through RTI—right to information—to get any information out of them. They could only give us three days instead of the whole ten days [tested]. It was in our bedrooms in our own house and they would not give it to us.<sup>112</sup>

4.127 Mrs Nothdurft and Mrs Shay Dougall, residents of the Western Downs Region, noted that when access had been granted to the report, it was incomplete, with no explanation given. Ms Dougall told the committee that:

[Mr and Mrs Nothdurft] sent a right to information in to get their own data back after EHP promised they would give it to them. Five months later they received a portion of the data after the EHP had checked with QGC about what it was they should release. They have received only a portion of the data.<sup>113</sup>

### ***Social licence***

4.128 A number of organisations have claimed that no social license exists for unconventional gas mining in communities across Australia.<sup>114</sup>

4.129 According to the Australian Centre for Corporate Social Responsibility, a social licence is 'the level of acceptance or approval continually granted to an organisation's operations or project by local community and other stakeholders'.<sup>115</sup>

---

112 Mrs Narelle Nothdurft, *Committee Hansard*, 17 February 2016, p. 17.

113 Mrs Shay Dougall, *Committee Hansard*, 17 February 2016, p. 17.

114 See, for example: Mr Julian Sharp, *Submission 14*; Dr Wayne Somerville, *Submission 16*; Gasfield Free Seaspray, *Submission 34*; Mr Peter Thompson, *Submission 43*; Bass Coast Shire Council, *Submission 65*; Sustainable Boolarra Group, *Submission 66*; Ms Cynthia Lyons, *Submission 67*; Mr Brian McLure, *Submission 93*; Dr Catherine Pye, *Submission 97*; Ms Christine Degan, *Submission 101*; Ms Elke Nicholson, *Submission 119*; Frack Free Moriac, *Submission 139*; Mrs Lynley Manson, *Submission 163*; Ms Megan Kuhn, *Submission 190*; No Fracking WAy, *Submission 218*; Ms Deborah and Mr Fergus O'Connor, *Submission 243*.

115 Australian Centre for Corporate Social Responsibility, *Defining the elusive and essential social licence to operate*, <http://accsr.com.au/news/defining-the-elusive-and-essential-social-licence-to-operate/> (accessed 3 March 2015).

4.130 Gaining and maintaining a social licence is a fluid process which relies on stakeholder expectations, and the continuing relationship between a company and its stakeholder group.<sup>116</sup>

4.131 Some communities have conducted local surveys of views on unconventional gas mining in the local area. For example, local resident groups of the Narrabri area have stated that, according to surveys carried out locally, there is no broad community support or social licence for coal seam gas mining in the area.<sup>117</sup>

4.132 Mrs Megan Kuhn told the committee about surveys conducted in the Narrabri area of NSW:

...our 'gas field free' community surveys, which began in 2012, have been witnessing the growth of something extremely powerful. The survey is a grassroots participatory process where 100 per cent of the community are approached to take part, whereby a simple question is posed to them by their own community members, and that is: 'Do you want your road or land gas-field-free?' The responses they can give are 'yes', 'no' or 'not sure'. It is undertaken by individual members, road by road, neighbour by neighbour, and it is a genuine opportunity for all community members to have their voices heard.<sup>118</sup>

4.133 Mrs Kuhn continued that if a majority of views against unconventional gas mining is recorded for an area, it is declared 'gasfield free'. Mrs Kuhn told the committee that: 'By establishing a mandate on this one issue, we are engaged in protecting our community. Our clear rejection of dangerous, invasive gas fields is undeniable'.<sup>119</sup>

4.134 However, the Energy Resource Information Centre has argued against claims that there is no social licence for unconventional gas mining in the Narrabri area, and stated that 85 per cent of landholders in the project support unconventional gas mining.<sup>120</sup>

## Senator Glenn Lazarus

### Chair

---

116 Australian Centre for Corporate Social Responsibility, *Defining the elusive and essential social licence to operate*, <http://accsr.com.au/news/defining-the-elusive-and-essential-social-licence-to-operate/> (accessed 3 March 2015).

117 Ms Sally Hunter, Vice-President, People for the Plains, *Committee Hansard*, 29 March 2016, p. 27; Mrs Megan Kuhn, *Committee Hansard*, 29 March 2016, p. 41.

118 Mrs Megan Kuhn, *Committee Hansard*, 29 March 2016, p. 41.

119 Mrs Megan Kuhn, *Committee Hansard*, 29 March 2016, p. 41.

120 Energy Resource Information Centre, *'Ring-in' protesters can't claim a social licence*, <http://www.energyresourceinformationcentre.org.au/conversation/ring-in-protesters-cant-claim-a-social-licence/> (accessed 4 March 2016).



# Chair's Additional Comments and Recommendations

1.1 In this chapter the Chair discusses the evidence received by the committee and sets out his recommendations.

## **Community concerns**

1.2 There is a high degree of confusion, concern and frustration surrounding the operation of unconventional gas mining in Australia.

1.3 For those communities that exist in and near unconventional gas mining operations, the committee has heard how polarising the issue has been for these communities, the type of harm the industry is having on these communities and how they fear for the safety of their health, family, business, environments—their land, air and water. The committee has also noted concerns regarding reductions in the value of their land and the inability to sell their land as a result of unconventional gas mining on their property or on nearby properties.

1.4 For those communities near exploration areas, the committee heard that there are strong concerns about their ability to plan for the future should unconventional gas mining be commenced in their areas, and their anxiety about their inability to prevent unconventional gas mining taking place.

## ***Interaction of landholders with the resources industry***

1.5 Being forced to engage with resource companies adds social and administrative burdens, and imposes significant time constraints on landholders and communities. This is potentially reducing productivity as people have less time to devote to their own business, families and jobs.

1.6 It also places additional stress and pressure on people and communities. Even if communication and negotiations on the part of resource companies is being done well, it does not detract from the fact that an additional burden is placed on people who have no right to reject the activity on their land. The Chair is concerned about the impact of unconventional gas mining on the mental health of community members who live in or near unconventional gas mining activity.

1.7 The committee heard that members of communities across Australia have limited pathways available to them in order to express their opposition to unconventional gas mining—rendering communities across Australia without a voice. The committee heard that in addition to not being able to refuse access to their land, community members who do not wish to have unconventional gas mining undertaken on their land are required to negotiate with the resources industry, with the possibility in Queensland of being taken to the Land Court to resolve a failed negotiation process.

1.8 The outcome of negotiations with unconventional gas mining companies is a foregone conclusion, as landholders have no right to refuse access and are forced to negotiate compensation.



1.9 Landowners with unconventional gas mining activity on their land are dedicating significant amounts of time to reading through large documents and legislation in order to facilitate the (at times) unwanted intrusion of unconventional gas mining. The committee heard first-hand experiences of landowners' interaction with the resources industry and saw the volume of administration and information that must be accumulated, read, responded to and stored in the households of rural families, leading to significant constraints on their ability to undertake the operation of their businesses and lives. The committee heard that members of communities across Australia have limited experience, resources, support and knowledge to adequately respond to extremely well-resourced energy companies.

