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SUBMISSION TO IPC - DENDROBIUM EXTENSION PROJECT SSD-8194

Objection to Proposed Extension Project (SSD-8194)

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Introduction

South32 proposes to extend the Dendrobium Mine Project for 30 years using aggressive longwall mining in the Special Area of the Sydney Water catchment. Documented evidence confirms the adverse impacts that previous operations at Dendrobium (and other mines in this area) have had on the water catchment. This proposal will result in further damage to the catchment area and loss of irreplaceable water for Australia's largest city.

Sutherland Shire Environment Centre (SSEC) calls for the NSW Government to reject South32's Proposed Mine Extension for Dendrobium Mine.

Summary

This submission argues that:

- past mining approvals have reflected a bias towards short term economic gains, claimed by mining companies, against long term permanent adverse impacts, on essential social and economic infrastructure assets, claimed by State water enterprises
- the current project exhibits the same biased focus with exaggerated net economic benefits generated by optimistic financial returns balanced against seriously undervalued environmental costs,
- the parameters and methodologies involved in catchment mining approvals have changed and hence the risks associated with mining under the catchment have increased,
- current mining operations, including Dendrobium's aggressive longwall methods, are proposed to continue to inflict unacceptable damage on the catchment, with no concessions to modify mine design to reduce the damage,
- claims that the Illawarra steel and manufacturing industry will collapse it the Project is not approved are not valid,

- approvals for mining projects have placed too much reliance on post-approval management of environmental risk as expressed in DPIE's promotion of its 'adaptive management' model.

and therefore, calls for:

- a rejection of the proposed Dendrobium Mine Extension

Water must have Priority

Water is an essential resource for the operation of our society. In this case the Special Areas section of the Catchment Area is vital for the provision of safe drinking water for the largest city in Australia.

Responsibility for the provision of water, and hence the management of the Sydney Catchment Area rests with WaterNSW. In order to fulfil its responsibility, WaterNSW states that:

> "In Declared Catchment Areas mining and coal seam gas activities must not result in a reduction in the quantity of surface and groundwater inflows to storages or loss of water from storages or their catchments." *(*WaterNSW, *Principles for Managing Mining and Coal Seam Gas Impacts in Declared Catchment Areas*, p2).

The water impact of mining by Dendrobium is highly contentious. Expert advice on past and predicted impacts by Dendrobium paint a worrying picture.

The condition that there must not be any loss of surface, ground or storage water has been breached by existing operations. In its submission to the Independent Expert Panel for Mining in the Catchment (IEPMC), WaterNSW stated that:

> "It is now clear that subsidence effects over both of the operating mines [Dendrobium & Metropolitan] in the Special Areas are causing impacts on groundwater levels and surface water flows, which is a risk to the quantity of water available in the Special Areas. (WaterNSW, *Submission to The Independent Expert Panel for Mining in the Catchment*, March 2019, p5).

Attachment A, Table A1 of the WaterNSW submission provides an extensive list of observed impacts of mining by Dendrobium and Metropolitan mines in the Metropolitan and Woronora Special Areas that support the conclusion by WaterNSW, that the operation of this mine, 'is a risk to the quantity of water available'. Of special interest is the number of reported cases where the impacts are 'Greater than Predicted'.

The 2018 initial report of the IEPMC states that:

> "Supported by its own analysis, the Panel concludes that in the case of Dendrobium Mine:
>
> - water inflow into all four mining areas (Areas 1, 2, 3A & 3B) exhibits some correlation with rainfall, ranging from weak in Area 3B to strong and rapid for Area 2
> - it is very likely that the high rate of influx is associated with a connected fracture regime that extends upwards to the surface
> - it is plausible that an average of around 3 ML/day of surface water and seepage from reservoirs is currently being diverted into the mine workings" (Independent Expert Panel for Mining in the Catchment, *Initial report on specific mining activities at the Metropolitan and Dendrobium coal mines*, 12 November 2018, p127).

With respect to water quantity impacts, the *2016 Audit of the Sydney Drinking Water Catchment* reported that: '… there was reduced water availability across the Catchment in 2013-16 compared to the previous audit period and the overall total surface water extraction has increased since the previous audit periods.' (p 13).

