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**Nature Reserves Preservation Group
of Kalamunda, Inc.**

26 Aug 2022

**TO: Chair, Environmental Protection Authority, Locked Bag 10, Joondalup DC, WA 6919
(electronically via the EPA's Consultation Hub)**

CC:

SUBJECT: Submission on South32 Worsley Alumina's proposed 'Worsley Mine Expansion'

Dear EPA Chair,

The NRPG non-profit organisation has worked for 30 years to preserve the natural areas in Kalamunda and surrounds. As such we recognise that our Northern Jarrah Forests are incredibly precious, biodiverse and globally unique, and they have been subject to extensive clearing and logging over the past 200 years.

The remaining mature, old-growth and two-tiered jarrah forests and linkages between these ecosystems, waterways, cultural heritage, wildlife habitat and regrowth and rehabilitation areas are critically important for climate, biodiversity, water, culture and communities.

The cumulative impacts of forest logging, mining, Dieback and other human activities have damaged our forests permanently (including that Climate Change has also now changed the growing conditions) and any further activities are a serious threat to their viability.

The NRPG strongly opposes the South32 proposed Worsley Mine Expansion and call on the EPA to reject this proposal because it is critical for the environmental protection of this region.

In this submission we focus on Flora, Fauna, Inland Waters and Greenhouse Gas Emissions. We acknowledge and fully support the Submission made by the West Australian Forest Alliance (WAFA) and our comments basically summarise those points, with a few additional denoted by "*".

FLORA AND VEGETATION:

The Primary Assessment Area (PAA) is 29,356 hectares in size (ERD, 123), and the proposal would result in the direct loss of up to an additional 4,399 ha of 'excellent' or 'very good' quality Jarrah, Marri and Wandoo forest and woodlands (ERD, 193 - 194), with mapped old-growth (P 166 and P 165 respectively).

Over a quarter of the PAA has high to medium potential of being old-growth forest, meaning it is relatively undisturbed (ERD, 193). 44% of the PAA is made up of cleared areas, agriculture and plantations, considered in the ERD as being 'completely degraded.' The proposal would result in the loss of up to 40% of the remaining native vegetation in the PAA (ERD, 225 and 198).

The proposal acknowledges (ERD, 198) that the native vegetation clearing has potential to 'reduce locally significant vegetation communities, riparian vegetation and Priority flora taxa, reducing their known extents in the local and regional areas,' and 'may also result in indirect impacts to flora and vegetation, including fragmentation, weed invasion, invasive pathogens, reduced vegetation health, impacts on ecological and social values of forests, altered surface water, groundwater level rise, direct loss of suitable habitat and disturb conservation-significant flora.

Eleven Priority flora species would be cleared, and two of these (*Synaphea panhesya* P1 and *Banksia subpinnatifida* var. *subpinnatifida* P2) would be cleared in their known entirety within the PAA (ERD, 200).

South32 states there are areas of high conservation value that are important to biodiversity or heritage, but fails to protect the vast majority of them, saying instead that they are managed internally and through negotiations (ERD, 96).

The cumulative impact assessment is insufficient and does not consider the known risk of ecosystem transition or collapse under climate change.

The reliance on 'rehabilitation' being a mitigation strategy is unacceptable, as they are not comparable to mature forests because:

- they do not provide the habitat or carbon storage capacity of mature forests
- they do not have the resilience to climate change of mature forests
- their substantially higher evaporation and transpiration rates, and the high water use threatens surrounding forests. (A review of the company's own past rehabilitation performance found native plant density and native species richness were well below those in surrounding forests (ERD, 245-46).)
- It is questionable whether, given the changes in our climate, it will be possible to rehabilitate the forest and ecosystem.

Conclusion:

The proposal cannot meet the EPA objective for Flora and Vegetation and should be rejected.

Additionally, all forests, woodlands, shrublands and heaths in the Primary Assessment Area (PAA) must at least be protected from clearing, and conditions imposed to ensure that these Protected Areas are not disturbed by clearing or impacted by increased spread of weeds or disease; groundwater or surface water alterations, or dust.

TERRESTRIAL FAUNA:

The proposal would have severe impacts on terrestrial fauna. The species expected to suffer the greatest impacts are Red-tailed, Baudin's and Carnaby's Cockatoos, Quokkas, Chuditch, Red-tailed Phascogales, Brush-tailed Phascogales, Woylies, Western Ring-tailed Possums and Numbats.