### ***Health***

1.10 In addition, the committee has heard compelling evidence to show that there are unresolved questions about the health and safety impacts on human and animal health, and the ability for resource companies to guarantee that their activities are able to be carried out safely.

1.11 Community members from the Western Downs Region of Queensland expressed strong concerns for their health, and told the committee that they face significant challenges in accessing adequate healthcare, often being referred backwards and forwards between the state's health contact line and local hospital.

1.12 The Chair is very concerned that the health needs of community members are not being addressed, and believes that the process for healthcare to be obtained by those living around unconventional gas mining must be made clearer. Improved access to health services must be made available.

1.13 A thorough investigation of the human health effects of coal seam gas mining, hydraulic fracturing and underground coal gasification must occur, particularly around the Hopeland area of Queensland.

### **Impact of unconventional gas mining on the environment**

1.14 The Chair is very concerned at the potential impact of unconventional gas mining on Australia's water resources and production capacity.

### ***Water resources***

1.15 Australia's water resources are a precious commodity, which should be valued and safeguarded against unnecessary or excessive use. The Chair notes the operation of the 'water trigger' in the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), which regulates coal seam gas mining where it may have a significant impact on water resources. However, the Chair is concerned that the level of water usage deemed to be acceptable is not reflective of community concerns.

1.16 The committee heard from residents of the Narrabri area of NSW, which draws on the Great Artesian Basin groundwater resource, that unconventional gas mining poses a significant threat to agricultural operations which also draw on that water resource.

1.17 Unconventional gas mining uses a large volume of water, which requires treatment before it can be used again or disposed of. The committee has not had time to consider comprehensively the treatment, re-use and disposal of produced water. A range of issues were raised by landholders in relation to water depletion and contamination, and the lack of immediate remedy available to them.

### ***Agricultural operation***

1.18 The committee heard that there is a level of anxiety for agricultural producers around protecting supply chain integrity from potential contamination by chemicals used and released by unconventional gas mining activity.

1.19 The committee heard that no insurance is available for agricultural producers to ensure that if contamination did occur, their operations would be safeguarded from financial or legal liability.

1.20 The stress placed onto agricultural producers by the operation of unconventional gas mining on or near their land is having a significant impact on their ability to plan their business and operations, and safeguard their products. It is having a significant effect on mental health— placing pressure on landowners to absorb the risk into their businesses and lives.

### **Regulation of the unconventional gas mining industry**

1.21 The Chair is particularly worried about the ability of the states and territories to appropriately resource and provide expertise to adequately regulate the unconventional gas mining industry. Unconventional gas mining is a highly technical activity, and significant expertise is required to conduct the industry as well as to monitor and regulate it. The Chair questions whether state and territory governments have the resources required to provide detailed regulatory oversight of unconventional gas mining.

1.22 It is the view of the Chair that there is strong support for greater regulation and oversight of the industry, and for laws governing unconventional gas mining to be harmonised across the country. While noting that there are a significant number of laws in each state and territory that may impact on unconventional gas mining, the committee considers that these laws should be reviewed with a view to providing consistent:

- rules for access to property to conduct activities associated with unconventional gas mining;
- rights for landholders to reject or dispute unconventional gas mining;
- regulatory standards not only for operation of unconventional gas mining, but for continued maintenance, decommissioning, rehabilitation of sites and ongoing monitoring of decommissioned sites.

1.23 On this basis, the Chair recommends that the Commonwealth government conduct an independent review of all relevant state, territory and Commonwealth legislation with a view to providing consistent legislation, and recommending law reform where required; and that this review be made publicly available. This needs to include development of a national strategy to address the conduct of unconventional

gas mining across the country, noting the locations of such mining and its impact on the agricultural industry. Further, a review of the management of workplace health and safety requirements across the sector is recommended. Landholders expressed concern that no government organisation conducted compliance checks on their land.

### **Concluding remarks**

1.24 The unconventional gas mining industry is a long way from having adequate regulation, oversight and operation.

1.25 Questions exist as to whether the industry has the social licence to operate in some communities, and that this opposition should carry a far greater weight when proposals for unconventional gas mining are considered.

1.26 The committee heard the frustration and concerns of people who have experienced unconventional gas mining activity in their community and those who may have unconventional gas mining in their community in the future.

1.27 The Chair notes the fatigue felt by affected community members, who told the committee that despite writing numerous submissions to previous state and federal parliamentary inquiries, letters to local and federal political representatives, staging protests and organising surveys of local views, they felt that their voices had still not been heard.

1.28 The committee heard that members of agricultural communities, who had never previously attended protest activity, felt that they had been driven to engage in it because there were such limited pathways for their opposition to unconventional gas mining to be heard.

1.29 The Chair questions the role of the unconventional gas mining industry as job provider. As noted in Chapter 2 of this report, in February 2014 APPEA, the industry's peak body, stated that the LNG industry had created 100,000 jobs. Although the committee agrees that jobs have been created by the industry, the committee notes APPEA's data from the end of 2015, which set out that 13,000 people were employed in the coal seam gas industry.

1.30 The jobs created by the industry may not be sustainable, and are decreasing in number.

1.31 The committee heard concerns over the number of fly-in-fly-out employees in the unconventional gas mining industry. It is the view of the Chair that fly-in-fly-out positions can have a detrimental impact on the mental health of workers, families, and the local communities who do not benefit from the influx of workers.

1.32 During the course of the committee's work, various announcements were made regarding the future of unconventional gas mining in Australia. For example:

- a proposed unconventional gas mining project in Gloucester, NSW, was cancelled by AGL;
- the Camden, NSW, gas project was announced to be finishing in 2023, twelve years earlier than scheduled; and

- 
- underground coal gasification was banned in Queensland, with Linc Energy entering voluntary administration.

1.33 These events call into question the economic viability of the unconventional gas mining industry in Australia. The committee has not had time to sufficiently consider whether the unconventional gas mining industry has a secure future as an energy provider in Australia.

#### **Recommendation 1**

**1.34 That the Commonwealth Government works with states and territories to develop a national strategy to manage the conduct of Unconventional Gas Mining in Australia.**

#### **Recommendation 2**

**1.35 That the Commonwealth Government appoint an Unconventional Gas Mining Commissioner to oversee the conduct, management, regulation and compliance of the entire industry on a national basis.**

#### **Recommendation 3**

**1.36 That the Commonwealth Government appoint a Resources Ombudsman to support Australians affected by mining, in particular coal seam gas mining, and to provide an appropriate and independent dispute resolution service to those affected by resource projects.**

#### **Recommendation 4**

**1.37 That the Commonwealth Government establish a community legal service to provide landholders and others affected by the resource industry and unconventional gas mining with access to free legal advice.**

#### **Recommendation 5**

**1.38 That the Commonwealth Government establish a dedicated health and medical service inclusive of mobile services to ensure that people affected by resource projects, and in particular, unconventional gas mining projects, have access to appropriate and timely health services.**

#### **Recommendation 6**

**1.39 That the Commonwealth Government makes resourcing available to the National Health and Medical Research Council to undertake long-term studies into the potential health effects of the unconventional gas mining industry.**

**Recommendation 7**

**1.40** That the Commonwealth Government establish an independent national testing and research centre to undertake testing associated with the resource sector, in particular the unconventional gas mining sector.