With respect to Dendrobium, the evidence confirms that Dendrobium mine, has in the past and continues to impact on surface, ground and storage water resources. With respect to water quality across all Sydney catchments, the 2016 Audit found that the majority of sites monitored had '… good levels of compliance with water quality guidelines …' (p 13). However, the four listed storage and catchment areas having the poorest water quality, included the 'Upper Nepean River flowing to Lake Nepean' (p 13). This is part of the Special Area where the Dendrobium proposal is located.

The record of past water impacts from Dendrobium operation have the potential to be exceeded with the Extension Project now under evaluation. However, the predicted extent of water loss appears to vary across different sources.

- South32 estimates the loss of water at '… less than 1% of the Avon and Cordeaux catchment yields …' and,
- they propose to compensate WaterNSW for the loss of '… surface water diverted from the Sydney drinking water catchment' (South32, EIS, July 2019, p ES ii).
- The DPIE report estimates of potential water losses for the Extension Project of up to 5ML/day (See DPIE section 3.8 ff).
- In Appendix L Cadence Economics, when evaluating the cost of water loss state that: 'In Area 5 of the Project, the Groundwater Assessment [study] concludes that over the life of extraction in this area, an average of 12 ML/d of inflow would be generated, peaking at 18 ML/d in 2033 and 2037. In Area 6 of the Project, inflow averages 3 ML/d, peaking in 4 ML/d in 2047". (South32, EIS Appendix L, p44)

However, some basic conclusions can be drawn.

- evidence referred to above confirms that actual impacts have proved to be consistently greater that predicted by Dendrobium.
- financial compensation does not replace lost water.
- in times of severe water shortage, water restrictions are imposed on users and recently some extreme water restrictions were in place for extreme drought impacted areas in NSW.
- unlike water, coal can easily be sourced from different locations. Australia has ample coal supplies and exports most of its coal production – as does Dendrobium.
- the water catchment is an integral part of our water supply infrastructure.
- it operates as an essential input into the production of the most valuable of all resources for society – water.
- if preserved in its pristine state, the catchment is a renewable and sustainable factor of production that will continue to capture water from rainfall.
- the only impediment to its operation would come from the lack of rainfall - as was witnessed during the recent severe drought. But the catchment responded when the drought was broken by the return of rain.
- coal extracted from the catchment area is but a temporary resource – it is not a renewable product and hence not a sustainable resource.

- any damage caused by mining, as documented from the Dendrobium operation, will incur permanent damage to the valuable resource that we have in the form of the Water catchment.
- no amount of monetary compensation for lost water or offsets for destruction of upland swamps or damage to catchment streams can reverse the damage and thus value to society of their water catchment -
  "The available data indicates that there has been a decline in the extent and condition of wetlands in some areas of the Catchment and efforts to rehabilitate wetlands that were impacted by longwall mining have been unsuccessful to date."(*2016 Audit of the Sydney Drinking Water Catchment*, (p 14).
- the proposed Extension Project will undermine a number of upland swamps that are expected to be adversely impacted
- South32 claim they assessed different extraction models to avoid undermining but regarded them as noneconomic and so resorted to offset proposals but,
- swamps cannot be offset
- climate change will increase the risks to water quantity and quality in the catchment and with this project. Hotter and drier weather impacts on vegetation and increases the risk of surface damage via erosion that will impact both water flows and water quality.
- the latest BOM & CSIRO State of the Climate report confirms: 'There has been a decrease in streamflow at the majority of streamflow gauges across southern Australia since 1975' (State of the Climate 2020).
- climate change brings with it increases in the frequency and severity of bushfires.
- Damage to surface runoff and quality follow as was witnessed in 2013.
- "Poor water quality recordings, particularly in the Nepean storage, appears to relate to the extensive bushfires across the sub-catchment in 2013 and heavy rainfall the following year." (*2016 Audit of the Sydney Drinking Water Catchment, (*p 22). Changes to normal water supply sources were undertaken to bypass the impacted water at the time.
- The Illawarra region along with much of SE Australia is predicted to experience reduced rainfall along with increased temperatures and prolonged periods of drought (BOM & CSIRO, State of the Climate 2020). The region is experiencing these predicted effects. At the same time the population of Sydney is predicted to continue to grow.
- Catchment damage is permanent and without the catchment the dams cannot be filled!
- What is the potential for alternative sources of water supply for Sydney? Raising Warragamba dam wall? Doubling the size of the Desalination Plant? At what cost and how quickly can these investments deliver lost water resources?
- Will NSW be prepared when the next severe drought coincides with a damaged catchment, low stream inflows and low reservoir levels?
- Taken together climate change with population growth will impose increased pressure on water supply.

