INQUIRY AND ADVISORY COMMITTEE
FINGERBOARDS MINERAL SANDS PROJECT

IN THE MATTER OF THE FINGERBOARDS MINERAL SANDS PROJECT ENVIRONMENT EFFECTS STATEMENT

IN THE MATTER OF DRAFT PLANNING SCHEME AMENDMENT C156 TO THE EAST GIPPSLAND PLANNING SCHEME

PART C SUBMISSIONS
ON BEHALF OF KALBAR OPERATIONS PTY LTD

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PART A – SUMMARY

1. These written submissions are made on behalf of Kalbar Operations Pty Ltd (**the Proponent / Kalbar**) to the Inquiry considering the Fingerboards Mineral Sands Project Environmental Effects Statement (**EES**) and the Advisory Committee considered proposed Planning Scheme Amendment (C156) to the East Gippsland Planning Scheme.

2. To begin with, the Proponent would like to begin by acknowledging the effort that submitters have put into participating in this process, even where those submitters opposed the Project.

3. Ultimately, this is – as the Council's Part B cases alluded to – a question about managing risk to obtain reward. Leaving aside the important benefits to the Proponent of obtaining the net revenue associated with the mining of the resource, the Project can be expected to deliver significant rewards at several levels:

    a. At a personal and regional level, the Project is expected to yield approximately 200 direct jobs during construction and a further approximately 200 jobs on an ongoing basis, a figure which Mr Campbell considered seemed 'reasonable' and was enough to demand that the Project be 'taken seriously'. The SLR review for Council even suggested that these figures might be understated, as they did not take into account indirect jobs during the construction period. Where possible, these jobs are expected to be filled from local labour.

    b. At a community level, the Proponent is committed to a community grants program before and during the operational life of the Project. Before the Project commences operation, the Proponent proposes to commit $40,000 a year in grants. Once the Project begins operating, that amount will rise to $250,000 a year for the life of the mine, leading to a total of $3.75m in community grants during the operational life of the Project.

    c. Also at a regional level, the Project is expected to involve capital expenditure of in the order of $200m – another figure which Mr Campbell regarded as reasonable. The expenditure of $200m in a regional Shire is a significant

addition to the local economy. Again, where possible, contractors and materials will be sourced locally.

d. At a State and national level, the Project, if approved, would yield royalties to the Government, supporting the provision of services across the State. Company tax paid by the Proponent would also contribute to the provision of services. There would also be the benefit of demonstrating that investment in exploration can lead to substantial returns, thus incentivising this activity.

e. At an environmental level, the proposed 200 hectare Gippsland Red Gum Grassy Woodland has the potential to deliver unprecedented benefits in markedly expanding the range of a critically endangered threatened ecological community. In addition, the infrastructure and experience used to support that restoration project has the potential to contribute valuable lessons learned and seed resources to restoration projects through Victoria and Australia.

4. There is also a benefit in the extraction of the resource. As emphasised in Opening, the rare earth elements are vital contributors to the ongoing transition towards a more sustainable society, being used in – among other things – electric vehicles and wind farms. The Fingerboards resource is potentially capable of significantly contributing to global demand for some rare earth elements. If the resource cannot be developed, supply constraints on rare earths have the potential to increase the cost of, and thus resistance to, the important transition away from reliance on fossil fuels.

5. These are significant rewards. But the Proponent acknowledges that there are risks that are associated with mining projects. Consequently, the Proponent has undertaken an extensive process of assessment across numerous disciplines to identify potential risks and having done so has proposed an extensive suite of mitigation measures aimed at identifying, monitoring, and managing impacts of the Project on the area, its environment, and its inhabitants.

6. Turning to the specific areas of risk identified by various parties,

a. Many community submitters raised concerns over potential water impacts. The evidence, however, strongly supports the view that, even in the worst case, the impacts of the Project can be managed to an acceptable level.

Importantly, the Proponent has taken a precautionary approach to impacts – it has agreed to conditions which will require it to monitor for potential impacts where no viable pathway has been established for the impact to occur (such as mounding impacts at the Perry River Chain of Ponds and the generation of acrylamide from PAM as a flocculant). In terms of water competition, the Proponent does represent a new entrant in the market, but the reality is that the Victorian *Water Act* establishes just that: a market. The Proponent will only be able to buy water from willing sellers at a price that is acceptable to them. In *Water Act* terms, this is deemed to be the best use of water.

b. Many community submitters have also expressed concern about dust, and toxic dust in particular. These concerns are sincerely held and deserve to be taken seriously, which is why the Proponent committed significant resources to air quality impact assessment and an assessment of the human health risk posed by mining. The conclusion of these assessments is that, while the Project will generate dust, the dust it generates will be manageable and it will not be toxic. As with water, monitoring will be in place.

c. Related to the above were concerns about radiation and health impacts more broadly. Again, considerable work has been undertaken to evaluate these concerns, including the Proponent notes, an independent evaluation by Dr Joyner. That evaluation, combined with the assessments in the EES and expert evidence, should give the IAC comfort that the radiation and health impacts of the Project have been properly identified and can be managed to an acceptable level.

d. The impact on the horticultural industry was another area of widespread concern. The Proponent is confident that the Project and the horticultural industry can co-exist and even thrive together. Through its proposed mitigation measures, the Proponent is committed to working with growers in the area. While there will be some areas of competition from time to time, there is nothing before the IAC to suggest that, subject to the adoption of appropriate measures, the Project will materially affect the viability of the local horticultural industry.

e. In terms of social impacts, the Project will have positive and negative impacts. For many people, the addition employment and income associated with a major new project in a regional area will contribute to a better standard of life and new opportunities. For others, though, the arrival of the Project will not be experienced positively. Where possible, the Project will seek to address its impacts through a variety of initiatives aimed at mitigating harms (e.g., managing price impacts) and enhancing benefits (e.g., community grants, training opportunities). The Proponent will also engage with members of the community, including opponents, through the Environmental Review Committee and the Community Reference Group which will be required under the Work Plan.

f. Over its life, the Project will involve the removal of a significant area of native vegetation and the loss of some actual and potential habitat. As required by Victorian law, these impacts will be minimised and then offset to the satisfaction of the Department of Environment, Land, Water and Planning. Careful management of impacts on fauna will occur under a Fauna Impact Mitigation and Landscape Plan, which provides for, among other things, the establishment of replacement habitat where hollows are lost, preclearing surveys, and the salvage and translocation of any fauna encountered on site. In addition to this, the Proponent proposes to establish a legally secured 200 hectare restoration project which has the potential to provide benefits even into the very long term.

g. One of the requirements of any mining project is rehabilitation. Both of the rehabilitation witnesses called have agreed that rehabilitation is feasible. Further testing and refinement will be part of the Project going forward.

h. The project will introduce a level of visual change that will be acute from locations close to mining activity. Whilst this is unavoidable, these impacts will be reduced over the medium and long term if rehabilitation is successful.

i. Finally, the technical assessments carried out for noise and traffic demonstrate that these matters can be appropriately managed through conditions. This was not the subject of substantial dispute.

7. Something should be said about the evidence from the opposing parties. Those parties chose, for the most part, to mount an argument based on uncertainty, rather than seeking to affirmatively demonstrate that the Project could not or was unlikely to be able to achieve acceptable outcomes. Not only was this argument in many places unsuccessful, as when Drs Currell and Webb acknowledged there were widespread and readily available management techniques to address many of their concerns, but taken at its highest, the mere existence of uncertainty over what impacts are likely to be does not mean that they cannot be managed. Indeed, the essence of the precautionary principle is adopting mitigation measures to ensure that, even if uncertainty exists over whether a risk will eventuate, mitigation measures be taken anyway.

8. The Proponent has at all times acknowledged that there are some uncertainties associated with mining. It proposes a series of measures aimed at ensuring that, if the Project proceeds past this point, it continually acquires new information aimed at identifying, managing, and mitigating risks. The IAC should feel comfortable that appropriate adaptive management arrangements can be established, noting that each of Dr Webb, Dr Currell, and Associate Professor Kiem acknowledged such an approach was appropriate, at least in their areas of expertise. The IAC can also take comfort from the introduction of the *Environment Protection Act 2017*, which includes provisions for regular review of operating conditions as well as the imposition of the general environmental duty. As a result, this is very much not a 'set and forget' Project.

9. Finally, the Proponent wishes to draw attention to the various accountability mechanisms to which it is subject. The IAC is already aware of the wide array of approvals required for this Project, all of which expose the Project to considerable scrutiny by the regulators. In addition to such statutory scrutiny, however, the Proponent will be held accountable by non-statutory accountability bodies, including the Environmental Review Committee and the Community Reference Group. It has also proposed an Independent Technical Reviewer to provide independent expert advice for use by regulators and non-statutory accountability bodies. It also, as part of the Community Engagement Plan and the Incorporated Document, volunteered to make information on the impacts of the Project and its environmental compliance publicly available at a level beyond even that required of State Projects in major urban areas.

10. For all of the above reasons, it is respectfully submitted that the IAC should find that the Project is capable of achieving acceptable outcomes, subject to appropriate conditions.

PART B – KEY ISSUES

11. The submissions made by the represented parties – principally, Council, MFG, but also the Environment Protection Authority – raised a number of key issues. Rather than addressing these individually in response to each submitter, it is convenient to address these at the outset.

The function of the EES process

12. Both Council and the MFG take issue with the adequacy of the information before the EES. As the Proponent understands the argument, it appears to be that, by the time a project comes to be assessed, there should be sufficient information available about the project to enable a subsequent decision-maker to make a determination under its applicable statutory framework without the need for further information. Failing to provide this level of information, it is suggested, is inconsistent with the spirit, if not the letter, of the Minister's determination to require an EES and inquiry.

13. An example of this is found in in Council's submission where it is asserted that:

> *Had the Minister intended that this process would result in nothing more than issues relating to water licensing being passed on to Southern Rural Water without clarity as to the water balance and what is sought, or without assessment of impacts on others, it is difficult to see why the Scoping Requirements and Terms of Reference were framed in the way that they are.*

14. The Proponent obviously takes issue with this characterisation. Each of the matters identified by Council has been addressed on the basis of a concept design for the Project, and the vast majority of the technical assessments presented in the EES have not even been the subject of critical comment, let alone contrary evidence. The implications of this will be addressed further below.

15. Beyond that, however, neither the text of the *Environment Effects Act 1978 (Vic)* ("EE Act") nor recent past practice supports any expectation that the project the subject of an EES should be, as it were, 'approval ready' for each and every approval that will subsequently be required. If anything, it indicates the contrary.

16. The EE Act is specifically drafted to create a broad and flexible framework for the assessment of the environmental effects of works in respect of which the Minister determines a statement is required. It does not specify any mandatory requirements that must be met for an EES to be valid or sufficient. To the extent the issue of sufficiency arises at all, it is in the context of s 5 which allows the Minister to call for a supplementary statement containing additional information if he considers it necessary for his assessment. Furthermore, the endpoint of the process under the EE Act is not a decision, but simply advice to subsequent decision-makers – which must be considered, but which is not binding.[1]

17. This flexibility has been recognised and relied upon by the Minister, particularly in respect of recent State projects, where the EES process has been used as a mechanism to, in effect, define the envelope of 'acceptable outcomes' for the project. The ultimate design of the project must fit within this envelope before any final decisions are made on the design of that project.

18. With the sole exception of the West Gate Tunnel Project, the practice of government in recent projects – including Melbourne Metro, Mordialloc Bypass, and the North East Link Project – have been to rely on a 'reference design'. As explained by the Minister in his assessment of the North East Link project,

> *The reference design is not intended to represent the final design for the project. Rather, it represents a feasible means by which the project might be designed, constructed and operated. It also identifies a project boundary, being the area within which all temporary and permanent works and structures must be located. The proponent explained to the IAC that a reference design is a tool to facilitate the assessment of potential environmental effects and that it does not necessarily constitute the only means by which the project could be delivered.*
>
> *The reference design has been used as a means by which to:*
>
> *1. identify and assess the environmental effects of the project; and*
>
> *2. prepare an environmental management framework (EMF, see Section 5.2), including environmental performance requirements*

[1] As expressly recognised in the Minister's Assessment of the Crib Point project, where the Minister stated that he had concluded that the impacts of the project were unacceptable, but each decision-maker would still need to make their own determination: page 4 *Executive Summary*. Available at: https://www.planning.vic.gov.au/__data/assets/pdf_file/0023/517280/Ministers-Assessment-March-2021.pdf

> *(EPRs, see Appendix A), and a UDS that will provide for management and mitigation of those identified impacts.*

19. For these State 'reference design' projects, it is expected that, after the EES hearing, the project will be put to tender and the tenderer will then provide a final detailed design. In this context, the EPRs (along with other standards of general applicability and any contractual requirements) become part of the design process and influence the choices to be made.

