

BEFORE THE INDEPENDENT PLANNING COMMISSION
PUBLIC HEARING HELD ON 20 JULY – 1 AUGUST 2020
FOR THE NARRABRI GAS PROJECT

OPENING SUBMISSIONS

FOR

NORTH WEST ALLIANCE

(16 JULY 2020)

PREPARED BY

ROBERT WHITE OF COUNSEL
(12 WENTWORTH SELBORNE CHAMBERS)

ENVIRONMENTAL DEFENDERS OFFICE LTD

INTRODUCTION

1. The North West Alliance (**NWA**) is an affiliation of groups across North West New South Wales who have an interest in education and advocacy around extractive industries projects. It is comprised of local, regional and state-wide community groups including groups based in Narrabri, Bellata, Maules Creek, Coonabarabran, Gilgandra, Dubbo, Coonamble, Burren Junction, Walgett, Tamworth, Armidale, Mullaley and the Liverpool Plains.
2. The Project has aroused substantial and unprecedented community interest. The Department's assessment report notes that it has received nearly 23,000 submissions, including 133 from special interest groups and 22,721 from the general public. 98% of the submissions are opposed to the Project.
3. NWA and its member groups seek a determination that the Narrabri Gas Project (**Project**) be refused development consent. The production of coal seam gas (**CSG**) carries with it significant environmental risks which have not been adequately addressed in the proponent's EIS. The production of CSG requires the extraction of large volumes of 'dirty' water in order to allow gas to flow. The evidence shows that this will worsen the state of groundwater resources which are already under pressure from current users. Also, given that CSG is composed primarily of methane, a potent greenhouse gas (GHG), direct emissions to the atmosphere will exacerbate anthropogenic climate change. The extent of knowledge around environmental impacts from CSG production generally, and from this project in particular, remains poorly documented and highly contentious.
4. In summary, NWA's case is that the Project should be refused approval on the basis of the following issues:
 - a. **Groundwater impacts:** The evidence demonstrates three major environmental risks associated with the Project. These are (i) long term risk of depressurisation and leakage from key water supply aquifers; (ii) groundwater and surface water contamination,

particularly with CSG produced water and/or other wastewater produced as a result of the Project and (iii) fugitive gas migration into aquifers overlying the target coal seams (a groundwater contamination and safety hazard). These are significant and real risks which have not been adequately accounted for in the EIS. Further, the independent expert reports raise significant concerns about the inadequacy of the groundwater modeling carried out in the environmental assessment, and the significant risk that this means impacts to groundwater remain insufficiently quantified. The Project is contrary to the public interest and the principles of ecologically sustainable development (**ESD**), including the precautionary principle, 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 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 local communities, contrary to the public interest and the principle of intergenerational equity. The Project assessment has overstated the economic and jobs benefits of the Project.
- d. **Ecology:** The Pilliga forests and woodlands represent the largest, relatively intact, unfragmented block of dry sclerophyll forest and woodland in eastern Australia. As such they provide a crucial refuge for biodiversity in a landscape largely cleared for agriculture, a matter that has been inadequately considered in the environmental assessment. The EIS does not provide an appropriate and adequate assessment of the likely impacts of the Project on terrestrial and aquatic fauna or groundwater dependent

ecosystems.

5. The application of the precautionary principle in particular, when applied to the potential groundwater impacts, dictates that the Project should be refused development consent. The precautionary principle is squarely engaged in this case because there is a *threat* of serious or irreversible damage to groundwater, including significant aquifers, and there remains scientific uncertainty as to the environmental damage. The evidence will demonstrate that the proponent has been unable to demonstrate that the threat of environmental damage does not exist or is negligible. Having regard to the significance of the threat of irreversible damage to vital groundwater resources, the most proportionate response is to refuse development consent.
6. NWA and its member groups are assisted in the presentation of its case by the following independent experts:
 - a. Assoc Prof Matthew Currell – Groundwater impacts
 - b. Dr Kevin Hayley – Groundwater modeling
 - c. Professor Stuart Khan – Water treatment processes
 - d. Mr Tim Forcey – Fugitive emissions
 - e. Professor Penny D. Sackett – climate change
 - f. Dr Alison Ziller – social impacts
 - g. Dr David Milledge – Faunal Ecology
 - h. Mr David Paull – Terrestrial Ecology
 - i. Dr Peter Serov – Aquatic and Groundwater Dependent Ecosystems
 - j. Alistair Davey – Economics
 - k. Greg Mullins – Bushfire risk and climate change