**Recommendation 8**

**1.41** That the Commonwealth Government establish a national chemical register that ensures a transparent chemical disclosure regime be made publicly available, in order to provide landholders and local residents with information that is relevant to them.

**Recommendation 9**

**1.42** That the Commonwealth, state and territory governments commit to improving the level of independent scientific research related to unconventional gas mining and its impacts, and that this research be published.

**Recommendation 10**

**1.43** That the Commonwealth Government work with states and territories to cease approvals for any further unconventional gas mining projects across the country or the expansion of, or installation of further wells on, any existing unconventional gas mining projects.

**Recommendation 11**

**1.44** That the Commonwealth Government work with states and territories to establish an independent and dedicated national Resource Sector Workplace Safety group to investigate the health, safety, wellbeing and welfare of Australian workers in the resource sector. The group should investigate all aspects of the health and safety of workers including the management of occupational health and safety on sites, mental and physical wellbeing, exposure to chemicals and other forms of exposure, the management of incidents, compliance, reporting and support provided to workers and their families.

**Recommendation 12**

**1.45** That the Commonwealth Government work with states and territories to establish Trust Fund requirements for all resource companies operating in Australia. These would include:

- **A Worker Protection Trust Fund**

This Trust Fund would be established by the Commonwealth Government and would require, in collaboration with all states and territories, for all resource companies operating in Australia to put monies into this trust fund upfront to ensure that should the company go broke, restructure, or encounter financial difficulty, that all Australian workers and Australian sub-contractors are paid in full and receive their entitlements;

- **A Landholder Protection Trust Fund**

This Trust Fund would be established by the Commonwealth Government and would require, in collaboration with all states and territories, for all resource companies operating in Australia to put monies into this trust fund up front to ensure that any damages sustained by Australian landholders as a result, whether directly or indirectly of projects undertaken by resource projects are compensated for the damage. Such damages may include but not be limited to, contamination of water, depletion of water, damage to land, damage to business, and damage to health; and

- **An Environment Protection and Rehabilitation Trust Fund**

This Trust Fund would be established by the Commonwealth Government and would require, in collaboration with all States and Territories, for all resource companies operating in Australia to put monies into this trust fund up front to address and remedy where possible:

- any damage caused whether directly or indirectly to the environment by the resource project; and
- rehabilitation of resource project sites and associated areas should the company go broke, restructure, or encounter financial difficulty.

### **Recommendation 13**

**1.46** That the Commonwealth Government work with all states and territories to ban the process of hydraulic fracturing (fracking) across the country.

### **Recommendation 14**

**1.47** That the Commonwealth Government works with all states and territories to give all landholders the immediate right to refuse mining on their land.

**Recommendation 15**

**1.48 That the Commonwealth Government introduce legislation to ban donations from resource companies to political parties.**

**Recommendation 16**

**1.49 That the Commonwealth Government establish a Royal Commission into the Human Impact of Unconventional Gas Mining.**

**Recommendation 17**

**1.50 That the Commonwealth Government work with the states and territories to urgently transition to green energy to ensure the country's power supply is ensured, jobs are ensured and new emerging export markets are opened and supported.**

**Recommendation 18**

**1.51 That the Commonwealth Government legislates to ensure national food security by developing a new law which implements the goals of the National Food Plan, provides statutory recognition of the Australian Council on Food and provides mandatory exclusion zones for resource development on important food-producing land.**

**Senator Glenn Lazarus**

**Chair**

# Additional comments by Opposition Senators

## Introduction

1.1 The work of the Senate Select Committee on Unconventional Gas Mining adds to the significant body of work of former Australian Senate inquiries, and inquiries conducted by state and territory governments.

1.2 The committee has published almost 300 submissions to date, from members of communities across Australia who have expressed their views on unconventional gas mining, and has heard from witnesses at public hearings in Queensland, New South Wales and the Northern Territory.

1.3 Opposition senators acknowledge the contribution made by submitters and witnesses to the committee, and thank them for participating.

1.4 The majority of evidence presented to the committee through submissions and public hearings was anecdotal in nature and presented general views on unconventional gas mining as an industry. These views were noted by the committee, and have been valuable in assisting the committee to understand the general feeling of communities towards unconventional gas mining activity in their area and in Australia more broadly.

## Health

1.5 The committee heard evidence of the impact of unconventional gas mining on the health of residents of the Western Downs Region of Queensland. However, the committee has not been able to establish whether the symptoms presented to the committee have been clearly caused by unconventional gas mining activity in the area. In fact, the committee heard that a comprehensive study was conducted by Queensland Health in 2013 which:

...found that a clear link could not be drawn between the health complaints of residents and the impacts of the local CSG industry on air, water or soil within the community. This report could not identify any emissions from CSG activities that would explain the reported symptoms...<sup>1</sup>

## Environment

1.6 The committee also heard anecdotal evidence regarding the environmental impact of unconventional gas mining activity, but heard little factual or scientific evidence to support the claims.

1.7 For example, submitters and witnesses from the Narrabri area raised their concerns over the amount of water that may be used by Santos' unconventional gas mining project in the area. In contrast, Santos told the committee that their Narrabri Gas Project would use a comparatively small amount of water when compared with cotton irrigation:

---

1 Queensland Government, *Submission 217*, p. 14.



For the proposed Narrabri Gas Project, 37.5 gigalitres of water will be extracted from the coal seams over the project life, equating to an average of only about 1.5 gigalitres of water per year. By comparison, this volume is around the same amount of water used to irrigate around 200 hectares of cotton annually. About 60,000 hectares of cotton are irrigated in the Narrabri area each year.<sup>2</sup>

1.8 In addition, the committee heard that the Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development (IESC) provides expert scientific advice on coal seam gas and large coal mining proposals. The IESC is a statutory committee and was established in 2012.

### **Land access**

1.9 The report asserts that landholders lack rights and power, but throughout Chapter 3 sets out the comprehensive legislation that exists across the states and territories to regulate the unconventional gas mining industry. In fact, the report notes that the Queensland Gas Company (QGC) have said that they do not operate on private land without the landholder's consent.<sup>3</sup>

1.10 There is a portrayal of confusion or lack of uniformity across states in relation to land access, and the report presents a table which displays Tasmania and Victoria which have minimal or no unconventional gas mining occurring. If anything, the table shows the relative uniformity in states which have unconventional gas mining: Queensland and New South Wales.