Water must be given priority over coal mining

Dendrobium's Mining Methods

The mining methods employed by Dendrobium are extremely aggressive. Longwall mining was introduced by the Colliery in 2005 and in the past has extended under major tributaries and to the edge of reservoirs.

The proposed dimensions of the extension project longwalls are of similar large size to previous longwalls, extend under smaller surface water streams and are close to major water sources and reservoirs.

Expert opinion on Dendrobium's longwall mining methods has identified serious issues.

- "The cumulative, and possibly accelerated, impact of mining on flow regimes in the Catchment is likely linked to the increased prevalence of the current longwall methods of underground mining". (Alluvium Consulting Australia, *2016 Audit of the Sydney Drinking Water Catchment*, 2017, p. 21)
- The IEPMC reported 'vertical surface subsidence typically of 2.5 to 3m' in existing operations using similar dimension longwalls in the proposed expansion areas.
- With respect to current operations in the catchment that have in-principle approval, WaterNSW requested:
  'for Longwalls 17 and 18 at Dendrobium, the mining dimensions should be restricted to prevent increasing the environmental consequences on Wongawilli Creek and Avon Reservoir (e.g. substantial narrowing of longwalls and greater setbacks from Avon Reservoir), particularly given the presence of local geological structures.' (WaterNSW, *Submission to the Independent Expert Panel for Mining in the Catchment*, March 2019, p6)
- WaterNSW is the agency responsible for the management of the water catchment and have expressed their opposition to the Project. "WaterNSW remains strongly opposed to this project in its current form as none of its key concerns have been adequately addressed through the RTS". (WaterNSW *Comment on RTS V2,* March 2019).
- Recommendations from the *2016 Audit of the Sydney Drinking Water Catchment* to reduce mining risks and impacts in the Special Areas, (including Dendrobium) are listed in Table 6 P 26)
- DPIE reported that "BCD concluded that, while the area of vegetation that would be directly cleared is relatively small, the likelihood of subsidence over a much more extensive area is high and this is *"predicted to have a significant impact on multiple threatened Coastal Upland Swamps and other water dependent ecosystems and threatened species…'."* *(DPIE 6.6.34, p115)*

A comparison of Dendrobium longwall mining to approved mining projects at Metropolitan and Russell Vale mines in the same region reveal:

- Metropolitan's approved extraction plans for its longwalls 305-307 are:
  - approximately half the void size proposed for Dendrobium,
  - have approximately double the inter pillar width,
  - are up to double the depth of Dendrobium longwalls and,
  - unlike Dendrobium are not considered to have surface to mine fractures (See DPIE, *Metropolitan Coal Mine Longwalls 305-307 Extraction Plans, Reasons for Approval*, 16 March 2020)
- Russell Vale's recent approved expansion project has:
  - replaced longwall mining methods with the much more conservative bord and pillar method,
  - '… the Applicant has employed all feasible and reasonable measures to avoid swamp impacts by adopting the bord and pillar mining method and considers that this substantially reduces the risk of impact to swamps as a result of the proposal.' (NSW

IPC, *Russell Vale Underground Expansion Project, Statement of Reasons for Decision*, 8 Dec 2020, p42)

Despite having a record of high-level adverse impacts with respect to subsidence, water loss, swamp and biodiversity loss, South32 claim they did assess different extraction methods but rejected almost all on the grounds that they were **uneconomic**!

- These included:
    - narrower LWs together with wider LW Pillars (of similar dimension to those recently approved for Metropolitan Mine longwalls in order to minimise water loss risk),
    - breaking LW sections to not undermine critical wetlands including upland swamps – the so-called 'minimum case'
- But in each case the options are rejected on economic grounds. As DPIE report on the 'minimum case' alternative: 'South32 later advised that: *"This longwall layout is not considered economically feasible, and is therefore considered unreasonable…"*.' (DPIE 6.6.38 p117)
- The only modification offered to the original mine design appears to be that of setbacks of 1000m from dam walls and 300m from major streams and reservoirs.
- However, WaterNSW called for greater setbacks to these minor concessions. (WaterNSW, Comment on RTS V2 March 2019).

Balancing Environmental Benefits with Economic Costs

This subheading is taken directly from the DPIE Report on the expansion project. (See DPIE p61). Its wording points to an inherent bias in the approach to assessing the project that the IPC should not follow.