20. While this approach has been controversial, it has been repeatedly endorsed by the Minister in his Assessments under the EE Act. In the North East Link Assessment, the Minister responded to commentary by the IAC regarding the use of reference designs by observing:

> *in my opinion, significant benefits flow from assessing a reference design instead of a detailed design for large, complex projects. A reference design encourages alternatives or innovations to be explored during assessment and in the detailed design, that respond to problems or impacts that may be unforeseen in some cases. This may result in improved environmental outcomes. A performance-based EMF, and UDS, as will be required for this project, is necessary to guide and support the delivery of alternative or innovative design solutions.*

21. If such an approach is acceptable for public sector projects, it cannot reasonably be argued that the approach is unacceptable for private sector projects.

22. In these circumstances, the apparent assumption that a project must be 'approval ready' before it can properly be the subject of an EES hearing is without foundation.

23. Having said that, it is important to be clear that what is proposed here is considerably more advanced than a reference design. Subject to any conditions on statutory approvals (which will be informed by the Minister's Assessment and the IAC report), the Proponent proposes to develop the Project Area generally in accordance with the description contained in Tabled Document 122, which provides an updated Project description which reflects the introduction of the centrifuges and removes the tailings storage facility. That description describes (including by imagery) the plant and equipment (including the centrifuge building) to be used in the mine as well as the processes to be undertaken.

24. The Project description also includes a number of diagrams depicting various proposed aspects of the mining process, including:

    a) Figures 3.2 – 3.4 provide general layouts for project infrastructure;

    b) Figures 3.9 – 3.12 provide indicative mining locations for select years of mining (years 1, 5, 8, 12, and 15)

    c) Figure 3.15 provides indicative locations for water management dams; and

    d) Figure 3.17 depicts the mine site water management process.

25. It should be said that the layout of the mine at any particular time will reflect the progress of mining, with certain plant and infrastructure moving to facilitate mining.

26. As requested by the IAC, Technical Note 39 provides a project overview which draws together information about a number of specific aspects of the Project.

27. One important aspect of the design of the Project which has not changed is the mining footprint. This is so notwithstanding the current Mining Licence which seeks a larger area than the Project Area.

28. Some matters that were uncertain at the outset of the hearing have been resolved during the course of the hearing. In particular,

    a) The existing East Gippsland Water pumping station on the Mitchell River was identified as a potential water source in the EES. As per Tabled Document 122, this is no longer pursued. If the Project is approved, the Proponent will construct a purpose-built pump station closer to the Project Area.

    b) The use of road transport for the movement of heavy metal concentrate (**HMC**) to Port Antony or Maryvale has now been ruled out.

29. To the extent uncertainty remains over what is proposed, it is confined to four areas:

    a) First, the road layout to be adopted within the Project Area. Two options exist and the evidence is that both of them are acceptable, subject to design refinement. The Proponent's preference is for the more recent (January 2021)

road design on the basis that it facilitates more efficient mining and reduces the need to move roads. The determination of the final road layout will be a matter for the Head, Transport for Victoria (after considering the Minister's Assessment and any recommendations made by the IAC).

b) Second, the location of the railway siding. The Proponent, along with the Council and Transport for Victoria, has a clear preference for Fernbank, but this has not previously been supported by DELWP. The Proponent continues to have constructive discussions with DELWP, however, and is confident that the choice of Fernbank as the appropriate location for a siding if the Project proceeds will be agreed with all relevant regulators.

c) Third, there is uncertainty over the source(s) of the water that the Project will rely on and the extent of reliance on those sources. The Proponent's clear preference is to obtain a winterfill licence and rely, as far as possible, on surface water to meet Project water needs. It is anticipated that the Proponent will also seek a groundwater extraction licence to provide a reserve source of water for drier years. The extent of the Project's ability to obtain water from either source cannot be resolved while the EES process is on foot, as Southern Rural Water is prohibited under s 8C of the EE Act from making a decision on whether to grant a licence and the Proponent is unable to obtain water entitlements without having a licence.

d) Fourth, there is uncertainty over the location of the borefield. Initial pump testing has indicated that, if the Project is to be substantially reliant on groundwater, then the borefield may need to move further south to an area where the aquifer is thicker. As set out above, however, the question of the Project's reliance on groundwater cannot be conclusively resolved until the EES process is completed.

30. As can be seen, in each case where uncertainty exists, the Proponent has – and has expressed – a clear preference but is not in a position by itself to be able to make a determination. This is particularly true in relation to the issue of the source of the Project's water needs.

31. One final point is worth noting in relation to the location of borefield. If the Proponent were successful in obtaining a licence to take groundwater, then relocation of the borefield could be authorised by a planning permit for a utility installation (a Section 2 use in the Farming Zone) from the Council. This is because, as explained by the Court of Appeal in *Stanley Rural Community Inc. v Stanley Pastoral Pty Ltd*, planning controls are incapable of regulating water take under the *Water Act 1989*, and hence any questions over the impact of the extraction are not relevant in planning decision-making.[2]

The relevance of the Scoping Requirements

32. Both Council and the MFG argue that the information presented in the EES fails to satisfy the Scoping Requirements. Council then seeks to go beyond this point to argue that the Scoping Requirements should be seen as imposing an onus on the Proponent.

33. Both these submissions are misconceived.

The adequacy of the EES

34. The adequacy of the EES and its compliance with Scoping Requirements is an administrative prerequisite to the exhibition of an EES. That is, the Minister will not authorise the exhibition of an EES that does not comply with the Scoping Requirements. In this case, by letter dated 25 August 2020, the Minister stated:

> *I am informed by the Department of Environment, Land, Water and Planning (DELWP) that the EES adequately covers the matters identified in the scoping requirements, which I issued for this EES in March 2018, and that you have sufficiently addressed matters raised by the project's technical reference group, with some specific exceptions. I therefore authorise the EES to be placed on exhibition to invite public comment, in accordance with my procedures and requirements under the Environment Effects Act 1978, as amended on 19 July 2020, subject to some final revisions to the EES main report and draft planning scheme amendment.*[3]

35. The reference to the Technical Reference Group is significant because, as the IAC will be aware, the Council was part of the Technical Reference Group and thus had the

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2 (2017) 54 VR 676, [136].

3 A copy of the letter is provided with this submission. Additional correspondence is also provided which address the revisions identified in that letter and demonstrates DELWP's satisfaction with those revisions.

opportunity to raise any concerns it may have had regarding the adequacy of the EES as part of that process.

36. It is in this context that the IAC has been appointed. Its role is set out in its Terms of Reference. Had the Minister wished the IAC to undertake a further assessment of the adequacy of the EES, he could have directed the IAC to do so. He did not.

37. Rather, the task assigned the IAC is that set out in clauses 5, 6, and 34 of the Terms of Reference, which in summary require the IAC to review the material before it and make findings on the environmental effects of the Project and the extent to which they can be managed to an acceptable level and to make recommendations based on its findings.

38. This approach is consistent with the position taken by the Assessment Committee which considered the Comprehensive Impact Statement (**CIS**) for the East West Link. In that case, Melbourne and Yarra City Councils argued that the CIS did not meet the Scoping Directions issued under s 30 of the *Major Transport Projects Facilitation Act 2009*. The Committee found that it was not its role to assess the adequacy of the CIS. It stated:

> *The Committee is directed by its Terms of Reference. As such it is required to assess the CIS and make recommendations based upon that assessment. Whether the CIS complies with the requirements of the Act or indeed the scoping directions, is not before the Committee. As mentioned by Mr Morris at the Hearing, if a submitter wished to challenge that they could do so, but not in this forum. (Emphasis added.)*[4]

39. The Committee continued:

> *Accordingly, the Committee accepts the opinions of the LMA and the City of Melbourne that the task of the Committee is to deal with what is before it in the CIS. The fact that the LMA has elected to proceed with a Reference Project as a means by which it can identify Performance Requirements that it says deals with any likely impacts of the declared project, is a matter for it. The task of the Committee is to assess whether those Performance Requirements and the management and structure surrounding them is appropriate having regard to the public hearing matters and the applicable law criteria. (Emphasis added.)*[5]

40. Fundamentally the same analysis is applicable here. If, as a matter of fact, the IAC concludes that it has insufficient information to make findings in respect of a matter in respect of which it is required by the Terms of Reference to make findings, then the

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4 [2014] PPV 76, p. 58.

5 [2014] PPV 76, pp. 58 – 59.

proper response is for the IAC to advise the Minister of that fact and to make such recommendations as it considers appropriate.

41. What is more problematic, however, is Council's suggestion that the Scoping Requirements impose a legal onus on the Proponent to address any and all perceived deficiencies which the Council or another party might identify following publication of the EES.

42. As a matter of law, there is nothing to support this proposition:

a) First, nothing in the EE Act operates to make compliance with the Scoping Requirements a matter of law. In fact, the EE Act itself makes no reference at all to Scoping Requirements.[6]

b) Second, it is well established the concept of the onus of proof, except where specifically invoked by statute, has no role to play in administrative proceedings. For example, in *Minister for Immigration and Multicultural and Indigenous Affairs v QAAH*, a majority of the High Court stated:

> *This Court has repeatedly said that the proceedings of the Tribunal are administrative in nature, or inquisitorial, and that there is an onus upon neither an applicant nor the Minister. It may be that the Minister will sometimes, perhaps often, have a greater capacity to ascertain and speak to conditions existing in another country, but that does not mean that the Minister is to bear a legal onus, just as, in those cases in which an applicant is the better informed, that applicant is not to be so burdened.*[7]

43. In fact, the application of the concept of an onus of proof is particularly inapposite in the context of an administrative inquiry under the EE Act because the function of the inquiry (and the Minister following the inquiry) is fact finding and advisory. Neither inquiry nor the Minister is required to make any decision.

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6 Cf. s 30, *Major Transport Projects Facilitation Act 2009* which mandates the issue of 'Scoping Directions' in assessment processes under that Act.

7 (2006) 231 CLR 1, [40] per Gummow A-CJ, Callinan, Heydon and Crennan JJ. See also *FTZK v Minister for Immigration and Border Protection* (2014) 64 AAR 15, [34] per Hayne J; *McDonald v Director-General of Social Security* [1984] FCA 59*; Dr Butler v Fourth Medical Services Review Board* (1997) 47 ALD 647; and *New Theme Pty Ltd v Victorian Casino and Gaming Authority* [2002] VSCA 80.

44. From a tactical perspective, the Proponent understands why the Council pursues this argument. It enables the Council to, in effect, have its cake and eat it by allowing it to complain about perceived information gaps but also, crucially, absolve itself of any obligation to resolve those gaps, even where it has the capacity to do so.

The application of standards

45. A significant proportion of the cases advanced by the Council and MFG amounted to an argument that the Proponent had not satisfied *them* or their witnesses to the requisite standard, although the precise standard to be satisfied was never articulated with sufficient clarity to understand how those demands could be met.

46. This approach was perhaps most clearly articulated by Dr Jasonsmith in the Groundwater Conclave. At the conclave, it was agreed that the risk assessment methodology and presentation style adopted for the Groundwater and Surface Water Impact Assessment was commonly accepted practice for a Victorian EES, a proposition which is obviously correct for people familiar with such documents.[8] Dr Jasonsmith's response is recorded as follows:

> *I do not consider myself to be in a position to assess whether the information presented in the EES Appendix A006 presents an evaluation of impacts in a way that meets regulatory requirements. I consider that the presentation of information in the EES Appendix A006 is inadequate to accurately constrain the potential risks of environmental harm that may result from the proposed Fingerboards mine, regardless of whether the regulatory requirements outlined in point 5.8 above are otherwise met (see point 5.29, below). (Emphasis added.)*[9]

47. Another example was Professor Kiem's insistence on stochastic modelling as the only valid means by which to assess climate change impacts in circumstances where the *Guidelines for Assessing the Impact of Climate Change on Water Availability* specifically recognised the validity of historical scaling as an alternative method and, in the 2020 edition at least, expressly stated that there was no preference.

48. The Proponent does not accept that the proper approach to evaluation of major projects is determined purely by the idiosyncratic preferences of the experts called by parties opposed to the Project. Where possible, the IAC should seek to evaluate proposals by

8 Groundwater Conclave Statement, 5.8.

9 Groundwater Conclave Statement, 5.21.

reference to standards of general application – preferably objective standards, if they exist.

