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PUBLIC WORKS COMMITTEE

Costs for remediation of sites containing coal ash repositories

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Costs for remediation of sites containing coal ash repositories

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Terms of reference

1. That the Public Works Committee inquire into and report on the costs for remediation of coal ash repositories in New South Wales, and in particular:

    (a) prospective or current quantum of government liability for remediating contamination at sites associated with:
        (i) Mount Piper power station,
        (ii) Bayswater power station,
        (iii) Liddell power station,
        (iv) Vales Point power station,
        (v) Eraring power station, and
        (vi) any other relevant power station.

    (b) prospective timing of government expenditure in relation to remediation at those sites,

    (c) economic and employment opportunities associated with coal ash re-use, site remediation and repurposing of land,

    (d) adequacy and effectiveness of the current regulatory regime for ensuring best practice remediation of coal ash repositories,

    (e) mitigation of actual or perceived conflict of interest arising from the state having ongoing liability for remediation costs the quantum of which will be impacted by government policy and regulatory action,

    (f) risks and liabilities associated with inadequate remediation including community and environmental health impacts, and

    (g) any other related matters.

2. That the committee report by Wednesday 31 March 2021.[1]

The terms of reference were self-referred by the committee on Tuesday 15 October 2019.[2]

1 The original reporting date was 1 July 2020 (*Minutes,* NSW Legislative Council, 15 October 2019, pp 503-504). The reporting date was later extended to 31 March 2021 (*Minutes*, NSW Legislative Council, 2 June 2020, p 962).

2 *Minutes*, NSW Legislative Council, 15 October 2019, pp 503-504.

Committee details

Committee members

The Hon Daniel Mookhey MLC	Australian Labor Party	*Chair*
The Hon Mark Banasiak MLC	Shooters, Fishers and Farmers Party	*Deputy Chair*
Ms Abigail Boyd MLC	The Greens	
The Hon Sam Farraway MLC	The Nationals	
The Hon Trevor Khan MLC	The Nationals	
The Hon Shayne Mallard MLC	Liberal Party	
The Hon Tara Moriarty MLC	Australian Labor Party	

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Chair's foreword

This inquiry was established to examine the costs for remediation of sites containing coal ash repositories across the state. Over 400 million tonnes of coal ash is stored in dump sites across Australia, and in NSW some 5.5 million tonnes is produced annually.

During this inquiry, it became clear that there are divergent views as to whether coal ash poses any risks. Community members, environmental groups and health professionals argued coal ash should be treated as hazardous waste material given the significant environmental and health risks it poses and has caused. In contrast, industry representatives and power station operators commented that there were technical processes that could be carried out, but are not currently, to make coal ash non-toxic and inert.

It also became apparent that more could be done by the two regulators of coal ash dams – NSW Environment Protection Authority and Dams Safety NSW – to improve the transparency of their respective operations and work together more effectively.

In terms of the prospective or quantum government liability for the remediation of contamination of sites containing coal ash dams, this is currently unknown, with no estimates provided by NSW Treasury. In response the committee has recommended that NSW Treasury immediately publish the baseline environmental studies conducted for each operating power station to improve transparency in terms of the NSW Government's liabilities for remediation at these sites.

The committee found that coal ash is a valuable resource with widespread support across the spectrum of stakeholders for its greater reuse. This will lead to industry development and job creation, a reduction in environmental harm and contribute to developing a circular economy. Therefore the committee has made recommendations that promote circular economy principles when dealing with coal ash waste and reuse, and support feasibility studies and pilot projects to assess and demonstrate commercial viability of new industries that boost the reuse of coal ash.

It is hoped that this report, with its findings and recommendations will inform the government in terms of the steps required to mitigate risks and liabilities for communities and the environment, improve transparency of the two regulators – the NSW Environment Protection Authority and Dams Safety NSW, and achieve increased rates of coal ash reuse.

I would like to thank all participants for their contribution to this inquiry. I also extend my thanks to my fellow committee members for their participation and the committee secretariat for their assistance.

Hon Daniel Mookhey MLC
Committee Chair

Findings

Recommendations

impacts of vegetation cover (including any contaminated vegetation, release of contaminants into the air via transpiration and cracking of capping materials)

to ensure the safe and beneficial reuse of coal ash while promoting strong environmental and public health standards.

Recommendation 10 **56**

That Transport for NSW review its procurement practices to, where feasible, mandate the use of recycled coal ash in government-funded transport infrastructure projects.

Recommendation 11 **57**

That Infrastructure NSW review its procurement practices to, where feasible, mandate the use of recycled coal ash in government-funded infrastructure projects.

Recommendation 12 **57**

That Transport for NSW review the construction standards for roads, with a view to ensuring that local government trials the use of coal ash in its road construction.

Recommendation 13 **57**

That the NSW Government partner with the Ash Development Association of Australia and other interested parties, and support feasibility studies and pilot projects to assess and demonstrate commercial viability of new industries, such as transformation of coal ash into lightweight aggregate or other higher value-add products.

Recommendation 14 **57**

That the NSW Environment Protection Authority ensure that the quantity of coal ash stored, produced, and the destination and purpose of coal ash reused, is publicly reported.

Recommendation 15 **58**

That the NSW Government promote circular economy principles when dealing with coal ash waste and promoting reuse, including facilitating consultation between regulatory bodies, electricity generators and key stakeholders in recycling, local government and construction sectors.

Recommendation 16 **66**

That NSW Treasury immediately publish on their website the baseline environmental studies conducted for each operating power station to improve transparency in terms of the NSW Government's liabilities for remediation at these sites.

Conduct of inquiry

The terms of reference for the inquiry were self-referred by the committee on Tuesday 15 October 2019.

The committee received 84 submissions and three supplementary submissions.

The committee held two public hearings at Parliament House in Sydney on Tuesday 1 September 2020 and Friday 16 October 2020, and one public hearing in Lake Macquarie on Tuesday 6 October 2020.

The committee also conducted a site visit to Myuna Bay and Vales Point Power Station.

Inquiry related documents are available on the committee's website, including submissions, hearing transcripts, tabled documents and answers to questions on notice.

Chapter 1 Background

This chapter provides a background of coal fired power stations in New South Wales and the production of coal ash as a by-product of this method of energy generation. It then identifies the regulators of coal ash dams in New South Wales, and outlines the government's Electricity Generation transactions. The chapter concludes with reference to the Australian Senate's report on the *Rehabilitation of mining and resources projects and power station ash dams as it relates to Commonwealth responsibilities.*

Coal fired power stations in New South Wales

1.1 Currently in New South Wales there are five operational coal fired power stations:

- Liddell and Bayswater power stations located near Muswellbrook, Upper Hunter, operated by AGL Energy Limited
- Mt Piper power station located near Lithgow, Central West, operated by Energy Australia
- Eraring power station located on the Central Coast, operated by Origin Energy, and
- Vales Point power station located on the Central Coast, operated by Delta Electricity.

1.2 There are also three coal fired power stations which have relatively recently ceased operations. These are:

- Munmorah power station located near Colongra, Central Coast which ceased operation in 2012
- Redbank power station located near Singleton, Hunter Region which ceased operation in 2014, and
- Wallerawang power station located at Wallerawang, Central Tablelands which ceased operation in 2014.[3]

1.3 Future closures of power stations are scheduled, with Liddell power station due to close in 2023,[4] Vales Point power station in 2029,[5] Eraring power station in 2032,[6] Bayswater power station in 2035,[7] and Mt Piper power station in 2043.[8]

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3 Senate Standing Committees on Environment and Communications, Australian Senate, *Retirement of coal fired power stations* (2017), p 5.

4 Submission 83, NSW Government, p 8; Evidence, Mr Steve Rieniets, Group General Manager Operations, Integrated Energy, AGL Macquarie Pty Limited, 1 September 2020, p 3.

5 Submission 13, Delta Electricity, p 10.

6 Evidence, Mr Greg Jarvis, Executive General Manager, Energy Supply and Operations, Origin Energy Limited, 1 September 2020, p 3.

7 Evidence, Mr Steve Rieniets, Group General Manager Operations, Integrated Energy, AGL Macquarie Pty Limited, 1 September 2020, p 3.

8 Media release, Energy Australia, 'Energy Australia invests $2m in Mt Piper groundwater management', 28 September 2018, https://www.energyaustralia.com.au/about-us/media/news/energyaustralia-invests-2m-mt-piper-groundwater-management; Media Release, Energy Australia, 'Energy Australia commits to Lithgow region with Mt Piper upgrades', 8 July 2019,

1.4 Upon closure, control of the power stations may revert to the responsibility of the NSW Government as per the terms and conditions set out in their Sale and Purchase Agreements.[9] This will be discussed in further detail in Chapter 5.

What is coal ash?

1.5 Coal ash is created primarily by burning coal in coal-fired power stations.[10] There are two types of coal ash − fly ash and bottom ash.[11] Fly ash is made up of light, fine ash particles[12] that can be easily eroded by wind and rain[13] whereas bottom ash is made up of heavy, coarse ash particles which fall to the bottom of the boiler at the power stations.[14] The core component of coal ash is silica.[15]

1.6 For the purposes of this report, the terms coal ash, fly ash, and coal combustion products are interchangeable.[16]

1.7 Power stations first dispose of ash into purpose-built emplacement facilities known as ash dams.[17] All three power station operators - Delta Electricity, Origin Energy and AGL Energy Limited – had similar processes of transporting coal ash in slurry form to the dams for storage.[18]

1.8 Mr Justin Flood, Executive Manager Sustainability, Delta Electricity explained that at Vales Point power station:

> … it is a lean phase slurry, where the ash is mixed with water that is then transported up to the ash dam from the power station. The ash beaches out—settles out—and then the water is returned, picks some more ash and it is a closed loop … So half the dam is ash, which then dries out and is capped, and the end of the dam is water.[19]

https://www.energyaustralia.com.au/about-us/media/news/energyaustralia-commits-lithgow-region-mt-piper-upgrades.

9 Submission 13, Delta Electricity; Submission 78, Origin Energy; Submission 80, AGL Macquarie.

10 Submission 83, NSW Government, p 3.

11 Submission 13, Delta Electricity, p 4; Submission 23, Ash Development Association of Australia, p 1.

12 Submission 80, AGL Energy Limited, p 2.

13 Submission 13, Delta Electricity, p 4.

14 Submission 80, AGL Energy Limited, p 2.

15 Submission 13, Delta Electricity, p 4; Evidence, Mr Justin Flood, Executive Manager Sustainability, Delta Electricity, 1 September 2020, p 15; Evidence, Mr Paul Winn, Researcher, Hunter Community Environment Centre, 1 September 2020, p 54.

16 Submission 13, Delta Electricity, p 4; Submission 11, Vecor Australia Pty Limited, p 5; Submission 23, Ash Development Association of Australia, p 1.

17 Submission 83, NSW Government, p 3.

18 Evidence, Mr Greg Jarvis, Executive General Manager, Energy Supply and Operations, Origin Energy Limited, 1 September 2020, p 8; Evidence, Mr Justin Flood, Executive Manager Sustainability, Delta Electricity, 1 September 2020, p 8; Submission 80, AGL Energy Limited, p 2.

19 Evidence, Mr Justin Flood, Executive Manager Sustainability, Delta Electricity, 1 September 2020, p 8.

1.9 Similarly, AGL Energy Limited detailed the process of transporting coal ash at the Bayswater and Liddell power stations:

> At Bayswater the fly ash produced is primarily transported in slurry form to be deposited in the authorised ash repositories located on-site, known as the Ravensworth Voids and the Bayswater Ash Dam. Bottom ash produced is primarily transported in slurry form to be deposited in the Bayswater Ash Dam. At Liddell, both fly and bottom ash is transported in slurry form to the Liddell Ash Dam.[20]

What are its risks?

1.10 Inquiry participants were divided in their views as to whether coal ash posed any risks. Community members, environmental groups and health professionals, who gave evidence to the committee, argued that coal ash should be treated as hazardous waste material that posed significant health and environmental risks.[21] Although not sharing the same concerns, industry representatives and power station operators commented that there were technical processes that could be carried out, but are not currently, to make coal ash non-toxic and inert.[22]

1.11 In its submission, the NSW Government acknowledged that contamination from these sites 'may threaten human health and the environment, limit land use or increase development costs'.[23]

1.12 Many inquiry participants contended that the ash dams were leaching heavy metals such as selenium, zinc, nickel, copper, aluminium, iron, magnesium, cadmium and lead into Lake Macquarie and other nearby waterways.[24] Community and environmental health impacts posed by coal ash will be discussed in Chapter 3.

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20 Submission 80, AGL Energy Limited, p 2.

21 Submission 2, Name suppressed, p 1; Submission 4, Coal-ash Community Alliance Inc, pp 2 and 4; Submission 5, Beyond Zero Emissions, p 1; Submission 21, Name suppressed, p 1; Submission 24, Mr Graeme Batterbury, p 1; Submission 25, Mr Gilbert Walker, p 1; Submission 26, Dr James Whelan, p 1; Submission 27, Bruce Derkenne, p 1; Submission 36, Lake Macquarie Sustainable Neighbourhood Alliance Inc, p 6; Submission 39a, Hunter Community Environment Centre, p 4; Submission 47, Doctors for the Environment Australia, p 3; Submission 57, Central Coast Community Energy Association Inc (CCCE), p 4; Submission 72, Ms Tonia Gardiner, p 1; Submission 79, Nature Conservation Council of NSW, p 1; Submission 81, Environmental Justice Australia, p 15.

22 Submission 11, Vecor Australia Pty Limited, pp 5, 8-9; Submission 84, Polyagg, p 1; Evidence, Mr Justin Flood, Executive Manager Sustainability, Delta Electricity, 1 September 2020, p 13; Evidence, Mr Greg Everett, Managing Director, Delta Electricity, 1 September 2020, p 16; Evidence, Mr Mark Ramsey, Director and Chief Executive, Vecor Australia Pty Ltd, 16 October 2020, p 2; Evidence, Mr Craig Heidrich, Chief Executive Officer, Ash Development Association of Australia, 16 October 2020, p 3.

23 Submission 83, NSW Government, p 11.

24 Submission 10, Warners Bay Area Sustainable Neighbourhood Group, p 2; Submission 39, Hunter Community Environment Centre, pp 24 and 30; Submission 36, Lake Macquarie Sustainable Neighbourhood Alliance Inc., p 8; Submission 42, Ramboll Australia, p 1; Submission 45, Bathurst Community Climate Action Network (BCCAN), p 1; Submission 58, Ms Renee McLean, p 1; Evidence, Ms Bronya Lipski, Lawyer, Environmental Justice Australia, 1 September 2020, p 28; Evidence, Mr Greg Piper MP, Member for Lake Macquarie, 6 October 2020, pp 3-4; Evidence, Mr

How are sites remediated?

1.13 During the inquiry, the committee heard of the cap and cover approach for site remediation.[25] The NSW Government stated that 'private sector operators [are] obligated to progressively cap ash dams with clean fill and soil and revegetate them to mitigate environmental risk'.[26]

1.14 According to Delta Electricity, the cap and cover approach meets best practice requirements for ash dam remediation:

> Capping of the exposed ash is conducted to ensure ash remains in the ash emplacement area. The current requirement is for at least half a metre of fill to be placed over the top of the ash with stormwater directed away from the ash dam catchment to manage ash dam water levels and to limit the amount of water penetrating the capped ash emplacement. The fill must be compliant with the NSW EPA resource recovery requirements for Excavated Natural Material and Virgin Excavated Natural Material. A layer of topsoil is then placed over the cap to allow for revegetation with native species.[27]

1.15 However, Mr Greg Jarvis, Executive General Manager, Energy Supply and Operations, Origin Energy Limited, noted while capping was taking place, it was important to remain cautious about how much was capped 'because then it stops you recycling that ash later if it becomes economic'.[28]

1.16 On the other hand, AGL Energy Limited advised of a 2017 report entitled *Rehabilitation: AGL's approach to rehabilitation of power generation infrastructure,* which identified the company's rehabilitation requirements and associated challenges for its sites. Mr Steve Rieniets, Group General Manager Operations, Integrated Energy, AGL Macquarie Pty Limited stated that the company was 'working through … what our rehabilitation plans look like …'.[29]

1.17 Other inquiry participants argued that the cap and cover approach was an inadequate method of remediation given the concerns of ground water contamination as a result of the ash dams being unlined.[30]

Stephen Dewar, Secretary, Lake Macquarie Sustainable Neighbourhood Alliance Inc, 6 October 2020, p 14.

25 Submission 13, Delta Electricity, p 8; Submission 83, NSW Government, p 11; Evidence, Ms Charlotte Alexander, Executive Director, Commercial Assets, NSW Treasury, 16 October 2020, p 18; Mr David Fowler, Executive Director, Regulatory Practice and Environmental Solutions, NSW Environment Protection Authority, 16 October 2020, p 45.

26 Submission 83, NSW Government, p 11.

27 Submission 13, Delta Electricity, pp 2, 3-4.

28 Evidence, Mr Greg Jarvis, Executive General Manager, Energy Supply and Operations, Origin Energy Limited, p 7.

29 Evidence, Mr Steve Rieniets, Group General Manager Operations, Integrated Energy, AGL Macquarie Pty Limited, 1 September 2020, p 4.

30 Submission 10, Warners Bay Areas Sustainable Neighbourhood Group, p 2; Submission 28a, Keep Lake Macquarie Clean, p 3; Submission 39, Hunter Community Environment Centre, p 33; Submission 47, Doctors for the Environment Australia, p 3; Submission 57, Central Coast Community Energy Association Inc, p 2; Submission 58, Ms Renee McLean, p 1; Submission 74, Name suppressed, p 1; Submission 76, CEN (Community Environment Network), Central Coast & Lake Macquarie, p 3; Submission 81, Environmental Justice Australia, pp 10, 19 and 23.

Best practice remediation

1.18 There was some discussion about the need to follow best practice remediation with several inquiry participants advocating for 'international best practice' to be adopted. [31] However, only a few inquiry participants actually specified the features of best practice remediation, as follows:

- recycling coal ash to avoid mass storage[32]
- appropriate lining of the ash dams and dry storage rather than wet slurry[33]
- comprehensive groundwater monitoring and having that information publicly available[34]
- involving the community in the development of management and rehabilitation plans and enclosure plans.[35]

Projected future deposits of coal ash

1.19 Both the Nature Conservation Council of NSW and Vecor Australia Pty Limited, told how 'Australia has over 400 million tonnes of fly-ash stored in dump sites',[36] with an additional 10 to 12 million tonnes created each year.[37] Others noted that coal ash accounts for nearly one-fifth of the entire nation's waste.[38]

1.20 Mr Steve Rieniets, Group General Manager Operations, Integrated Energy, AGL Macquarie Pty Limited gave evidence that the company, if approved, was planning to augment the Bayswater ash dam 'to provide additional ash storage capacity to ensure Bayswater can continue

31 Submission 16, Blue Mountains Unions Council Inc, p 1; Submission 45, Bathurst Community Climate Action Network (BCCAN), p 1; Submission 79, Nature Conservation Council of NSW, p 4; Submission 81, Environmental Justice Australia, pp 5 and 13; Evidence, Mr Chris Gambian, Chief Executive Officer, Nature Conservation Council of NSW, 1 September 2020, p 40; Evidence, Ms Lyn Fraser, Member, Warners Bay Area Sustainable Neighbourhood Group, 1 September 2020, p 6;

32 Evidence, Ms Liz Hadja, Climate and Energy Campaigner, Nature Conservation Council of NSW, 1 September 2020, p 27; Evidence, Dr Heinz-Joachim Muller, Steering Committee Member, CEN (Community Environment Network) Central Coast & Lake Macquarie, 6 October 2020, p 14.

33 Evidence, Ms Bronya Lipski, Lawyer, Environmental Justice Australia, 1 September 2020, p 27; Evidence, Dr Heinz-Joachim Muller, Steering Committee Member, CEN (Community Environment Network) Central Coast & Lake Macquarie, 6 October 2020, p 14.

34 Evidence, Ms Bronya Lipski, Lawyer, Environmental Justice Australia, 1 September 2020, p 27.

35 Evidence, Ms Bronya Lipski, Lawyer, Environmental Justice Australia, 1 September 2020, p 27.

36 Evidence, Mr Mark Ramsey, Director and Chief Executive, Vecor, 16 October 2020, p 1; Evidence Mr Chris Gambian, Chief Executive, Nature Conservation Council of NSW, 1 September 2020, p 24.

37 Evidence, Mr Mark Ramsey, Director and Chief Executive, Vecor, 16 October 2020, p 1; Evidence Mr Chris Gambian, Chief Executive, Nature Conservation Council of NSW, 1 September 2020, p 24.

38 Evidence Mr Chris Gambian, Chief Executive, Nature Conservation Council of NSW, 1 September 2020, p 24; Submission 21, Name Suppressed, p 1; Submission 36, Lake Macquarie Sustainable Neighbourhood Alliance Inc., p 13.

to operate until its planned end of life and deliver further water management improvements within the Bayswater ash dam'.[39]

1.21 Likewise, Origin Energy had planning approval to raise the Eraring ash dam wall but were yet to make a decision as to whether they would proceed, given the significant costs of such a development.[40]

1.22 During the inquiry, the committee heard that coal ash can be reused for beneficial purposes such as in concrete manufacture.[41] The management and potential re-uses of coal ash will be discussed in Chapter 4.

The regulators: NSW Environment Protection Authority and Dams Safety NSW

1.23 In New South Wales, coal ash dams are regulated by both the NSW Environment Protection Authority (NSW EPA) and Dams Safety NSW. The two regulators have distinct functions and powers in relation to ash dams as outlined below.

1.24 The NSW EPA is responsible for regulating the environmental impact of ash dams and places conditions on licences that require power station operators to manage dust and water pollution from ash disposal.[42]

1.25 Dams Safety NSW is a statutory authority created under the *Dams Safety Act 2015* to fulfil the following four objectives in relation to dams:

- ensure that risks that arise in relation to dams, including any risks to public safety and to the environment and economic assets are at a level that is acceptable to the community;
- to promote transparency in regulating dam safety;
- to encourage proper and efficient management in matters relating to dam safety; and
- to encourage the application of risk management and the principles of cost-benefit analysis in relation to dam safety.[43]

1.26 Dam stability and structural integrity is also regulated by Dams Safety NSW.[44]

1.27 The adequacy and effectiveness of the current regulatory regime for ensuring best practice remediation of coal ash repositories will be discussed in more detail in Chapter 2.

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39 Evidence, Mr Steve Rieniets, Group General Manager Operations, Integrated Energy, AGL Macquarie Pty Limited, 1 September 2020, p 4.

40 Evidence, Mr Greg Jarvis, Executive General Manager, Energy Supply and Operations, Origin Energy Limited, pp 11-12.

41 Submission 83, NSW Government, p 3; Submission 11, Vecor Australia Pty Limited, pp 3-4; Submission 78, Origin, p 1; Evidence, Mr Steve Rieniets, Group General Manager Operations, Integrated Energy, AGL Macquarie Pty Limited, 1 September 2020, p 4.

42 Submission 83, NSW Government, p 3.

43 Evidence, Mr Chris Salkovic, Chief Executive Officer, Dams Safety NSW, 16 October 2020, p 27.

44 Submission 83, NSW Government, p 16.

Overview of the Electricity Generation transactions

1.28 In 2012, the NSW Government commenced the Electricity Generation transactions.[45]

1.29 The Electricity Generation transactions included the sale of the following:

- the Gentrader assets of both Eraring Energy (Eraring coal-fired power station and Shoalhaven power stations) and Delta Electricity (Mount Piper and Wallerawang coal-fired power stations) for combined cash proceeds of $210 million;
- Green State Power's renewable energy assets for gross proceeds of $72 million;
- Macquarie Generation's assets (Bayswater and Liddell coal-fired power stations) for gross proceeds of $1.505 billion;
- Delta Electricity's gas-fired Colongra power station for gross proceeds of $234 million;
- Delta Electricity's Vales Point coal-fired power station for gross proceeds of $1 million; and
- Brown Mountain Power Station and Cochrane Dam for gross proceeds of $4.5 million.[46]

1.30 The NSW Government has argued that the transactions resulted in the State avoiding approximately $2 billion in liabilities.[47]

1.31 In turn, the State provided indemnities to respective purchasers that cover the cost associated with remediating pre-existing contamination at the Mount Piper, Bayswater, Liddell, Vales Point, Eraring, Shoalhaven, Colongra and Wallerawang power stations.[48]

1.32 Further, the contingent liabilities disclosed regarding to the Electricity Generation transactions include the potential costs to the State for remediating pre-existing contamination at:

- Mt Piper power station site;
- Colongra power station site;
- Eraring and Shoalhaven power stations;
- Bayswater and Liddell power stations; and
- Vales Point power station.[49]

1.33 The prospective or quantum of government liability for remediating contamination at sites and prospective timing of government expenditure will be discussed in Chapter 5.

45 Submission 83, NSW Government, p 3.

46 Submission 83, NSW Government, p 3.

47 Submission 83, NSW Government, p 3

48 Submission 83, NSW Government, p 5.

49 Submission 83, NSW Government, pp 6-7.

Australian Senate Environment and Communications References Committee Report

1.34 In March 2019, the Australian Senate's Environment and Communications References Committee released a report on the *Rehabilitation of mining and resources projects and power station ash dams as it relates to Commonwealth responsibilities.*

1.35 The report examined the production and storage of coal ash in Australia, with a particular focus on power stations and ash dam sites in Port Augusta, South Australia.[50] It was noted that the Port Augusta site includes a 273 hectare ash storage dam, and is one of the first ash dam sites in Australia to enter the closure and rehabilitation phase, with significant community and environmental concerns raised since the closure of the power stations.[51]

1.36 The report also considered best practice approaches to managing and rehabilitating ash dams, current industry performance, and the regulatory framework for rehabilitation. Based on the evidence received, the committee was unable to reach agreement on a unanimous set of recommendations.[52]

50 Environment and Communications References Committee, Australian Senate, *Rehabilitation of mining and resources projects and power station ash dams as it relates to Commonwealth responsibilities* (2019), p 123.

51 Environment and Communications References Committee, Australian Senate, *Rehabilitation of mining and resources projects and power station ash dams as it relates to Commonwealth responsibilities* (2019), p 125.

52 Environment and Communications References Committee, Australian Senate, *Rehabilitation of mining and resources projects and power station ash dams as it relates to Commonwealth responsibilities* (2019), p 147.

Chapter 2 Adequacy and effectiveness of the current regulatory regime for ensuring best practice remediation

This chapter examines the current regulatory framework for coal ash dams as set by both the NSW EPA and Dams Safety NSW. It then discusses the adequacy and effectiveness of the two regulators, particularly in relation to water and air quality monitoring and public access to information. The chapter concludes with an overview of the regulatory record of the three power station operators.

Regulatory framework

2.1 As previously noted in chapter one, coal ash dams are regulated by both the NSW EPA and Dams Safety NSW. The two regulators have distinct functions and powers in relation to ash dams.