Consider the following introductory paragraph in this subsection that is linked to subsidence impacts.

"6.2.37 The Department's view is that the costs of reducing panel width are such that it should only be adopted as a measure to avoid, reduce or minimise subsidence impacts if the evidence supports the view that the resulting environmental benefits outweigh the economic costs." (DPIE p61)

Note that:

- The subheading **is not worded as**: 'Balancing Environmental Loss with Economic Benefits"
- The balancing act is based on a premise that: the project has economic benefit and hence predicated on the assumption that it should be approved unless the environment costs can be proven to outweigh the economic benefits.
- But economic benefits are mainly measured by market-based transactions that lend themselves to conventional measurement in financial terms. They are hence better regarded as financial benefits not economic benefits which have a much broader meaning.
- Environmental impacts or costs do not normally involve market-based transactions and hence are far more difficult to value in monetary terms.
- For instance, how does society value: the environment, a world heritage wilderness or a pristine stream, the loss of clean air, the state of public health or a Juukan Gorge cave?
- Consider the 'minimum case' mine design to address upland swamp impacts. The evaluation model requires that the proponent first attempt to 'avoid', then 'reduce', then 'minimise'

and if the reduction in economic benefit is considered 'unreasonable' then accept the environmental damage – take the economic benefit and consult on 'offset' options.

- Hence DPIE support the project on the grounds that South32 has followed the procedural steps required.
  They accept that South32's valuation of the financial cost of avoiding swamp damage is 'unreasonable'. Further they accept that it is difficult to minimise or even reduce swamp damage. They do not even consider that there is a means of avoiding damage because that would preclude their premise that the project has economic value and hence must be supported.
- Nor do they acknowledge that an upland swamp has proven to be impossible to rehabilitate, cannot be offset in the original catchment and the damage is for perpetuity.
- The decision process is heavily biased towards financial benefits when weighed against the non-financial / intrinsic value of environmental features. Further detailed comment on the economic assessment of the project is provided in the next section.

Coal Mining in the Catchment and Water Supply are Incompatible

Economic Benefit Claims by South32

South32 claim significant economic benefits for the Illawarra region and State and Federal governments from their current and proposed future operations. (South32, *Dendrobium Mine – Plan for the Future: Coal for Steelmaking – Environmental Impact Statement*, July 2019) However, these claims need to be put into perspective.

Claim: "Underground coal mining is currently the only major revenue generating industry that is both compatible with the catchment status of the Project area, and permissible with consent." (p ES-5)

Comment: It is FALSE to claim that coal mining is the 'only revenue generating industry' in the catchment. As argued above the catchment is an integral input to the production of water for two of the largest State-owned enterprises in NSW – WaterNSW and Sydney Water. Water supply production is not only one of the largest government operations in the State, it also is an essential service without which the city of Sydney could not operate. The productive capacity / value of the Sydney economy massively exceeds the productive value of all coal mining in the Illawarra, yet alone that of Dendrobium Colliery.

Claim: '… both compatible with the catchment status of the Project area …' (p ES-5)

Comment: This claim is FALSE – mining is clearly not compatible with the catchment as it imposes permanent damage on this essential piece of economic and social infrastructure and transfers costs to WaterNSW and Sydney Water.

Claim: '… permissible with consent …' (p ES-5)

Comment: This claim is TRUE. But why is this industry given consent to operate when no other activity, even walking, is banned and the damage it imposes on the catchment renders it incompatible?

Claim: '… essential supply of metallurgical coal to BlueScope Port Kembla Steelworks …' (p ES-ii)

Comment: It is true that Dendrobium is a key supplier of BlueScope. But it is not an 'essential' supplier. There are alternative supplies of coal for BlueScope as Australia has extensive

coal mines. There are also other techniques to produce of steel as the new owner of Whyalla Steelworks proposes to transition to. However, it is accepted that both supply and production changes could involve costs for BlueScope. Contrast Dendrobium's operation however with the size and scope of Sydney Water and its supply of an essential product for economic and social sustainability. Further comment on this claim is provided in the context of the commissioned BAEconomics study funded by DPIE.

Claim: Dendrobium is '… primarily producing metallurgical coal for steelmaking …' (p ES-i)

Comment: The EIS predicts that most of Dendrobium coal will be of high quality and metallurgical. Illawarra mines extract a mix of metallurgical and thermal coal and Dendrobium point out that they currently mix their coal from Dendrobium Colliery with coal from other mines and that they export a large proportion of their output.