The impacts to these, and seven other conservation significant fauna, include:

- Injury and death during clearing operations
- Loss of habitat, including habitat considered critical for species survival
- Further fragmentation of habitat
- Decline in breeding success through removal of breeding habitat
- Increased predation by foxes and cats
- Increased deaths and injury on roads
- Impacts of dust, noise and vibration during clearing and operations.

The proposed clearing would destroy a significant proportion of suitable habitat that is critical for species survival, and acknowledges it would have impacts at local, regional and even population levels, which is unacceptable.

South32 completely ignores impacts on Numbats, claiming it is unlikely they are in the area, in spite of several Officially-recorded sightings.

South32 proposes to destroy a minimum of 64 breeding trees for Black Cockatoos; clear 60% of the habitat for the critically endangered Woylie, which it acknowledges is particularly threatened by its proposed clearing at a local and even regional level. South32 acknowledges the likelihood of significant impacts for Brush-tailed Phascogales but fails to propose any mitigation actions. The company's claim that, for various species, 'impacts at a population level are less likely as suitable habitat will remain in the PAA and surrounding forested areas' is not supported by evidence and is at odds with the precautionary principle (ERD, 347 and 349).

For some fauna, South32 proposes mitigation actions to manage what it describes as 'significant residual impacts'. The approach relies on rehabilitation which cannot provide the quality of habitat required, a highly questionable fenced enclosure for Woylies, artificial nest boxes, inadequate protected areas that can be modified and removed, and a heavy reliance on 'offsets'. Offsets are 'the least preferred option' (EPA 2021, 7).

The mitigation proposals are wholly inadequate and misleading. The company gives its rehabilitation a 6/10 for Black Cockatoos for foraging, in spite of evidence that only the Carnaby's reliably use the rehabilitation as a food source and only after a minimum of 4 years of growth. None of the Cockatoo species can use the rehabilitated areas for breeding. Artificial hollows are not reliably used by Forest Red-tails or Baudin's Cockatoos and cannot be relied upon as a mitigation strategy.

Conclusion:

The reliance on unproven biodiversity offsets to address serious, potentially regional and population wide impacts on fauna, half of which are listed as endangered or critically endangered, is unacceptable.

South32's approach to these impacts is unscientific and at odds with the EPA mitigation hierarchy and the precautionary principle.

The EPA should reject the proposal, and at the very least: all forests, woodlands, shrublands and heaths in the Primary Assessment Area (PAA) must be protected from clearing and conditions must be imposed to ensure that these Protected Areas are not disturbed by clearing or impacted by increased spread of weeds or disease, groundwater or surface water alterations, or dust.

TERRESTRIAL ENVIRONMENTAL QUALITY:

The proposal would have significant impacts on soil and water, particularly through erosion, compaction and contamination, but does not provide adequate data and information regarding this, such as contamination records from hydrocarbon and chemical spills and leaks, or the erosion record of current operations.

It cites unpublished research without providing supporting data on relevant matters, and omits research citation on some impacts such as deep ripping to address soil compaction. It also fails to account for the loss of soil carbon resulting from clearing.

*There are also serious concerns by reputable botanical Scientists such as Prof. Kinglsey Dixon, regarding the removal of the cap-rock which changes the hydrology which the forest ecology has evolved to exist with, and destroys entire fungal networks. Therefore it is highly doubtful that it is possible to rehabilitate the forest to its original condition.

Key potential environmental impacts (ERD, 449) are:

- Erosion
- Soil health decline
- Soil compaction
- Salinisation and death of trees and vegetation (as seen on the Blackwood River between Balingup and Nannup, due to felling of plantation trees causing water level rise in the valleys)
- Contamination of land and soil through spills and leaks
- Acid sulfate soil disturbance

The ERD provides little to no information by which an assessment of current practices can be made. The company says it expects that the risks of significant potential environmental impacts for land and soils will not change from current mining and refining operations. However, it is expected that with expansion of the mining operation there would be increases in erosion, chemical spills, loss of carbon and a reduction in the overall soil health within the PAA.

The assessment of impacts on soil health is inadequate, despite acknowledging its importance for biological and chemical processes and the resilience of flora and fauna ecosystems. It also omits to provide assessment of the environmental impacts regarding carbon sequestration.

Conclusion

The company's assessment on this factor is insufficient for the purposes of a Public Environmental Review, it does not meet the EPA's objective for this factor, and should be rejected.