NSW EPA as a regulator

2.2 The NSW EPA has regulatory responsibilities under the *Protection of the Environment Operations Act 1997* for surface water pollution, groundwater pollution and air pollution from ash dams in New South Wales.[53]

2.3 The Act stipulates the types of activities that require an environment protection licence which 'focuses on protecting the environment and address air, noise, waste and land contamination issues as well as regulating discharges to waters'.[54] For example, the conditions of the environment protection licences for the five operating coal fired power stations relate to 'pollution prevention and monitoring, and cleaner production through recycling and reuse and the implementation of best practice'.[55]

2.4 Regulation specifically aimed at coal ash reuse in Australia generally falls under waste management laws.[56] The New South Wales Coal Ash Order 2014, issued by the NSW EPA under the Protection of the Environment Operations (Waste) Regulation 2014, sets out requirements that must be met by suppliers of coal ash.[57]

2.5 In its submission, the NSW Government noted the role of the NSW EPA in regulating the reuse of coal ash under its Resource Recovery Framework:

> The EPA has issued a resource recovery order (orders) and resource recovery exemption (exemptions) for coal ash and blended coal ash under the Resource Recovery Framework. Orders and exemptions allow some wastes to be beneficially and safely re-

53 Submission 83, NSW Government, p 11.

54 Submission 83, NSW Government, p 11.

55 Submission 83, NSW Government, p 11.

56 Submission 81, Environmental Justice Australia, Attachment 1, p 39.

57 Coal Ash Order 2014 (NSW)

used independent of the usual NSW laws that control applying waste to land, using waste as a fuel, or using waste in connection with a process of thermal treatment.

Orders and exemptions are only appropriate if the re-use:

- is genuine, rather than a means of waste disposal
- is beneficial or fit-for-purpose, and
- will not cause harm to human health or the environment.[58]

2.6 The NSW Government further noted that the orders and exemptions contain conditions which generators, processors and consumers must use to supply and use the waste, including material and processing specifications, record-keeping, reporting and other requirements. [59]

2.7 Power station operators are responsible for ensuring compliance with the licence requirements[60], via an annual self-assessment.[61]

2.8 When questioned as to whether the NSW EPA had varied licences with respect to issues arising specifically to ash dams, Mr David Fowler, Executive Director, Regulatory Practice and Environmental Solutions, NSW Environment Protection Authority, responded that it was likely that they had. He outlined that the monitoring requirements under the licensing framework can be changed 'depending on risks that we might identify or issues that might arise'.[62]

2.9 Further, Mr Fowler explained that the NSW EPA had provisions called pollution reduction studies, which 'allow us to look at particular focused activities on that site' as well as pollution reduction programs, which 'allow us to impose requirements to undertake certain works if appropriate.[63] The NSW EPA advised that it had required 16 Pollution Reduction Programs and Studies be completed in relation to power station coal ash dams.[64]

Dams Safety NSW as a regulator

2.10 Mr Chris Salkovic, Chief Executive Officer, Dams Safety NSW explained that 'much of what we do relates to the prevention' of dam failure meaning an 'uncontrolled release of the contents of a dam or a dam ceasing to perform its functions'.[65]

2.11 To measure compliance with the Dams Safety Regulation 2019 and the *Dams Safety Act 2015,* the agency used a risk-based regulatory framework of six different consequence categories or

58 Submission 83, NSW Government, p 9.

59 Submission 83, NSW Government, p 9.

60 Submission 83, NSW Government, p 11.

61 Evidence, Mr David Fowler, Executive Director, Regulatory Practice and Environmental Solutions, NSW Environment Protection Authority, 16 October 2020, p 39.

62 Evidence, Mr David Fowler, Executive Director, Regulatory Practice and Environmental Solutions, NSW Environment Protection Authority, 16 October 2020, p 39.

63 Evidence, Mr David Fowler, Executive Director, Regulatory Practice and Environmental Solutions, NSW Environment Protection Authority, 16 October 2020, p 39.

64 Answers to questions on notice, NSW Environment Protection Authority, pp 3-4.

65 Evidence, Mr Chris Salkovic, Chief Executive Officer, Dams Safety NSW, 16 October 2020, p 27.

hazard ratings, when conducting audits.[66] These consequence categories were defined by the level of potential loss of life, environmental consequence and property damage.[67]

2.12 Mr Salkovic described the six consequence categories or hazard ratings as low, significant, high A, high B, high C and extreme.[68] He advised that audit frequency of a dam was dependent on the consequence rating. For example, extreme dams were audited once every two years and for lower consequence dams, auditing was conducted once every four years.[69] However, Mr Salkovic did state that 'if incidents occur or if there is non-compliance than that frequency will change'.[70]

2.13 When questioned as to who was conducting the risk assessments of the ash dams, Mr Peter Boyd, Governance and Assurance Manager, Dams Safety NSW, confirmed that the 'regulation requires the dam owner to carry out the assessment. We can also require an independent check of the assessment … if we so desire'.[71]

Adequacy and effectiveness of NSW EPA and Dams Safety NSW

2.14 Some inquiry participants reported that the current regulatory framework 'constrain[s] the ability to maximise the re-use of coal ash',[72] by regarding it as a 'waste stream' rather than a resource.[73] This will be discussed in detail in Chapter 4.

2.15 Environmental Justice Australia suggested that current regulation around coal ash reuse procedures was not robust enough. Although there is some requirement under the NSW Coal Ash Order 2014 for generators of coal ash to undertake sampling and testing, compliance with this is largely self-regulated.[74] It argued that currently little information is publicly available about the toxicity of coal ash. Environmental Justice Australia called for regulation to require testing of coal ash and public release of this information before widespread reuse is undertaken.[75]

2.16 Meanwhile, Lake Macquarie City Council was of the view that under existing regulations, the classification of coal ash as a waste stream, rather than a resource, acted as a 'barrier for reuse', particularly in terms of cost and time.[76]

66 Evidence, Mr Chris Salkovic, Chief Executive Officer, Dams Safety NSW, 16 October 2020, p 27.

67 Evidence, Mr Chris Salkovic, Chief Executive Officer, Dams Safety NSW, 16 October 2020, p 28.

68 Evidence, Mr Chris Salkovic, Chief Executive Officer, Dams Safety NSW, 16 October 2020, p 27.

69 Evidence, Mr Chris Salkovic, Chief Executive Officer, Dams Safety NSW, 16 October 2020, p 27.

70 Evidence, Mr Chris Salkovic, Chief Executive Officer, Dams Safety NSW, 16 October 2020, p 27.

71 Evidence, Mr Peter Boyd, Governance and Assurance Manager, Dams Safety NSW, 16 October 2020, pp 29-30.

72 Submission 78, Origin Energy, p 2.

73 Submission 9, Lake Macquarie City Council, p 2. See also Submission 11, Vecor Australia, p 18; Evidence, Ms Greg Jarvis, Executive General Manager, Energy Supply and Operations, Origin Energy Limited, 1 September 2020, p 2.

74 Submission 81, Environmental Justice Australia, pp 22-3.

75 Submission 81, Environmental Justice Australia, p 21.

76 Submission 9, Lake Macquarie City Council, p 2.

2.17 Many inquiry participants argued that the current regulatory regime for the management and remediation of coal ash dams was 'inadequate' and did not promote best practice remediation.[77]

2.18 Environmental Justice Australia argued that the government had 'no coherent standards or rules for the management and remediation of coal ash repositories' which was 'complicated' by the sharing of regulatory responsibilities between the NSW EPA and Dams Safety NSW.[78]

2.19 In terms of the regulatory role performed by the NSW EPA, Ms Bronya Lipski, Lawyer, Environmental Justice Australia, stated that the environment protection licences did not provide 'clear limits … of the types of pollutants that can be released into the environment from these sites'. She argued that if environment protection licences and regulations were more 'robust' then the contamination would not be occurring.[79]

2.20 Mr Bruce Macfarlane, Member, Keep Lake Macquarie Clean commented that the community had 'no confidence that the Environment Protection Authority is in control of the industry. We are concerned that it is not focused on meaningful environmental outcomes and protection of community health.'[80]

2.21 Environmental Justice Australia proposed that coal ash specific regulations be established under the *Protection of the Environment Operations Act 1997* to 'ensure that coal ash dumps are comprehensively managed, remediated and rehabilitated'.[81] Such regulations would 'mitigate the current and future threat of contamination of land, groundwater and surface water and to prevent harm to human health, aquatic resources and ecosystems'.[82]

2.22 Similarly, Ms Liz Hadja, Climate and Energy Campaigner, Nature Conservation Council of NSW called for the development of specific regulations for coal ash dams, at both operational and non-operational power station sites, 'consistent with international best practice'.[83]

2.23 In regards to the regulatory role performed by Dams Safety NSW, Environmental Justice Australia expressed the view that given the closure of the Myuna Bay Sport and Recreation Centre, Dams Safety NSW 'appears to fail in its function to keep the public informed of dams safety and its object to promote transparency in regulating dams safety with respect to coal ash dams'.[84]

2.24 By contrast, when questioned as to whether the current regulatory environment for the management of coal ash dams was fit for purpose, all three power station operators – Delta Electricity, Origin Energy and AGL Energy - were in agreement that it was.[85] All three operators

77 Submission 81, Environmental Justice Australia, p 12.

78 Submission 81, Environmental Justice Australia, p 12.

79 Evidence, Ms Bronya Lipski, Lawyer, Environmental Justice Australia, 1 September 2020, p 34.

80 Evidence, Mr Bruce Macfarlane, Member, Keep Lake Macquarie Clean, 6 October 2020, p 13.

81 Submission 81, Environmental Justice Australia, pp 4 and 12.

82 Submission 81, Environmental Justice Australia, p 17.

83 Evidence, Ms Liz Hadja, Climate and Energy Campaigner, Nature Conservation Council of NSW, 1 September 2020, p 24.

84 Submission 81, Environmental Justice Australia, p 13.

85 Evidence, Mr Justin Flood, Executive Manager Sustainability, Delta Electricity, 1 September 2020, p 15; Evidence, Mr Greg Jarvis, Executive General Manager, Energy Supply and Operations, Origin

gave evidence that regular inspections and testing were conducted on each of their respective ash dams with reports submitted to both regulators.[86]

2.25 At the hearing, representatives of NSW EPA and Dams Safety NSW were asked if there was a memorandum of understanding [MOU] between the two regulators as a means to improve the working relationship between the two agencies. Mr David Fowler, Executive Director, Regulatory Practice and Environmental Solutions, NSW Environment Protection Authority, responded that while there was no MOU 'at this time', it was a matter that the NSW EPA was interested in exploring.[87]

2.26 Mr Fowler gave evidence that conversations had taken place between NSW EPA and Dams Safety NSW about an MOU with both organisations concluding that it was necessary to 'ensure that our regulatory oversight effectively aligns … [and] That we both have a similar level of exposure to intelligence around those activities and in particular the dams, their operation and their impact'.[88]

2.27 Mr Chris Salkovic, Chief Executive Officer, Dams Safety NSW confirmed that the two organisations had agreed in principle to an MOU with plans to proceed to formalise one in 2021.[89]

Water and air quality monitoring

2.28 Some inquiry participants expressed disappointment about the level of water and air quality monitoring undertaken by both the power station operators and the NSW EPA in relation to the power stations and coal ash dams.[90]

2.29 Mr Bruce Macfarlane, Member, Keep Lake Macquarie Clean, stated that the 'citizens of Lake Macquarie are not receiving meaningful reports on water and air quality'. He argued that '[r]egular testing and other investigations should be carried out by independent and impartial organisations' with results to be communicated regularly.[91]

Energy Limited, 1 September 2020, p 15; Evidence, Mr Steve Rieniets, Group General Manager Operations – Integrated Energy, AGL Macquarie Pty Limited, 1 September 2020, p 15.

86 Evidence, Mr Justin Flood, Executive Manager Sustainability, Delta Electricity, 1 September 2020, p 15; Evidence, Mr Greg Jarvis, Executive General Manager, Energy Supply and Operations, Origin Energy Limited, 1 September 2020, p 15; Evidence, Mr Steve Rieniets, Group General Manager Operations – Integrated Energy, AGL Macquarie Pty Limited, 1 September 2020, p 15.

87 Evidence, Mr David Fowler, Executive Director, Regulatory Practice and Environmental Solutions, NSW Environment Protection Authority, 16 October 2020, p 47.

88 Evidence, Mr David Fowler, Executive Director, Regulatory Practice and Environmental Solutions, NSW Environment Protection Authority, 16 October 2020, p 47.

89 Evidence, Mr Chris Salkovic, Chief Executive Officer, Dams Safety NSW, 16 October 2020, p 47.

90 Submission 4, Coal-ash Community Alliance Inc., p 15; Submission 10, Warners Bay Area Sustainable Neighbourhood Group, p 1; Submission 15, Mr Greg Piper MP, p 3; Submission 22, Dr Peter Sainsbury, p 1; Supplementary submission 28a, Keep Lake Macquarie Clean, pp 1-2; Evidence, Mr David Tait, Member, Keep Lake Macquarie Clean, 6 October 2020, p 12; Evidence, Mr Greg Piper MP, Member for Lake Macquarie, 6 October 2020, p 5; Evidence, Dr Kathleen Wild, Member, Doctors for the Environment, 1 September 2020, p 30.

91 Evidence, Mr Bruce Macfarlane, Member, Keep Lake Macquarie Clean, 6 October 2020, p 13.

2.30 Similarly, Mr David Tait, Member, Keep Lake Macquarie Clean, observed that '[t]here appears to be no published attempt to analyse or interpret that monitoring data in any way that is comprehensible to the general community'.[92]

2.31 Mr Greg Piper MP, observed that '[w]hile there is currently a legislative requirement to monitor air pollution on site, there is little or none in the communities surrounding these power stations and ash dams'.[93] He added that that the public 'now expect much more in the way of transparency around' monitoring, real-time recording and publicly accessible data in relation to the management of the power stations.[94]

2.32 Environmental Justice Australia noted that 'environmental monitoring for groundwater and air quality adjacent to coal ash repositories is conducted by the coal ash dump operators'. In order to 'access and interrogate this data', Environmental Justice Australia commented that one would have to 'navigate the websites of several different companies, download pdfs that provide only partial data and manually create a dataset'.[95] It argued that '[i]t should be possible to access a centralised dataset that includes all monitoring data for all coal ash repositories'.[96]

2.33 In response to concerns about air quality monitoring, Mr Adam Gilligan, Director, Regulatory Operations Metropolitan North, NSW Environment Protection Authority, advised that '[e]ach individual licensee is required to do a combination of stack monitoring in terms of what they emit into the environment and ambient monitoring in terms of what is actually being breathed in by the community'.[97] This was in conjunction with the 'government-operated network of ambient air monitoring across the State'.[98]

2.34 In terms of discrete monitoring of dust from ash dams, Mr David Fowler, Executive Director, Regulatory Practice and Environmental Solutions, NSW Environment Protection Authority indicated it was 'difficult to identify the source of the dust from discrete ambient monitoring'. He advised that the government had conducted studies of ambient air to characterise the composition of ambient air pollution and found that 'there was nothing … to indicate that the coal ash dams played a particular or identifiable role in that dust impact'.[99]

2.35 In relation to ground water monitoring, the NSW EPA advised that it intended to conduct a 'comprehensive study of surface water and groundwater around the power stations and their

92 Evidence, Mr David Tait, Member, Keep Lake Macquarie Clean, 6 October 2020, p 12.

93 Submission 15, Mr Greg Piper MP, p 3.

94 Evidence, Mr Greg Piper MP, Member for Lake Macquarie, 6 October 2020, p 5.

95 Submission 81, Environmental Justice Australia, p 15.

96 Submission 81, Environmental Justice Australia, p 15.

97 Evidence, Mr Adam Gilligan, Director, Regulatory Operations Metropolitan North, NSW Environment Protection Authority, 16 October 2020, p 46.

98 Evidence, Mr Adam Gilligan, Director, Regulatory Operations Metropolitan North, NSW Environment Protection Authority, 16 October 2020, p 46.

99 Evidence, Mr David Fowler, Executive Director, Regulatory Practice and Environmental Solutions, NSW Environment Protection Authority, p 46.

potential impacts on the surrounding environment'.[100] Mr Fowler advised that scoping work had started with the NSW EPA to work 'very closely with the power stations themselves'.[101]

Lack of publicly accessible information

2.36 Several inquiry participants noted the lack of publicly accessible information in relation to the management and remediation of coal ash dams.[102]

2.37 Environmental Justice Australia observed it was 'harder for community members to access information about licencing obligations and compliance when multiple agencies are involved', and particularly when information about coal ash repositories is 'extremely limited'.[103]

2.38 For example, Ms Bronya Lipski, Lawyer, Environmental Justice Australia, gave evidence that little was known about the ash dam assessments undertaken by Dams Safety NSW:

> We do not know a lot. We know that it has reporting requirements that operators must submit every five years. Those reports are not publicly available … Short of submitting a GIPA request, it is very difficult to have access to that information. That is exactly the type of information that should be publicly available.[104]

2.39 In addition, Ms Lipski claimed '[t]here is certainly a lot of community anger around the lack of information available to them about what they are living next to'.[105]

2.40 The Nature Conservation Council of NSW expressed concern given that 'comprehensive information about coal ash dumps is not readily available to the Australian public'. It argued that 'the public has a right to know about coal ash dumps and how they are managed …' and noted that '[c]urrently this information is only available through lengthy and expensive Freedom of Information procedures.'[106]

2.41 In particular, a number of inquiry participants claimed there was inadequate public information about groundwater monitoring.[107] As a result, many called on the government to 'provide public

100 Evidence, Mr David Fowler, Executive Director, Regulatory Practice and Environmental Solutions, NSW Environment Protection Authority, 16 October 2020, p 44.

101 Evidence, Mr David Fowler, Executive Director, Regulatory Practice and Environmental Solutions, NSW Environment Protection Authority, 16 October 2020, p 44.

102 Submission 53, Mr Peter O'Shannessy, p 1; Submission 57, Central Coast Community Energy Association Inc (CCCE), p 7; Submission 36, Lake Macquarie Sustainable Neighbourhood Alliance, p 2; Submission 79, Nature Conservation Council of NSW, p 3.

103 Submission 81, Environmental Justice Australia, p

104 Evidence, Ms Bronya Lipski, Lawyer, Environmental Justice Australia, 1 September 2020, p 31.

105 Evidence, Ms Bronya Lipski, Lawyer, Environmental Justice Australia, 1 September 2020, p 39.

106 Submission 79, Nature Conservation Council of NSW, p 3.

107 Submission 10, Warners Bay Area Sustainable Neighbourhood Group, p 2; Submission 16, Blue Mountains Unions Council Inc, p 1; Submission 21, Name suppressed, p 3; Submission 24, Mr Graeme Batterbury, p 1; Submission 36, Lake Macquarie Sustainable Neighbourhood Alliance Inc., p 2; Submission 45, Bathurst Community Climate Action Network (BCCAN), p 2; Submission 48, Coal Point Progress Association, pp 1-2; Submission 79, Nature Conservation Council of NSW, p 5; Submission 81, Environmental Justice Australia, p 5; Evidence, Mr Stephen Dewar, Secretary, Lake

access to all groundwater monitoring data (current and historical) via a website similar in function to the website for air pollution monitoring maintained by the NSW EPA'.[108]

Regulatory record of the three power station operators

2.42 All three power station operators acknowledged that each had breached regulations set by NSW EPA.

2.43 For example, Delta Electricity advised that in 2018 it had received a clean-up order from the NSW EPA, after reporting that it had found asbestos and general waste in the soil used for capping the ash dams.[109]

2.44 Meanwhile, Origin Energy advised that over the past five years it had received the following penalty notices from the NSW EPA in relation to its ash dam:

- Penalty Notice No. 3173528903 relating to ash dam dusting on 17 October 2019 ($15,000) (note EPA public register states it was 2017 which is incorrect).
- Penalty Notice No. 3173527280 relating to ash dam dusting on 15 September 2018 ($15,000).
- Penalty Notice No. 3085780868 relating to ash dam dusting on 27 September 2016 ($15,000).[110]

2.45 Likewise, AGL Energy indicated that on five occasions it had received regulatory orders from the NSW EPA in relation to fly ash spills, dust emissions, pipeline leak and coal ash order non-compliance.[111]

2.46 In relation to AGL Energy, Mr Adam Gilligan, Director, Regulatory Operations Metropolitan North, NSW Environment Protection Authority, outlined that in terms of the Ravensworth ash pipeline leak, which occurred on 4 September 2019, AGL Energy has:

> undertaken to make payments totalling $500,000 to environmental projects. They have also undertaken to do further works onsite that range between $500,000 and $600,000, and that there are a number of other elements to that but they are the most significant financial aspects.[112]

Macquarie Sustainable Neighbourhood Alliance Inc, 6 October 2020, p 13; Evidence, Ms Bronya Lipski, Lawyer, Environmental justice Australia, 1 September 2020, pp 27 and 39.

108 Submission 10, Warners Bay Area Sustainable Neighbourhood Group, p 2; Submission 16, Blue Mountains Unions Council Inc, p 1; Submission 21, Name suppressed, p 3; Submission 24, Mr Graeme Batterbury, p 1; Submission 36, Lake Macquarie Sustainable Neighbourhood Alliance Inc., p 2; Submission 45, Bathurst Community Climate Action Network (BCCAN), p 2; Submission 48, Coal Point Progress Association, pp 1-2; Submission 79, Nature Conservation Council of NSW, p 5; Submission 81, Environmental Justice Australia, p 5; Evidence, Mr Stephen Dewar, Secretary, Lake Macquarie Sustainable Neighbourhood Alliance Inc, 6 October 2020, p 13; Evidence, Ms Bronya Lipski, Lawyer, Environmental justice Australia, 1 September 2020, pp 27 and 39.

109 Answers to questions on notice, Delta Electricity, 8 September 2020, p 3; Evidence, Mr Justin Flood, Executive Manager Sustainability, Delta Electricity, 1 September 2020, p 18.

110 Answers to questions on notice, Origin Energy, 28 September 2020, p 3.

111 Answers to questions on notice, AGL Energy, 28 September 2020, pp 6-7.

112 Evidence, Mr Adam Gilligan, Director, Regulatory Operations Metropolitan North, NSW Environment Protection Authority, 16 October 2020, p 41.

2.47 In January 2019, AGL Energy notified the NSW EPA that it had 'not [been] fully compliant with the requirements of the coal ash order' in terms of sampling and testing requirements for coal ash.[113] In response, the company entered into an Enforceable Undertaking.[114]

2.48 As Mr Adam Gilligan, Director, Regulatory Operations Metropolitan North, NSW Environment Protection Authority, explained that 'enforceable undertakings essentially sit between a penalty notice and a prosecution' whereby the NSW EPA can order remediation and 'also the payment of an amount towards a project, generally a community or environmental project …'.[115]

2.49 The NSW EPA advised that under the terms of the Enforceable Undertaking:

> AGL paid $82,000 to the NSW Department of Planning, Industry and Environment to assist with the installation of air monitoring equipment in the Upper Hunter which will contribute to the state-wide air quality monitoring network. AGL also contributed $18,000 to the Singleton Shire Landcare Network for use towards the Col Fisher Park Weed Eradication Project. AGL also paid the EPA's investigation and legal costs of $37,356 as well as carrying out staff training and placing notices about the Enforceable Undertaking in local media.[116]

2.50 Mr Adam Gilligan, Director, Regulatory Operations Metropolitan North, NSW Environment Protection Authority, informed the committee that in the last five years, the NSW EPA has issued 'nine penalty notices to AGL related to Liddell and Bayswater, three to Origin Energy related to Eraring and two to Delta Electricity related to Vales Point'.[117] These penalty notices were issued to the three power station operators for the following reasons:

Delta Electricity

- two penalty notices issued in 2020 (with a total financial penalty of $30,000) in response to the alleged receipt of asbestos and other waste at the coal ash dam by contractors at the Vales Point power station.

Origin Energy

- three penalty notices (in 2017, 2019 and 2020 for a total financial penalty of $45,000) in response to the alleged emission of dust from the coal ash dam on three separate occasions at the Eraring power station.

AGL Macquarie

- a penalty notice (in 2020 with a total financial penalty of $15,000) in response to the alleged emission of dust from the coal ash dam at Liddell power station.

113 Evidence, Ms Susan Rose, Group Counsel, Environment, Safety and Approvals, AGL Macquarie Pty Limited, 1 September 2020, p 3; Answers to questions on notice, NSW EPA, 12 November 2020, p 3.

114 Answers to questions on notice, NSW EPA, 12 November 2020, p 3.

115 Evidence, Mr Adam Gilligan, Director, Regulatory Operations Metropolitan North, NSW Environment Protection Authority, 16 October 2020, p 41.

116 Answers to questions on notice, NSW EPA, 12 November 2020, p 3.

117 Evidence, Mr Adam Gilligan, Director, Regulatory Operations Metropolitan North, NSW Environment Protection Authority, 16 October 2020, p 42.

- two penalty notices issued in 2018 and 2020 (with a total financial penalty of $30,000) in response to ash overflows or other ash related issues at Liddell power station.
- two penalty notices in 2015 for Bayswater power station – one for limit exceedances, one for failure to maintain equipment in a proper and efficient condition
- in 2016 one penalty notice for an ash transfer leak related to discharge of saline water to the Hunter River at Bayswater power station.
- In 2019 two penalty notices (with a total financial penalty of $30,000) in response to an unauthorised discharge of diesel from the day tanks at the Bayswater power station.
- a penalty notice (in 2019 with a total financial penalty of $15,000) in response to an unauthorised discharge from the lime softening plant at the Bayswater power station.[118]

Committee comment

2.51 In New South Wales, coal ash dams are regulated by two government agencies, the NSW Environment Protection Authority and Dams Safety NSW. The committee understands that both regulators have distinct functions and powers in relation to coal ash dams – one being the regulator of the environmental impact of ash dam pollution and the other being the regulator of the structural integrity of the dams themselves.

2.52 The committee acknowledges the views of many inquiry participants that the current regulatory framework is inadequate for the management and remediation of coal ash dams, and NSW EPA and Dams Safety NSW are ineffective in their role as regulators of coal ash dams. We also note the concerns raised by many inquiry participants regarding the lack of confidence in the regulators to protect the environment, ensure compliance and keep the community informed.

2.53 We agree with the suggestion of Environmental Justice Australia that greater regulation and oversight of coal ash dams is required, particularly via specific coal ash regulations proposed to be established under the *Protection of the Environment Operations Act 1997*. This is discussed further in chapter 4.

2.54 The committee has observed deficiencies in terms of communication, collaboration, and the sharing of knowledge and information between NSW EPA and Dams Safety NSW in regards to coal ash dams.