49. A related issue arises in the context of uncertainty. In its submissions, MFG asserts that Dr Currell gave evidence that there was an unacceptable level of uncertainty associated with the Project. The Proponent does not read his evidence that way, but it would observe that, even if his evidence is read that way, it depends on an approach to uncertainty where the acceptable level of uncertainty appears to be determined purely by community sentiment, rather than any more transparent probability-based measure.

50. In response to a question regarding the timing of further work to establish the existence (or otherwise) of a connection between the Chain of Ponds and the Project Area and in circumstances where Dr Currell had accepted that there was no evidence to support the existence of a large impermeable connection between the Chain of Ponds and Project Area, he stated:

> *Q.* *The absence of any supporting evidence of the existence of such a large area of impermeability might be a reason why you would conclude that, yes, it is prudent to do that, but that can safely be done post approval, rather than immediately now?*
>
> *A.* *Well, again, I'll just go back to my previous answer on, you know, if there's an impact that is deemed to be, you know, of high significance to some stakeholders here. Then my view would be no, be prudent to do that work upfront and understand it and close it out.*

51. An EES inquiry is not a mediation. It is a fact finding and assessment forum for the purposes of providing advice to the Minister and subsequent decision-makers, rather than a consensus building forum. Accepting that it may be good politics to, as far as possible, assuage the concerns of all parties is not the same as saying that it is a necessary requirement of the EES process.

52. The Scoping Requirements specifically state that the level of investigation required for the EES should be proportionate to the extent of risk associated with the relevant issue. Whether such an approach satisfies other participants in the process is not by itself a matter which the IAC needs to consider. Rather, the question for the IAC should be whether it considers it has sufficient information to carry out the task assigned to it by the Terms of Reference.

Sensitive receptors

53. MFG raised concerns with the identification of sensitive receptors in its EES submission, during the hearing and during cross examination.[10] Council's Part B Submissions also raise this as an area of concern.[11]

54. MFG prepared a map showing receivers within 3km of the Project Area. It compared its map with Figure 8.25 and Table 8.33 in chapter 8 of the EES and stated that 40% of the receptors had been missed.[12]

55. The difference between the MFG map and Figure 8.25 and Table 8.33 in chapter 8 of the EES is principally because of a different method and purpose.

56. Figure 8.25 and Table 8.33 of the EES show the sensitive receptors used in the air quality assessment. They identify the nearest / most affected receptors for air quality purposes, generally those within 2km of the Project Area and some lesser distances from the infrastructure corridor. For example, the Air Quality technical study relevantly explained:[13]

> "**3.2.3 Sensitive receptors**
>
> Kalbar has identified 49 locations in the immediate vicinity of the Project for consideration as sensitive receptors.
>
> …
>
> There are additional residences located further south; however, these are located at least 0.8 km from the proposed product haul route and/or rail siding and are further from mining operations than any of the receptors assessed in this report. Concentrations of air pollutants at these receptors will be lower than the concentrations predicted at receptors in Table 3, and compliance at the receptors assessed in this report will ensure compliance at receptors further afield."

57. The same list of nearest receivers was used in the noise studies.

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10 MFG EES submission (no. 813), pp 475-478; MFG Part B submissions [233(b)]; Tabled Document 483 (MFG hearing presentation – cultural heritage and social license, presented by Debbie Carruthers, pp 13-15). The issue was also raised extensively in cross examination.

11 At [239].

12 MFG EES submission (no. 813), pp 475-478.

13 EES Appendix A009, section 3.2.3 (Sensitive Receptors) p 16 (pdf p 30).

58. The SLR review commissioned by Council understood the approach employed. In response to the question *"Has the EES identified sensitive receptors with the potential to be impacted by emissions to air from the project?"*, the SLR review stated:[14]

> "The nearest sensitive receptors comprised of residential dwellings have been identified and included in the modelling assessment.
>
> Receptors are identified in all directions and over reasonable distance from the Project.
>
> These receptors are generally conservatively representative of receptors further away from the project – i.e. compliance assessed at nearest receptors suggests compliance at receptors further from Project."

59. In response to the IAC's request,[15] Kalbar checked its receptor information and prepared maps showing all receptors within 2km and 2-5km of the Project and infrastructure boundaries (refer TN04, revised 19 April 2021, Tabled Document 145).

60. Several additional receptors were identified within the 2km boundaries, however all were further away than the receptor locations identified in the EES and used in the air and noise studies, save for receptor R2004 which was closer. Kalbar was already aware of R2004, but in consultation with the landowner determined not to characterise this location as a sensitive receptor in the EES. However, as a conservative approach, and in the interests of completeness, it included this as an additional receptor in TN04.

61. Updated air and noise predictions were carried out for R2004 as documented in TN04. No changes were required to the Project or proposed mitigations to maintain compliance with adopted criteria.

62. It is noteworthy that Council continued to raise this issue in its Submissions, stating:

> "239 Mr Welchman agreed that controls in respect of air quality/dust management – and particularly the draft plan – should:
>
> (a) be updated to include all receptors (PDF 62) – given his reliance on Kalbar, which had failed to identify the relevant receptors in the area, and not taking any action when the community identified the existence of further receptors". [footnotes omitted]

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[14] SLR Review (part of Council's EES submission, no. 716), Table 11 Air Quality technical Review, p 95,

[15] Tabled Document 16, 11 December 2020, request 23.

63. Kalbar does not accept this pejorative submission, for the reasons outlined above.

64. Returning to the discrepancy raised by MFG, Kalbar has prepared a simple comparison by overlaying the MFG map with its original receptor locations (as per EES Figure 8.25). This comparison is shown in Figure 1. The difference in setback used in the two maps is apparent. It is also apparent that the nearest receptors were identified in the EES.

Figure 1 EES sensitive receptor points (green squares with corresponding identifiers – e.g., 'R0X' etc.) overlaid on MFG map (coloured circles with numbers are the MFG identified receptors)

65. A further checking of receptors was undertaken and reported in TN39 (Project Overview).[16] Attachment 5 to TN39 includes a table reconciling each of the receptors identified in the MFG map against the receptors identified by Kalbar in TN04. As recorded in that table, some of the MFG points could not be verified as relevant receptors (including 4x located in paddocks, 2x farm dams and 1x shearing shed). Only one instance was identified where a residence was shown in the MFG map and missed in the TN04 map. This is MFG receptor 65, which was shown in Figure 13 of TN39, and is located within a cluster of other receptors (Figure 2).

[16] Tabled Document 537, 25 June 2021, response to item (j), IAC request for an explanation of the location of all sensitive receptors, p 11.

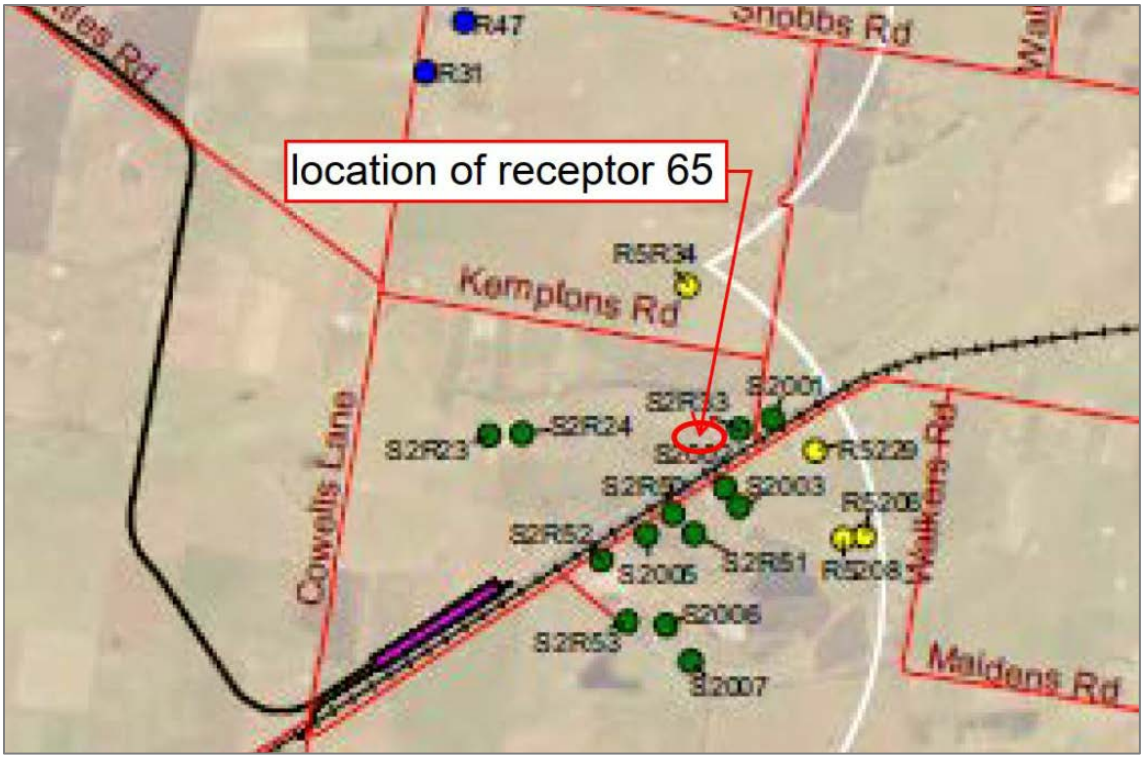

Figure 2 Extract from TN39, Figure 13, p 12 (caption in original "Extract from TN004 (Figure 1 – sensitive receptors within 2km of the Project including siding)")

Mitigation measures

Language and content of mitigation measures

66. The Council has been critical of the conditions proposed on the basis of a perceived lack of specificity, notably around monitoring. In this context, Council sought to contrast the evidence of Mr Delaire with that of other experts.

67. This criticism should not be accepted. Consistent with the broader Victorian approach to planning decision-making, the approach taken to imposing conditions on projects assessed by EES has adopted a performance-based approach in which broad objectives are specified, and the means to achieve those largely left to the proponent, subject to appropriate oversight.

68. A useful example is EPR GW1 on the North East Link project. It states:

Monitor groundwater

Develop and implement a pre-construction, and construction groundwater monitoring program to:

- *Establish baseline water level and quality conditions throughout the study area, including the delineation (to the extent practicable) of those portions of existing contaminant plume(s) that may be impacted by the project*

- *Calibrate the predictive model prior to commencement of construction, manage construction activities, and verify the model predictions*

- *Assess the adequacy of proposed design and construction methods, and where required, identify and implement any additional measures required to mitigate impacts from changes in groundwater levels, flow and quality.*

A post-construction groundwater monitoring program must be developed and implemented to:

- *Confirm the acceptability of resultant water quality and water level recovery (and potential mounding) as predicted by the numerical groundwater model. Acceptability is to be assessed with consideration to the Groundwater Dependent Ecosystem Monitoring and Mitigation Plan (as required by EPR FF6) and other identified beneficial uses of groundwater*

- *Confirm the effectiveness of applied measures as identified in the Groundwater Management Plan (refer EPR GW4) and if required, identify and implement contingency measures to restore groundwater to an acceptable level.*

The duration of post-construction monitoring must be a minimum of two years or until acceptable restoration of groundwater and a relatively stable hydrogeological regime, taking into account prevailing climatic conditions and natural variability, has been confirmed by the Independent Environmental Auditor, in consultation with EPA Victoria and Melbourne Water. The pre-construction, construction and post-construction monitoring program(s) must be developed in consultation with EPA Victoria and Melbourne Water, and be consistent with EPA Victoria Publication 668 Hydrogeological assessment groundwater quality guidelines, EPA Victoria Publication 669 Groundwater Sampling Guidelines, and the State Environment Protection Policy (Waters).

69. Significantly, this EPR outlines specific requirements that must be met by any acceptable monitoring plan, but otherwise leaves the details of the plan to be developed as part of the post-assessment phase. It does not specify any particular, numerical criteria that must be met or any particular locations that must be monitored. Rather, these matters are left to discretion of the Independent Reviewer and Environmental

Auditor (who is required to approve subplans under the EMF), subject to consultation with the EPA and consistency with statutory and policy guidance.

70. A performance-based approach has long been adopted in Victoria because it allows the development of flexible approaches which focus regulatory effort where it is most useful, while avoiding wasted effort on monitoring and management of insignificant impacts. In this regard, as both Dr Webb and Dr Currell acknowledged in cross-examination, the effectiveness of any monitoring program will depend on, among other things, the precise location and sequence of mining. In these circumstances, a performance-based approach subject to independent approval / oversight by appropriate persons / bodies represents best practice.

