BEFORE THE INDEPENDENT PLANNING COMMISSION

PUBLIC HEARING HELD ON 2-3 JULY 2020

FOR THE VICKERY EXTENSION PROJECT

CLOSING SUBMISSIONS

FOR

LOCK THE GATE

(14 JULY 2020)

NOTE: These closing submissions replace the Opening Submissions provided to the Commission prior to the Public Hearing.

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INTRODUCTION

1. Lock the Gate (**LTG**) is a network of groups and individuals throughout Australia that are concerned about the impacts of coal mining.

2. LTG seeks a determination that the Vickery Extension (**Project**) be refused development consent.

3. In summary, LTG's case is that the Project should be refused approval on the basis of the following issues:

    a. **Groundwater and water availability**: The Project risks adverse impacts on future groundwater quality and quantity within the Namoi River floodplain, including from the long-term groundwater impacts arising from the final void, with associated impacts on water availability for local communities and the environment. The Project is contrary to the public interest and the principles of intergenerational equity and intragenerational equity.

    b. **Climate change**: The Project is not in the public interest and contrary to the principles of ecologically sustainable development (**ESD**) because, in order to ensure that the rise in global temperatures will be limited to well below 2 degrees Celsius above pre- industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius, the Project should not be approved at this time;

    c. **Social and economic impact**: The Project will have a significant negative social impact on residents and the community of Boggabri and the surrounding area, contrary to the public interest and the principle of intergenerational equity. The Project has overstated the economic and jobs benefits of the Project.

    d. **European Heritage**: The property 'Kurrumbede' is formerly the home of the Mackellar family and is closely associated with the poet Dorothea Mackellar who was a frequent visitor to the property. The Project will impact the visual and aesthetic amenity of the homestead, garden, outbuildings and broader rural aspect and as such significantly impact on the preservation of Australia's literary history. The Project is contrary to the public interest and the principle of intergenerational equity.

FACTUAL BACKGROUND

The assessment process

4. On 6 September 2018, the Minister for Planning (**Minister**) requested the Independent Planning Commission of New South Wales (**IPC**) conduct a public hearing into the carrying out of the Vickery Extension Project, to consider the evidence and to publish a report to the (now) Department of Planning, Industry and Environment (**Department**). A public hearing was held on 4-5 February 2019. The IPC published its Issues Report on 30 April 2019. At that time the IPC was not the consent authority; the Issues Report concluded that there were a number of 'key' issues where uncertainty remained about the predicted impacts of the Project.[1]

5. On 19 February 2020 the Minister wrote to the IPC with the following request:

    1. Conduct a further public hearing into the carrying out of the Vickery Extension

[1] IPC Issues Report dated 30 April 2019 at [380]

Project (SSD 7480) prior to determining the development application for the project under the Environmental Planning and Assessment Act 1979, paying particular attention to:

a) the Department of Planning, Industry and Environment's assessment report, including any recommended conditions of consent;

b) key issues raised in public submissions during the public hearing; and

c) any other documents or information relevant to the determination of the development application.

2. Complete the public hearing and make its determination of the development application within 12 weeks of receiving the Departments assessment report in respect of the project, unless the Planning Secretary agrees otherwise.

6. As such, the IPC is now the consent authority for the Project: s 4.5(a) of the EP&A Act & clause 8A of the State and Regional Development state environmental planning policy (**SEPP SRD**).

7. The Department's assessment report was published on 19 May 2020. The referral letter from the Planning Secretary sending the Department's assessment report to the IPC stated as follows:

> *The project would generate significant benefits to NSW and the region including employment for up to 450 FTE workers and 500 construction workers, a direct capital investment in the project of $607 million, a net benefit of $1.16 billion NPV from generation of additional tax revenue and royalties, and funding for local community projects and infrastructure for the Gunnedah and Narrabri LGA through planning agreements.*
>
> *The Department has recommended a comprehensive and precautionary suite of conditions to protect the environment and the amenity of the local community, including conditions to ensure that the project complies with relevant criteria and standards, and residual impacts are effectively minimised, managed and/or at least compensate (sic) for.*
>
> *Based on its assessment and subject to the recommended conditions of consent, the Department considers that the Project is approvable.*

8. Whilst the Project is described variously by the proponent and by the Department as the 'Vickery Extension Project', it is important that the Project is assessed under the *Environmental Planning and Assessment Act 1979* (**EP&A Act**) as if it were a greenfield coal development as the previously approved Vickery Coal Project (**Approved mine**), and its associated environmental and social impacts, has not substantively commenced. This was acknowledged in the IPC Issues Report dated 30 April 2019 at paragraph [97].

9. The evidence (both oral and written) has demonstrated that the Department and the proponent has significantly underestimated the environmental impacts of the Project, in particular the impacts on groundwater quality and quantity within the Namoi River floodplain with associated impacts on water availability for local communities and the impacts of GHG emissions on climate change. At the same time the Department has overestimated the economic benefits of the Project, both to the local community and to NSW as a whole. Insufficient consideration has been given to the social impacts of the Project, in particular on the community of Boggabri, and to the public interest, which tell against the approval of the Project.

ROLE & POWERS OF THE IPC

10. The IPC is a statutory agency: s 2.7(3) of the EP&A Act. It is independent from, and not subject to the direction or control of, the Minister and the Department: s 2.7(2).

11. The Statement of Expectations published by the Minister for the period from 1 May 2020 to 30 June 2021 confirms the importance of the independence of the IPC from Government and from the Department:

> The [IPC] plays an integral role in *upholding the integrity* of the NSW planning system, by fulfilling its *primary purpose* of *providing independent decision making on contentious State significant development applications* … (emphasis added)

12. The Memorandum of Understanding between the Department and IPC (**MoU**) dated 5 May 2020 notes the 'independence' of the IPC and expressly states that it is to bring 'a high level of independence and transparency to the assessment and determination of State significant developments.' Members of the IPC are appointed by the Minister but are 'not subject to the direction or control of the Minister, except in relation to procedural matters.' Further the MoU expressly identifies that the IPC is 'also independent of DPIE and other government agencies, and plays an important role in strengthening public confidence in the planning system…'

13. The MoU identifies the IPC's objectives which are to build public trust in the NSW planning system by:

    - being independent and objective in its decision-making;
    - being fair, open and transparent in its operations;
    - delivering robust and timely determinations within the legislative and government policy framework to best serve the people of New South Wales; and encouraging affective community and other stakeholder participation to inform [IPC] determinations.

14. The IPC has the functions of the consent authority under Part 4 for State significant development: s 2.9(1)(a) of the EP&A Act.

15. In its role as consent authority, the task of the IPC is not to consider whether the recommendations of the Department in its assessment report are correct or preferable on the material available to it, but rather to determine, based on the evidence now before the IPC, what is the preferable outcome.[2]

RELEVANT MATTERS TO BE CONSIDERED

16. The IPC is a statutory body. It can have no wider powers than those conferred by the EP&A Act which created it. As consent authority, the matters for consideration by the IPC in determining a State Significant development application[3] are those expressly stated in section 4.15(1) of the EP&A Act, but also those matters, which by implication from the subject matter, scope and purpose of the EP&A Act, are required to be considered.[4]

17. Section 4.15 relevantly provides*:*

[2] *Bulga Milbrodale Progress Association Inc v Minister for Planning* (2013) 194 LGERA 347 at [28] and [7]-[11].
[3] Defined in section 4.40, EP&A Act.
[4] *Bulga Milbrodale Progress Association Inc v Minister for Planning* (2013) 194 LGERA 347 at [52].

Matters for consideration—general

In determining a development application, a consent authority is to take into consideration such of the following matters as are of relevance to the development the subject of the development application:

(a) the provisions of:

(i) any environmental planning instrument, and

(ii) any proposed instrument…

(iii)any development control plan, and

(iiia) any planning agreement…

(iv) the regulations

that apply to the land to which the development application relates,

(b) the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality,

(c) the suitability of the site for the development,

(d) any submissions made in accordance with this Act or the regulations,

(e) the public interest.

18. As well as the provisions of any relevant environmental planning instrument (**EPI**) (for which see below), s 4.15 requires that the IPC must take into account the likely environmental impacts of the development, the likely social impacts, the economic impacts, the suitability of the site for the development, and any submissions made in accordance with the EP&A Act. The IPC must also take into account the public interest: section 4.15 EP&A Act. The considerations relevant to the public interest are summarised below.

19. The Minister's Statement of Expectations states that he expects the IPC '*to make decisions based on the legislation and policy frameworks and informed by the Planning Secretary's assessment*'. To the extent that this statement seeks to depart from the text of s 4.15, it is bad in law; the IPC is bound to make its decisions in accordance with s 4.15 of the EP&A Act, and not the Statement of Expectations. In particular, there is no reference to the phrase 'policy frameworks' in s 4.15. Further, contrary to the suggestion in the Statement of Expectations, the EP&A Act does not identify that the Department's report should be given precedence over other evidence. The Department's report is not a mandatory relevant consideration. Whilst it is no doubt a relevant consideration to be taken into account by the IPC, it is of no greater import than other relevant evidence placed before the IPC, including by objectors to the Project. In that regard the IPC's letter dated 1 July 2020 to the EDO denying LTG's counsel equivalent speaking time to that of the Department is highly concerning and gives rise to three legal errors on the part of the IPC. The relevant part of the letter states as follows:

In your letter you seek equivalent speaking time for your client's counsel as compared to the time allocated for Mr Mike Young, the representative of the [Department].

The Panel has asked me to refer you to the Minister for Planning and Public spaces' 11 March 2020 request for this public hearing (a copy of which is enclosed) which ***specifically requires the Commission to pay particular attention to the Department's Assessment Report in its conduct of the public hearing. This focus is reflected in the allocation of time to Mr Young***. (emphasis added)

20. In fact, the Minister's letter dated 11 March 2020 states no such thing. In that letter, the Minister requests the IPC to conduct a further public hearing, paying particular attention to:

    a) the Department's assessment report, including any recommended conditions of consent;

    b) key issues raised in public submissions during the public hearing during the public hearing; and

    c) any other documents or information relevant to the determination of the development application.

21. Contrary to the IPC's statement in the 1 July letter, there is no suggestion in the Minister's letter that greater attention should be directed to the Department's assessment report compared to 'key issues raised in public submissions during the public hearing', including those issues raised on behalf of LTG. Nor is there any identification that greater 'focus' should be directed to the Department's assessment report.

22. As noted above, the IPC's letter dated 1 July 2020 and its admitted 'focus' on the Department's evidence gives rise to three legal errors on the part of the IPC. By directing its 'focus' to the Department's assessment report and giving less attention to the issues raised in public submissions during the public hearing, it not only misunderstands the nature of the task before it, namely to determine the development application according to s 4.15 of the EPA Act, but it also gives rise to a reasonable apprehension of bias on the part of the IPC in favour of the recommendations identified in the Department's assessment report (contrary to the decision of the High Court in *Ebner v Official Trustee in Bankruptcy* (2000) 2015 CLR 337). Finally, by giving greater focus to the Department and less time at the public hearing to LTG, it has denied procedural fairness to LTG and the objectors to the development (see *Minister for Immigration and Citizenship v Li* (2013) 249 CLR 332).

23. It should also be noted that the independent experts who gave evidence during the public hearing do not represent LTG or any other objector. Rather, their role as experts is to provide an objective analysis of the Project and its impacts, independently of the proponent and the Department, to assist in the decision-making process.

The public interest

24. The public interest is of a "wide ambit".[5] A consent authority may range widely in the search for material as to the public interest.[6] According to Preston CJ, "*A requirement that regard be had to the public interest operates at a high level of generality*."[7] The public interest must

[5] *Shoalhaven City Council v Lovell* (1996) 136 FLR 58 at [63].
[6] *Terrace Tower Holdings Pty Limited v Sutherland Shire Council* (2003) 129 LGERA 195, per Mason P at [81].
[7] *Warkworth Mining Ltd v Bulga Milbrodale Progress Association Inc* (2014) 200 LGERA 375 at [298].

be applied having regard to the scope and purpose of the relevant statute.[8]

25. The objects of the EP&A Act include:

    a. facilitating ESD by integrating relevant economic, environmental and social considerations; and

    b. promoting the social and economic welfare of the community and a better environment, and to provide increased opportunity for community participation in environmental planning and assessment.