2.55 The committee notes that NSW EPA and Dams Safety NSW are intending to establish a memorandum of understanding between the two agencies to clarify and assist in the regulation of coal ash dams. We are of the view that such a memorandum would improve and strengthen the interaction and working relationship between these two agencies in relation to the management and remediation of coal ash dams. The committee therefore recommends that the NSW Environment Protection Authority and Dams Safety urgently establish a Memorandum of Understanding in relation to the management and remediation of coal ash dams by 30 June 2021.

[118] Answers to questions on notice, NSW EPA, 12 November 2020, pp 5-6.

Recommendation 1

That the NSW Environment Protection Authority and Dams Safety NSW establish a Memorandum of Understanding by 30 June 2021 in relation to the management and remediation of coal ash dams.

2.56 Further, the committee acknowledges the frustration felt by inquiry participants and community members by the perceived lack of transparency of the power station operators and the NSW Environment Protection Authority in relation to water and air quality monitoring, and in turn the absence of publicly available information that is easy to access and interpret. We agree that information about the management of coal ash dams is extremely limited and difficult to obtain.

2.57 Therefore, in order to improve transparency and access to information, the committee supports the proposal put forward by inquiry participants that the NSW Environment Protection Authority establish air and groundwater monitoring stations surrounding all power stations and coal ash dams, and that data from these and existing stations be published on the Authority's website by 1 July 2022.

Recommendation 2

That the NSW Environment Protection Authority establish air and groundwater monitoring sites surrounding all power stations and coal ash dams, and that current, real time and historical data of these and other existing monitoring sites be published on the Authority's website by 1 July 2022.

2.58 In addition, the committee supports the NSW Environment Protection Authority's undertaking to conduct a comprehensive study of surface water and groundwater around the power stations and their potential impacts on the surrounding environment. We urge the NSW Environment Protection Authority to commence this study as soon as possible and publish it by the end of 2022.

Recommendation 3

That the NSW Environment Protection Authority conduct and publish a study of surface and groundwater around all coal fired power stations and associated coal ash dams, and their potential impacts on the surrounding environment, by the end of 2022.

2.59 The committee understands that the regulatory record of the three power station operators, Delta Electricity, Origin Energy and AGL Energy, in terms of their compliance with the requirements of their respective environmental protection licenses and broader regulations enforced by the NSW Environment Protection Authority, is published online. However, the committee believes that any breaches by the operators should be reported in real time, and recommends that the NSW Environment Protection Authority publish all breaches of environmental legislation in real time on their website.

Recommendation 4

That the NSW Environment Protection Authority publish, in real time, breaches of environment protection legislation.

2.60 Similarly, the committee calls on Dams Safety NSW to publish on its website in a timely manner, where practicable, all ash dam assessments and responses undertaken by Dams Safety NSW or submitted to it by power station operators from time to time.

Recommendation 5

That Dams Safety NSW publish on its website in a timely manner, where practicable, all ash dam assessments and responses undertaken by Dams Safety NSW or submitted to it by power station operators from time to time.

Chapter 3 Potential impacts of coal ash dams

This chapter discusses the risks and liabilities associated with inadequate remediation of coal ash dams, including community and environmental health impacts. It then notes risks at specific sites near Wollongong and the Blue Mountains.

Risks and liabilities associated with coal ash dams

3.1 As noted in Chapter 1, the cap and cover method of remediation of coal ash dams is an obligation imposed by the government on private sector operators, in an attempt to mitigate environmental risk. This method involves coal ash being mixed with water to form a slurry, and piped from the power station and emptied into a dam. The coal ash is then capped with fill, which helps to 'seal' the coal ash in the dam, and this is then vegetated with grasses. Larger trees or vegetation is not planted so as to not disturb the capping.

3.2 During this inquiry, concerns were raised about the risks and liabilities associated with inadequate remediation of coal ash dams, and in particular the potential consequences this could have for communities and the environment, if not addressed.

3.3 For example, Mr Stephen Dewar, Secretary, Lake Macquarie Sustainable Neighbourhood Alliance Inc. argued, 'the measures in place now are not adequate. The cheap form of rehabilitation of the ash dams being covered with soils and then revegetated with a few plants is unacceptable'.[119]

3.4 Wollongong City Council commented that '[p]otential further contamination from these sites may occur if they are not remediated appropriately and if there is a lack of long-term monitoring to ensure that remediation efforts have been successful'.[120]

3.5 Mr David Tait, Member, Keep Lake Macquarie Clean acknowledged that the cap and cover '[approach] may address the more obvious air pollution issues, [but] it will not by itself prevent cumulative effects of leachate entering the lake over time'.[121]

3.6 Similarly, Mr Paul Winn, Researcher, Hunter Community Environment Centre, observed that 'one of the great problems' faced by power station operators in managing ash dams is trying to reduce the amount of leachate by 'reduc[ing] the amount of water you put on the ash but if you have a windy day then it all blows away'. In turn, more water is used 'to reduce the amount of wind blow and then that causes more metals leaching out. They are in a tricky position'.[122]

3.7 The Bathurst Community Climate Action Network noted that the risks and costs of pollution from coal ash dams increases as long as coal ash disposal continues unchanged. The Network identified the following risks:

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119 Evidence, Mr Stephen Dewar, Secretary, Lake Macquarie Sustainable Neighbourhood Alliance Inc, 6 October 2020, p 14.

120 Submission 75, Wollongong City Council, p 5.

121 Evidence, Mr David Tait, Member, Keep Lake Macquarie Clean, 6 October 2020, p 12.

122 Evidence, Mr Paul Winn, Researcher, Hunter Community Environment Centre, 1 September 2020, p 51.

- health impacts such as air pollution and limits on consumption of seafood from Lake Macquarie
- ecological impacts such as degradation and loss of marine ecosystems
- community impacts such as concerns of loss of property value, negative effects on tourism and recreational uses, the loss of community space, and stresses of all these on people's mental health, and
- other impacts such as the inability of local government to use land in the future.[123]

3.8 Environmental Justice Australia argued that the risks and liabilities associated with inadequate remediation are 'enormous',[124] and

> stems fundamentally from the absence of carefully designed and rigorously implemented laws and regulation that underpin operator and State requirements for comprehensive management and rehabilitation.[125]

3.9 In addition, Ms Bronya Lipski, Lawyer, Environmental Justice Australia commented that '…the community has little confidence that these sites have been comprehensively remediated to reduce the risk of contamination into the future'.[126]

Should coal ash dams be lined?

3.10 Currently in New South Wales, all coal ash dams are unlined, which means that water can pass through the coal ash dam, absorb toxic metals, and then this leachate can potentially leak into the environment. Dr Heinz-Joachim Muller, Steering Committee Member, Community Environment Network Central Coast and Lake Macquarie, described the problem of coal ash leachate using the analogy of percolating coffee:

> …the water trickles through the whole ash layer like through coffee in a coffee filter and over time … the contaminants are leached through, as long as there is water coming through...[127]

3.11 The Hunter Community Environment Centre explained that the 'contaminated water [from the leachate was] highly detrimental … making the local water unsuitable for drinking. This effect has been seen in many studies on local water quality near ash ponds'.[128] In addition, '[c]oal ash leachates can be consumed or absorbed by aquatic organisms and cause toxic effects …'.[129]Mr Paul Winn, Researcher, Hunter Community Environment Centre advised that some metals

123 Submission 45, Bathurst Community Climate Action Network (BCCAN), pp 1-2.

124 Evidence, Ms Bronya Lipski, Lawyer, Environmental Justice Australia, 1 September 2020, p 25.

125 Submission 81, Environmental Justice Australia, p 4.

126 Evidence, Ms Bronya Lipski, Lawyer, Environmental Justice Australia, 1 September 2020, p 25.

127 Evidence, Dr Heinz-Joachim Muller, Steering Committee Member, Community Environment Network Central Coast and Lake Macquarie, 6 October 2020, p 15.

128 Supplementary submission 39a, Hunter Community Environment Centre, p 4.

129 Supplementary submission 39a, Hunter Community Environment Centre, p 4.

contained within coal ash could leach out 'almost immediately after the ash has been dumped and for some other metals… [it could] take several years'.[130]

3.12 A number of inquiry participants called for ash dams to be remediated by replacing unlined dams with lined dams, as is the case in the United States, in order to reduce contamination and improve environmental outcomes.[131]

3.13 However, Mr Justin Flood, Executive Manager Sustainability, Delta Electricity, considered lining ash dams as 'impractical as it would be impossible to remove the ash from existing placement dams without causing significant environmental and economic harm in the process'.[132]

3.14 Similarly, Polyagg reported the case of an American power company which was required to remove 76 million tons of coal ash in 7 storage basins, from unlined to lined landfills - at an estimated cost of US$3.5 billion.[133]

3.15 In terms of community and environmental health concerns associated with inadequate remediation, Mr Greg Piper MP, Member for Lake Macquarie told the committee, '[l]ess is known about any long-term impacts that components (particularly heavy metals concentrated in coal ash) will have, both in terms of human health and on the environment'.[134]

3.16 In response to concerns about inadequate remediation, the NSW EPA referred to the National Environment Protection (Assessment of Site Contamination) Measure 1999 (NEPM), which sets out a nationally consistent approach for the assessment of contamination. Under the NEPM a site assessment should be carried out to determine whether site contamination poses a threat to human health or the environment and whether it is of significant magnitude to warrant remediation.[135]

3.17 The NSW EPA explained that pending the results of the site contamination assessment, the options chosen for site clean-up should include on-site or off-site treatment to reduce risk to an acceptable level. If that is not practical, the contamination should be isolated on site through the containment of contaminated soil and through removal of contaminated material to an approved site or facility.

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130 Evidence, Mr Paul Winn, Researcher, Hunter Community Environment Centre, 1 September 2020, p 47.

131 Submission 4, Coal-ash Community Alliance Inc., p 7; Submission 6, Name suppressed, p 1; Submission 7, Mr Stephen Crawford, p 1; Submission 57, Central Coast Community Energy Association Inc (CCCE), p 2; Submission 59, Professor Howard Dick, p 2; Submission 74, Name suppressed, p 1; Submission 76, CEN (Community Environment Network), Central Coast & Lake Macquarie, p 3; Submission 79, Nature Conservation Council of NSW, p 4; Evidence, Ms Liz Hadja, Climate and Energy Campaigner, Nature Conservation Council of NSW, 1 September 2020, p 24; Evidence, Mr Heinz-Joachim Muller, Steering Committee Member, Community Environment Network Central Coast and Lake Macquarie, 6 October 2020, p 15.

132 Evidence, Mr Justin Flood, Executive Manager Sustainability, Delta Electricity, 1 September 2020, p 3. See also Submission 39, Hunter Community Environment Centre, p 4.

133 Submission 84, Polyagg Pty Ltd, p 2.

134 Submission 15, Mr Greg Piper MP, p 3.

135 Answers to questions on notice, NSW Environment Protection Authority, 12 November 2020, pp 5-6.

3.18 The NSW EPA further stated when deciding which option to choose, the sustainability (environmental, economic and social) of each option should be considered in order to achieve an appropriate balance between the benefits and effects of implementing the option. If there is no readily available or economically feasible method available, then regulatory controls or other forms of remediation could be adopted.[136]

3.19 Mr David Fowler, Executive Director, Regulatory Practice and Environmental Solutions, NSW Environment Protection Authority, was of the view that the cap and cover remediation approach 'further reduc[ed] the likelihood of ingress of water into the dam itself, noting that the dam itself—because of the nature of coal ash—is not particularly porous and water tends to wash across the surface rather than leach through the body of the ash'.[137]

Community health impacts

3.20 As previously noted in Chapter 1, inquiry participants were divided in their views as to whether coal ash posed any risks.

3.21 Industry representatives and power station operators claimed there were technical processes that could be carried out, but are not currently, to make coal ash non-toxic and inert.[138]

3.22 For example, Vecor Australia explained that the 'best practice for preventing the leaching of toxic heavy metals from fly ash is by … encapsulating the fly ash … [through] the process of sintering' whereby the ash is heated to high temperatures in order to fuse ash particles together.[139] From this, a 'crystalline matrix' is formed locking 'any heavy metals present in the ash', and thus creating 'an inert, stable product that is highly resistant to leaching, abrasion and corrosion'.[140] However, coal ash is not currently treated this way.

3.23 Community members, environmental groups and health professionals argued that coal ash was a hazardous waste material that posed significant health and environmental risks.[141]

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136 Answers to questions on notice, NSW Environment Protection Authority, 12 November 2020, pp 5-6.

137 Evidence, Mr David Fowler, Executive Director, Regulatory Practice and Environmental Solutions, NSW Environment Protection Authority, 16 October 2020, p 45.

138 Submission 11, Vecor Australia Pty Limited, pp 5, 8-9; Submission 84, Polyagg, p 1; Evidence, Mr Justin Flood, Executive Manager Sustainability, Delta Electricity, 1 September 2020, p 13; Evidence, Mr Greg Everett, Managing Director, Delta Electricity, 1 September 2020, p 16; Evidence, Mr Mark Ramsey, Director and Chief Executive, Vecor Australia Pty Ltd, 16 October 2020, p 2; Evidence, Mr Craig Heidrich, Chief Executive Officer, Ash Development Association of Australia, 16 October 2020, p 3.

139 Submission 11, Vecor Australia Pty Limited, p 9.

140 Submission 11, Vecor Australia Pty Limited, p 9.

141 Submission 2, Name suppressed, p 1; Submission 4, Coal-ash Community Alliance Inc, pp 2 and 4; Submission 5, Beyond Zero Emissions, p 1; Submission 21, Name suppressed, p 1; Submission 24, Mr Graeme Batterbury, p 1; Submission 25, Mr Gilbert Walker, p 1; Submission 26, Dr James Whelan, p 1; Submission 27, Bruce Derkenne, p 1; Submission 36, Lake Macquarie Sustainable Neighbourhood Alliance Inc, p 6; Submission 39a, Hunter Community Environment Centre, p 4; Submission 47, Doctors for the Environment Australia, p 3; Submission 57, Central Coast Community Energy Association Inc (CCCE), p 4; Submission 72, Ms Tonia Gardiner, p 1;

3.24 A number of inquiry participants argued coal ash dams were adversely affecting the health of the surrounding communities.[142] Many claimed coal ash was 'toxic' and caused negative health outcomes.[143]

3.25 For example, inquiry participants observed:

- 'The toxins in coal ash have been linked to asthma, heart disease, cancer, respiratory diseases and stroke. Communities that live near coal-fired power stations are most at risk'.[144]
- 'Given the proximity of NSW's large ash repositories to heavily populated areas and marine ecosystems, the current permissive regulatory regimen poses an unacceptable ongoing risk to human and environmental health'.[145]
- 'A "cap-in-place" approach to rehabilitation is especially problematic for unlined ash dumps … as it leaves contaminated soil and water in place. This ensures the likelihood that contamination of waterways and land will continue well into the future and puts the local environment and community health at risk'.[146]

3.26 Others noted the incidence of ash dust clouds blowing from the dams onto nearby communities when the ash has been allowed to dry out.[147]

Submission 79, Nature Conservation Council of NSW, p 1; Submission 81, Environmental Justice Australia, p 15.

142 See Submission 2, Name suppressed, p 1; Submission 4, Coal-ash Community Alliance Inc, pp 2-3, 14; Submission 11, Vecor Australia Pty Limited, p 5; Submission 21, Name suppressed, p 1; Submission 22, Dr Peter Sainsbury, p 1; Submission 36, Lake Macquarie Sustainable Neighbourhood Alliance Inc, p 5; Supplementary submission 39a, Hunter Community Environment Centre, pp 2 and 16; Submission 44, Lithgow Environment Group Inc, pp 1 and 15; Submission 47, Doctors for the Environment Australia, pp 3-4; Submission 52, Mr Adrian Spicer, p 1; Submission 75, Wollongong City Council, p 1; Submission 79, Nature Conservation Council of NSW, p 1; Submission 81, Environmental Justice Australia, p 14; Evidence, Ms Lyn Fraser, Member, Warners Bay Area Sustainable Neighbourhood Group, 6 October 2020, p 13.

143 Submission 2, Name suppressed, p 1; Submission 10, Warners Bay Area Sustainable Neighbourhood Group, p 2; Submission 15, Mr Greg Piper MP, p 4; Submission 21, Name suppressed, p 1; Submission 24, Mr Graeme Batterbury, p 1; Submission 36, Lake Macquarie Sustainable Neighbourhood Alliance Inc., p 8; Submission 60, Dr Kevin McDonnell, p 1; Submission 79, Nature Conservation Council of NSW, p 1; Submission 81, Environmental Justice Australia, p 21; Submission 82, Climate Action Newcastle, p 1; Evidence, Dr Kathleen Wild, Member, Doctors for the Environment, 1 September 2020, p 26.

144 Submission 22, Dr Peter Sainsbury, p 1.

145 Submission 5, Beyond Zero Emissions, p 3.

146 Submission 81, Environmental Justice Australia, p 19.

147 Submission 21, Name suppressed, p 1; Submission 36, Lake Macquarie Sustainable Neighbourhood Alliance Inc., p 8; Submission 39, Hunter Community Environment Centre, p 5; Evidence, Ms Lyn Fraser, Member, Warners Bay Area Sustainable Neighbourhood Group, 6 October 2020, p 13; Evidence, Mr Stephen Dewar, Secretary, Lake Macquarie Sustainable Neighbourhood Alliance Inc., pp 14, 16-17.

3.27 Dr Kathleen Wild, Member, Doctors for the Environment indicated that it was 'unclear to what extent the communities have been surveyed in terms of … health consequences' of living in close proximity to these sites.[148]

3.28 In giving evidence, Dr Wild referred to international epidemiological studies which found detrimental health outcomes for children living near coal ash and associated power station sites:

> there are poorer health outcomes and some signifiers of poor health in, for example, children who live nearer to coal ash sites and coal-fired power station repositories than those who live further away.[149]

3.29 From her assessment as to whether any epidemiological studies had been conducted in Australia to survey community health impacts, Dr Wild said she 'could not find any evidence to that effect'. She added it was 'premature to assert that the communities are not suffering any health outcomes when those studies have not been performed'.[150]

3.30 To try and overcome these community health concerns, inquiry participants made a number of recommendations, including:

- further research be conducted into the long term impacts and health conditions within communities living near coal ash dams[151]
- baseline studies be conducted to ascertain the true levels of pollution and of the health of surrounding communities[152]
- 'That the NSW EPA make a public announcement of the risks to human health … of using groundwater identified as above [National Health and Medical Research Council] drinking water quality guidelines …'.[153]

3.31 When questioned about the perceived link between the circulation of additional metals in the air and waterways, and impacts on health outcomes for the community, specifically cancer, Mr Adam Gilligan, Director, Regulatory Operations Metropolitan North, NSW Environment Protection Authority, replied that the NSW EPA was working with NSW Health with regard to those sorts of concerns and whether those concerns were warranted.[154]

3.32 Mr Gilligan noted that the advice provided by NSW Health in response to community concerns relating to the incidence of both lung cancer and skin cancer on the Central Coast was as follows:

> …skin cancer incidence on the Central Coast could be explained on the basis that it actually increases as you move further north throughout New South Wales in terms of

148 Evidence, Dr Kathleen Wild, Member, Doctors for the Environment, 1 September 2020, p 26.

149 Evidence, Dr Kathleen Wild, Member, Doctors for the Environment, 1 September 2020, p 28.

150 Evidence, Dr Kathleen Wild, Member, Doctors for the Environment, 1 September 2020, p 28.

151 Submission 52, Mr Adrian Spicer, p 3; Submission 75, Wollongong City Council, p 1; Submission 47, Doctors for the Environment Australia, p 5.

152 Submission 22, Dr Peter Sainsbury, p 1.

153 Submission 39, Hunter Community Environment Centre, p 6; Submission 44, Lithgow Environment Group Inc., p 19.

154 Evidence, Mr Adam Gilligan, Director, Regulatory Operations Metropolitan North, NSW Environment Protection Authority, 16 October 2020, p 45.

ultraviolet exposure, and that the lung cancer incidence could be explained due to higher rates of smoking on the Central Coast, rather than being linked to a power station specifically.[155]

Environmental impacts on Lake Macquarie

3.33 Lake Macquarie is a regionally significant waterway, and is a popular tourist and recreation resource. Many inquiry participants argued coal ash was contaminating Lake Macquarie due to the leaching of heavy metals into the soil and ground water as a result of the dams being unlined. This, in turn, was impacting the aquatic life of the lake.[156]

3.34 Ms Liz Hadjia, Climate and Energy Campaigner, Nature Conservation Council of NSW, reflected that the Eraring and Vales Point power stations reside by Lake Macquarie, and that neither of the coal ash dams associated with these sites are lined to protect groundwater'.[157]

3.35 Contamination of Lake Macquarie by coal ash dam leachate was acknowledged by Mr Justin Flood, Executive Manager Sustainability, Delta Electricity, but that it was from historical practices no longer followed. He explained that up until the late 1990s at Vales Point power station 'there was a once-through system' of transporting ash to the storage dams, whereby water was drawn from the lake, put up to the ash dam and then discharged back into the lake'.[158] As a result of this once-through system, selenium contamination was found in Wyee Bay.[159]

3.36 To rectify this issue, Mr Flood advised that a re-circulating, closed loop system was implemented to 'limit the amount of selenium in the environment such that the selenium levels have stabilised since the late 1990s'.[160]

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155 Evidence, Mr Adam Gilligan, Director, Regulatory Operations Metropolitan North, NSW Environment Protection Authority, 16 October 2020, p 45.

156 Submission 10, Warners Bay Area Sustainable Neighbourhood Group, p 2; Supplementary Submission 28a, Keep Lake Macquarie Clean, p 3; Submission 39, Hunter Community Environment Centre, pp 24 and 30; Submission 36, Lake Macquarie Sustainable Neighbourhood Alliance Inc., p 8; Submission 42, Ramboll Australia, p 1; Submission 45, Bathurst Community Climate Action Network (BCCAN), p 1; Submission 58, Ms Renee McLean, p 1; Submission 76, CEN (Community Environment Network), Central Coast & Lake Macquarie, p 4; Evidence, Ms Liz Hadja, Climate and Energy Campaigner, Nature Conservation Council of NSW, 1 September 2020, p 24; Evidence, Ms Bronya Lipski, Lawyer, Environmental Justice Australia, 1 September 2020, p 28; Evidence, Mr Greg Piper MP, Member for Lake Macquarie, 6 October 2020, pp 3-4; Evidence, Mr Stephen Dewar, Secretary, Lake Macquarie Sustainable Neighbourhood Alliance Inc, 6 October 2020, p 14; Evidence, Ms Lyn Fraser, Member, Warners Bay Area Sustainable Neighbourhood Group, 6 October 2020, p 13.

157 Evidence, Ms Liz Hadja, Climate and Energy Campaigner, Nature Conservation Council of NSW, 1 September 2020, p 24.

158 Evidence, Mr Justin Flood, Executive Manager Sustainability, Delta Electricity, 1 September 2020, p 10.

159 Evidence, Mr Justin Flood, Executive Manager Sustainability, Delta Electricity, 1 September 2020, p 10.

160 Evidence, Mr Justin Flood, Executive Manager Sustainability, Delta Electricity, 1 September 2020, p 10.

3.37 When questioned if there was a link between coal ash and the quality of the lake, the water and the fish, and whether the NSW EPA had investigated this, Mr Adam Gilligan, Director, Regulatory Operations Metropolitan North, NSW Environment Protection Authority, replied:

> In terms of a link, it is difficult for us to do that when we are talking about a legacy and we are talking about a difference in terms of the way that the power station has operated historically in terms of direct discharge from ash dams to the current arrangements. We have not specifically assessed that and it would be difficult to do so.[161]

Contamination of seafood in Lake Macquarie

3.38 A related issue raised by inquiry participants was the safety and edibility of seafood in Lake Macquarie.[162]

3.39 In March 2019, it was reported in the media that 'concerning levels of the heavy metal cadmium has been found in crabs dwelling in Lake Macquarie … to such an extent it's becoming unhealthy to eat'.[163]

3.40 Mr Paul Winn, Researcher, Hunter Community Environment Centre, was of the view that the NSW EPA had not sufficiently addressed the health risks associated with ash dams, particularly for those people who eat fish caught from the waterways that have been contaminated'.[164]

3.41 In response to these concerns, Mr Adam Gilligan, Director, Regulatory Operations Metropolitan North, NSW Environment Protection Authority, confirmed that the presence of metals had been identified in seafood from the lake, including selenium in fish and cadmium in crabs.[165] However, Mr Gilligan noted that there were 'dietary limits in place with respect to crabs caught within the lake' in order to minimise exposure:

> it is recommended that consumption of crabs caught in Lake Macquarie should be limited to:
>
> - Three servings per month for a child less than six years of age (one child's serving equates to 75 grams of edible crab meat)

161 Evidence, Mr Adam Gilligan, Director, Regulatory Operations Metropolitan North, NSW Environment Protection Authority, 16 October 2020, p 44.

162 Submission 4, Coal-ash Community Alliance Inc, p 3; Submission 10, Warners Bay Area Sustainable Neighbourhood Group, p 2; Submission 14, Name suppressed, p 1; Submission 19, Mr Daniel Endicott, p 1; Supplementary submission 28a, Keep Lake Macquarie Clean, p 3; Submission 36, Lake Macquarie Sustainable Neighbourhood Alliance Inc., p 8; Submission 39, Hunter Community Environment Centre, p 26; Submission 48, Coal Point Progress Association, p 1; Submission 64, Name suppressed, p 1.

163 Tabled document, Mr David Tait, Member, Keep Lake Macquarie Clean, 6 October 2020; Submission 4, Coal-ash Community Alliance Inc, p 3; Supplementary submission 28a, Keep Lake Macquarie Clean, p 3.

164 Evidence, Mr Paul Winn, Researcher, Hunter Community Environment Centre, 1 September 2020, p 42.

165 Evidence, Mr Adam Gilligan, Director, Regulatory Operations Metropolitan North, NSW Environment Protection Authority, 16 October 2020, p 43.

