LOCK THE GATE ALLIANCE
AUSTRALIANS WORKING TOGETHER TO PROTECT OUR LAND, WATER, AND FUTURE

Nic Clyde
NSW Community Coordinator
Lock the Gate Alliance

15 December 2020

SUBMISSION: DENDROBIUM EXPANSION PROJECT

1. SUMMARY

Thank you for the opportunity to make a submission on this project. We oppose further longwall mining inside the Special Area, therefore our submission is that this application should be refused.

The predicted impacts on our precious drinking water supply, Aboriginal cultural heritage, biodiversity and climate are unacceptable.

Given the magnitude of the predicted impacts, every effort should have been made to explore the viability of less-damaging alternatives to this development. This has not occurred.

2. UNACCEPTABLE IMPACTS ON DRINKING WATER

South32 / Illawarra Coal are seeking approval to mine in a new area inside Sydney's drinking water catchment. The Project's Areas 5 and 6 are located within the catchments of the Avon and Cordeaux Rivers, and the associated Avon and Cordeaux Dams, which are part of Greater Sydney's water supply system. These catchments are included within the Metropolitan Special Area, which is a 'Special Area'.

2.1 Key agencies oppose this development

DPIE-Water describe the proposed mine extension as "a large-scale, high-risk activity."[1] The NSW Independent Advisory Panel for Underground Mining (IAPUM) says that "it should be assumed that surface losses from the catchment will occur over the long term and potentially in perpetuity".[2] WaterNSW says it's "unacceptable" and "[i]f the project is not amended … it should not be approved."[3]

[1] DPIE Water advice, 20 September 2020, https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-8194%2120201030T030052.086%20GMT

[2] Independent Advisory Panel for Underground Mining, Advice re: Dendrobium Extension Project SSD-8194, October 2020

[3] WaterNSW Advisory Panel for Underground Mining, Advice re: Dendrobium Extension Project SSD-8194, October 2020

[4] DPIE Water advice, 20 September 2020, https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=PAE-8943318%2120200917T022400.336%20GMT

The IAPUM also stated that "[c]onsideration of long-term surface water quality risks is unsatisfactory, being based on the existing lack of evidence of consequences with no regard for potential long-term cumulative consequences for water resources or localised consequences due to emergence of contaminated groundwater."[4]

2.2 Annual loss of up to 1.9 GLpa (or 3.3 GLpa in cumulative losses)

WaterNSW estimates that this project will result in the cumulative loss of up to 3.3 gigalitres/year (GLpa) of surface water from the drinking water catchment. This water 'take' would comprise water loss from nine major watercourses and over 100 smaller tributaries.[5]

South32's groundwater model predicts the maximum loss of surface water to the mine workings of 1,935 ML/annum as a result of the Project (3,330 ML/annum for the Dendrobium Mine cumulatively with the Project), which is equivalent to approximately 5.2 ML/day and 9.1 ML/day for the Project-only and cumulative scenarios, respectively.[6] To put 3.3GLpa into perspective, in a time of drought, this amount of fresh water could supply more than 67,000 people with 100% of their water needs for an entire year.[7] And 3.3GLpa is thought by WaterNSW to be an underestimate.

Another way of assessing the magnitude of water losses would be to compare 3.3 GL/year to total inflows to the Upper Nepean Catchment in the drought year of 2018/19. 3.3GL represents almost 7% of total inflow of 48GL to the Upper Nepean Catchment in 2018/19.[8] In times of drought, this is a significant amount of drinking water to lose to a single mining project, especially so when the proponent has so-far refused to consider the less damaging, non-caving bord and pillar method.

Greater Sydney's dams currently have plenty of supply but it would be a mistake to be lulled into a false sense of security by this. Not much more than a year ago a worst-case scenario was posited (using WaterNSW data) that suggested that if the drought did not break, water supply from Warragamba would have stopped flowing by January 2022 (with no rain and a failure to take aggressive water saving / water recycling action). The same data set predicted that "most of Sydney's water supply will remain flowing until at least October 2021 when, under the worst-case scenario, the upper Nepean River will run dry."[9]

2.3 The value of drinking water is increasing

If you read through the planning documents for this project, you will notice that the value of fresh water per ML only heads in one direction. In the space of less than two years, the value assigned to drinking water that would be lost to this project has increased from $53.85 per megalitre (South32 EIS valuation) to as high as $3,180 per megalitre (IPART retail drought-scenario valuation). In its Initial report, the IEPMC (Nov 2018) warned that the "greatest consequences of mining on surface water supply volumes are likely to be during extreme drought periods. Therefore, water balances should include drought periods and results for these periods should be highlighted."

---

[4] Op cit, IAPUM, pg 25

[5] NSW DPIE, Dendrobium Mine Extension Project AR, October 2020, 5.3.14, pg 39

[6] South32, Feb 2020, Dendrobium Mine – Plan for the Future: Coal for Steelmaking – Submissions Report, pg 125

[7] This calculation is based on the level of water savings achieved in Orange, NSW in the 2019 drought of 134 litres per person, per day. 3.3GL / 134 = 67,470. The reference for the 134 litres statistic is an article in the SMH published on 20 November 2019 called The NSW town that defied the drought, www.smh.com.au/national/nsw/the-nsw-town-that-defied-the-drought-20191119-p53bwb.html.

[8] Sunday Telegraph, Day zero: the dates we will run out of water, 15 September 2019. Inflows to the Upper Nepean Catchment were reported as being 48GL in 18/19 against avergare annual inflows of 346GL.

[9] Paul Karp, The Guardian, 'Critical': parts of regional NSW set to run out of water by November, 15 September, 2019, https://www.theguardian.com/australia-news/2019/sep/15/parts-of-regional-nsw-set-to-run-out-of-water-bynovember

At the IES stage of this project, South32 valued lost water at $76.50 per megalitre, but proposed to compensate at the rate of $53.85 per megalitre. In 2015, WaterNSW estimated the value of water in Sydney's catchment as $2,276 a megalitre.[10] In DPIE's October 2020 AR, the Department announced that it required South32 to compensate NSW for each lost ML of water at IPART's retail price. At the time South32 submitted their last offer only six months ago, they were using retail prices equivalent to $2,300/ML ("base scenario") and $3,120/ML ("drought scenario"). Current IPART retail prices are $2,350/ML (base) and $3,180/ML (drought).

2.4 $17.3M cannot offset an unknown quantity of water in perpetuity

NSW DPIE and South32 say they have modelled post-mining water losses over 271 years from 2048 until the year 2319. Neither appear to have revealed the ***volume*** of water losses modelled post-mining. In response to a question about *how* post-mining water losses have been calculated, neither DPIE in their response to the IPC (4 December 2020) nor South32 in their letter to DPIE (30 November 2020) disclose the volume of water that their $17.3 million payment is meant to offset. Without an understanding of the volume of water losses modelled and expected, it is simply not possible to determine the magnitude of risk or water loss that the NSW community would be exposed to.

WaterNSW expressed concern that the EIS identified that the Project would take up to 3.3 gigalitres/year (GLpa) of surface water from its drinking water catchment (3,300MLpa). If cumulative losses are calculated using IPART's base price for water ($2,300 per megalitre), then $17.3 million would offset 7,522ML of water losses post-mining (and this is based on the non-drought value per ML of $2,300).[11] If water losses continue at roughly the same volume in the decade post-mining, then $17.3 million would represent a one-off payment for 2.3 years of water loss.[12] For water losses that the government's own experts advise could last in perpetuity, 2.3 years of compensation would be an excellent deal for South32 ('gift' or 'subsidy in perpetuity' would perhaps be a more suitable description) but an extremely poor deal for NSW.

We note that Table 9 at page 87 of the AR summarises what is described as South32's Final Surface Water Offset Offer based on a letter from South32 dated 07/10/20. South32 propose payment of $86.4 million over 27 years. Of the $86.4 million in payments, $19,387,587 will cover water losses over just the last 3 years of mining from 2046 until mine closure in 2048.