26. The considerations relevant to these objects are detailed below.

The public interest and ESD

27. Decisions of the Land and Environment Court, and the Court of Appeal, have held that the public interest requires consideration of principles of ESD at the stage of merits assessment of projects which are equivalent to State significant development,[9] including coal mines.[10]

28. In *Minister for Planning v Walker* (2008) 161 LGERA 423, Hodgson JA stated at [56]:

> *… I do suggest that the principles of ESD are likely to come to be seen as so plainly an element of the public interest, in relation to most if not all decisions, that failure to consider them will become strong evidence of failure to consider the public interest and/or to act bona fide in the exercise of powers granted to the Minister, and thus become capable of avoiding decisions. It was not suggested that this was already the situation at the time when the Minister's decision was made in this case, so that the decision in this case could be avoided on that basis; and I would not so conclude.*

29. In *Barrington-Gloucester-Stroud Preservation Alliance Inc v Minister for Planning and Infrastructure* (2012) 194 LGERA 113, Pepper J stated at [170]:

> *I therefore reject the submission of AGL and the Minister that there was no requirement to consider ESD principles.* ***In the words of Hodgson JA in* Walker*, the time has come that "the principles of ESD" can now "be seen as so plainly an element of the public interest"*** *(at [56]). [Emphasis added.]*

30. The public interest also includes community responses to the Project. In *Bulga Milbrodale Progress Association Inc v Minister for Planning and Infrastructure and Warkworth Mining Ltd* (2013) 194 LGERA 347, Preston CJ stated at [63]:

> *The public interest also includes community responses regarding the project for which approval is sought. In Telstra Corporation Ltd v Hornsby Shire Council (2006) 67 NSWLR 256; 146 LGERA 10, I confirmed (at [192]) that community responses are aspects of the public interest in securing the advancement of one of the express objects of the EPA Act in s 5(c), being "to provide increased opportunity for public involvement and participation in environmental planning and assessment" (see also Kulin Holdings Pty Ltd v Developments Pty Ltd v Baulkham Hills Shire Council (2003) 127 LGERA 303 at [58]). I said, however, that in considering the community responses, an evaluation*

[8] *Patra Holdings v Minister for Land* (2002) 119 LGERA 231 at [11].
[9] *Bulga Milbrodale Progress Association Inc v Minister for Planning and Infrastructure and Warkworth Mining Ltd* (2013) 194 LGERA 347 at [58].
[10] *Hunter Environmental Lobby Inc v Minister for Planning* [2011] NSWLEC 221.

must be made of the reasonableness of the claimed perceptions of adverse effect on the amenity of the locality (see also Foley v Waverley Municipal Council [1963] NSWR 373 at 376; (1962) 8 LGRA 26 at 30). An evaluation of reasonableness involves the identification of evidence that can be objectively assessed to ascertain whether it supports a factual finding of an adverse effect on the amenity of the locality. A fear or concern without rational or justified foundation is not a matter which, by itself, can be considered as an amenity or social impact: Telstra v Hornsby Shire Council at [193] and [195].

31. In the Court of Appeal proceedings, (*Warkworth Mining Ltd v Bulga Milbrodale Progress Association Inc* (2014) 200 LGERA 375), the Court endorsed this approach, and held at [295]:

> *Likewise, we consider that community responses to the project were relevant to the public interest. As his Honour pointed out, at [430], the evidence of the community responses was relevant to a consideration of noise impacts, air quality, visual impacts and more generally, the social impacts on the community. All of those factors were aspects of the overall public interest.*

Principles of ESD

Intergenerational equity

32. Section 1.4 of the EP&A Act provides that ESD "has the same meaning it has in section 6(2) of the *Protection of the Environment Administration Act 1991*" (**POEA Act**). Section 6(2) of the POEA Act provides:

> *For the purposes of subsection (1) (a), ecologically sustainable development requires the effective integration of social, economic and environmental considerations in decision-making processes. Ecologically sustainable development can be achieved through the implementation of the following principles and programs:*
>
> *(a) the precautionary principle—namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.*
>
> *In the application of the precautionary principle, public and private decisions should be guided by:*
>
> *(i) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and*
>
> *(ii) an assessment of the risk-weighted consequences of various options,*
>
> *(b) inter-generational equity—namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations,*
>
> *(c) conservation of biological diversity and ecological integrity—namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration,*

(d) improved valuation, pricing and incentive mechanisms—namely, that environmental factors should be included in the valuation of assets and services, such as:

(i) polluter pays—that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement,

(ii) the users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste,

(iii) environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.

33. ESD includes two ethical elements: concern for the present – intragenerational justice or equity; and concern for the future – intergenerational equity. Intragenerational equity describes equity within the present generation while intergenerational equity describes equity between the present and future generations. The needs that are to be equitably shared relate to the three components of ESD: economic development, social development and environmental protection. Equity is not limited to the use or exploitation of natural resources. It extends to maintenance and enhancement of the environment. The importance to ESD of the component of environmental protection is made clear in Australia (and NSW) where intergenerational equity is defined by section 6(2)(b) of the POEA Act to require "*that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations*".

34. The principles of intergenerational equity and intragenerational equity were discussed in *Bulga Milbrodale Progress Association Inc v Minister for Planning and Infrastructure and Warkworth Mining Ltd* (2013) 194 LGERA 347, where Preston CJ stated at [492]:

In an assessment of the equity or fairness of the Project's distribution of benefits and burdens, assistance can be gained by consideration of ***two distinct principles of ecologically sustainable development, inter- generational equity and intra-generational equity****. The principle of inter- generational equity provides that the* ***present generation should ensure that the health, diversity and productivity of the environment are maintained or advanced for the future generations*** *(see s 6(2)(b) of the* Protection of the Environment Administration Act*). The principle of intra-generational equity involves* ***people within the present generation having equal rights to benefit from the exploitation of resources as well as from the enjoyment of a clean and healthy environment****: see* Telstra v Hornsby Shire Council *at [117]. A decision-maker should conscientiously address the principles of ESD in dealing with any application for a project under the former Pt 3A of the EPA Act: see* Minister for Planning v Walker *at [62], [63]. [Emphasis added.]*

35. In *Taralga Landscape Guardians Inc v Minister for Planning and RES Southern Cross Pty Ltd* (2007) 161 LGERA 1, a merits appeal against the approval of a large wind farm, the Court recognised that achieving intergenerational equity involved a consideration of the conservations of options subprinciple. Preston CJ stated at [74]:

The attainment of intergenerational equity in the production of energy involves meeting at least two requirements. The first requirement is that the timing of and the subsequent use in the production of energy of finite, fossil fuel resources needs to be sustainable. Sustainability refers not only to the exploitation and use of the resource …but also to the environment in which the exploitation and use takes place and which may be affected.

> *The objective is not only to extend the life of the finite resources and the benefits yielded by exploitation and use of the resources to future generations, but also to maintain the environment, including the ecological processes on which life depends, for the benefit of future generations.* ***The second requirement is, as far as is practicable, to increasingly substitute energy sources that result in less greenhouse gas emissions for energy sources that result in more greenhouse gas emissions, thereby reducing the cumulative and long-term effects caused by anthropogenic climate change. In this way, the present generation reduces the adverse consequences for future generations.*** *(emphasis added)*

36. These issues were articulated to the IPC in a very personal way by Mr James Barlow, member of the Boggabri Farming and Community Group, owner and manager of Mirrabinda when he said:

> *"Legacy is the most important thing. Like my grandfather handing the farm to my father and my father to me. Being passed down in a better, more sustainable, environmentally friendly state than it was before. I dream of one day passing this legacy to my daughter, but the future looks very hazy and very noisy if this mine is approved. It's the same as the planet. It's our responsibility as humans to pass it to our children and so on in a better state than we found it. It's imperative we make decisions to protect the long-term sustainability of Earth which in turn protects all civilisation long after we are gone. It's hard, I know, finding the balance between economics and health. Health of our communities, health of our environment."*[11]

The precautionary principle

37. The precautionary principle is a tool for decision makers to manage environmental risks. The most widely employed formulation adopted in Australia is that stated in s 6(2)(a) of the *Protection of the Environment Administration Act 1991* (NSW), which provides:

> *…If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.*

38. The precautionary principle is triggered where there is a risk of serious and irreversible environmental harm and a lack of scientific uncertainty as to that harm. If the community can establish that there is a likelihood or possibility that serious or irreversible environmental harm might occur, then the onus of proof is on the Proponent of the Project to establish the likely environmental consequences of the Project and provide evidence to assist the panel in the assessment of the risk-weighted consequences (see *Conservation Council of South Australia v Development Assessment Committee and Tuna Boat Owners Association (No 2)* [1999] SAERDC 86, [25]).

39. LtG contend that there are risks of serious and irreversible environmental harm and a lack of scientific uncertainty as to that harm, particularly in relation to water impacts, and the proponent has failed to properly establish the environmental consequences, particularly in relation to water resources. On that basis, the IPC should engage the precautionary principle and refuse the Project.

[11] Public Hearing Transcript 3 July 2020 P-24, lines17-27

THE ISSUES

A. GROUNDWATER IMPACTS AND WATER AVAILABILITY

40. As the IPC Chair announced at the outset of the July 2020 public hearings, some 500 submissions had been made about the Project, many of which raise concerns about water demand and groundwater impacts. Many rural property occupiers are dependent upon the continued viability of the Namoi River floodplains and have raised concerns about the impact of mining on future groundwater quality, including from the long-term groundwater impacts potentially arising from the final void. Along with the NSW Government agencies, Associate Professor Matthew Currell of RMIT University in his report dated 12 February 2019 opined that there remains significant uncertainty regarding the impacts of the Project on groundwater and surface water quality and quantity. Those uncertainties remain 18 months later and the IPC should not have confidence that the development will not have adverse impacts on the underground water system and aquifers in the Namoi floodplain.

41. LTG adduces further expert evidence from Associate Professor Currell. In his opinion, key issues for consideration by the IPC are:

    a. more in-depth assessment of risks to Groundwater Dependent Ecosystems (GDEs), incorporating more detailed studies of inter-aquifer connectivity and analysis of current and potential future hydraulic gradients under different modelling scenarios are still needed to ensure a full consideration of impacts to GDEs, alluvial groundwater and surface water.

    b. the information before the IPC still lacks detail on the full range of plausible impacts to groundwater arising from issues associated with the hydraulic parameters, inter-aquifer connectivity and potential effects on the Namoi Alluvium. This prevents the IPC from developing informed judgements as to the full possible scope and consequences of the project for GDEs and other water users.

    c. further detailed analysis of existing groundwater monitoring data and more extensive analysis of modelling outputs is still required. The Department propose that these issues could be addressed by conditions of consent. However, conducting such work following commencement of the project would leave open the prospect of significant unforeseen impacts occurring, and it is unclear whether the proposed conditions of consent could be achieved.

    d. concerns in relation to an incomplete understanding of the geochemical conditions in groundwater and surface water, required to properly understand possible water quality impacts, remain. Much of the discussion of water quality impacts and geochemistry appears to focus on post-mining impacts, whereas the Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development advice specifically related to the development of a more comprehensive understanding of potential water quality impacts during project operation.

    e. given the high degree of water stress experienced in the Namoi catchment in recent times, the apparent inability of the mine to source sufficient water for operation during dry times is of concern. Without further details, it is difficult to judge whether additional proposed management measures are feasible. Questions about the long-term viability and sustainability of the project, from the perspective of its ongoing water requirements, thus remain unresolved.

    f. the potential for water quality impacts resulting from the placement of mine

waste on the Namoi Alluvium, at an embayment of the river in the northwest of the project area, remains of concern.

Water availability and licensing

42. The proposed Project is adjacent to the highly productive Upper Namoi Alluvial aquifer within the Namoi River catchment. A water supply borefield is proposed (within Upper Namoi Zone 4) to extract water from the Upper Namoi Alluvial aquifer. This water source is also extensively used for agricultural production. Any deficit in the water supply necessary to operate the mine would have to come from this source.[12]

43. Many landowners, including the NSW Farmers Association (Boggabri Branch), provided written submissions and gave evidence at the public hearings, both in 2019 and 2020, as to the lack of water availability in the area, the impact on water availability from Whitehaven Coal acquiring water licences and the social consequences of the number of farms being acquired, either for the footprint of the Project itself or in order to obtain further water allocations.[13]

44. Water is a key issue of concern for this community. As Ms Elizabeth Laird, representing the Country Women's Association of New South Wales, Maules Creek branch said:

> "*Losing your water can make you feel really, really powerless. It is so hot and it is so dry here over summer, you know, you need to come. You need to come in summer and you need to see what it's like and you need to see how dry it is and when you've had your water lost from your region and you feel that it's not just from drought but it' s from hydrological drawdown due to mining, you'll become very, very protective of that precious resource.*"[14]
>
> *"Water is precious to us all. If the piecemeal approvals continue, we understand that there will be ground water piped between Maules Creek, Tarrawonga, the farm bores and Vickery."*[15]

45. It is critical that the proponent is able to demonstrate that it has adequate water supply to enable production: DPIE Water Advice dated 21 November 2019 Attachment A. This is required to satisfy the Secretary's Assessment Requirement to demonstrate access to sufficient water for all projects running concurrently. If there is unaccounted water take by a project, less water is available for the environment and other users that have a legal right to access water.