FACTUAL BACKGROUND

The assessment process

7. On 3 March 2020 the Minister for Planning and Public Spaces wrote to the IPC with the following request:
 1. *Conduct a public hearing into the carrying out of the Narrabri Gas Project (SSD 6456) 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 Department's assessment report in respect of the project, unless the Planning Secretary agrees otherwise.*
8. As such, the IPC is 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**).
9. The Department's assessment report was published on 11 June 2020. The referral letter from the Planning Secretary sending the Department's assessment report to the IPC stated that '*based on this assessment the Department considers that the Project is in the public interest and is approvable subject to strict conditions.*'
10. The evidence will demonstrate that the Department has underestimated the likely environmental impacts of the Project, including the impacts of the Project on vital groundwater resources in the Pilliga, and has not engaged lawfully with the precautionary principle, which, on the facts of this case, dictate a refusal of the Project. The Department has misunderstood and misrepresented the alleged 'need' for the Project and 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 community responses opposed to the Project, an important aspect of the public interest, and to the social impacts of the Project, all of which decisively tell against the approval of the Project.

ROLE & POWERS OF THE IPC

11. 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).
12. 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)*
13. 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...’
14. 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.

15. 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.
16. 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.¹

RELEVANT MATTERS TO BE CONSIDERED

17. 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 application² 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.³
18. Section 4.15 relevantly provides:

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...*

¹ *Bulga Milbrodale Progress Association Inc v Minister for Planning* (2013) 194 LGERA 347 at [28] and [7]-[11].

² Defined in section 4.40, EP&A Act.

³ *Bulga Milbrodale Progress Association Inc v Minister for Planning* (2013) 194 LGERA 347 at [52].

(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.

19. 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.
20. 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 assessment report should be given precedence over other evidence. The Department's assessment 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.
21. Further, the Statement of Expectations states that the Minister encourages the IPC to "*seek guidance from the Planning Secretary to*

clarify policies or identify policy issues that may have implications for State significant development determinations.” Again, this statement is inconsistent with the proper role of an independent IPC, which is required to determine the Project according to law, and not by reference to any guidance from the Planning Secretary on policy issues that may have implications for the Project.

22. The objectors to the Project have been denied procedural fairness to date because the IPC has met privately with supporters of the Project, namely the proponent, the Department and Narrabri Shire Council, but has not met with those groups, including NWA, its members, or members of the community who oppose the Project. While noting that representatives of NWA and its members were invited to attend the site visit, this visit did not permit interrogation of the Project assessment material to a standard that would be possible in private meetings. NWA is also concerned that attendance at the site meeting has been used to justify limiting the time granted to individuals to appear at the public hearing, including those individuals most directly affected by the Project.
23. NWA formally requests that the IPC meets with it prior to determining the development application.

The public interest

24. The public interest is of a “wide ambit”.⁴ A consent authority may range widely in the search for material as to the public interest.⁵ According to Preston CJ, “A requirement that regard be had to the public interest operates at a high level of generality.”⁶ The public interest must be applied having regard to the scope and purpose of the relevant statute.⁷
25. The objects of the EP&A Act include:

- a. facilitating ESD by integrating relevant economic,

⁴ *Shoalhaven City Council v Lovell* (1996) 136 FLR 58 at [63].

⁵ *Terrace Tower Holdings Pty Limited v Sutherland Shire Council* (2003) 129 LGERA 195, per Mason P at [81].