- Six servings per month for all other ages (one serving for all other ages equates to 150 grams of edible crab meat).[166]

3.42 With regards to the consumption of fish and other seafood from Lake Macquarie, Mr Gilligan advised that the general advice provided by Food Standards Australia and New Zealand (FSANZ) was to be followed, which states people can 'safely consume 2-3 serves of seafood a week as part of a balanced diet. This level of consumption is protective for exposure to mercury and selenium for seafood consumed from the Lake Macquarie area'.[167]

3.43 In addition, Mr Gilligan informed that sampling in the lake first began around 2018, followed by further sampling in early 2020, with the analysis still underway. Mr Gilligan noted that if there was 'any suggestion that advice to the community about consumption needs to change', then the public would be informed.[168]

3.44 When questioned as to what steps the NSW EPA had ordered in relation to coal ash dams to minimise the risk posed to the lake and aquatic life, Mr Gilligan replied that such questions assumed there was a link which was 'not necessarily the case', stating that:

> Lake Macquarie has received a whole range of pollutant inputs over the last 100 years or so from a range of different sources. It is also important to note that some of the metals we are talking about are also present in the local geology. There has not been a cause-effect relationship certainly.[169]

Myuna Bay Sport and Recreation Centre

3.45 In March 2019 the Myuna Bay Sport and Recreation Centre was suddenly closed due to concerns about the risk of seismic activity damaging Eraring ash dam wall.[170]

3.46 Origin Energy advised that it commissioned engineering reviews into the stability of the Eraring ash dam wall which were completed in early March 2019.[171] The review found it was not safe for the Myuna Bay Sport and Recreation Centre to remain open 'due to the serious potential

166 Evidence, Mr Adam Gilligan, Director, Regulatory Operations Metropolitan North, NSW Environment Protection Authority, 16 October 2020, p 43; Answers to questions on notice, NSW Environment Protection Authority, 12 November 2020, p 5.

167 Answers to questions on notice, NSW Environment Protection Authority, 12 November 2020, p 5.

168 Evidence, Mr Adam Gilligan, Director, Regulatory Operations Metropolitan North, NSW Environment Protection Authority, 16 October 2020, p 43.

169 Evidence, Mr Adam Gilligan, Director, Regulatory Operations Metropolitan North, NSW Environment Protection Authority, 16 October 2020, p 43.

170 Submission 15, Mr Greg Piper MP, p 4; Submission 18, Jo Lane, p 1; Submission 21, Name suppressed, p 4; Submission 36, Lake Macquarie Sustainable Neighbourhood Alliance Inc., p 10; Submission 44, Lithgow Environment Group Inc., p 7; Submission 52, Mr Adrian Spicer, p 1; Submission 59, Professor Howard Dick, p 4; Submission 81, Environmental Justice Australia, p 13; Evidence, Mr Greg Piper MP, Member for Lake Macquarie, 6 October 2020, p 5.

171 Answers to questions on notice, Origin Energy, 28 September 2020, p 4.

risk to clients and staff arising from the potential failure of Eraring power station's ash dam wall in the event of major seismic activity'.[172]

3.47 Origin Energy then notified the Office of Sport of the review's findings, and subsequently provided the review to Dams Safety NSW, NSW Department of Communities and Justice, then Minister for Sport Mr John Sidoti and local state MP Mr Greg Piper, while Lake Macquarie City Council, Scouts NSW and the NSW Roads and Maritime Service received a detailed briefing on the reviews.[173]

3.48 Following this, a 'second independent expert report found the risk to life was "intolerable" and considered "unacceptable" if the coal ash dam wall collapsed in the event of seismic activity'.[174]

3.49 On 12 December 2019, the Acting Minister for Sport issued a media release confirming the Government's decision to permanently close the Myuna Bay Sport and Recreation Centre, following the completion of an independent assessment of Origin's original engineering review.[175]

3.50 Mr Greg Piper MP, Member for Lake Macquarie expressed concern about the way in which the decision had been made, given the lack of transparency, with '[t]he community, the local member, the Minister, the Government … all blindsided by that decision ...'[176]

3.51 The Lake Macquarie Sustainable Neighbourhood Alliance Inc., commented that it was 'curious that the proposed solution was to close the Sport and Recreation Centre rather than deciding to seek out and implement best practice standards in the management of the coal ash dam – leading to its removal from the site and adequately storing it away from Lake Macquarie'.[177]

3.52 When questioned about the timeline of events and their involvement in the closure of the Myuna Bay Sport and Recreation Centre, Mr Chris Salkovic, Chief Executive Officer, Dams Safety NSW replied that when they received the initial findings from Origin Energy, Dams Safety NSW advised Origin Energy to:

> get an independent review of the findings … Which they did but what actually transpired at the time was the Minister responsible for the Office of Sport initiated their own independent review. So we helped the Office of Sport engage an independent organisation to do that.[178]

3.53 Mr Salkovic stated that at no point did Dams Safety NSW advise the Office of Sport to close the centre.[179]

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172 Office of Sport, *Former Myuna Bay Sport and Recreation Centre site*, https://www.sport.nsw.gov.au/former-myuna-bay-sport-and-recreation-centre-site.

173 Answers to questions on notice, Origin Energy, 28 September 2020, p 4.

174 Office of Sport, *Former Myuna Bay Sport and Recreation Centre site*, https://www.sport.nsw.gov.au/former-myuna-bay-sport-and-recreation-centre-site.

175 Answers to questions on notice, Origin Energy, 28 September 2020, p 4.

176 Evidence, Mr Greg Piper, Member for Lake Macquarie, 6 October 2020, p 5.

177 Submission 36, Lake Macquarie Sustainable Neighbourhood Alliance Inc., p 10.

178 Evidence, Mr Chris Salkovic, Chief Executive Officer, Dams Safety NSW, 16 October 2020, p 32.

179 Evidence, Mr Chris Salkovic, Chief Executive Officer, Dams Safety NSW, 16 October 2020, p 32; Answers to questions on notice, Dams Safety NSW, 12 November 2020, p

Finding 1

That the decision to close Myuna Bay Sport and Recreation Centre was made with no transparency and that communication with stakeholders and the local community was inadequate.

Risks at specific sites: Wollongong and the Blue Mountains

3.54 During the inquiry, participants spoke of actual and potential risks for both operational and non-operational power station sites located near Wollongong and the Blue Mountains.

Wollongong

3.55 The Tallawarra coal fired power station near Wollongong, which ceased operation in 1989, contains three coal ash ponds, 'two of which are capped and have been revegetated, the third filled with water'.[180]

3.56 Wollongong City Council noted that the three ash ponds are 'in proximity to several surface and ground water sources, of particular importance Lake Illawarra, Duck Creek and two main aquifer systems, and is also nearby public access areas, residential areas and grazing land'.[181]

3.57 Given this, Wollongong City Council were concerned by the 'neglect of [the] legacy sites which may be continuing to disperse contaminants into the surrounding environment, potentially impacting on environmental and human health of the area and the ability for sites to be repurposed for other land uses'.[182]

3.58 However, in its submission Delta Electricity referred to the 2019 Australian Senate report on *Rehabilitation of mining and resources projects and power station ash dams as it relates to Commonwealth responsibilities*, which 'outlined that the only example in the Australian context of a rehabilitated ash dam is Tallawarra power station … [which] is subject to ongoing monitoring, with no environmental issues of note arising since decommissioning'.[183]

Blue Mountains

3.59 Inquiry participants referred to two coal fired power stations past the Blue Mountains – Wallerawang power station and Mount Piper power stations near Lithgow – which had specific risks.

180 Submission 75, Wollongong City Council, p 2.

181 Submission 75, Wollongong City Council, p 2.

182 Submission 75, Wollongong City Council, p 1.

183 Submission 13, Delta Electricity, p 8.

3.60 Wallerawang power station ceased operation in 2014, with the site including Kerosene Vale Ash Repository, which 'fills the entire valley of Sawyers Swamp Creek. It is on top of old mine voids and coal chitter from the old Lisdale open cut coal mine'.[184]

3.61 According to Ms Liz Hadja, Climate and Energy Campaigner, Nature Conservation Council of NSW, the coal ash repository at Wallerawang 'to this date remains un-rehabilitated'.[185]

3.62 Lithgow Environment Group Inc., claimed that '[h]eavy metals, salts, and other contaminants have been leaching into these hydraulically connected underground mine workings for many decades'.[186] In turn, 'anomalies' in salinity levels were being 'recorded five, six or seven kilometres away from the power stations'.[187]

3.63 Further, Lithgow Environment Group Inc., emphasised how important dam safety was, given there was the potential for the 'village of Lidsdale with some 100 houses located 1.4km downstream of Kerosene Vale Ash Dam …[being] buried under 60 million tonnes of toxic coal ash sludge' if the dam failed.[188]

3.64 In terms of the Mount Piper power station, which is still operational, increased salinity levels near the ash repository had been observed. According to Mr Chris Jonkers, Vice President, Lithgow Environment Group Inc., the 'salinity levels have increased eightfold from around 1,000 in 2006 to 8,000 now. If it increases another eightfold over the next 14 years the water here is going to be saltier than the seawater off Bondi Beach'.[189]

Committee comment

3.65 Throughout this inquiry, the committee heard that one of the greatest concerns of inquiry participants is community and environmental health impacts resulting from inadequate remediation of coal ash dams.

3.66 The committee agrees with inquiry participants that little research, if any, has been conducted on the impacts and long term consequences in relation to the health of communities residing near coal ash dams. We are disappointed with the response by the NSW EPA and NSW Health to community concerns about a potential link between the circulation of additional metals in the air and waterways, and impacts on health outcomes for the community. This response, in conjunction with the lack of research conducted to date on this matter, demonstrates a complete disregard by the government towards the health of its citizens.

184 Submission 44, Lithgow Environment Group Inc, pp 2 and 5.

185 Evidence, Ms Liz Hadja, Climate and Energy Campaigner, Nature Conservation Council of NSW, 1 September 2020, p 24.

186 Submission 44, Lithgow Environment Group Inc, p 6.

187 Evidence, Mr Chris Jonkers, Vice President, Lithgow Environment Group Inc., 1 September 2020, p 43.

188 Submission 44, Lithgow Environment Group Inc., p 7.

189 Evidence, Mr Chris Jonkers, Vice President, Lithgow Environment Group Inc., 1 September 2020, p 43.

3.67 Given this, the committee recommends that NSW Health immediately undertake an epidemiological assessment of the health of residents near coal ash dams to establish the health impacts of coal ash and publish by 31 December 2022.

Recommendation 6

That NSW Health immediately undertake an epidemiological assessment of the health of residents near coal ash dams to establish the health impacts of coal ash and publish by 31 December 2022.

3.68 The Committee acknowledges community concerns that the cap and cover method of storing coal ash in unlined dams is resulting in heavy metals and other pollutants escaping from coal ash dams. The committee is concerned by evidence received about the environmental impacts of coal ash dams, in particular, the contamination of Lake Macquarie and its aquatic life.

3.69 We note that the contamination of Lake Macquarie has occurred over many years, and that the 'cap and cover' method will not protect Lake Macquarie from the risk of further contamination.

3.70 The committee is cognisant of the cost implications of excavating coal ash from unlined dams and replacing them with lined dams. It is impractical to simply excavate coal ash and then redump it into a new dam with higher environmental controls when, as explored in chapter 4, there are other more beneficial uses of the coal ash.

3.71 While the committee has found evidence about the level of contamination in Lake Macquarie to be persuasive, we are frustrated by the responses of the NSW EPA to health and environmental concerns voiced by the community. As a result, we are of the view that an independent assessment of the environmental impacts of coal ash pollution is required.

3.72 The committee therefore recommends that the NSW EPA commission a comprehensive and independent assessment of the environmental impacts of coal ash dams to provide a better understanding of the issues and to inform best practice remediation.

Recommendation 7

That the NSW Environment Protection Authority commission a comprehensive and independent assessment of the environmental impacts of coal ash dams to provide a better understanding of the issues and to inform best practice remediation.

3.73 In regards to actual and potential risks for both operational and non-operational power station sites located near Lake Macquarie, Wollongong and the Blue Mountains, the committee is very concerned by the risks posed in Lake Macquarie, namely the risks posed by the Eraring ash dam which led to the closure of the Myuna Bay Sport and Recreation Centre. The committee is dissatisfied by the lack of authority exercised by Dams Safety NSW as the regulatory body responsible for dam structural integrity as well as the proper and efficient management in matters relating to dam safety. As a result, the committee is of the view that this situation could have been handled better by Origin Energy, Dams Safety NSW and the Office of Sport.

Finding 2

That the decision making process to close Myuna Bay Sport and Recreation Centre was made with inadequate community consultation by Origin Energy, Dams Safety NSW and the Office of Sport.

Chapter 4 Coal ash management: reuse and recycling

While coal ash dams can pose environmental risks, and therefore significant liabilities for remediation, there are also potential opportunities associated with coal ash reuse and recycling. This chapter notes economic and employment opportunities that may be created by developing industries to put recycled coal ash to constructive uses. It also considers the possible economic and employment benefits associated with site remediation at the current power station and ash dam locations as the power stations close. It considers what may be needed to make use of these opportunities, in terms of government leadership and regulation, as well as some of the issues that may need addressing.

Potential uses and opportunities for coal ash

4.1 As noted in Chapter 3, there are environmental and economic liabilities associated with coal ash dams. Yet many stakeholders to this inquiry – community, environmental and industry groups alike – expressed the view that coal ash is potentially a valuable resource. Coal ash can be recycled into a range of building materials, creating economic and employment opportunities in regional areas, while also transforming an environmental hazard into useful products. Australia has 'huge stockpiles' of coal ash, of which some proportion would be suitable for recycling.[190] Recycled coal ash has a number of potential uses, predominantly in products for construction. In some overseas jurisdictions, up to 97 per cent of coal ash is recycled.[191] In Australia, particularly in New South Wales, rates of reuse are much lower.

Support for recycling and reuse of coal ash

4.2 The majority of stakeholders to the inquiry argued that Australia, and New South Wales in particular, could be doing more to encourage reuse of coal ash. Stakeholders pointed to both economic and environmental benefits of coal ash recycling, and called for increased targets and rates of recycling.[192]

4.3 Representatives of industry organisations or companies involved in the ash recycling industry highlighted economic opportunities in the recycling of ash, with flow-on environmental benefits such as addressing contamination of land and water near ash dams, and reducing use of newly extracted materials in the construction industry.[193]

4.4 Environmental and community groups also called for greater reuse of coal ash, with the desire both to limit environmental issues associated with the ash dams, and also to take up opportunities to create a circular economy and limit use of newly extracted materials in the construction industry. It was observed that:

190 Submission 5, Beyond Zero Emissions, p 2.

191 Submission 43, Australian Energy Council, p 1; Submission 57, Central Coast Community Energy Association, p 2.

192 See Evidence, Dr Heinz-Joachim Muller, Steering Committee Member, Community Environment Network Central Coast and Lake Macquarie, 6 October 2020, p 12.

193 Submission 23, Ash Development Association of Australia, p 3; Submission 11, Vecor Australia, p 24.

- 'There is potential for Australia to use stockpiled coal ash to manufacture zero and low carbon cements. Using coal ash in this way can grow a new industry in coal regions, allow for the ongoing management and remediation of coal-ash repositories, and position Australia as a leader in decarbonising our built environment.'[194]
- 'A rapid increase in coal ash utilisation is necessary to reduce the massive volumes of coal ash generated and stockpiled.'[195]
- '…the potential for increased reuse of coal ash in cement and other products should be investigated as an opportunity for resource reclamation and to reduce the amount of coal ash in storage.'[196]

4.5 Power companies and industry bodies themselves noted the potential of greater recycling and reuse of coal ash, suggesting that the current regulatory framework and market conditions limit reuse. For example, the Australian Energy Council noted:

> 'Coal ash is a material with immense beneficial re-use capabilities that can reduce Australia's greenhouse gas emissions, yet is currently under-utilised. Encouraging the increased uptake of coal ash re-use should form a key pillar of any remediation strategy.'[197]

4.6 Likewise, Origin Energy argued that a greater uptake of coal ash use will create employment opportunities:

> 'Increasing coal ash utilisation…through a review of the relevant regulations…should facilitate significant economic and employment opportunities including in relation to construction, processing and transport of coal ash products.'[198]

Current rates of reuse of coal ash

4.7 The committee received different estimates of the quantity of coal ash currently produced, stored and reused in New South Wales at present. This section reviews these estimates, and then explores the variety of ways that coal ash can be reused.

Reuse rates of coal ash

4.8 The Ash Development Association of Australia gave the following breakdown of rates and types of reuse across Australasia. According to these estimates, 47 per cent of ash generated across Australasia was reused, including in cement, and as non-cement construction material. The Association stated that in 2018:

- Approximately 12.6 Mt (million tonnes) of coal combustion products were produced within Australasia

194 Submission 5, Beyond Zero Emissions, p 1.
195 Submission 39, Hunter Community Environment Centre, p 29.
196 Submission 36, Lake Macquarie Sustainable Neighbourhood Alliance, p 13.
197 Submission 43, Australian Energy Council, p 1.
198 Submission 78, Origin Energy, p 2.

- Some 5.936 Mt or 47 per cent of CCPs produced have been effectively utilised in various value-added products or to some beneficial end over the period.
- Approximately 1.983 Mt or 33 per cent of fine grade fly ash was used beneficially in high value-added applications such as cementitious binders, concrete manufacture or mineral fillers.
- About 0.42 Mt or 7 per cent of CCPs were used in non-cementitious applications such as flowable fills, structural fills, road bases, coarse/fine aggregates.
- Some 3.56 Mt were used in projects offering some beneficial use (e.g. on-site remediation, local haul roads etc.). These uses typically generate no economic return, that is, cost avoidance or recovery only.
- Some 6.65 Mt were placed into onsite storage ponds awaiting future use opportunities where the material would be harvested for economic use.
- More than 52 Mt of CCPs (mainly fly ash) have been used in cementitious applications or concrete manufacture from 1975 to 2018 i.e 43 years.[199]

4.9 A number of submissions to the inquiry estimated the rates of coal ash produced and recycled by the five operating coal fired power stations in New South Wales. For instance, Polyagg estimated that around 5.5 million tonnes of coal ash is produced in New South Wales, and that 3 million tonnes of this is put into storage each year.[200]

4.10 The Hunter Community Environment Centre estimated:

> … the five operating NSW coal-fired power stations collectively generate 4.8 million tonnes (Mt) of coal ash waste a year, and dump about 3.8 Mt a year into on-site ash dams, placement areas, or mine voids, which have collectively accumulated about 160 Mt of coal ash. ...
> - Bayswater generated the highest volume of ash annually with about 1.5Mt, of which only 0.23Mt is reused.
> - Eraring generates about 1.2Mt, of which about 0.42Mt is reused.
> - Liddell generates about 0.8Mt of ash with no reuse.
> - Vales Point generates about 0.7Mt of ash waste a year, 0.18Mt is reused.
> - Mt Piper generates 0.6Mt of ash with 0.17Mt reused.
> - In total, about 3.8Mt of coal ash waste is dumped in NSW every year.[201]

4.11 According to these estimates, the average rate of recycling across the five coal fired power stations in New South Wales is just over 20 per cent. Eraring's recycling rate of 35 per cent, well below the 80 per cent recycling target,[202] is the highest of the five operating power stations.

199 Submission 23, Ash Development Association of Australia, pp 3-4.

200 Submission 84, Polyagg, p 2.

201 Submission 39a, Hunter Community Environment Centre, p 2.

202 Submission 15, Mr Greg Piper MP, p 3.

Liddell is not currently recycling any ash.[203] The remaining three power stations, Bayswater, Vales Point and Mt Piper recycle around 15, 25 and 28 per cent of their ash respectively.[204]

4.12 In addition to the quantities of ash being generated each year, there are significant stockpiles of ash stored in ash dams. The Ash Development Association of Australia estimated that there are 650 million tonnes of coal ash currently stored in ash dams in Australia that could potentially be reused.[205] The Hunter Community Environment Centre estimated the current ash 'stockpile' dumped in ash dams in New South Wales is now about 216 million tonnes.[206]

4.13 A theme throughout the inquiry was the lack of transparency around the industry. The Coal Ash Community Alliance claimed: 'With the lack of transparency in and around the industry, it has been near impossible for the community to understand the complexity of the reuse of coal ash.'[207]

4.14 The Blue Mountains Unions Council called on the NSW Government to conduct and publish an audit of the extent of coal ash reuse from the state's five coal-fired power stations during the last 10 years, identifying where and how much coal ash was generated and the quantity, destination and purpose of coal ash transferred for reuse.[208]

4.15 Despite the lack of transparency, most stakeholders agreed that Australia's rate of fly ash reuse is low, certainly lower than other jurisdictions around the world. The Australian Energy Council noted:

> …Australia's fly ash re-use rate hovers around 44 percent, making it among the lowest in the world and far behind other countries like Japan (97 percent), the UK (70 percent) and China (69 percent).[209]

4.16 The Central Coast Community Energy Association noted that The Netherlands reuses 100 per cent of its coal ash, because land fill is not allowed, and in Germany around 97 per cent is reused,[210] with an average of about 53 per cent globally.[211]

4.17 Power station operators expressed the view that it would be preferable to recycle a greater proportion of the ash generated. Delta Electricity said that it encourages reuse of coal ash, and would prefer to see higher reuse rates than the 20 per cent currently re-purposed from Vales

203 Submission 39a, Hunter Community Environment Centre, p 19. In January 2019, AGL Macquarie announced that coal ash from Liddell and Bayswater power stations was suspended from sale after discovery the heavy metal content of the ash exceeded levels set by the EPA's Coal Ash Order. Submission 81, Environment Justice Australia, Attachment 1, p 39.

204 Submission 39a, Hunter Community Environment Centre, p 19.

205 Submission 23, Ash Development Association of Australia, p 2.

206 Submission 39a, Hunter Community Environment Centre, p 2.

207 Submission 4, Coal Ash Community Alliance, p 6.

208 Submission 16, Blue Mountains Unions Council, p 2.

209 Submission 43, Australian Energy Council, p 1.

210 Submission 57, Central Coast Community Energy Association, p 2.

211 Evidence, Mr Paul Winn, Researcher, Hunter Community Environment Centre, 1 September 2020, p 41.

Point.[212] Origin Electricity stated that reuse of ash from the Eraring Power Station had increased from 30 per cent in 2018 to 35 per cent in 2019, but noted the potential to better utilise coal ash in various applications.[213]

Economic and employment opportunities in reusing coal ash

4.18 This section considers the potential economic and employment opportunities associated with recycling or reuse of coal ash. Submissions also noted economic and employment uses associated with site remediation and repurposing of the coal ash dams themselves, which are considered later in this chapter.

Current uses in construction

4.19 Submissions to this inquiry identified a range of uses to which recycled coal ash can be put, including:

- Road construction, including pavements
- Engineering fill
- Aggregate
- Concrete manufacture
- Bricks, blocks and tiles
- Mine Backfill
- Soil amendment and stabilisation
- Waste encapsulation
- Adsorbents
- Rare earth metal recovery
- Carbon products and composites / glass.[214]

4.20 In its submission, Origin Energy identified that its customers are using coal ash for end uses including concrete, structural fills, pavements, aggregates and other pre-cast building materials.[215] The main uses are explained below.

Cement

4.21 The primary reuse of coal ash currently in Australia is as a cement in the production of concrete. Fly ash can be used to replace a portion of the Portland cement typically used in concrete

212 Submission 13, Delta Electricity, p 1.

213 Submission 78, Origin, pp 1-2.

214 Submission 23, Ash Development Association of Australia, p 4; Submission 83, NSW Government, p 3.

215 Submission 78, Origin, p 1.

production. For instance, Vecor noted that concrete made with up to 20 to 30 per cent fly ash creates a more durable product compared with concrete made with Portland cement alone.[216]

4.22 The use of fly ash rather than Portland cement may have certain environmental benefits in lessening adverse impacts and emissions from cement production, as well as limiting the environmental hazard caused by stored coal ash.[217]

4.23 Beyond Zero Emissions identified a number of benefits of using coal ash in the manufacture of cement, particularly reducing greenhouse gas emissions associated with cement manufacture:

> Most cement emissions are related to manufacturing clinker, which is the main ingredient in cement. The benefit of coal fly-ash is that it can replace clinker in ordinary cement. That already happens to quite a large extent in Australia but it is not being used to its full potential. The other use of coal fly-ash is to create geopolymer cement, which is a completely different type of cement if you are using concrete. Australia is one of the world leaders in the development and the deployment of geopolymer cement. In the short to medium term at least, fly-ash is probably the most important material for decarbonising cement, a product whose manufacture causes 8 per cent of world emissions.[218]

Lightweight aggregate and sand

4.24 In addition to being used in the cement portion of concrete, coal ash can be treated to be usable as a lightweight aggregate or sand. Lightweight aggregate is made by processing fly ash with water to produce rounded pellets, which are heated to a temperature of 1,100 degrees Celsius.[219] This process produces a range of particle sizes, which can be graded for different purposes.[220]

4.25 Several inquiry participants highlighted a range of possible uses for lightweight aggregate made from coal ash, such as in structural lightweight concrete, precast concrete products, fill, screed and draining applications.[221] It was also submitted that lightweight aggregates made from coal ash can be used in large infrastructure projects such as bridges, stadiums and high-rise buildings.[222]

4.26 The Ash Development Association of Australia noted considerable opportunities, both currently and in the future, for the use of treated coal ash as aggregate in infrastructure development. The Association noted that urban and regional infrastructure development in Australia is expected to use more than 160 million tonnes of aggregate annually.[223]

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216 Submission 11, Vecor Australia, p 7.

217 Submission 81, Environmental Justice Australia, p 21.

218 Evidence, Mr Michael Lord, Lead Researcher, Beyond Zero Emissions, 16 October 2020, p 3.

219 Submission 39, Hunter Community Environment Centre, pp 29-30.

220 Submission 39, Hunter Community Environment Centre, pp 29-30.

221 See Submission 11, Vecor Australia; Submission 39, Hunter Community Environment Centre; Submission 79, Nature Conservation Council of Australia; Submission 23, Ash Development Association of Australia; Submission 84, Polyagg Pty Ltd.

222 Submission 11, Vecor Australia, p 13.

223 Submission 23, Ash Development Association of Australia, p 4.

4.27 The Nature Conservation Council of NSW spoke of the environmental benefits to the conversion of coal ash into lightweight aggregate for the building industry, as once coal ash is heat treated and incorporated into solid substrate, the potential for leaching of toxic chemicals into the water or re-emission of particles into the air is reduced.[224] Similarly, the Hunter Community Environment Centre noted that through the heating process, heavy metals are encapsulated so they cannot leak out.[225]

Bricks and tiles

4.28 Coal ash can also be manufactured into bricks.[226] Environmental Justice Australia noted that bricks, along with concrete, are one of the primary ways coal ash is encapsulated for reuse in Australia.

4.29 The committee heard that newer technologies can create higher value products, such as ceramics, tiles and glassware. Vecor Australia said it had developed innovative technologies that can create high quality products, such as porcelain tiles, that use up to 70 per cent fly ash.[227]

Roads

4.30 Coal ash can be used in road construction as a cementitious material as well as road base.[228] Power station operators identified use in road construction as the most economical and had the greatest potential to recycle coal ash in the short to medium term.[229] While there may be limits to the amount of ash that can be used, depending on the type of road, Origin Energy argued that there is potential to use more ash in road construction than is currently the case.[230]

4.31 Issues relating to use of coal ash in roads are considered later in this chapter.

Creating new industries in coal regions

4.32 Using both new and stockpiled coal ash as a low-carbon cement can grow new industry in coal regions, which is particularly important as the sector transitions from reliance on coal fired power generation.[231] The practicalities of recycling coal ash indicate that the most economically and environmentally feasible location of recycling facilities is close to existing ash repositories. Hence, the new industries would be created in the same areas affected by future power station closures.[232]

224 Submission 79, Nature Conservation Council of NSW, p 2.

225 Submission 39, Hunter Community Environment Centre, pp 29-30.

226 See Submission 43, Australia Energy Council; Submission 52, Mr Adrian Spicer; Submission 78, Origin; Submission 79, Nature Conservation Council; Submission 81, Environment Justice Australia.