46. The *Aquifer Interference Policy*[16] requires the proponent to demonstrate that it has the ability to hold sufficient water entitlement prior to approval. The proponent has also failed to demonstrate that it has put in place a strategy to avoid and minimise water take wherever possible. The Aquifer Interference Policy identifies that 'by avoiding the take of water … water related impacts on water sources and their dependent ecosystems and on other water users can be avoided.'[17]

47. The IPC therefore needs to be satisfied, prior to granting development consent, that the

[12] David Watt submissions
[13] The NSW Farmers Association (Boggabri Branch) notes that nearly 80 farms in the district have been acquired by mines
[14] Public Hearing Transcript 2 July 2020 P-39, lines 16-21
[15] Public Hearing Transcript 2 July 2020, P-37, lines 17-19
[16] Published by Department of Water in September 2012
[17] Published by Department of Water in September 2012 at section 3.2

proponent has demonstrated that it has adequate water supply prior to production. This is not a matter which can be left to water licensing under the *Water Management Act 2000*. That is because clause 14(1) of the Mining SEPP requires the consent authority, before granting development consent, to have regard to the potential for conditions to be imposed ensuring that impacts on significant water resources, including surface and groundwater resources, are avoided, or are minimized to the greatest extent practicable.

48. For the reasons that follow, this is not a case where conditions can satisfactorily mitigate the harm to groundwater resources. Development consent should be refused.

49. The advice from DPIE – Water and the NSW Natural Resources Access Regulator (NRAR) is that the proponent has failed to confirm in the EIS and its RTS that it has enough water entitlements for the Project.[18] Attachment A states that the proponent has not identified: all WALs held in each water source, the project(s) each WAL applies to, and where a WAL is being counted against multiple projects how much of the total is allocated to each project. The proponent is unable to satisfy the requirement that it will not be required to account for continuing take where nominated. These concerns were repeated by DPIE – Water in its letter dated 11 March 2020.

50. Associate Professor Currell's 2020 expert report also questioned the water balance calculations used to assess the mine's water requirements – including the view that significantly more groundwater will be required because a) available water has been over-estimated (particularly in dry years) and b) mine site water requirements may have been under-estimated and c) a lack of consideration of the wide variability in available water in the Namoi System under different climatic conditions.

51. He also noted the uncertainty as to how the mine will secure sufficient water supplies to suppress dust on the site, during dry years where surface water in the Namoi River is limited or unavailable (as has occurred in recent times). Landholders argue that this will likely result in the proponent seeking to extract additional groundwater (beyond the volumes predicted in the EIS), which in turn would have implications for the Namoi Alluvium aquifer, and other water users dependent on it in the region.

52. In order to manage this issue, the proponent proposes to conduct 'periodic water balance reviews', adjust its operations during dry years or obtain additional entitlements through the open water market. Associate Professor Currell note that the DPIE analysis indicates that during particularly dry years, it is indeed likely there will be a shortfall in available water to meet the mine's normal operating requirements.

53. Associate Professor Currell opined that, given the high degree of water stress experienced in the Namoi catchment in recent times, this issue remains of concern. Without further details, he said it is difficult to judge whether additional 'water efficiency measures' or 'scaling back operations' will be feasible, or if so, whether this will be adequate to save enough water to make up the shortfall, which appears to be inevitable in very dry years (DPIE, 2020).

54. Supplementary evidence from Associate Professor Currell notes that further information provided by Whitehaven Coal in a letter dated 29 June 2020 does not adequately address these issues. That is because the modeling used by the proponent does not capture the likelihood that higher rates of extraction from the borefield will be required to meet the Project's water demand. The model assumes higher pumping rates only on a sporadic basis (e.g. years 1, 5, 9, 13 etc. of the operation). If the higher volume of extraction is required for longer periods (e.g. in multiple successive dry years, such as has recently been experienced) then greater levels of drawdown will be required – this in not included in the modeling assessment.

[18] Letter dated 21 November 2019: App G1-4.

55. If the required water savings and/or additional entitlements cannot be achieved, then there is a risk the mine will not be able to secure sufficient water. Associate Professor Currell suggested that this may have major environmental consequences – e.g. inability to adequately control dust emissions. Once the mine reaches a certain size, it will be difficult to scale back the operations in response to low water availability in a given year or season (and the ongoing availability of water is likely to be difficult to predict in advance). The Department's representative was unable to satisfactorily answer the IPC's question as to how the Project would be able to reduce the water demand in terms of non-availability.[19] Bearing in mind that the open cut coal mines are designed to operate on a continuous 24/7 basis, the inference is that the proponent has no obvious answer other than to buy water (which prices farmers out of the market) or to (unlawfully) take water without a licence, as it has allegedly done at the mine at Maules Creek.

56. David Watt has assessed that, in dry years, the Project will have a deficit of approximately 3,841 ML. As the Upper Namoi Zone 4 groundwater is the only locally available water source in extreme dry conditions, 100% of the deficit would have to come from this source. The average licence entitlement in zone 4 is 127 ML. For the proponent to procure the deficit of 3,841 ML, it will have to obtain 30 of these licences. That is up to 30 farmers who would have to sell their water from their farms or potentially their farms as a whole (because detaching water from an irrigated farm drastically reduces the value of the land). This has social impacts which are identified below.

57. BMT note in their Memorandum dated 30 January 2020 that the proponent's water balance modeling analyses the total volume of rainfall available and predicted to be used over a 26 year life of mine period. In BMT's view this may not be appropriate because the water demand in drier years will be higher. BMT notes that the proponent asserts that in dry years the maximum requirement for imported water remains within the licenced allocation. This assertion should be treated with caution having regard to the views of DPIE-Water set out above. In any event, BMT notes that the proponent does not clarify whether the licence allocation is sufficient in the event of drought greater than has occurred before. This is a concern also raised by IESC in its Assessment Report dated 28 September 2018.

58. The consequences for farmers and other water dependent businesses are significant. As Mr Grant McIlveen stated in his evidence to the public hearing:

> *"In finishing, I would like to read a statement – not from me or anyone else, but from Whitehaven Coal after a 7.30 report did a story late last year that in October 2018, the assessment also noted in 2017's annual review of Maules Creek Coal, the mine showed a generally poor correlation between modelling and observed data and warned of significant implications if the mine's licensing requirements – for the 5 mine's licensing requirements. Whitehaven's response:*
>
> *"This is not out of the ordinary for new mines where the accuracy of data and models improve as the mine develops."*
>
> *"This is exactly what we have been saying for years now – that Whitehaven's models on the Vickery are very poor at best. With this mine, we will be the people that will have to live with their mistakes."*[20]

59. Residents' concerns were raised about the conduct of Whitehaven in relation to water sharing at other mines in the region. Maules Creek Coal Pty Ltd, the operator of the Maules Creek Coal Mine, and a company within the Whitehaven group of companies, has been charged by NRAR with taking water from the Maules Creek Water Source and the Bluevale Water Source without a water licence for the period 1 July 2016-30 June 2019.

[19] Public Hearing Transcript 2 July 2020 P-15, lines 40-45
[20] Public Hearing Transcript 2 July 2020 P-64, lines 1-12

The particulars of the offence relate to the capture of surface (rain) water by the construction of dams in the course of mining operations, thus preventing rainwater runoff entering into the environment downstream of the mine operations, which has an impact on other water users and the environment – especially during severe drought.[21]

60. Similarly, no assessment has been carried out of the potential impact of the proposed bore field in Upper Namoi Zone 4 to demonstrate that sufficient water is available. The assessment should be carried out against the DPIE Water impact assessment criteria as described in the Water resource plans Fact Sheet. This assessment is to ensure the proposed extraction is consistent with the rules of the Water Sharing Plan. DPIE has stated that the proponent has ignored DPIE's advice on this issue in response to the EIS. AS DPIE notes, there is no guarantee the bore field will be approved at the volume requested.

61. Associate Professor Currell said this in oral evidence

> *"inter-aquifer connectivity and about aquifer hydraulic parameters. So the predictions of how much effect there will be on water levels and water availability in aquifers surrounding the mine are strongly controlled by the hydraulic parameters that are used in groundwater modelling. And there are some doubts – or at least there's remaining uncertainty about the veracity of those parameters. There are two important areas where this is significant. Number 1, the mine pit which going to be dug within a geological formation called the Maules Creek formation, and the extent to which that might be connected hydraulically with the Maule alluvium which is obviously a very important aquifer and is in very close proximity to the mine pit in this case. And this is controlled by the level of heterogeneity and the level of hydraulic conductivity between those two units. I believe that the data that has been used to actually understand this is not sufficiently detailed and not sufficiently adequate that we can be confident that those drawdown predictions have actually been made in a way that fully considers possible risks of drawdown to the alluvium."*[22]
>
> *"I think that there's some really serious questions about what are impacts that remain unresolved. I note that the DPIE appointed an expert hydrogeology peer reviewer to look at these issues, and I respectfully disagree with the peer reviewer's views on these particular points. They definitely raise some valid points, but I think the particular concerns that I've outlined in my written report show that there is yet to be sufficient characterisation of these impacts."*[23]
>
> *"to get the envelope of changes in drawdown, if we, say, tweak one of the storage coefficients by, say, an order of magnitude, to actually see how that would affect drawdown is something that I think is really important to communicate, especially given the inherent uncertainties we normally have with groundwater modelling. I will just note that based on that sensitivity analysis that changing those storage coefficients as the IESC had flagged or recommended leads to some changes in groundwater drawdown predictions that are somewhere, you know, in the order of five to 10 metres in some of the monitored bores, which I would think is a pretty significant effect depending on sort of proximity to other water users and ecosystems."*[24]
>
> *"rainfall leaching through that waste material and then recharging the alluvium and causing a water quality impact such as sort of mobilising some of the trace elements and, you know, metal contents that might be there in the waste is a valid concern. The peer reviewer has sort of argued that, well, the water that, you know, infiltrates*

[21] NRAR Media Release dated 2 July 2020
[22] Public Hearing Transcript 3 July 2020 P-69, lines 24-39
[23] Public Hearing Transcript 3 July 2020 P-70, lines 15-20
[24] Public Hearing Transcript 3 July 2020 P-71, lines 3-12

through the waste rock is going to make its way back towards the mine pit because we're going to create a great big void. However I don't think that it's all that simple and easy to predict the flow path that water from, you know, a big pile of overburden is going to take, and I don't think it can be ruled out that some of that poor quality water might actually make its way in the other direction back towards the Namoi River and the rest of the alluvium"[25]

Impacts to groundwater

62. The IESC identified key potential impacts from the Project as follows:

    a. Groundwater drawdown from mining operations, primarily in the Maules Creek Formation that may affect groundwater availability and aquifer interactions;

    b. Groundwater drawdown mainly associated with the proposed water supply borefield in the Alluvial Groundwater Source (located in Zone 4 of the Upper and lower Namoi Groundwater Sources Water Sharing Plan) that may affect groundwater availability and the dynamics of surface water-groundwater interactions.

63. Associate Professor Currell identified the following key issues in his 2019 expert report, based on his analysis of the Vickery Extension Project EIS, the IESC advice and other relevant material:

    Issue 1: The need for more in-depth consideration of possible impacts on **groundwater dependent ecosystems**, due to changes in groundwater levels, water quality and water balance.

    Issue 2: A need for more in-depth field-based studies to inform assessment of the degree of **connectivity between different hydrogeological units and the range(s) of hydraulic parameters** used in the groundwater modelling - with important implications for predictions of drawdown in the **Namoi alluvium**.

    Issue 3: A need for more detailed assessment of how changes in groundwater levels and water balance may impact **hydraulic gradients and groundwater discharge to/recharge from the Namoi River** along its length.

    Issue 4: A need for more in-depth, field-based studies to examine **ground-surface water connectivity** (including both spatial changes along the Namoi and temporal changes under different conditions) and the implications for GDEs and water availability.

    Issue 5: A need for more detailed analysis to understand the **potential for mobilization of metals and other chemical constituents in groundwater and surface water** due to the Project.