Claim: Employment of 500 operational staff (including 100 contractors) and up to an additional 200 for the construction of the proposed extensions into areas 5 & 6. (p ES-ii)

Comment: It is true that Dendrobium is a large employer for a single company. But employment numbers are often exaggerated for large mining projects.
In this case there is a big discrepancy between the headline employment number and that used in the Cadence Economics study. "Over the period of the proposed development, an average of 265 FTE workers will be employed". (Appendix L p17)
But how significant is Dendrobium anyway in the context of the broader Illawarra economy?
The last Census statistics for 2016 for the Illawarra reveal a total of 1,442 employed in mining (assumed to be all in coal). But this represents only 1.4% of the total workforce for the region which has a large and highly diversified industry base.
Contrast this with employment data from the Newcastle / Hunter region coal fields where a total of 10,508 persons identified mining as their industry of occupation (assumed to be in coal) and in the smaller population Hunter regions, mining employment represents 20% of total employment.
A further contrast can be made with employment numbers of Sydney Water (2,550) for whom the catchment is a critical infrastructure asset.
And as recently demonstrated mining jobs are not necessarily secure given the recent shutdowns in the Peabody Australia's Metropolitan and Wambo coal mines.

Claim: $714 million (in real, undiscounted terms) in royalties, taxes and rates for local councils and the NSW and Commonwealth Governments. (p ES-ii)

Comment: This sum is not disputed but needs to be viewed in context.

- It is an estimate that is subject to future economic and other adverse events.
- It represents only $24 million per year based on the proposed 30-year life of the project.
- It is spread over 3 levels of government and thus the royalties share for NSW government would be much less.
- It is less than the return paid to NSW government by WaterNSW ($29m tax plus dividends of $38m in 2017-18) and Sydney Water ($242m in tax plus dividends of $546m in 2017-18); (WaterNSW, Annual Report 2017-18 & Sydney Water Annual Report 2017-18)
- As a proportion of the total royalties received by NSW government (projected $2 billion for 2019-20 State Budget (Budget Statement 2019-20 Budget Paper No. 1 and revised down to $1.7 billion in latest 2020-21 State Budget) this is a rather small amount.

- The cost of mine rehabilitation following closure is a potential liability risk that the NSW government must consider. Bonds provided by mining companies to cover rehabilitation costs are typically inadequate and in the event of company bankruptcy, or premature closure, remediation and compensation costs could flow to the NSW government.
- In the event of a major adverse event, private companies may be unable to afford remediation and / or compensation costs.

When placed into context this seemingly large economic contribution from Dendrobium mine is relatively small. It is a large company and employer but within the much larger and highly diversified economy of the Illawarra. The two State enterprises, (WaterNSW and Sydney Water) for whom the Sydney Water Catchment Area is a vital infrastructure asset, are considerably larger in terms of employment and financial return to the NSW Treasury. The short-term economic benefits of this project to the State do not justify the risk of longer-term damage to this vital water asset (the catchment).

Dendrobium's Net Economic Benefits are Exaggerated

Claimed Economic Benefits and Costs for Dendrobium

South32 commissioned an economic impact study from Cadence Economics. Study projects: '… a net benefit of $1,073 million in NPV terms ($2,872 million in real, undiscounted terms) to the State of NSW and $431 million in NPV terms ($1,149 million in real, undiscounted terms) to the greater Wollongong Region. This includes an estimated $272.1 million in royalties, payroll tax and Council rates in NPV terms ($714 million in real, undiscounted terms).' (South32 EIS 2019 pES-26).

A very minor change to the estimates is found in South32's Amendment Report of august 2020. For instance, the total net benefit is reduced to $1,070 million in NPV terms.

Direct Benefits

The direct benefits are based on revenue and cost data provided by South32. As previously stated, the employment predictions are not consistent across different sections of the study nor are the mining salaries that are quoted.

Indirect Benefits

However, the major concern lies with the valuation of indirect costs. Many of these costs relate to the contentious environmental, social and amenity costs. These costs relate directly to the major objections to the Project. But as they are not market based costs, they are difficult to value in any Benefit Cost Analysis.

The Economic Assessment Study (EIS Appendix L Table 15 and Amended Report Table 9) identifies the following indirect costs and their valuations. These are divided into:

- Mitigation and Managements Costs:
  being budget estimates projected by South32 for environmental mitigation and management costs (a total of $94.3 million (in 2018 dollar terms) over the life of the project) for Biodiversity impacts, Water impacts - including surface and ground water, Ambient noise impacts, Subsidence impacts, Aboriginal cultural heritage and historical heritage costs). Individual budgeted breakdown is not provided.