⁶ *Warkworth Mining Ltd v Bulga Milbrodale Progress Association Inc* (2014) 200 LGERA 375 at [298].

⁷ *Patra Holdings v Minister for Land* (2002) 119 LGERA 231 at [11].

- 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,⁸ including coal mines.⁹

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*

⁸ *Bulga Milbrodale Progress Association Inc v Minister for Planning and Infrastructure and Warkworth Mining Ltd* (2013) 194 LGERA 347 at [58].

⁹ *Hunter Environmental Lobby Inc v Minister for Planning* [2011] NSWLEC 221.

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 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] NSWLR 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.

32. This aspect is of particular relevance in this case, given that there have been nearly 23,000 submissions on the Project, including 133 from special interest groups and 22,721 (to date) from the general public. 98% of the submissions are opposed to the grant of development consent.

Principles of ESD

Intergenerational equity

33. 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.

34. 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*”.

35. 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.]

36. 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)*

The precautionary principle

37. The precautionary principle is one of the principles of ESD: *Telstra Corporation Ltd v Hornsby Shire Council* (2006) 67 NSWLR 256. 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 in s 6(2) of the POEO Act is adopted by s 1.4 of the EP&A Act. The precautionary principle is to be considered when making determinations of development applications under the EP&A Act: *Telstra (supra)* at [126].
39. 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 IPC 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]).

40. The precautionary principle is particularly relevant in this case because the magnitude of the potential environmental impacts of the extraction of this unconventional source of gas are so little understood. Hancock and Walker (2012) state that the magnitude of groundwater management intervention required for CSG projects is only sparingly understood by industry and regulators alike. Evidence given by experts providing advice to NWA and its members will demonstrate that the proponent in this case has failed to undertake the analysis required to give even a basic understanding of the likely impacts. Given this lack of understanding of the risks, and the national significance of environmental systems at risk from proposed CSG activities within the Pilliga, it is crucial that independent scientific work be undertaken prior to the grant of development consent to assist in identifying and understanding the processes that are potentially responsible for these hazards.
41. NWA and its members contends 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.

THE ENVIRONMENTAL ISSUES

A. GROUNDWATER

42. CSG is natural gas found in coal seams at depths of approximately 300 to 1000 m underground. The CSG is trapped underground by water pressure. To extract the CSG, a well is drilled into the coal seam and the water is pumped out to release the gas. The water – known as ‘produced water’ – is then separated from the gas at the surface. The produced

water is highly saline. The quantities of produced water can be very large. Coal seams are less permeable than conventional gas systems and the gas does not flow as easily, which means that more wells are required to develop a CSG field than a conventional gas field.

43. The wells are drilled deep underground through different geological layers including groundwater formations. Groundwater – water that is located under the ground – is stored in porous soils and rocks. These saturated soils and rocks are called aquifers and the top of the saturated portion of ground constitutes the water table.¹⁰ Groundwater is a valuable source of water in the Pilliga, as it is used primarily for irrigation, cattle and stock farming, as well as for domestic purposes.
44. The target coal seams for the Project are underneath aquifers that supply important sources of water for agriculture and domestic use and are important recharge zones for the Great Artesian Basin. The extraction of gas depressurizes gas bearing geological formations and may cause groundwater levels to decline which can impact on water users.
45. NWA and its members will adduce evidence from Associate Professor Matthew Currell from RMIT that the DPIE’s assessment that the project ‘would not result in any significant impacts on people or the environment’, is far from having been demonstrated and is not supported by the available evidence. There remain important uncertainties and knowledge gaps in relation to groundwater risks. Important relevant information and data continues to be lacking or has not been considered - including recently published peer reviewed research with significant findings regarding inter-aquifer connectivity.
46. In its assessment report, the Department has adopted an approach that such issues can be dealt with after the Project approval. Such an approach is inconsistent with the precautionary principle.
47. Contamination of groundwater and surface water are major environmental risks that require careful management in any unconventional gas operation, including the extraction of gas from coal

¹⁰ National Centre for Groundwater Research and Training (2013) ‘What is Groundwater’

seams (Hamawand et al, 2013; Vengosh et al, 2014; Vidic et al, 2013; Jackson et al, 2014). The major pathways by which contamination of groundwater can take place are:

- a. contamination by wastewater (produced water) that is spilled, leaked or inappropriately managed as it is brought to the surface and subsequently stored, treated and transported;
- b. contamination due to well integrity failures, or legacy/abandoned boreholes, which allow gas and/or fluids to escape from gas reservoirs and cross-contaminate other aquifers.