71. Further, in relation to issues such as noise and air quality where numerical criteria can plausibly be identified, the position of EPA appears to be that such criteria should not identified in conditions on the basis that this might convey that attaining those targets was sufficient to comply with the duties and requirements of the *Environment Protection Act 2017* ("EP Act 2017"). Similar logic would presumably apply to, for example, water quality standards and indicators. The merits of this criticism are addressed below, but at the very least it can be observed that there is a tension between the competing demands of the Council and the EPA.

Response to EPA's drafting comments on mitigations

72. The EPA's response to drafting[17] seeks substantial changes to mitigations.

73. The gravamen of EPA's response is reflected in its overarching comments which include:[18]

> "It needs to be made clear that the objectives in the New EP Act, Environment Reference Standard (ERS) or other guidance are not compliance standards to pollute up to (language in the mitigation measures such as "apply dust reduction measures to achieve the PM10 objective…" and "contingency procedures will be developed and implemented if noise emissions during construction exceed relevant guideline values" should be amended).

[17] Tabled Documents 621-627.

[18] Tabled Document 621.

> The focus needs to move away from compliance, and towards prevention (for example the objective of monitoring as described in the preamble to Table 9-1 in the risk treatment plans is not solely for ensuring compliance with acceptance criteria but should be to ensure reactive management which can enable minimising the risk of harm to human health or the environment to the extent reasonably practicable).
>
> The focus needs to be on demonstrating that the mitigation measures, and any other measures reasonably practicable, have been implemented and are effective (for example 'performance measures' which merely show compliance with 'standards' are not sufficient, they need to show that the mitigation measures have minimised the risk of harm to human health or the environment to the extent reasonably practicable)".

74. EPA has added the comment "EPA Comment: As per EPA's cover letter, language to be updated to reflect the [intent of the GED / New EP Act]" to seven noise mitigations and three air quality mitigations.[19]

75. The EPA's EES submission in October 2020 made specific recommendations for the drafting of mitigations. Mr Delaire[20] and Mr Welchman,[21] in particular, reviewed these and gave evidence in response. Kalbar then updated drafting based on this evidence and EPA's recommendations.

76. EPA now seeks a substantial rewrite of the mitigation register that it did not seek in October 2020. It seems to take issue with the adoption of quantified standards in mitigations.

77. Kalbar's overarching position on this issue is that it is appropriate to use a mix of compliance standards and other best practice measures to minimise impacts from the Project. Quantitative criteria and standards retain a role under the EP Act 2017, as they are an indicator of the potential threat that a hazard (such as noise or air emissions) can present to human health and the environment. As Kalbar said in its Part B submissions, mitigations were developed through each of the technical studies not simply to 'pollute up to the limit', but to minimise impacts *and* achieve compliance with relevant criteria.[22] The EES Draft Evaluation Objectives required this. So does the *Mineral*

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19 Tabled Document 623.

20 He prepared a table responding to each of the EPA's suggested changes. Tabled Document 310.

21 Evidence statement of Mr Welchman, section 4.2.

22 See Kalbar Part B submissions, [61]-[78] under the heading 'New EP Act'.

Resources (Sustainable Development) Act 1990 (**MRSD Act**) which, amongst other things, seeks to:[23]

> "establish a legal framework aimed at ensuring that—
>
> (i) risks posed to the environment, to members of the public, or to land, property or infrastructure by work being done under a licence or extractive industry work authority are identified and are eliminated or minimised as far as reasonably practicable".

78. The key approval required for the Project is under the MRSD Act. Compliance with the GED will be an ongoing duty. The Project will also require a development licence under the EP Act 2017 in relation to water discharges. The Project mitigations do not need to be recast entirely to show how the Project will comply with the GED.

Practicability

79. Council and submitters have been critical of the use of the phrase 'where practicable' and its cognates (such as "reasonably practicable") on the basis they, in effect, render any such commitments meaningless.

80. This should not be accepted:

a) the phrase 'reasonably practicable' is a phrase used in both the MRSD Act and the EP Act 2017. The EP Act 2017 provides specific guidance on what is to be taken into account in assessing practicability.[24] In this context, it cannot be said that the context of practicability is an inappropriate regulatory tool.

b) the concept of practicability has been frequently deployed in EPRs for major government projects. For example, the word 'practicable' appears in the North East Link EPRs some forty times, in a variety of contexts – 'to the extent practicable', 'where practicable', 'as far as practicable', etc. – but all importing an element of judgment.

c) insofar as the Proponent is expected to make judgments about practicability, this will usually if not invariably be subject to independent oversight. This is

[23] Mineral Resources (Sustainable Development) Act 1990, section 2(b), objectives.

[24] See for example, section 6(2) of the *Environment Protection Act 2017*

particularly true if the Proponent's proposed ITR[25] is adopted, as the ITR would be expected to monitor compliance with controls – which would extend to making findings about whether measures claimed not to be practicable were in fact practicable.

Availability of draft subplans

81. A further issue is the complaint by MFG and its witnesses that, in respect of radiation and water, subplans had not been provided for comment as part of this EES process. In particular, the Council asserted that a plan depicting proposed groundwater monitoring locations was 'necessary' before the IAC could make any findings on the acceptability of groundwater impacts.

82. The combined experience of the Proponent's representatives is that subplans are not prepared prior for assessment as part of an EES, even where it is reasonably anticipated that such a plan will be required (for example, a Construction Noise and Vibration Management Plan is an inevitable feature of projects involving tunnelling, such as Melbourne Metro, WGTP, and NELP). In many cases, the final content of the relevant subplans will itself depend on the recommendations of the IAC and the Minister's Assessment which could render a draft plan entirely irrelevant.

83. Had it been expected that these would be produced for comment, the Proponent would have anticipated that the Scoping Requirements might reflect this, as they did for the rehabilitation plan. The reality is that there has been nothing to prevent any of the experts from nominating the parameters that they consider appropriate for any monitoring or management program.

Environmental management framework

84. The EMF (EES Chapter 12) covers various elements, some purely descriptive (e.g., approvals needed for the Project; roles and responsibilities), some internal and aspirational (e.g., Kalbar internal policies and commitments) and some covering elements that will feature within future legal requirements (e.g., mitigation measures, monitoring programs).

[25] TN 040, Tabled Document 542

85. The key elements of the EMF include:

a) Descriptive and explanatory content – e.g., outline of approvals required for the Project, roles of various entities (both regulators and within Kalbar).[26]

b) Objectives and indicators (which are based on the draft evaluation objectives in the EES Scoping Requirements).[27]

c) Management plans that will be prepared pursuant to approvals.[28]

d) Mitigation measures identified through the EES technical studies.[29]

e) Proposed monitoring programs.[30]

f) Internal Kalbar policies, training, compliance commitments and the like.[31]

g) Community and stakeholder engagement principles and indicative processes.[32]

86. The mitigation measures, monitoring programs and management plans sections are of most importance for this EES process in providing a basis for the IAC to advise on the impacts of the Project.

> "The mitigation measures outlined in the EMF have been developed in this EES to avoid and minimise adverse environmental effects. The relevant statutory approval or consent that would give effect to the management and monitoring potential effects are outlined in Section 25.5 (Statutory approvals and consents). Environmental Management Plans (EMPs) would be prepared to incorporate the mitigation measures and these would be approved and enforced pursuant to the relevant statutory approval."

87. The mitigation measures act as a checklist for the proponent, its consultants and decision makers in relation to future approvals. They will guide consultants preparing further work and decision makers in understanding whether the risks identified through

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26 Sections 12.2-12.3.

27 Section 12.4.4.

28 Section 12.4.5.

29 Section 12.4.7 and EES Appendix H.

30 Section 12.4.8.

31 Section 12.4.2, 12.4.9, 12.4.11.

32 Section 12.4.10.

the EES have been managed. The management measures that follow from the mitigations will clearly need to be more developed and detailed than the mitigation measures themselves. Mitigation measures (or EPRs) developed in an EES process are invariably worded at a high level. This matches their purpose, which is to guide future decisions, arising out broad studies and a risk-based assessment, rather than to fulfill all the matters that need to be addressed by the subsequent application process and decision.

88. As with the mitigation measures, Council was critical of the EMF for its perceived vagueness. The reality, however, is that the nature of the EMF as fundamentally a management documents means that it does not descend into detail. The level detail provided in the draft EMF is entirely consistent with the level of detail provided in EMFs for recent EES projects (including Melbourne Metro, West Gate Tunnel, and North East Link). In fact, the EMF is somewhat more detailed in that it specifically identifies a range of indicators to be taken into account in assessing the Project's compliance with its various obligations.

Gloucester Resources

89. MFG in its opening submissions sought to draw some analogy between the circumstances of this Project and the circumstances in the Gloucester Resources case, where a coal mine had been refused permission.

90. Counsel for MFG properly acknowledged in her opening that that case was very different in many ways, particularly in relation to visual impact. It is appropriate to be clear quite how different the circumstances of Gloucester were:

- Gloucester Resources was about a coal mine. Coal is a resource that is likely to be phased out over the next 30 years. Mineral sands are of a different ilk. The demand for zircon and titanium dioxide is forecast to increase. And indeed, the demand for rare earths (being a valuable part of mineral sands) are likely increase by up to five times, including to produce technology solutions that can produce electricity without generating greenhouse gases.

- The Gloucester mine was estimated to produce Scope 1 and Scope 2 GHG emissions to be about 1.8Mt CO2-e over the life of the mine; and Scope 3

emissions to be at least 36Mt CO2-e. Whilst the Fingerboards mine is estimated to produce similar Scope 1 and Scope 2 emissions (1.7Mt CO2-e over the life of the mine), Scope 3 emissions are not consequential when compared with the use of the Gloucester coal for steel making. This is a very important difference between the Gloucester case and this project.

- The Gloucester mine was close to a township which had a core of urban development (population of 2,390), a periphery of rural-residential estates, and many smaller agricultural and agritourism properties. The outlying holdings of the town itself were within one to two kilometres of the boundary of the proposed mine. There is no town close to the Project Area.

- The Planning and Assessment Commission of NSW had refused consent to the proposed mine. There has been no refusal in this case. Rather, this hearing is to advise as to the assessment of the proposal under Victorian laws.

- The relevant statutory provisions are different. For example, in Gloucester, the Authority was required to consider whether the development was likely to have a significant impact on uses that, in the opinion of the consent authority having regard to land use trends, are likely to be the preferred uses of land in the vicinity of the development. There is no similar provision here. Moreover, the pattern of land use, and land use trends, at Gloucester are quite different to those in Glenaladale.

- The Gloucester case ultimately turned on the mitigation measures proposed in that case. The mitigation measures proposed at Fingerboards are not the same as in Gloucester. The proposed mitigation measures for the Project are much more detailed and comprehensive, and illustrate how the Victorian system is much more rigorous than that which applies in other States.

- Visual impact was a key factor in Gloucester case. Whilst visual impact is relevant at Fingerboards, the number of persons in the affected viewshed is much fewer, the strip mining method to be employed means that the amount of disturbed area at any time is much less, and the duration of the impact on any

observer is much shorter. There is a substantial difference in the visual impact of two proposed mines.

- The social impacts on the Gloucester community are not the same as at Fingerboards. For a start, the number of persons living within the vicinity of the mine (whether one kilometre or two kilometres or five kilometres) is much fewer. The spatial pattern of objections is also different. Importantly, the Gloucester proposal was confronting because it was a coal mine and this was seen as a retrograde step having regard to the message it sent about our need to deal with climate change.

91. All of these factors mean that the *Gloucester* case has little, if any, role to play in the evaluation of the impacts of this Project in this environment.

PART C – ENVIRONMENTAL EFFECTS

WATER

The assessment framework

92. The Project will need to obtain licences under the *Water Act 1989* to take and use surface water or to extract groundwater (or in order to meet its project water needs, estimated to be in the order of 3GL/yr. None of the experts sought to challenge that calculation, notwithstanding what their clients might assert.

93. Before turning to the particular issues raised, it is useful to make some observations about the framework in which the water issues fall to considered.

94. First, under the Victorian (and indeed Australian) framework, water is a tradable commodity. That is, the State has determined that questions of allocation are, fundamentally, to be decided by the market. This is also reflected in the use of the auction process for water resources where the State seeks to maximise the value it obtains for the transfer of valuable rights. This was recognised by the experts in agreeing that any questions about the 'best' allocation of water were beyond the scope of this process (and could be said to be irretrievably subjective in any event).