64. In his 2020 report, he analysed those seven issues noted above, specifically the extent to which they have been adequately addressed by the proponent and the Department, including through recommended Conditions of Consent.

65. Those issues raised by Associate Professor Currell in his evidence are addressed in these submissions below.

[25] Public Hearing Transcript 3 July 2020 P-71, lines 21-30

Issue 1: Groundwater dependent ecosystems assessments

66. The proponent's Submissions Report included a new figure mapping potential GDEs within the project area (Whitehaven, 2019, figure 4 – reproduced as Figure 1 below). This only partly addresses the request from the IESC that the proponent produce:

> *"Maps that illustrate the distribution of potential groundwater-dependent ecosystems (GDEs), particularly terrestrial ones,* ***superimposed on contours of estimated depths to the water table (in metres below ground level) both pre-mining and at maximum predicted drawdown. These maps should also show the locations of bores used to estimate the water table depths. These maps are needed to fully understand potential impacts to GDEs****." [emphasis added] (IESC, 2018).*

67. The map produced included the location of potential GDEs. However, it does not show any contours of estimated depths to water table at different stages before or during mining or relevant bore locations (as requested by the IESC). While the peer reviewer (HydroGeoLogic, 2019a) believes the information provided is sufficient, the full scope of the original request of the IESC has not been fulfilled. He opines that it is important to see how water table patterns (and potentially, drawdown) are expected to develop in relation to the potential GDE locations as mining progresses.

68. The proponent argues in the Submissions Report that water table drawdown is not predicted to exceed 1m beyond the Maules Creek Formation (i.e., towards the Namoi River and its alluvium). However, as discussed in further detail below, Associate Professor Currell identified that the assumption of limited drawdown is predicated on assumptions regarding inter-aquifer connectivity and aquifer hydraulic parameters which are yet to be sufficiently characterized at the site.

69. Irrespective of how much drawdown is predicted, he is of the view that the creation of these contour maps is important in order to assess potential changes to hydraulic gradients which may occur during the project, potentially impacting the rates of groundwater flow from the alluvium towards the open cut, or from the project area (e.g. western emplacement) towards the alluvium and river. There are places where the Maules Creek Formation (in which significant drawdown is predicted to occur) is immediately adjacent to the Namoi River and as such water table levels in this unit during mining must also be considered in any GDE risk assessment (as is recommended to be conducted by the IESC, according to the methods of Serov, 2012).

70. As such, more in-depth assessment of risks to GDEs, incorporating more detailed studies of inter-aquifer connectivity and analysis of current and potential future hydraulic gradients under different modelling scenarios are still needed to ensure a full consideration of impacts to GDEs, alluvial groundwater and surface water.

Issue 2: Hydraulic parameters, inter-aquifer connectivity and potential effects on Namoi Alluvium

71. The issue of hydraulic parameters and particularly, the degree of inter-aquifer connectivity is a major one. It is an important deficiency in the EIS groundwater assessment. The project will cause significant drawdown in the Maules Creek Formation due to the open cut mining – e.g. decrease in groundwater levels expected to exceed 150m during and following the completion of mining. The current predicted impact of this drawdown on groundwater levels within the Namoi Alluvium (an aquifer of great importance in the region) is assumed to be small to negligible (Submissions Report Whitehaven, 2019). However, this is predicated on the assumption of low hydraulic conductivity in the Maules

Creek Formation, and limited connectivity between this unit and the Namoi Alluvium in the project area. In the Submissions Report, the proponent states:

> *"As the Project open cut is constrained to the Maules Creek Formation, the groundwater modelling indicates the 1 m drawdown contour would not extend beyond the Maules Creek Formation towards the Namoi River and its alluvium. Therefore negligible impact to potential GDEs is predicted."*

72. Associate Professor Currell warns that, if there is locally higher hydraulic conductivity material within the relevant formation(s) and/or greater connectivity between the Maules Creek Formation and Namoi Alluvium than currently simulated in the modelling, then drawdown in the Namoi alluvium may be significantly greater than anticipated. This could result in un-foreseen effects on GDEs, groundwater users, and potentially surface water (e.g. through increasing the hydraulic gradients and leakage rates from the Namoi and its alluvium towards the open cut). The project's proposed open cut boundary comes close to the Namoi River – within approximately 2 km - where both moderate and high potential GDEs have been mapped using the BOM's Groundwater Dependent Ecosystem Atlas (see Currell report).

73. Typically he notes, sedimentary aquifer material is heterogeneous, and the connectivity between different units may be significantly enhanced by local scale heterogeneity and geological features (e.g. lenses of high permeability material, local fractures and other potential conduits). Groundwater modelling of the type conducted in the EIS assumes bulk hydraulic parameters across the different geological units, and therefore does not account for such local-scale heterogeneity. Therefore, it is critical to conduct field-based studies to identify possible areas where connectivity between different geological units may be enhanced, to complement the modelling. Even if such areas are small and localized, they can have a significant effect on inter-aquifer connections, by enhancing flow and propagation of drawdown between aquifers that otherwise have limited connectivity (e.g., Bianchi et al., 2011).

74. Therefore, Associate Professor Currell is of the opinion that more detailed field-based characterization of hydraulic properties and inter-aquifer connectivity is required to properly understand the full extent of possible drawdown in both aquifers, and effects on GDEs. He said that the proponent should commission one or more pumping tests at targeted locations on the western and southern extents of the project area, utilizing nested monitoring bores, to examine whether inducing significant drawdown within the Maules Creek Formation – which will occur during mining - results in measurable water level changes within the Namoi alluvium (and vice versa).

75. In the EIS, the fieldwork conducted to estimate hydraulic properties (vertical and horizontal hydraulic conductivity) is outlined in section 3.1 (e.g. Table 7 and Table 8). A combination of slug tests, low flow constant rate pumping core sample analysis were completed to estimate these parameters, but it is unclear whether pumping tests of the type described above have been conducted.

76. The peer reviewer (HydroGeoLogic, 2019) commented that the characterisation of hydraulic parameters and connectivity of the two different units derived from field studies was adequately documented in the EIS, along with the predicted water table drawdown impacts (as was noted in the DPIE's assessment report paragraph 150). While this may be true in a general sense – e.g. multiple lines of evidence were indeed used to estimate hydraulic parameters used in the groundwater modelling – in Associate Professor Currell' opinion this has not been sufficiently targeted to understand the specific issue of inter-aquifer connectivity and scope of potential drawdown and GDE impacts described above.

Storage coefficients and drawdown predictions

77. A further issue raised by the IESC is the question of the appropriate values of storage coefficients (e.g., specific storage) used in the groundwater modelling and impact predictions. This is important, as this property can vary widely in geological materials, and such variation can have a significant effect on the amount of drawdown experienced in response to extraction of a given volume of water:

> *"The proponent should undertake further transient predictive model simulations to investigate the full range of plausible parameterisations for specific storage. As specific storage is a critical parameter for determining the extent and magnitude of drawdown the proponent needs to provide clarification of, and justification for, the values used in the groundwater model. The IESC notes that the specific storage values used in the alluvial areas of model layer two could be unrealistically high. This may cause the predicted extent and magnitude of drawdown to be under-estimated and could result in non-compliance with the NSW Aquifer Interference Policy"* (IESC, 2018)

78. If the Specific Storage coefficients in the Namoi Alluvium adopted in the modeling are overestimated, drawdown magnitudes would be under-estimated in the modeling predictions. Similarly, if hydraulic conductivity values differ from those used in the modeling, the drawdown magnitude and extent may differ from what is shown in the model.[26]

79. It is unclear from the groundwater assessment in the EIS the extent to which specific storage (or specific yield) values are informed by analysis of field data (e.g. pumping tests within the local area) and/or the level of confidence in the adopted parameter values (Table 13 of the EIS groundwater assessment shows adopted model values based on calibration fitting but gives little indication of plausible ranges in these parameters). This does not appear to have been clarified in the Submission Report.

80. The sensitivity analysis conducted by HydroSimulations in 2019 (referred to in the Submissions Report) indicates that changes in the specific storage values of one order of magnitude, and changes in specific yield by a factor of three do result in changes in predicted water levels up to and exceeding 10m in some bores – which may be significant in the context of possible impacts to GDEs and water users. There also does not appear to have been any specific attempt to study how changing specific storage values in the alluvial aquifer (layer 2), in line with the IESC's comment above, influences the predictions of drawdown - e.g. whether a reduction in these values leads to significant changes in the predicted drawdown levels in the alluvium.

81. This issue is relevant to assessing the likely degree of drawdown induced by pumping at the proposed borefield (as well as the open cut) – i.e., if the storage coefficient(s) in the alluvium have been over-estimated, drawdown predictions may be unrealistically low, and the extent of drawdown may propagate further from the borefield within the Namoi Alluvium towards the Namoi River. As discussed below, given the inherent uncertainty in predictions from a complex numerical groundwater model of this kind, a wide range of possible impact scenarios (e.g. multiple maps showing different drawdown patterns that occur when different combinations of model parameters are selected) is needed to give a sense of possible variation in the geographic extent and magnitude of drawdown impacts. The updated model outputs (in response to the IESC advice) should (for example) include maps of modelled drawdown with lower Ss values (as well as other variations in hydraulic parameters) to address the IESC's comment.

82. While future modelling, evaluation and 'validation' of the groundwater modelling with new site data (as proposed in the recommended consent conditions) may to some extent help refine predictions of drawdown and increase confidence in these and appropriate

[26] Currell Supplementary Advice 10 July 2020

model parameters in future, it is important as part of the assessment process under s 4.15 of the EP & A Act that a full range of plausible impacts to groundwater are assessed and presented, to inform judgements as to the full possible scope and consequences of the project for GDEs and water users.

Issues 3 & 4: Hydraulic gradients along the Namoi River, and field-based studies to examine ground-surface water connectivity

83. In a similar vein to the IESC's request for maps of water table depth to inform assessment of possible impacts on GDEs (issue 1 above), a close analysis of the local-scale hydraulic gradients along the Namoi River should in Associate Professor Currell's view be produced, in order to better constrain the level of baseflow and/or leakage from the river to the adjacent aquifer(s). The IESC made the following observation:

> *"Because the direction of surface water-groundwater exchange in the river bed and banks strongly affects biogeochemical processes in the sediments, more information is needed on how groundwater drawdown may alter spatial and temporal patterns of surface water-groundwater exchanges in the Namoi River."* (IESC, 2018)

84. Further:

> *"The direction of surface water-groundwater exchanges across the bed and banks of most alluvial rivers strongly influences the rates and types of biogeochemical processes (e.g. nitrogen transformation, dissolved carbon dynamics) in the bed sediments (Boano et al. 2014). Changes to surface flow or the effects of groundwater drawdown may reverse the direction of surface water-groundwater exchange, alter the locations of upwelling and downwelling zones, or even cause repeated reversals of surface water-groundwater exchange over time. Given the significance of these biogeochemical processes to river water quality, especially during low flows, more information is needed on how these exchanges may be affected by the proposed project."*

85. While the EIS did show contour maps of groundwater elevations in the area (as of 2017), which indicate the Namoi River is likely to be predominantly a losing stream (i.e., leaking into the underlying groundwater), as well as some maps of predicted drawdown at the end of mining (EIS Figs 50, 51 and 62), there is limited ability to assess hydraulic gradients at the local scale which control and/or are indicative of ground-surface water interaction in the project area. A conceptual model sketch is provided (in cross section) showing indicative flow directions between the aquifer(s) and Namoi River (Fig. 33 of the EIS groundwater assessment), however it is unclear how consistent this conceptualization is with monitored field data showing water levels at different times, either in the pre-development phase, or during the peak of mining (i.e., based on model predictions).

86. According to the map from the Submission Report there are areas where the Maules Creek Formation appears to be directly adjacent to the Namoi River (as well as areas where the river is flanked by extensive alluvium), and there is a high potential for GDEs to occur along the stream length. As such understanding effects of water level changes on near-stream hydraulic gradients both within the Namoi Alluvium and the Maules Creek formation, under current conditions and a range of possible modelled scenarios, is key to understanding groundwater, surface water and GDE impacts.

87. Ground-surface water interaction can be highly variable over time (e.g. changing depending on river levels, recent climate and groundwater usage rates) – e.g. Winter et al., (1998). This can have important consequences for water users and ecosystems at particular times – e.g. during low-flow periods when the climate is dry and rivers are highly

dependent on baseflow (groundwater discharge).