48. For the Narrabri Gas Project, the major potential contamination source is ‘produced water’ that is pumped from the coal seams in order to depressurize the seams and allow gas to de-sorb and flow freely (via the gas wells) to the surface. CSG produced water typically exhibits poor quality, due to its extended period of residence within coals.

Contaminants that are characteristic of CSG produced water include high levels of sodium, heavy metals and other trace elements, such as barium and boron.

49. The risks associated with potential groundwater and/or surface water contamination with produced CSG water are of particular significance in the Project (in comparison with other gas projects), due to:

- a. the unusually poor water quality associated with the Gunnedah Basin coal seams underneath the Project area, and
- b. the unusually high quality of the shallow groundwater and surface water in the Project area, which covers areas of potential recharge for the Pilliga sandstone – one of the main aquifers in the southern Great Artesian Basin, as well as the importance of water in the Namoi Alluvium (which also occurs within or close to the Project area) to local water users.

50. The evidence will demonstrate that the information provided in the environmental assessment and the Department’s assessment report relating to assessment and management of groundwater and surface water contamination lacks detail and /or critical supporting data commensurate

with the significance of the risks and the potentially impacted receptors.

51. Gas will be extracted from up to 850 wells drilled throughout the life of the Project. It is estimated that approximately 37.5 billion litres (GL) of water (up to 80 GL) will be produced from the target coal seams via these wells during the life of the Project, or approximately 1.5 GL per year. Whilst it is documented in the environmental assessment that this water is saline, the quoted salinity value in the environmental assessment is lower than previously published estimates of the produced waters from coal seams in the Project area. These salinity levels are significantly higher than typical CSG production water. As documented in a 2014 report to the Office of the Chief Scientist and Engineer, in addition to having high salinity, the water produced from the coal seams in the Narrabri region also contains significant level of heavy metals, boron and fluoride, which could make the produced water an environmental and human health hazard, and a major potential source of groundwater and surface water contamination in the area.
52. Produced water will be generated at all CSG wells drilled for the Project. The environmental assessment states that the produced water pumped from the target coal seams is planned to be managed through a network of water gathering lines and infield balance tanks. This water treatment system, whereby waste water from each CSG is transported to water treatment facilities, means that there will be hundreds of potential sites of contamination. Any spills or leaks of produced water that occur on route to or during storage at the water treatment facilities, could potentially detrimentally affect the surrounding land and shallow ground water in the uppermost unconfined water table aquifers.
53. The proponent has also failed to demonstrate how it will dispose of waste brine arising from the water treatment process leading to significant uncertainty about the environmental impacts of this disposal process. Independent expert evidence to be adduced by NWA and its members from Dr Stuart Khan show that there is a significant risk of low term environmental harm arising from this waste material.
54. Based on international experience with unconventional gas, the size of the project and the number of wells and required infrastructure to collect,

transport and store the produced water, there is a strong likelihood that leaks and/or spills of produced water will occur throughout the life of the project, risking contamination of shallow aquifers and surface water bodies in the area.

55. The evidence will demonstrate that the proponent has underestimated the risk of waste water spills and leaks, which leaves the Project vulnerable and poorly equipped to respond to the incidents that will inevitably arise. The combination of significant volumes of poor quality water being produced and managed across hundreds of sites in the project area over a period of 25 years, and the otherwise high quality of the groundwater hosted in the Pilliga Sandstone Aquifer (the predominant shallow aquifer in the region), and alluvium, raises significant concerns from an environmental and water management perspective.