INLAND WATERS:

The proposal would impact the Hotham and Williams Rivers (directly), the downstream environments of the

Murray River Catchment (regionally) and the Peel-Yalgorup System, recognised as a Wetland of International Importance under the “Ramsar Convention”.

Direct impacts of the proposal on waterways include:

- erosion of riverbanks and scouring of streams
- changes to the water balance in Water Dependant Ecosystems
- increases in salinity due to cumulative clearing impacts
- sedimentation and turbid waters through clearing impacts
- waterway contamination from spills or storm water runoff from clearing areas
- altered flow regimes and water quality causing impacts to aquatic fauna and overall waterway health

The proposal would also involve three new crossings over the Hotham River. This would cause disturbance to riparian areas and likely increases in turbidity and pollutants entering the river system.

Groundwater extraction is proposed to increase from 500 ML/a to 900 ML/a, primarily for use in dust suppression (ERD, 21).

The ERD acknowledges the increased groundwater abstraction ‘has the potential to cause localised drawdown, which may affect vegetation’ (ERD, 225).

Company-commissioned modelling shows that after clearing for bauxite mining ‘generally groundwater level rises at 5 meters above the pre-mining groundwater table elevations, however, some areas of up to 10 meters elevation are noted’ (Appendix I1: GHD 2020a, 37).

Whilst the ERD presents rehabilitation as a mitigation strategy, there is no modelling of the actual impacts of rehabilitation on groundwater flows and levels and no mention of the known impacts thirsty rehabilitation has on surrounding forests through competition for water.

The ERD also fails to address directly how removing the bauxite regolith down to bedrock or clay levels (and replacing with overburden and topsoil) alters the ground hydrology.

The company acknowledges that ‘There is insufficient information with which to assess the impacts to the [Groundwater Dependent Ecosystems] GDEs’ and ‘the majority of the GDEs are deemed as high-risk areas of concern ...[and] are likely to require management to address potential mining related impacts’ (Appendix I1: GHD 2020a, ii).

South32 has failed to adequately address the impacts of increased water use and further clearing, mining and groundwater abstraction in a drying landscape. The region has been identified by the IPCC as an ecosystem at risk of climate collapse or ecosystem transition.

Most concerning is the lack of long-term monitoring that would allow the modelling to be accurately calibrated: something the company’s commissioned consultant considered was an issue. The lack of monitoring was not just in groundwater dependent ecosystems, but across all mining areas and includes both monitoring of groundwater levels and salinity and of changes to surface water flow and water quality over the life of mine.

In addition, the company has failed to consider the impacts of taking nearly 1 billion litres of water every year from this already drought-prone, at-risk environment. And it overlooks the additional evapotranspiration from rehabilitation and the implications for the surrounding forest.

Conclusion:

The impacts on inland waters, vegetation and groundwater dependent ecosystems are unacceptable. The ERD is not sufficient for the purposes of a Public Environmental Review and the EPA should reject this proposal.

GREENHOUSE GAS EMISSIONS:

Alumina refining is highly intensive carbon polluting industry, and Western Australia’s emissions continue to climb.

South32 Worsley’s ERD acknowledges that the proposal would cause the emission of 269 million tonnes