1.11 Opposition senators also highlight that regular compensation payments which have been paid to landholders with unconventional gas mining on their land have allowed farmers to supplement their incomes and help to weather difficult conditions, including drought.

### **GasFields Commission Queensland**

1.12 The Committee heard a number of issues in relation to the GasFields Commission Queensland during hearings.

1.13 It should be noted that the Queensland Government has commenced a review of the GasFields Commission Queensland which is due to report to the Minister for State Development by mid 2016.

1.14 The Queensland Government has appointed an Independent Reviewer, Mr Robert Scott, to investigate whether there are opportunities to improve the regulatory and administrative settings for petroleum and gas regulation, including dispute resolution to address community concerns.

---

2 Santos, *Submission 57*, p. 24.

3 QGC, *Where we work*, <http://www.qgc.com.au/qclng-project/where-we-work.aspx>.

---

1.15 Mr Scott, a former member of the Land Court for 14 years, will, among other purposes:

- evaluate whether the GasFields Commission Queensland is achieving its purpose;
- evaluate whether the functions given to the Gasfields Commission Queensland are sufficient to allow it to effectively manage disputes about land access and other disputes between resource companies and landholders;
- investigate whether an alternative model, such as an independent Resources Ombudsman, is needed to provide a mechanism for dispute resolution between resource companies and landholders; and
- whether there can be harmonisation between the CSG Compliance Unit and the Gasfields Commission Queensland to provide efficiencies and improve dispute management processes.

1.16 This will be determined through consultation with stakeholders and review of information sources.

### **Opportunities for Northern Australia**

1.17 Opposition senators recognise the significant opportunities which are afforded by unconventional gas mining regarding employment and regional development.

1.18 The committee heard about the positive impact that unconventional gas mining had on rural and regional communities. Mr Matt Doman, Director, South Australia and Northern Territory, Australian Petroleum Production and Exploration Association, told the committee that unconventional gas mining had provided many benefits to communities across Australia:

Many communities right across Australia have felt the full force of the global financial crisis, drought, the decline in Australian manufacturing and the downturn in employment. In contrast the CSG industry at its peak in Queensland employed over 40,000 people and paid royalties which have supported programs which have invested more than \$495 million over the last four years in new community infrastructure, roads and flood mitigation.<sup>4</sup>

### **Conclusion**

1.19 Opposition senators note that this is the committee's interim report, and should the committee have the time to do so, further examination of the issues relating to unconventional gas mining activity in Australia will occur.

---

4 Mr Matt Doman, Director, South Australia and Northern Territory, Australian Petroleum Production and Exploration Association, *Committee Hansard*, 12 April 2016, p. 26.

**Senator the Hon. Joseph Ludwig**  
**Deputy Chair**

**Senator Anne McEwen**

# **Additional comments by Senator Nova Peris OAM**

## **Senator for the Northern Territory**

1.1 Senator Nova Peris OAM, Senator for the Northern Territory, notes that Territory Labor recognises community concern around the process of hydraulic fracturing ('fracking'), and has committed that 'any activity taken relating to the shale gas industry in the Northern Territory will be both environmentally and financially sustainable for local communities'.<sup>1</sup>

1.2 It is the policy of Territory Labor that a moratorium on unconventional gas mining exploration and extraction would be put into place:

Considering all factors associated with the development of an onshore shale gas industry and the timeframe needed to comprehensively review the science Territory Labor will implement a moratorium covering all unconventional gas prospecting exploration and extraction activities.<sup>2</sup>

1.3 Territory Labor have stated that the moratorium would continue until the expiration or completion of:

- a scientific inquiry undertaken by an independent expert advisory panel, including thorough community consultation; and
- development of the regulatory framework ensuring appropriate environmental protections and safeguards.

1.4 At the end of this process, Territory Labor, in government, would either:

- ban hydraulic fracturing; or
- allow hydraulic fracturing in highly regulated and tightly prescribed areas.<sup>3</sup>

## **Senator Nova Peris OAM**

### **Australian Labor Party**

---

1 Territory Labor, *Australian Labor Party Northern Territory Branch 2016 Conference Fracking Motion*, <http://www.territorylabor.com.au/Portals/territorylabor/Fracking2016.pdf>.

2 Territory Labor, *Australian Labor Party Northern Territory Branch 2016 Conference Fracking Motion*, <http://www.territorylabor.com.au/Portals/territorylabor/Fracking2016.pdf>.

3 Territory Labor, *Australian Labor Party Northern Territory Branch 2016 Conference Fracking Motion*, <http://www.territorylabor.com.au/Portals/territorylabor/Fracking2016.pdf>.



## **Additional comments by Government Senators**

1.1 Gas both conventional and unconventional is a vital source of energy to Australia and to the world particularly our northern neighbours. Australia's future energy security and its economic growth will be driven through diversity of supply with unconventional gas playing an increasingly vital role in our future energy mix. Australia is currently the world's third largest, and by 2020 will be the world's largest, exporter of liquefied natural gas (LNG).

1.2 Domestically, 24 per cent of all energy consumed in Australia is gas. On the east coast more than 40 per cent of this gas comes from unconventional sources. Around 98 per cent of this originates in Queensland.

1.3 State and Territory Governments have primary responsibility for the development of unconventional gas with the immediate legal frameworks deriving from State and Territory legislators. The Australian Government has an overarching role in the development of energy policy in the context of other important Commonwealth legislation such as the *Environment Protection and Biodiversity Conservation Act 1999* (the EBPC Act) and regulatory and scientific framework such as the *National Harmonised Regulatory Framework for Natural Gas from Coal Seams*.

1.4 Furthermore, the Commonwealth Government works with state and territory governments through the COAG Energy Council on an active gas sector reform program. This program recognises that there are community concerns around the possible risks and impacts of unconventional gas development. These concerns need to be taken seriously, and more work is needed to address community concerns and strengthen regulatory approaches, particularly in those states which do not yet have an active industry. However, experience has shown that existing regulatory frameworks can support communities, various industries and governments to effectively meet land access challenges, expectations and opportunities; and advance Australia's sustainable development goals in agricultural production, mineral resource development, biodiversity and heritage conservation.

1.5 The Government Senators adopt and support the Australian Government's submission to the Committee being Submission 123.

1.6 The Commonwealth's *Domestic Gas Strategy* and the Government's *Agricultural Competitiveness White Paper* identifies the following strategies and principals in the development of unconventional gas:-

- Conducting research through its environmental and scientific agencies, including the Department of Environment, the CSIRO and Geoscience Australia;
- Supporting the expansion of the Gas Industry Social and Environmental Research Alliance (GISERA) model in New South Wales;
- Supporting the Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development (IESC);
- Supporting the Industry Growth Centres Initiative;

- Access to agricultural land should only be done with the farmer's agreement, and farmers should be fairly compensated;
- There must be no long-term damage to water resources used for agriculture and local communities; and
- Prime agricultural land and quality water resources must not be compromised for future generations.