If water losses continue roughly at the same volume as expected towards the end of mining (which we understand is more likely than not, at least for a significant amount of time post-mining, if not in perpetuity), then the one-off payment designed to cover water losses in perpetuity appears to exhaust by about 2051 (only 3 years after the cessation of mining).
It is abundantly clear that this 'offer' from South32 does not even come remotely close to meeting the Planning Minister's requirement that promises a net gain to the Metropolitan water supply as a result of new mining projects.

[10] Planning Assessment Commission Review Second Report on Russell Vale Underground Expansion Project, pg 23 https://www.ipcn.nsw.gov.au/resources/pac/media/files/pac/projects/2015/10/russell-vale-collieryunderground-expansion-project--second-review/review-report/russellvaleiireviewreportfinalpdf.pdf
[11] $17.3M divided by $2300 = 7,522ML
[12] 7,522ML divided by annual cumulative losses of 3.3GL = 2.3 years

What do the economic assessments say about water offset payments?

BAEconomics' review of the economics of this Project uses the word 'loss' 49 times. Not once does it use this word to refer to or describe the cost of water loss in the review. Indeed the word 'water' is not mentioned at all in BAEconomics' review. The Cadence economic assessment does mention water. Table 15: Summary of indirect costs impacts ($ million^) contains a line item for 'Water impact - including surface and ground water', however the value of water losses is not revealed. A footnote in Table 15 indicates that the amount is "Confidential, included in the total internalised costs" (pg 22, Appendix L).

2.5 Dendrobium losses of 3.3GLpa will be larger than the refused Russell Vale project

The Dendrobium Extension will cause larger water losses (3.3GLpa) than Wollongong Coal's Russell Vale *longwall* mine (2.6GLpa), which was refused consent. The Planning Assessment Commission (PAC) rejected Wollongong Coal's longwall mine application at Russell Vale in 2016, describing the potential loss of 2.6 gigalitres of surface water per annum as "high risk".[13] The Russell Vale mine is inside the same Special Area as Dendrobium.

In 2016, NSW Planning recommended that *longwall* mining at Russell Vale mine be approved however the PAC disagreed, finding that the project was not in the public interest. In their Second Review Report, the PAC found that "short term economic benefits" were not enough to justify "the risk of permanent and irreversible loss of water up to **2.6GL per year** and damage to upland swamps with resulting impact on water quality and uncertain environmental consequences". The Dendrobium project is likely to result in a greater loss of water, with 3.3GL per year expected (ie 25% per year more than the Russell Vale longwall project).

Longwall mining is very damaging to water catchments as it results in rivers, creeks and endangered swamp ecosystems cracking, with the loss of substantial volumes of drinking water. South32's coal-mining neighbor – Wollongong Coal – has approval to re-commence mining inside the same Special Area of the catchment, but there is one important difference with their plan: they have now abandoned *longwall* mining in favour of *bord and pillar* mining. The bord and pillar mining proposed at Russell Vale is still undesirable under a Special Area of our water catchment (leaving coal pillars is better than leaving voids, but even coal pillars are likely to fail eventually), but in general terms, if mining is to occur, this method of mining creates significantly less subsidence than longwall mining. WaterNSW is on the public record saying that the bord and pillar method now proposed at Russell Vale "is much safer than the previous proposal for longwall mining and is unlikely to cause significant surface subsidence".[14]

Wollongong Coal have now given a commitment never to propose longwall mining in the catchment again. They say it's economic and that it will also create more employment (because bord and pillar is more labour intensive). DPIE agrees that the proposal is economic. And yet bord and pillar at Dendrobium has not been considered.

2.6 WaterNSW's long list of concerns

WaterNSW is the authority responsible for the care and protection of our drinking water catchment. WaterNSW is "strongly opposed" to this project, saying that the "predicted loss of surface water of up to 5.2 megalitres per day" would be "unacceptable". WaterNSW is

[13] Planning Assessment Commission Review Second Report on Russell Vale Underground Expansion Project

[14] WaterNSW, Russell Vale Colliery Revised Preferred Underground Expansion Project (09_0013), 29 August 2019

blunt in its assessment of this project: "If the project is not amended, WaterNSW maintains that it should not be approved."[15]

Lock the Gate agrees with WaterNSW that a doubling of existing water losses would be unacceptable. We are also alarmed at WaterNSW's statements that even these already unacceptable water losses may not even be worst case, and may need to be revised upwards. We agree with WaterNSW's assessment that this project should not be approved.

The following statements from WaterNSW are of great concern to Lock the Gate:

- "previous concerns … have largely not been adequately addressed by South32."
- "the predicted loss of surface water of up to 5.2 megalitres per day … is unacceptable."
- The project, as currently proposed, is not consistent with WaterNSW's statutory role "to protect and enhance the quality and quantity of water in declared catchment areas" or its Mining Principles.
- "The proposed mine design is likely to cause serious or irreversible damage to environmental features, including numerous watercourses and swamps."
- WaterNSW also remains concerned about the nature and extent of predicted environmental impacts in various watercourses, including nine major streams (3rd order or above), particularly those in the north western corner of Area 5.
- South32 has not adequately considered WaterNSW's previous recommendations to revise the mine design with narrower longwalls or a reduced mining height in order to reduce surface water losses.
- WaterNSW again raises its previous concerns that the groundwater model may underestimate the full extent of surface water losses. The Independent Expert Panel for Mining in the Catchment stated that the surface water component of mine inflows could be in the order of 40-50%, which contrasts with South32's groundwater model that assumes an average of only 15 to 25%.
- WaterNSW also remains concerned that the potential water quality impacts from the extensive stream fracturing downstream of the reservoirs (e.g. in Avon and Cordeaux Rivers) would increase the risk of water quality issues in the water supply.

Further, WaterNSW considers that additional information and expert review of the new water quality information is required to demonstrate that the project would meet the statutory NorBE test.

2.7 Catchment mining action plan

The Government announced in April 2020 that it had accepted all of the recommendations made by the Independent Expert Panel for Mining in the Catchment. At the time, Minister Stokes said: "We've accepted all of the recommendations from the panel and have established an interagency taskforce to implement a detailed action plan throughout this year… We want to ensure we have every measure in place to protect Sydney's water supply for generations to come."[16]

Lock the Gate would like to comment on two of the eight actions in this plan that are relevant to the Dendrobium determination:

[15] WaterNSW response to Amendment and Supplementary Information – Dendrobium Mine Extension Project (SSD 8194), 17 Sept 2020, https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=PAE-8943318%2120200917T022400.336%20GMT

[16] https://www.nsw.gov.au/news/stronger-protection-for-sydneys-water-catchment-following-extensive-review

Ensuring there is a net gain for the metropolitan water supply by requiring more offsetting from mining companies;

This project will more than double the water losses at Dendrobium. It appears that *existing* water losses will continue and will not be offset. This continues to be a net loss for the metropolitan water supply. The proposal is for new losses caused by additional mining will be offset, but only for the period of mining plus a few short years after that (perhaps for a maximum of only 3 years post-mining). The IAPUM advise that "it should be assumed that surface losses from the catchment will occur over the long term and potentially in perpetuity". WaterNSW advise that surface water loss estimates attributable to the new project may have been significantly underestimated. It is very clear that the proposal before the IPC does not meet the Minister for Planning's objective of a net gain for the metropolitan water supply.

Adopting a more stringent approach to the assessment and conditioning of future mining proposals to minimise subsidence impacts;

This action has very clearly been applied to the assessment and determination of the Russell Vale mine. The opposite is clearly true for Dendrobium. NSW DPIE has failed to assess the economic viability and environmental impacts of non-caving bord and pillar mining at Dendrobium.