- Other Indirect Costs:
  being the valuation of non South32 budget items ($8.1 million in NPV terms) comprising Greenhouse gas emissions ($0.1 mill), Air quality impacts ($8.0mill), Residual value of land ($0.0 mill), Transport/ traffic impacts ($0.0 mill), Visual amenity ($0.0 mill), Net public infrastructure costs ($0.0), Loss of surplus to other industries ($0.0 mill).

These estimates are not true valuations of environmental costs of this project.

The first category is merely the total budget South32 proposes to spend on the listed items. The DPIE and EIS Reports both detail extensive possible impacts under all these items and South32's budget estimates could amount to a fraction of the true value of the impacts.

To what extent will these budgets achieve avoidance, reduction, minimisation, rehabilitation or offset of these impacts?

Is it even possible to avoid, reduce, minimise, rehabilitate or even offset damage or loss? The industry has a poor record on achieving predicted impacts and rehabilitation attempts.

What is the true value of environmental assets in their undamaged state? Consider the Rio Tinto's Juukan Gorge destruction!

In the case of biodiversity impacts, significant negative impacts are predicted from the Project and the only option being offered is offsets. But offsets will not prevent the loss of invaluable environmental features such as swamps which play an important role in the catchment.

If South32 were to be held to fully compensate for irreversible environmental damage, then it might completely negate any economic value attributable to the project.

Consider for example: if certain environmental damage is unavoidable (as is projected), then the true environmental cost is the project's opportunity cost – that is the loss of the calculated Economic Benefit for the project ($2,872 million in real, undiscounted terms)!

The second category is directly estimated but using methods that significantly underestimate their true values.

- The Greenhouse gas emissions estimates are questionable.
  - Only Scope 1 & Scope 2 emissions are counted and given a NPV value of $111.7mill.
  - The DPIE Report describes why Scope 3 emissions (91% of the estimated total emissions from the project) are not to be counted.
  - The treatment of Scope 3 is a vexed question. Clearly there is a double counting issue as Dendrobium's Scope 3 emissions are BlueScope and Liberty Steel Scope 1 emissions if all the Project's product was consumed by these two domestic companies.
  - But the estimated total GHGE that this mine will support is massively greater than the amount included in the mine's Net Economic Benefit calculation.
  - The challenge in addressing climate change is such that regardless of attribution issues, the chain of GHGE emissions must be reduced. In this case the overlapping Scope 3 mine and Scope 1 steel emissions must be reduced and eventually eliminated.

    - Claiming that 'The Project's direct contribution to Australian emissions would be relatively small.' is misleading in its inference that this Project is not a large GHGE contributor.
    - The product from the Dendrobium Expansion Project will generate a significant addition to Australia's GHGE.
      Instead of being only '… 0.5% of NSW's and 0.1% of Australia's annual GHGEs' it should be recognised as supporting more like 5% and 0.5% respectively of Australia's annual GHGEs. (DPIE 6.9.6, p150)
- Another misleading assessment of the magnitude of the Project's GHGE is their scaling, by the ratio of NSW to Global population, on the grounds that GHG emissions are a global problem. This reduces the value of the Scope 1 & 2 from $111.7 mill back to only $0.1 mill.
    - This is nonsense!
    - The emissions will be generated by this project. They will not be generated anywhere else in either the State or the globe. There is no other enterprise to which attribution for the emissions can be allocated.
    - As all other items in the economic assessment, both revenue distributions and cost payments, are included on the basis of their location being within NSW, the value of the Project's total emissions must be included, as a component of the Project's indirect costs, as they also originate from NSW.

A more representative value of its Scope 1 &2 emissions for assessing the Net Economic benefit, is $112 mill in NPV terms. This single environmental indirect cost item would put a serious dent in the claimed net benefit of $1,070 million in NPV terms.

In addition it should be recognised that the product from this project will underpin a very large contribution to GHGE in Australia.