227 Submission 11, Vecor Australia, p 8.

228 Submission 9, Lake Macquarie Council, p 1.

229 Evidence, Mr Greg Jarvis, Executive General Manager, Energy Supply and Operations, Origin Energy Limited, 1 September 2020 p 9.

230 Evidence, Mr Glenn Orgias, General Manager Commercial Transactions, Origin Energy Limited, 1 September 2020, p 9.

231 Submission 5, Beyond Zero Emissions, p 1.

232 Evidence, Mr Mark Ramsey, Director and Chief Executive, Vecor Australia Pty Ltd, 16 October 2020, p 4.

4.33 According to Vecor Australia, fly ash processing could generate new industries that both provide employment and have the effect of limiting the environmental harm caused by storing coal ash, by treating it in ways that prevent potentially toxic chemicals leaching out. Mr Mark Ramsey, Director, Vecor Australia, noted that '[e]ach of these industries has the potential to create hundreds of permanent manufacturing, distribution and sales jobs.'[233]

Issues and limits in reusing coal ash

4.34 Having noted the potential uses and economic opportunities associated with recycling coal ash, it should be acknowledged that there are environmental and safety concerns, as well as economic considerations, that currently affect the viability of coal ash recycling. These are canvassed below.

Asbestos legacy and other waste material

4.35 Of concern was the dumping of asbestos in several ash dam sites, meaning there are certain locations where the stored ash cannot be disturbed or reused. For instance, at Vales Point there are six legacy asbestos dumps identified where that coal ash cannot be disturbed.[234] Eraring ash dam has buried asbestos,[235] and Mr Chris Jonkers, Vice President, Lithgow Environment Group, noted that once Wallerawang station is decommissioned there are plans to bury its asbestos in the ash dam.[236]

4.36 A report published by Environmental Justice Australia in 2019 noted that some of the ash dumps in New South Wales are licenced to receive waste products other than coal ash, including fabric filter bags, chemical cleaning residues, detergents and oil sheens, soil contaminated with oil and chemicals.[237] The report suggested there is insufficient publicly available information about what waste materials may be present in the ash dams.[238] Presence of other pollutants may affect the feasibility of future recycling of the ash.[239]

Toxicity and heavy metal content

4.37 Environmental Justice Australia pointed out that the toxicity of some coal ash may limit its safe reuse, particularly where there is a high metal content. It noted that there is little publicly available information about the toxicity of coal ash currently stored in NSW ash dams, and a strict and transparent regulatory regime would be required to enable widespread reuse.[240]

4.38 Reuse industry representatives suggested that the issues of toxicity are serious, but can be managed with proper standards and processes. Ms Fiona Robinson, Regional Director, Australia

233 Evidence, Mr Mark Ramsey, Director and Chief Executive, Vecor Australia Pty Ltd, 16 October 2020, p 2.

234 Evidence, Mr Justin Flood, Executive Manager, Delta Electricity, 1 September 2020, p 9.

235 Evidence, Mr Gary Blaschke, Member, Coal Ash Community Alliance, 1 September 2020, p 41.

236 Evidence, Mr Chris Jonkers, Vice President, Lithgow Environment Group, 1 September 2020, p 44.

237 Submission 81, Environment Justice Australia, Attachment 2, p 30.

238 Submission 81, Environment Justice Australia, Attachment 2, p 30.

239 Submission 81, Environment Justice Australia, Attachment 2, p 39.

240 Submission 81, Environmental Justice Australia, p 21.

and New Zealand, Ramboll Australia, suggested that the most serious issues are in excavating material from the ash dams themselves, but that risks in processing can be managed:

> I think that the issues around the processing, once it is out of the impoundment can be managed, so things like dust, water management and health-related management during the processing of the material once it is excavated from the impoundment. It is probably quite manageable under fairly standard…industry health and safety and environmental management programs.[241]

4.39 Mr Michael Lord, Lead Researcher, Beyond Zero Emissions, argued that the issue of safe management of potentially toxic materials needs to be taken seriously, but that these risks can be managed:

> …these ashes contain, to different extents, different types of heavy metals and things which are toxic. I believe in some instances they are also radioactive. So I just think there need to be safe processes established around it and proper standards for what types of fly-ash we want to process and bring into the built environment.[242]

4.40 Similarly, Mr Paul Winn, Researcher, Hunter Community Environment Centre also noted that treatment at high temperatures encases any metals in a way that they will not be released, making the coal ash safe to use as sand in construction:

> The major constituent of coal ash is silica. Silica melts at about 1,000 degrees. If you can melt silica at 1,000 degrees the metals within that ash are contained and if it gets wet they will not be released.[243]

Feasibility of recycling stockpiled ash

4.41 Power station operators explained that it is more difficult to reuse coal ash once it has been stored in an ash dam, and that the best time to use the ash is when it is produced. Mr Justin Flood, Executive Manager Sustainability, Delta Electricity, told the committee that coal ash is mixed with salt water before being stored, making it less useable, whereas dry ash can be re-used immediately:

> When it is dry it can go into those concrete tankers and it is easy to transport and to re-use immediately. We mix it with saltwater, so straight away you are adding salt and water to the mix and it makes it less usable. So, it is better to use as it is produced rather than store it in the ash dam and dig it up later, although we are investigating ways to re-use it later and mine an ash dam.[244]

4.42 The Ash Development Association of Australia suggested that there are technical issues in safe ash harvesting, but that it is achievable with appropriate standards. The Association noted that there is a lack of current standards in Australia, but said relevant standards for harvesting ash

241 Evidence, Ms Fiona Robinson, Regional Director, Australia and New Zealand, Ramboll Australia, 16 October 2020, p 5.

242 Evidence, Mr Michael Lord, Lead Researcher, Beyond Zero Emissions, 16 October 2020, p 5.

243 Evidence, Mr Paul Winn, Researcher, Hunter Community Environment Centre, 1 September 2020, p 54.

244 Evidence, Mr Justin Flood, Executive Manager Sustainability, Delta Electricity 1 September 2020, p 9.

from ash dams exist overseas.[245] The Association also pointed out that harvesting of stored ash is not only feasible, but is already happening overseas, and in New South Wales, at Eraring. It noted that '[c]ompanies like Boral routinely harvest better quality ash out of dams than they can on a day to day basis direct from the station…'[246]

4.43 Several inquiry participants suggested that the feasibility issues around harvesting of stored ash may be more about economic than technical viability. Ms Robinson noted that while it is more technically difficult to use the coal ash currently in impoundments, it would become more viable to do so as the supply of fresh ash runs out:

> Without the development of additional markets or international consumers, the coal ash that is currently in impoundments is less viable for re-use in cement production because it is technically difficult and would require safe excavation and deep watering and blending to provide a product to the concrete market. As has been pointed out, as supply of current coal ash risings decreases, the coal impoundments will be considered a viable resource in the future.[247]

4.44 Beyond Zero Emissions noted that, while only fresh fly ash is being used today in Australia, there will be future economic and employment opportunities associated with extracting and treating stockpiled ash and using it to manufacture cement products. This is already happening in other parts of the world.[248]

4.45 Beyond Zero Emissions suggested that while fresh coal-ash would be primarily used until power stations start to close in 2025 after that it would be possible to use stockpiled fly-ash:

> Our strategy assumes that in the short-term (up until 2025) fresh fly-ash will be used to manufacture low-carbon cements. In the longer term, following the closure of coal-fired power stations in Australia, we assume that the cement industry will move to use stockpiled fly-ash.[249]

4.46 Whether or how ash can be reused also depends on the grade or type of ash. Vecor Australia observed that there are natural limits on the volume of fly ash that can be reused in making cement, as only certain grades of ash, representing a portion of the total produced, can be used in cement. Hence Vecor recommended that other applications for fly ash be more actively pursued by government:

> The volume of fly ash which can be reused as a supplementary cementitious material (SCM) is clearly limited: even with use of fly ash as an SCM being widely adopted, national reuse rates have stagnated below 50%. Therefore, the State should pursue re-use opportunities that are non-cementitious applications for fly ash.[250]

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245 Evidence, Mr Craig Heidrich, Chief Executive Officer, Ash Development Association of Australia, 16 October 2020, p 5.

246 Evidence, Mr Craig Heidrich, Chief Executive Officer, Ash Development Association of Australia, 16 October 2020, p 5.

247 Evidence, Ms Fiona Robinson, Regional Director, Australia and New Zealand, Ramboll Australia, 16 October 2020, p 4.

248 Evidence, Mr Craig Heidrich, Chief Executive Officer, Ash Development Association of Australia, 16 October 2020, p 5.

249 Submission 5, Beyond Zero Emission, p 2.

250 Submission 11, Vecor Australia, p 7.

4.47 Ms Robinson suggested that it is possible to find new ways to reuse lower standard fly ash that has been stored, but this requires both research into new processes or products. She noted that in other parts of the world, particularly the United States, ways to reuse lower grade coal ash are being found.[251]

4.48 The approach to management of ash dam storage and rehabilitation affects the viability of reusing coal ash. Mr Greg Jarvis, Executive General Manager, Energy Supply and Operations, Origin Energy, stated that Origin is hopeful of recycling stored ash in its dam, should it become feasible and economically viable, but this depends on whether it is capped as part of remediation:

> Look, we have put money aside in our accounts for rehabilitation of the dam. We are still working through exactly what that means and we are hopeful we can still recycle a lot of this ash in the dam, but there is a lot more study to go. We are still capping but you have to be careful about how much you cap because then it stops you recycling that ash later if it becomes economic.[252]

Economic considerations: incentives and the market for coal ash products

4.49 During the inquiry, concerns were raised about the current low rates of recycling of coal ash being driven by simple economic considerations: weak regulation and environmental standards mean power station operators have not had to adequately factor in the environmental cost of storing ash in dams. This makes dumping in dams a cheap way to dispose of the ash, and provides no incentive to find alternatives such as reuse.[253] The economic considerations of coal ash dams is explored in this section.

Is a coal ash levy required?

4.50 Some inquiry participants called for a levy, for example, $20 per tonne, to be placed on ash dumped in dams, which would provide a greater incentive to find alternative uses for the ash, as well as provide a funding stream that could be used to fund future site remediation.[254]

4.51 Mr Michael Lord, Lead Researcher, Beyond Zero Emissions suggested that a levy on dumping coal ash into dams had been influential in stimulating the market for coal ash in Europe. Asked whether he thought New South Wales should charge a fee per tonne for the amount of ash put into ash dams he agreed:

> I think so and I think that is what has driven the market in Europe. There are various incentives through EU regulation which drove the coal ash market in Europe so that there was more demand than supply.[255]

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251 Evidence, Ms Fiona Robinson, Regional Director, Australian and New Zealand, Ramboll Australia, 16 October 2020, p 4.

252 Evidence, Mr Greg Jarvis, Executive General Manager, Energy Supply and Operations, 1 September 2020, p 7.

253 See Submission 59, Professor Howard Dick, p 5.

254 See Submission 45, Bathurst Community Climate Action Network; Submission 53, Mr Peter O'Shannessy; Submission 59, Professor Howard Dick; Submission 69, Name suppressed; Submission 79, Nature Conservation of NSW; Submission 81, Environmental Justice Australia.

255 Evidence, Mr Michael Lord, Lead Researcher, Beyond Zero Emissions, 16 October 2020, p 10.

4.52 Not all inquiry participants saw a levy on dumping as the best way to incentivise coal ash reuse. Power station operators rejected the idea that a $20 per tonne type levy on dumping coal ash would create greater incentive for reuse. Mr Justin Flood, Executive Manager Sustainability, Delta Electricity said that a levy would not make the ash more attractive to end users, because they would not see a cost benefit to them.[256]

4.53 Vecor Australia pointed to the role that stronger environmental regulation could play in creating commercial solutions for recycling ash waste. Currently, the relative cost-effectiveness of dumping ash onsite limits the commercial viability of recycling. This is in contrast with jurisdictions such as the United States and Japan, where more stringent environmental regulations drive power companies to focus more on recycling rather than dumping coal ash.[257]

Developing new markets

4.54 There was some discussion about the potential for new industries to be fostered around coal ash recycling − if these different stakeholder interests could be aligned.[258] Concerns about whether there is absorptive capacity in the market for more coal products, barriers to entry for new players, the structure of the cement industry in Australia inhibiting greater take-up of coal ash products, and of logistical issues and cost barriers are all explored in this section.

Market absorptive capacity

4.55 Power station operators highlighted limits to how much coal ash product the market can absorb, particularly without more incentives. For instance, Mr Flood stated:

> At the moment we are the producer of ash and we cannot force the market take it. We have identified potential uses as an aggregate, as a bound application in concrete cement. It is well established and so that market is fairly saturated so we have tried to expand it in road and civil applications. Having an incentive, I suppose, for the road and civil markets to take ash in preference to quarried material would be of benefit.[259]

4.56 Other stakeholders disagreed with this assessment of demand-side barriers. For example, Mr Paul Winn, Researcher, Hunter Community Environment Centre suggested the demand for non-cement uses is there, but restricted by barriers to accessing the ash:

> I think the market demand is there; there is a massive demand for aggregates, particularly lightweight aggregates. These are better than what you get from a quarry because it is light, so you get cheaper transport issues, high-rise construction they are much more favourable, and also the building industry has got big difficulties finding deposits of sand…there is only so much sand close to major metropolitan areas, so ash

256 Evidence, Mr Justin Flood, Executive Manager Sustainability, Delta Electricity, 1 September 2020, p 9.

257 Submission 11, Vecor Australia, p 6.

258 See Evidence, Mr Mark Ramsey, Director and Chief Executive, Vecor Australia, 16 October 2020, p 8.

259 Evidence, Mr Justin Flood, Executive Manager Sustainability, Delta Electricity, 1 September 2020, p 8.

> can be made for sand for building materials. So I do not think there is a limit to the market…[260]

4.57 Mr Winn went on to suggest that government assistance is required to help link entrepreneurs who can manufacture coal ash products with their potential market.[261]

4.58 As a company with an interest in the coal ash recycling industry, Polyagg raised concerns about the 'lack of an established lightweight aggregate market' in Australia, noting that there are well-established lightweight aggregate markets overseas. Polyagg suggested that market development is required to create an environment conducive to processing and use of coal ash for lightweight aggregate.[262]

Barriers to market entry – capital investment

4.59 Vecor Australia highlighted the cost of capital investment in new plants as a barrier to entry for companies that could otherwise recycle coal ash into usable products. It suggested that unless there is support for the set-up costs, the cost to establish a fly ash manufacturing plant would need to be recouped in the sale process of products, making them less competitive in the market:

> Economic models suggest that the initial one-off fixed capital investment needed to set up a fly ash manufacturing plant heavily determines its final sale price. If the fixed capital investment is reduced, businesses like Vecor can sell their product at a lower price that is more competitive with existing market prices. This would ensure that the product is economically viable and quarries are less likely to undercut the price to exclude these recycled products from the market. Hence, the government has a high degree of control over whether a manufactured fly ash aggregate operation would be commercially viable or not.[263]

4.60 Polyagg was also of the view that capital costs required for coal ash processing plants were a barrier. It suggested that it was harder to justify the capital investment required when the remediation of ash ponds through a 'cap and cover' method is a relatively low-cost exercise that meets current contractual obligations for remediation.[264]

Barriers to entry - structure of cement industry

4.61 Some stakeholders also argued that the 'vertical integration' of the cement industry in Australia was a barrier to greater use of coal ash products in cement. Polyagg noted the 'vertically integrated nature of the construction materials industry in Australia' as a barrier to obtaining investors in projects to process coal ash into lightweight aggregate.[265]

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260 Evidence, Mr Paul Winn, Researcher, Hunter Community Environment Centre, 1 September 2020, p 54.

261 Evidence, Mr Paul Winn, Researcher, Hunter Community Environment Centre, 1 September 2020, p 54.

262 Submission 84, Polyagg, p 4.

263 Submission 11, Vecor Australia, p 21.

264 Submission 84, Polyagg, p 4.

265 Submission 84, Polyagg, p 4.

4.62 Mr Winn highlighted frustrations new players interested in coal-ash recycling have encountered trying to enter the industry, due to restrictive contracts between power companies and the cement industry:

> When we released our first report a couple of years ago we were inundated by entrepreneurs wanting to get hold of ash, and they could not get hold of it. They wanted to create industry and regional and rural jobs. They could not get it because the power stations would not let them, because they have these restrictive contracts with the cement industry. Those contracts mean that cement companies who have the contracts for that ash have the sole rights to that ash body. The ACCC has looked at that issue in Queensland and made some prosecutions over restrictive trade issues.[266]

> …The cement industry is a vertically integrated industry. They own quarries, trucks—the whole box and dice. They have a lot of plant geared towards largely imported limestone clinker. If they utilise something else then all of that plant equipment is not used. Everyone that I have spoken to believes that is the reason. They do not want too much ash on the market at any one time. [267]

4.63 Mr Ron McLaren, a former Manager of Fly Ash Australia, suggested that existing cement companies are a barrier to increasing fly ash use, as they make more from traditional cement than fly ash.[268]

4.64 Mr McLaren explained that during the 1980s and 1990s Fly Ash Australia was a joint venture owned by Boral and Rocla, and the reuse of fly ash expanded during this time. However, with the sale of Fly Ash Australia to cement making companies, sales of fly ash diminished:

> …in 1998 Rocla sold its shareholding in FAA to Cement Australia (CA). CA is a joint venture between two giants in the world construction industry, La farge Holcin of Switzerland and Heidelberg Cement of Germany. The companies are cement makers and have little interest in promoting fly ash and in fact they limit its use as they make more returns selling cement than fly ash. Sales to other states have stopped and there is little research for new uses or other promotions.[269]

Logistical costs and considerations

4.65 A key issue affecting the economic viability of recycling coal ash is the logistical difficulties and costs associated with transporting ash to processing facilities, and from there to sites where the products will be used. In a raw form, coal ash is both dangerous and expensive to move. As noted, reuse industry executives suggested that, to be economically viable, processing facilities would have to be located close to ash dam sites.[270]

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266 Evidence, Mr Paul Winn, Researcher, Hunter Community Environment Centre, 1 September 2020, p 48.

267 Evidence, Mr Paul Winn, Researcher Hunter Community Environment Centre, 1 September 2020, p 48.

268 Submission 38, Mr Ron McLaren, p 1.

269 Submission 38, Mr Ron McLaren, p 1.

270 Evidence, Mr Mark Ramsey, Director and Chief Executive, Vecor Australia Pty Ltd, 16 October 2020, p 11.

4.66 According to Mr Craig Heidrich, Chief Executive Officer, Ash Development Association of Australia, coal ash has actually been imported into Australia for use in building products because it was cheaper to ship it from India and China and reuse it near ports than to transport locally produced ash:

> As at the calendar year 2019, 154,000 tons of ash was imported into Australia. Why? Logistics, logistics, logistics. It costs money to move these materials and it was more cost effective for that material to be brought out of places like India and China into regional areas at ports, and off-loaded and used in those mixes.[271]

4.67 The cost effectiveness of using coal ash in road construction largely depends on the logistical costs of transporting material from the power station to the construction site. Ms Pamela Henderson, Executive Director Technical Services, Infrastructure & Place, Transport for NSW noted that the cost of transport can be a major barrier for greater use of coal ash in construction, if the distance from the power station is too great.[272]

Market value of different products

4.68 The committee heard that coal ash reuse products have different value, depending on the product, which also means different levels of economic viability depending on the use to which particular coal ash is put. Mr Michael Lord, Lead Researcher, Beyond Zero Emissions pointed out that not all uses of coal ash are equal when it comes to the market value. While coal ash has various potential uses in concrete, the highest value use is when it replaces cement, not sand or aggregate.[273] Different fly ashes have different potential uses in cement, so some grades of fly ash produced are more attractive in the market than others.[274] Similarly, Mr Mark Ramsey, Director, Vecor Australia noted different values of fly ash, depending on use, and the need for differentiated solutions to manage different types of fly ash.[275]

NSW Government as regulator and buyer of coal ash

4.69 Evidence to this inquiry highlighted a number of ways in which the NSW Government could support the development of a viable coal ash recycling industry. Broadly, it has regulatory powers that could both incentivise and disincentivise coal ash recycling. As a major builder of new infrastructure, it also has significant ability to create demand for coal ash products to be used in construction. It could also play a further role in shaping the market through leadership and coordination around development of new industries.

4.70 The Ash Development Association of Australia highlighted the way governments, in coordination with industry, can create a regulatory environment that supports maximum

271 Evidence, Mr Craig Heidrich, Chief Executive Officer, Ash Development Association of Australia, 16 October 2020, p 11.

272 Evidence, Ms Pamela Henderson, Executive Director Technical Services, Infrastructure & Place, Transport for NSW, 16 October 2020, p 16.

273 Evidence, Mr Michael Lord, Lead Researcher, Beyond Zero Emissions, 16 October 2020, p 8.

274 Evidence, Mr Michael Lord, Lead Researcher, Beyond Zero Emissions, 16 October 2020, p 8.

275 Evidence, Mr Mark Ramsey, Director, Vecor Australia Pty Ltd, 16 October 2020, p 9.

utilisation of coal ash quality products.[276] By contrast, jurisdictions without appropriate government leadership see lack of standards and regulatory barriers leading to low rates of use, and large volumes of coal ash ending up in landfill:

> In some countries the majority of CCPs are already consumed in accordance with established product standards or technical guidelines. This has resulted in mature markets with steady demand for quality products used in construction materials and geotechnical applications. In other markets, lack of adequate standards, poor market education and regulatory barriers - such as designation of CCPs as wastes and not resources – are resulting in poor utilization rates with large volumes of CCPs landfilled.[277]

Regulations affecting use of recycled ash in government construction projects

4.71 The New South Wales Government plays a role, both as a potential buyer of recycled coal ash for use in construction, and through its regulation and standard setting role for roads, that can have a major impact on the amount of fly ash used in construction.

4.72 As a major purchaser of infrastructure in the state, Transport for NSW sets limits on the amount of fly ash that can be used to replace Portland cement in concrete, and for other road construction purposes. Ms Pamela Henderson, Executive Director, Technical Services, Infrastructure and Place, Transport for NSW, noted that in most Transport for NSW specifications, fly ash can be used to replace a minimum of 20 per cent but not more than 40 percent of Portland cement in concrete. She noted that using a certain amount of fly ash enhances workability, durability and strength of the concrete, but if the content is too high it can have a negative impact on road performance.[278] Transport for NSW also prescribes limits on the amount of coal ash that can be used in other parts of road making, such as road base, depending on the project.[279]

4.73 Mr Glenn Orgias, General Manager, Origin Energy, noted that more coal ash is used in road construction in Victoria than New South Wales at present, and that different standards and regulations apply.[280] Origin Energy requested a review of regulations governing the maximum amount of coal ash that can be used in roads, to allow for greater use of fly ash in pavements and other quarry products.[281] It gave the example of a private haul road it had built with 92 per cent coal ash, that has exceeded performance standards for 25 years.[282]

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276 Answers to questions on notice, Ash Development Association of Australia, 20 October 2020 – Attachment 1, David Harris, Craig Heidrich, Joachim Feuerborn, 'Global aspects on Coal Combustion Products' (2019) World of Coal Ash, pp 2-3.

277 Answers to questions on notice, Ash Development Association of Australia., 20 October 2020 – Attachment 1, David Harris, Craig Heidrich, Joachim Feuerborn, 'Global aspects on Coal Combustion Products' (2019) World of Coal Ash, pp 2-3.

278 Evidence, Ms Pamela Henderson, Executive Director, Technical Services, Infrastructure and Place, Transport for NSW, 16 October 2020, p 13.

279 Evidence, Ms Pamela Henderson, Executive Director, Technical Services, Infrastructure and Place, Transport for NSW, 16 October 2020, p 16.

280 Evidence, Mr Glenn Orgias, General Manager Commercial Transactions, Origin Energy Limited, 1 September 2020, p 8.

281 Submission 78, Origin, p 3.

282 Submission 78, Origin, p 3.

4.74 Lake Macquarie City Council noted that with its responsibility for delivering local infrastructure including roads, footpaths, cycleways, kerbs and gutters, it is a substantial user of cement products, that could include coal ash. It noted that greater quantities of coal ash could potentially be used if supported by State government:

> Whilst Lake Macquarie council currently uses coal ash in construction material, the opportunity to increase the proportion of coal ash used presents an exciting opportunity to deliver more of this kind of infrastructure. Increasing the proportions used would be aided by the State government technical agencies including the Transport for NSW roads technical branch who set the standards that local government generally follows for roads.[283]

4.75 Environmental Justice Australia suggested that the NSW Government could provide regulations to establish standards for the reuse of fly ash in concrete in all government projects, by setting a minimum level of ash substitution for Portland Cement.[284]

NSW Government as a market leader

4.76 As well as having a regulatory role, governments can take a more active role in shaping the recycling industry, through potential support for research and innovation, and through its own procurement policies, as a major purchaser of infrastructure.