88. Associate Professor Currell says that this issue should have been addressed using:

    a. Further detailed analysis of existing groundwater monitoring data – e.g. showing groundwater elevations at transects of monitoring wells at different distances from the river, changes in these elevations through time, and any corresponding observed changes in groundwater electrical conductivity (to inform a detailed assessment of gaining/losing sections of the stream under different hydrological and climatic conditions);

    b. More extensive analysis of modelling outputs – e.g. maps showing water table and drawdown patterns that occur with a range of different model set-ups and parameter selections (e.g. drawing on the sensitivity analysis, in which model parameters were modified and the resulting changes in model outputs recorded), and ranges of possible changes to baseflow under different modelling assumptions/parameter combinations.

89. The IESC commented on this issue and raised it as a key area for additional work:

    "Further transient predictive model simulations are needed to examine a greater range of variability in hydraulic conductivity and specific storage. This information is needed to improve the current understanding of potential variability of drawdown impacts that could occur and to further support the proponent's statements that seepage losses from both the Upper Namoi Alluvium and the Namoi River will be limited given the intensive use of these water resources."

90. The Submissions Report does not explore this issue in further detail. The sensitivity analysis (e.g. Tables 2 and 3 of the Submissions Report) includes information about the degree of difference in water levels observed at certain points in the model under different model parameter values, but this has not (to my knowledge) been translated into an updated set of predictions of possible water table patterns, hydraulic gradients and seepage losses/baseflow under different parameter combinations (in line with the IESC advice).

91. Because groundwater modelling is inherently uncertain, predictions of potential impacts with a range of alternative assumptions and parameters should supplement the 'mean' or 'calibrated' model predictions, to give a more complete sense of 'best and worst case' impacts. This should be carefully combined with field studies and monitoring programs that provide more local scale insight into hydrological processes that can't be captured by the modelling (which, as noted above, typically adopts averaged parameters which may not capture local scale variability).

92. In Associate Professor Currell's opinion, conducting such work following commencement of the project (e.g. during 5-yearly model validations, as per the draft recommended conditions) would leave open the prospect of significant unforeseen impacts occurring. The DPIE assessment report states that conditions have been recommended which will require the proponent to "comply with a range of water management performance measures including ensuring negligible impacts to alluvial aquifers beyond those predicted in the EIS". However, without a detailed understanding of ground-surface water interactions and inter-aquifer connectivity (incorporating local-scale heterogeneity) under current conditions, and a wide range of possible outcomes under consideration (informed by a range of modelling scenarios), it is likely to be difficult to achieve this aim. There is risk the proponent and regulator may be forced into 'reactive' monitoring and mitigation in response to impacts which differ from modelling predictions. The potential for time-lags to delay the full manifestation of impacts from a development activity on groundwater systems means that such 'reactive' monitoring and mitigation can be ineffective (e.g.

Currell, 2016; Thomann et al., 2020).

Issue 5: Geochemistry and water quality issues (affecting groundwater and/or surface water)

93. A need to further characterize geochemical conditions in groundwater and surface water, to properly understand possible water quality impacts, was another issue raised by the IESC:

> *"Further geochemical analyses should be undertaken using a range of environmental conditions (especially pH) that are representative of what may occur at the project site, particularly as the solubility and bioavailability of metals depends on water chemistry."* (IESC, 2018)

94. The IESC further pointed out the need to monitor a greater number of chemical species in groundwater, at a greater frequency than proposed, adopt trigger levels and water quality objectives based on 95% species protection guidelines (as groundwater discharges to local surface water systems), and adopt more extensive water quality objectives and monitoring plan for discharge from sediment dams.

95. DPIE's hydrogeology peer reviewer noted that the information provided in the Submission Report in this regard was not adequate (particularly in relation to post-mining impact assessment). In Associate Professor Currell's view the information provided is also inadequate for effective impact assessment and development of monitoring and management protocols throughout the operation of the project as well.

96. The DPIE Assessment Report, relying on the assessment of the peer reviewer, notes that the information provided is not yet satisfactory, but believes this work can be carried out during operation of the mine, in accordance with the recommended consent conditions (e.g. Table 7 of DPIE, 2020). These conditions include a requirement to develop a Groundwater Management Plan, which includes:

> *"..trigger levels for identifying and investigating any potentially adverse groundwater impacts associated with the development, on:*
>
> *− regional and local aquifers (alluvial and hardrock); and*
>
> *− groundwater supply for other water users such as licensed privately-owned groundwater bores;"*

97. As well as:

> *"(monitoring of) geochemical characteristics of groundwater flows to the open cut, to inform the progressive development of the final landform and optimise the final void dimensions, to be described in the rehabilitation strategy required by condition B104."*

98. And:

> *"water quality in sediment dams prior to discharge into the environment; − controlled and uncontrolled discharges and seepage/leachate from the site;"*

99. From the current recommended conditions it remains unclear whether the groundwater quality monitoring program will include objectives and/or trigger levels designed to protect aquatic ecosystems in surface water bodies dependent on groundwater discharge (as well as irrigation and stock uses), as per the IESC's advice.

100. Similarly, the full suite of chemical constituents to be monitored in groundwater and surface water storages (e.g. sediment dams), or frequency of monitoring are not apparent from the conditions.

101. There does not appear to be any further request or requirement for studies to better understand the effect of changing pH or other geochemical characteristics on the mobility of metals in ground and/or surface water, as per the IESC advice. Much of the discussion of water quality impacts and geochemistry in the Submission Report, DPIE Assessment Report and peer reviewer's reports appears to focus on post-mining impacts, whereas the IESC advice specifically related to the development of a more comprehensive understanding of potential water quality impacts during project operation, and a more comprehensive groundwater and surface water quality monitoring program designed to account for this.

Possible water quality impacts of placing mine overburden on top of the Namoi Alluvium

102. DPIE's view is that the risk of impact of the stockpile of mine waste on the Namoi Alluvium has not been adequately addressed. The stockpile is a risk to aquifer compaction and groundwater contamination through generation of leachate. DPIE notes that compaction has not been addressed at all by the proponent. The Department was unable to answer the question from the IPC how it has reached the conclusion that waste emplacement on the alluvium is acceptable: Transcript 2 July p17, lines 5-10.

103. This is also an issue raised by Associate Professor Currell in his 2020 report. He estimates the area covered would be approximately 200 ha. His concern is that leaching of metals and other potentially harmful elements in the overburden could occur, recharging the underlying groundwater and therefore impacting water quality within the Namoi Alluvium. HydroGeoLogic (2020) expressed a view that due to long term development of 'sink' conditions in the mine void, any poor quality water recharging the alluvium will ultimately discharge back into the mine void (being within the void's 'capture zone'). In Associate Professor Currell's view this has still not been comprehensively demonstrated.

104. He noted that, if the conceptual model outlined in Figure 33 of the groundwater assessment (reproduced below) is correct, it is assumed there will continue to be a groundwater divide between the Namoi River and mine pit at the peak of mining. This would mean there could be a potential flow-path towards the alluvial aquifer and river, from the area of emplaced overburden. It is not fully demonstrated in the figures provided (e.g. Hydrogeologic 2020; Whitehaven, 2019) that all flow would indeed be captured by the mine void (as specific flow paths are not mapped). Due to the inherent uncertainty in groundwater modelling of this type, he said that is reasonable to conclude that the specific water table patterns that develop in the later stages of mining may vary from the predicted pattern. This may include the development of water table mounding below the emplaced mine overburden, with some flow directed back towards the alluvium, rather than towards the mine void.

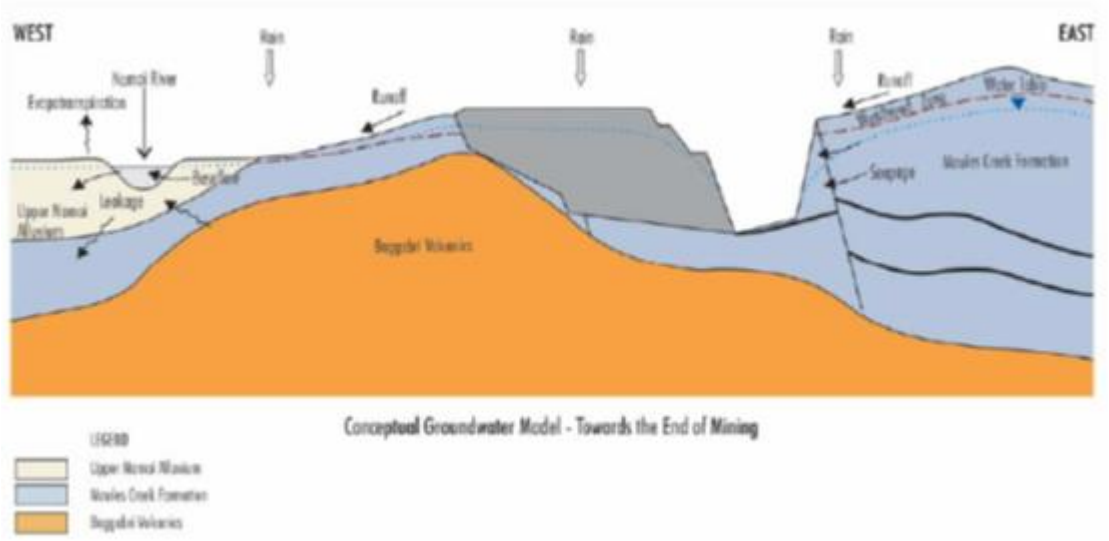

Figure 2 – Conceptual groundwater flow model at peak of mining (reproduced from HydroSimulations, 2018 in the project EIS).

105. Ms Elizabeth Laird, representing the Country Women's Association of New South Wales, Maules Creek branch

> *"We have read the justification and disagree that leaving a final void is a precautionary principle in action. If a void is the only way to protect the region and avoid serious environmental damage, then signing this approval means the risks of long-term impacts on the ground water is borne by the community and our children. If the final void is the only way to localise impacts, then the mine is in the wrong place. If backfilling a void will make the impact worse, then this is a no-go zone. Responsible mining in these times of water insecurity does not leave voids, our regional water needs cannot afford an irresponsible project... We believe that closing the void is the cost of doing business and these costs must be paid by the proponent."*[27]

Summary

106. Based on Associate Professor Currell's assessment, there remain multiple areas that were highlighted by the IESC and his 2019 previous review which have yet to be addressed (including in the recommended consent conditions). There remain significant concerns surrounding the groundwater-related impacts arising from the Project.

107. If the Project is granted development consent in the absence of this information, the IPC will have failed to assess the likely environmental impacts of the Project: s 4.15.

108. LTG submits that there are threats of serious or irreversible environmental damage to water resources and groundwater dependent ecosystems caused by the Project going ahead. As Associate Professor Currell's evidence demonstrates, there is a lack of full scientific certainty in relation to these impacts. The precautionary principle is therefore engaged and the IPC which should not be used as an excuse to postpone the prevention of the environmental measures to a later date via conditions of consent and/or management plans. Rather, the IPC should reject the proposal.

[27] Public Hearing Transcript 2 July 2020, P-38, lines 8-25

B. CLIMATE CHANGE

109. In summary, LTG's case is that approval of the Project at the current time is not in the public interest and contrary to the principles of ESD, in particular the principles of intergenerational equity and improved valuation, pricing and incentive mechanisms, because the greenhouse gas (**GHG**) emissions (Scope 1, 2 & 3) from the proposed development would adversely impact on the environment, including the environment of NSW, and hinder measures to limit dangerous anthropogenic climate change.

110. The effects of carbon in the atmosphere arising from the activities at the site, and the burning of the coal extracted from the development, are inconsistent with a carbon budget and internationally agreed policy intentions to keep global temperature increases to below 2 degrees Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5 degrees Celsius, and would have a cumulative effect on climate change effects in the long term. In light of that substantial environmental harm, and the critical importance of combatting climate change now, the Project should be refused.

111. There are multiple statutory pathways under the EP&A Act by which the IPC must have regard to the impacts of the Project on climate change, and which permit the IPC to refuse the development on this ground. These are:

a. s 4.15(1)(a), which requires the IPC to take into consideration the provisions of the *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007* (**Mining SEPP**), which requires the decision maker to have regard to the downstream impacts of the mine (s 14(2)) ;

b. s 4.15(1)(b), which requires the IPC to take into consideration the likely impacts of the proposed development, including environmental impacts (which includes the impacts of GHG emissions on climate change); and

c. s 4.15(1)(e), which requires the IPC to take into consideration the public interest, including the principles of ESD.

112. As set out above, section 4.15 of the EP&A Act makes any applicable EPI a mandatory relevant consideration. The activities the subject of the Project meet the definition of "mining" in clause 3 of Mining SEPP. Consequently, the Mining SEPP applies to the determination of the Project.