- Air Quality Impacts are valued at $8.1 mill in NPV terms.
    - Detailed air quality assessment is available from monitoring existing operations.
    - However, the economic assessment applied restrictions that that would be expected to undervalue the impacts.
    - Namely the exclusion of '… those emissions that are remote from any residential areas, including from the proposed ventilation shafts modelled as upcast shafts…' and '… any potential damage from PM10 or TSP. This is because there are no credible damage functions available to assess the impacts of PM10 or TSP, (Appendix L p25)
    - It is well known that air pollution does not remain in a stationary location. It drifts with the wind!

All other indirect costs are assumed away as being insignificant, non-existent or as discussed previously assumed to be removed by South32's budget offers.

In summary, the true value of the environmental costs is not included in the claimed Net Benefits of the Project.

Recall the discussion on mine design – alternative mine designs were considered by rejected by South32 on financial groups – even suggesting that it is 'unreasonable' to expect South32 to forgo financial return to reduce environmental damage. And none of the alternative mine designs included the considerably more conservative model offered by Wollongong Coal for it Russell Vale expansion project and which was endorsed by the IPC as being of benefit (IPC *Statement of Reasons for Decision*)

The fact that DPIE support this attitude further reinforces SSEC's claim that the approval process is biased towards financial returns and against benefits provided by the valuable environment in the catchment.

Climate Change

Claim: South32's company-wide Climate Change Strategy reflects key strategies of the Paris Agreement. (EIS pES-20).

Comment: This is a highly contentious claim. Although South32 acknowledge that GHG gas emissions will constitute an adverse indirect impact of the project, they offer limited concessions to alleviate the impact.

- The only mitigation plan appears to be maximum use of flaring for Scope 1 emissions
- The attributable cost of emissions from the Project is misleading with respect to its impact on climate change. The product from this mine will be a significant contributor to Australia's GHGE with its downstream Scope 3 emissions being over 10 times the size of its direct attributable emissions.
- The scaling method used to apportion emissions cost to this Project is spurious. It results in only a tiny fraction of the Project's emissions being included in the indirect costs of this project.
- As stated previously, if the full value of greenhouse gas emissions were to be attributed to this project, it would constitute one of the largest cost items in the project's Economic Assessment (a change from $0.1 mill to $112 million in NPV terms)
- The 30-year period extends to the time when Australia needs to be carbon neutral. The proposed extension is incompatible with Australia's emissions commitment.

Australia is a signatory to the Paris Agreement on Climate Change. As such Australia is committed to reducing its greenhouse gas emissions.

This project's product will be a major contributor to Australia's GHG emissions extending to a critical period when it can be expected that GHG emissions will be required to be net zero.

As mentioned above the measurement of emissions attributable to the project is seriously flawed.

The Project will be a major contributor to Climate Change and impact Australia's Paris Agreement commitments

Planning Approval Experience

In the past Coal appears to have been given priority over Water in planning decisions for mining approvals.

As previously argued, there is an inherent bias towards the valuation of market-based economic benefits (net sales revenue and operational costs) when compared with non-market-based / non-financial / intrinsic environmental values when weighing Economic Benefits against Environmental Costs.

The bias is further emphasised by:

- the strong emphasis on the claimed essential support for the Port Kembla steel industry in the South32 Project Documents (including in its title) and,

- supported by the DPIE commission study by BAEconomics into the impact of non-approval of the Project on the steel industry and manufacturing in the Illawarra economy

BlueScope Steel

In addition to the Cadence Economic study commissioned by South32, DPIE commissioned a further economic impact study by BAEconomics into the potential impact of the Dendrobium Expansion Project on BlueScope Steel.

The study provides detailed and useful comment on the interconnected operation of the mines in the Illawarra Special areas of the Catchment and BlueScope Steel in Port Kembla.

It is not disputed that BlueScope Steel receives economic benefit from Illawarra metallurgical coal, and the proximity of mines such as Dendrobium, and the Port Kembla Coal Export terminal.

However, the SSEC rejects the claim by BAEconomics that: '… dependencies between Illawarra Metallurgical Coal and the primary steelmaking operations at BlueScope mean that the failure of one will compromise the other.' (BAEconomics, p17). And more specifically the claim that rejection of the Dendrobium project could lead to a closure of Illawarra Metallurgical Coal and possible BlueScope.