3. STRATEGIC NEED FOR WATER IS CERTAIN WHILE THE STRATEGIC NEED FOR COAL IS UNCLEAR.

Drinking water will remain a valuable resource in perpetuity. Metallurgical coal use will likely enter long-term, structural decline to meet net zero targets

Whilst the need for and value of drinking water will obviously persist in perpetuity, the same cannot be said for metallurgical coal. The pressures of tightening climate policy, demand from a growing population for water security and technological innovation will likely see Illawarra steel-making shift to a low-carbon model. When this does happen, this will render the key economic justification for this project redundant. Evidence accepted by the Land and Environment Court in the Rocky Hill decision found that "[t]he advent of new technology developments could well see the need for coking coal in steel production removed within the life of the proposed project".[17]

The Rocky Hill case heard evidence from Tim Buckley from IEEFA, who considered that there will be sufficient production capacity to meet a declining demand for coking coal, without approving new coking coal mines. In particular, Mr Buckley considered that at the time there was more than enough existing Australian production capacity to supply the global market needs for coking coal.

Under the International Energy Agency's (IEA) central Stated Policies Scenario (STEPS) per the World Energy Outlook 2020: "Global coal trade in thermal and coking coal is now projected to decline by around 15% in the STEPS over the 2019-30 period." Imports to India

[17] Caselaw, Point 472, https://www.caselaw.nsw.gov.au/decision/5c59012ce4b02a5a800be47f#_Toc431201

barely return to pre-Covid levels over the coming decade as most of the projected growth in coal demand is met by a rise in domestic production. There is a substantial decline forecasted in imports to China, Japan and Korea as well as to Europe.

*IEA WEO 2020 coking coal **production** forecast per the IEA STEPS (in Mtce)*

2019: 936
2025: 811
2030: 764
2040: 704 (down 25% on 2019)

4. CLIMATE CHANGE

4.1 NSW is one of the most at risk States from climate change

The NSW Climate Change Council exists to provide *"independent, expert insight on climate change-related issues"* to the NSW Minister for the Environment. In a letter to the Premier leaked to the Sydney Morning Herald last year in February 2019 the Council warned:

> *"NSW remains one of the most at risk States from climate change, including from bushfires, extreme rainfall, increased summer heatwaves and heat extremes, declining water supplies and sea level rises. This summer is indicative of the challenges we are to face. These impacts place much of the States' infrastructure at risk and will have devastating consequences on our rural and ever-expanding urban communities. In addition, climate change presents major challenges for key government services, including for our emergency services and our public health system."*[18]

Given that this planning process is required to consider the impacts of the development on the NSW environment, Lock the Gate recommends that the IPC Dendrobium panel seek an updated briefing from the NSW CCC on the significance of the impact of Dendrobium's GHGEs on NSW.

4.2 UN Secretary-General warns of a dramatic emergency. NSW DPIE recommends 10 new fossil fuel projects in a row are approvable.

The UN Secretary-General Antonio Guterres – at a UN climate summit - has just asked world leaders to declare a state of "climate emergency" in their countries to spur action to avoid catastrophic global warming. Mr Guterres asked: "Can anybody still deny that we are facing a dramatic emergency?" The answer to that question – at least here in NSW – appears to be "yes they can".

Here in NSW, the leadership of the NSW DPIE has recommended that every major new coal and gas project put forward by DPIE to the IPC, since the IPC was created in March 2018, was or is "approvable". So far – since March 2018 – ten new projects have been

[18] SMH, Peter Hannam, March 12, 2019, 'Ignored': climate experts appeal to Berejiklian government, https://www.smh.com.au/environment/climate-change/ignored-climate-experts-appeal-to-berejiklian-government-20190312-p513lq.html

recommended for approval: Dartbrook, United Wambo, Bylong, Rix's Creek South, Glendell, Vickery Coal Project, Narrabri Gas Project, Russell Vale, Dendrobium and Maxwell Underground. Of the projects already approved by the IPC, the cumulative total of Scope 1, 2 and 3 GHG emissions – if all projects are developed and proceed to the end of their approvals – will be **851 Mt CO2-e**. If Dendrobium and Maxwell Underground are approved, that cumulative total will rise to approximately **1.45 Gt CO2-e.**

4.3 Scope 1 emissions

Scope 1 emissions larger than combined total of six mines determined by the IPC

Scope 1 emissions from Dendrobium will be larger than the combined total of Scope 1 emissions from all six coal mines determined by the IPC to date (17 – 22 Mt compared to 13.4 Mt). In refusing consent for KEPCO's Bylong Coal Project, the IPC found that "it is rational to refuse fossil fuel developments with greater environmental, social and economic impacts than fossil fuel developments with lesser environmental, social and economic impacts as this 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."[19]

Table 1: Dendrobium's Scope 1 emissions would very large compared to other coal mines recently approved

Coal projects determined by the IPC	Status	Date of approval	Total Scope 1 GHG Mt CO2~e
Dendrobium			**17 - 22**
United Wambo (new mine)	Approved	29/08/19	5.8
Vickery Coal Project (new mine)	Approved	12/08/20	3.1
Bylong (new mine)	Refused	18/09/19	2.1
Russell Vale	Approved	8/12/20	1.4
Rix's Creek South Mine (expansion)	Approved	12/10/19	0.8
Glendell Coal Mine pit (expansion)	Approved	4/03/20	0.1

Scope 1 emissions will put Dendrobium Extension Project on list of 100 top emitters

Total Scope 1 emissions over the life of the Project will be substantial at approximately 17 to 22 Mt of CO2-e (0.59 and 0.77 Mt CO2-e per annum). On their own, Scope 1 emissions from this project will comprise about 0.5% of NSW's total GHG inventory. Scope 1 emissions alone would put Dendrobium at 58th or 64th place on the list of Australia's top 100 emitters of Scope 1 CO2-e.[20] These are new and additional emissions that would occur in NSW at a time when the NSW Government requires a reduction in emissions of 35% by 2030.

4.4 Scope 2 emissions

Total Scope 2 emissions over the life of the Project are estimated to be approximately 1.7 Mt CO2-e, or an average of about 0.1 Mt CO2-e per annum.

[19] NSW IPC, Statement of Reasons, Bylong Coal Project, pg 145

[20] 590,000tpa of Scope 1 emissions would put Dendrobium at 64th place on the list of Australia's top 100 emitters of Scope 1 CO2-e. 770,000tpa of Scope 1 emissions would put Dendrobium at 58th place on the list of Australia's top 100 emitters of Scope 1 CO2-e.

4.5 Scope 3 emissions

Total Scope 3 emissions from the combustion of product coal by third parties (ie customers such as the BlueScope Steelworks, Liberty Primary Steel Steelworks or various international steelworks) are estimated to be approximately 237 Mt CO2-e over the life of the Project, or an average of about 8.2 Mt CO2-e per annum.

4.6 Conditioning of Scope 1 emissions

Conditioning of Scope 1 and Scope 2 emissions in NSW is typically weak and ineffective. This is likely to be the case with this Project, should it be approved. Scope 1 and Scope 2 emissions - which cannot be avoided or mitigated - should be offset.

NSW DPIE says a reduction in Scope 1 is a "key area for active management"

At page xiv of the AR, the Department says that it "considers that the key areas for active management of GHGEs within the development assessment and approval process for new projects in NSW are reductions in direct (ie Scope 1) emissions and improved energy efficiency (ie reduction and efficiency in the use of fuels and bought-in electricity)."

Offsets

In the Bylong Coal Project Statement of Reasons for the decision to refuse consent, the IPC noted that no offsets were proposed by KEPCO:

> *"[T]he Commission is of the view that the Applicant has not minimised Scope 1, 2 and 3 GHG emissions to the greatest extent practicable as required under Clause 14(1)(c) of the mining SEPP. The Commission also finds that there are no offset measures proposed by the Applicant …"*

Fugitive emissions likely to be vented to the atmosphere

The Air Quality and Greenhouse Gas Assessment for this project says that 67% of the total estimated CO2-e fugitive emissions are likely to be emitted via mine ventilation air (MVA) and 33% via pre- and post-drainage.

Mine ventilation air at the existing Dendrobium mine has an average concentration of methane (CH4) of 0.07%. South32 say that currently there are no mine methane abatement technologies or opportunities available which are viable due to the low methane concentration of the mine vent air.[21] In their Annual Review FY20 Dendrobium Mine and Cordeaux Colliery, South32 say that all "study work relating to the introduction of VAM abatement technology has been placed on hold ahead of commencing pre-feasibility studies due to capital constraints".

In their application, South32 say that methane "would be flared or, if the gas was too low in methane content for flaring (or other operational reasons), vented to the atmosphere."[22]

The company also say:

[21] Annual Review FY20 Dendrobium Mine and Cordeaux Colliery, 6.17.3 Decarbonisation Strategies https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=DA60-03-2001-PA-44%2120200929T221842.544%20GMT, pg 75 and 77

[22] South32, 3.5.7, Gas Management and Abatement https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-8194%2120200901T035457.531%20GMT

> *South32 would operate the Project to minimise direct (Scope 1) greenhouse gas emissions as far as possible, in particular through maximising gas flaring to convert methane to carbon dioxide. Gas liberated during mining of Area 5 and Area 6 is expected to be highly variable in content and composition. On this basis, South32 determined that utilisation of the fugitive methane (i.e. for electricity generation) would not be feasible for the Project.*[23]

South32 say that currently there are no mine methane abatement technologies or opportunities available, which are viable due to the low methane concentration of the mine vent air.[24] In their application, South32 say that methane "would be flared or, if the gas was too low in methane content for flaring (or other operational reasons), vented to the atmosphere."[25] To understand the current debate on abating coal mine methane, we encourage the Commission to read the Meeting Report from the CSIRO's 'Expert Dialogue on Ventilation Air Methane (VAM)', Melbourne, Australia, 25 October 2018.[26]

Minimising GHG emissions "to the greatest extent practicable"

Clause 14 of the Mining SEPP says that before granting consent for a development, 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 *"that greenhouse gas emissions are minimised to the greatest extent practicable"*.

NSW DPIE have proposed a condition of consent (B13.(a)(iii)) which would require the Applicant to *"take all reasonable steps"* to *"improve energy efficiency and reduce greenhouse gas emissions of the development"*. In the draft consent, 'reasonable' is defined as:

> *"applying judgement in arriving at a decision, taking into account: mitigation benefits, cost of mitigation versus benefits provided, community views and the nature and extent of potential improvements".*

As the terms 'improve' and 'reduce' are not defined in the consent conditions, it is up to the IPC to use language in consent conditions which will lead to robust, measurable results. If it is not possible to mitigate the majority (67%?) of fugitive emissions at this point in time, the Commission must require offsets.

On the particular issue of offsets, please note Justice Pain's 2011 judgement on conditioning GHG emissions in Hunter Environment Lobby Inc v Minister for Planning [2011] NSWLEC 221. At point 93 of the judgement, Justice Pain found:

---

[23] Dendrobium Mine – Plan for the Future: Coal for Steelmaking – Submissions Report, pg 132

[24] Annual Review FY20 Dendrobium Mine and Cordeaux Colliery, 6.17.3 Decarbonisation Strategies https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=DA60-03-2001-PA-44%2120200929T221842.544%20GMT, pg 75 and 77

[25] South32, 3.5.7, Gas Management and Abatement https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-8194%2120200901T035457.531%20GMT

[26] The Expert Dialogue brought international experts together in an open, collaborative environment to more thoroughly and candidly explore the technical, economic, and policy barriers that inhibit Ventilation Air Methane (VAM) project implementation. The roundtable developed a discrete list of achievable tasks or action items that could help eliminate barriers to increase VAM project development. https://www.globalmethane.org/tools-resources/resource_details.aspx?r=4749

> *"It was common ground between the experts that scope 1 emissions are a direct consequence of the carrying out of the activities authorised by the project approval, and are the emissions over which the proponent has potentially greatest control. A condition requiring the offsetting of emissions directly attributable to the operation of the project, in order to address direct potential or actual adverse impacts on the environment, is related to the purpose of assessing and approving a significant extension of a coal mine both in terms of time and rate of extraction of the resource. I am satisfied that a condition requiring Ulan to offset the scope 1 emissions of the project would be within the scope and purpose of the power conferred first on the Minister and now on the Court under s 75J."*[27]

It is doubtful that fugitive emissions will be minimised 'to the greatest extent practicable'

According to the NSW Chief Scientist and Engineer, new technologies have been piloted in NSW coal mines "to prove their technical viability and safety for capturing and combusting ventilation air methane (VAM) at low concentrations (less than one per cent) and high temperatures". [28]

CSIRO has developed three technologies that aim to mitigate methane emissions by either destroying or enriching the gas or capturing the ventilated air – known in the industry as Ventilation Air Methane (VAM) – from coal mines and using it to generate electricity:

- VAMMIT is a compact flow reversal reactor with a newly-structured regenerative bed to destroy methane in a cost-effective manner

- VAMCAP is a capture and enrichment unit which essentially collects and separates the methane from the ventilated air using carbon composites.

- VAMCAT uses a catalytic combustion gas turbine to create electricity from an otherwise waste product.[29]

The failure to consider these options requires intervention from the IPC. Mitigation of greenhouse gas emissions is in NSW DPIE's blind spot. A culture exists in the Department which leads to a lack of meaningful examination of these issues in assessment reports, further leading to vague, unenforceable conditions of consent. This means the process is failing to meet its obligations and air quality and greenhouse gas management plans are being developed by the Applicant and signed off by the Planning Secretary which do not deal with a serious, lasting and essentially irreversible environmental impact. Instead, coal mining companies pledge to 'investigate' and 'consider' and 'review' mitigation options. If the NSW IPC starts to require offsets for all Scope 1 and Scope 2 greenhouse emissions which cannot be minimized or avoided, this will result in two useful outcomes. It will create an incentive for coal companies to invest in abatement technologies that work. Where this is not possible, it will result in carbon offsets for the balance of Scope 1 and Scope 2 emissions.

[27] https://www.caselaw.nsw.gov.au/decision/54a6364d3004de94513d9150
[28] NSW Chief Scientist and Engineer, August 2020, Opportunities for prosperity in a decarbonised and resilient NSW, Decarbonisation Innovation Study, pg 151
[29] Ecos. CSIRO, Robert Hobson, Capturing fugitive methane emissions, 31 March 2020, https://ecos.csiro.au/capturing-fugitive-methane-emissions/

4.7 NSW Government's net zero plan is proof of 'concerns relating to GHGEs'

In their Assessment Report, NSW Planning state that "no State agency expressed significant concerns relating to GHGEs."[30] It is worth dwelling on this statement for a moment because it tells us something about the world-view and culture within the Resources Assessment team and the leadership at the NSW Department of Planning which signs off on their coal mine assessments.

The NSW Government – in a whole-of-government Cabinet decision – has agreed to a goal of decarbonising the NSW economy and reaching net zero by 2050. The only reason for having this whole-of-government position is because of "concerns relating to GHGEs". These concerns are the driver of net zero. The Resources Assessment team – which writes these assessment reports – is located in the same Department coordinating the net zero transition. The same Department which produced the 'Net Zero Plan Stage 1: 2020–2030'. The NSW Government clearly has concerns relating to GHGEs. This is what the IPC should pay attention to.

5. ABORIGINAL CULTURAL HERITAGE

At page xv of the AR, the Department confirms that the Biodiversity Conservation Division proposed changes to South32's mine design to avoid impacts on six Aboriginal heritage sites. Only one of these sites has been substantially protected by South32's revision of its Project design (by reducing the western extent of one longwall by 290 m). The five remaining sites are all located centrally above longwall panels and remain at risk of impacts. Regarding this – in a controversial statement - the Department wrote that it "does not consider that the scientific or cultural benefit of avoiding the risk of impacts is warranted".

We note the submission from the Director, South East Branch Biodiversity & Conservation Division (BCD), Environment, Energy and Science:

> *"We maintain that the proposed longwall layout is likely to harm multiple Aboriginal cultural heritage sites, including a number of sites of high Aboriginal cultural and scientific significance, due to subsidence from undermining."*[31]

NSW DPIE's Assessment Report (pg 44) describes BCD as the *"**only** (our emphasis) agency that expressed significant concerns relating to predicted or potential Aboriginal heritage impacts"*. It is unclear why DPIE would characterise the agency with responsibility for management and protection of Aboriginal objects and declared Aboriginal Places under the National Parks and Wildlife Act 1974 in this way. As we see it, the agency with responsibility for the management and protection of Aboriginal objects and declared Aboriginal Places has expressed concern that the proposed longwall layout is likely to harm multiple Aboriginal cultural heritage sites, including a number of sites of high Aboriginal cultural and scientific significance, due to subsidence from undermining.

BCD also made the comment that the *"proposed mine layout and extraction method remains unchanged from the EIS"* and that the feasibility of alternatives *"is not detailed nor*

[30] NSW DPIE, Dendrobium Mine Extension Project AR, October 2020, 5.3.14, pg 150
[31] BCD advice, Dendrobium Mine Extension Project, 9 March 2020, https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=PAE-2097%2120200309T220139.987%20GMT

demonstrated beyond a claim. Hence, there is no capacity to understand alternatives and what balances there are to any decision making beyond such a claim."[32]

The NSW IPC - like our community and increasingly, superannuation funds - should expect high standards regarding the protection of significant sites and engagement with traditional owners about this issue. HESTA manages $56 billion in investments on behalf of over 870,000 members. HESTA has worked closely with South32 as the lead engager through Climate Action 100+. Commenting in a media release dated 10 December 2020 on the Parliamentary Inquiry into Juukan Gorge, HESTA noted that "that Aboriginal Heritage sites remain vulnerable to destruction" and that the damage at Juukan Gorge should "highlight to companies and investors alike the financial costs from actions that damage a company's social license to operate".[33]

We do not believe that NSW DPIE, South32 or the NSW IPC have social licence to allow these sites to be damaged. There is a way to limit or avoid damage to these sites, and that is to refuse consent for a longwall mine.

6. ALTERNATIVE DEVELOPMENT OPTIONS

Neither the Applicant nor NSW DPIE have adequately explored alternative development options which would allow decision makers to consider trade-offs and decide whether the community as a whole is better or worse off as a result of this proposal.

In a meeting on 16 November 2020 with NSW DPIE, the IPC's Dendrobium panel was informed by the Department that "we're required to look at alternatives, obviously, under the Act. I guess I would leave it to the commission to determine whether that requirement of alternative analysis would go as far as exploring bord-and-pillar mining as part of that process, but certainly it's not something we've done in any detail in our assessment."[34]

This assessment process extinguishes merits appeal rights to the Land and Environment Court therefore this hearing and written submissions process is the only opportunity to establish common ground on facts and evidence material to the IPC's determination of the Dendrobium Extension Project. Our view is that open disclosure of information on the viability of development alternatives and future demand for coal and supply of coal to the Port Kembla steelworks (that is relevant to the Dendrobium decision) is very much in the public interest. Some information which should be in the public domain, appears still to be undisclosed and / or unexplored.

6.1 The law and relevant guidelines require consideration of alternative development options

The EP&A Act requires 'an assessment of the risk-weighted consequences of various options'

[32] BCD advice, pg 20

[33] HESTA, media release, 10 December 2020, HESTA welcomes Parliamentary Inquiry's call for Australian mining companies to independently review all their agreements with Traditional Owners

[34] INDEPENDENT PLANNING COMMISSION, MEETING WITH DEPARTMENT OF PLANNING, INDUSTRY AND ENVIRONMENT RE: DENDROBIUM EXTENSION PROJECT, 16 November 2020, pg 22, https://www.ipcn.nsw.gov.au/resources/pac/media/files/pac/transcripts-and-material/2020/dendrobium-extension-project/department-meeting-transcript.pdf

In the Dendrobium Assessment Report, NSW DPIE states that the EP&A Act adopts the definition of Ecologically Sustainable Development (ESD) found in the *Protection of the Environment Administration Act 1991*, as follows:

> *"ecological sustainable development requires the effective integration of 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;*
> > *b) inter-generational equity;*
> > *c) conservation of biological diversity and ecological integrity; and*
> > *d) improved valuation, pricing and incentive mechanisms."*
>
> *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***

Economic assessment guidelines in NSW require the consideration of 'alternative development options'

The 'Guidelines for the economic assessment of mining and coal seam gas proposals' in NSW recommend that alternatives should be considered:

> *"The economic assessment … is a widely used tool for deciding between alternative development options. It is intended to allow decision makers to consider trade-offs and decide whether the community as a whole is better or worse off as a result of the proposal. It should be based on rigorous, transparent and accountable evidence that is open to scrutiny."*[35]

6.2 Alternatives to 305m wide longwalls

Narrower longwalls and reduced height of panels

WaterNSW has been crystal clear in stating its view that "South32 has not adequately considered WaterNSW's previous recommendations to revise the mine design with narrower longwalls or a reduced mining height in order to reduce surface water losses." [36]

IAPUM says the only justification for 305m wide panels is commercial

In their advice, the IAPUM said they had not been able to satisfy DPIE's request to "provide advice on the relative environmental costs and benefits associated with different longwall widths" because "the EIS and supporting documentation, including the Proponent's responses to some of the Panel's questions, do not provide the necessary information and analysis to enable the impact of different longwall panel widths to be fully and adequately assessed."

[35] Guidelines for the economic assessment of mining and coal seam gas proposals | December 2015 | Page 3, https://www.planning.nsw.gov.au/~/media/Files/DPE/Guidelines/guidelines-for-the-economic-assessment-of-mining-and-coal-seam-gas-proposals-2015-12.ashx

[36] op cit, WaterNSW, 17 September 2020

Where DPIE and South32 state that less-damaging options are uneconomic, the IAPUM found that it "is possible that more conservative layouts are still economic and better represent the lower bound for environmental impacts and consequences".

Bord and pillar

Why hasn't less-damaging 'non-caving' bord-and-pillar mining been considered? In recent advice to the IPC from the Independent Advisory Panel for Underground Mining, bord and pillar workings are described as causing "the least amount of subsidence" in contrast to longwall mining, which "results in the greatest subsidence".[37] WaterNSW is on the public record saying that "the first workings mining method" (otherwise known as bord and pillar) now proposed at Russell Vale "is much safer than the previous proposal for longwall mining and is unlikely to cause significant surface subsidence".[38]

A key word search of the Cadence Economics May 2019 assessment of this project finds not a single mention of 'bord and pillar' or 'non-caving' mining methods.[39] A key word search of the BAEconomics review also finds not a single mention of these terms. NSW DPIE's AR similarly contains no discussion of the economic viability of bord and pillar, 'non-caving' mining as an alternative either.

In a meeting on 16 November 2020, NSW DPIE told the IPC's Dendrobium panel that they did not ask South32 to consider bord and pillar as an alternative to longwall mining because they did not think South32 would view bord and pillar as economically viable (which perhaps means 'sufficiently profitable'). Commissioner Hann asked DPIE to comment on what work the Department had done "in assessing whether bord-and-pillar is more suitable from a management of subsidence than … longwall and what discussions you've had in that regard with the applicant?" A NSW DPIE representative replied that this was not explored with South32 "because we had a pretty fair idea of what their response would be, and, really, they would say, 'We have no project here. We can't make it work. We won't do it'."[40]

WaterNSW appear to be willing to entertain the idea that a less-damaging version of the project could be considered, if South32 were willing to compromise and put one forward. Our default position is that there should be no further mining approvals granted inside the Special Areas of our drinking water catchment. And we remain 100% opposed to any further longwall mining in the Special Areas. We agree with the NSW Planning Assessment Commission's refusal to approve new longwall mining at Russell Vale. It is unacceptable to ask the community to shoulder the risk of fresh water losses in perpetuity, with a one-off payment of $17.3 million offered by South32 as compensation.

To this date, no one has been able to explain why DPIE view bord and pillar as profitable at Russell Vale, but not 8kms south at Dendrobium.

6.3 Coal mine assessment; not an industry development plan

This process should not substitute for the development of an industry plan for the Illawarra.

---

[37] IAPUM advice to the IPC on the Russell vale project, Nov 2020, pg 4

[38] WaterNSW, Russell Vale Colliery Revised Preferred Underground Expansion Project (09_0013), 29 August 2019

[39] ECONOMIC IMPACT ASSESSMENT OF THE DENDROBIUM MINE – PLAN FOR THE FUTURE: COAL FOR STEELMAKING, May 2019 https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-8194%2120190724T060901.866%20GMT

[40] INDEPENDENT PLANNING COMMISSION, MEETING WITH DEPARTMENT OF PLANNING, INDUSTRY AND ENVIRONMENT RE: DENDROBIUM EXTENSION PROJECT, 16 November 2020, pg 21, https://www.ipcn.nsw.gov.au/resources/pac/media/files/pac/transcripts-and-material/2020/dendrobium-extension-project/department-meeting-transcript.pdf

It might be tempting to be drawn down the path of viewing the assessment of this Project as a cornerstone decision in the development of a quasi-industry plan that - whilst sacrificing part of the Metropolitan Special Area - will determine the future viability of coal mining in the southern coalfields, coal exports through Port Kembla and steel making at BlueScope.

Working those issues out is a process that should occur with elected members of parliament, First Nations people, unions, civil society, government, WaterNSW, coal and steel industry reps and people representing industries of the future. The work of the Coal Commission on German economic diversification serves as a template for what an actual process could look like that builds consensus and determines these issues in the public interest.

It would be completely inappropriate for the Commission to make any decision other than whether – on its merits – further *longwall* mining at Dendrobium until 2049 either is or is not in the public interest.

6.4 This mine assessment will not determine the future of steel making

BlueScope will make their own decision about their blast furnace reline in 2025 (or perhaps before). As DPIE flag in the AR, it is possible that BlueScope may decide they will not continue to make steel from coal at Port Kembla from 2030 onwards. In this context, BlueScope's demand for coal cannot be used to justify longwall mining in the catchment for perhaps another 18 years beyond 2030 when perhaps there's no demand at all from them for steel making from 2030 onwards.

7. BLUESCOPE AND THE DENDROBIUM EXTENSION PROJECT

7.1 Where does Bluescope source 2.9Mtpa of coal for steel making?

"The production of 3Mt of steel from the Port Kembla plant requires the use of around 2.9Mt of coal which comprises 2.5Mt of hard coking coal and 0.4Mt of PCI coal (PCI coal or pulverised coal injection coal is finely ground coal that is injected directly into a blast furnace). Of the total coal use, 2.4Mt is sourced locally from the Southern Coalfield while the remainder is supplied from Queensland. Of the total from local sources, 2.2Mt is hard coking coal and 0.2Mt is PCI coal. Of the 2.2Mt of hard coking coal around 1.5Mt (68 per cent) is sourced from Illawarra Metallurgical Coal, 0.6Mt (27 per cent) from Metropolitan and 0.1Mt (5 per cent) from Tahmoor. Metropolitan also supplies the 0.2Mt of locally produced PCI coal. Illawarra Metallurgical Coal supplies a blended hard coking coal product to BlueScope which comprises coals from both the Wongawilli Seam (Dendrobium Mine) and the Bulli Seam (Appin Mine)." [41]

7.2 About 13% of Dendrobium's saleable coal appears to be sold to Bluescope

In a meeting with the NSW IPC on 19/11/20, South32's COO said that "Dendrobium Mine produces some of the world's best-quality metallurgical coal, primarily used for steelmaking at BlueScope Steelworks." This statement is misleading. In the 12-month period ending 30

[41] BAEconomics Report, pg 5
here: https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-8194%2120201102T060302.347%20GMT

June 2020, Dendrobium produced 3,767,563 tonnes of saleable coal.[42] For the previous year, saleable coal produced at Dendrobium was 3,610,034 Mt. DPIE's AR reveals that in 2019 Dendrobium sold 0.505 Mt to Bluescope. Based on these numbers, the actual breakdown of saleable coal sold to Bluescope from Dendrobium for steel making would be around 13%. In other words, that year, 87% of the saleable coal went somewhere other than Bluescope.

7.3 Production of coal to supply Bluescope's can be maintained in the Southern Coalfields until 2035 – a decade *after* Bluescope's 2025 blast furnace re-line decision

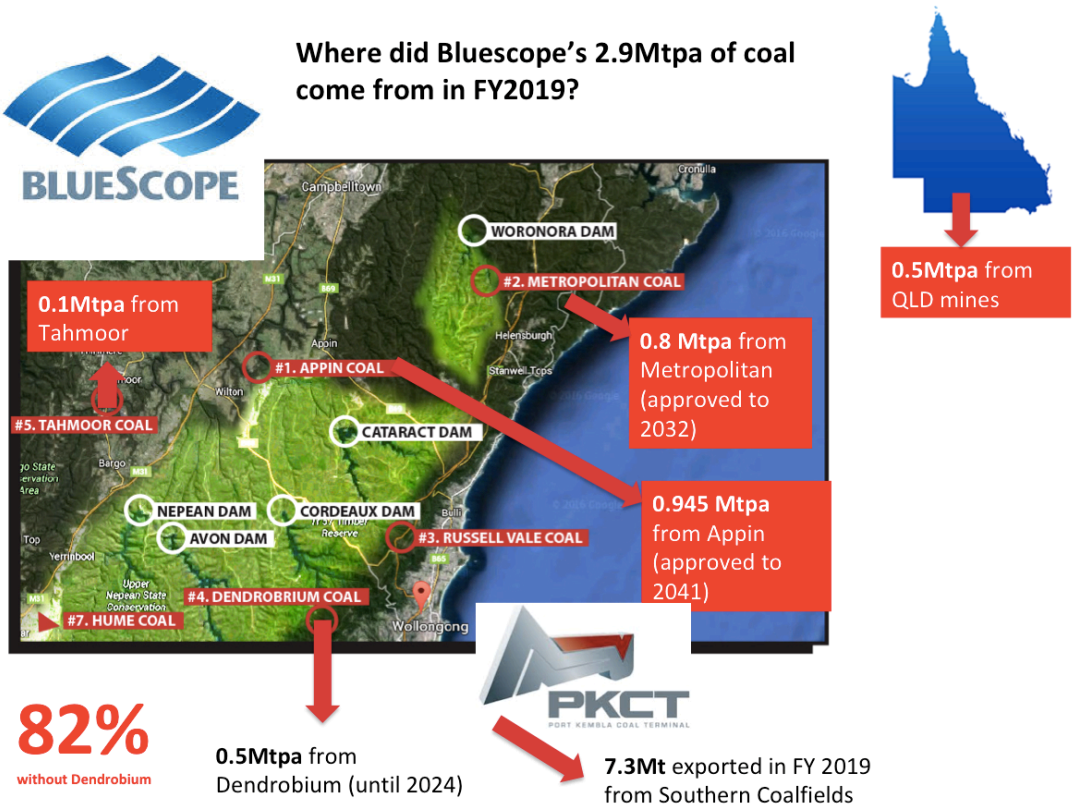
Current production of saleable coking coal from the Southern Coalfields is approximately 11Mtpa, being the combined output from Appin, Metropolitan, Tahmoor and Dendrobium (see Table 2). About 2.4Mtpa of this production goes to Bluescope, with most or all of the balance being exported via PKCT. Bluescope currently buys coal from all of the Southern Coalfields producers plus an additional 0.5Mtpa from Queensland.

As Dendrobium has enough coal to mine until the end of 2024, it appears as though security of supply from 2024 is the key issue – at least from Bluescope's perspective – that needs to be resolved. The next questions to be asked are: a) how long will Bluescope require supply; and b) which Sothern Coalfields mines might this coal come from, in the event that *longwall* mining ceases at Dendrobium?

7.4 Only 18% of coal supplied to BlueScope in FY19 was mined at Dendrobium

An analysis of the information in the AR and in the BAEconomics Review report reveals that status quo at BlueScope is to source about 80% or more of their coal needs from mines other than Dendrobium.

[42] https://www.south32.net/docs/default-source/illawarra-coal/dendrobium/dendrobium-and-cordeaux-annual-review/dendrobium-mine-and-cordeaux-colliery-annual-review-fy20.pdf?sfvrsn=a4405678_2



7.5 Our understanding of current coal supply to BlueScope

Bluescope currently source 2.9Mtpa of coal for steel making at Port Kembla? We have written to BlueScope asking the company to confirm that the information in **Table 2** (below) provides an accurate representation of current suppliers, the volume of coal they are currently supplying and their likely capacity to continue supplying BlueScope in future. To date, Lock the Gate has not received a reply from BlueScope. Perhaps this information will be included in BlueScope's submission to the IPC on this project.

If – as contemplated by the Department - Bluescope decides in 2025 not to go ahead with a reline of their blast furnace, but to either cease production or transition to green or lower carbon steel making at Port Kembla from 2030 onwards, would that change the Department's assessment that this project – in its current form – is approvable?

There appear to be multiple scenarios that provide coal supply to BlueScope in the absence of further longwall mining at Dendrobium from 2024

If Tahmoor South is approved, then it appears as though approximately 8.5Mtpa of saleable coking coal from the Southern Coalfields will be on the market until at least 2032 (when Metropolitan Coal's approval expires). From 2032 until 2035, about 6.5Mtpa would likely be available to BlueScope, being production from Appin and Tahmoor plus 0.5Mtpa from Queensland. If longwall mining at Dendrobium was refused consent and South32 re-submitted a bord and pillar proposal instead, then – assuming approval of that proposal - additional bord and pillar production from Dendrobium could be added to these totals.

As stated above, we have written to BlueScope asking them to provide information about multiple scenarios that could replace the approximately ½ tonne of coal from Dendrobium used annually to make steel.

Table 2: BlueScope coal supply for steel-making in FY19 (2.9Mtpa)

Mine	Company	Annual saleable coking coal production / availability (Mt) in the Illawarra	QTY (Mt) sold to Bluescope
Bulli Seam Operations (Appin – approved to 2041)	Illawarra Metallurgical Coal	3.18Mt[43]	0.945
Metropolitan Mine (approved to 2032)	Peabody	1.4Mt[44]	0.8
Dendrobium	Illawarra Metallurgical Coal	3.75Mt[45]	0.505
QLD mines (not specified)		QLD is the world's largest exporter of coking coal	0.5
Tahmoor (currently approved to 2022)	SIMEC	2.5Mt[46]	0.1
Russell Vale (approved – 5 yrs) Wongawilli Seam		0.46Mt[47]	
Tahmoor South Coal (proposed from 2022 – 2035) Bulli Seam	SIMEC	3Mt[48]	
Total		**11.3Mt + 0.5Mt (ongoing from QLD)** + more if Tahmoor South approved.	**2.85Mt**

Is the IPC satisfied that enough information is on the public record to determine if BlueScope is able to source enough coal from mines other than Dendrobium in the Southern Coalfields and put that together with coal imported from Queensland to continue making steel at Port Kembla from 2024 in the absence of an approval for further *longwall* mining at Dendrobium? What are the specific benefits of Dendrobium coal in comparison with coals from other mines? What if any factors would limit the replacement of Dendrobium coal with other available alternatives?

[43] https://www.south32.net/docs/default-source/illawarra-coal-bulli-seam-operations/annual-review/appin-mine-annual-review-fy20.pdf?sfvrsn=9a796618_4, pg 17

[44] https://www.argusmedia.com/en/news/2110515-peabody-to-cut-staff-at-nsws-metropolitan-coal-mine, 2 June 2020

[45] Annual Review FY20, https://www.south32.net/docs/default-source/illawarra-coal/dendrobium/dendrobium-and-cordeaux-annual-review/dendrobium-mine-and-cordeaux-colliery-annual-review-fy20.pdf?sfvrsn=a4405678_2,

[46] Current production about 2.5Mt of which about 10% goes to Whyalla, https://www.smh.com.au/environment/sustainability/subsidence-from-coal-mine-near-sydney-leaves-creek-smashed-up-20200604-p54zjp.html

[47] Cadence Economics, Economic Impact Assessment Of The Russell Vale Colliery, July 2019, pg 4

[48] https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-8445%2120200803T061021.569%20GMT

Additional information which Lock the Gate Alliance encourages the IPC to obtain directly from BlueScope:

1. Does BlueScope expect that demand for coal for steel making at Port Kembla will be sustained at about 2.9Mtpa for as long as coal-based steel making occurs at Port Kembla? Is there a prospect that lower-carbon steel-making techniques may lower demand for coal at Port Kembla steel works ahead of a zero-carbon transition?

2. In BlueScope's latest sustainability report, the company says it "is now investigating options for an industrial scale trial of biochar" which could "replace coal or coke without significant modifications to existing steelmaking processes".[49] If this investigation is successful, what volume of coal would Bluescope anticipate being replaced by biochar for primary steel making at Port Kembla?

3. What is BlueScope's view on the need to protect Greater Sydney and the Illawarra's drinking water from the impacts of longwall mining? Given BlueScope's sustainability commitments and an apparent availability of alternative supply, does BlueScope have a preference for coal **not** mined by longwall methods inside the Special Areas of the drinking water catchment?

4. Does BlueScope support the development of an industry plan that would explore options for supplying coal for steel making at Port Kembla in a way that avoids further long term damage to Greater Sydney and the Illawarra's water supply from longwall mining until a transition to low or zero-carbon steel making can occur?

5. What is Bluescope's vision for steelmaking at Port Kembla, given Australia's commitment to the Paris Agreement, with its objective of limiting global warming to 2°C, but aiming for 1.5°C, the latter of which requires the elimination of 59% of all coal use by 2030 (IPCC SR15 report), even after allowing for potential massive use of negative emissions technology such as CCS (BECCS, DACCS). How does Bluescope envisage transforming its business, and on what timeline? The Grattan Institute has suggested that government funding "in the order of $500 million is likely to be necessary to underpin a multi-billion dollar modernization of Australia's steel industry". Is BlueScope considering co-funding a transition to low-carbon steel making from 2025 when your blast furnace re-line decision is due?

   Note: we understand that BlueScope is a founding member of the Net Zero Pathway Methodology project and is playing a leading role in Industry Emissions Transition Initiative (ETI,) which is an industry-led initiative to develop pathways to net zero emissions supply chains across critical sectors of the Australian Economy. We also note the company's statement that BlueScope will release the outcomes of it's climate change scenario analysis in FY2021, along with long-term carbon reduction plans.

6. If a decision is made to proceed with a blast furnace reline investment of $500M, what would the implication of that be in terms of BlueScope's future demand for coal? How long would BlueScope expect to be buying coal for steel making at Port Kembla?