95. The significance of this for the current process is that questions about from whom any water rights will be obtained are not matters that should concern the IAC. In circumstances where the Project has no power to compulsorily obtain water rights, it can reasonably be assumed that rights will only be obtained from willing sellers at a price which they regard as satisfactory. In this context, concerns about the impact of transfers on willing sellers are misguided.

96. Second, as mentioned previously, it is not possible for the Proponent to obtain a water licence while this process is ongoing. While it is fair to observe this leads to some uncertainty, the Proponent cannot reasonably be criticised for failing to obtain a licence in circumstances where Southern Rural Water cannot lawfully grant the licence. In any event, as discussed below, the Proponent has sought to address this uncertainty by modelling the impacts of a 'worst case' (maximum impact) scenario in which the Project is entirely reliant on groundwater for its entire lifespan. In truth, a more plausible outcome is that the Project will be reliant on both surface and groundwater, but mainly surface water. Based on the most recent modelling which was carried out for TN37, the <u>average</u> annual draw from groundwater is likely to be between 125 – 350ML per year depending on the climate change scenario that occurs.[33] Indeed in the majority of years no groundwater will be required.

97. Third, as is highlighted by MFG, both the water sources from which the Project seeks to obtain water are either fully allocated (in the case of groundwater) or have only a small amount (2GL) of unallocated water potentially available which will be auctioned (and allocated) later this year (in the case of surface water). On a fair assessment, this supports a view that, relative to the 'no Project' scenario, the operation of the Project will have no <u>additional</u> impact on water availability. This is because, even in the absence of the Project, the same entitlements to take water would exist and could be relied upon by whoever held them. In this regard, any suggestion that the Project will necessarily increase water take beyond what is already permitted is incorrect.

[33] Tabled Document 535, Technical Note 37, pp. 17 – 18, Figure 18.

98. Fourth, it should be observed that the Project has a defined lifespan. Once the Project is complete, its entitlements will be returned to the market. Any impact on water availability is not permanent.

99. Fifth, and finally, water is a valuable commodity. Even from a purely financial perspective, the Proponent has strong incentives to minimise water use as far as possible; and, where water is used, to recover as much of it as possible.

Climate change, water availability and water security

100. In its Part B Submissions, Council takes issue with the approach taken to the consideration of climate change in the EES.

101. Before responding to this, it is important to be clear about what the Scoping Requirements did and did not require to be assessed. What they required was an assessment of:

> *changes to availability of surface water and groundwater for beneficial and licenced users in the immediate and wider vicinity of the project <u>due to predicted extraction groundwater or surface water for operational use</u> accounting for climate risks and the potential effects of climate change*[34]

102. That is, climate change was to be accounted for insofar as it bore upon the impact of the extraction of water for Project purposes on the availability of water to third parties.

103. By contrast, the Council and Associate Professor Kiem seem to suggest that the Scoping Requirements required that climate change be taken into account in all aspects of Project planning. Whatever the merit of this suggestion as a matter of principle, it is clearly not what the Scoping Requirements require.

104. In terms of its impact on availability, the Project has the potential to affect the availability of water (including in the sense of the price of water) in two (non-exclusive) ways:

a) By taking water from the Mitchell River under a winterfill licence; or

[34] Final Fingerboards Mine EES Scoping Requirements, section 4.3 (Assessment of likely effects) p18. It is acknowledged that climate change impacts were also mentioned in the identification of potential mitigation measures.

b) By extracting groundwater from the LaTrobe Group using bores.

105. Having regard to the factual material, the scope for climate change to materially affect the impact of the Project on the extent of water availability (including the price of water) is intrinsically limited:

a) In relation to surface water, any winterfill licence would only permit the Proponent to take water when flows exceeded 1,400 ML/day. This restriction was agreed at the conclave to provide 'adequate protection for year-round irrigators and other surface water users who are permitted extract surface water at flow rates below the 1,400ML/day limit during the same period'.[35]

b) This threshold limit on the ability of the Project to take surface water is not affected by climate change. As such, even under severe climate change scenarios where flows in the Mitchell River were significantly reduced, irrigators would continue be adequately protected from changes to water availability 'due to predicted extraction groundwater or surface water for operational use'.

c) To the extent that a reduction in surface water flows would require the Project to rely more heavily on groundwater, it was agreed at the conclave[36] – and confirmed in Dr Kiem's evidence[37] – that groundwater levels in the LaTrobe Group would not be affected by climate change during the life of the Project. It follows that there is no scope for climate change to exacerbate the impact of groundwater extraction by the Project.

106. Further, as stated above, the LaTrobe Group aquifer is fully allocated and surface water from the Mitchell River soon will be. Consequently, even if the Project did not go ahead, the same volume of water could be extracted from both systems, albeit by different persons. As a result, it is difficult to say that the Project itself will have any impact on the overall availability relative to a 'no project scenario' (acknowledging that the location from which water is extracted could bear upon availability at a local level).

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35 Water Balance Conclave, 2.1

36 Water Balance Conclave 3.1

37 Hearing Recording, day 15, 24 May, 1:08:54 – 1:09:09: https://www.youtube.com/watch?v=PRvGEBfeJTE

107. Nothing in Associate Professor Kiem's evidence or the Council's submission explains how they anticipate that climate change would exacerbate the impact of the Project on water availability beyond the extent already accounted for in the EES material and, in particular, to do so in a way that requires an adjustment to proposed mitigation measures. In fact, Associate Professor Kiem specifically agreed that:

a) The environmental risks of a dry climate (i.e., reduced rainfall) scenario were likely to be adequately addressed by the existing mitigation measures present in the EES;[38] and

b) The currently presented mitigation and management measures (refer to 2.8) are considered adequate to address the potential environmental effects of limited water supply to the project.[39]

108. Assuming for the sake of argument that the Scoping Requirements did require a broader assessment of climate change impacts, the following points are made:

a) Council is (seemingly) critical of Mr Muller for not using a baseline of the kind required by the *Guidelines for Assessing the Impact of Climate Change on Water Availability in Victoria* (2016, rev. 2020) (**Climate Change Guidelines**). However, nothing in the Scoping Requirements required the application of the Climate Change Guidelines or even identified them as a relevant policy document to be considered. In fact, those guidelines are expressly intended to assist water corporations in undertaking long term (50 year or more) planning.[40]

b) To the extent Council insists on stochastic modelling as the sole acceptable method for assessing climate change impacts, this insistence is directly inconsistent with the Climate Change Guidelines which it suggests should have been utilised. The 2020 Climate Change Guidelines expressly state that both historical scaling and stochastic data generation were valid options and that '[n]o single approach is recommended over another',[41] noting the degree of

38 Water Balance Conclave, 3.2

39 Water Balance Conclave, 2.3

40 Climate Change Guidelines (2016), pp. i and iii.

41 Climate Change Guidelines (2020), p. 34.

effort involved in such modelling and the potential need to make trade-offs to moderate that effort.[42]

c) More specifically, in relation to the issue of droughts worse than those seen on record, the 2020 Climate Change Guidelines indicate that stochastic modelling is not required to evaluate the impact of these:

> *There are various techniques available to generate synthetic droughts that are more severe than the worst drought on record. This can include stochastic data generation, as applied for setting very high levels of security for water supplies in some of Australia's capital cities (e.g. Seqwater, 2017) or, more simply, can involve historical sampling (with or without replacement) from the historical record, as is currently adopted by many Water Corporations.*[43]

109. In circumstances where official government guidance for water corporations engaged in long term planning expressly recognises the validity of historical scaling as a means of assessing climate change impacts on water supply, Associate Professor Kiem's preference for stochastic modelling can be given only little weight, especially given the comparatively short life of the Project.

110. The reality is that Council's position on climate change is inconsistent with the Climate Change Guidelines which it sought to criticise Mr Muller for not applying. If it wishes to continue to insist on the importance of stochastic modelling, then it should identify with precision – not merely by making vague references to concepts such as stationarity – how it says that undertaking stochastic modelling might lead to different outcome whether in terms of effects or mitigation measures.

111. This is especially so in light of TN 37, produced in response to the IAC's request for climate change modelling consistent with the 2020 Climate Change Guidelines. As noted, due to time constraints, that modelling used the historical scaling method.[44] The results indicates that the impact of climate change will not increase groundwater consumption beyond any scenario already modelled or materially alter the impact of the Project on water availability.

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42 Ibid, p. 36.

43 Ibid, p. 33.

44 Tabled Document 535, p. 3, section 2.2.

112. To the extent the Council wishes to assert that it cannot know the outcome of stochastic modelling without the modelling being done and therefore the modelling has to be done, this is self-fulfilling prophecy and should not be accepted. What we do know is that climate change cannot, as a brute physical fact, result in the Project being more than 100% reliant on groundwater and thus extracting more groundwater than modelled for EES purposes. That scenario has been modelled and its impacts are available for the IAC to consider.

Water balance

The water balance

113. As required by the Scoping Requirements, the Proponent has prepared a water balance model to assess the likely water demand generated by the Project. That has projected likely water demand in the order of 3 GL/yr. As noted, none of the water experts challenged that figure.

114. Having said that, it is accepted that the water balance is, at heart, a model and, as a model, it is subject to the uncertainty that until work begins and the system operates, is necessarily reliant on assumptions. This was expressly identified in the EES, as was the water balance's reliance on inputs from the Proponent regarding the water process system (including the volume of water entailed). In this context, there is nothing improper about the reliance of Mr Muller – a modeller – on inputs from Mr Wolmarans and others. To suggest that he should have undertaken some sort of detailed interrogation of those inputs in circumstances where he himself was not an engineer is not reasonable.

115. Nor is it reasonable to suggest that, because the Council was not able to interrogate an expert witness about those inputs, the water balance should be disregarded. The situation here is comparable to the many State transport projects which rely upon strategic transport modelling outputs – whether from the Victorian Integrated Transport Model or from privately developed models – which is, functionally, unchallengeable because even the developers of the model software cannot identify precisely how any particular result is derived. Notwithstanding this, the IAC routinely accepts such those outputs and gives them weight in its deliberations.

116. The reality is that if Council wished to suggest that particular inputs or outputs were factually incorrect or fundamentally implausible, it had the opportunity to advance material in support of those propositions. Merely putting questions to a witness does not establish that any assumption is invalid.

117. Ultimately, even if the water balance is wrong and more water is required than anticipated, the Proponent cannot simply take that water and thus deprive others of access to that water. Before taking *any* water for the Project, Kalbar would need to:

a) In the case of surface water, obtain a take and use licence either directly from SRW or by transfer from an existing licence holder (which transfer would need to be approved by SRW); or

b) In the case of groundwater, obtain a licence from SRW and obtain allocations from existing allocation holders.

118. In each case, it would be necessary to obtain a licence that permitted the extent of water required and that could only be obtained from a person who was willing to provide it, either by auction (SRW) or private sale (existing holders). In these circumstances, the vendor will by definition receive appropriate compensation for the impact on them. The fact that the Council or others might prefer that the transferred licence or allocation be used for some other purpose is not relevant, given the market context established by the Water Act.

119. If the Project is unable to obtain the water it requires as set out above, it will scale back its operations in line with the water to which it has access.

Centrifuges in the water balance

120. One area that does require particular comment is the issue of centrifuges and the potential impact of different recovery rates. Council has sought to advance the argument that a reduction in the efficiency of the centrifuges from 72.7% to 68% would result in water lost to entrainment increasing by 800ML (or 0.8GL). It is unclear how this figure was derived, but it is not consistent with the calculations undertaken by the Proponent. Such a reduction in efficiency would result in an increase in water lost to entrainment of 300ML. In order for losses to increase by 800ML, the recovery would need to be reduced to 63%.

121. The Proponent considers it unrealistic to assume that the centrifuges would achieve an efficiency of less than 65%, noting that of six P1 samples, only one recorded a solids concentration range of below 65%, and even that achieved a range of between 60 and 65%.[45] All other tests returned results of being between 65 and 71% for a test material that was never intended to achieve the final design density, given the sample was prepared by screening rather than cycloning.[46] As indicated in TN 23, it is anticipated based on P1 tests that the recovery range for the full-scale centrifuge processing cycloned fines would be in the order of 65 – 73%.[47]

122. The Proponent does acknowledge that the ability to recover water through the centrifuges is an important issue in minimising water usage by the Project. It is for this reason it has accepted that conditions should be imposed which require the carrying out of a pilot program to prove up the centrifuges prior to mining commencing.