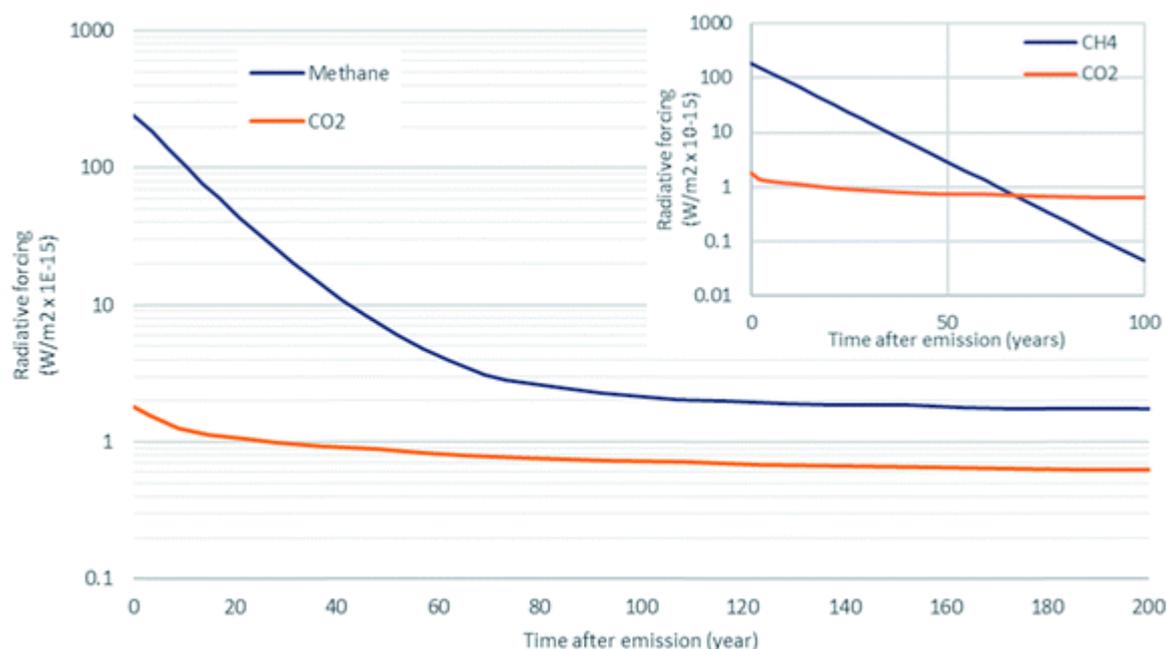
of CO₂e over 15 years. This would be made up of 43 Mt CO₂e Scope 1 and 2 emissions (if planned emission reductions are achieved), and 226 Mt CO₂e Scope 3 emissions.

The company says that it aims to achieve net zero operational (Scope 1 and 2) emissions by 2050, with reduction expected to be achieved by switching from coal to gas and then potentially other low carbon fuels.

This planned switch from coal to gas it claims will reduce South32 Worsley's operational CO₂ emissions but ignores the extremely high Global Warming Potential (GWP) of methane emissions from gas production.

*It should be noted that 'Natural gas' (commonly called 'gas'), is methane, and while it is often claimed as being 'clean', it has two serious problems:

- It is a fossil fuel (unless from biomass) and is generally used very inefficiently when burned, plus it emits toxic by-products.
- It is a very powerful Greenhouse gas (GHG) with a Global Warming Potential (GWP) equivalent to 84-100+ times that of CO₂, in the most critical near-term period of 20 years. (Ref: R.W. Howarth advised on methane portions of New York's climate law. 2019 [cited 2019 31 August]; Available from: <http://news.cornell.edu/stories/2019/07/howarth-advised-methane-portions-nys-new-climate-law>, and: "Methane emissions: choosing the right climate metric and time horizon" <https://pubs.rsc.org/en/content/articlehtml/2018/em/c8em00414e>). As such it can cause high global warming effects even from very small leakage and venting between the source through the supply chain to point of combustion, (or by anaerobic decomposition of waste or biomass). For example, gas leakage of just 2-3% in the supply chain can make it as bad, or worse, than burning coal for electricity generation.



*Graph: "Radiative forcing of a 1kg pulse emission of methane and carbon dioxide over time" <https://pubs.rsc.org/en/content/articlehtml/2018/em/c8em00414e>

If the company is not able to reach interim 5 yearly targets, it may resort to carbon offsets (of an unspecified nature) (ERD, 622).

The South32 Worsley refinery has comparatively high GHG emissions intensity (emissions/t alumina): about 50% higher than the average for the Alcoa refineries in WA. The company claims that its GHG intensity is about 16% higher than other Australian refineries, however, this has not been able to be verified. According to the company, this is largely due to its use of coal rather than gas (ERD, 617, Appendix E10).

The company admits its emissions contribute to 'chronic and acute physical impacts in the southwest of Western Australia' that 'impact the health and resilience of ecosystems, habitats and species' and will 'affect the efficacy of existing and future mitigation activities' (ERD, 618-19).

Conclusion:

WA has a serious problem, with carbon emissions continuing to rise and a lack of action by Government or regulators to prevent private industry from developing climate-wrecking projects. WA's GHG emissions already exceed the level required to support the Paris Agreement. Hence, WA must cut its emissions more steeply than other States in the future.

If the proposal is approved, Australia will not be heeding the science and meeting its international climate commitments, and the environmental impacts from climate change will be severe.

The EPA should reject this proposal.

Sincerely,

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