B. CLIMATE CHANGE

56. In summary, NWA's case on this issue 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, including potential fugitive emissions, from the proposed development would adversely impact on the environment, including the environment of NSW, and hinder measures to limit dangerous anthropogenic climate change.
57. Emissions associated with the production of CSG and its processing arise from both use of fossil fuel derived energy for these activities and fugitive emissions of CSG at various points along the supply chain.
58. CSG, like all natural gas, is composed primarily of methane (CH₄). Direct emission of methane to the atmosphere during production and distribution needs to be minimized because methane is a powerful GHG, 86 times more powerful than carbon dioxide when its atmospheric warming impacts are considered over a 20-year time period, and 34 times more powerful over a 100-year time period. The concentration of methane in the Earth's atmosphere has tripled since pre-industrial times

and continues to rise rapidly. It is responsible for about a quarter of total atmospheric warming to date. In Australia at present, there are no regulations that directly limit methane emissions from oil and gas production. Potential fugitive emissions from CSG are potentially so great that any benefits from the burning of gas for electricity generation compared to coal are negated.

59. Bowerman, Frame et al. (2013) showed that, under a scenario which is equivalent to a 1.5°C increase in global mean surface temperature at the end of this century), the climate will benefit most when methane emissions are reduced early, together with strong reductions in carbon dioxide. The commitment to the Paris Agreement implies strong reductions in carbon dioxide emissions in the near term. Reducing methane emissions will therefore have the greatest effect on peak temperature when done in the near term. This is inconsistent with approving significant CSG production.
60. The effects of adding new methane sources in the atmosphere arising from the fugitive emissions, and the burning of the gas extracted from the CSG, 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.
61. 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 Project (including fugitive emissions)

- (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.

62. As set out above, section 4.15 of the EP&A Act makes any applicable EPI a mandatory relevant consideration. Coal seam gas development is defined in clause 3 of Mining SEPP and falls within the definition of 'petroleum production'. Consequently, the Mining SEPP applies to the determination of the Project.

63. 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.

...

64. 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.

65. In the Rocky Hill decision at [513], Preston CJ, having reviewed the authorities, concluded that the consideration of the impacts of a project

on the environment and the public interest justify considering not only the Scope 1 (including fugitive emissions) and Scope 2 emissions but also the Scope 3 emissions of the Project (downstream burning of the gas resource). 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.

66. The Department's assertion that total project-related Scope 1-3 emissions would be low relative to Australian emissions is irrelevant for the purposes of the s 4.15 assessment process. That is because all of the direct and indirect GHG emissions of the Project (including potential fugitive emissions) will adversely impact the NSW environment. The IPC accepted this argument in the Bylong Coal Project determination,¹¹ 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]

67. The argument should be accepted in this case.
68. Approval of the Project would breach the obligation of intergenerational equity in that the development of a new greenfield CSG development would have an adverse impact on climate change, in particular the 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.
69. Approving this CSG Project 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.
70. NWA will adduce expert evidence from Professor Penny D. Sackett. In her report, Professor Sackett will document the current serious impacts

¹¹ at [690]

of climate change and summarise the science of anthropogenic climate change and its impacts. In addition to this summary, NWA and its members rely 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].

71. Further, the Professor Sackett will demonstrate 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.¹²

72. 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.

73. In Professor Sackett's opinion, the carbon budget approach, as adopted by the Intergovernmental Panel on Climate Change (**IPCC**), is the most robust way to determine the cumulative amount of carbon that can be emitted into the atmosphere to stay within the temperature goals of the Paris Agreement.

74. In Professor Sackett'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,

¹² Professor Will Steffen, Expert Report, [27], [36].

including CSG – 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.

75. 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.
76. 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.
77. 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.