Groundwater impacts

Modelling and characterisation

123. A significant amount of modelling has been undertaken to inform the Project to date. No real attempt was made to challenge the substance of the modelling or to challenge that it was carried out in accordance with applicable standards.

124. Both Dr Webb and Dr Currell specifically eschewed any attempt to challenge the model based on non-compliance with the *Australian Groundwater Modelling Guidelines* or the Independent Expert Scientific Committee on Coal Seam Gas and Large Scale Coal Mining's explanatory note on uncertainty analysis in groundwater modelling,[48] with Dr Currell acknowledging also that the modelling appears to be consistent with applicable Victorian policy and guidance to the extent he was familiar with it.

45 Tabled Document 348, p. 8.

46 Ibid.

47 Ibid, cover page.

48 IESC, *Information Guidelines Explanatory Note: Uncertainty analysis – Guidance for groundwater modelling within a risk management framework* (2018).

125. Furthermore, the modelling has taken an appropriately conservative approach to modelling groundwater impacts:

a) In respect of mounding, the modelling has assumed that seepage from the tailings immediately reports to the regional groundwater table. In fact, as was agreed by all witnesses, this will not happen – seepage will in fact take time to traverse the distance between the pit bottom and the water table. Modelling contained in TN26 includes consideration of traversal and suggests actual mounding will be markedly less than predicted in the EES (7 – 0.35 L/s depending on conductivity, instead of the 53L/s estimated in the EES).[49] Nonetheless, the use of instant report in modelling is appropriate as it enables the identification of potential impacts that might not have been identified by a more 'realistic' (but still uncertain) assessment of mounding.

b) In respect of drawdown, drawdown was modelling for two scenarios, including a 'worst case' scenario of the Project being entirely reliant on groundwater for its life. This scenario included uncertainty analysis to assess the effect of different aquifer values on the extent of drawdown. Again, this is an appropriate modelling approach for the identification of potential impacts, as it is based on the plausible worst case.

Mounding

126. It is convenient to observe at the start that mounding *per se* is not a bad thing. More water in the ground is not automatically a negative outcome, especially as it can contribute to more water being able to be recovered by groundwater users accessing the regional groundwater table. Mounding only becomes a problem where it causes other issues, such as mobilisation of contamination.

127. In this regard, the apparent (or possible) position of the EPA that the tails, including coarse tails, should be maximally dewatered cannot be justified by the requirement under the General Environment Duty to prevent harm, save to the extent it is clearly demonstrated that there is likely to be a risk of harm attributable to the mounding.

[49] Tabled Document 393, p. 23.

128. One issue that Dr Webb identified is the issue of daylighting into active mine pits (he specifically eschewed any prospect of daylighting to natural ground level). As Mr Georgiou stated, and Dr Webb agreed, this issue is readily managed by standard mining infrastructure. Attempts by Council to portray this infrastructure as 'significant' or in any way unusual for a mining project are pure rhetoric.

Rainfall recharge

129. The only aspect of the mounding modelling that seems to have been directly challenged was the non-inclusion of rainfall recharge over active pits in the mounding calculations.

130. In light of the degree of conservatism in the modelling (demonstrated in TN26), there is nothing before the IAC that would justify concluding that the extent of rainfall is such that the modelled mounding does not provide an adequate basis for decision-making.

131. There is no reason to believe this outcome would be materially affected by climate change. As appeared to be agreed by the experts, the most likely outcome of climate change for South Eastern Australia is a drier climate with periods of more intense rainfall. To the extent there is a drier overall climate, this would imply less recharge rather than more. To the extent there were periods of intense rain, rainwater would not simply be left to seep into the ground. It would be captured by the same water recovery infrastructure used to manage ordinary seepage, supplemented, if necessary, by pumping.

Mobilisation

132. MFG did not take issue with the mounding modelling, but argued that the mounding would mobilise existing elevated levels of nutrients and metals in the Coongulmerang Formation and transport these toward the Mitchell River. This was not a concern identified by Dr Webb.

133. It was suggested by MFG, and Dr Currell in his written evidence, that this was a 'new path', although Dr Currell also characterised it as simply an increase in the rate of transport of nutrients and metals towards the Mitchell River. In cross-examination, he accepted that the existing fieldwork suggested that there was already a connection

between the Coongulmerang Formation and the Mitchell River. As a result, any mounding will not create a 'new path', but merely change the timing and potentially concentration of the arrival of those nutrients and metals.

134. Importantly, and despite MFG's submissions, Dr Currell did not suggest that this impact would be significant or unacceptable if occurred. Rather, he said that it could be insignificant. To the extent he expressed the view that the uncertainty was unacceptable (a word attributed to him by MFG, rather than actually used by him), this was on his basis that the acceptable level of uncertainty was determined by community concern, rather than risk analysis. This approach is not consistent with the framework established by the Scoping Requirements.

135. In this context, the modelling of groundwater mounding effects in the EES is sufficient to demonstrate that, even in dry conditions, the capacity of mobilisation of nutrients and metals to affect water quality in the Mitchell River is limited. Baseflow analysis forming part of the Groundwater Modelling Report, which was not challenged, suggests that, assuming (conservative) modelled mounding, the amount of water sent to the Mitchell River alluvium by the Project would increase by 0.725ML/day, equivalent to a 1 – 2% increase in flow rates under low flow conditions.[50] No reason has been identified as to why such a small increase in flows could affect river quality at a broad level. To the extent mobilisation occurs in wet conditions, the impact would be proportionally lower. In these circumstances, there is no basis for concluding that mobilisation will have unacceptable impacts on water quality in the Mitchell River.

136. Having said that, the Proponent accepts that it would be appropriate to require water quality monitoring, including at interception bores between the Project Area and the Mitchell River, to be established to ensure predicted outcomes (or better) are occurring and to allow for corrective action to be taken (which could include pumping water out) if significant departures from predictions are identified.

Drawdown

137. As noted, worst case drawdown was modelled on the basis of 15 years of pumping 3GL/yr. In reality, the extent of actual drawdown will depend on the extent to which

[50] Witness Statement of John Sweeney, [6.3.4]

the Project has to rely on groundwater. As Dr Webb and Dr Currell agreed, the less pumping that was required, the less drawdown that would occur.

138. To the extent that drawdown might affect other groundwater users, this can be addressed through either:

a) Compensation agreements under the MRSD Act for 'land affected' within the meaning of that Act; or

b) Conditions on any licence granted under the Water Act.

139. Council contended that there is no requirement under the MRSD Act to enter into compensation agreements. This is correct in respect of land that is not 'land affected,' but not in respect of 'land affected'. Section 42(5) of the MRSD Act makes it an offence to act on a mining licence before having registered compensation agreements in place with the owners of the 'land affected'.

140. Dr Currell expressed a concern that, despite the modelling, there might be potential for drawdown to propagate significantly in the upper aquifers utilised by other bore users. In part, this was said to be on the basis that the modelling had treated the Seaspray Group as homogenous, when it was in fact heterogenous. That statement is not correct.

141. The Seaspray Group was modelled, as it is, as a heterogenous body. This is depicted graphically in Figure 2.5 of Groundwater Modelling Report. It is also reflected in Table 4.1, which shows how different zones are modelled. Consequently, there is no reason to assume that the modelling of the aquifers artificially constrained drawdown.

142. One point of contention in relation to drawdown was the pumping test carried out by the Proponent. It is not in dispute that the pumping test was suboptimal as it ran for less than four days and there were design difficulties.[51] Nonetheless, this does not provide a reason to dismiss the modelling that has been done:

a) As agreed at the conclave, the pumping test was carried out in accordance with the Australian Standard, even if more could have been done.[52]

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51 Groundwater Conclave, 2.3 and 2.4.

52 Groundwater Conclave, 2.4.

b) As Dr Webb observed, there are 'many' projects were pumping tests are not carried out as part of the impact assessment,[53] and the fact that one was carried out at all was a positive. In this context, it is difficult to argue that a pumping test is a necessary part of impact assessment.

c) The pumping test is, as Mr Georgiou and Mr Middlemis pointed out, one piece of evidence among many. In terms of identifying aquifer parameters, it was supplemented by existing data and uncertainty analysis. Ultimately, it was agreed at conclave that the aquifer values used to model drawdown, including storativity and transmissivity, were appropriate.

d) Finally, it is worth reiterating that the level of drawdown that occurs will ultimately be driven by the extent to which the Project can access groundwater. In this context, the significance of any pumping test based on an assumption of maximal pumping is necessarily reduced.

Sensitive receptors other than the Mitchell River

143. Concern was expressed over the potential for the Project to impact on the Gippsland Lakes and the Perry Chain of Ponds.

144. No plausible mechanism has been identified by which the Project would materially impact on the Gippsland Lakes. Again, any contribution made by the Project to water flows in the Mitchell River is very small in the context of the broader catchment. However, it is appropriate for the flows from the Project Area to the River to be monitored and managed. This will assist in protecting the Lakes downstream.

145. In terms of the Perry Chain of Ponds, the only identified mechanism by which the Project could affect the Perry Chain of Ponds was on the basis of an unidentified and extensive area of low permeability which would allow mounding to traverse the 1.5km between the Project Area and the Chain of Ponds. No such area was identified and the conclave agreed that any areas of low permeability were likely to be smaller, rather than larger.[54] In these circumstances, it is considered that sufficient information is available

[53] Hearing Recording, day 17, 46:50 – 47:04: https://www.youtube.com/watch?v=vB1xhpK3d7U

[54] Groundwater Conclave, 1.7. Dr Webb also observed in his evidence that, based on the evidence, he considered areas of impermeability were 'probably not that extensive': Hearing Recording, day 17, 1:00:04: https://www.youtube.com/watch?v=vB1xhpK3d7U

to conclude the risk of impacts on the Perry Chain of Ponds is unlikely. This is also confirmed by the particle tracking, which suggested that groundwater does not travel towards the Chain of Ponds in any event.[55] Once more, however, the Proponent accepts that the groundwater monitoring plan should including monitoring requirements for the Chain of Ponds to ensure impacts do not reach it.

Acid sulphate soils

146. Under the heading 'Perching', the Council Part B Submission raises the issue of potential acid sulphate soils.[56] The risk of such soils occurring was evaluated in the EES in accordance with appropriate standards, and the prospect of such soils being found on site has been assessed as low. The suggestion of non-compliance with any relevant standard is not supported by the evidence, including that of Dr Webb and the conclave.

147. Nonetheless, consistent with the agreed expert position, the Proponent would consent to a requirement that contingencies be adopted for the identification of potential acid sulphate soils and appropriate responses, noting that Dr Webb agreed that there are well established management measures for acid sulphate soils.

Impact on surface water

148. The material before the IAC demonstrates that it is unlikely that the Project would have a significant impact on water quality in the Mitchell River. In fact, it was agreed at the conclave that surface water modelling was generally adequate and the offset measures for surface water were adequate.

149. Apart from the issue of mobilisation of water from the Coongulmerang Formation to the Mitchell River, addressed above, the other risk to surface water identified in the submissions of the represented parties was that of dam failure.

150. It is accepted that, if the water storage dam fails, this could have serious consequences. The Proponent is, however, committed to doing everything in its power to prevent dam failure. As indicated, all large dams will be required to comply with ANCOLD standards and non-large dams will also adhere to those standards as far as they can be

55 Groundwater Modelling Report, Appendix B to Appendix 6, p. 180, Figure 7.26.

56 Tabled Document 407 [195].

applied. These standards are designed to provide a substantial margin of safety and are not the type of standards commonly applied to farm dams.

Polyacrylamide in tailings

151. MFG argues that the use of polyacrylamides (**PAM**) as a flocculant in the centrifuges poses a health risk. The basis for this was the evidence of Dr Jasonsmith, who claimed that there was a risk that PAM might breakdown into toxic chemicals, presumably the neurotoxic monomer acrylamide, under anaerobic conditions.

152. This evidence cannot be accepted. Dr Jasonsmith conceded that she had not conducted a literature review on the issue of anaerobic degradation of PAM. To the extent she had done any research, she identified two articles in her statement in support of her hypothesis. Neither of these articles provided observational evidence of PAM degrading into acrylamide (or any other toxic chemical). Rather, they both referred to further articles. One of those further articles did not report the degradation of PAM into acrylamide. In fact, the reactions it described – notably deamination – are incompatible with the formation of acrylamide. The other article did describe generation of some quantity of acrylamide but under highly specific laboratory conditions, including a temperature of 35 degrees C and the use of specific inoculum. There is no reason to believe that the conditions at the bottom of a mine pit will in any way resemble these conditions (in particular, there simply will not be a custom designed inoculum).

153. Furthermore, Dr Jasonsmith was unable to identify how PAM could actually degrade into acrylamide. In particular, she offered no explanation of how the carbon–carbon double bond that is part of the chemical structure of acrylamide could be reformed in circumstances where PAM does not contain such a double bond.

154. In these circumstances, it is submitted that there is no basis for finding that there is any realistic prospect of PAM degrading into acrylamide under the types of anaerobic conditions likely to be experienced as part of this project.

155. Furthermore, and as alluded to by Mr Saracik, it should be noted that PAM has been endorsed by the National Health and Medical Research Council for use as a drinking

water treatment chemical,[57] and is in fact used for that purpose in the Woodglen Reservoir. Notably, the Drinking Water Treatment Chemical Fact Sheet for PAM contemplates the potential for residual amounts of acrylamide in PAM in drinking water. The Fact Sheet states:

> *Polyacrylamides contain varying residual amounts of unreacted acrylamide monomer.*
>
> *When employed in drinking water treatment, polyacrylamide should be used in such a way that any contaminants or by-products formed by the use of the chemical do not exceed guideline values in the Australian Drinking Water Guidelines.*[58]

156. Relevantly, the Chemical Characteristics Fact Sheet for acrylamide specifies a limit of 0.0002 mg/L for acrylamide,[59] while noting the WHO has a higher guideline limit of 0.0005mg/L.[60] It also observes:

> *When nonionic or anionic polyacrylamides are used in water treatment at a typical dose level of 1 mg/L, the maximum theoretical concentration of acrylamide has been estimated at 0.0005 mg/L, with practical concentrations 2–3 times lower. (Emphasis added.)*[61]

157. In this context, if the IAC wishes to take a precautionary approach, it could impose a condition requiring monitoring of seepage for the presence of acrylamide, with a requirement to take action if levels exceed Australian Drinking Water Guideline values.

Spring fed dams

158. The starting point for the assessment of the issue of spring fed dams is that there is no persuasive evidence before the IAC of the existence of any spring fed dams in the area.

159. Indeed, Dr Webb, in response to a question on behalf of Council, described consideration of mitigation measures for spring fed dams as 'speculative' for precisely this reason.

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57 *Australian Drinking Water Guidelines* (v 3.4, October 2017), 'Drinking Water Treatment Chemical Fact Sheet – Polyacrylamide', p.1068, at p. 1069.

58 Ibid, p. 1069.

59 Ibid, p. 365.

60 Ibid, p. 366.

61 Ibid, p. 365.

160. The only identifiable dam which is claimed to be spring fed is on 2705 Bairnsdale-Dargo Road, a property to which the Proponent has consistently been refused access. This identification occurs in a letter found in Dr Jasonsmith's expert evidence – notwithstanding that she was not called as a groundwater expert specifically – and even she describes it as 'anecdotal'.

161. Notwithstanding this, the Proponent is amenable to a process that requires it to consult with the community with a view to identifying and minimising impacts on spring fed dams to the extent reasonably practicable. In saying this, it should be recognised that it may not be practicable to protect any such dams within the Project Area itself, but owners of such land are entitled to a compensation agreement which could address compensation for loss of water.

Mitigation measures

162. There was comparative little dispute about the appropriate mitigation measures for water impacts. All the experts agreed that an adaptive management approach, incorporating monitoring, was an appropriate approach to managing the water impacts associated with the Project. In fact, Associate Professor agreed that adaptive management was the only way to address the uncertainty over climate change impacts[62] and described the proposed mitigation as 'as good as can be done'.[63]

163. Consequently, the Proponent has proposed conditions that would require the preparation of plans for the management of water impacts. It is anticipated that these plans would identify the number and location of monitoring bores, the triggers for responsive action, and the responsive actions to be taken if the triggers are met.

164. To the extent it is submitted that this kind of material needs to be before the IAC before it can make a decision, this should not be accepted. The precise design of the monitoring and mitigation regime is best approved by the relevant regulators on the basis of their specialist expertise.

165. In terms of potential responses to identified issues, Dr Webb acknowledged that methods existed for managing potential adverse impacts, particularly around

[62] Hearing Recording, day 14, 1:22:00 – 1:22:21: https://www.youtube.com/watch?v=lQWHl9dCug0

[63] Ibid, 1:23:07.

daylighting, mounding, and acid sulphate soils.[64] Dr Currell as also acknowledged methods exist for managing mounding, including intercepting lower quality water.[65]

BIODIVERSITY

Clearing of native vegetation

166. The Proponent does not understand there to be any significant dispute between experts over the overall extent of clearing expected, subject to any further avoidance or minimisation that may be able to be achieved. To the extent there are disputes over the precise demarcation of the EVCs to be cleared, the Ecology Expert Conclave agreed these disputes were less important than the overall extent of clearing.[66]

167. The total area to be cleared is, on the information currently available, 223.58 ha of patches of native vegetation, comprising mostly of two EVCs - Plains Grassy Forest (110.47ha, 49%) and Valley Grassy Forest (74.88ha, 33%), both with a conservation status of Vulnerable.[67] The balance (18%) is made up of Plains Grassy Woodland, Aquatic Herbland, Plains Grassy Wetland, Box Ironbark Forest, and Lowland Forest. Some 67.96 hectares of the vegetation to be cleared consists of additional regrowth which occurred after the original Ecological Impact Assessment.

168. A relatively small area (1.74 ha) of the Plains Grassy Woodland satisfies the requirements to be characterised as the EPBC Act listed threatened community Gippsland Red Gum Grassy Woodland and Associated Native Grassland.

Avoidance and minimisation

169. The avoid, minimise, offset framework is a well-established part of Victoria's native vegetation management framework which requires the application of a hierarchical approach where impacts are avoided, if possible, minimised where they cannot be avoided, and offset to the extent they cannot be avoided or minimised further.

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64 Hearing Recording, day 17, 40:46 – 1:04:12: https://www.youtube.com/watch?v=vB1xhpK3d7U

65 Hearing Recording, day 19, 2:06:50 – 2:07:49: https://www.youtube.com/watch?v=vB1xhpK3d7U

66 Tabled Document 238, p. 2-3.

67 It is acknowledged that the Ecological Impact Assessment lists Plains Grassy Forest as 'Endangered'. However, as Mr Lane identified, this is not correct. The document *Bioregional Conservation Status for each BioEVC* identifies the conservation status of Plains Grassy Forest in the Gippsland Plains Bioregion as 'Vulnerable'.

170. The obligation to avoid and minimise impacts is, however, qualified by an acknowledgment that avoidance and minimisation do not need to be undertaken to an extent that would undermine the objectives of the proposed use or development.[68] This is reflected in policy documents supporting the native vegetation management regime:

a) The Native Vegetation Guidelines describe the three-step approach required and state, relevantly,

> *An application to remove native vegetation must demonstrate or provide appropriate evidence to show that no options exist to avoid native vegetation removal, that will not undermine the objectives of the proposed use or development. (Emphasis added.)*[69]

b) Similarly, the Assessor's Handbook states that an application to clear native vegetation should be accompanied by an 'avoid and minimise' statement which should state that:

> *no feasible opportunities exist to further avoid and minimise impacts on native vegetation without undermining the key objectives of the proposal.*[70]

171. Here, the key objective of the Project is to mine the ore body within the Project Area. Due to the relatively shallow depth of the ore body beneath the ground surface, together with other technical and financial factors, that mining is required to be open cut. The result is that, as the Inquiry in considering the Murray Basin Stage 2 Mineral Sands observed, 'where a resource to be won is directly beneath native vegetation it is not practically possible in an open mine to avoid removing the native vegetation.'[71]

172. Having said that, the Proponent is continuing to refine the design of the Project avoid and minimise clearing where possible. In discussions with DELWP, the Proponent has

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68 Guidelines for the removal, destruction or lopping of native vegetation, available at: https://www.environment.vic.gov.au/__data/assets/pdf_file/0021/91146/Guidelines-for-the-removal,-destruction-or-lopping-of-native-vegetation,-2017.pdf;

Assessor's handbook: Applications to remove, destroy or lop native vegetation, available at: 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.

69 *Assessor's handbook: Applications to remove, destroy or lop native vegetation*

70 Ibid, p. 12.

71 Murray Basin Mineral Sands Stage 2 Project – Inquiry Report, September 2008, available at: https://s3.ap-southeast-2.amazonaws.com/hdp.au.prod.app.vic-engage.files/4716/2132/5255/373._Kalbar_-_Murray_Basin_Mineral_Sands_Stage_2_EES_Report.pdf, p. 50.

already identified a number of further potential avoidance opportunities. As set out in Tabled Document 592,

> *Kalbar are exploring several additional options to further avoid the removal of native vegetation (including patches and scattered remnant trees), and these include the Perry Gully (including patches of high-quality vegetation totalling an area of 23.56 hectares), an area of native vegetation in the south eastern corner of the project area (i.e. approximately 11.42 hectares), vegetation along Limpyers Road (approximately one hectare and 25 Large Trees), including several plants of the State significant Woollyheaded Pomaderris Pomaderris eriocephala, and vegetation in the northern part of the proposed mine area. …. There are also opportunities to avoid scattered native trees on the edge of the proposed mine footprint and the extent of any further avoidance will be determined during micro-siting measures.*[72]

173. If all of the quantified options identified above were able to be taken up, this would result in a reduction in the extent of overall clearing of approximately 15%, as well as avoiding impacts on State significant flora species.

174. Outside the Project Area, there is more scope to avoid impacts and these have been taken into account in developing the Project design, with the result being that only 1.63 ha of clearing is expected outside the Project Area.

175. Relevantly for the purposes of the Evaluation Objective, neither Mr Lane nor Mr Kern identified any specific avoidance or minimisation opportunities that had not been taken or that should be further explored.

176. The proposed controls for the Project require the Proponent to continue to explore any feasible options to avoid or minimise clearing and require the provision of an 'avoid and minimise' statement as part of any Native Vegetation Management Plan to be submitted to DELWP. DELWP would then either approve that NVMP on the ground that no further avoidance or minimisation was possible, or require further work to be undertaken.

Offsetting

177. Two issues were raised by Council and MFG regarding offsetting. These were:

a) The availability (or otherwise) of the required offsets; and

[72] Tabled Document 592, p. 5.

b) The timing for securing offsets.

178. In relation to the first matter, the evidence and material does not support a finding that the offsets are not available. Mr Lane's evidence rose no higher than that there were not sufficient credits on the register and that he, personally, was not satisfied that offsets could be obtained. Significantly, there is no evidence Mr Lane had, in any way, sought to determine for himself whether suitable offsets might or might not be available.

179. On the other hand, both Mr Organ and Mr Kern were confident that offsets could be obtained:

a) Mr Organ gave evidence that he was comfortable that the offsets could be obtained, which should be given weight given his initial involvement in negotiations and the experience of his firm as offset brokers (rather than merely assessors).

b) Mr Kern stated that not only were offsets available, but that they were available locally:

> *we do have some certainty that a lot of the credits that they need are present. This is the data from Mr. Organ, of course in the Biodiversity Offset Strategy, that a lot of credits required are already on the register. They've also identified several… a cluster of properties that of people they're talking to. The problem is… so they can demonstrate that the potential offsets are present... potential eligible offsets are present in the local area and across the State to some matter from the native vegetation credit register.*[73]

180. The fact that there are insufficient credits on the register says nothing about whether sufficient credits can in fact be obtained. There is no obligation on landholders to register all potential offset sites, and it is common for additional offsets to be sourced from outside the register when required.

181. The argument appeared to be that, in the absence of absolute certainty that the offsets existed and were available, there is a risk that the Project might proceed without obtaining the required offsets. However, the terms of clause 6 of the Incorporated Document and Work Plan would make this impossible because they would require all

73 Hearing Audio Recording, 3 June 2021, 52:34 – 54:32. Ellipses indicate pauses in speech.

the offsets for each stage of the Project to be obtained to the satisfaction of DELWP before clearing could occur for that stage. As a result, there is no prospect of uncompensated clearing occurring.

182. The same, or similar, logic applies to the argument that the Proponent should be required to secure all the offsets required for the Project prior to any clearing occurring. The basis for this argument seemed to be the risk identified by Mr Kern that if a staged approach was taken, there was a risk that the offsets relied upon for future stages of the Project might become unavailable over time. If that scenario were to occur, the Proponent would have to halt the Project, either permanently or until it could obtain the required offsets.

183. In reality, there is a powerful incentive for the Proponent to ensure that this does not occur, as it would disrupt the operation of the Project. The Proponent will seek to hedge the risk of offsets becoming unavailable by entering into option agreements with landholders to ensure that some, or even all, of the offsets continue to be available. It might even choose to fully secure those offsets ahead of them being required.

184. No persuasive reason, however, has been identified for compelling the Proponent to acquire all the offsets required for every stage of the Project before the Project even commences.

Assessment of significance

185. MFG and Council have both sought to argue that the extent of the clearing alone is sufficient to warrant refusal. This should not be accepted. Nothing in the planning scheme or the native vegetation framework establishes a hard cap on the extent of permissible clearing. As Mr Kern agreed, the acceptability of any clearing ultimately falls to be judged in the context of the merits of the Project as a whole.

186. In emphasising the extent of clearing, assertions were made about the impact being not 'normal'. The obvious question is what the benchmark for 'normal' is, especially where the clearing will be staged over a 15 year period. Considered over the life of the Project, the total clearing is equivalent to 15 ha per annum.

187. Beyond that, as Mr Kern appeared to agree, clearing is clearing. If 500 permit applications clear 0.5 ha each to accommodate $1m dwellings in rural zones, then the

overall effect would be greater than this $5b Project, notwithstanding that each act of clearing might by itself be small and might appear reasonable on its face. In this context, assertions about what is 'normal' or not are not of any assistance.

188. The staged nature of the clearing also helps to mitigate potential impacts in two ways:

- Due to the continuing nature of the obligation to avoid and minimise, it creates space to evaluate further avoidance opportunities as the Project proceeds. In this context, it is also relevant that the mitigation measures indicate that clearing should be staged in such a way as to retain as much connectivity as possible.

- It also means that, in the event the Project does cease unexpectedly, any vegetation expected to be cleared in subsequent stages will not be removed as part of the Project. While this is self-evident, it is relevant because it means this is not a development in which all the vegetation is cleared upfront and there is then a risk that the compensating benefits will never be realised.

189. Moreover, provided the offsets can be acquired as Mr Organ and Mr Kern believe they can, the policy objective of 'no net loss' will be satisfied (including in respect of large trees). To hold otherwise would be to undermine a fundamental precept of the Victorian native vegetation management framework.

190. In terms of the weight to be given to the clearing, MFG places significant emphasis on the conservation status of the EVCs to be removed. It is relevant to make two points about this:

a) First, the area of endangered (as opposed to vulnerable) vegetation to be removed is a relatively small component of the overall clearing, accounting for 11.12 ha.[74] This is important because the Assessor's Handbook identifies the fact that an EVC is not endangered as an indicator of lower biodiversity value for assessment purposes.[75]

[74] Again, it is appropriate to note that Plains Grassy Forest (EVC 151) is Vulnerable, rather than Endangered, in the Gippsland Plains Bioregion.

[75] *Assessor's handbook: Applications to remove, destroy or lop native vegetation*, Table 9, p. 43.

b) Second, it should be appreciated that conservation status for EVCs does not reflect extinction risk (as it does for taxa of flora and fauna), but rather decline in geographical extent relative to pre-1750 extent. The result is that an EVC may still be present in large quantities in a bioregion but be considered 'endangered' because its extent has been significantly reduced. For example, DELWP modelling indicates that there are in the order of 18,877.89 hectares of the endangered Plains Grassy Woodland in the Gippsland Plains Bioregion.[76] It is in this context that the removal of up to 9.91 ha of Plains Grassy Woodland EVC falls to be assessed.

191. Beyond that, it was Mr Organ's evidence, which was not meaningfully contested, that a very large proportion of the vegetation to be cleared (approximately 85%) was of low to moderate quality. Mr Kern's evidence statement also specifically acknowledged the 'limited' vegetation cover and its 'degraded' condition.[77] While much of the vegetation could serve as potential habitat for significant species, there was little evidence of it doing so.

192. Specifically in relation to the regrowth that occurred post-assessment, Mr Organ stated it consisted of:

> *67.96 hectares of highly modified secondary grassland [previously known as Degraded Treeless Vegetation under the former Victorian Native Vegetation Management Framework (NRE 2002)] were mapped across paddocks, primarily located adjacent to other patches of higher quality vegetation in the gullies that were previously mapped in EES Appendix A005 (Figures 2j, 2k, 2o, 2r, 2t, 2u, 2w and 2x) (Plates 1-6). Although these areas have been classified as Plains Grassy Forest, they are structurally and floristically deficient, and dominated by 3-4 species of native grasses (i.e. Weeping Grass Microlaena stipoides, Kangaroo Grass Themeda triandra, wallaby grasses and spear grasses) and generally lacked other lifeforms such as native trees, shrubs and herbs. However, the EVC cannot be accurately determined as the patches are highly modified and devoid of woody understory and overstorey species that are characteristic of an EVC. These areas have low ecological value and landscape function, are currently grazed by cattle, and are highly unlikely to support habitat for significant flora and fauna species.*[78]

193. This assessment was again not meaningfully contested.

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76 Table 23, Appendix A05.

77 Statement of Lincoln Kern, [2.6]

78 Tabled Document 290, section 3.1.

194. Mr Kern's contention was that, even in its degraded state, the vegetation to be cleared could potentially form the basis for ecological restoration. There is no evidence, however, that any restoration project is proposed for any of the land to be affected by the proposed clearing and the more plausible outcome is that, in the absence of the Project, the vegetation would continue to exist in its current state.

195. Overall, the Proponent accepts that a significant volume of vegetation is to be cleared but submits that having regard to the offsets to be provided and the mitigation measures to be adopted (including, as discussed below, the establishment of artificial hollows), as well as the broader benefits of the Project if it proceeds, the impact is acceptable.

Fauna impacts

196. The Biodiversity Evaluation Objective requires the Project to avoid and minimise impacts on significant fauna. It does not require avoidance or minimisation of impacts on more common taxa. Having said that, the proposed mitigation measures (including those in the Fauna Impact Mitigation and Landscape Plan or 'FIMPL'[79]) include a number of measures (including, for example, the establishment of ramps in trenches so that fauna do not become trapped, preclearing surveys) aimed at ensuring all wildlife is protected from adverse impacts as far as possible.

197. Mr Organ was not cross-examined on the topic of any further avoidance or minimisation opportunities and the experts were unanimous that the fauna surveys were appropriately carried out (which, relevantly, included surveys for the Giant Burrowing Frog).

Hollow bearing trees

198. The main issue raised in terms of impacts on fauna is the extent of loss of hollow bearing trees, with emphasis placed on the long timeframes for the reoccurrence of hollows in trees. Mr Kern was critical in his evidence of nest boxes as an inadequate response.

199. In terms of quantifying the impact, no hollow audit was undertaken for the EES, as the Scoping Requirements did not require an audit or any kind of arboricultural assessment.

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79 Tabled Document 592.

This is in contrast to, for example, the Scoping Requirements for North East Link and Yan Yean Stage 2, both of which required arboricultural assessments.

200. Nor does the Victorian native vegetation management framework require identification of hollows as part of assessments for clearing of native vegetation. This is because, as agreed by Mr Kern, the native vegetation framework in effect assumes that any tree that meets the criterion for a 'large tree' (based on EVC or species specific measures) has hollows. Importantly, the *Guidelines for the removal, destruction or lopping of native vegetation* (DELWP, 2017) specifically recognise the difficulty of replacing large trees in the short term and prescribe a response. The *Guidelines* state:

> *The presence or absence of large trees is used to determine the assessment pathway of an application to remove native vegetation (section 6). Large trees are often the oldest part of an ecological system and are difficult to replace in the short term. To address this and to ensure the protection of large trees in the landscape, when large trees are approved to be removed, the secured offset must include large trees (see section 5).*[80]

201. It may be accepted that Mr Kern and others may not regard this as a satisfactory regulatory response, but it remains the State's official regulatory response. Consequently, to the extent the Project does require the clearing of large trees, the Proponent will be required to ensure that any offset sites it nominates have an appropriate number of large trees.

202. In the event, the implied criticism that the impact of the Project is uncertain because of the absence of a tree hollow audit, reflects an attempt to superimpose additional requirements above and beyond those required of most other projects.

203. Nonetheless, the Ecological Impact Assessment recognised that any loss of hollow bearing trees would be an additional impact on top of the broader loss of habitat associated with clearing of native vegetation and thus undertook a qualitative assessment of the impact. This is found at 7.3.3 of the Ecological Impact Assessment.

204. In terms of mitigation measures, the first mitigation measure relied upon is the continuing obligation on the Project to avoid the removal of native vegetation

80 *Guidelines for the removal, destruction or lopping of native vegetation,* p. 8.

(including large hollow bearing and potentially hollow bearing trees) where possible. To the extent such removal can be avoided, this is the most effective solution.

205. Where impacts cannot be avoided, it is proposed to rely upon a combination of artificial hollows and nest boxes. This is identified in the Ecological Impact Assessment where one of the management measures for loss of hollow bearing trees is:

> *Where hollow-bearing trees are lost, salvaged or artificial hollows must be installed in retained vegetation adjacent to the project footprint (under the supervision of an ecologist to ensure appropriate site selection and minimise unintended impacts).*

206. This is also reflected in TE21 of the Mitigation Register, both as exhibited and subsequently amended, which provides:

> *Salvaged or artificial hollows will be installed (under the supervision of an ecologist) in retained vegetation adjacent to the project footprint where hollow-bearing trees are lost.*

207. 'Salvaged' hollows in this case are hollow bearing trees that, although they are required to be removed, are able to be situated elsewhere on nearby land and thus continue to provide a habitat function.

208. In this context, the assertion by MFG that no alternatives to nest boxes are proposed is demonstrably wrong.

209. Tabled Document 592 is a copy of a draft FIMLP, which provides more detail on mitigation of impacts on fauna. In respect of hollows, in particular, it provides:

> *Tree hollows represent a critical habitat resource in Australia landscapes. Protect and create hollow resource in both protection and rehabilitation zones as follows:*
>
> - *Install / create chainsaw hollows using qualified arborist where tree hollows are lacking. Design should be for arboreal species listed in the species factsheets. Chainsaw hollows should be the priority method for restoring the loss of tree hollows to improve fauna uptake following restoration.*
> - *Install hollows at a density of 10 hollows per hectare (including any retained hollows in live or dead trees).*
> - *Where tree hollows are lacking and chainsaw hollows are not feasible, install nest boxes designed for specific arboreal species.*

- *Nest boxes can be obtained from La Trobe Wildlife Sanctuary (03) 9479 1206 for a range of arboreal animals including:*
    - *Microbats.*
    - *Brushtail Possum.*
    - *Ringtail Possum.*
    - *Sugar Glider.*
    - *Phascogale/Antechinus.*
    - *Lorikeet/Rosella and Large Parrot.*
    - *Owl.*
    - *Kookaburra.*
- *Location of hollow resources should consider the following:*
    - *Install away from bright lights.*
    - *Install at least 3 metres above ground.*
    - *Hollows should face east.*
    - *One hollow per tree.*
- *Investigate use of new prosthetic hollows for Powerful Owl which are currently being trialled by Melbourne University.*

210. As can be seen, the FIMLP contemplates the creation of artificial hollows as the preferred approach to mitigation loss of hollows, with nest boxes to be used where artificial hollows are not feasible.

211. The use of artificial (or chainsaw) hollows is an increasingly popular response to some of the recognised limitations of nest box programmes. Recent research by Griffith et al.[81] and Terry et al.[82] suggests that artificial hollows carved directly into trees experienced similar levels of visitation by hollow-dependent species as naturally occurring hollows. Moreover, Griffith et al. suggest that it is possible to establish

[81] Griffith, Semmens, Watson, and Jones, 'Installing chainsaw-carved hollows in medium-sized live trees increases rates of visitation by hollow-dependent fauna' (2020) 28(5) *Restoration Ecology* 1225 – 1236. Available at: https://doi.org/10.1111/rec.13191

[82] Terry, Goldingay, and van der Ree, 'Can chainsaw carved hollows provide an effective solution to the loss of natural tree cavities for arboreal mammals?' (2021) *Forest Ecology and Management* 490. Available at: https://doi.org/10.1016/j.foreco.2021.119122

hollows in trees that do not meet the 'large tree' criterion for the relevant EVC, indicating the possibility to establish more hollows earlier than would be the case under normal conditions.[83]

212. