IN THE MATTER OF THE
FINGERBOARDS MINERAL SANDS PROJECT
INQUIRY AND ADVISORY COMMITTEE

SUBMISSION ON BEHALF OF MINE-FREE GLENALADALE

A. INTRODUCTION

1. Mine-Free Glenaladale Inc. (**MFG)** opposes the Fingerboards mineral sands mine project (the **Project**) in the strongest terms.

2. The environmental effects of locating a mine in this particular landscape (with its deep narrow gullies draining into major waterways and its highly dispersive soils prone to erosion) have either not been adequately assessed (in the case of soils, groundwater, the effects of climate change, access to water and exposure to radiation), or are simply unacceptable and unable to be mitigated (in the case of loss of native vegetation and habitat for threatened species, the wholesale destruction of a large area of valued landscape and the fundamental change to the amenity of local residents).

3. These submissions expand upon the Opening Submission made on behalf of MFG,[1] and address the following matters in greater detail:

   a. the legal framework;

   b. the environmental effects, with specific regard to the evaluation objectives of resource development, biodiversity, water, catchment values and hydrology, amenity and environmental quality and rehabilitation; and

   c. the inadequacy of the Environment Effects Statement (**EES**) and updated material, including addressing the addition of centrifuges.

4. Members and supporters of MFG will make submissions directly to the IAC on topics including the potential agricultural, health, heritage and socio-economic

[1] Opening Submissions of Mine-Free Glenaladale (Submitter 813) (**Tabled Document 250**).

impacts of the Project. Members and supporters will also make submissions directly to the IAC on the impacts of dislocation from a community and landscape that they love and call home.

5. MFG supports the submissions of the East Gippsland Shire Council (**EGSC**),[2] and specifically adopts those submissions with respect to:

   a. uncertainty;

   b. adaptive management;

   c. the nature of this Inquiry.

6. MFG also supports the submission of the Gunaikurnai Land and Waters Aboriginal Corporation (**GLaWAC**) that the Project is at a scale and impact that cannot co-exist with the cultural heritage values of the site, its waterways, and the landscape it sits within.[3]

B. THE LEGAL FRAMEWORK

B.1 Acceptable outcomes

7. The IAC has been appointed by the Minister for Planning to hold an inquiry into the environmental effects of the project. Under its Terms of Reference, the IAC is to:

   a. consider and report on the potential environmental effects of the Project, their significance and acceptability, and in doing so have regard to the draft evaluation objectives in the EES scoping requirements and relevant policy and legislation; and

   b. report its findings and recommendations to the Minister for Planning to inform his assessment under the *Environment Effects Act 1978.*

[2] Closing Submissions on behalf of East Gippsland Shire Council (27 May 2021) (**Tabled Document 407**).
[3] Submission of Gunaikurnai Land and Waters Aboriginal Corporation (29 October 2020) (**Submission 662**) PDF 11.

8. The IAC's reporting obligation is expanded upon by clause 34 of the Terms of Reference which sets out the matters that the report must contain. In particular, the IAC is required to draw conclusions and make findings with respect to:

   a. the environmental effects of the project and their significance and acceptability; and

   b. whether acceptable outcomes can be achieved, having regard to legislation, policy, best practice, and the principles of ecologically sustainable development.

9. It is therefore necessary to consider the concept of 'acceptability' and its proper construction in the present case.

10. In coming to its conclusions, the IAC must engage with the *Mineral Resources (Sustainable Development) Act 1990* (**MRSD Act**) and its purpose to encourage economically viable mining in a way that is compatible with the economic, social and environmental objectives of the State and the principles of sustainable development.[4]

11. Much has been said by the Proponent about the application of the MRSD Act to this case. The MRSD Act facilitates mining, but it does not facilitate mining at all costs: the necessary corollary of the requirement to obtain a licence to mine is that mining may not be acceptable in all circumstances.

12. Further, it is an objective of the MRSD Act to establish a legal framework aimed at ensuring that risks posed to the environment by work being done under a mining licence are identified and are eliminated or minimised as far as reasonably practicable. This sets up a test for the robustness of the environmental management framework proposed for this Project: does it eliminate or minimise as far as reasonably practicable all risks to the environment?

13. As set out in section 2A of the MRSD Act, it is Parliament's intention that, in the administration of the MRSD Act, regard should be given to the principles of sustainable development.

[4] *Mineral Resources (Sustainable Development) Act 1990* (**MRSD Act**), ss 1 and 2A.

14. For the purpose of the MRSD Act, the principles of sustainable development include integrated decision-making, the protection and maintenance of biological diversity and ecological integrity, and the precautionary principle.[5]

15. In the administration of the MSRD Act, regard should also be given to the principle that 'development should make a positive contribution to regional development and respect the aspirations of the community and of Indigenous peoples'.[6]

16. The 'acceptability' of the Project also raises the overlapping but broader question of whether it is 'ecologically sustainable'. This is supported by the IAC's Terms[7] and by *Ministerial Guidelines for Assessment of Environmental Effects under the* Environment Effects Act 1978 (**Ministerial Guidelines**), which specify that the EES process is guided by the 'need to assess the consistency of proposed works with principles and objectives of ecologically sustainable development' (**ESD**).[8]

17. The common definition of ESD is 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs'.[9]

18. All of the constituent principles of ESD are relevant and applicable to the assessment of whether the environmental effects likely to arise from the Fingerboards mineral sands mine project are acceptable.[10] However, in the circumstances of the present case, the IAC should pay particular attention to the following principles of ESD:

    a. integrated decision-making which ensures mutual respect and reciprocity between economic and environmental considerations;

    b. the conservation of biological diversity and ecological integrity should be a fundamental consideration;

    c. the precautionary principle;

[5] MRSD Act, s 2A(2)(f), (c) and (g).
[6] MRSD Act, s 2A(2)(h).
[7] Fingerboards Mineral Sands Project Inquiry and Advisory Committee Terms of Reference [34](b).
[8] *Ministerial Guidelines for Assessment of Environmental Effects under the* Environment Effects Act 1978 (2006) 3.
[9] World Commission on Environment and Development, *Our Common Future* (1987) 44.
[10] See: *Telstra v Hornsby Shire Council* [2006] NSWLEC 133, [108]-[120].

d. the sustainable or 'prudent' use of resources; and

e. the internalisation of environmental costs into decision-making for economic and other development plans, programmes and projects likely to affect the environment.

B.2 Net community benefit

19. Section 3.7 of the Scoping Requirements provides that "the project will need to consider a balance of economic, social and environmental outcomes that… provide a net community benefit over the short and long-term".

20. In coming to its conclusions, the IAC (and ultimately the Minister for Planning) must also engage with the policy matrix of the *Planning and Environment Act 1987*. This necessarily includes planning policy considerations.

21. As per Clause 71.02-3 of the Victorian Planning Provisions, it is necessary to integrate the range of planning policies relevant to the issues to be determined and balance conflicting objectives in favour of net community benefit and sustainable development for the benefit of present and future generations.

22. The planning policies of relevance to the issues to be determined indicate that 'acceptable' environmental effects and outcomes will be those that protect and maintain the existing environmental, landscape, social and economic values of this place.

23. This position is supported by the extensive list of planning policies of relevance to present case, including:

a. Biodiversity (Cl. 12-01), including Protection of biodiversity (Cl. 12.01-1S) and Native vegetation management (Cl. 12.01-2S)

b. Waterbodies and wetlands (Cl. 12-03), including River corridors, waterways, lakes and wetlands (Cl. 12.03-1S)

c. Climate change impacts (Cl. 13-01), including Natural hazards and climate change (Cl. 13.01-1S)

d. Soil degradation (Cl. 13-04), including Contaminated and potential contaminated land (Cl. 13.04-1S) and Erosion and landslip (Cl. 13-04-2S)

e. Air quality management (Cl. 13.06), including Air quality management (Cl. 13.06-1S)

f. Amenity and safety (Cl. 13.07), including Land use compatibility (Cl. 13.07-1S)

g. Agriculture (Cl. 14.01), including Protection of agricultural land (Cl 14.01-1S)

h. Water (Cl. 14-02), including Catchment planning and management (Cl. 14.02-1S); and

i. Earth and Energy Resources (Cl. 14.03), including Resource exploration and extraction (Cl. 14.03-1S).

24. Mr John Glossop was called by the Proponent to give evidence on town planning.[11] Far from undertaking a strategic assessment of the proposal or the Amendment in accordance with Planning Practice Note 46, or undertaking a net community benefit analysis, Mr Glossop considered a much narrower question, namely, whether mining of the resource should take precedence over agricultural uses in what he described as the "short term" 20 year horizon.

25. In answering that question, Mr Glossop put considerable weight on the fact that the agricultural land within the project area was not nominated as being of high significance in the planning scheme, but little weight on the fact that the project area was not nominated as being an appropriate location for a mine (despite the fact that clause 14.03-01S expressly protects the brown coal resource in Central Gippsland).

26. Aspects of the project area that suggest it is not appropriate for a mine include:

a. the significant amount of remnant vegetation in an otherwise cleared area that would require removal, as indicated in clause 21.04;

b. the nomination of the Bairnsdale-Dargo Road (which runs through the project area) as a scenic road in clause 21.04; and

[11] Evidence of Mr John Glossop (4 May2021) <https://www.youtube.com/watch?v=Vl76S0EkIsI>.

c. the application of the ESO and the VPO to areas within the project area.

27. MFG does not accept that 20 years is a short-term horizon. Nor does it accept that it has been demonstrated that the project area will be restored to agricultural land within 20 years. For example, the agricultural land currently features natural soil and topography, extensive shade trees for stock, spring fed dams, etc.

28. In truth, the only point at which it can be assessed whether mining should take precedence over agricultural uses, and whether the Amendment should be approved, is once a full net community benefit analysis has been undertaken whereby all relevant benefits and disbenefits have been identified and weighted.

29. Mr Glossop's evidence is of very limited utility in undertaking that exercise, and should be given limited weight. The IAC is best placed to undertake that exercise, but only on the basis of the evidence before it, none of which includes expert evidence as to the economic and social benefits of the Project that are asserted in the EES. Instead, the IAC will have direct testimony from individuals within the local community as to the impacts of the Project on their livelihoods and sense of place.

C. ASSESSMENT OF SPECIFIC ENVIRONMENTAL EFFECTS

C.1 Resource Development

30. The Proponent has failed to properly address the evaluation objective for Resource development, which is:

> *To achieve the best use of available mineral sands resources, in an economic and environmentally sustainable way, including while maintaining viability of other local industries.*

31. The Proponent has failed to demonstrate that the Project is the best use of land's resources and has failed to properly consider the potential impacts on the existing local industries, businesses and landholders, as required by the Scoping Requirements.[12]

[12] *Scoping Requirements for Fingerboards Mineral Sands Project Environment Effects Statement,* March 2018 (**Scoping Requirements**), 14.

32. Moreover, the Proponent has failed to provide any independent evidence to demonstrate project feasibility as required by the Scoping Requirements,[13] including the predicted economic costs and benefits from construction and operation of the Project.

33. These matters are important in assessing the acceptability of the environmental effects of the Project because they go to the overall purpose of the MRSD Act which is to encourage *economically viable* mining in a way that is *compatible* with the economic, social and environmental objectives of the State and the principles of sustainable development (emphasis added).[14]

34. The issue of whether the Project is financially viable is particularly relevant in the present case, whereby the MRSD Act provides at section 15(6)(d):

> An applicant for a licence must satisfy the Minister that the applicant… is *likely to be able to finance the proposed work and rehabilitation of the land* (emphasis added).

35. And at section 16(6B):

> Without limiting subsection (6), an applicant for a mining licence… must satisfy the Minister that there is a reasonable prospect that the mining of the mineral resource described in the application will be *economically viable* (emphasis added).

36. Mr Roderick Campbell was the only expert called to give evidence on economics.[15] His evidence focused largely on the BAEconomics Economic Impact Assessment which informed Chapter 9 of the EES (Environmental and Socioeconomic Impact Assessment).

37. Mr Campbell's evidence was that the BAEconomics assessment overstates the economic benefits of the project and understates its costs, leaving decision-makers with very little idea of what benefits might be achieved.[16]

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[13] Scoping Requirements, 14-15.
[14] MRSD Act, ss 1 and 2A.
[15] Expert Witness Statement of Mr Rod Campbell (January 2021) (**Tabled Document 93**) and Supplementary Statement of Mr Rod Campbell (March 2021) (**Tabled Document 187**).
[16] Evidence in chief of Mr Roderick Campbell (5 May 2021).

38. This makes it very difficult to assess whether the Project is the best use of the land's resources, as required by the Scoping Requirements.

39. Mr Campbell's evidence was that key values within the BAEconomics assessment are based on unorthodox and non-transparent calculations.[17]

40. The largest benefit of the project according to BAEconomics is not profits or royalties, but the value it would bring to Victorian suppliers to the mine. That is, the overall net value of the Project is estimated at $392 million, with the economic benefit to local suppliers estimated at $209 million (more than half of the claimed benefits). Mr Campbell described this approach as "highly unorthodox".[18]

41. Mr Campbell gave evidence that while there may be some local businesses, such as the coffee shops or mechanics in Bairnsdale that might see a sustained increase in their income beyond what might otherwise have been the case, it is "extraordinary" for this benefit to be the largest value in the entire assessment.

42. Mr Campbell also raised concerns that the BAEconomics assessment contained no discussion of operating costs, no discussion of revenue (other than a ballpark figure), and no discussion about the timing of costs. As a consequence, decision-makers have no idea about the financial strength of the Project,[19] or whether the Project is likely to be economically viable, as required by section 16(6B) of the MRSD Act.

43. Mr Campbell also gave evidence that the BAEconomics assessment assumes that environmental impacts in relation to air quality, visual amenity, transport, water, biodiversity, and noise impacts are perfectly offset by the mitigation techniques outlined in the EES and therefore are given zero value. This is an unrealistic assumption,[20] which indicates that the Proponent has not properly considered the potential impacts on the existing local community and industries.

44. Mr Campbell's substantive criticisms of the BAEconomics report were not undermined through cross-examination, which largely concentrated on attempts to discredit him rather than to challenge his opinions.

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[17] Expert Witness Statement of Mr Rod Campbell (January 2021) (**Tabled Document 93**) 1 [3].
[18] Ibid [6].
[19] Evidence in chief of Mr Campbell (5 May 2021).
[20] Expert Witness Statement of Mr Rod Campbell (January 2021) (**Tabled Document 93**) 1-2 [7].

45. Much of the cross-examination focussed on Mr Campbell's supposed bias against mining projects. His answers revealed that his interest was not in opposing mine projects but in ensuring they are properly assessed, particularly from an economic perspective. The high point of this criticism appears to be that he has been too consistent in demanding rigorous assessment of the purported economic benefits of mining.

46. There was a suggestion that, because he had been in contact with MFG earlier in the process, he was lacking independence. This is rich given the number of project consultants who have been called by Kalbar, who had authored the various reports within the EES, and who relied on data and material provided by Kalbar without independent investigation.

47. There was also a suggestion that Mr Campbell was not sufficiently qualified in cost benefit analysis or CDE modelling to critique the BAEconomics report. This is also rich given the proponent did not call any evidence at all on economic impact. In any event, Mr Campbell disputed that he did not have the relevant qualifications, the suggestion for which was founded on a comment in passing by a Court in Queensland as to why an alternative expert was sought in a particular matter.

48. Ultimately, the IAC simply cannot find there to be economic benefits of the proposal in the order suggested by BAEconomics, and certainly not such as to outweigh the economic disbenefits. There is insufficient material before the IAC in order to meet the relevant scoping requirement, and no basis on which to conclude that the proposal will result in a net community benefit given the paucity of basic information required to undertake such an assessment.

49. Turning to the issue of whether the Project is the best use of the land's resources, it is clear that the value of the existing agricultural businesses within the Project area has been significantly understated.

50. The Project area is a productive agricultural area, as evidenced by 170 years of farmers successfully growing meat, dairy and wool, and areas of "exceptional" horticultural value are immediately downwind of the proposed mine. That is, the Victorian Government recognises the downwind horticultural area as having farm

gate production estimated at over $100 million per year, and providing up to 2000 permanent and seasonal jobs.[21]

51. Dr Doris Blaesing was called by the Proponent to give evidence on horticulture.[22]

52. Dr Blaesing was an unimpressive witness, and was unduly defensive. She conceded there were multiple inaccuracies in the Horticultural Impact Assessment (**HIA**) and that it contained outdated information, but was reluctant to concede that the HIA was therefore unreliable and out of date.

53. When inaccuracies were pointed out, Dr Blaesing deferred to her general knowledge of the horticultural industry or minimised the effect of the inaccuracy on her assessment. One has to wonder why information was included in the HIA if its accuracy was of no consequence. On any issue where there was a dispute, she preferred her own general understanding of aspects of the horticulture industry over the actual practices of the growers in the Lindenow Valle, notwithstanding that she indicated she did not assume those growers were being untruthful. She was prepared to give technical evidence such as "windbreaks are a very effective method of controlling dust" yet when pressed conceded she was not qualified to give that evidence.[23] It will be recalled that the witness who was qualified to give that evidence – Mr Welchman – had placed no reliance on windbreaks, and had not recommended them as a mitigation measure.

54. Dr Blaesing had not considered the impact on confidence within the industry as a result of the mine's presence, and appeared to assume that the majority of growers supported the Project or considered they could readily co-exist. This is not borne out by the submissions before the IAC, noting that 9 out of the 12 growers in the Lindenow Valley co-authored the 50 pages of submissions on horticulture in MFG's submission to the EES.

55. Given:

    a. Dr Blaesing's reliance on other technical experts;

[21] Media Release for the Hon. Jaclyn Symes, *Gippsland's foodbowl safe as farmers win certainty* (July 2019) (**Tabled Document 304**).
[22] Evidence of Dr Doris Blaesing (12 May 2021) <https://www.youtube.com/watch?v=nPq2PDXeVkA>.
[23] Evidence of Dr Doris Blaesing, under examination of Ms Porter (12 May 2021).

b. Dr Blaesing's lack of direct familiarity with the site and growers; and

c. the multiple inaccuracies or instances of outdated information in the HIA,

Dr Blaesing is in no better position to assess the horticultural impacts of the project than the IAC and her evidence should be given very little weight. Where there is any inconsistency between Dr Blaesing's evidence and the information put forward by the growers themselves, the IAC should rely on the latter.

C.2 Impacts on Biodiversity

56. MFG consider the impacts on biodiversity to be unacceptable, with regard to the evaluation objective for biodiversity, which is:

> *To avoid or minimise potential adverse effects on native vegetation, listed threatened and migratory species and ecological communities, and habitat for these species, as well as address offset requirements for residual environmental effects consistent with state and Commonwealth policies.*

57. In considering the impacts on biodiversity, the IAC should pay particular attention to the most pertinent principles of ESD:

a. the conservation of biological diversity and ecological integrity should be a fundamental consideration; and

b. the precautionary principle.

C.2.1 Effects on native vegetation, ecological communities and flora species

58. The impacts of the Project on native vegetation, ecological communities and flora species are patently excessive and unacceptable.

59. A total of 223.58 hectares (more than 550 acres) of native vegetation is proposed to be removed.[24] This includes:

a. 110.47 ha of endangered Plains Grassy Forest (EVC 151)

[24] *Additional Ecological Information,* Aaron Organ, 7 May 2021 (**Tabled Document 290**) 6.

b. 9.91 ha of endangered Plains Grassy Woodland (EVC 55)

c. 0.93 ha of endangered Aquatic Herbland (EVC 653)

d. 0.28 ha of endangered Plains Grassy Wetland (EVC 125)

e. 74.88 ha of vulnerable Valley Grassy Forest (EVC 47)

f. 7.51 ha of vulnerable Box Ironbark Forest (EVC 61)

g. 4.89 ha of vulnerable Lowland Forest (EVC 16)

60. The IAC will note that a conservation status of 'endangered' means it has:

a. contracted to less than 10% of former range; or

b. less than 10% pre-European extent remains; or

c. a combination of depletion, degradation, current threats and rarity is comparable overall to the above.[25]

61. A conservation status of vulnerable means only 10 to 30% pre-European extent remains, or a combination of depletion, degradation, current threats and rarity is comparable overall to that amount.[26]

62. The level of native vegetation clearing is extreme for any recent project in Victoria, particular because the ecological vegetation classes (**EVCs**) affected are mostly endangered or vulnerable and already too uncommon because of past clearing.[27]

63. The proposed removal of native vegetation also extends to the loss of 834 large trees,[28] which all experts agreed serve an important ecological function and provide habitat for a range of fauna species.[29] Further, there is evidence before the IAC that the loss of large trees would be an irreversible impact that cannot be mitigated by the proposed revegetation, assuming it is successful, for at least 100 to 200 years

[25] See 'Bioregions and EVC benchmarks' <https://www.environment.vic.gov.au/biodiversity/bioregions-and-evc-benchmarks>.
[26] Ibid.
[27] Expert Witness Statement of Mr Lincoln Kern (1 February 2021) (**Tabled Document 92**) 5.
[28] Evidence in chief of Mr Aaron Organ (11 May 2021).
[29] Expert Meeting Statement – Ecology Conclave (19 April 2021) (**Tabled Document 238**) 4.

because hollows only start forming in eucalypts once they reach 80 or more years of age.[30]

64. It is also proposed that almost ten hectares of State significant Forest Red Gum Grassy Woodland ecological community be destroyed.

65. In terms of its scale, all ecology experts characterised the native vegetation clearing as "substantial" compared to most development projects in Victoria.[31]

66. Mr Lane gave evidence that it is "not normal" to remove 100 hectares, let alone 200 hectares of native vegetation.[32]

67. The importance and value of native vegetation to be removed is demonstrated by the fact that numerous State significant flora species have been identified within the Project area. For example, the Proponent has identified three state significant flora species that will be directly impacted by the Project irrespective of the implementation of the proposed measures to avoid and minimise impacts: the Slender Wire-lily (Rare in Victoria), the Blue Mat-rush (Poorly known in Victoria), and the Sandfly Zieria (Rare in Victoria).

68. Triggered by the survey work undertaken by Treetec, the Proponent has now identified additional State significant flora species recorded within the Project area, including:[33]

    a. Wavy Swamp Wallaby-grass (Vulnerable in Victoria)

    b. Eastern Bitter-cress (Vulnerable in Victoria)

    c. Pale Swamp Everlasting (Vulnerable in Victoria)

    d. Woolly-head Pomaderris (Rare in Victoria)

    e. Fisch's Greenhood (Rare in Victoria)

[30] Expert Witness Statement of Mr Lincoln Kern (1 February 2021) (**Tabled Document 92**) 13 [3.2]
[31] Expert Meeting Statement – Ecology Conclave (19 April 2021) (**Tabled Document 238**) 3.
[32] Examination in chief of Mr Brett Lane (24 May 2021).
[33] *Additional Ecological Information,* Aaron Organ, 7 May 2021 (**Tabled Document 290**), Appendix 1.0.

69. An additional 15 State significant flora species were also identified in the Victorian Biodiversity Atlas search completed by Nature Advisory as having the potential to occur within the Project area.

70. The sheer scale of native vegetation removal proposed by the Project is significant and unacceptable. Such removal is inconsistent with a key principle of sustainable development and ESD; that is, the conservation of biological diversity and ecological integrity should be a fundamental consideration.

71. Such removal is also contrary to Victorian Planning Policy on nature conservation and biodiversity, which seeks to protect, restore and enhance sites and features of nature conservation and biodiversity. Specifically:

    a. the objective of Clause 12.01 (Biodiversity) is to assist the protection and conservation of Victoria's biodiversity; and

    b. the objective of Clause 12.01-2S (Native vegetation) is to ensure that there is no 'net loss' to biodiversity as a result of the removal, destruction or lopping of native vegetation.

72. The objective of no 'net loss' to biodiversity is to be achieved by applying the three step approach of avoid, minimise and offset. As set out in the *Assessor's Handbook for Applications to remove, destroy or lop native vegetation*:

> All applications must demonstrate or provide evidence to show no options exist to further avoid and minimise native vegetation removal without undermining the objectives of the proposal.
>
> …
>
> The effort to avoid the removal of, and minimise impacts on, native vegetation should be commensurate with the biodiversity and other values of the native vegetation and should focus on areas of native vegetation that have the most value.[34]

[34] *Assessor's Handbook for Applications to remove, destroy or lop native vegetation* (DELWP, 2018) <https://www.environment.vic.gov.au/__data/assets/pdf_file/0022/91255/Assessors-handbook-Applications-to-remove,-lop-or-destroy-native-vegetation-V1.1-October-2018.pdf> 20.

73. This requires a balancing of the native vegetation at issue, a proportionate rigour in design options, and the overall objectives of the proposal. However, in the present case, the requisite balancing exercise has not occurred.

74. Mr Aaron Organ provided evidence that the three step approach of avoid, minimise and offset had been followed "where possible".

75. However, the adopted approach is not consistent with the Guidelines, a position supported by the Forest Fire Regions Group, Gippsland Regional Directorate, Department of Environment, Land, Water and Planning (**DELWP**) who submit:

> The Proponent has failed to demonstrate that it has avoided impacts on native vegetation with the highest biodiversity values. This includes mapped habitat for threatened species, endangered and vulnerable EVCs and large trees.[35]

76. In circumstances where the IAC has heard evidence that the vast majority of proposed clearing is of already depleted EVCs and, consequently, protection is more important,[36] the removal of more than 220 ha of native vegetation, including multiple endangered and vulnerable EVCs, is a significant and unacceptable impact that cannot be adequately mitigated. In that regard, the IAC should note that, while offsets are regarded as "gain" by DELWP, they do not ordinarily require establishment of new vegetation; rather, they ordinarily relate to additional protection, maintenance and improvement of existing vegetation.[37]

77. Turning to the Commonwealth protected native vegetation, the removal of 1.74 ha of the nationally significant Gippsland Red Gum Grassy Woodland and Associated Native Grassland ecological community should also be considered to be a significant and unacceptable impact of the Project.

78. The Gippsland Red Gum Grassy Woodland and Associated Native Grassland is a critically endangered ecological community listed under the *Environment Protection Biodiversity and Conservation Act 1999* (**EPBC Act**).

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[35] Submission by the Forest Fire Regions Group, Gippsland Regional Directorate, DELWP (19 May 2021) (**Tabled Document 377**), 10.
[36] Evidence of Mr Aaron Organ, under examination of Ms Porter (11 May2021).
[37] See <https://www.environment.vic.gov.au/native-vegetation/native-vegetation/offsets-for-the-removal-of-native-vegetation>.

79. This critically endangered ecological community was listed because it has undergone a very severe decline in extent and faces continued threatening processes.[38] As set out in the relevant Policy Statement:

> The ecological community was formerly widespread across the central Gippsland plain, but now less than five per cent of its original extent remains. Most known remnants are small—under 10 hectares— and comprise isolated fragments surrounded by a mostly cleared, agricultural landscape.
>
> …
>
> The protection, management and recovery of remnants on public and private land is crucial to the future survival of this unique ecological community.[39]

80. The proposed removal of a further 1.74 ha of this critically endangered ecological community is unacceptable. Moreover, at least 14 plant and animal species that may be found in or near this ecological community are listed as nationally threatened under the EPBC Act, including the endangered Swift Parrot, Regent Honeyeater (migratory), Spot-tailed Quoll and Southern-brown Bandicoot.[40]

C.2.2 Effects on listed threatened and migratory species

81. The Scoping Requirements identify the loss of, or degradation to, habitat for fauna species listed as threatened under the EPBC Act, the *Flora and Fauna Guarantee Act 1988* (**FFG Act**) and or DSE Advisory List as a "key issue".[41]

82. MFG have long expressed dissatisfaction with the timing and thoroughness of the fauna surveys undertaken by the Proponent.[42] However, even on the material contained in the EES and subsequent material provided by the Proponent, it is clear that the impact on listed threatened and migratory species is significant and unacceptable.

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[38] *Gippsland Red Gum Grassy Woodland and Associated Native Grassland EPBC Act Policy Statement 3.22* (2010) <https://www.environment.gov.au/system/files/resources/1251b430-f8b8-47c9-bf1d-c5c787771589/files/gippsland-red-gum.pdf> 3.
[39] Ibid, 4.
[40] Ibid, 24.
[41] Scoping Requirements, 15.
[42] Submission 813, 5. See also Jenner, B. *Rare or Threatened Flora and Fauna Surveying of the proposed Kalbar Fingerboards Mineral Sands Project Site* (Treetec Professional Tree Services) (2 November 2020).

83. In considering the effects on listed threatened and migratory species, it is important to recall:

a. the EPBC Act, and its objective to protect the environment, especially those aspects of the environment that are matters of national environmental significance;[43] and

b. the FFG Act, with its guarantee for all taxa of Victoria's flora and fauna to persist and improve in the wild (emphasis added).[44]

84. Further to the nationally threatened species that may be found in or near the Gippsland Red Gum Grassy Woodland and Associated Native Grassland (i.e. Regent Honeyeater, Spot-tailed Quoll and Southern-brown Bandicoot identified above), there is evidence before the IAC that the following nationally significant species are known to occur, or have the potential to occur, within the Project area:[45]

a. Swift Parrot (critically endangered)

b. Grey-headed Flying Fox (vulnerable)

c. Painted Honeyeater (vulnerable)

d. Giant Burrowing Frog (vulnerable)

e. Australian Grayling (vulnerable); and

f. Dwarf Galaxias (vulnerable).

85. It is difficult to understand how the Proponent's assessment of the impacts on these species could be characterised as acceptable.

86. Using the Swift Parrot as an example, the Proponent's assessment against the Significant Impact Guidelines does not appear to have been updated to take account of the updated amount of native vegetation to be cleared.[46]

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[43] EPBC Act, s 3(1).
[44] FFG Act, s 4.
[45] Expert Witness Statement of Mr Aaron Organ (February 2021) (**Tabled Document 70**) 11; See also Presentation of Brendan Casey (20 May 2021) (**Tabled Document 388**).
[46] See EES Appendix 005 (Detailed Ecological Investigations) 310.

87. Moreover, the Significant Impact Guidelines for critically endangered and endangered species provides:[47]

> An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:
>
> - adversely affect habitat critical to the survival of a species
> - modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline

88. "Habitat critical to the survival of a species or ecological community" refers to "areas that are necessary for activities such as foraging, breeding, roosting, or dispersal".[48]

89. The National Recovery Plan for the Swift Parrot identifies Plains Grassy Woodland (EVC 55) and Box Ironbark Forest (EVC 61) as threatened ecological communities containing habitat suitable for Swift Parrots and, specifically, habitat suitable for foraging.[49]

90. The Recovery Plan also identifies clearing of native vegetation and fragmentation of habitat are "threatening processes" for the Swift Parrot.[50]

91. In circumstances where the Project will result in the destruction of 9.91 ha of endangered Plains Grassy Woodland (EVC 55) and 7.51 ha of vulnerable Box Ironbark Forest (EVC 61), both of which are known foraging habitat for the Swift Parrot, it is clear that there will be a significant and unacceptable impact on the critically endangered Swift Parrot.