C. SOCIAL AND ECONOMIC IMPACTS

78. 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.
79. The evidence has demonstrated that the Project has given rise to a number of concerns within the community, including water impacts, threats to agriculture and the natural environment, landowner and community rights, issues of trust and human health and well-being. The Project will have a significant negative social impact on residents, some businesses, and local communities, contrary to the public

interest, and the principles of ESD. ESD requires the effective integration of social considerations in decision-making processes.

80. A number of landowner, resident and business objectors will speak to the significance of the Project in terms of the social impacts on the community. These will include impacts on community relationships, the inability of the Project to coexist with farming neighbours, and the relationship between water use and social impacts.
81. NWA has engaged independent expert, Dr Alison Ziller, of Macquarie University to review the social impact assessment for the proposal. Dr Ziller has concluded that:

The Narrabri Gas Project, hereafter 'the project', will provide little social benefit to the town of Narrabri and the surrounding LGA, but at the same time will threaten the basis of its wellbeing by creating new and additional risks to current livelihoods, cultural and recreational practices and public health. In part these risks arise from unresolved concerns about the public health risks of the project, the dispersed distribution of the large number of proposed wells, and from the fact that this resource extraction proposal adds to 8 existing mines and several others 3 which are awaiting approval or commencement (Table 2 below). The Narrabri gas wells and pipeline are another resource extraction project, not a one-off. Therefore, the project will have a cumulative effect.

In my view, the social impacts of the project are inadequately specified in the available documentation from the proponent... and the social risks it entails are inadequately identified or addressed. This means that the precautionary principle is inadequately addressed.

These inadequacies and the shortfalls of information that they represent currently affect, and if the project is approved will continue to affect, the social cohesion and wellbeing of the town through distributional inequity, stress, anxiety, disappointment, recriminations, social conflict and other public health impacts.

82. Through its members, NWA has also engaged expert economic advice that shows that there is a cost of production for Project. This calls into question both the commercial viability of the Project and the ability of the Project to deliver on the claimed social and economic benefits.

D. ECOLOGICAL IMPACTS

83. Independent expert advice commissioned by NWA and its members has identified that uncertainty about the location of gas infrastructure as well as the scale of direct and indirect impacts has made a transparent assessment of the biodiversity impacts of this Project impossible.
84. The Pilliga Forests constitute an important refuge area for wildlife, containing high conservation-value small remnant patches, which are part of a recognised National Biodiversity Hotspot with endemic species and high levels of ongoing threat, whose irreplaceability is of the highest order. The threat and serious and irreversible harm is clear.
85. The evidence will demonstrate that the installation and operation of the 850 gas wells will result in the following detrimental impacts;
- a. Increased fragmentation of a landscape already under severe environmental stress;
 - b. increased sedimentation of ephemeral waterways and the reduced availability of surface water essential to the maintenance of many vertebrate populations;
 - c. increased disturbance from an increase in vehicle movements, dust, noise and lighting associated with gas mining operations;
 - d. cumulative impacts resulting from the exacerbation of perturbations already operating in the project area due to intensive forestry operations and climate change, particularly the loss of hollow bearing trees, vegetation loss and increased fire frequency.
86. There are significant deficiencies in the way the impact assessment is presented in the environmental assessment. These include:
- e. The scale of the direct impact of the project through vegetation removal is not certain. Figures provided by the proponent are likely to be under-estimates.
 - f. The magnitude of 'indirect impacts' has been grossly underestimated and does not take into account the variety and magnitude of expected impact types. A number of threatened

fauna species will be disproportionately impacted by indirect means which are not accounted for in the methodology. For example, the increase in feral predator activity in the gas field that will result from the internal fragmentation cannot be offset.

- g. Cumulative impacts have been inadequately considered.
- h. The survey effort undertaken for the environmental assessment was insufficient and this has inhibited a proper assessment of impacts on these species.

87. The proponent has failed to establish the likely environmental consequences of the Project and the precautionary principle should be engaged.

Conclusion

88. The likely environmental impacts are so significant that the Project should be refused development consent.

Robert White

Counsel for North West Alliance

12 Wentworth Chambers

180 Phillip Street, Sydney

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