7. NSW DPIE says that Illawarra Metallurgical Coal was "highly profitable in FY19" with underlying earnings before income tax (EBIT) of US$359 million on sales revenue of US$1.135 billion. BAEconomics suggest that Illawarra Metallurgical Coal may consider

[49] Bluescope, Sustainability Report 2019/20, pg 18

closing Appin and Dendrobium if they do not gain approval for further longwall mining at Dendrobium (the implication – perhaps - being that the company would rather close the mines than reduce production and their profit margin by shifting to bord and pillar at Dendrobium). If Illawarra Metallurgical Coal did decide to close both its Appin and Dendrobium mines, could BlueScope continue steel making from 2025 using a blend of coals from Tahmoor South (if approved), Russell Vale, Metropolitan and Queensland mines?

8. Global crude steel production reached 1,869.9 million tonnes (Mt) in 2019. Of this 1,869.9Mt, BlueScope produced 3Mt. If global steel producers are able to produce more than 1,860Mt of steel without any coal at all from Dendrobium, is it logical to assume that coal from Dendrobium – for the purpose of steel making - is not unique and that high quality steel can be produced using coal from other sources?

9. Wollongong Coal has been given approval to mine an amount of coking coal from the Wongawilli Seam that would be roughly equivalent to the amount of Dendrobium coal currently consumed by BlueScope at Port Kembla. Does BlueScope have a view about the viability of future supply of coal from the Wongawilli Seam to BlueScope via bord and pillar mining at either Russell Vale or Dendrobium? We note that at the Public Hearing for Russell Vale on 19 October 2020, WCL told the IPC that all "coal extracted will be hard coking coal for the steel manufacturing industry worldwide, including the Australian markets if required".[50]

10. BAEconomics say that BlueScope imports coal from Queensland at a rate of about 0.5Mtpa. Given that this is about the same amount that is currently supplied by Dendrobium for steel making at Port Kembla, is it possible to import a Dendrobium-equivalent coal from Queensland using existing infrastructure at Port Kembla? Would it be possible to import even larger volumes? What are the characteristics of the coal that is currently purchased from Queensland? If import capacity at BlueScope's Port Kembla facility is limited, would it be possible to source coal from the Southern Coalfield that could replace the coal currently purchased from Queensland (i.e., to enable a substitution of Queensland coal for local and Dendrobium coal for Queensland coal)?

11. If conditions existed that enabled Bluescope to source coal supply based partly on a corporate objective of minimising overall environmental harm, which supplies would it use less of, and which ones more of? What would be the cost of such a decision to the company (transport logistics e.t.c)?

7.6 What about the option of new infrastructure to allow a higher volume of coal imports?

BlueScope suggested to the IEPMC in Feb 2019 that:

> *"any significant increase in seaborne coal imports would require very substantial capital investment to expand the facilities. BlueScope has recently estimated such investment to be at least $150 million."*

That sounds like a lot of money but it needs to be considered against the cost of lost drinking water – $86.4 million over just 26 years (and that amount appears to cover only new water losses – not existing). And IAPUM advise that water losses may persist in

[50] NSW IPC, transcript, Russell Vale public hearing, 19 October 2020

perpetuity. Beyond a one-off payment for an unknown quantity of water losses post-mining, these losses are not costed. So it appears that the value of lost drinking water over – perhaps just 40 or 50 years – may be on par with the cost of building infrastructure at Port Kembla that would be capable of meeting BlueScope's needs. Perhaps this infrastructure build could be planned in such a way that the new infrastructure could continue it's useful life until well beyond the transition from coal to green steel?

Illawarra Metallurgical Coal (IMC) made close to a $500M last FY year before tax. Perhaps IMC could approach BlueScope to invest in new Port infrastructure rather than a new longwall mine? After all, their parent company is already part owner of Port Kembla Coal Terminal.

7.7 Coal-free steel likely economic in about a decade

South32 is seeking approval for a project to mine metallurgical coal until about 2049. South32 and NSW Planning justify new mining in the water catchment by observing that coking coal is currently used to make steel. NSW DPIE says it is "likely to be many years" before green steel technology "is adopted at a scale that would significantly reduce global demand for coking coal" however renewable energy analysts anticipate that it could happen in about a decade.

Hydrogen could replace coal in the steel-making process both as a purifying agent and to fire furnaces. Green hydrogen could become economic in the 2030s, according to BloombergNEF.[51] The Grattan Institute's May 2020 'Start with steel: A practical plan to support carbon workers and cut emissions' report, finds that Port Kembla and Whyalla have "good prospects for moving from existing fossil fuel-based steel-making to supply low-emissions steel to the domestic market".

> *If these regions hosted direct reduction and electric arc plant of similar capacity to their existing furnaces, about 80 per cent of the existing iron and steel jobs (including fabrication) would be retained. And about 70 per cent of jobs would be retained if direct reduced iron was shipped to these locations and processed in new electric arc furnaces.* [52]

7.8 Can Bluescope make steel without Wongawilli Seam coal?

Coal mined from the Wongawilli Seam coal is a desired part of Bluescope's blend. Dendrobium is the only mine in the Southern Coalfield that currently produces Wongawilli Seam coal, however the Russell Vale UEP – if approved – would also produce Wongawill Seam coal. The Dendrobium Extension Project would cease extraction from the Wongawilli Seam sometime "around 2024", when production would move to Area 5, which would extract coal solely from the Bulli Seam. South32 does not currently plan to ecommence until around 2033." [BAEconomics report]

In a discussion with the IPC Panel on 16 November 2020, Mr Howard Reed – representing NSW DPIE - said:

> *"BlueScope were reasonably open with the Department in the discussions that we had, but they didn't, you know, tell us all their secrets. And so I don't know whether*

[51] How 'green hydrogen' could make 'green steel' real, December 03, 2019, https://www.bloomberg.com/professional/blog/how-green-hydrogen-could-make-green-steel-real/

[52] The Grattan Institute's May 2020 'Start with steel: A practical plan to support carbon workers and cut emissions https://grattan.edu.au/wp-content/uploads/2020/05/2020-06-Start-with-steel.pdf

their choice would be to run the current blast furnace using Bulli Seam coal at a lower level of efficiency, or whether some adjustment can be made using the pulverised coal injection component – I don't know whether that would increase the volatiles in the blast furnace – or whether they would have to import from Queensland which Mike was talking about the costs. I believe it's about $40 a tonne margin both in terms of a margin for the coal from Queensland itself. About $20 a tonne plus additional shipping and handling costs, and that, I don't think, takes into account any work that – excuse me – BlueScope would need to do on its on berthing facilities.

So it's all a bit – it's a bit of a grey area, but I think that the Department has done a lot of the necessary work here even if we haven't closed out every possible permutation. In the end, it's a very great difficulty for BlueScope if Dendrobium doesn't get approved. That being said, they've got an issue down the track in any case – it's proper to be straight forward about this – insofar as Area 5 is Bulli Seam. So there is a projected period of time in the operations both when Area 5 is operating and then when area – well, mainly when area 5 is operating. When there will be no Wongawilli Seam coal. There will be a little bit from Area 3C, but that gets closed out. And so down the track, what, eight years of so, BlueScope is going to have to find a way to operate without a significant supply of Wongawilli Seam coal."

CONCLUSION

With a growing population creating greater demands on our water catchment, business as usual is no longer an option.

There are central public policy and industry planning questions that arise from South32's application to continue mining with a discredited mining method on land specifically set aside to protect Sydney and the Illawarra's drinking water.

If maintaining the supply of coking coal to Port Kembla is a matter of strategic importance and public interest for New South Wales, then a broader assessment and analysis needs to be undertaken to consider the least-harm options for supplying this product until a transition to low-carbon steel making occurs. The proponent has not established its case that this longwall proposal is necessary but in any case, the damage it would inflict, added to the damage that has already been done, is clearly unacceptable.

We are at a crossroads with this proposal, finding ourselves with two options:

1. business as usual that inflicts further damage on our water catchment, potentially in perpetuity; or

2. refuse consent for this project and instead, pursue an industry plan that looks after workers, guarantees the protection of our water catchment and ensures security of coking coal supply to Port Kembla Steelworks until a fast-tracked transition to green steel is economically viable.