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[47] *Matters of National Environmental Significance: Significant impact guidelines 1.1* (2013) <http://www.environment.gov.au/system/files/resources/42f84df4-720b-4dcf-b262-48679a3aba58/files/nes-guidelines_1.pdf> 9.
[48] Ibid, 10.
[49] *National Recovery Plan for the Swift Parrot (Lathamus discolor)* (2011) <https://www.environment.gov.au/system/files/resources/c3e20a20-8122-4a9c-bd06-455ea7620380/files/lathamus-discolor-swift-parrot.pdf> PDF 15.
[50] Ibid, PDF 18.

92. Another area of potential significant impact, to which the Proponent has not adequately turned its mind, is the loss of hollow-bearings trees which provide habitat for various listed species.

93. The EES identifies a number of species known or considered to be potentially present within the Project area using hollow-bearing trees for breeding and roosting, including the endangered Masked Owl and the vulnerable Powerful Owl (both listed under the FFG Act),[51] however, the impact of removing the hollow-bearing trees has been largely dismissed through the proposed mitigation measure of installing nest-boxes. For example, it is noted that "some species such as the Powerful Owl may only rarely use next boxes for breeding",[52] yet no alternative is proposed.

C.2.3. Unavailable offsets

94. Notwithstanding MFG's opposition to the native vegetation removal proposed, MFG consider the Offset Strategy to be fundamentally flawed.

95. Should removal be permitted, the Offset Strategy does not provide any certainty that the offsets required are available and able to be secured, particularly species habitat units.

96. Moreover, the Proponent's suggestion that the offsets will be staged as each stage of the mine is implemented is inappropriate. The IAC has heard evidence that a significant problem with the staged approach to offsets is that the critical offsets might be taken from the market over time.[53]

97. The Guidelines for the removal, destruction or lopping of native vegetation provide:[54]

> An application to remove native vegetation must include an offset strategy that includes *evidence* that an offset that meets the offset requirements for the proposed native

[51] EES Appendix 005 (Detailed Ecological Investigations) 95; See also: DELWP, *Advisory List of Threatened Vertebrate Fauna in Victoria* (2013) <https://www.environment.vic.gov.au/__data/assets/pdf_file/0014/50450/Advisory-List-of-Threatened-Vertebrate-Fauna_FINAL-2013.pdf>.
[52] EES Appendix 005 (Detailed Ecological Investigations) 106.
[53] Expert Witness Statement of Mr Lincoln Kern (1 February 2021) (**Tabled Document 92**) 24 [9.2].
[54] *Guidelines for the removal, destruction or lopping of native vegetation* (DELWP, 2017) <https://www.environment.vic.gov.au/__data/assets/pdf_file/0021/91146/Guidelines-for-the-removal,-destruction-or-lopping-of-native-vegetation,-2017.pdf> 12.

> vegetation removal is *available*, and explains *how the offset will be secured* if a permit is granted (emphasis added).

98. The IAC has heard evidence from Mr Brett Lane that a substantial deficit currently exists for some species offsets required, and that the current Offset Strategy does not provide a high level of confidence that the considerable offset targets can be met.[55]

C.3 Impacts on Water, Catchment Values and Hydrology

99. The Project poses significant and unacceptable environmental effects on water, catchment values and hydrology, with regard to the relevant evaluation objective which is:

> *To minimise effects on water resources and on beneficial and licenced uses of surface water, groundwater and related catchment values (including the Gippsland Lakes Ramsar site) over the short and long-term.*

100. Furthermore, the information provided by the Proponent on water, catchment values and hydrology is flawed and inadequate to inform an assessment of the potential environmental effects (and their acceptability). In particular, the IAC should not place reliance on Mr Jarrah Muller's evidence.

101. First, Mr Muller "inherited" an existing water balance model and evidently made no assessment for himself of whether the model would assist in responding to the relevant scoping requirements relating to water balance and supply.[56]

102. Second, he placed undue reliance upon the Proponent to provide data he could input into the model.[57] The inadequacy of that data is highlighted best by the miscalculation of water recovery rates from fines tailings, which resulted in water usage estimates for the Project in the EES being out by an extraordinary 1.7GL per year, and the last minute introduction of centrifugation in order to improve water recovery. Mr Muller made no assessment for himself of the adequacy or reliability of that data.

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[55] Evidence in chief of Mr Brett Lane (24 May 2021).
[56] Evidence of Mr Jarrah Muller, under examination of Ms Porritt (6 May2021).
[57] Evidence of Mr Jarrah Muller, under examination of Ms Porritt and Ms Porter (6 May2021).

103. Third, although it would have taken only one day to model and one to two weeks to analyse, Mr Muller did not undertake stochastic climate modelling.[58]

104. Models are only ever as good as the assumptions that underpin them. Mr Muller effectively became the conduit for transferring data supplied by the proponent into a modelled outcome, without any considered view about the reliability of that data or the assumptions relied on.

105. A perfect example of this occurred during the hearing: MFG called for the spreadsheet provided to Mr Muller that contained new inputs to the model in light of centrifugation. MFG also requested Mr Muller to run the model using an input of 63% rather than 73% solids concentration. This was on the basis that there is insufficient evidence to substantiate an assumption of 73%, and evidence suggesting an assumption of between 60 and 65% might be reasonable. Kalbar itself, in Technical Note 23, estimated that "the full-scale production [centrifuge] unit P3 (which is the unit intended to be used for the Fingerboards project) will achieve solids concentrations of 65-73%".

106. One might have expected correspondence from Mr Muller to eventuate in response. Instead, these two simple requests resulted in Technical Note 22, which was evidently produced by Kalbar rather than Mr Muller, and contained a series of impenetrable assertions that were unsubstantiated by evidence, and two chains of email correspondence that are barely comprehensible (grammatically or substantively).

107. Technical Note 22 demonstrates that reducing the solids density to 63% reduces the water recovery by 0.83GL per year. That is a staggeringly large difference, comparable to the 1.7GL per year error that resulted in the introduction of centrifuges in the first place. This is then declared to be "not a realistic scenario based on the current centrifuge testwork results". It is unclear who wrote the text of section 6 of Technical Note 22, but it is inconsistent with the text of Technical Note 23 which, as noted above, estimates that the P3 unit to be used in the Project will achieve solids concentration of "65-73%".

[58] Evidence of Mr Jarrah Muller, in response to questioning by Deputy Chair Reifschneider (6 May2021).

108. How these figures have been derived, and why the highest figure in this range was fixed upon (in January 2021, before the P1 testing had been undertaken), is entirely unclear, and yet has a significant impact on the outcomes of the model, as demonstrated in section 6 of Technical Note 22.

109. Dr O'Loughlin's opinion is that the water balance model should have been run on a range based on the evidence, with 59% as the lowest bound and 71% as the highest bound.[59]

110. The inadequacy of Mr Muller's water balance model has consequences for the adequacy of the work undertaken by other experts called by the Proponent. For example, Mr Sweeney gave evidence that the 'water balance very much informed the water management system'.[60]

111. In relation to the seepage of contaminated water, the extent of mounding, impacts on GDEs, and the location and effectiveness of bores and the borefield (to name a few), the community is effectively being asked to rely on an exercise of judgment by the Proponent's witnesses and to have faith that the considerable further work required will be undertaken and that all of the effects identified by that work will be acceptable.

C.3.1 Effects on groundwater quality

112. The potential effects on groundwater quality are significant and unacceptable, particularly discharges to groundwater associated with seepage from tailings.

113. From the outset, the tailings to be returned to the mine void should be characterised as waste. This much was recognised by Mr John Sweeney, who agreed that the water that seeps to the groundwater will be water that has "interacted with waste,"[61] and by Dr Loch, who agreed that the manufactured fill including tailings cannot be regarded as "soil".[62]

[59] Evidence in chief of Dr O'Loughlin (31 May 2021).
[60] Evidence of Mr John Sweeney, under examination of Ms Armstrong (10 May 2021).
[61] Evidence of Mr John Sweeney, under examination of Ms Armstrong (10 May 2021).
[62] Evidence of Dr Loch, under examination of Ms Porter (11 May 2021).

114. The *Environment Protection Amendment Act 2018* defines waste to include:[63]

> (a) matter, including solid, liquid, gaseous or radioactive matter, that is deposited, discharged, emitted or disposed of into the environment in a manner that alters the environment;
>
> …
>
> (c) matter that is discarded, rejected, abandoned, unwanted or surplus, irrespective of any potential use or value

115. With the addition of centrifuges, the Proponent plans to use centrifuges to dewater fines tailings, which will then be deposited into the mine void as backfill/waste. The tailings will be flocced with polyacrylamide before being returned to the mine void.

116. The Proponent suggests that the centrifuge cake to be returned to the mine void will be dewatered to the extent that any water remaining in the cake will not drain freely from the material, even when it is deposited back into the void with overburden.[64] However, there is evidence before the IAC that it is unlikely all residual water would remain permanently entrained within this material once it is deposited into the mine voids (following centrifugation). Rather, it is likely that this water would, over time, mix with recharging groundwater passing through the mine voids before reaching the water table.[65]

117. Several experts called by the Proponent gave evidence about the lack of information on seepage rates. Mr John Sweeney confirmed that the time for seepage had not been quantified, only "estimated"[66] and Mr Joel Georgiou confirmed that seepage modelling has not yet been done.[67] Mr Jarrah Muller confirmed that seepage figures are important given they indicate how much water is entering the groundwater.[68]

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[63] *Environment Protection Amendment Act 2018*, s 6. See also definition in *Environment Protection Act 1970,* s 7.
[64] Technical Note 01 (Implementation of centrifuges for water recovery and tailings management) (18 January 2021) (**Tabled Document 43**) [5].
[65] Supplementary Statement of Associate Professor Matthew Currell (10 March 2021) (**Tabled Document 186**) 3 [5].
[66] Evidence of Mr John Sweeney, under examination of Ms Porter (10 May 2021).
[67] Evidence of Mr Joel Georgiou, under examination of Ms Armstrong (14 May2021).
[68] Evidence of Mr Jarrah Muller, under examination of Ms Porritt (6 May2021).

118. There is also evidence before the IAC that the hazard presented by flocculants to be used for the treatment of tailings has not been assessed.[69]

119. This view has been supported by experts called by the Proponent, with Mr Sweeney confirming that the amount of flocculant in water had not been quantified.[70] Mr Sweeny also conceded that it was not possible to assess the risks to groundwater without such information.[71]

120. Dr Jasonsmith gave evidence that the potential hazard to human health and the environment presented by the use of polyacrylamide depends on a number of factors, including its concentration and how it will behave and be changed in the environment. The Proponent has not demonstrated that polyacrylamide will present an acceptable risk to the environment, at the concentrations used and conditions to which it will be subject at the proposed Fingerboards mine.[72]

121. Moreover, it was agreed in the expert conclave on groundwater that the comments of Dr Jasonsmith regarding the chemical composition of flocculants and the toxicity of biodegradation by-product degradation were not disputed.[73] Indeed, Dr Jasonsmith is the only witness qualified to give evidence on this topic.

C.3.2 Effects on surface water quality

122. The potential effects on surface water quality are significant and unacceptable.

123. The Scoping Requirements identify the potential for mounding and migration of groundwater from the backfilled tailings material along the mine path during operations, decommissioning and post-closure as a likely effect to be assessed.[74]

124. There is evidence before the IAC that one of the major risks associated with the Project is the potential for mounding of groundwater in the water table aquifer below the site.[75]

[69] Supplementary Statement of Dr Julia Jasonsmith (22 March 2021) (**Tabled Document 211**) PDF 40 [25].
[70] Evidence of Mr John Sweeney, under examination of Ms Porter (10 May 2021).
[71] Ibid.
[72] Supplementary Statement of Dr Julia Jasonsmith (22 March 2021) (**Tabled Document 211**) PDF 38 [19].
[73] Expert Meeting Statement – Groundwater (30 April 2021) (**Tabled Document 255**) 14 [6.2].
[74] Scoping Requirements, 18.
[75] Supplementary Statement of Associate Professor Matthew Currell (10 March 2021) (**Tabled Document 186**) 1 [2].

125. Such mounding is anticipated to occur due to seepage of water through the coarse/sand-sized tailings to the water table, through the mine pit voids. This seepage, and the associated water table rise is likely to increase rates of flow of poor-quality groundwater in the Coongulmerang Formation away from the site and towards sensitive receptors, including the Mitchell River floodplain.

126. Creating a new pathway for poor quality groundwater to flow to the floodplain creates a risk of harming ecological communities, such as groundwater dependent ecosystems (**GDEs**) on the floodplain, and water users accessing alluvial groundwater in this area. This risk is primarily related to the fact that groundwater within the water table aquifer (Coongulmerang Formation) contains elevated concentrations of multiple potentially harmful contaminants, including heavy metals and cyanide.

127. Without the effect of water table mounding (caused by mining), there is limited or no pathway for this poor-quality groundwater to flow to the floodplain, and as such this would be a new risk created by the proposed mine.

128. Associate Professor Currell provided evidence that this risk may be considerable, and that it has not been adequately examined in the groundwater and surface water impact assessment.[76] Mr Sweeney also confirmed that further work was required to properly understand the effect of mounding,[77] including further work to quantify the effect on total sediment deposition, nutrients and selected metals.[78]

129. In the circumstances, mounding and migration of contaminated (and/or poor quality) groundwater towards sensitive receptors is a potentially significant environmental effect that has not been adequately assessed.

130. Turning to other unassessed effects on surface water quality, the Scoping Requirements require the Proponent to describe potential and proposed design options and measures which could avoid or minimise significant effects on

[76] Ibid.
[77] Evidence of Mr John Sweeney, under examination of Ms Porter (10 May 2021).
[78] Evidence in chief of Mr John Sweeney (10 May 2021); See also Presentation of Mr John Sweeney (**Tabled Document 293**), Slide 18.

beneficial uses of surface water, accounting for the potential effects of climate change.[79]

131. Mr James Weidmann was called by the Proponent to give evidence on surface water and flooding.

132. It was concerning to hear that the risk of dam failure was not within Mr Weidmann's scope of work. That is, dam failure – and its associated impacts on surface water – have not been assessed by the Proponent's expert on flooding (or at all). Mr Weidmann ultimately recommended that a dam failure impact assessment be undertaken.[80]

133. He also conceded that his work had not been updated to reflect the use of centrifuges.[81] This means no modelling has been done for the potential flooding of the Perry Gully which is to be backfilled with caked tailings.

134. Mr Tony McAlister, who gave evidence of surface water, offered that he would feel much more comfortable if he could prove up a number of assumptions. Specifically, he said there should be pilot scale testing of centrifuges and how well they work in this context, to enable refinement of the flow and water quality elements of them.[82]

135. In the circumstances, the Proponent has failed to consider key some of the most significant potential risks to surface water quality, as required by the Scoping Requirements.

C.3.3 Changes to the availability of groundwater and surface water

136. The proposed changes to availability of groundwater and surface water due to predicted extraction are potentially significant, unacceptable and poorly understood.

137. The latest water balance model anticipates that the mine will require ~2.8 GL per year. For the reasons set out above and in EGSC's submissions, the water balance

[79] Scoping Requirements, 18.
[80] Evidence in chief of Mr James Weidmann (10 May 2021).
[81] Evidence in chief of Mr James Weidmann (10 May 2021).
[82] Evidence in chief of Mr McAlister (6 May 2021).

model is based upon questionable assumptions that were not capable of testing through the evidence at the hearing.

138. Accepting that it is reliable (which has not been demonstrated), the model assumes that the main source of water to be Mitchell River winter-fill (when the river is flowing at >1,400 ML/day) and groundwater from a borefield.[83] However, as conceded by Mr Georgiou, there is no real clarity about where the water for the mine will come from.[84]

139. If a surface water licence is not granted or the full winterfill application is not available in a given year, the Proponent proposes to use groundwater from the Latrobe Group aquifer and or scale down its mining operations.

140. Depending on whether a surface water and/or groundwater licence is granted, the proposed borefield would potentially extract a significant volume of groundwater from the Latrobe Group aquifer. However, there is evidence before the IAC that this aquifer is already a fully allocated water resource. Regionally, aquifer levels have been falling substantially over time in this aquifer, and it has been determined that current extractions far exceed recharge.[85]

141. The IAC has heard evidence that further work needs to be undertaken to determine sustainable rates and understand the effects of pumping of groundwater.[86] In particular, the IAC has heard evidence that the one pump test undertaken to inform the assessment of likely drawdown impacts encountered a number of issues. As a result, there is ongoing uncertainty regarding the response of the aquifer to pumping, the aquifer's extent and hydraulic parameters, the long-term viability of water supply from the borefield and the potential for greater inter-aquifer leakage (and thus impacts on existing bores and other values supported by groundwater).[87]

[83] See Presentation of Mr Jarrah Muller (6 May 2021) (**Tabled Document 274**) Slide 16.
[84] Evidence of Mr Joel Georgiou, under examination of Ms Porritt (14 May2021).
[85] Expert Witness Statement of Associate Professor Matthew Currell (29 January 2021) (**Tabled Document 88**) 4 [7].
[86] Evidence of Mr Joel Georgiou, under examination of Ms Porritt (14 May 2021).
[87] Expert Witness Statement of Associate Professor Matthew Currell (29 January 2021) (**Tabled Document 88**) 3 [6].

142. Mr Georgiou's evidence was clear that the current nominated borefield location contains gravels that are not thick enough to eliminate boundary effects or achieve the extent of water at the rate required by the mine. The borefield is likely to be located to the south-west of the nominated location, in an area that has not been the subject of assessment through the EES or Inquiry process.[88]

143. Another change to the availability of water that is of particular concern to MFG is the destruction of "spring fed" dams fed by perched water.

144. The IAC has heard evidence that the "spring fed" dams must be supported by perched water. It inevitably follows that the new "rehabilitated" landforms will not have any "spring fed" dams as the landforms that support perched water will be destroyed through mining operations.

145. This is a real and ongoing concern of landowners and the community. It should go without saying that the availability of water is necessary to sustain existing ecological services, and the existing towns, farms and local economy.

C.3.4 Effects on nearby and downstream water environments

146. The potential adverse effects on nearby and downstream water environments due to changes to water quality, flow regimes and waterway conditions are significant and unacceptable.

147. In circumstances where the nearby and downstream water environments subject to potential adverse effects include the heritage listed Mitchell River, the unique Perry River Chain of Ponds and the Ramsar listed Gippsland Lakes, the IAC should pay particular attention to the precautionary principle.

148. The Mitchell River (*Wangangarra* to the Gunaikurnai people) is the largest unregulated river in the state, and recognised by law as a Heritage River.[89] The Mitchell is one of the largest contributors of natural freshwater flows into the Gippsland Lakes, and has populations of rare and important fish species such as Australian Grayling.

[88] Evidence of Mr Georgiou, under examination of Ms Porritt and Ms Porter (14 May 2021).
[89] *Heritage Rivers Act 1992.*

149. Similarly, the Perry River Chain of Ponds is unique and home to many threatened plant and animal species such as Dwarf Galaxias, Pygmy Perch, Green and Golden Bell Frog and Gaping Leek-orchid.[90]

150. The Gippsland Lakes (and surrounding wetlands and lower parts of the inflowing rivers) are recognised as wetlands of international importance under the Convention on Wetlands of International Importance Especially as Waterfowl Habitat (**Ramsar Convention**).[91]

151. As set out above at C.3.2, there is evidence before the IAC that the Project is likely to increase rates of flow of poor-quality groundwater away from the site and towards sensitive receptors, including the Mitchell River. There is also evidence that a significant volume of groundwater is likely to be extracted from an aquifer that is already heavily allocated.

152. The potential adverse effects from such impacts have not been properly considered. There has been limited characterisation of groundwater dependent ecosystems (**GDEs**) to understand their relationship to groundwater in the first instance. This position is supported by numerous concessions made by the experts called by the Proponent. For example:

    a. Mr Sweeney confirmed that the hydrology of the Chain of Ponds was not directly investigated;[92]

    b. Mr Georgiou conceded that he had not assessed the Saplings Morass in any way;[93] and

    c. Mr Sweeney advised that further work needs to be done to understand mobility and mass flux of nutrients to the Mitchell River and Gippsland Lakes.[94]

[90] See <https://www.wgcma.vic.gov.au/our-region/projects/protecting-our-ponds>.
[91] Convention on Wetlands of International Importance (Ramsar, Iran, 1971) <https://www.ramsar.org/sites/default/files/documents/library/current_convention_text_e.pdf>.
[92] Evidence of Mr John Sweeney, under examination of Ms Porter (10 May 2021).
[93] Evidence of Mr James Weidmann, under examination of Ms Porritt (10 May2021); Evidence of Mr Joel Georgiou, under examination of Ms Porritt (14 May2021).
[94] Evidence in chief of Mr John Sweeney (10 May 2021); See also Presentation of Mr John Sweeney (**Tabled Document 293**), Slide 16.

153. Moreover, GDEs such as spring fed dams and areas of River Red Gum have not been fully identified within the Project area.

154. Associate Professor Matthew Currell gave evidence that the level of remaining uncertainty about the potential impacts on the nearby and downstream environments is unacceptable given the significance of such features and the ready ability to investigate those impacts in greater depth.[95] That is, the level of effort applied to the investigation of these issues is not proportionate to the significance of the potential adverse effects, as required by the Scoping Requirements.[96]

C.4 Impacts on Amenity and Environmental Quality

155. MFG submit that the impacts on amenity and environmental quality have not been adequately assessed, with regard to the relevant evaluation objective which is:

> *To protect the health and wellbeing of residents and local communities, and minimise effects on air quality, noise and the social amenity of the area, having regard to relevant limits, targets and standards.*

156. In considering the impacts on amenity and environmental quality, the IAC should pay particular attention to the following principles of ESD:

    a. the precautionary principle; and

    b. the internalisation of environmental costs into decision-making for economic and other development plans, programmes and projects likely to affect the environment.

C.4.1 Effects from radiation and or hazardous materials

157. The Scoping Requirements require the assessment of any likely radiation effects associated with the Project during operations, rehabilitation, decommissioning and post-closure.[97]

[95] Evidence in chief of Associate Professor Matthew Currell (31 May 2021).
[96] Scoping Requirements, 12.
[97] Scoping Requirements, 20.

158. The IAC should be concerned about the lack of information and/or effort to determine 'baseline conditions' in circumstances where the Proponent has failed to characterise background radiation levels within the Project site and the broader area, as required by the Scoping Requirements.[98]

159. Associate Professor Gavin Mudd gave evidence that considerable further work is required to ascertain the levels of radionuclides naturally present in crops and vegetables as well as in surface water and groundwater.[99]

160. Moreover, he gave evidence that almost all of the data and information which would be required for statutory radiation licences and approvals remains left for "future work", limiting the ability to assess the standards and procedures for the proposed Fingerboards project.[100]

161. This makes it very difficult to assess likely radiation effects associated with the Project and or identify design response or mitigation measures to address any significant effects arising from adverse changes to the background radiation levels in the vicinity of the Project, as required by the Scoping Requirements.[101]

162. Mr Darren Billingsley was called by the Proponent to give evidence on radiation.[102] With respect to baseline data, he agreed that both radionuclide analysis and airborne dust monitoring could have been done in the past, and that more work is to be done on radionuclide data on crops .[103]

163. Mr Billingsley also acknowledged that the Australian Radiation Protection and Nuclear Safety Agency (**ARPANSA**) *Code of Practice and Safety Guide, Radiation Protection and Radioactive Waste Management in Mining and Mineral Processing*

[98] Scoping Requirements, 19.
[99] Expert Witness Statement of Associate Professor Gavin Mudd (29 January 2021) (**Tabled Document 87**) 1.
[100] Ibid.
[101] Scoping Requirements, 19 and 20.
[102] Evidence of Mr Darren Billingsley (12 May 2021) <https://www.youtube.com/watch?v=nPq2PDXeVkA>.
[103] Evidence of Mr Darren Billingsley, under examination of Mr Forrester (12 May 2021).

states that a Radioactive Waste Management Plan (**RWMP**) is an "integral part of a project" and "should be addressed from the inception of project planning".[104]

164. However, contrary to the Code of Practice, a RWMP was not prepared at the "inception of project planning" and "will need to be developed by Kalbar".[105]

165. Further to the lack of baseline data and non-compliance with the Code of Practice, pathways for exposure have not been adequately considered, whether it be workers exposed to ore dust on site, locals inhaling dust blown across the neighbouring area, or ingestion of contaminated/dusty food.

166. As recommended by Dr Joyner, the Department of Health and Human Services (**DHHS**) and Associate Professor Tilman Ruff, all possible exposure pathways for works and the public should be assessed, including through farm work and other types of prevalent local employment or other activities, as well as sampling of all agricultural products downwind and downstream of the proposed mine (including vegetables, grain, fish, and animal products in the form of both meat and dairy products).[106]

167. The issue of radiation exposure is particularly important in light of evidence before the IAC that radiation risks to health are greater than previously thought and are not adequately reflected in regulatory limits. That is, health risks exist below the maximum permissible doses for the public and for workers.[107]

168. In this vein, it was concerning that Mr Billingsley did not consider acute versus chronic exposure events on the basis that "the average over the year will even out".[108]

169. However, it is noted that when questioned about Associate Professor Ruff's recommendation that dose assessments should be revised upwards to account for

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[104] ARPANSA, *Code of Practice and Safety Guide, Radiation Protection and Radioactive Waste Management in Mining and Mineral Processing* (August 2005) (**Tabled Document 419**), 32 [3.9].
[105] SGS Radiation Services, *Fingerboards Project: Radiation Assessment Report* (April 2020) (**Radiation Assessment Report (Appendix A011)**) 67 [11].
[106] Expert Witness Statement of Associate Professor Tilman Ruff (1 February 2021) (**Tabled Document 89**); Radiation Assessment Report of Dr Ken Joyner (7 December 2020) (**Tabled Document 9**) 5; DHHS Review of Kalbar Project (18 January 2021) (**Tabled Document 41**) 4.
[107] Evidence in chief of Associate Professor Tilman Ruff (2 June 2021).
[108] Evidence of Mr Darren Billingsley, in response to question of Chair Wimbush (12 May 2021).

such health risks, Mr Billingsley agreed that "best practice dose calculations should be used".[109]

C.4.1.1 Export of radioactive materials

170. Until requested to do so, the Proponent had not addressed the legal issues around the export of HMC and the potential for extraction of uranium and thorium once exported from Australia.[110]

171. This significant issue was identified by Associate Professor Mudd, who gave evidence that the amount of uranium recoverable from the Heavy Mineral Concentrate (**HMC**) is "considerable" (estimated to be 185 tonnes), therefore requiring proper consideration against the International Atomic Energy Agency (**IAEA**) international safeguard requirements.[111]

172. Through Technical Note 21, the Proponent acknowledged that the mineral concentrate to be exported from the Fingerboards mine will exceed 0.05% by weight of a combination of uranium and thorium, therefore engaging Regulation 9 of the *Customs (Prohibited Exports) Regulations 1958 (Cth).* That is, permission must be sought from the Minister or his/her delegate to export concentrate from the Project to overseas markets.

173. However, the Proponent failed to fully address the legality of exporting nuclear material against the international safeguard requirements. That is, the EES (and updated material) states that "HMC will be exported for secondary processing in mineral separation plants in Asia"[112] yet the Proponent has only provided international safeguard information on the export of nuclear material from Australia to China.[113]

174. This issue needs to be explored further, given uranium and thorium are both potential nuclear source materials requiring transparent management. As noted at the expert meeting on radiation, the final destinations for HMC over the Project's life

[109] Evidence of Mr Darren Billingsley, under examination of Ms Porter (12 May 2021).
[110] Response provided through Technical Note 021 (**Tabled Document 334**).
[111] Expert Witness Statement of Associate Professor Gavin Mudd (29 January 2021) (**Tabled Document 87**) 8 [33].
[112] Updated EES Chapter 3: Project Description (8 February 2021) (**Tabled Document 122**) 1.
[113] Technical Note 021 (**Tabled Document 334**) 4.

cannot be confidently foreseen now and could potentially involve nations with which Australia does not have pre-exiting nuclear safeguard agreements.[114]

C.4.2 Dust emissions on primary industry and local water supplies

175. In assessing the impacts on amenity and environmental quality, the Scoping Requirements specifically require assessment of 'any effects of dust emissions on Lindenow Valley primary industry and local water supplies'.[115]

176. There is evidence before the IAC that this has simply not occurred.

177. With respect to the effect of dust emissions on local water supplies, Ms Karen Teague gave evidence that the Woodglen water storage dam was not assessed on the basis that the water will be treated before it is released to customers.[116]

178. This is concerning, given the Woodglen water storage stores potable water for the communities of Bairnsdale, Paynesville, Lindenow, Lindenow South, Eagle Point, Newlands Arm, Raymond Island, Banksia Peninsula, Granite Rock, Wy Yung, Bruthen, Sarsfield, Nicholson, Johnsonville, Swan Reach, Metung, Lakes Entrance, Lake Bunga, Lake Tyers, Lake Tyers Beach and Nowa Nowa.[117]

179. With respect to dust emissions generally, Mr Simon Welchman conceded that:

    a. fine dust (including fine dust from HMC) was not modelled;[118]

    b. windbreaks as a mitigation measure were not specifically considered (despite Dr Blaesing referring to them as a 'key mitigation measure');[119] and

    c. climate change was not considered in the air quality assessment (in terms of dust generation), either directly or indirectly.[120]

[114] Expert Meeting Statement – Radiation Conclave (16 April 2021) (**Tabled Document 234**) PDF 11.
[115] Scoping Requirements, 20.
[116] Evidence in chief of Ms Karen Teague (13 May 2021).
[117] East Gippsland Water 'Water Supply Systems' <https://www.egwater.vic.gov.au/customer-info/water-supply-systems/> (accessed 28 May 2021).
[118] Evidence of Mr Simon Welchman, under examination of Ms Porter (13 May 2021).
[119] Ibid.
[120] Evidence of Mr Simon Welchman, under examination of Ms Porritt (13 May 2021).

180. Dr Blaesing acknowledged that dust that may be blown from the site and deposited on neighbouring horticultural properties. However, when asked about how specific dust impacts might be managed by local business (such as an edible flower business), Dr Blaesing gave evidence that such businesses would need to take it upon themselves to ensure that their product was not ruined by dust.[121]

C.5 Rehabilitation

181. MFG submit that the Proponent has failed to demonstrate that rehabilitation can occur in accordance with the evaluation objective for rehabilitation, which is:

> *To establish safe progressive rehabilitation and post-closure stable rehabilitated landforms capable of supporting native ecosystems and/or productive agriculture that will enable long-term sustainable use of the project area.*

182. This issue is of significant concern in a context where the Victorian-Auditor General recently published a report on the systemic regulatory failures for mine rehabilitation in Victoria and in which the Department for Jobs Precincts and Regions (**DJPR**) was identified as not effectively regulating operators' compliance with their rehabilitation responsibilities.[122]

183. It is also a significant concern to the community given there is a complete lack of specific and or detailed financial costings for project rehabilitation in the EES and subsequent material.

184. The Proponent has failed to adequately investigate (or demonstrate) whether it can establish safe and stable rehabilitated landforms, as required by the evaluation objective for rehabilitation.

185. For example, with respect to Perry Gully, Mr Michael Cheetham was not aware of the contents to be backfilled into Perry Gully[123] and Dr Loch was not aware that

[121] Evidence of Dr Doris Blaesing, in response to question of Member Meredith Gibbs (12 May 2021)
[122] *Rehabilitating Mines: Victorian Auditor-General's Report* (August 2020) (**Tabled Document 409**) 1 and 6.
[123] Evidence of Mr Michael Cheetham, under examination of Ms Porter (7 May2021).

cake would be backfilled into the Perry Gully, or the possible extent (i.e. how far up) backfilling could occur.[124]

186. That is, the erosion and rehabilitation experts called by the Proponent have not considered one of the most sensitive landforms within the Project area requiring safe and stable rehabilitation.

187. The IAC has also heard evidence that erosion at the interface of the mine and the area outside the mine void is not understood.[125]

188. This issue is of particular concern to MFG given the firsthand local knowledge and experience with the highly dispersive soils in the area which are prone to severe erosion. For example, the proposed rehabilitated landscape which the Proponent says "will not tunnel" has been known to tunnel after treatment. There is at least one example in the Project area where tunnel erosion has been treated, only for the tunnelling to recommence years later.[126]

189. The Proponent has also failed to characterise the relevant physical and chemical properties of overburden and topsoil materials to be used in rehabilitation.[127]

190. Dr Loch conceded that he was not aware that the cake to be returned to the mine void would contain more flocculants (arising from the use of centrifuges).[128]

191. He also gave evidence that of the three levels of soil to be returned to the mine void, the second level (at 20cm-90cm below the surface) would contain fertiliser, organic matter and tailings but "exactly how it is rehabilitated depends on the trials".[129] That is, the physical and chemical properties of overburden and topsoil materials to be used in rehabilitation and how they will impact rehabilitation are not yet known.

192. The lack of understanding about the manufactured soils makes it very difficult to assess levels of certainty of successful outcomes from the proposed design and

[124] Evidence of Dr Rob Loch, under examination of Ms Porter (11 May2021).
[125] Evidence in chief of Dr Jessica Drake (1 June 2021).
[126] Images of paddock treated for tunnel erosion (**Tabled Document 297**).
[127] Scoping Requirements, 23.
[128] Evidence of Dr Rob Loch, under examination of Ms Porter (11 May2021).
[129] Ibid.

mitigation measures and consequential performance management measures for rehabilitation, as required by the Scoping Requirements.[130]

193. Indeed, Dr Jessica Drake provided evidence that:

> The information provided on soils, overburden and tailings as part of rehabilitation and closure planning and criteria is not complete. There is a lack of certainty and clarity about how soil, manufactured soil, overburden and tailings will be used in rehabilitation, and thus it is currently unclear how the design criteria will be achieved.[131]

194. Dr Drake also gave evidence that new experiments need to be undertaken to identify and evaluate the effects of the Project in relation to soil rehabilitation and to identify and appropriately assess the actual or likely effects of using centrifuged fine tailings as they relate to soil rehabilitation.[132]

195. Dr Loch also gave evidence that further trials are essential.[133]

196. In the circumstances, MFG is justifiably concerned that the Proponent does not know whether the centrifuged tailings and manufactured soils will actually support the restoration that they have described given they have not yet trialled it.

197. Such fears were not allayed by the presentation of Dr Gibson-Roy.

198. Dr Gibson-Roy gave a lengthy presentation on the Proponent's rehabilitation activities, albeit without providing any written report or data.[134] He is a paid employee of the Proponent and is evidently extremely eager to pursue the opportunity he has been given to undertake restoration work on a large scale. The weight to be given to his presentation should be limited having regard to the fact that he was not an expert witness, did not provide any documents to substantiate his presentation and can in no way be regarded as independent.

199. While Dr Gibson-Roy spoke extensively on soils, soil structure and soil manipulation, and seemed very confident in the future success of his work, whenever he was pressed in any detail on soil content or structure he deferred to the

[130] Scoping Requirements, 24.
[131] Expert Witness Statement of Dr Jessica Drake (27 January 2021) (**Tabled Document 90**) 5.
[132] Supplementary Statement of Dr Jessica Drake (17 March 2021) (**Tabled Document 210**) 4.
[133] Evidence in chief of Dr Rob Loch (11 May2021).
[134] Presentation of Dr Paul Gibson-Roy (5 May2021).

work of Dr Loch. He readily acknowledged that he is not a qualified soil scientist or soil biologist. He seemed entirely comfortable to equate his work on other sites with this site, regardless of the fact that here he will be required to work with manufactured soil comprised of coarse and caked fines tailings that have been treated with flocculant. The IAC should not share that confidence.

200. Dr Gibson-Roy suggested that the restoration might include translocation of young Gippsland Red Gums and other flora species. As has been made clear by other projects such as the North East Link or growth area planning, translocation of flora is very difficult and should at a minimum be substantiated by evidence to demonstrate that it is likely to succeed. No such evidence has been put forward by the Proponent.

201. When pressed on the timing of the restoration project by reference to the proponent's rehabilitation staging, he first suggested that the reserve could be established despite the presence of a large stockpile and part of a dam within it, then suggested that the rehabilitation staging was still being determined, and finally suggested that additional time would be of benefit to his work. This is one example demonstrating his lack of independence in being able to satisfy the IAC that his restoration work will be timely and successful.

202. The IAC should proceed on the basis that at best, the reserve will only be in its infancy at the close of mining operations, and that it will not replace like with like in terms of the Gippsland Red Gum Grassy Woodland community, because:

    a. the planted Gippsland Red Gums will take many hundreds of years of growth to replace what is lost and to bear hollows;

    b. the soil food web within the manufactured soil will not replicate that which is lost;

    c. there is no evidence before the IAC to demonstrate that a restoration project of this scale, using manufactured soil made up of mined and chemically treated earth and a seed collection and generation project Dr Gibson-Roy accepts is a great challenge, will be successful; and

d. it will require a permanent and intensive maintenance regime involving slashing, controlled burning, weed removal and fauna management to ensure it continues as a Gippsland Red Gum Grassy Woodland.

203. While a large established reservation of Gippsland Red Gum Grassy Woodland is a worthy ambition, it should not be regarded as a "benefit" of the project but rather as a measure that should be required to mitigate the staggering biodiversity impact of this project.

D. INADEQUACY OF THE EES

204. MFG is deeply concerned about the state of the published EES.

205. While the *Environment Effects Act 1978* is silent on what might be included in an EES, section 3(3) requires the Minister to specify the procedures and requirements that are to apply to the preparation of the EES in an Order declaring the project to be public works.

206. The Minister's procedures and requirements provide that:

> The level of detail of investigation for the EES studies should be consistent with the scoping requirements issued for this project and *be adequate to inform an assessment of the potential environmental effects (and their acceptability) of the project* and any relevant alternatives, in the context of the Ministerial Guidelines (emphasis added).[135]

207. On any view, the EES is manifestly inadequate to inform an assessment of the potential environmental effects of the Project.

208. The various inadequacies of the published EES were noted in MFG's Opening Submission, with key themes including:

a. a lack of baseline monitoring for key impact areas, including for groundwater and soils;

[135] *Terms of Reference*, Attachment 1 'Decision on Project: Fingerboards Mineral Sands Mine' (18 December 2016).

b. a lack of detailed investigation, assessment and or analysis of potential environmental effects and risks;

c. a failure to assess cumulative impacts; and

d. a failure to properly consider the implications of a changing climate, including factoring such changes into mine management.

209. Subsequent information provided by the Proponent throughout the hearings has done little to address MFG's concerns.

210. The sheer extent of outstanding information and, in turn, the inadequacy of the information to inform an assessment of the potential environmental effects of the project, is encapsulated in the IAC's request for further information issued in Week 4 of the public hearings, and after the close of the Proponent's case:[136]

> Can the Proponent provide a succinct (no more than ten pages) consolidated overview of the project proposed in its current form that at least identifies:
>
> (a) Location of proposed roads
>
> (b) Previous and proposed mining licence extent
>
> (c) Area of land to be potentially mined
>
> (d) Location of all proposed dams, including sequencing
>
> (e) Current agreed water balance including expected take from surface water and groundwater, over what period
>
> (f) Location and scale of centrifuge building units and other fixed infrastructure and plant
>
> (g) Final agreed statistics on flora and fauna species impacted - including area and number impacted
>
> (h) Clarity on whether road-based transport options to Melbourne are still being considered or not
>
> (i) Proposed location of expanded borefield

[136] Letter from the IAC to Kalbar Operations Pty Ltd (Information Request) (26 May 2021) (**Tabled Document 401**) 2 [9].

(j) Location of all sensitive receptors

D.1 Addition of the use of centrifuges

211. The Proponent advised the IAC of its intention to use centrifuges in January 2021, albeit after discovering a key assumption underpinning the water balance in the exhibited EES was incorrect.[137]

212. The evidence before the IAC is that centrifuges present a "potential" technical solution to the Proponent's conundrum of dewatering tailings to the extent required, with the caveat that there is no known precedent for the application of centrifuges in managing tailings in a commercial mineral sands project, in Australia or internationally.[138]

213. That is, the Proponent intends to implement a world first as a last minute addition to its Project. Such a half-baked proposition is, understandably, of concern to MFG. The consequences of altering the Project to include centrifugation instead of a TSF have not been properly assessed, beyond provision of Technical Notes and supplementary evidence.