113. Clause 14 of the Mining SEPP relevantly provides:

> ***14 Natural resource management and environmental management***
>
> *(1) Before granting consent for development for the purposes of mining, petroleum production or extractive industry, the consent authority must consider whether or not the consent should be issued subject to conditions aimed at ensuring that the development is undertaken in an environmentally responsible manner, including conditions to ensure the following:*
>
> *...*
>
> *(c) that greenhouse gas emissions are minimised to the greatest extent practicable.*
>
> *(2) Without limiting subclause (1), in determining a development application for development for the purposes of mining, petroleum production or extractive industry, the consent authority must consider an assessment of the greenhouse gas emissions (including downstream*

emissions) of the development, and must do so having regard to any applicable State or national policies, programs or guidelines concerning greenhouse gas emissions.

…

114. Accordingly, clause 14(2) of the Mining SEPP makes the downstream greenhouse gas emissions of the Project a mandatory relevant consideration to be taken into account by the IPC when determining the Project.

115. In the Rocky Hill decision at [513], Preston CJ, having reviewed the authorities, concluded that the consideration of the impacts of the Project on the environment and the public interest justify considering not only the Scope 1 and Scope 2 emissions but also the Scope 3 emissions of the Project. Likewise, the Department explicitly acknowledges in the Assessment Report that the Scope 3 emissions from the combustion of product coal is a significant contributor to anthropological climate change and the contribution of the Project to the potential impacts of climate change in NSW must be considered in assessing the overall merits of the development application.[28]

116. It is irrelevant for the purposes of the s 4.15 assessment process that the Scope 3 emissions would not contribute to Australia's Nationally Determined Contribution (NDC) to the Paris targets and it is not necessary to determine whether consideration of the Scope 3 emissions extends beyond the borders of New South Wales to, for example, the use of coal in South Korea. That is because all of the direct and indirect GHG emissions of the Project will adversely impact the NSW environment. The IPC accepted this argument in the Bylong Coal Project determination,[29] agreeing with Preston CJ in Rocky Hill that:

"Nevertheless, the exploitation and burning of a new fossil fuel reserve, which will increase GHG emissions, cannot assist in achieving the rapid and deep reductions in GHG emissions that are necessary in order to achieve "a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century" (Article 4(1) of the Paris Agreement) or the long term temperature goal of limiting the increase in global average temperature to between 1.5°C and 2°C above pre-industrial levels (Article 2 of the Paris Agreement)." [525]

117. The argument should be accepted in this case.

118. Approval of the Project would breach the obligation of intergenerational equity in that the development of a new greenfield open cut coal mine, which the IPC should rightly consider this project to be, would have an adverse impact on climate change, in particular a carbon budget and internationally agreed policy intentions to keep global temperatures to less than 2 degrees Celsius and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius.

119. Approving this coal mine will worsen the impacts of climate change, thus contributing to the burden that will be borne by future generations in living with, and addressing, the consequences of climate change.

120. The Project will result in approximately 370 million tonnes of greenhouse gas emissions (carbon dioxide equivalents (CO_2-e)).[30]

121. LTG adduces expert evidence from Professor Will Steffen, an Emeritus Professor at the Australian National University and a Senior Fellow at Stockholm Resilience Centre. In his

[28] Department's Assessment Report at xiv
[29] at [690]
[30] Department's Assessment Report at page xiv

report, Professor Steffen documents the current serious impacts of climate change and explains that the rate of climate change is "alarming"[31] and primarily driven by carbon dioxide (**CO_2**) emissions, with about 90% of CO_2 emissions arising from fossil fuel (coal, oil, gas) combustion.[32]

122. Professor Steffen's first report to the IPC provided in 2019 (**2019 Steffen report**) summarises the science of anthropogenic climate change and its impacts (at [7]-[32]). In addition to this summary, LTG relies upon the helpful summary of the science and the international framework on climate change set out in the judgment of Mallon J in *Sarah Thomson v The Minister for Climate Change Issues* (2018) 2 NZLR 160; [2017] NZHC 733 at [8]-[42].

123. Further, the 2019 Steffen report provides a synthesis of current climate projections against the carbon budget which demonstrates that Australia is not on track to meet its NDC target for 2030. Further, if every country followed Australia's level of action, the world would be on a trajectory to reach a 3- 4°C temperature rise by 2100 and would thus face extremely damaging levels of climate change impacts.[33]

124. Professor Steffen expanded on this issue in response to questions asked by the IPC Panel at the public hearing,

> "*But if you actually look at the commitments these countries have made, that would take us to a 3.2 degree Celsius world... It will trigger a lot of feedbacks in the climate system, melting of permafrost, burning of the Amazon Forest and those sort of things. They're high probability events at 3.2 degrees...*"[34]

125. Professor Steffen was asked by the IPC whether the fact that the proponent has made a commitment to sell coal to countries that are signatories to the Paris Agreement alleviated his concerns in relation to Scope 3 emissions. He gave his answer in his written supplementary report dated 10 July 2020:

> "*virtually every country that is a signatory to the Paris Agreement – and that is nearly all countries on Earth – have made commitments that are not consistent with the temperature target range of the Paris Agreement (keeping temperature rise to 'well below 2℃ and aiming for 1.5℃). In fact, current policy commitments would most likely lead to 3℃ or more of heating (Rogelj et al. 2016). Furthermore most countries are not on track to meet even their inadequate Paris commitments, and thus global emissions of greenhouse gases have continued to rise since 2015."*

126. In order to address the issue of dangerous climate change, Australia, along 196 other Parties, is a signatory to the Paris Agreement, which entered into force on 4 November 2016. The Paris Agreement aims to strengthen the global response to the threat of climate change, in the context of sustainable development and efforts to eradicate poverty, including by, *inter alia*:

> *Holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change.*

127. In Professor Steffen's opinion, the carbon budget approach, as adopted by the Intergovernmental Panel on Climate Change (**IPCC**), is the most robust way to determine

[31] Professor Will Steffen, Expert Report, [10].
[32] Professor Will Steffen, Expert Report, [7].
[33] Professor Will Steffen, Expert Report, [27], [36].
[34] Public Hearing Transcript, 3 July 2020, P-28, lines 45

the cumulative amount of carbon that can be emitted into the atmosphere to stay within the temperature goals of the Paris Agreement.

128. Professor Steffen's further advice prepared for this IPC hearing provides an updated analysis of the carbon budget which shows that it is no longer possible to limit temperature rise to 1.5°C with a 66% probability of success. On 9 July 2020 the World Meteorological Organisation published new climate predictions identifying that there is an approximately 20% chance that one of the next 5 years will be at least 1.5°C warmer than pre-industrial levels, but the chance is increasing with time.[35]

129. Professor Steffen's further advice also notes the worsening risks and impacts of climate change have become even more evident over the past 12 months with the 2019-2020 bushfires in eastern Australia and another mass bleaching of the Great Barrier Reef.

130. Residents in the area of the proposal are already living with these impacts, as a neighbour of the proposed mine said at the public hearing:

> *"Just prior to this epidemic we had witnesses a record drought in most of Australia, and let's not forget the devastating bushfires only last year. Hotter and drier than we've ever seen before. As farmers, we are seeing the changes first-hand on the ground, as the environment is our life. It is our livelihoods. It will only get harder to grow crops in extreme weather patterns. That is a fact. Our crops, everyone's food."*[36]

131. In his supplementary report, responding to the IPC's questions, Professor Steffen identified the environmental impacts that are likely to arise from temperature increases. He noted that the majority of tropical coral reefs are projected to die at a temperature rise of 1.5°C and over 99% will be dead at a 2°temperature rise (IPCC 2018). He also identified that, at the current 1.1°C level of heating, the profitability of broad-acre cropping has already been reduced by 22% (Hughes et al. 2019). A 3°temperature rise would significantly increase heat stress and reduce the productivity of pasture-based dairy cattle in temperate zones (Lees et al. 2019) and beef cattle in northern Australia. Declining forage production due to declining or more variable rainfall would likely reduce numbers and productivity of domestic livestock (sheep and cattle) (McKeon et al. 2009). Professor Steffen said this:

> *"… the point is that the high-probability impacts are severe, presenting very large challenges to our health, well-being, economy, livelihoods and natural ecosystems. Australia at a 3℃ temperature rise would be largely unrecognizable compared to 20th century Australia and would be one of the toughest continents on the planet for humans to thrive upon."*

132. In Professor Steffen's opinion, under any reasonable set of assumptions regarding probabilities of actually meeting the carbon budget and the sensitivity of the climate system to the level of greenhouse gases in the atmosphere, fossil fuel combustion must be phased out quickly, and most of the world's existing fossil fuel reserves – coal, oil and gas – must be left in the ground, unburned, if the Paris Agreement temperature targets are to be met. It therefore follows that no new fossil fuel development, including the Project, can be permitted because its approval would be inconsistent with the carbon budget approach towards climate stabilisation and the Paris Agreement climate target.

133. As Ms Amanda King said to the Panel:

> *"So at this point, after what we have lived through this last summer and to avoid what scientists around the world refer to as climate catastrophe, surely it would be nothing more than common sense to redirect funds and energy away from fossil fuels*

[35] WMO Geneva 9 July 2020: Global Annual to Decadal Climate Update, led by the UK's Met Office
[36] Public Hearing Transcript 3 July 2020 P-22, lines 34-39

immediately to the renewable energy space and the transition we also desperately need. Funds and energy to protect the remaining natural environment, the water, the habitat, the wildlife that is left, to preserve all arable land to ensure we're able to feed, grow in population but mostly to do all that we can to provide a liveable planet for our children."[37].

Professor Steffen's evidence is based on a body of scientific evidence that confirms the immediately and significant threat posed to the environment, including the environment of NSW, and communities from climate change. A selection of the relevant evidence is provided to the IPC as a bundle of relevant documents, listed in Appendix 1 to these submissions.

134. The proponent's argument that the Project contributes insignificantly to global GHG emissions, and thus has a minimal impact on climate change, should be dismissed immediately. Arguing that a single proposal or event is immaterial because it is a tiny percentage in terms of its impact fails to acknowledge cumulative and incremental impacts: see Preston CJ in Rocky Hill at [514]-[524]. In the Bylong Coal Project determination, the IPC also accepted that the cumulative environmental impact of the Project needed to be considered when weighing the acceptability of GHG emissions associated with the mine.[38] Once again the IPC accepted the finding of Preston CJ in Rocky Hill when his Honour said:

"it would be rational to refuse fossil fuel developments with greater environmental, social and economic impacts than fossil fuel developments with lesser environmental, social and economic impacts. To do so not only achieves the goal of not increasing GHG emissions by source, but also achieves the collateral benefit of preventing those greater environmental, social and economic impacts."

135. Further as Professor Steffen explained to the IPC in his verbal submission:

"Australia is an important player. If you look at just our domestic emissions, we rank about 15 out of 197 countries. We're equivalent to many of the European countries like France, like Britain, like Spain. When you consider our exports, we would rank fifth or sixth in there with China, USA and so on, so we have a major role to play in stabilising the climate system."[39]

136. In his supplementary report, in response to a question from the Panel on whether this view was impacted by the fact that the proposal would replace expected diesel truck movements with rail movements, Professor Steffen said no, noting that:

"*most of the emissions associated with the Project will come from the combustion of the coal rather than the transport of the coal*"[40]

137. The proponent has not adduced evidence to demonstrate that, if the Project is not approved, the export markets will need to secure an alternative source of coal and that this coal may be of an inferior quality and may lead to poorer environmental outcomes. The IPC agreed with Preston CJ that unacceptable development does not become acceptable because alternative development is pursued that has unacceptable impacts:

"If a development will cause an environmental impact that is found to be unacceptable, the environmental impact does not become acceptable because a hypothetical and uncertain alternative development might also cause the same unacceptable environmental impact. The environmental impact remains unacceptable regardless of where it is caused. The potential for a hypothetical but uncertain alternative development to cause the same

[37] Public Hearing Transcript 3 July 2020 P-42, lines 18-25
[38] Bylong Coal Project (SSD 6367) Statement of reasons for decision at [692]-[695].
[39] Public Hearing Transcript 3 July 2020 P-27, lines 36-40
[40] Professor Steffen supplementary expert advice dated 10 July 2020

unacceptable environmental impact is not a reason to approve a definite development that will certainly cause the unacceptable environmental impacts. In this case, the potential that if the Project were not to be approved and therefore not cause the unacceptable GHG emissions and climate change impacts, some other coal mine would do so, is not a reason for approving the Project and its unacceptable GHG emissions and climate change impacts: see Kane Bennett, "Australian climate change litigation: Assessing the impact of carbon emissions" (2016) 33 EPLJ 538 at 546-548; Justine Bell-James and Sean Ryan, "Climate change litigation in Queensland: A case study in incrementalism" (2016) 33 EPLJ 515 at 535 [Rocky Hill 545]

138. The approval of the Project at the current time is contrary to the principle of intergenerational equity because of the cumulative impact of GHG emissions from the Project, which is inconsistent with the carbon budget approach towards climate stabilisation and the Paris Agreement climate target. The Project's contribution to cumulative climate change impacts mean that its approval would be inequitable for current and future generations.

139. Because the Project will contribute to cumulative anthropogenic GHG emissions that are currently projected to exceed the carbon budget, any conditions to be attached to the Project that do not require it to be carbon neutral will be insufficient to address its cumulative GHG impacts.

140. The IPC asked Professor Steffen for his opinion of carbon capture and storage (CCS) and HELE (high energy low emissions) technologies in terms of making coal a less polluting product. In relation to CCS, Professor Steffen:

> *"It hasn't gone very far here and hasn't gone very far anywhere because it's very expensive, and now it's been economically undercut by renewables and storage systems which are far, far cheaper than any fossil fuel development with CCS and even now cheaper than fossil fuel developments with – without CCS. So basically, as far as I can see, CCS is dead in the water because it's yesterday's technology and it's already being undercut by zero technology energy systems."*[41]

141. In relation HELE, Professor Steffen said:

> *"...that certainly helps cut emissions, but it certainly doesn't reduce them anywhere near what needs to be reduced, so I think the point is, in terms of thermal coal – I'm talking now about thermal coal rather than meteorological coal – thermal coal is being bypassed really fast by the technological developments in renewables, so that's not only true here in Australia, where for new power generation, renewables are definitely cheaper than coal or gas. That's true now in most other parts of the world."*[42]

142. Accordingly, approval of the Project at the current time would be irrational, is not in the public interest, is contrary to the principles of ESD and should be refused consent.

Response to Ashurst letter of 16 June 2020 ("Ashurst submission")

143. The Proponent of the Project submitted a voluminous submission, dated 16 June 2020, about the consideration of greenhouse gas emissions. Our client is concerned that, the submission was only made available to the public two days prior to the public hearing making it difficult for the public to provide a meaningful response to the submission. In any event, most of the arguments covered in the Ashurst submission re-hash bad science and

[41] Public Hearing Transcript 3 July 2020 P-29, lines 28-34
[42] Public Hearing Transcript 3 July 2020 P-29, line 43 - P-30, line 2

have previously been rejected by the Land & Environment Court in Rocky Hill. That decision may not be a legal precedent but the IPC will need to identify compelling reasons why the logical reasoning in that case should be rejected.

144. Section 4.15 of the *Environment Planning and Assessment Act 1979* (NSW) (**EP&A Act**) sets out the matters for consideration, for the panel of the Project. That section provides the panel with a broad discretion to consider the matters it thinks appropriate, and giving matters weighting as it thinks appropriate. That section also takes precedent over other state policies such as the Mining SEPP.

145. There is no legal prohibition under s 4.15 preventing the panel from considering the environmental impacts of greenhouse gas emissions caused by the Project including the consideration of scope 3 greenhouse gas emissions. The decision in Rocky Hill demonstrates this. Contrary to the Ashurst submission at [7.17], LTG submits that Scope 3 emissions should be counted and is in line with the NSW Climate Change Policy Framework. Our client submits that the Project's Scope 3 emissions, including those emission caused by the burning of the Project's product coal should be considered as an important factor weighting against the approval of the Project, per s 4.15 of the EP&A Act. The task before the IPC, in determining the merits of the Extension Project, is precisely the same as the task that was before the Land and Environment Court in the *Gloucester Resources Limited v Minister for Planning* [2019] NSWLEC 7 (**Rocky Hil**l) where the Court applies the wrong time test for in rejecting the development application of the Rocky Hill coal mine.

146. Our client submits that the proponent has not sufficiently demonstrated why the Extension Project, over other existing and approved coal mine projects, should be permitted to facilitate the exploitation and burning of significant new fossil fuel reserves in light of the global carbon budget, which recognizes the urgent need to significantly reduce GHG emissions to avoid dangerous climate change (Rocky Hill [697], [699]). The "wrong time" basis for refusal effectively requires proponents to demonstrate why the fossil fuel reserves relevant to their project should be allowed to be exploited and burned, over and above other projects, at a time when a rapid and deep reduction in GHG emissions is needed to stay within the global carbon budget, and avoid dangerous climate change. This is particularly so given evidence that predicted GHG emissions from existing (including approved but not yet constructed) fossil fuel projects will already set us on course to exceed the carbon budget (Rocky Hill [527], [697], [699]).

147. Given the significance of the issue of climate change, our client considers certain reports should be considered by the IPC panel in full (**Appendix 1**).

C. SOCIAL AND ECONOMIC IMPACTS

148. Under s 4.15 of the EP&A Act, the IPC must consider the likely impacts of the development, including social and economic impacts in the locality.

149. The evidence has demonstrated that the Project will have a significant negative social impact on residents, some businesses, and the community of Boggabri, contrary to the public interest, and the principles of ESD. ESD requires the effective integration of social considerations in decision-making processes.

150. A number of landowner, resident and business objectors spoke to the significance of the Project in terms of the social impacts on the community. This included impacts on community relationships, the inability of mines to coexist with farming neighbours, and the relationship between water use and social impacts.

151. Mr Peter Wells, a neighbour of Whitehaven Coal in speaking to his concerns about mining impacts on other businesses, including farmers, said:

> *We've seen this in the local water pricing wars that have developed around Maules Creek and Boggabri with farmers outpriced in their market, and the retrospective water approvals ticked off by planning process not enforcing the original EIS conditions.*[43]

152. Mr. Patrick Murphy representing the Boggabri Business & Community Progress Association noted:

> *"Our association is made up of individual people, businesses, organisations and schools from within the area, all with a common goal and that is a sustainable, positive future that Boggabri and the local people can proudly call this the little town with the big heart. A home they can enjoy for generations to come. This new greenfield mine will not help us achieve that. Our community has been hollowed out by families who once shopped, played sport and were involved in Boggabri. Our trust and respect for Whitehaven has diminished completely through broken commitments and a very poor environment track record and the seemingly contemptful way that they treat the landholders, through no fault of the landholder who are unlucky enough to be lumped with Whitehaven as a neighbour."*[44]

153. Overall, the Project does not "promote the social and economic welfare of the community and a better environment", contrary to s 1.3(a) of the EP&A Act. The Project should be refused.

154. LTG has adduced expert evidence from Dr Alison Ziller Lecturer in Social Impact Assessment at the Department of Geography and Planning at Macquarie University in the form of on expert report to the first IPC public hearing (February 2019), further expert evidence to the current public hearing (1 July 2020) and a supplementary advice based on questions from the IPC Panel (10 July 2020).

155. In her opinion, key issues for consideration by this IPC are:

a. The lack of hard evidence provided by the proponent to support the numbers of jobs that will be created for local people and therefore the questionable social benefits to be provided;

b. The impact on public health; and

c. The lack of tangible mitigation strategies.

156. The IPC also heard evidence in relation to the economic analysis of the Project, including from Mr Robert Henderson (an economic and financial consultant), Mr Simon Nicholas (Institute for Energy Economics and Financial Analysis), Dr Alistair Davey (Pegasus Economics) and Mr Roderick Campbell (The Australia Institute).

157. Collectively, this evidence showed:

a. the proponent's conclusion that the project will generate benefits for the state of NSW is based on out-of-date coal price forecasts;

b. coal marketing forecasting based on assumptions that the world will respond to avoid dangerous climate change, predict significant declines in coal trade. This includes the International Energy Agency's Sustainable Development Scenario,

[43] Public Hearing Transcript 2 July 2020, P-48, line 47 - P-49, line 3
[44] Public Hearing Transcript 3 July 2020, P-15, lines 22-32

which sees global thermal coal trade volumes drop by 65% by 2040 from 2017 levels and thermal coal trade for power generation drops by 79% by 2040;

c. increasing coal supply will lower the value of Australia's existing coal operations. This will inevitably put further downward pressure on coal prices;

d. the purported economic benefits are overstated, including by externalising the cost of GHG emissions;

e. the costs to alternative industries have not been adequately considered, including industries that trade internationally and are, or may become reliant on, trade agreements that consider Australia's contributions global to efforts to reduce greenhouse gas emissions;

f. the rapid shift to renewables creates a significant risk that the Vickery Extension Project will become a stranded asset leading the people of NSW with the financial burden of undertaking site rehabilitation.

158. In his presentation to the IPC on 2 July 2020, Mr Davey said:

"*If you actually use some of the most recent coal price forecasts available from the World Bank, as well as from KPMG, then you will find that the project is actually loss making, and these forecasts that have been – that we've used in our report actually do assume a fairly substantial price rise on current – on current coal prices that are probably at their lowest point. So it's not as if we've taken current coal prices and set them into an economic analysis. Nothing could be further from the truth. The economic forecasts or the price forecasts we've used are quite reasonable and assume quite a substantial price rise on current – current – current levels. In terms of estimating that this is likely to be a price – is likely to be a profit losing proposition, we have used exactly the same costs as outlined by Whitehaven in its original economic assessment. The only exception is that we've added another $40 million based on their publicly available material in regard to their elevated rail spur*."[45]

159. Mr Roderick Campbell from The Australia Institute noted in his presentation to the IPC:

"The key problem with all of these assessments is that they ignore the Paris Climate Agreement and the International Energy Agency's 'sustainable development' scenario on what happens to coal consumption and the international coal trade and New South Wales coal exports when the world acts on climate change, as the New South Wales government, Australian government and governments around the world are committed to doing. 15 By failing to address what will actually happen to coal markets over the next couple of decades, all of these – all of these assessment documents overlook the huge uncertainty around the ability of the project to proceed in the medium to long term and to provide any of the estimated benefits. A lot of the benefits around jobs, incomes, royalty payment, all of these are presented in the assessments as having a 20 reasonable degree of certainty around them; whereas, in fact, they're highly uncertain. If the world acts according to our stated policies, most of those benefits are unlikely to be achieved."[46]

160. LTG argues that:

a. the proponent has failed to substantiate that the Project would employ an operational workforce of approximately 344 FTE jobs between 2020 and 2044;

[45] Public Hearing Transcript 2 July 2020 P-93, lines 24-35
[46] Public Hearing Transcript 3 July 2020 P-47, lines 9-23

b. the proponent has failed to substantiate that 70% of those jobs would be taken up by local people;

c. the Department has not demonstrated why it considers that the employment projections are reasonable;

d. inadequate financial benefits will accrue to the local communities, particularly within Narrabri LGA, thus underscoring the distributional inequity of the development;

e. residents within Narrabri LGA in particular suffer from poor health relative to other parts of NSW and the SIA does not adequately assess the public health impacts of the Proposal on those residents;

f. the proposed mitigation strategies identified in the SIA are intangible and will not deliver an effective response to the social costs of the Project; and

g. those negative impacts are not outweighed by the purported economic benefits of the Project and the purported benefits are overstated.

161. Set against the questionable economic benefits of the Project are significant negative social impacts.

Jobs

162. The proponent's SIA asserts that a major social benefit of the proposed extension will be jobs for local people. This assertion is rebutted by both Daniel Boyce, Manager Planning and Regulatory Services, Narrabri Shire Council (NSC), Dr Davey and Dr Ziller.

163. Mr Boyce raises legitimate concerns about the calculation of employment projections for the proposed development when compared to the employment projections for the Approved mine. There is no obvious explanation why the projection rates should be dramatically greater for the proposed Project than for the approved development. The proponent has been unable to justify its assumption in the SIA that '21% of the (fulltime) workforce would reside in Boggabri' and that '13% of the (fulltime) workforce would reside in Narrabri'. The proponent has stated that 'further details regarding the Project workforce' will only be provided to Narrabri and Gunnedah Shire Councils 'after the approval of the Project'. The proponent is not prepared to accept 'a condition of any development consent which dictates where the workforce will reside … within the region' (RTS p170). Figure 1 of the NSC report suggests that towns in the Narrabri LGA are not receiving the claimed employment benefits from mining development. As a result it is unlikely that the stated local economic benefits of local employment and associated local spending will be realised.

164. In any event, if the claimed employment benefits do materialise for the town of Boggabri, that brings with it other social costs. The increase in demand for accommodation is likely to increase housing prices and impacts on locals who are not earning mining wages both in terms of rental availability, cost and purchases of property. This may have an impact on disadvantaged segments of the community, including those from lower socio-economic and indigenous backgrounds. Whilst Dr Ziller in her supplementary report dated 10 July 2020 noted some positive social impacts of mining in general, she also stated that each positive impact is associated with an adverse social outcome.

165. Further, Dr Davey, Mr Boyce and Dr Ziller raise concerns about the potential use of

Automotive Haulage Systems (AHS) within the Proposal, and the impacts on the claimed job creation figures. NSC refer to a 2015 study by McKinsey on the Metals and Mining Sector which notes the productivity improvements in the mining sector which can be achieved through digitization and automation. In Whitehaven's Submissions Report, which is dated August 2019, the proponent stated that 'Whitehaven has no current plans for the Project to include an automated fleet' (p 170). However, one month later, in September 2019 Whitehaven advised the Australian Financial Review as follows:

> *'The work that we are doing is all about optimizing Vickery to ensure that we can bring that cost down. Success of an autonomous rollout at Maules Creek will be instrumental at Vickery given the proportion of its total costs that's going to be spent in moving dirt.'*

166. This was a reference to automation trials at the Maules Creek mine involving haul trucks. Subsequently, in its presentation for Investor Day in September 2019, Whitehaven announced:

> *'The potential for the introduction of AHS capability at the mine, likely to be implemented post box cut mining (year 3) will significantly enhance the economics of the project by reducing life of mine operating costs by (approx.) $4t.'*

167. The above contradictory and potentially misleading statements should be concerning to the panel determining the Project, and community members and local residents who are relying on the Proponent's promises about employment opportunities that the Project will create. Further, the Proponent's economic analysis relies on the purported jobs figures, in August 2019, to demonstrate that the Project will have an economic benefit to the local community. As such, it is incumbent on the IPC address this discrepancy in the Proponent's position about jobs.

168. The identification by the company of potential savings of approximately $4tn suggests that the use of AHS will go well beyond the automation of haul trucks and will likely extend to other (currently) low-skilled labour intensive operations, including mining fleet, CHPP operations and rail load out. This may impact on employment opportunities for local residents.

169. Mr Boyce notes that 'throughout the process, it has become apparent that the proponent has used job creation as the primary social and economic driver' to justify approval of the Project. In his opinion, supported by those of Drs Davey and Ziller, the assumptions used to calculate the job projections appear 'optimistic, flawed and unreliable and the purported economic benefits to the community of Boggabri seem unlikely to materialize.'

Public Health

170. Dr Ziller is further concerned that the proponent's SIA does not adequately draw out the poor public health profile of the local area and consider the likely social impacts in that context. She notes that the Project is proposed for a region in which the public health profile is one of relative health disadvantage. This disadvantage concerns the residents of the region, not the employees of the mining companies. Many of the people currently experiencing health disadvantage will not benefit from the small number of jobs that the Project may make available locally. The distributional inequity of the Project is demonstrated by the identification that the proposed financial benefits to the state will be achieved at the social cost of adding to the burden of disadvantage already evident in the public health profile of the region.

Mitigations

171. Dr Ziller identifies that, whilst the SIA proposes 72 management strategies to address social costs of the Project, more than three quarters of these strategies fall into the general category of consult, encourage and inform. In her opinion, there is no management strategy proposed that addresses the likely social costs of the Project in a tangible and durably effective manner.

172. The Mayor of Narrabri Shire Council, Ms Redding, expressed the lived experience of the proponent's interactions with the community:

> *"As mayor of this shire, it is a great concern that this proposal in its current form is contributing to anxiety and apprehension within our community, particularly amongst the residents of Boggabri and its surrounds. It is our understanding that the purpose of these hearings is to consult with affected communities and listen to what they have to say. As a long-term member of the Narrabri Shire Council, I have come across different forms of consultation to varying degrees of success. What I can say is that the current proponent claims to have – that they have consulted with our community, but it seems to me that they largely ignored the concerns of the Narrabri Shire about the potential impacts of this proposal on our people."*[47]

173. During the public hearing, community members also spoke to the impacts of mines in this farming community. Mr David Quince, Chair of the Mullaley Gas & Pipeline Accord said:

> *"In the Namoi Valley, Whitehaven Coal owns more than 61,050 hectares over 471 freehold titles, which has resulted in at least 90 family farms being bought out, with many leaving the region permanently. This has enormous negative social impacts, as many were compulsory acquisitions forcing people from their homes and their businesses. It has impacted on people's health, livelihoods, caused division in the communities over who benefits from the mines and who doesn't, and changed the social dynamic. Outside the compulsory acquisition zone, proximity to mines decreases the value of rural properties, and this affects succession planning on farms, making it less attractive for the next generation of agricultural workers.*
>
> *This reallocation of land to mining always results in direct loss of agricultural productivity and hence economic activity for this sector. There is further loss of revenue from support industries such as agricultural service providers. The flow-on effects would be considerable, with farming families leaving the area. This impacts on the school, school ..... and local sporting teams. Typically, there is cost-shifting to farmers that remain in the area, as they bear the additional costs of maintenance, of fence lines, feral animals and noxious weed control as well as rates, as seen by a 38.5 rate increase over three years to the Gunnedah Shire directly attributed to the imposts of the mining industries on council resources.*
>
> *This is not a burden that the agricultural industry and existing ratepayers should have to carry. By removing land that has been traditionally used for agriculture from the economic and social contributions to the community, there is an exponential negative impact on rural communities. We have a considerable concern about the cost-benefit analysis for the Vickery Extension Project. The short-term economic benefits of this mining proposal outweighs the long-term costs to landholders and agricultural production communities.*
>
> *Farmers, along with others, now bear direct costs of climate change, as rising temperatures and concurrent increasing severity and frequency of droughts and other extreme weather events is resulting in drastically reduced food production. The Vickery*

[47] Public Hearing Transcript 2 July 2020 P-30, line 45 - P31, line 10

Extension Project is just another fossil fuel project that is a direct threat to food security, as it would contribute to global warming. The destruction of our environment for the purposes of sourcing fuel that contributes to global warming is self-evidently unsustainable and counterproductive. The Mullaley Gas & Pipeline Accord are committed to a sustainable future through being environmentally, socially and economically responsible."[48]

174. These impacts were further expanded on in the personal experience of Ms Sally Hunter who told the public hearing:

> *"Last week, my family said goodbye to friends of ours. They are leaving our area, having been bought out by Whitehaven. They were a neighbour to Maules Creek Mine but were not in a compulsory acquisition zone and were never 5 supposed to be impacted. The reality turns out that the impact zone is larger than was identified in the EIS process, larger than what was identified in the conditions of consent, larger than what the proponent talked about at the PAC public hearing like this one today. They are the sixth family to have been bought out since Maules Creek Mine was approved. None of these six families were identified for compulsory acquisition. Six more families forced out of our area, who were never supposed to be bought out, never supposed to be impacted."*[49]

175. The Project will have a significant negative social impact on residents and the community of Boggabri and the surrounding area, contrary to the public interest and the principle of intergenerational equity. The Project has overstated the economic and jobs benefits of the Project.

D. EUROPEAN HERITAGE

176. The property 'Kurrumbede' is formerly the home of the Mackellar family and is closely associated with the poet Dorothea Mackellar who was a frequent visitor to the property. She based a number of poems on her experiences of the environment and pastoral practices there. Kurrumbede also has links to Andrew 'Boy' Charlton who worked as a jackaroo there for over 8 years.

177. LTG adduced by LTG from Ms Sharyn Anderson a PhD confirmed candidate whose research is based on Dorothea Mackellar who expressed the following views in relation to the importance of Kurrumbede:

> *"it is essential Kurrumbede be preserved for future generations and given full Heritage protection. This should include permanent protection from further development, such as is proposed in the Vickery Extension Project proposal, as this will severely impact the visual and aesthetic amenity of all buildings, including the homestead, garden and broader rural aspect. Kurrumbede and its environs was well known and loved by one of Australia's most iconic poets: Dorothea Mackellar. It is imperative that the country house, property and landscape surrounding Kurrumbede, that she depicted so well in her poetry, is restored and preserved for future generations. The Vickery Extension Project is inimical to the sense of place Dorothea Mackellar created in her poetry. It is vital that Kurrumbede be protected: restored and preserved for all Australians, for all time."*

178. Ms Phillipa Murray on behalf of the Dorothy Mackellar Memorial Society stated:

> *"The society believes the house and outbuildings to be of significant heritage value.*

[48] Public Hearing Transcript 2 July 2020 P-72, line 31 - P-73, line 20
[49] Public Hearing Transcript 2 July 2020 P-5, lines 3-12

We are awaiting the outcome of a nomination for these buildings to be added to the State Heritage Register. Not only were they the home of Australia's best-known poet, but they are a truly wonderful example of an early 20th century working station"[50]

179. While the proponent has focused on protection of the main property, Ms Anderson makes it clear that the retention and preservation of the both homestead and rural environs of Kurrumbede is valuable in the context of the literary history of our nation.

"In my opinion Kurrumbede bears witness to the Australian literary and historical record. Its preservation, which includes maintaining the integrity of homestead, farm buildings, garden and environs must be preserved. It is my opinion that the expansion of coal mining and its infrastructure will severely impact the visual, aesthetic and cultural importance of this property closely associated, as it is, with Dorothea Mackellar's life and creative work."[51]

180. Ms Murray has been involved with discussions with Whitehaven about the preservation of the property but remains concerned about the risks of the Project. She further described her experiences:

"The company has endeavoured to tick all the boxes you [IPC] metaphorically raised in your report after the last round of hearings here in February last year, but it has stopped short of one vital statement. It is yet to give to us a firm and definitive commitment to the preservation and maintenance of the homestead and surrounds. This is what the society and I believe the community at large would like to see. We can only wonder why the proponent is stalling; is it because such an undertaking is going to be extremely difficult to fulfil with its current plans for a rail loop 300 metres from the house, a coal handling preparation plant 800 metres away, and the mine pit just a kilometre distant?

We are not in the business of coal mining, and indeed the proponent has said on more than one occasion they are not in the business of running an historical site; however, we have to question why the mine infrastructure has been planned so close to the homestead. Despite all the protective measures and requirements in place, it's difficult to see how the homestead and outbuildings will survive the blasting and dust, which will shake and fall on any renewed garden and homestead. The mining company has owned Kurrumbede since 2013 and claims to be well-aware of its historical and cultural significance; if this is the case, why hasn't it taken steps to ensure the buildings are preserved? It was only after society members visited last year that the company fenced off outbuildings to livestock"[52]

181. The Project will impact the visual and aesthetic amenity of the homestead, garden, outbuildings and broader rural aspect. As Ms Anderson opines, the Project is "inimical to the sense of place Dorothea Mackellar created in her poetry, for all Australians, for all time."

182. Louise Somerville, member of Knitting Nannas Against Gas, the Country Women's Association of NSW, and a daughter of a farming family, spoke to the Panel:

"When my children were small, I would read picture books to their primary school class. I vividly remember reading the poem 'My Country' by Dorothea Mackellar and seeing the small children emotionally affected by the pictures and words of this iconic Australian poem. The historic Kurrumbede Homestead that inspired Mackellar's poem in 1908 sits in the map of this proposed coal mine. It would be an outrageous

[50] Public Hearing Transcript 2 July 2020 P69, lines 21-25
[51] Public Hearing Transcript 3 July 2020 P-40, lines 1-6
[52] Public Hearing Transcript 2 July 2020 P-69, line 36 - P-70, lines 8

decision by bureaucrats if a corporation was given the green light to destroy this entire landscape and such a valuable part of our heritage, only to the magnificent homestead of Kurrumbede to take in the vista of an ugly mine pit. I would like to finish today with a piece of that poem in honour of Dorothea:

> *Core of my heart, my country, land of the rainbow gold. For flood and fire and famine, she pays us back threefold. Over the thirsty paddocks watch. After many days the filmy veil of greenness, that thickens as we gaze. An opal-hearted country, a wilful lavish land. All of you who have not loved her, you will not understand. Though earth holds many splendours wherever I may die. I know to what brown country my homing ports will fly."*[53]

CONCLUSION

183. For the reasons set out above, the Project should be refused.

Environmental Defender's Office

14 July 2020

[53] Public Hearing Transcript 3 July 2020 P-44, lines 29-44

APPENDIX 1 - BUNDLE OF RELEVANT DOCUMENTS

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