1.7 Government Senators observe that much of the evidence called for more improvement in the regulatory framework to ensure the unconventional gas industry operates in a responsible manner. The Government and Government Senators strongly support the principle of continuous improvement of regulatory frameworks to support the responsible development of these resources.

1.8 The Government Senators believe that the State and Territory legal frameworks have the Constitutional jurisdiction to manage this industry as is already occurring in NSW. The approval processes in each State and Territory must take into account the risk to agricultural land and local communities as is their Constitutional responsibility, as is the responsibility for securing compensation to other land users for breach of the licence or permit conditions by gas miners.

1.9 The Commonwealth Government is clearly already working with the States and the Territories in the overarching management of this important industry as is verified by Submission 123.

1.10 Managed well, unconventional gas has an exciting future providing a significant contribution to Australia's Gross National Product through vital energy supply and many meaningful and well paid jobs.

1.11 Government senators note that this is the committee's interim report, and should the committee have the time to do so, further examination of the issue relating to unconventional gas mining activity in Australia should occur.

**Senator the Hon David Johnston**  
**Senator for Western Australia**

**Senator Joanna Lindgren**  
**Senator for Queensland**

## **Australian Greens' Additional Comments**

1.1 The Australian Greens were proud to support the formation of this Select Committee, and to extend its terms of reference to include shale and tight gas, from the initial scope of only coal seam gas.

1.2 We support the recommendations in the majority report and the Chair's additional report, indeed many of the recommendations we Greens already have private members bills before parliament to act upon (landholders' right to say no, a ban on fracking and a ban on political donations from the fossil fuel sector), or have announced policy on in the lead up to the 2016 federal election (securing rehabilitation bonds upfront).

1.3 We welcome the acknowledgement of the need for such reforms by Senator Lazarus, but remain frustrated that the Liberal, National and Labor parties continue to ignore the environmental, social and economic problems with unconventional gas in their blind dedication to their fossil fuel donors.

1.4 The Australian Greens' position opposing unconventional gas has been formed in response to listening to the science and the community's concerns about unconventional gas over the last five years. Since 2011 the Australian Greens have been campaigning against the risky and unnecessary unconventional gas industry. We stand with the thousands of community members, scientists, health professionals and food producers who do not want to risk their land, water and the climate for the sake the private profits of multi-national corporations flogging another fossil fuel to worsen global warming, when there are abundant clean energy alternatives.

### **A potted parliamentary history of unconventional gas**

1.5 The community is right to feel as though the majority of parliamentarians blindly back unconventional gas. Since 2011, Australian Greens Senators have stood alone in consistently opposing this dangerous experiment on our land and water, until the last two years when we have welcomed support from Senator Lazarus and some other independent Senate crossbenchers on this issue.

1.6 In 2011 on behalf of the Australian Greens I introduced a private members bill *Environment Protection and Biodiversity Conservation Amendment (Protecting Australia's Water Resources) Bill 2011* to add water to the list of issues the federal government could protect under our national environmental laws. That bill received no support from the big parties during the Committee inquiry into it, however, the Greens were able to work with then Independent member for New England, Tony Windsor to convince the Gillard Government to subsequently introduce such a 'water trigger' to our national environmental laws. We ensured that earlier drafts of the bill which automatically delegated back to states the newly created power over water were amended to make sure that the new federal power to protect water was kept in federal hands, and supported those laws to pass the Senate. On several occasions we subsequently sought to include shale and tight gas in that water trigger but did not receive any support from other parties in the Senate.



1.7 I have introduced legislation into the federal Parliament three times since 2011 to give landholders the right to say no to unconventional gas. The second iteration of the bill *Landholders' Right to Refuse (Gas and Coal) Bill 2013* was voted down by the Liberal, National and Labor parties in the Senate on 6 March 2014. I reintroduced the *Landholders' Rights to Refuse (Gas and Coal) Bill 2015* bill a third time in March 2015, and again restored it to the notice paper after the 44<sup>th</sup> Parliament was prorogued by Prime Minister Turnbull. The purpose of the Bill is twofold—to allow all landholders including farmers, graziers, residents, local councils and native title holders to say "no" to unconventional gas and coal mining on their land; and to ban hydraulic fracturing (or "fracking") for unconventional gas, because of the extraordinary risk to our land, water, climate and healthy rural communities from this industry and extraction method. That third version of the Greens' attempt to give landholders the right to say "no" went to inquiry, where the evidence received overwhelmingly supported the need for the Bill, and the body of the report supported the objectives of the Bill, yet the big parties recommended that the Bill not pass.

1.8 Over the last five years I have also introduced numerous motions calling initially for a moratorium on this risky industry until more scientific research was done, then calling for food producing land to be off limits for mining and gas, then as the risks became more clear, calling for a complete ban on fracking and unconventional gas. Each time the Greens have received no support from the Labor, Liberal or National parties.

### **Community sentiment**

1.9 Over the last decade Australia has witnessed a huge community campaign of resistance against coal, coal seam gas (CSG), shale gas and other unconventional gas which has united city and country, farmers, environmentalists, scientists and Indigenous Australians. The Lock the Gate movement and many other local groups and individuals have resisted the destruction of our land, water and climate in the public interest. The Australian Greens wish to place on record our support and admiration for this grassroots movement. Very few predicted its success, but the campaign has upended the old certainties to challenge the fossil fuel industry and shown that organised people can defeat organised money. It has also taken its toll on communities and families, and the Australian Greens again formally convey our condolences to the family of Mr George Bender, a proud Queensland farmer who fought the unconventional gas industry that threatened to overrun his land. He will not be forgotten.

### **Looking forward**

1.10 The Australian Greens believe that Australia must rapidly transition away from polluting fossil fuels like coal and gas towards clean energy. We therefore do not support any new coal or unconventional gas approvals.

1.11 The Greens will continue to push for landholders and local communities to be given the right to refuse coal and unconventional gas on their land, and will continue to support communities who stand up for their land, water and a safe climate. The chronic power imbalance between landholders and wealthy multinational coal and gas companies underpins every interaction, and hopelessly disadvantages landholders.

1.12 Landholders must be given the legal right to decide that they would prefer to be able to keep farming or living on their land, and for their children and grandchildren to have that option, rather than be forced to negotiate merely the price of entry with big coal and gas companies. Without the right to say "no", this David and Goliath situation forced upon families and communities across Australia is even more weighted in favour of big coal and gas.