4.77 Vecor Australia pointed out that the NSW Government has developed a Circular Economy Policy, which puts support for innovation as a focus area, but suggested the policy is having little cut through. It suggested that, as a result, New South Wales is lagging behind other states in policy initiatives that would support recycling industries that generate economic growth and job opportunities:

> While in 2018 the State government took steps towards creating a new 'Circular Economy Policy', this has subsequently stagnated. Without any comprehensive programs facilitating the development of new ash re-use industries, NSW is falling behind in terms of growth opportunities and jobs. Meanwhile other states are gaining a lead with modern policy initiatives that support the development of more 'circular' industries.[285]

Government support for new industry development

4.78 In its submission the NSW Government did not reference the Circular Economy Policy, or focus on any potential government role in fostering a coal ash recycling industry. It suggested the government is more focused on potential repurposing of ash dam sites rather than potential harvesting and reuse of the ash currently stored there. The submission stated:

> Re-use of ash dams is generally limited given the characteristics of the ash in the ground. However, given the strategic location of ash dams near electricity transmission and

283 Evidence, Mr Tim Browne, Manager Environmental Systems, Lake Macquarie City Council, 6 October 2020, p 2.

284 Submission 81, Environmental Justice Australia, p 24.

285 Submission 11, Vecor Australia, p 18.

> distribution networks, there are significant opportunities to re-purpose ash storage areas for large scale solar photovoltaic projects (solar farms).[286]

4.79 In contrast, many stakeholder's highlighted ways the NSW Government could support new industry development focused on promoting coal ash harvesting for reuse, including commissioning a feasibility study into environmentally responsible reuse of coal ash.[287] The Hunter Community Environment Centre suggested a feasibility study should include an assessment of the economic feasibility of manufacturing sand and aggregate from fly ash, and that the NSW Government should look for investors to assist in the process of trialling a pilot plant.[288]

4.80 Vecor Australia similarly called for government to conduct a feasibility study into the economic viability of manufacturing sand and aggregates from fly ash, and from there to support pilot plants testing novel technologies:

> The core recommendation is for the government to conduct a feasibility study into the economic viability of manufacturing sand and aggregates from fly ash. This would result in one or more pilot plants being established to test novel technologies (such as Vecor's) for fly ash re-use.[289]

4.81 Several companies in the recycling industry called for the NSW Government to invest, or take the lead in mobilising capital investment for plants to process coal ash. Polyagg called for the NSW Government to take a lead position in a consortium to plan and develop a pilot plant to convert coal ash into lightweight aggregate.[290]

4.82 Vecor Australia also supported the establishment of government programs that support innovation and industries that make beneficial reuse of coal ash:

> …the regulatory environment as it currently stands does not provide a sufficiently positive environment for new technologies such as Vecor's to be recognised and adopted by the market…In order to push the market to adopt new technologies that have wider community benefits, programs must be in place to support innovation and industry growth, with an emphasis on promoting resource recovery.[291]

4.83 Inquiry participants also noted the importance of the government regulatory role to create an environment where capital investment in new industries will happen. The Ash Development Association of Australia explained the importance of the legislative and regulatory environment for encouraging reuse of coal ash:

> The development of sound legislation, regulations and other necessary measures designed to provide industry with the level of 'legal certainty' are a minimum requirement for capital investment in modern economies. These investments provide

286 Submission 83, NSW Government, p 10.

287 See Submission 41, Mr Michael Collins; Submission 49, Mannering Park Progress; Submission 54, Lynn Benn; Submission 58, Ms Renee McLean; Submission 62, Ms Maxine Pearson; Submission 66, Ms Kathryn Hines; Submission 68, Name suppressed.

288 Submission 39, Hunter Community Environment Centre, p 6.

289 Submission 11, Vecor Australia, p 4.

290 Submission 84, Polyagg Pty Ltd, p 5.

291 Submission 11, Vecor Australia, p 18.

> for the efficient and effective recovery or value-adding and 'best use' of CCPs for beneficial ends.[292]

4.84 The Australian Energy Council noted the role governments can play in creating market incentives to encourage greater uptake of coal ash, through both coordinating consultation among stakeholders and using its regulatory powers.

> The AEC would welcome market incentives being put in place to encourage greater uptake of coal ash re-use products. With a view to driving the development of a circular economy, the AEC considers it worthwhile for government agencies to facilitate consultation between regulatory bodies, electricity generators and key stakeholders in the recycling and construction sectors. Fostering cooperation between all relevant stakeholders will help in identifying solutions that maximise the re-use value of coal ash.[293]

4.85 The Ash Development Association of Australia called on the NSW Government to establish a State chaired working group of key industry bodies to develop a clear action plan towards a focus on resource development, harvesting and encouraging further investment.[294] It further recommended consultation to establish a framework for pathways, including possible mandatory use, to increase usage in a way that promotes economic efficiencies and conserves finite natural resources.[295]

Site remediation and repurposing of land

4.86 This section notes two issues relevant to the economic opportunities associated with coal ash recycling. First, there are economic and jobs creation opportunities created by site remediation and repurposing, which can be seen as an economic opportunity in areas hit economically when power plants close. Second, the approach to site remediation will affect whether ash can be harvested in the future, when it is technically and economically feasible to do so, and this may be a consideration in planning remediation and any repurposing of ash dam sites.

Economic and job creation opportunities from site remediation and repurposing

4.87 Several inquiry participants referred to the economic and employment benefits that can flow from remediation work on the site of former coal fired power stations and ash dams, as well as possibilities of economic gain from possible repurposing of the sites. Wollongong and Lake Macquarie City Councils both highlighted a desire to focus on potential benefits from site remediation and repurposing.[296]

4.88 Wollongong City Council also pointed out the cost of not adequately remediating land, in that land that could otherwise be put to beneficial purposes is 'locked up':

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292 Submission 23, Ash Development Association of Australia, p 5.

293 Submission 43, Australian Energy Council, p 2.

294 Submission 23, Ash Development Association of Australia, p 8.

295 Submission 23, Ash Development Association of Australia, p 8.

296 Submission 9, Lake Macquarie City Council, p 1.

> Without effective remediation, the repurposing and development of land can be made difficult, potentially affecting community assets and causing the 'lock up' of large parcels of land that could be used for more beneficial purposes.[297]

4.89 The Australian Manufacturing Workers Union NSW Branch noted the need for future jobs in areas affected by power station closures, and suggested that remediation of land could be part of a transition program creating jobs and fostering resilience in these communities.[298]

4.90 A number of community groups, including Central Coast Community Energy Association and Coal Point Progress Association also noted employment opportunities associated from site remediation, which may require similar skills as used for mining:

> There is a huge amount of work involved in remediating the existing sites. Just at Lake Macquarie there are 60 million tons of coal ash to be removed from unlined dams near open water bodies and close to populated areas. The skills required for this task are actually quite similar to the skills above ground mining. This will keep miners employed for many years to come even if mines and coal fired power station have been finally shut down. Once remediated, the land used for coal ash dams and everything else related to power stations will provide large areas of valuable land for re-vegetation, settlements and leisure.[299]

4.91 Power station operators noted both the challenges and potential benefits of site remediation and reuse. AGL Limited pointed to a previously commissioned report on challenges associated with closing, repurposing and rehabilitating large power generation sites,[300] while Origin stated that there exists potential for economic and employment benefit from remediation or repurposing of the Eraring Power Station following its forecast closure in 2032. Origin stated that:

> Origin is currently investigating a range of opportunities to re-use the ash from the ERAD to assist with future site remediation, each with associated economic and employment flow on effects…[301]

4.92 AGL spoke of the need for engagement with government regulatory agencies to facilitate development of effective land use planning controls. It noted the need for appropriate approval pathways for rehabilitation and remediation activities, and for permissible uses to maximise economic and employment opportunities post closure, while still meeting rehabilitation and remediation requirements.[302]

4.93 The NSW Government noted that reuse of ash dam sites is generally limited given the characteristics of the ash in the ground, but that the strategic location of ash dams near electricity distribution networks means there are opportunities to repurpose remediated ash storage sites

297 Submission 75, Wollongong City Council, p 4.

298 Submission 77, Australian Manufacturing Workers Union, p 2.

299 Submission 57, Central Coast Community Energy Association, p 5; Submission 48, Coal Point Progress Association, p 2; Submission 4, Coal-ash Community Alliance, p 6; Submission 74, Name suppressed, p 1; Submission 75, Wollongong City Council, pp 1 and 3; Submission 76, CEN (Community Environment Network), Central Coast & Lake Macquarie, pp 2-3.

300 Submission 80, AGL Energy Limited, p 2.

301 Submission 78, Origin, p 2.

302 Submission 80, AGL Energy Limited, p 3.

for large scale solar farms.[303] It noted the example of Vales Point, where Sunset Power International is progressing development of a 45 MW solar facility on ash dam ponds that have been capped and vegetated as an example of land repurposing. Such repurposing is not universally welcomed – community groups and Environmental Justice Australia raised concerns about the transparency of the process, lack of community consultation, continued risks regarding land that has not been adequately remediated, and the locking up of land that could go to community use. [304]

Committee comment

4.94 The committee notes the widespread support across the spectrum of stakeholders for the greater safe reuse and recycling of coal ash. We acknowledge the considerable benefits to reusing coal ash, both in new industry development and job creation, reducing harm to the environment as a result of storing coal ash in unlined ash dams, and in developing a 'circular economy' where one industry's waste product is re-used in another, to maximise use of existing resources and limiting the need for new extractive industries.

Finding 3

That coal ash is a valuable resource, and that there is widespread support across the spectrum of stakeholders for the greater reuse of coal ash, as this will lead to industry development and job creation, a reduction in environmental harm and contribute to developing a circular economy.

4.95 The committee believes that greater urgency must be placed on increasing the reuse of newly generated coal ash for the remaining life of the five coal-fired power stations. The current rates of reuse of coal ash generated by these plants is unacceptably low. International jurisdictions manage to reuse up to 97 percent of coal ash, while in New South Wales the rate appears to be around 20 per cent. Despite having set a target of 80 percent for the recycling of coal ash, none of the five operating power stations are close to reaching this level of recycling. This needs to change.

4.96 The NSW Government needs to take a leadership role to ensure that coal ash reuse increases, and opportunities for future harvesting of stored ash are created. Hence the committee recommends that the Department of Planning, Industry and Environment establish a coal ash reuse taskforce, comprised of state government agencies, unions, industry stakeholders and community groups, to develop a strategy to achieve at least 80 percent reuse of coal ash produced in New South Wales. This taskforce should report by 2022.

303 Submission 83, NSW Government, p 10.

304 Submission 4, Coal Ash Community Alliance, p 6; Submission 81, Environmental Justice Australia, p 20.

Recommendation 8

That the Department of Planning, Industry and Environment establish a coal ash reuse taskforce comprised of state government agencies, unions, industry stakeholders and community groups to lead development of a strategy to achieve at least 80 percent reuse of coal ash produced in New South Wales, and report by 2022.

4.97 The committee notes that there are an array of regulations, managed by different government agencies, which affect the incentives and viability of coal ash recycling. The committee recommends that the newly established coal ash reuse taskforce review regulations affecting coal ash recycling, including the regulation of ash dams, waste standards so that stored coal ash is able to be mined in the future, the prohibition of other waste to enter ash dams, and land remediation, to ensure the safe and beneficial reuse of coal ash while promoting strong environmental standards.

Recommendation 9

That the newly established coal ash reuse taskforce inquire into and review regulations affecting coal ash reuse, including:

- the stability and regulation of ash dams
- waste standards to ensure that coal ash is not contaminated with other waste, and
- land remediation, including the state and effectiveness of current capping, the current and future risk of leakage of contamination into the surrounding environment, and impacts of vegetation cover (including any contaminated vegetation, release of contaminants into the air via transpiration and cracking of capping materials)

to ensure the safe and beneficial reuse of coal ash while promoting strong environmental and public health standards.

4.98 As a major purchaser of infrastructure, the government can promote greater use of recycled coal ash products in its own construction projects, by examining both standards and procurement processes to encourage the use of recycled coal ash in construction. The committee therefore recommends that Transport for NSW review its procurement practices to, where feasible, mandate the use of recycled coal ash in government-funded transport infrastructure projects, and that Infrastructure NSW does the same for non-transport infrastructure projects.

Recommendation 10

That Transport for NSW review its procurement practices to, where feasible, mandate the use of recycled coal ash in government-funded transport infrastructure projects.

Recommendation 11

That Infrastructure NSW review its procurement practices to, where feasible, mandate the use of recycled coal ash in government-funded infrastructure projects.

4.99 We are aware of the leadership role that Transport for NSW has in terms of the setting of standards for road construction projects and that local government follows these standards. The committee believes that Transport for NSW should review the construction standards for roads, with a view to ensuring that local government trials the use of coal ash in its road construction.

Recommendation 12

That Transport for NSW review the construction standards for roads, with a view to ensuring that local government trials the use of coal ash in its road construction.

4.100 As noted in this inquiry, there are other ways that governments could support new industry development, particularly where there are social and environmental gains to be made as well as economic benefits. The committee considers that the government could do more to foster new industries focused on ash recycling in coal affected regions. The committee therefore recommends that the government partner with the Ash Development Association of Australia and support feasibility studies or pilot projects to assess and demonstrate commercial viability of new industries, such as transformation of coal ash into lightweight aggregate or other higher value-add products.

Recommendation 13

That the NSW Government partner with the Ash Development Association of Australia and other interested parties, and support feasibility studies and pilot projects to assess and demonstrate commercial viability of new industries, such as transformation of coal ash into lightweight aggregate or other higher value-add products.

4.101 The committee believes that greater monitoring and transparency of the quantities of coal ash produced and reused is needed – both to build community confidence in the industry as well as to motivate the reuse of coal ash. Hence the committee recommends that the government require power station and ash dam operators to publish data on the quantity of coal ash stored, produced and the destination and purpose of coal ash reused.

Recommendation 14

That the NSW Environment Protection Authority ensure that the quantity of coal ash stored, produced, and the destination and purpose of coal ash reused, is publicly reported.

4.102 The committee notes that remediation and repurposing of former ash dam sites can generate new jobs and economic opportunities in communities around coal fired power stations as they close. In order to balance social, environmental and economic objectives, the committee believes that there should be a transparent process to determine the approach to remediating and/or repurposing of the ash dam sites.

4.103 The committee believes that the government should promote circular economy principles when dealing with coal ash waste, including facilitating consultation between regulatory bodies, electricity generators and key stakeholders in the recycling, local government and construction sectors.

Recommendation 15

That the NSW Government promote circular economy principles when dealing with coal ash waste and promoting reuse, including facilitating consultation between regulatory bodies, electricity generators and key stakeholders in recycling, local government and construction sectors.

Chapter 5 Government liability for remediation

This chapter explores the issue of government liability and possible expenditure for remediating contamination at power stations once they are closed. It then examines concerns relating to actual or perceived conflicts of interest in relation to the government's dual role of remediation and policy making with regards to coal ash dams.

Prospective or quantum government liability for remediating contamination at sites

5.1 As noted in Chapter 1, in 2012 the NSW Government commenced the Electricity Generation transactions which included the sale of Eraring, Bayswater, Liddell and Vales Point power stations. From this, the NSW Government concluded that the State had avoided liabilities of approximately $2 billion.[305]

5.2 At the time of the transactions, the government adopted the following approach in terms of which entity would be responsible for remediating any contamination at the power stations:

> …the State should be responsible for the cost of cleaning up any contamination it had caused whilst it owned the relevant power station, and the purchasers would be responsible for the costs associated with cleaning up any contamination they caused thereafter.[306]

5.3 The NSW Government indicated that its 'potential liabilities in relation to the cost of remediating contamination … arise from contractual obligations (i.e. indemnities) negotiated with the relevant purchaser of the site'.[307]

Sale and purchase agreements

5.4 During the course of the inquiry, the three power station operators - Delta Electricity, AGL Energy Limited and Origin Energy - all referred to the Sale and Purchase Agreements entered into with the NSW Government.[308]

5.5 In 2013, Origin Energy acquired the Eraring power station with Origin having 'primary responsibility for remediation of the Eraring Ash Dam as per the Electricity Generation transaction.[309] In terms of possible government liability for remediation of pre-existing contamination on the site prior to the sale, Origin stated it had 'not undertaken an assessment of the quantum of the NSW Government liability for remediation of this contamination'.[310]

305 Submission 83, NSW Government, p 3.

306 Submission 83, NSW Government, p 5.

307 Submission 83, NSW Government, p 5.

308 See Submission 13, Delta Electricity; Submission 78, Origin Energy; Submission 80, AGL Energy.

309 Submission 78, Origin Energy, p 2.

310 Submission 78, Origin Energy, p 2.

5.6 In 2014, AGL Energy Limited acquired the Bayswater and Liddell power stations from Macquarie Generation, a statutory corporation owned by the NSW Government.[311] While AGL Energy Limited indicated that the Agreement was 'subject to confidentiality obligations', it noted that the Agreement extends to cover:

- the terms of the Sale and Purchase Agreement, including any terms relating to liability for contamination; and
- any baseline contamination reports prepared prior to the sale of Bayswater and Liddell power stations and associated assets.[312]

5.7 When questioned as to whether AGL Energy Limited had attempted to quantify the contamination on the sites in order to understand the State's liability for cleaning up that contamination, Mr Steve Rieniets, Group General Manager Operations – Integrated Energy, AGL Macquarie Pty Limited replied that it was currently being investigated:

> We are working through those studies of what our rehabilitation plans look like. That, obviously, needs to ensure what the current condition is. Progressively, we are working through those and they will be shared once we have further consultation of what those plans look like.[313]

5.8 Nonetheless, AGL Energy Limited were of the view that it did not 'expect the NSW Government to incur any material expenditure as a result of the rehabilitation by AGL Macquarie of the Ravensworth Voids, Bayswater Ash Dam and Liddell Ash Dam once they reach the end of their operational lives'.[314]

5.9 In 2015, Vales Point power station was sold to Sunset Power International Pty Ltd, trading as Delta Electricity. In its submission, Delta Electricity described the 'Put and Call Option Deed' ('Handback Deed') whereby:

> Upon closure of Vales Point power station, the NSW Government has granted Delta a put option to transfer Vales Point power station back to the NSW Government after decommissioning obligations have been met. There are no specific de-commissioning obligations pertaining to the ash dam aside from maintaining site security and de-powering the site. If Delta does not exercise the put option, the NSW Government has a call option allowing it to transfer Vales Point back to the NSW Government.[315]

5.10 Delta Electricity maintained it did 'not believe … there will be a liability for the State in terms of the Vales Point ash dam'.[316] This was reasoned on the progressive capping of the ash dams currently underway, which was anticipated to be largely done by the end of Vales Point's life.[317]

311 Submission 80, AGL Macquarie, p 2.

312 Submission 80, AGL Macquarie, p 2.

313 Evidence, Mr Steve Rieniets, Group General Manager Operations – Integrated Energy, AGL Macquarie Pty Limited, 1 September 2020, p 4.

314 Submission 80, AGL Macquarie, p 3.

315 Submission 13, Delta Electricity, p 3.

316 Evidence, Mr Justin Flood, Executive Manager Sustainability, Delta Electricity, 1 September 2020, p 6.

317 Evidence, Mr Justin Flood, Executive Manager Sustainability, Delta Electricity, 1 September 2020, p 6.

5.11 Delta Electricity was hopeful that the cost of capping and a proposed solar farm on the rehabilitated ash ponds would mitigate any liability of the state:

> The cost of capping—there is a fee charged for people to deposit excavated natural material onto the site for the capping purpose, so we expect that to be cost neutral. There is the ongoing environmental monitoring costs for the ash dam, with the groundwater. We have a proposal for a solar farm on the already rehabilitated ponds 1 to 3 at Vales Point and we believe the lease fees will cover that more than adequately.[318]

5.12 However, Delta Electricity noted that 'at closure, the remediation requirements for the Vales Point ash dam will depend upon the amount of recycling over time and the final level of the ash dam'. It is likely that of the seven planned ash ponds, all but two will be capped and covered by closure. This is due to the possibility that two ash ponds 'will not be at capacity' by closure and if 'the put and call option is triggered by either party, it is possible the NSW Government will be responsible for capping and rehabilitating the limited remaining areas of exposed ash'.[319]

Determining pre-existing contamination at sites

5.13 Further to the sale and purchase agreements, the issue of pre-existing contamination prior to the sales was raised, with concerns as to how pre-existing contamination was determined and estimations of government liability.

5.14 As Ms Charlotte Alexander, Executive Director, Commercial Assets, NSW Treasury explained, baseline studies were produced identifying existing contamination at the time of the Electricity Generation transactions, 'which is the line in the sand of what was the State's responsibility versus what will be any new contamination from that point'.[320]

5.15 Mr Paul Winn, Researcher, Hunter Community Environment Centre, told the committee he had viewed documents relating to the sale of the Vales Point Power Station and Eraring Energy provided to the Legislative Council under an Order for Papers.[321] Mr Winn claimed the baseline studies show 'quite concerning groundwater contamination below all of the ash dumps in New South Wales as well as surface waters and sediments around those facilities'.[322]

5.16 Ms Bronya Lipski, Lawyer, Environmental Justice Australia observed that the baseline studies were not publicly available and suggested there 'be ongoing, annual … assessments of what has

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318 Evidence, Mr Justin Flood, Executive Manager Sustainability, Delta Electricity, 1 September 2020, p 6.

319 Submission 13, Delta Electricity, p 3.

320 Evidence, Ms Charlotte Alexander, Executive Director, Commercial Assets, NSW Treasury, 16 October 2020, p 17.

321 In June 2019, the NSW Legislative Council agreed to a motion of Ms Abigail Boyd MLC, that the NSW Government provide all documents relating to, and including, the contract for the sale of Vales Point Power Station to Sunset Power International Pty Ltd and a joint venture between Vales Point Investments Pty Ltd and Waratah Energy Pty Ltd, and all documents relating to, and including, the contract for the sale of Eraring Energy to Origin Energy, be provided to the House under Standing Order 52. The papers were provided on 27 June 2019.

322 Evidence, Mr Paul Winn, Researcher, Hunter Community Environment Centre, 1 September 2020, p 42.

happened since then … [to ensure] we have a really good understanding of what is going on now and how that differs potentially from when those baseline studies were undertaken'.[323]

5.17 This was echoed by a number of inquiry participants who called for the baseline studies to be publicly available.[324]

5.18 Environmental Justice Australia indicated there was uncertainty as to whether the baseline studies 'contain the prospective quantum of government liability for undertaking the remediation of contamination described'. However, it noted that 'the cost for remediation of coal ash generated and stored prior to the sale of the state's coal-fired power stations is currently identified in NSW Treasury briefings as an uncalculated contingent liability'.[325]

5.19 Likewise, several inquiry participants argued that 'in the event that the … baseline studies do not contain prospective quantum associated with remediation for pre-sale contamination, an estimation of that quantum … must be established and made publicly available'.[326]

5.20 In its submission to the inquiry, the NSW Government explained the process for how liabilities for pre-existing contamination are to be claimed by the power station operators:

> In general terms, for any liabilities to materialise in relation to the indemnities covering pre-existing contamination, the purchasers must successfully lodge a claim with the State for losses incurred as a result of a regulatory or court order to remediate contamination where such contamination is pre-existing as identified in baseline environmental studies (whether undertaken by the State or the purchasers).[327]

Prospective timing of government expenditure in relation to remediation at those sites

5.21 A second issue identified in relation to government liability was the prospective timing and estimates of government expenditure for the remediation of sites.

5.22 In its submission, the NSW Government advised that it accounts for the contractual obligations in relation to the remediation of sites via the accounting standard *AASB 137 Provisions, Contingent Liabilities and Contingent Assets*. Under AASB 137, a contingent liability is:

> (a) a possible obligation that arises from past events and whose existence will be confirmed only by the occurrence or non-occurrence of one or more uncertain future events not wholly within the control of the entity; or
>
> (b) a present obligation that arises from past events but is not recognised because:

323 Evidence, Ms Bronya Lipski, Lawyer, Environmental Justice Australia, 1 September 2020, p 32.

324 Submission 16, Blue Mountains Unions Council Inc, p 2; Submission 21, Name suppressed, pp 2-3; Submission 24, Mr Graeme Batterbury, p 1; Supplementary submission 39a, Hunter Community Environment Centre, p 40; Submission 81, Environmental Justice Australia, p 4.

325 Submission 81, Environmental Justice Australia, p 8.

326 Submission 16, Blue Mountains Unions Council Inc, p 2; Submission 81, Environmental Justice Australia, pp 4-5.

327 Submission 83, NSW Government, p 5.

> (i) it is not probable that an outflow of resources embodying economic benefits will be required to settle the obligation; or
>
> (ii) the amount of the obligation cannot be measured with sufficient reliability.[328]

5.23 Under AASB 137, a provision shall be recognised when:

> (a) an entity has a present obligation (legal or constructive) as a result of a past event;
>
> (b) it is probable that an outflow of resources embodying economic benefits will be required to settle the obligation; and
>
> (c) a reliable estimate can be made of the amount of the obligation.[329]

5.24 As a result, the contingent liabilities disclosed under the Electricity Generation transactions include the potential costs retained by the State for remediating pre-existing contamination at:

- Mt Piper power station site;
- Colongra power station site;
- Eraring and Shoalhaven power stations;
- Bayswater and Liddell power stations; and
- Vales Point power station.[330]

5.25 Given this, the NSW Government stated that the contingent liabilities were reviewed and assessed, during the preparations of the State's financial statements, as to whether events and conditions mean a provision should be recognised under AASB 137.[331]

5.26 Since 2012, the NSW Government has 'either recognised a liability or disclosed a contingent liability for any indemnity for pre-existing contamination' on an annual basis in the publicly-disclosed Crown Entity Financial Statements and Report on State Finances.[332]

5.27 For example, in relation to the Wallerawang power station site which ceased operation in 2018, the State has disclosed a provision on the 'Crown Entity's balance sheet for the cost (where net costs exceed $10 million) of decommissioning, demolishing and rehabilitating' the site.[333]

5.28 Further, the NSW Government outlined that when it reports on the potential liability relating to these power stations in its audited financial statements, it does so on an aggregated basis (i.e. within a total liability provision for the Crown Entity):

> The total provision for pre-existing and additional decommissioning commitments is included in the total provisions of $2.19 billion as disclosed in Crown Entity 2018-19 financial statements. The provision amount relating to pre-existing contamination outlined above is included in this aggregate figure.[334]

328 Submission 83, NSW Government, p 6.

329 Submission 83, NSW Government, p 6.

330 Submission 83, NSW Government, pp 6-7.

331 Submission 83, NSW Government, p 7.

332 Submission 83, NSW Government, p 6.

333 Submission 83, NSW Government, p 7.

334 Submission 83, NSW Government, p 7.

5.29 Moreover, the NSW Government provided justification for why it did not disclose specific provisions:

> [d]isclosure of specific provisions would be commercially harmful to the State, by prejudicing any future negotiations with counterparties if and when payments are required to be made under the environmental indemnities provided by the State. Disclosure of this information would impinge on the State's ability to minimise the financial risk associated with the environmental indemnities.[335]

5.30 The NSW Government explained that, apart from provisions for remediation costs for the Wallerawang power station and the impending closure of Liddell in 2022-23, the State 'has not made a provision at this stage for any of the other contingent liabilities relating to the indemnities provided to the power station purchasers'.[336]

5.31 According to assessments undertaken by NSW Treasury, there 'remains sufficient uncertainty as to the timing and cost of the potential liability arising from the State's contractual obligations'.[337] Despite this, the NSW Government informed that NSW Treasury was:

> continually monitoring any developments and events related to the indemnities that could trigger a future payment by the State. When these circumstances arise and a reliable estimate of liability can be made, the State will make a provision in relation to the relevant obligation.[338]

Mitigation of actual or perceived conflict of interest arising from the state's dual role in relation to coal ash dams

5.32 There was some discussion by inquiry participants as to whether there was an actual or perceived conflict of interest by the government given its dual role in relation to coal ash dams – firstly as the body liable for remediation of contamination of sites and secondly as the body that creates policy and regulation on this issue.

5.33 As the NSW Government outlined in its submission, the NSW EPA is an independent statutory authority that sits in the Environment Portfolio as part of the Planning, Industry and Environment cluster while the State's contractual obligations arising from major transactions are managed within Treasury under the Treasurer.[339]

5.34 According to the NSW Government, this separation of 'environmental and commercial management … provides appropriate mitigation to any risk of actual or perceived conflict of interest'.[340]

5.35 Ms Charlotte Alexander, Executive Director, Commercial Assets, NSW Treasury objected to the proposition that the government presented a conflict of interest given that it was both liable

335 Submission 83, NSW Government, p 7.
336 Submission 83, NSW Government, p 8.
337 Submission 83, NSW Government, p 8.
338 Submission 83, NSW Government, p 8.
339 Submission 83, NSW Government, p 12.
340 Submission 83, NSW Government, p 12.

for remediation of contamination as well as also being the body in charge of making laws for how strict those rehabilitation requirements should be.[341] Ms Alexander emphasised that the role of NSW Treasury was to 'have a commercial counterparty to the power station operators in relation to our ongoing financial liability to them under the indemnities'.[342]

5.36 Further, Ms Alexander noted that the NSW EPA is 'one of a number of State-based regulators that regulate the Government and the private sector as well' stating that the NSW EPA has a role of an environmental regulator to the power station operators while NSW Treasury has commercial arrangements with the power station operators.[343]

5.37 However, some inquiry participants argued the government faced a conflict of interest given its dual position.[344]

5.38 For example, Ms Broyna Lipski, Lawyer, Environmental Justice Australia agreed there was a conflict of interest and while she hoped the NSW EPA was 'independent enough to be able to undertake that type of work … I certainly will always welcome an independent expert and independent bodies to participate …'[345]

5.39 Mr Chris Gambian, Chief Executive, Nature Conservation Council of NSW was of the view that transparency was key, stating that:

> If the Parliament is made regularly aware of the scale of the liability, if the data is broadly available and if the public has access to actual technical data, then I agree with the submission that the EPA is well equipped to regulate some of these areas and has done so well in the past.[346]

Committee comment

5.40 During this inquiry, the committee learned that the prospective or quantum government liability for remediating contamination at sites containing coal ash repositories is currently unknown. The committee is disappointed that no estimations were provided by NSW Treasury as to the government's liability, and in turn the prospective timing of government expenditure in relation to remediation.

341 Evidence, Ms Charlotte Alexander, Executive Director, Commercial Assets, NSW Treasury, 16 October 2020, p 15.

342 Evidence, Ms Charlotte Alexander, Executive Director, Commercial Assets, NSW Treasury, 16 October 2020, p 15.

343 Evidence, Ms Charlotte Alexander, Executive Director, Commercial Assets, NSW Treasury, 16 October 2020, p 15.

344 Supplementary submission 28a, Keep Lake Macquarie Clean, p 2; Submission 57, Central Coast Community Energy Association Inc (CCCE), p 5; Evidence, Mr David Tait, Member, Keep Lake Macquarie Clean, 6 October 2020, p 12; Evidence, Ms Bronya Lipski, Lawyer, Environmental Justice Australia, 1 September 2020, p 39; Evidence, Mr Chris Gambian, Chief Executive, Nature Conservation Council of NSW, 1 September 2020, p 39.

345 Evidence, Ms Bronya Lipski, Lawyer, Environmental Justice Australia, 1 September 2020, p 39.

346 Evidence, Mr Chris Gambian, Chief Executive, Nature Conservation Council of NSW, 1 September 2020, p 39.

5.41 In terms of the baseline studies which identify existing contamination which is the responsibility of the government, the committee is concerned by the lack of transparency around this. We agree with inquiry participants that these baseline studies should be made publicly available in order to better understand the remediation liabilities of the government. The committee, like inquiry participants, also anticipates that the publication of these baseline studies may help to shed light on the estimations of costs to government in regards to remediation. The committee is of the view that publication of these studies would not be an onerous task given these documents were provided to the NSW Legislative Council via an Order for Papers under Standing Order 52.

Recommendation 16

That NSW Treasury immediately publish on their website the baseline environmental studies conducted for each operating power station to improve transparency in terms of the NSW Government's liabilities for remediation at these sites.

Appendix 1 Submissions

No.	Author
1	Mr Thomas Cutler
2	Name suppressed
3	Name suppressed
4	Coal-ash Community Alliance Inc.
5	Beyond Zero Emissions
6	Name suppressed
7	Mr Stephen Crawford
8	Dr John Shiel
9	Lake Macquarie City Council
10	Warners Bay Area Sustainable Neighbourhood Group
11	Vecor Australia Pty Limited
12	Ms Paula Morrow
13	Delta Electricity
14	Name suppressed
15	Mr Greg Piper MP
16	Blue Mountains Unions Council Inc
17	Name suppressed
18	Ms Jo Lane
19	Mr Daniel Endicott
20	Mr Joseph Tamas
21	Name suppressed
22	Dr Peter Sainsbury
23	Ash Development Association of Australia
24	Mr Graeme Batterbury
25	Mr Gilbert Walker
26	Dr James Whelan
27	Bruce Derkenne
28	Keep Lake Macquarie Clean
28a	Keep Lake Macquarie Clean
29	Mr Derek Robertson
30	Ms Marion Giles

No.	Author
31	Mr Graeme Tychsen
32	Mrs Jan Mitchell
33	Name suppressed
34	Name suppressed
35	Ms Sandra Kirby
36	Lake Macquarie Sustainable Neighbourhood Alliance Inc.
37	Name suppressed
38	Mr Ron McLaren
39	Hunter Community Environment Centre
39a	Hunter Community Environment Centre
40	Name suppressed
41	Mr Michael Collins
42	Ramboll Australia
43	Australian Energy Council
44	Lithgow Environment Group Inc.
45	Bathurst Community Climate Action Network (BCCAN)
46	Cooranbong Sustainable Neighbourhood
47	Doctors for the Environment Australia
48	Coal Point Progress Association
48a	Coal Point Progress Association
49	Mannering Park Progress
50	Ms Joan McCarthy
51	Mr Michael Campbell OAM
52	Mr Adrian Spicer
53	Mr Peter O'Shannessy
54	Lynn Benn
55	Name suppressed
56	Mrs Leah Stevens
57	Central Coast Community Energy Association Inc (CCCE)
58	Ms Renee McLean
59	Professor Howard Dick
60	Dr Kevin McDonnell
61	Mr Damian Rake
62	Ms Maxine Pearson
63	Mr Neil Wynn

No.	Author
64	Name suppressed
65	Ms Cherylyn Fenton
66	Ms Kathryn Hines
67	Name suppressed
68	Name suppressed
69	Name suppressed
70	Ms Julia Lee
71	Mrs Keelah Lam
72	Ms Tonia Gardiner
73	Dr Stephen O'Brien
74	Name suppressed
75	Wollongong City Council
76	CEN (Community Environment Network), Central Coast & Lake Macquarie
77	Australian Manufacturing Workers Union New South Wales Branch
78	Origin
79	Nature Conservation Council of NSW
80	AGL Energy Limited
81	Environmental Justice Australia
82	Climate Action Newcastle
83	NSW Government
84	Polyagg Pty Ltd

Appendix 2 Witnesses at hearings

Date	Name	Position and Organisation
Tuesday 1 September 2020 **Macquarie Room** **Parliament House, Sydney**	Mr Justin Flood	Executive Manager Sustainability, Delta Electricity
	Mr Greg Everett	Managing Director, Delta Electricity
	Mr Greg Jarvis	Executive General Manager, Energy Supply and Operations, Origin Energy Limited
	Mr Glenn Orgias	General Manager Commercial Transactions, Origin Energy Limited
	Mr Steve Rieniets	Group General Manager Operations – Integrated Energy, AGL Macquarie Pty Limited
	Ms Susan Rose	Group Counsel – Environment, Safety & Approvals, AGL Macquarie Pty Limited
	Dr Kathleen Wild	Member, Doctors for the Environment
	Mr Chris Gambian	Chief Executive, Nature Conservation Council of NSW
	Ms Liz Hadjia	Climate and Energy Campaigner, Nature Conservation Council of NSW
	Ms Bronya Lipski	Lawyer, Environmental Justice Australia
	Mr Paul Winn	Member, Hunter Community Environment Centre
	Mr Gary Blaschke OAM	Member, Coal-Ash Community Alliance Inc
	Ms Bernadette Mullaney	Member, Bathurst Community Climate Action Network
	Mr Chris Jonkers	Vice President, Lithgow Environment Group Inc
Tuesday 6 October 2020 **Lake Macquarie City Council Chambers, Speers Point**	Mr Tim Browne	Manager Environmental Systems, Lake Macquarie City Council
	Mr Greg Piper MP	Member for Lake Macquarie

Date	Name	Position and Organisation
	Ms Lyn Fraser	Member, Warners Bay Area Sustainable Neighbourhood Group
	Mr David Tait	Member, Keep Lake Macquarie Clean
	Mr Bruce Macfarlane	Member, Keep Lake Macquarie Clean
	Mr Stephen Dewar	Secretary, Lake Macquarie Sustainable Neighbourhood Alliance Inc
	Dr Heinz-Joachim (Jo) Muller	Steering Committee Member, CEN (Community Environment Network) Central Coast & Lake Macquarie
Friday 16 October 2020 Macquarie Room Parliament House, Sydney	Mr Craig Heidrich	Chief Executive Officer, Ash Development Association of Australia
	Mr Stephen Blanks	Director, Vecor Australia Pty Ltd
	Mr Mark Ramsey	Director, Vecor Australia Pty Ltd
	Mr Michael Lord	Lead Researcher, Beyond Zero Emissions
	Ms Fiona Robinson	Regional Director, Australia and New Zealand, Ramboll Australia
	Ms Charlotte Alexander	Executive Director, Commercial Assets, NSW Treasury
	Ms Pamela Henderson	Executive Director Technical Services, Infrastructure & Place, Transport for NSW
	Mr David Fowler	Executive Director, Regulatory Practice and Environmental Solutions, NSW Environment Protection Authority
	Mr Adam Gilligan	Director, Regulatory Operations Metropolitan North, NSW Environment Protection Authority
	Mr Chris Salkovic	Chief Executive Officer, Dams Safety NSW
	Mr Peter Boyd	Governance & Assurance Manager, Dams Safety NSW

Appendix 3 Minutes

Minutes no. 2
Tuesday 1 October 2019
Public Works Committee
Room 1136, Parliament House, 3.02 pm

1. Members present
Mr Mookhey, *Chair*
Mr Banasiak, *Deputy Chair*
Mr Blair
Ms Boyd
Mr Khan
Mr Mallard

2. Apologies
Ms Moriarty

3. Previous minutes
Resolved, on the motion of Mr Mallard: That draft minutes no. 1 be confirmed.

4. Correspondence
The committee noted the following items of correspondence:

Received

- 25 September 2019 – Letter from Mr Banasiak, Mr Mookhey, and Ms Boyd requesting a meeting of the Public Works Committee to consider a proposed self-reference into the Narromine to Narrabri Greenfield Inland Rail corridor
- 25 September 2019 – Letter from Ms Boyd, Mr Banasiak, and Mr Mookhey requesting a meeting of the Public Works Committee to consider a proposed self-reference into the costs for rehabilitation of sites containing coal ash repositories.

5. Consideration of terms of reference – Inland Rail corridor
The committee considered the following self-referred terms of reference:

1. That the Public Works Committee inquire into and report on the relative benefits to New South Wales of the Narromine to Narrabri Greenfield Inland Rail corridor, and in particular:
    a) the floodplain modelling being used for the project including the impacts on individual landholders,
    b) route selection issues including the rejection of existing alignments and the balancing of time saving calculations with additional property and flood impacts,
    c) property management and valuation including mitigation and the potential circumstances for compensation for landholders,
    d) facilitating producer and grain market input to minimise freight costs, particularly for the "East West" freight routes,
    e) any financial implications for New South Wales if or when parts of the existing line become disconnected from the new route,
    f) the ability to plan the corridor to cater for additional infrastructure services, such as a water pipeline, power lines and the broadband data cables, and

g) any other related matter.

2. That the committee report by the end of June 2020.

Resolved, on the motion of Mr Blair: That the committee defer consideration until a later meeting.

Resolved, on the motion of Mr Banasiak: That the Chair on behalf of the committee write to the Australian Rail Track Corporation seeking a briefing on the Inland Rail project.

6. Consideration of terms of reference – Coal ash remediation

The committee considered the following self-referred terms of reference:

1. That the Public Works Committee inquire into and report on the costs for remediation of coal ash repositories in New South Wales, and in particular:
   (a) prospective or current quantum of government liability for remediating contamination at sites associated with:
      (i) Mount Piper power station,
      (ii) Bayswater power station,
      (iii) Liddell power station,
      (iv) Vales Point power station, and
      (v) Eraring power station,
   (b) prospective timing of government expenditure in relation to remediation at those sites,
   (c) economic and employment opportunities associated with coal ash re-use, site remediation and repurposing of land,
   (d) adequacy and effectiveness of the current regulatory regime for ensuring best practice remediation of coal ash repositories,
   (e) mitigation of actual or perceived conflict of interest arising from the state having ongoing liability for remediation costs the quantum of which will be impacted by government policy and regulatory action,
   (f) risks and liabilities associated with inadequate remediation including community and environmental health impacts, and
   (g) any other related matters.

2. That the Committee report by the 16 March 2020.

Resolved on the motion of Ms Boyd: That the terms of reference be amended by:

a) inserting after paragraph 1(a)(v) '(vi) any other relevant power station.'

b) omitting '16 March 2020' and inserting instead '1 July 2020'.

Resolved, on the motion of Ms Boyd: That the committee adopt the terms of reference as amended.

7. Conduct of the inquiry into the costs for remediation of sites containing coal ash repositories

7.1 Proposed timeline

Resolved, on the motion of Mr Mallard: That the secretariat:

- revise the proposed timeline for the inquiry given the amended reporting date and circulate to the committee via email for in-principle agreement
- open the submission portal to the inquiry as soon as the inquiry is published on the committee's webpage.

7.2 Stakeholder list

Resolved, on the motion of Mr Banasiak: That the secretariat circulate to members the Chairs' proposed list of stakeholders to provide them with the opportunity to amend the list or nominate additional stakeholders, and that the committee agree to the stakeholder list by email, unless a meeting of the committee is required to resolve any disagreement.

7.3 Advertising

The committee noted that all inquiries are advertised via Twitter, Facebook, stakeholder letters and a media release distributed to all media outlets in New South Wales.

It is no longer standard practice to advertise in the print media. The committee should pass a resolution if it wishes to do so.

8. Adjournment

The committee adjourned at 3.20 pm, *sine die*.

Emma Rogerson
Committee Clerk

Minutes no. 3
Thursday 20 February 2020
Public Works Committee
McKell Room, Parliament House, 2.05 pm

1. Members present

Mr Mookhey, *Chair*
Mr Banasiak, *Deputy Chair*
Ms Boyd
Mr Farraway
Ms Jackson (substituting for Ms Moriarty)
Mr Khan

2. Apologies

Mr Mallard

3. Previous minutes

Resolved, on the motion of Mr Mallard: That draft minutes no. 2 be confirmed.

4. Correspondence

The committee noted the following items of correspondence:

Received

- 10 October 2019 – Letter from Mr Richard Wankmuller, Chief Executive Officer, Inland Rail to Chair, advising that Inland Rail would be happy to brief the committee on the Inland Rail project.

Sent

- 2 October 2019 – Letter from Chair to Mr Richard Wankmuller, Chief Executive Officer, Inland Rail, requesting a confidential briefing on the progress of Inland Rail.

5. Inquiry into the costs for remediation of sites containing coal ash repositories

5.1 Revised inquiry timeline

Resolved on the motion of Ms Boyd: That the committee adopt the following timeline for the administration of the inquiry:

- Sunday 16 February 2020 – submission closing date
- March/April 2020 – hearing and site visits
- Late June 2020 – report deliberative
- Wednesday 1 July 2020 – table report.

5.2 Public submissions

The committee noted that the following submissions were published by the committee clerk under the authorisation of the resolution appointing the committee: submission nos. 1, 4, 5, 7, 8, 9-13, 15, 16, 18-20, 22-32, 35, 36, 38, 39, 41-54, 56-63, 65, 66, 70-73, 75-77.

5.3 Partially confidential submissions

Resolved on the motion of Ms Boyd: That the committee keep the following information confidential, as per the request of the author: names and/or identifying and sensitive information in submissions nos. 2, 3, 6, 14, 17, 21, 33, 34, 37, 40, 55, 64, 67-69 and 74.

5.4 Site visit proposal

The committee discussed the site visit location as Lake Macquarie on Friday 27 March 2020 with:

- the morning involving a tour of Lake Macquarie to set the geographical context of the Eraring and Vales Point power stations and the viewing of an ash dam, and
- the remainder of the day to be a public hearing, inviting Lake Macquarie Council and local community members as witnesses.

6. Briefing on the Inland Rail project

The committee received a briefing on the Inland Rail project from:

- Richard Wankmuller, CEO of Inland Rail
- Rebecca Pickering, Director, Engagement, Environment & Property
- Duncan Mitchell, Project Director for Narromine to Narrabri
- Simon Eldridge, Director of Government and Stakeholder Relations
- Clementine Julian, Government Relations Advisor for NSW.

7. Adjournment

The committee adjourned at 3.40 pm, until Friday, 27 March 2020 for site visit activity for the coal ash remediation inquiry.

Rebecca Main
Committee Clerk

Minutes no. 4
Thursday 28 May 2020
Public Works Committee
Virtual meeting via Webex, 9.30 am

1. Members present

Mr Mookhey, *Chair*
Mr Banasiak, *Deputy Chair* (from 9.38 am)
Ms Boyd
Mr Farraway

Mr Khan
Mr Mallard
Ms Moriarty (from 9.37 am)

2. Previous minutes

Resolved, on the motion of Mr Khan: That draft minutes no. 3 be confirmed.

3. Correspondence

The committee noted the following items of correspondence:

Received

- 13 March 2020 - Email from Mr Rhys Thomas, Policy Advisor, Australian Energy Council, declining witness invitation to appear at 30 March 2020 Public Works hearing
- 16 March 2020 - Email from Mr Chris Jonkers, Vice President, Lithgow Environment Group Inc, declining witness invitation to appear at Public Works 30 March 2020 hearing due to prior commitments and COVID-19
- 16 March 2020 - Email from Ms Margaret Sewell, Secretary, Bathurst Community Climate Action Network, declining witness invitation to appear at Public Works 30 March 2020 hearing
- 17 March 2020 - Email from Ms Selene Hung, Associate Director, Parliamentary Services, Treasury NSW, advising Treasury will coordinate witnesses from Treasury not organise witnesses from across the NSW government agencies

Sent

- 19 March 2020 – Email from secretariat to Ms Selene Hung, Associate Director, Parliamentary Services, NSW Treasury, advising the Public Works hearing is postponed due to the COVID-19 pandemic
- 19 March 2020 – Email from Secretariat to Ms Kellie Harris and Mr Browne, Lake Macquarie Council Chambers, advising the Public Works off-site hearing on 27th March 2020 is postponed due to the COVID-19 pandemic
- 19 March 2020 – Email from Secretariat to Mr Justin Flood, Vales Point Power Station, advising the Public Works site visit on 27 March 2020 will be postponed due to the COVID-19 pandemic
- 19 March 2020 – Email from Secretariat to all proposed witnesses, advising the Public Works hearings on 27th March and 30th March 2020 are postponed due to the COVID-19 pandemic

4. Inquiry into the costs for remediation of sites containing coal ash repositories

4.1 Public submissions

The committee noted that the following submissions were published by the committee clerk under the authorisation of the resolution appointing the committee: submission nos. 78-83.

Resolved on the motion of Mr Mallard: That the committee authorise the publication of submission no. 38.

Resolved on the motion of Ms Boyd: That the committee accept and authorise the publication of submission no. 84.

4.2 Revised inquiry timeline

Resolved on the motion of Ms Boyd: That, subject to health advice, the committee adopt the following amended timeline for the administration of the inquiry:

- August 2020 – site visit and hearing in Lake Macquarie and/or Newcastle
- August/September 2020 – two hearings at Parliament House.

4.3 Additional witnesses

Resolved on the motion of Ms Boyd: That the NSW Environment Protection Authority and Dams NSW be invited to appear before the committee.

4.4 Revised site visit proposal

The committee discussed rescheduling the site visit to Lake Macquarie with a view to:

- approaching Professor Stuart Khan, University of New South Wales, University of Wollongong and/or others as nominated by members, seeking a guide to facilitate a tour of the sites at Lake Macquarie relevant to the inquiry terms of reference,
- tour the ash dam facilities at Eraring and/or Vales Point power stations.

4.5 Extension of reporting date

Resolved on the motion of Mr Farraway: That the reporting date be extended to 31 March 2021.

5. Adjournment

The committee adjourned at 9.55 am, *sine die*.

Allison Stowe
Committee Clerk

Minutes no. 5
Tuesday 1 September 2020
Public Works Committee
Macquarie Room, Parliament House, 9.18 am

1. Members present

Mr Mookhey, *Chair*
Mr Banasiak, *Deputy Chair*
Ms Boyd
Mr Fang (substituting for Mr Farraway) *(via Webex)* (from 9.20 am)
Mr Khan
Mr Mallard (from 9.22 am)
Ms Moriarty (from 9.19 am until 12.45 pm, from 2.58 pm)

2. Previous minutes

Resolved, on the motion of Mr Banasiak: That draft minutes no. 4 be confirmed.

3. Correspondence

The committee noted the following items of correspondence:

Received

- 29 May 2020 – Letter from Ms Jo Lynch, Hunter Community Environment Centre to committee, inviting the committee on a tour of sites near Vales Point and Eraring waste dams
- 29 July 2020 – Letter from Professor Stuart Khan, School of Civil & Environmental Engineering, UNSW to secretariat, providing suggestions for guides for the committee's site visit to Lake Macquarie
- 21 August 2020 – Letter from Government Whip to secretariat, advising that the Hon Wes Fang MLC will be substituting for the Hon Sam Farraway MLC at the public hearing on 1 September 2020
- 25 august 2020 – Email from Ms Renee Winsor, Environment Planning Manager, Wollongong City Council to secretariat, advising that representatives are unable to attend hearing on 1 September 2020.

Sent

- 21 July 2020 – Letter from secretariat to Professor Stuart Khan, School of Civil & Environmental Engineering, UNSW, seeking suggestions of a guide for the committee's site visit to Lake Macquarie.

4. Inquiry into the costs for remediation of sites containing coal ash repositories

4.1 Submissions

Resolved, on the motion of Mr Khan: That the committee authorise the publication of supplementary submission no. 39a.

4.2 Site visit and hearing – Lake Macquarie

The committee noted that the site visit to Lake Macquarie to tour ash dam facilities at Eraring and/or Vales Point power stations, and hold a half day hearing in either Lake Macquarie or Newcastle is confirmed for Tuesday 6 October 2020.

The committee considered the correspondence from Professor Stuart Khan, UNSW, dated 29 July 2020, suggesting potential guides for the tour of sites at Lake Macquarie relevant to the inquiry's terms of reference.

Resolved, on the motion of Mr Khan: That the secretariat contact Ross McFarland (AECOM) and / or Ian Gregson (GHD) seeking their availability to conduct a tour of sites at Lake Macquarie relevant to the terms of reference and if any costs are involved.

4.3 Allocation of questioning

Resolved, on the motion of Mr Banasiak: That the sequence of questions to be asked during the inquiry hearings be left in the hands of the Chair.

4.4 Public hearing

Witnesses were admitted.

The Chair made an opening statement regarding the broadcasting of proceedings and other matters.

The following witnesses were sworn and examined:

- Mr Justin Flood, Executive Manager Sustainability, Delta Electricity
- Mr Greg Everett, Managing Director, Delta Electricity
- Mr Greg Jarvis, Executive General Manager, Energy Supply and Operations, Origin Energy Limited
- Mr Glenn Orgias, General Manager Commercial Transactions, Origin Energy Limited
- Mr Steve Rieniets, Group General Manager Operations – Integrated Energy, AGL Macquarie Pty Limited (via videoconference)
- Ms Susan Rose, Group Counsel – Environment, Safety & Approvals, AGL Macquarie Pty Limited.

The evidence concluded and the witnesses withdrew.

The following witnesses were sworn and examined:

- Dr Kathleen Wild, Member, Doctors for the Environment (via videoconference)
- Mr Chris Gambian, Chief Executive, Nature Conservation Council of NSW
- Ms Liz Hadjia, Climate and Energy Campaigner, Nature Conservation Council of NSW
- Ms Bronya Lipski, Lawyer, Environmental Justice Australia (via videoconference).

The evidence concluded and the witnesses withdrew.

4.5 *In camera* hearing

Resolved, on the motion of Mr Khan: That the Committee proceed to take evidence from Mr Paul Winn, Mr Gary Blaschke OAM, Ms Bernadette Mullaney, and Mr Chris Jonkers *in camera*.

The following witnesses were sworn and examined:

- Mr Paul Winn, Member, Hunter Community Environment Centre
- Mr Gary Blaschke OAM, Member, Coal-Ash Community Alliance Inc
- Ms Bernadette Mullaney, Member, Bathurst Community Climate Action Network (via videoconference)
- Mr Chris Jonkers, Vice President, Lithgow Environment Group Inc (via videoconference).

The Committee proceeded to take *in camera* evidence.

Persons present other than the Committee: Emma Rogerson, Taylah Cauchi, Stewart Smith and Hansard Reporters.

Mr Winn tendered drone footage of five operating coal ash dams and Wallerawang.

Resolved, on the motion of Mr Khan: That the hearing resume in public.

4.6 Public hearing

Mr Blaschke OAM tendered the following documents:

- Opening statement
- Additional comments.

The evidence concluded and the witnesses withdrew.

The public hearing concluded at 3.18 pm.

4.7 Tendered documents

Resolved, on the motion of Ms Moriarty: That, pending advice from the secretariat regarding publication on the inquiry webpage, the committee accept and publish the drone footage of five operating coal ash dams and Wallerawang, tendered by Mr Paul Winn, Member, Hunter Community Environment Centre.

Resolved, on the motion of Mr Khan: That the consideration of the publication of the following documents be deferred until reviewed by the secretariat:

- Opening statement, tendered by Mr Gary Blaschke OAM, Member, Coal-Ash Community Alliance Inc
- Additional comments, tendered by Mr Gary Blaschke OAM, Member, Coal-Ash Community Alliance Inc.

4.8 *In camera* transcript of evidence – 1 September 2020

Resolved, on the motion of Mr Khan: That the committee redact the name and position title of the health official named by Mr Blaschke in the transcript of *in camera* evidence dated 1 September 2020.

Resolved, on the motion of Ms Boyd: That the committee authorise the publication of the transcript of *in camera* evidence given on 1 September 2020.

4.9 Additional witnesses – Hearing 16 October 2020

Resolved, on the motion of Mr Khan: That the Chair, on behalf of the committee, write to Dams NSW and NSW EPA forwarding the transcript of evidence dated 1 September 2020 and seeking a response to comments and issues raised.

Resolved, on the motion of Mr Banasiak: That:

- Transport NSW be invited to appear as a witness at the hearing on 16 October 2020
- the Chair, on behalf of the committee, write to Transport NSW seeking a response to comments and issues raised in the transcript of evidence dated 1 September 2020.

5. Other business

The committee noted that Ms Boyd agreed to undertake to provide documents tabled in the Legislative Council under Standing Order 52 in relation to the Sale of the Vales Point Power Station and Eraring Energy.

6. Adjournment

The committee adjourned at 3.30 pm, until Tuesday 6 October 2020, TBC, Lake Macquarie site visit and hearing).

Emma Rogerson
Committee Clerk

Minutes no. 6
Tuesday 6 October 2020
Public Works Committee
Myuna Bay Rest Area, Myuna Bay, 9.28 am

1. Members present
Mr Mookhey, *Chair*
Mr Farraway
Ms Boyd
Mr Khan
Mr Mallard
Ms Moriarty

2. Apologies
Mr Banasiak, *Deputy Chair*

3. Inquiry into costs for remediation of sites containing coal ash repositories

3.1 Site visit – Guided tour of sites around Lake Macquarie relevant to the terms of reference
The committee met with Ms Johanna Lynch and Mr Paul Winn of Hunter Community Environment Centre and toured sites between Myuna Bay/Eraring Power Station and Vales Point Power Station.

Mr Winn provided the committee with a map of sites around Lake Macquarie impacted by water pollution from the coal ash dams.

3.2 Site visit – Vales Point Power Station
The committee toured the Vales Point Power Station ash dam with representatives from Delta Electricity.

3.3 Public hearing

Witnesses and the media were admitted.

The Chair made an opening statement regarding the broadcasting of proceedings and other matters.

The Chair noted that Members of Parliament swear an oath to their office, and therefore do not need to be sworn prior to giving evidence before a committee.

The Mr Greg Piper MP, Member for Lake Macquarie was admitted and examined.

The following witness was sworn and examined:

- Mr Tim Browne, Manager Environmental Systems, Lake Macquarie City Council.

The evidence concluded and the witnesses withdrew.

The following witnesses were sworn and examined:
- Ms Lyn Fraser, Member, Warners Bay Area Sustainable Neighbourhood Group
- Mr David Tait, Member, Keep Lake Macquarie Clean
- Mr Bruce Macfarlane, Member, Keep Lake Macquarie Clean
- Mr Stephen Dewar, Secretary, Lake Macquarie Sustainable Neighbourhood Alliance Inc
- Dr Heinz-Joachim Muller, Member, CEN (Community Environment Network) Central Coast & Lake Macquarie.

Mr Macfarlane tendered the following document:

- Supplementary submission from Keep Lake Macquarie Clean.

Mr Tait tendered the following documents:

- Document entitled "What testing exactly do we want?"
- Media article entitled "Crabs in Lake Macquarie contaminated with 'unhealthy' levels of cadmium", Ben Millington, *ABC News*, 11 March 2019.

The evidence concluded and the witnesses withdrew.

The public hearing concluded at 2.49 pm.

3.4 Tendered documents

Resolved, on the motion of Ms Boyd: That the consideration of the publication of the following documents be deferred until reviewed by the secretariat:

- Supplementary submission tendered by Mr Bruce Macfarlane, Keep Lake Macquarie Clean
- Document entitled "What testing exactly do we want?", tendered by Mr David Tait, Keep Lake Macquarie Clean
- Media article entitled "Crabs in Lake Macquarie contaminated with 'unhealthy' levels of cadmium", Ben Millington, *ABC News*, 11 March 2019, tendered by Mr David Tait, Keep Lake Macquarie Clean.

4. Other business

Resolved, on the motion of Ms Boyd: That the Chair write to Dr Ian Wright, aquatic ecologist lecturing in environmental science at Western Sydney University, requesting a submission on certain issues relating to the inquiry's terms of reference.

5. Adjournment

The committee adjourned at 3.00 pm, until Friday 16 October 2020, 9.15 am, Macquarie Room, Parliament House (public hearing).

Emma Rogerson
Committee Clerk

Minutes no. 7
Friday 16 October 2020
Public Works Committee
Macquarie Room, Parliament House, 9.19 am

1. Members present

Mr Mookhey, *Chair*
Mr Banasiak, *Deputy Chair*
Ms Boyd
Mr Farraway (until 10.30 am, from 1.04 pm)
Mr Khan (from 10.46 am until 11.49 am)
Mr Mallard (via Webex, from 9.22 am until 1.56 pm)
Ms Moriarty (until 10.30 am, from 1.03 pm)

2. Previous minutes

Resolved, on the motion of Ms Boyd: That draft minutes nos. 5 and 6 be confirmed.

3. Correspondence

The committee noted the following items of correspondence:

Received

- 4 September 2020 – Email from Mr Ian Gregson, GHD, to secretariat, declining invitation to facilitate tour of sites around Lake Macquarie on 6 October 2020 due to conflict of interest
- 15 September 2020 – Letter from Ms Tracy Mackey, Chief Executive Officer, NSW EPA to Chair, accepting invitation to give evidence at public hearing on 16 October 2020
- 21 September 2020 – Email from Ms Suzanne Pritchard, President-Secretary, Coal Point Progress Association to secretariat, advising she is unable to attend the public hearing on 6 October 2020 in Lake Macquarie
- 23 September 2020 – Email from Mr Ross McFarland, AECOM to secretariat, advising that he is unavailable to facilitate a tour of sites around Lake Macquarie due to work commitments in Canberra
- 28 September 2020 – Email from Ms Jo Lynch, Coordinator, Hunter Community Environment Centre, to secretariat advising that both her and Mr Paul Winn will be available to facilitate a guided tour of site around Lake Macquarie relevant to the terms of reference on 6 October 2020
- 9 October 2020 – Letter from Mr Rodd Staples, Secretary, Transport for NSW to Chair, providing a response to correspondence dated 4 September 2020 and declining the invitation to give evidence at the hearing on 16 October 2020
- 13 October 2020 – Email from Ms Rachel Simpson, Chief of Staff, Office of the Secretary, Transport for NSW to secretariat, advising Transport for NSW will attend the hearing on 16 October 2020.

Sent

- 3 September 2020 – Letter from secretariat to Mr Ross McFarland, AECOM, seeking availability and cost to facilitate tour of sites around Lake Macquarie relevant to the terms of reference on 6 October 2020
- 3 September 2020 – Letter from secretariat to Mr Ian Gregson, GHD, seeking availability and cost to facilitate tour of sites around Lake Macquarie relevant to the terms of reference on 6 October 2020
- 4 September 2020 – Letter from Chair, to Mr Chris Salkovic, Chief Executive Officer, Dams Safety NSW, forwarding transcript of evidence dated 1 September 2020 for opportunity to respond to comments and issues raised
- 4 September 2020 – Letter from Chair, to Ms Tracey Mackey, Chief Executive Officer, NSW EPA, forwarding transcript of evidence dated 1 September 2020 for opportunity to respond to comments and issues raised
- 4 September 2020 – Letter from Chair, to Mr Rodd Staples, Secretary, Transport NSW forwarding transcript of evidence dated 1 September 2020 for opportunity to respond to comments and issues raised
- 7 September 2020 – Email from secretariat to Dr Larissa Schneider, DECRA Fellow, College of Asia & the Pacific, ANU, inviting her to make a submission to the inquiry
- 28 September 2020 – Email from secretariat to Ms Jo Lynch, Coordinator, Hunter Community Environment Centre, seeking availability of representatives to facilitate a guided tour of site around Lake Macquarie relevant to the terms of reference on 6 October 2020
- 13 October 2020 – Letter from Chair to Hunter Community Environment Centre, thanking them for facilitating site visit on 6 October 2020
- 13 October 2020 – Letter from Chair to Delta Electricity, thanking them for facilitating site visit on 6 October 2020
- 12 October 2020 – Letter from Chair to Dr Ian Wright, Senior Lecturer, Science Western Sydney University, inviting him to make a submission on certain issues relating to the inquiry's terms of reference
- 13 October 2020 – Letter from Chair to Mr Rodd Staples, Secretary, Transport for NSW, asking Transport for NSW to reconsider the invitation to give evidence at the public hearing on 16 October 2020.

4. Inquiry into costs for remediation of sites containing coal ash repositories

4.1 Public submissions

Resolved, on the motion of Mr Farraway: That the committee authorise the publication of supplementary submission no. 48a.

4.2 Answers to questions on notice and supplementary questions

The committee that the following answers to questions on notice were published by the committee clerk under the authorisation of the resolution appointing the committee:

- answers to questions on notice from Mr Paul Winn, Hunter Community Environment Centre, received 7 September 2020
- answers to questions on notice from Delta Electricity received 8 September 2020
- answers to questions on notice from Origin Energy, received 28 September 2020
- answers to questions on notice from AGL, received 28 September 2020
- answers to questions on notice from Ms Bronya Lipski, Environmental Justice Australia, received 2 October 2020.

4.3 Tendered documents – 1 September 2020

Resolved, on the motion of Mr Banasiak: That the committee accept and publish the following documents tendered during the public hearing, with the exception of identifying and/or sensitive information which are to remain confidential, as per the recommendation of the secretariat:

- Opening statement, tendered by Mr Gary Blaschke OAM, Coal-Ash Community Alliance Inc
- Additional comments, tendered by Mr Gary Blaschke OAM, Coal-Ash Community Alliance Inc.

4.4 Tendered documents – 6 October 2020

Resolved, on the motion of Ms Boyd: That the committee accept and publish the following documents tendered during the public hearing, as per the recommendation of the secretariat:

- Document entitled "What testing exactly do we want?", tendered by Mr David Tait
- Media article entitled "Crabs in Lake Macquarie contaminated with 'unhealthy' levels of cadmium", Ben Millington, ABC News, 11 March 2019, tendered by Mr David Tait.

Resolved, on the motion of Ms Moriarty: That the committee accept and publish the following document tendered during the public hearing as a supplementary submission as per the recommendation of the secretariat:

- Supplementary submission tendered by Mr Bruce Macfarlane.

4.5 Tendered documents from SO52 in relation to the Sale of the Vales Point Power Station and Eraring Energy – Ms Boyd

The committee noted the following documents tabled by Ms Boyd for the inquiry, as tabled in the Legislative Council under Standing Order 52 in relation to the Sale of the Vales Point Power Station and Eraring Energy:

1. Bayswater Power Station

a. Preliminary Environmental Site Assessment - Part 1 – Environmental Resources Management - October 2013

b. Stage 2 Environmental Site Assessment - Part 1 - Environmental Resources Management - 31 January 2014

2. Eraring Power Station

a. Preliminary Environmental Site Assessment - Part 1 – Environmental Resources Management - 27 June 2013

b. Stage 2 Environmental Site Assessment - Part 1 - Environmental Resources Management - December 2015

3. Liddell Power Station

a. Preliminary Environmental Site Assessment - Part 1 – Environmental Resources Management - October 2013
b. Stage 2 Environmental Site Assessment - Part 1 - Environmental Resources Management - 31 January 2014
c. Updated Groundwater Quality Assessment - Part 1 – Environmental Resources Management - 5 June 2015

4. Liddell and Bayswater Power Stations - Stage 2 PFAS Investigation - Part 1 - AECOM - 28 June 2019

5. Mt Piper Power Station

a. Preliminary Environmental Site Assessment - Part 1 – Environmental Resources Management - July 2013
b. Sampling Analysis and Quality Plan - Part 1 - Environmental Resources Management - September 2013
c. Stage 2 Environmental Site Assessment - Part 1 - Environmental Resources Management - August 2014

6. Vales Point Power Station

a. Preliminary Environmental Site Assessment - Part 1 – Environmental Resources Management - 5 February 2014
b. Stage 2 Environmental Site Assessment - Part 1 - Environmental Resources Management - July 2014
c. A Station, Environmental Site Assessment - Part 1 – Environmental Resources Management - September 2014
d. Additional Baseline Contamination Assessment - Part 1 - Jacobs – July 2017
e. Consolidated PFAS Report - Part 1 - Jacobs - 14 December 2018

The committee noted that these documents are available for viewing upon request from the secretariat.

Resolved, on the motion of Ms Boyd: That, pending advice from the secretariat regarding the publication on the inquiry webpage, the committee authorise publication of the documents tabled by Ms Boyd from the SO52 in relation to the Sales of the Vales Point Power Station and Eraring Energy.

4.6 Public hearing

Witnesses, the public and the media were admitted.

The Chair made an opening statement regarding the broadcasting of proceedings and other matters.

The following witnesses were sworn and examined:

- Mr Craig Heidrich, Chief Executive Officer, Ash Development Association of Australia *(via videoconference)*
- Mr Stephen Blanks, Director, Vecor Australia
- Mr Mark Ramsey, Director, Vecor Australia
- Mr Michael Lord, Lead Researcher, Beyond Zero Emissions *(via videoconference)*
- Ms Fiona Robinson, Regional Director, Australia and New Zealand, Ramboll Australia *(via videoconference)*.

The evidence concluded and the witnesses withdrew.

The following witnesses were sworn and examined:

- Ms Charlotte Alexander, Executive Director, Commercial Assets, NSW Treasury

- Ms Pamela Henderson, Executive Director Technical Services, Infrastructure & Place, Transport for NSW.

The evidence concluded and the witnesses withdrew.

The following witnesses were sworn and examined:

- Mr David Fowler, Executive Director, Regulatory Practice and Environmental Solutions, NSW Environment Protection Authority
- Mr Adam Gilligan, Director, Regulatory Operations Metropolitan North, NSW Environment Protection Authority
- Mr Chris Salkovic, Chief Executive Officer, Dams Safety NSW
- Mr Peter Boyd, Governance and Assurance Manager, Dams Safety NSW

The evidence concluded and the witnesses withdrew.

The hearing concluded at 2.33 pm.

5. Adjournment

The committee adjourned at 2.37 pm, *sine die.*

Emma Rogerson
Committee Clerk

Draft minutes no. 8
Monday 15 March 2021
Public Works Committee
Room 1043, Parliament House, 1.06 pm

1. Members present

Mr Mookhey, *Chair*
Mr Banasiak, *Deputy Chair*
Ms Boyd
Mr Farraway
Mr Khan
Mr Mallard
Ms Moriarty (from 1.12 pm)

2. Previous minutes

Resolved, on the motion of Mr Banasiak: That draft minutes no. 7 be confirmed.

3. Correspondence

The committee noted the following items of correspondence:

Received

- 16 October 2020 – Email from Ms Johanna Lynch, Coordinator, Hunter Community Environment Centre to secretariat, providing copy of supporting documents provided to committee during site visit at Myuna Bay on 6 October 2020
- 26 October 2020 – Email from Ms Johanna Lynch, Coordinator, Hunter Community Environment Centre to committee, advising that HCEC has engaged economist Dr. Ingrid Schraner to look into coal-ash waste reuse and will share any new information as it arises

- 2 November 2020 – Email from Mr David Tait, Member, Keep Lake Macquarie Clean to secretariat, providing a copy of the Keep Lake Macquarie Clean Eraring Ash Dam Monitoring report referred to during evidence on 6 October 2020
- 12 November 2020 – Letter from Mr Chris Salkovic, Chief Executive Officer, Dams Safety NSW to Chair, seeking to clarify and correct evidence given on 16 October 2020
- 16 November 2020 – Letter from Mr Michael Pratt, Secretary, NSW Treasury to Chair, seeking to clarify evidence given by NSW Treasury witness, Ms Charlotte Alexander, Executive Director, Commercial Assets, NSW Treasury at the hearing on 16 October 2020
- 17 December 2020 – Email from Dr Ingrid Schraner, LilliPilli Consulting on behalf of the Hunter Community Environment Centre, providing copy of commissioned report entitled Re-using coal-ash in New South Wales: Economic considerations
- 17 February 2021 – Email from Pat Dunn, COO, Terra System Pty Lt to committee, expressing support for the Hunter Community Environment Centre's recommendation 5 concerning a feasibility study into the environmentally responsible reuse of coal ash in NSW
- 19 February 2021 – Letter from Ms Hasti Kalarostaghi, Partner, Sydney, Hunt & Hunt Lawyers to committee, seeking to clarify the transcript of evidence of Delta Electricity dated 1 September 2020 and responses to questions on notice provided by Delta Electricity on 8 September 2020 in relation to notices issued by the NSW EPA.

Resolved, on the motion of Ms Boyd: That the committee authorise the publication of correspondence from:

- Ms Johanna Lynch, Coordinator, Hunter Community Environment Centre, regarding supporting documentation provided to the committee during site visit at Myuna Bay on 6 October 2020, dated 16 October 2020
- Dr Ingrid Schraner, LilliPilli Consulting, providing copy of commissioned report entitled Re-using coal-ash in New South Wales: Economic considerations, dated 17 December 2020

Resolved, on the motion of Mr Khan: That the committee:

- authorise publication of correspondence from Ms Hasti Kalarostaghi, Partner, Sydney, Hunt & Hunt Lawyers seeking to correct the transcript of evidence of Delta Electricity dated 1 September 2020 and responses to questions on notice provided by Delta Electricity on 8 September 2020 in relation to notices issued by the NSW EPA
- authorise the insertion of a footnote to page 18 of Delta Electricity's transcript of evidence from 1 September 2020, as per the recommendation of the secretariat.

4. Inquiry into costs for remediation of sites containing coal ash repositories

4.1 Answers to questions on notice and supplementary questions

The following answers to questions on notice and supplementary questions were published by the committee clerk under the authorisation of the resolution appointing the committee:

- answers to questions on notice from Mr Craig Heidrich, Chief Executive Officer, Ash Development Association of Australia, received 20 October 2020
- answers to questions on notice from Mr Mark Ramsey, Vecor Technologies Pty Limited, received 6 November 2020
- answers to questions on notice from Transport for NSW, received on 11 November 2020
- answers to questions on notice from Dams Safety NSW, received on 12 November 2020
- answers to questions on notice from NSW EPA, received on 12 November 2020
- answers to questions on notice from NSW Treasury, received on 16 November 2020.

4.2 Transcript clarifications– 16 October 2020

Resolved, on the motion of Mr Banasiak: That the committee authorise the insertion of a footnote to:

- Page 35 of Dams Safety NSW's transcript of evidence from 16 October 2020, as requested by the witness
- page 20 of NSW Treasury's transcript of evidence from 16 October 2020, as requested by the witness.

4.3 Tabled documents from SO52 in relation to the Sale of the Vales Point Power Station and Eraring Energy – Ms Boyd

The committee to note that, as per the resolution of 16 October 2020, the documents tabled by Ms Boyd form the SO52 in relation to the Sales of the Vales Point Power Station and Eraring Energy have been published on the inquiry webpage.

4.4 Attachments to submissions

Resolved, on the motion of Mr Khan: That the committee authorise the publication of attachments 1-2 to submission no. 81.

4.5 Consideration of Chair's draft report

The Chair submitted his draft report entitled *Costs for remediation of sites containing coal ash repositories,* which, having been previously circulated, was taken as being read.

Resolved, on the motion of Ms Boyd: That the following paragraph 1.10 be omitted: 'Inquiry participants were divided in their views as to whether coal ash posed any risks. Industry representatives and power station operators claimed there were technical processes that could be carried out, but are not currently, to make coal ash non-toxic and inert whereas community members, environmental groups and health professionals argued it was hazardous waste material that posed significant health and environmental risks', and the following new paragraph be inserted instead:

'Inquiry participants were divided in their views as to whether coal ash posed any risks. Community members, environmental groups and health professionals, who gave evidence to the committee, argued that coal ash should be treated as hazardous waste material that posed significant health and environmental risks. Although not sharing the same concerns, industry representatives and power station operators commented that there were technical processes that could be carried out, but are not currently, to make coal ash non-toxic and inert.' [FOOTNOTE: Submission 2, Name suppressed, p 1; Submission 4, Coal-ash Community Alliance Inc, pp 2 and 4; Submission 5, Beyond Zero Emissions, p 1; Submission 21, Name suppressed, p 1; Submission 24, Mr Graeme Batterbury, p 1; Submission 25, Mr Gilbert Walker, p 1; Submission 26, Dr James Whelan, p 1; Submission 27, Bruce Derkenne, p 1; Submission 36, Lake Macquarie Sustainable Neighbourhood Alliance Inc, p 6; Submission 39a, Hunter Community Environment Centre, p 4; Submission 47, Doctors for the Environment Australia, p 3; Submission 57, Central Coast Community Energy Association Inc (CCCE), p 4; Submission 72, Ms Tonia Gardiner, p 1; Submission 79, Nature Conservation Council of NSW, p 1; Submission 81, Environmental Justice Australia, p 15. Submission 11, Vecor Australia Pty Limited, pp 5, 8-9; Submission 84, Polyagg, p 1; Evidence, Mr Justin Flood, Executive Manager Sustainability, Delta Electricity, 1 September 2020, p 13; Evidence, Mr Greg Everett, Managing Director, Delta Electricity, 1 September 2020, p 16; Evidence, Mr Mark Ramsey, Director and Chief Executive, Vecor Australia Pty Ltd, 16 October 2020, p 2; Evidence, Mr Craig Heidrich, Chief Executive Officer, Ash Development Association of Australia, 16 October 2020, p 3.]

Resolved, on the motion of Ms Boyd: That paragraph 1.32 be amended by omitting 'under' and inserting instead 'regarding to'.

Resolved, on the motion of Ms Boyd: That Recommendation 2 be amended by:

(a) inserting 'all' after 'sites surrounding'

(b) inserting at the end 'by 1 July 2022.'

Resolved, on the motion of Ms Boyd: That Recommendation 3 be amended by inserting 'all' before 'coal fired power stations'.

Resolved, on the motion of Ms Boyd: That the following new recommendation be inserted after Recommendation 4:

'Recommendation X

That Dams Safety NSW publish on its website in a timely manner, where practicable, all ash dam assessments and responses undertaken by Dams Safety NSW or submitted to it by power station operators from time to time.'

Resolved, on the motion of Ms Boyd: That paragraph 3.18 be amended by inserting 'The NSW EPA further stated' before 'when deciding which option'.

Resolved, on the motion of Ms Boyd: That Recommendation 6 be amended by inserting at the end: 'and publish by 31 December 2022.'

Resolved, on the motion of Ms Boyd: That paragraph 3.73 be amended by omitting 'We are perplexed by the decision to immediately close the centre without any consideration to implement remediation works to rectify the risk posed by the ash dam'.

Resolved, on the motion of Ms Boyd: That Finding 2 be amended by omitting 'could have been handled better' and inserting instead: 'was made with inadequate community consultation'.

Resolved, on the motion of Ms Boyd: That paragraph 4.11 be amended by inserting the following footnote after 'recycling target', [FOOTENOTE: Submission 15, Mr Greg Piper MP, p 3.]

Resolved, on the motion of Ms Boyd: That paragraph 4.16 be amended by inserting at the end: 'with an average of about 53 per cent globally'.

Resolved, on the motion of Ms Boyd: That paragraph 4.17 be omitted: 'The Hunter Community Environment Centre suggested that only 20 per cent of coal ash produced in New South Wales is recycled, compared to an average of about 53 per cent globally.'

Resolved, on the motion of Ms Boyd: That paragraph 4.21 be amended by omitting 'Each of the main uses as identified above are explained below' and inserting instead: 'The main uses are explained below'.

Resolved, on the motion of Ms Boyd: That paragraph 4.94 be amended by inserting 'continued risks regarding land that has not been adequately remediated' before 'and the locking up'.

Resolved, on the motion of Ms Boyd: That Recommendation 8 be omitted: 'That the newly established coal ash reuse taskforce review regulations affecting coal ash reuse, including:

- the regulation of ash dams
- waste standards to ensure that coal ash is not contaminated with other waste, and
- land remediation

to ensure the safe and beneficial reuse of coal ash while promoting strong environmental standards.'

and the following new recommendation be inserted instead:

'That the newly established coal ash reuse taskforce inquire into and review regulations affecting coal ash reuse, including:

- the stability and regulation of ash dams,
- waste standards to ensure that coal ash is not contaminated with other waste, and
- land remediation, including the state and effectiveness of current capping, the current and future risk of leakage of contamination into the surrounding environment, and impacts of vegetation cover (including any contaminated vegetation, release of contaminants into the air via transpiration and cracking of capping materials)

to ensure the safe and beneficial reuse of coal ash while promoting strong environmental and public health standards.'

Resolved, on the motion of Ms Boyd: That Recommendation 12 be amended by inserting 'and other interested parties' after 'Ash Development Association of Australia'.

Resolved, on the motion of Ms Boyd: That paragraph 4.102 be amended by inserting 'stored' before 'produced and the destination'.

Resolved, on the motion of Ms Boyd: That Recommendation 13 be amended by inserting 'stored' after 'quantity of coal ash'.

Resolved, on the motion of Ms Boyd: That the following new recommendation be inserted after paragraph 4.103:

'Recommendation X
That the NSW Government promote circular economy principles when dealing with coal ash waste and promoting reuse, including facilitating consultation between regulatory bodies, electricity generators and key stakeholders in recycling, local government and construction sectors.'

Resolved, on the motion of Ms Boyd: That the following paragraph 5.41 be omitted: 'We note that power station operators claimed, that while no assessments had been undertaken to determine the quantum of government liability for remediation of pre-existing contamination at the sites, the government would not be liable.'

Resolved, on the motion of Ms Boyd: That the following paragraph 5.43 be omitted: 'The committee acknowledges inquiry participant's concerns that there may be an actual or perceived conflict of interest by the government given the dual role it holds in relation to the coal ash dams – on the one hand, as the body liable for remediation of contamination of sites and on the other, as the body that creates policy and regulation. However, the committee is of the view that there is insufficient evidence to draw any sound conclusions on this matter.'

Resolved, on the motion of Mr Banasiak: That:

a) the draft report, as amended, be the report of the committee and that the committee present the report to the House;

b) the transcripts of evidence, submissions, tabled documents, answers to questions on notice, and correspondence relating to the inquiry be tabled in the House with the report;

c) upon tabling, all unpublished attachments to submissions be kept confidential by the committee;

d) upon tabling, all unpublished transcripts of evidence, submissions, tabled documents, answers to questions on notice, and correspondence relating to the inquiry, be published by the committee, except for those documents kept confidential by resolution of the committee;

e) the committee secretariat correct any typographical, grammatical and formatting errors prior to tabling;

f) the committee secretariat be authorised to update any committee comments where necessary to reflect changes to recommendations or new recommendations resolved by the committee;

g) dissenting statements be provided to the secretariat within 24 hours after receipt of the draft minutes of the meeting;

h) the report be tabled by 22 March 2021.

i) the Chair to advise the secretariat and members if they intend to hold a press conference, and if so, the date and time.

5. Adjournment

The committee adjourned at 2.00 pm, *Sine die.*

Emma Rogerson
Committee Clerk