Consider the following:

- BlueScope Steel receives economic benefit due the close proximity of one of its primary inputs (metallurgical coal).
- But:
    - It does not enjoy proximity to its other major raw material, iron ore. Liberty Steel in Whyalla has the reverse access position.
    - BlueScope has access to other source of metallurgic coal both within the Illawarra and via import from QLD mines for example.
    - Proximity does not ensure least cost. Indeed, the ACCC was concerned that South32 might exert monopsony pricing power over BlueScope when assessing South32's offer to purchase neighbouring Metropolitan Coal in 2016.
    - Dendrobium still has years left in the operation of its existing approvals for including the using the option of Area 3c which it wishes to avoid on economic grounds.
    - Approval of this project would lock in destructive activity in the catchment for another 28 years, before which alternative steel making technology, currently being trialled, would be expected.
    - BlueScope's other strategic asset is its proximity to Port Kembla terminal facilities that facilitate both export and import access.
- Importantly, there is no indication from BlueScope that its future is uncertain.
    - As mentioned previously, BlueScope Steel, projects a far more positive future for the company than that inferred by the BAEconomics report.
    - A recent media release by BlueScope lists future investment plans and business opportunities flowing from the recent NSW State Government proposal for massive expansion of renewable energy in the State. (BlueScope Steel, $20 million Renewables Manufacturing Zone, Media Release 16 Nov 2020).
    - Investment of $20 mill is planned by BlueScope to develop a renewable energy manufacturing hub in the Illawarra with a targeted 300 jobs.
    - Work on the planned refurbishment of the Port Kembla blast furnace is continuing.

    - A new product division has been announced to produce steel products for renewable energy projects.
    - Replacing currently imported renewable components with locally manufactured components is projected.
- BlueScope's Sustainability Report 2020 projects an optimistic future embracing new low emission technologies.

Risk Management

The risk of adverse impacts to the catchment from mining have been identified in past approval processes and considered acceptable, subject to various conditions imposed on miners. But experience confirms that adverse impacts do occur and that, the observed severity of these impacts, tend to be greater than predicted. In addition, impacts caused by subsidence may not be immediate – they may take years occur and / or appear.

Scientific analysis of mining impacts continues to improve but prediction of adverse impacts remains a difficult task. The planning decision for mining approval in the catchment therefore continues to be a subjective evaluation of extensive reports, on the risk of adverse impacts on the catchment, weighed against, possible economic gains to miners, community and government.

The critical methodology of risk evaluation has evolved. No longer is the probability of an adverse event simply based on either crude subjective classification or statistical measurement of past adverse impacts. Risk needs to include the potential for unknown adverse events and the severity of the impact of the adverse event plus involve sophisticated computer modelling. An example of an unknown adverse event would have been the prediction that a tornado would sweep across a narrow part of the Kurnell peninsula and render Sydney's Desalination Plant unusable for several years. An example of a low probability but catastrophic impact, would be the recognition of a potential draining of an entire water reservoir through the entrance of an underground mine, such as Russell Vale, that would inundate several suburbs of the Illawarra.

The risk profile for mining has changed due to a combination of climate change + rapid population growth + more aggressive mining techniques + extension of mining closer to critical tributaries and reservoirs + ongoing permanent damage to catchment (swamps, tributaries, surface subsidence).

As WaterNSW has succinctly stated: "In responding to the issues raised by WaterNSW, the IEPMC and other agencies, the RTS places too much reliance on 'post-approval' management, rather than providing relevant information that would allow key issues to be properly assessed prior to a determination". (WaterNSW, *Comment on RTS V2* March 2019)

It should be added that DPIE supports the same post-approval approach and exhibits unjustified confidence in their ability to risk manage via their 'adaptive management' model.

This submission argues that:

- ***past mining approvals have reflected a bias towards short term economic gains, claimed by mining companies, against long term permanent adverse impacts, on essential social and economic infrastructure assets, claimed by State water enterprises,***
- ***the current project exhibits the same biased focus on exaggerated net economic benefits generated by optimistic financial returns balanced against seriously undervalued environmental costs,***

- ***the parameters and methodologies involved in catchment mining approvals have changed and hence the risks associated with mining under the catchment have increased,***
- ***current mining operations, including Dendrobium's aggressive longwall methods, are proposed to continue to inflict unacceptable damage on the catchment, with no concessions to modify mine design to reduce the damage,***
- ***claims that the Illawarra steel and manufacturing industry will collapse it the Project is not approved are not valid,***
- ***approvals for mining projects have placed too much reliance on post-approval management of environmental risk as expressed in DPIE's promotion of its 'adaptive management' model.***

and therefore, calls for:

- ***a rejection of the proposed Dendrobium Mine Extension***

Preservation of the Water Catchment is Vital for Sydney's Future

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