1.13 There is unprecedented level of risk and scientific uncertainty associated with fracking and its impacts upon surface water, ground water, clean air and a safe climate. Threats to water resources from fracking are not adequately understood, but the evidence is building that they are severe and have potentially devastating consequences. Huge coal seam gas projects in Queensland were approved with minimal baseline data and hopelessly inadequate groundwater monitoring. Both of the major parties have approved huge fracking operations without adequate scientific certainty about their impacts. Even though federal approvals for the Santos and British Gas Group gasfields were given in 2010, and further approvals were given to Arrow Energy in 2013, the scientific work to assess the risks of those projects has not been done. The CSIRO, the National Industrial Chemicals Notification and Assessment Scheme (NICNAS) and the Environment Department's Office of Water Science have not even commenced scientific work on the impacts of fracking chemicals on deep aquifers.

1.14 Risks associated with aquifer contamination, fracture growth, leaks from well casings and earthquakes caused by fracking are all poorly understood but potentially very grave.

1.15 Alarmingly, the human health impacts of fracking are also very poorly understood although mounting evidence shows that they can be severe. Gas leaks caused by faulty equipment and fissures in the earth, as well as contaminated drinking water are unacceptable risks for our rural communities to endure. In the gasfields of Queensland, at Tara and Chinchilla, residents have reported headaches, nose bleeds, skin rashes and nausea amongst children. During the inquiry, the Committee heard directly from landholders affected by the CSG industry. Shay Dougall and Narelle Nothdurft from the Hopeland Community Sustainability Group provided powerful evidence which ought to ring warning bells.

1.16 A recent review of 685 peer-reviewed scientific papers on the impacts of unconventional gas published between 2009 and 2015 showed that the weight of scientific evidence 'indicates hazards and elevated risks to human health':

84% of public health studies contain findings that indicate public health hazards, elevated risks, or adverse health outcomes; 69% of water quality studies contain findings that indicate potential, positive association, or actual incidence of water contamination; and 87% of air quality studies

contain findings that indicate elevated air pollutant emissions and/or atmospheric concentrations.<sup>1</sup>

1.17 Studies in the USA have shown that the fugitive emissions of greenhouse gas from fracked shale gas are vastly higher than for conventional gas. The claims of the gas industry that CSG, shale and tight gas are low-emissions alternatives to coal simply are not supported by robust Australian studies.

1.18 The precautionary principle, to which Australia has committed and which is written into our national environment laws, demands that where an action presents a risk of harm to the public or the environment, the absence of scientific consensus is not an excuse for regulators to do nothing.

### **Fixing the system – banning mining donations**

1.19 Throughout the course of several inquiries I have now participated in into coal seam gas mining, and this inquiry into unconventional gas, we have received extensive evidence about the failure of State and Federal governments from both the Labor and Liberal-National sides of politics to regulate the coal and unconventional gas industries adequately. The massive expansion of CSG in Queensland and the unconstrained proliferation of coal mines in the Hunter Valley in NSW, the Bowen and Surat Basins in Queensland are each examples of a total failure of adequate regulation.

1.20 This failure of regulation has been consistent across both federal and State governments, and it calls for systemic reform. The Greens believe that reforming our democracy to curb the influence of corporate donors, especially those involved in extractive industries such as coal and unconventional gas, is vital to securing adequate protection for landholders, a healthy environment and a safe climate.

1.21 The Greens' Bill, the *Commonwealth Electoral Amendment (Donations Reform) Bill 2014* would ban political donations from mining companies, developers, tobacco, alcohol and gambling companies. The Australian Greens believe that passing that Bill would go a long way towards addressing the many failures of regulation identified during successive CSG inquiries.

### **Recommendation 1**

**1.22 That the Parliament pass the *Landholders' Right to Refuse (Gas and Coal) Bill 2015* in order to ban fracking and to give landholders the right to say 'no' to coal and unconventional gas on their land.**

---

<sup>1</sup> Jake Hays and Seth B. C. Shonkoff, 20 April 2016, *PLOS One* Toward an Understanding of the Environmental and Public Health Impacts of Unconventional Natural Gas Development: A Categorical Assessment of the Peer-Reviewed Scientific Literature, 2009-2015  
<http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0154164>

**Recommendation 2**

**1.23 That the Parliament pass the Greens' *Commonwealth Electoral Amendment (Donations Reform) Bill 2014* in order to ban political donations from mining companies, developers, tobacco, alcohol and gambling companies.**

**Senator Larissa Waters**

**Senator for Queensland**



# Appendix 1

## Submissions

1	Dr Pauline Roberts
2	Mr Lachlan Barker
3	Mr Trevor Jennings
4	Mr & Mrs Clive and Pamela Newman
5	Mr David Knox
6	Ms Stina Foster
7	Ms Kay Schieren
8	Mr David Kirkpatrick
9	Ms Patricia White
10	Ms Cheryl Duffin
11	Mr Michael Hodder
12	Dr Geralyn McCarron
13	Mr Alan Manson
14	Mr Julian Sharp
15	National Toxics Network Inc.
16	Dr Wayne Somerville
17	Mr John Polglase
18	Ms Jenny Chester
19	East End Mine Action Group Inc.
20	Rev Graham Slaughter
21	Mr Richard Deem
22	Ms Frances Winfield
23	Mr Steve Winfield
24	Ms Lorraine Stern
25	Mr Peter James McGowan
26	Mr Joseph Hill
27	Knitting Nannas Against Gas
28	Mr & Mrs Nood and Narelle Nothdurft
29	Mr & Mrs Gary and Kerry Ladbrook
30	Ms Kylie Haeusler
31	Mr Robert Brown
32	Ms Donna Kenny
33	Ms Hayley Rundell
34	Gasfield Free Seaspray
35	Mr & Mrs David and Julie Boulton
36	Confidential
37	Northern Territory Department of Mines and Energy
38	Knitting Nannas (Bellingen)
39	Ms Theresa Mason
40	Mr Philip Baker
41	Mr & Mrs Michael and Marion Bell
42	Dr Hugh Barrett
43	Mr Peter Thompson
44	Environmental Defenders Office of Northern Queensland (EDO NQ)
45	Dr Gavin Mudd
46	Australian Dairy Industry Council
47	Stop Coal Seam Gas Sydney Inc.
48	Tasmanian Government
49	Narrabri Shire Council
50	Ms Dianna Flint
51	Mr Trevor Flint
52	Dr Chris Dalton