214. Mr Ivan Saracik was called by the Proponent to give evidence on centrifuges.[139] He is a mechanical engineer with experience in project management of mines, including the use of filtration and centrifuges in the mining of various resources. His evidence was clear that centrifuges are a last port of call due to their high capital cost (in the order of $25 million for this project, with operational costs unknown but likely to be high), and that he had never seen centrifuges used in a mineral sands project. Given the uncertainties of dewatering the fines to an appropriate level in this case, his evidence was that he would have recommended the use of centrifuges early in the process.[140]

[137] Letter on behalf of Kalbar Operations Pty Ltd to the IAC (18 January 2021) (**Tabled Document 42**).
[138] Expert Witness Statement of Associate Professor Conleth O'Loughlin (9 March 2021) (**Tabled Document 185**) 7 [14].
[139] Evidence of Mr Ivan Saracik (4 May2021).
[140] Evidence of Mr Ivan Saracik, under examination of Ms Porter (4 May 2021).

215. Mr Saracik accepted that Associate Professor O'Loughlin has expertise and experience in the design and operation of centrifuges for all manner of applications that Mr Saracik himself does not have. He also accepted that he is not experienced in the analysis or assessment of laboratory testing of centrifuges.[141] Given this, it is alarming that Mr Saracik was prepared to write his expert witness report in the absence of the P1 testing that has since occurred (and resulted in variable percentage weight in solids for the caked material that is less than the 70% wt outlined in the October 2018 test and predicted to occur in the field by Alfa Laval). Indeed, it was Dr O'Loughlin who requested that additional information to give him sufficient comfort to sign off on the conclave report that was ultimately produced.

216. It is also alarming to learn that the testing was undertaken by Wave Engineering, the very firm that has been appointed as the EPCM engineers for the project.

217. Having received the results of Wave Engineering's April tests, Dr O'Loughlin maintained that a full scale testing regime is necessary to demonstrate that centrifuges can be used to successfully treat the mineral sands tailings to be produced on this project.

218. Mr Saracik simply does not have the relevant expertise to give "absolute confidence"[142] that centrifugation will work in this case, that it will produce a 65-70% wt total solids cake, that there will be no leaching of the remaining water content over time, or that the use of PAM flocculants is safe to use on the project. The IAC will note that Mr Saracik's evidence in that regard contrasts with the single metric of 73% solids concentration used in the water balance model, or the assertion in Technical Note 23 that centrifugation will result in 65-73% solids concentration. Technical Note 22 demonstrates the difference in the water balance between achievement of a 63% versus a 73% solids concentration (0.83GL/year).

219. Associate Professor Conleth O'Loughlin was called by MFG to give evidence on centrifuges. He gave evidence that "we don't know what we don't know". That is,

[141] Ibid.
[142] Evidence of Mr Ivan Saracik, under examination of Ms Porter (4 May2 021).

centrifuges can dewater tailing in principle, but it is not proven technology for dewatering tailings from mineral sands mining.[143]

220. In circumstances where there is no precedent for the use of centrifuges for mineral sands mining at a commercial scale – in Australia or the world – an unacceptable level of uncertainty remains regarding the use of centrifuges. Moreover, in circumstances where there is no known precedent, alternatives need to be considered in the event that centrifuges prove to be unworkable.

D.2 Expansion of mining licence area

221. In the third week of the public hearings, the IAC was advised that the Proponent had recently lodged a mining licence application for an area larger than the project area proposed in the EES (namely, 2143 ha compared to 1675 ha).

222. The Proponent's announcement raises a number of issues, including whether the mining application impacts the adequacy of the information currently before the IAC, particularly the Draft Work Plan.

223. While the Proponent is yet to provide any detail on the mining licence application beyond the tabling of two maps,[144] at first blush it appears that the application now covers additional areas of endangered and vulnerable EVCs (unsurveyed) and new directly impacted landholders. The EGSC's maps (Tabled Documents 403-406) are useful in that regard, but the IAC does not have the benefit of an assessment of the environmental effects of including this additional land within the Project area.

224. The Proponent's announcement also raises procedural fairness issues noting, for example, that the IAC directed the Proponent to indicate in February "whether there are any other significant project changes being countenanced that the IAC and submitters should be aware of"[145] to which the Proponent responded on 12 February

[143] Evidence in chief of Associate Professor Conleth O'Loughlin (31 May 2021).
[144] Survey Plan (**Tabled Document 344**) and Plan by ERR from Survey Plan (**Tabled Document 345**).
[145] Letter from the IAC to the Parties: Adjournment of Hearing and Second Directions Hearing (8 February 2021) (**Tabled Document 105**) PDF 4.

2021 that "No further changes to the design of the Project are currently contemplated".[146]

225. Coupled with the inevitable expansion of the nominated borefield location, there is a significant tract of land to be utilised for Project purposes that has simply not been assessed.

D.3 Minimal consideration of the Environment Protection (Amendment) Act 2018

226. As previously identified by the IAC, there appears to have been minimal consideration of the increased obligations that will apply to the Project on the commencement of the substantive provisions of the *Environment Protection Act 2017*, as amended by the *Environment Protection (Amendment) Act 2018.*[147]

227. MFG intend to address this matter in further detail following the submissions of the Environment Protection Authority (**EPA**). However, in the interim, MFG contest the Proponent's submission that it has adopted a risk-based approach to harm minimisation "consistent with the new duties that will apply".[148]

228. For example, regarding the concept of minimising risks of harm to human health and the environment, section 6(2) provides:

> To determine what is (or was at a particular time) reasonably practicable in relation to the minimisation of risks of harm to human health and the environment regard must be had to the following matters:
>
> (a) the likelihood of those risks eventuating;
>
> (b) the degree of harm that would result if those risks eventuated;
>
> (c) what the person concerned knows, or ought reasonably to know, about the harm or risks of harm and any ways of eliminating or reducing those risks;
>
> (d) the availability and suitability of ways to eliminate or reduce those risks;

[146] Submissions on Variations to the Project made on behalf of Kalbar Operations Pty Ltd (12 February 2021) (**Tabled Document 141**), paragraph [28].
[147] IAC Request for Information (11 December 2020) (**Tabled Document 16**) 6 [2.9(i)].
[148] Part B Submissions on behalf of Kalbar Operations Pty Ltd (18 May 2021) (**Tabled Document 358**) 20 [67].

(e) the cost of eliminating or reducing those risks.

229. In circumstances where the experts called by the Proponent have conceded that they have not considered or modelled the potential flooding risks or erosion risks associated with the Perry Gully which will be backfilled with tailings,[149] it is difficult to accept that the Proponent is on the path to minimising risks to the requisite degree.

D.4 Various other inadequacies

230. MFG is concerned that there remain significant unanswered questions in relation to the environmental effects of the Project:

a. there are significant uncertainties about groundwater impacts, particularly how the major disturbance of the site through mining and emplacement of the tailings will influence seepage rates, water table levels and flow of groundwater towards surface water bodies and other aquifers in the area;

b. there is ongoing uncertainty regarding the response of the aquifer to pumping, the aquifer's extent and hydraulic parameters, the long-term viability of water supply from the borefield and the potential for greater inter-aquifer leakage (and thus impacts on existing bores and other values supported by groundwater);

c. the actual or likely effects related to soil erosion and soil dispersion (including tunnel erosion) remain unknown, particularly at the interface of the mine site and natural soils;

d. the chemical hazards presented by tailings to human and environmental health remain unknown, as such hazards were not adequately assessed;

e. radiation exposure pathways for workers (including farm workers) and the public and environment are yet to be adequately assessed, along with the

[149] Evidence in chief of Mr James Weidmann (10 May2021), specifically concession that modelling was not updated to address addition of centrifuges; Evidence of Mr Michael Cheetham, under examination of Ms Porter (7 May2021); Evidence of Dr Rob Loch, under examination of Ms Porter (11 May2021).

sampling of agricultural products downwind and downstream of the planned mine;

f. there is a complete lack of specific and detailed financial costings for Project rehabilitation.

231. It follows that the IAC is unable to make findings (and the Minister is unable to make an assessment) of the potential environment effects and the acceptability of those effects.

232. It is also noted that MFG awaits the Proponent's updated EMF and mitigation register and is therefore unable to meaningfully engage with the detail of those matters at this stage.

E. CONCLUSION

233. MFG's participation in this process has clearly been critical, in that their local expertise and knowledge has exposed real issues with the Project and its assessment that have had to be addressed (with extreme reluctance by the Proponent). For example:

a. MFG identified errors in the water balance that subsequently led to the radical amendment to the project to replace the Tailings Storage Facility with centrifuges.

b. MFG identified serious deficiencies in the identification of sensitive receptors.

c. MFG's report by TreeTec[150] and its witness Mr Kern (and Council's witness Mr Lane) identified deficiencies in the survey and classification of EVCs, resulting in additional native vegetation losses being identified in Mr Organ's second supplementary expert witness statement.

[150] Jenner, B. *Rare or Threatened Flora and Fauna Surveying of the proposed Kalbar Fingerboards Mineral Sands Project Site* (Treetec Professional Tree Services) (2 November 2020).

d. MFG's witness Associate Professor Gavin Mudd identified that the Proponent had not addressed the legal issues around the export of HMC and the potential for extraction or uranium and thorium once exported from Australia.

e. MFG also called evidence from witnesses not otherwise addressed by the Proponent, such as economics and geotechnical engineering (centrifugation).

234. It is unacceptable that there is still so much work to do in order to understand the environmental effects of the Project and to assess their acceptability or otherwise. The EES and this Inquiry process are intended to inform the various statutory approvals that will be required in order for the Project to proceed. It involves full public participation so as to give the Inquiry, and subsequently the Minister, the full range of views and expert opinion. It is therefore inappropriate – indeed, misconceived – to suggest that this work can be left to the approvals phase.

235. In light of the above, MFG seeks the following findings from the IAC:

a. The EES and updated material is manifestly inadequate to inform an assessment of the potential environmental effects of the Project.

b. To the extent that the environmental effects of the Project are able to be assessed, those effects will be significant and unacceptable, and are unable to be adequately mitigated, having regard to relevant legislation and policy, best practice, and the principles of ecologically sustainable development.

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3 June 2021