53	The Wilderness Society Newcastle
54	Ms Kerrin Schelfhout
55	Ms Jennifer Hanson
56	EDOs of Australia (Australian Network of Environmental Defenders Offices Inc.)
57	Santos Limited
58	Mr Bill Newell
59	Dr. F.S. Fisher
60	Mr Craig Webb
61	Mr & Mrs Gary and Maggie Evison
62	Mr Stephen Issell
63	Mr Glen Daly
64	Ms Nardia Zoellner
65	Bass Coast Shire Council
66	Sustainable Boolarra Group
67	Ms Cynthia and Mr John Lyons
68	Ms Annette M. Dean
69	Ms Pauline Winrow
70	Mrs Louise Somerville
71	Rushbrook
72	Mr Craig Andrews
73	Mr Barry Ritchie
74	Ms Mary Beth Gundrum
75	Mrs Margaret Scheidler
76	Mr Peter Small
77	Stop Pilliga Coal Seam Gas
78	Lesley Willing
79	Jaki Lockyer
80	Mr Damien O'Sullivan
81	AFANT
82	Ms Angela Froud
83	Ms Anitra Thomas
84	Ms Annette Hutchins
85	Armidale Action on Coal Seam Gas and Mining
86	Australian Psychological Society
87	The Australian Wine Industry
88	Mr Avon Rayner
89	Beach Energy Limited
90	Ms Bernadette Tapscott
91	Confidential
92	Mr Brett Lancaster
93	Mr Brian McLure
94	Confidential
95	Name Withheld
96	Ms Carey Lai
97	Dr Catherine Pye
98	The Centre for Coal Seam Gas
99	Name Withheld
100	Ms Charmaine Roth
101	Ms Christine Degan
102	Ms Christine Dixon
103	Coonabarabran Residents Against Gas
104	Cotton Australia
105	CSG-Free Maffra and Districts

---

106	Mr Daniel Cahill
107	Mr Daniel Tapp
108	Western Downs Regional Council
109	Queensland Churches Together
110	Mr Russ Kirwan
111	Surf Coast Shire Council
112	Municipal Association of Victoria (MAV)
113	Ms Patricia McAuliffe
114	Mr Zachary Casper
115	Protect Arnhem Land (PAL)
116	Doctors for the Environment Australia
117	Mr Justin Moore
118	Ms Sharlene Henderson
119	Ms Elke Nicholson
120	Dr Samantha Phelan
121	Australian Petroleum Production & Exploration Association (APPEA)
122	Ms Denise Finley
123	Australian Government
124	Mr Richard Cottee
125	EDOA
126	Australia Pacific LNG
127	Australian Ethical Investments
128	Darling Downs Environment Council
129	Mr David Black
130	Mr David Smith
131	Ms Desley Banks
132	Ms Diane Lawton
133	Ms Effie Ablett
134	Ms Ellen Foley
135	Ms Ellie Bock
136	Ms Emma Stilts
137	Environmental Justice Australia
138	Ms Fiona Elizabeth Chapman
139	Frack Free Moriac
140	Frack Free Tas Inc
141	Friends of the Earth Australia
142	Gold Coast and Hinterland Environment Council Association Inc.
143	Mr Geoff Aylmer
144	Groundswell Gloucester Inc.
145	Ms Heather Drayton
146	Lock the Gate Alliance
147	Ms Heather Gibbons
148	Mr Herbert Bamberry
149	Mr Hugh Nicholson
150	Mr Humphrey Boogaerdt
151	International Association of Hydrogeologists
152	Ms Jane Touzeau
153	Ms Jasmine Scheidler
154	Mr Jeff Kite
155	Mr John Coverdale
156	Mr John Stewart
157	Ms Kim Roberts
158	Ms KJ Browne



159	Ms Laura Shore
160	Ms Lucille Palmer
161	Ms Lucy Daley
162	Mr Luke Vassella
163	Mrs Lynley Manson
164	Ms Lynne Deweaver
165	Mr Marcus Kuhn
166	Mr Mark Head
167	Ms Maria C. Niermann
168	Ms Melissa King
169	Mr Michael Murphy
170	Ms Nanette Nicholson
171	National Farmers' Federation
172	Origin Energy
173	OzEnvironmental
174	Mr Philip Armit
175	Mr Philip Richmond
176	Mr Robert Alexander
177	Ryde - Hunter's Hill Flora and Fauna Preservation Society
178	Mr Robert Bartlett
179	Ms Rosemaree Thomasson
180	Rosewood District Protection Organisation Inc
181	Mrs Sally Hunter
182	Ms Sarah Cuthbert
183	Ms Shirley Doyle
184	Name Withheld
185	Mr and Mrs Tony and Stephanie Meggitt
186	Mr Stephen Friederich
187	Mr Steve Liddicut
188	Dr Steve Robinson
189	Sustainable Agriculture and Communities Alliance
190	Ms Megan Kuhn
191	Mr Tony Pickard
192	Ms Janette Lawson
193	University of Melbourne Energy Institute
194	Ms Vicki Gordon
195	Western Rivers Alliance
196	Warrnambool 'Unfrackabools'
197	Ms Jane Stevenson
198	Ms Maureen O'Sullivan
199	Mr TJ Best
200	Mr David Paull
201	Mr Leigh Evans
202	Ms Maureen Verstedden
203	Ms Shay Dougall
204	Confidential
205	Confidential
206	Confidential
207	Confidential
208	Confidential
209	Confidential
210	Confidential
211	Confidential

---

212	Confidential
213	Confidential
214	Confidential
215	Confidential
216	South Gippsland Landcare Network
217	Queensland Government
218	No Fracking WAy
219	Comet Ridge Ltd
220	Alternative Technology Association
221	Chamber of Minerals and Energy of WA
222	Halliburton Australia Pty Ltd
223	Confidential
224	Confidential
225	Confidential
226	Confidential
227	Confidential
228	Confidential
229	Confidential
230	Confidential
231	Confidential
232	Confidential
233	Business Council of Australia
234	Ms Jennifer Hunt
235	AgForce Queensland
236	Mr Brian Feeney
237	Mr Rohan Sullivan
238	Mr Mark Jones
239	Miss Michelle Agius
240	Ms Pat Schultz
241	Mrs Dianne Hoy
242	Stop Coal Seam Gas Blue Mountains
243	Deborah and Fergus O'Connor
244	Ms Marcia Lorenz
245	Mr Gadrian Hoosan
246	p&e Law
247	Western Downs Alliance
248	Ms Sandra Bamberry
249	Name Withheld
250	Ms Sarah Ciesiolka
251	Lock the Gate Alliance NT
252	Waubra Foundation
253	AWE Limited
254	Gasfield Free Bairnsdale
255	Ms Debbie Carruthers
256	Ms Gillian Laland
257	Groundwater Solutions International
258	Interbeing
259	Jenny and Rick Robertson
260	Dr Jo McCubbin
261	Kees Dogger & Michelle Lee-Dogger
262	Ms Lesley Keegan
263	Limestone Coast Protection Alliance
264	Ms Lisa France

265	Mr Mark Rich
266	Mr Kris Schmah
267	Confidential
268	Ms Patricia Kahler
269	Mr Stuart Box
270	Ms Stacey O'Brien
271	Elena Garcia and Alan Jamison
272	Leon and Ree Price
273	Northern Land Council
274	Bender Family
275	Mr John Jenkyn
276	Arrow Energy
277	Community Over Mining
278	Mr Dahl Borck
279	Mrs Erica Bates
280	Dr Errol Lawson
281	Grain Producers SA
282	Mr Greg Glazov
283	Mrs Jeanette Gamble
284	Mr Jeff Kiehne
285	Ms Karen Auty
286	Ms Kylie Goldthorpe
287	Ms Laura Grawert
288	Market Forces
289	Nature Conservation Society of SA
290	NTSCORP
291	Mr Peter Graham
292	Primary Producers SA
293	Protect the Bush Alliance
294	Queensland Resources Council
295	Regnan
296	Ms Renee Rossini
297	Mrs Sarah Gittins
298	Mr Simon Maynard
299	Basin Sustainability Alliance
300	Maules Creek Community Council
301	Property Rights Australia
302	Mr Adrian Ingleby
303	Mr Darryl Bishop
304	David and Margaret McConachy
305	Mullaley Gas and Pipeline Accord
306	South Australian Chamber of Mines and Energy
307	GasFields Commission Qld

---

## Additional Information

- Environmental Authority - *EPPG00878413* - (Public hearing, Dalby, 17 February 2016)
- QGC - *Map of Nothdurft property Lot IRP202346* - (Public hearing, Dalby, 17 February 2016)
- Dr Penny Hutchinson - *Response* - (public hearing, Dalby, 17 February 2016)
- QGC - *Response to public hearing and submission* - (public hearing, Dalby, 17 February 2016)
- Ms Anne Kennedy - *Great Artesian Basin Recharge Systems and Extent of Petroleum and Gas Leases, Second Edition* - (public hearing, Narrabri, 29 March 2016)
- Ms Anne Kennedy - *NTN Unconventional Gas Exploration and Production Human Health Impacts and Environmental Legacy* - (public hearing, Narrabri, 29 March 2016)
- Ms Anne Kennedy - *United States House of Representatives Committee on Energy and Commerce, Chemicals used in Hydraulic Fracturing* - (public hearing, Narrabri, 29 March 2016)
- Ms Anne Kennedy - *The Pilliga Push, March 2016* - (public hearing Narrabri, 29 March 2016)
- Ms Sonya Marshall Documents received (public hearing, Narrabri, 29 March 2016)
- People for the Plains - *The local economic impacts of CSG development* - (public hearing, Narrabri, 29 March 2016)
- People for the Plains - *The Australia Institute report 'Be careful of what you wish for'* - (public hearing, Narrabri, 29 March 2016)
- Mr Kevin Humphries, MP (public hearing, Narrabri, 29 March 2016)



## **Answers to questions on notice**

- Anne Kennedy - Public hearing, Narrabri, 29 March 2016
- Santos Limited - Public hearing, Darwin, 12 April 2016
- Central Petroleum, answers to questions on notice, public hearing Darwin 12 April 2016
- Comet Ridge, answers to questions on notice
- Molopo, answers to questions on notice
- Queensland Government, answers to questions on notice



## **Appendix 2**

### **Public hearings and witnesses**

**Dalby, 17 February 2016**

*Private Capacity*

Mr Joseph Hill

Ms Helen Bender

Mr Brian Bender

Mr Daryl Bishop

Ms Shay Dougall

Mr Allan Nothdurft

Mrs Narelle Nothdurft

Mr Peter McGowan

Mr John Jenkyn

Mr Lindsay Boyle

Mrs Anne Boyle

Dr Geralyn McCarron

*Monash University*

Dr Gavin Mudd, Senior Lecturer Environmental Engineering

**Narrabri, 29 March 2016**

*Private Capacity*

Mr Herbert Bamberry

Ms Sandra Bamberry

Dr James Barrett

Ms Jacqueline Cain

Ms Sarah Ciesiolka

Dr Christopher Dalton

Mr Ken Flower

Ms Jennifer Hunt



Mr Gregory Johnson  
Mrs Anne Kennedy  
Mrs Megan Kuhn  
Mr David Truman  
Mr Max Mudford  
Mr Stuart Murray  
Mr David Charles Paull  
Mr Anthony John Pickard  
Mr David Quince  
Mrs Cherie Robinson  
Mrs Sonya Marshall  
Ms Rogers

*People for the Plains*

Mrs Kirsty Kelly, Secretary  
Mrs Sally Hunter, Vice President

*Narrabri and District Chamber of Commerce*

Mr Russell Stewart, President  
Mr Ian Duffey, Vice President

*Knitting Nannas Against Gas*

Ms Clare Twomey, Founder

*Pilliga Push Action Camp*

Mr Daniel Lanzini, Camp Coordinator

*Coonabarabran Residents Against Gas*

Mrs Jane Judd, Representative

---

*New South Wales Parliament*

Mr Kevin Humphries, Member for Barwon

*The Wilderness Society*

Ms Naomi Crystal Hodgson, Campaign Manager

*Federal Seat of New England*

Mr Mercurius Goldstein, Greens candidate

*Pilliga Push Action Camp*

Ms Johanna Evans, Representative

*Narrabri Shire Council*

Councillor Conrad Bolton, Mayor

**Darwin, 12 April 2016**

*Private Capacity*

Mr James Wright

Mr Richard Cottee

Mr Braedon Earley

Mr Mark Fraser

Ms Belinda Quinlivian

Mr Lex Silvester

Mr Rohan Sullivan

Mr Daniel Tapp

Ms Pauline Cass

Mr David Armstrong Managing Director/Owner

*Traditional Owners*

Mr Robert Anderson

Ms Rosita Ankin

Mr Andrew Dowadi

Mr Nicholas Fitzpatrick

Mr Gadrian Hoosan

Mr Eddie Mason

Ms Molly Yarrngu

Ms Helen Williams

*Department of Mines and Energy*

Mr Ron Kelly, Chief Executive

*Department of the Chief Minister*

Dr Rachel Bacon, Deputy Chief Executive

*Chamber of Commerce and Industry, Northern Territory*

Mr Gregory Bicknell, Chief Executive Officer

*Doctors for the Environment Australia*

Dr Marion Carey, Coordinator, Unconventional Gas Special Interest Group

Emeritus Professor John Willoughby, Member

*Northern Land Council*

Mr Robert Dalton, Policy and Research Officer

*Environment Centre NT*

Mr Ian Harris, Director

*Santos*

Mr Armon Hicks, Group Executive, Public Affairs

*Lock the Gate Alliance Northern Territory*

Ms Naomi Hogan, Coordinator

*Environmental Defenders Office NT*

Mr David Morris, Principal Lawyer

*Northern Land Council*

Mr Joe Morrison, Chief Executive Officer

*Don't Frack Katherine*

Ms Charmaine Roth, Vice-Chairperson

*Northern Territory Cattlemen's Association*

Mr Tom Ryan, Executive Officer

*Amateur Fishermen's Association of the Northern Territory*

Mr Tristan Sloan

*MS Contracting*

Mr Bill Sullivan, Chief Executive Officer

*Australian Petroleum Production and Exploration Association*

Mr Richard John Wilkinson, Chief Technical Officer

Mr Matthew Doman, Director SA and NT

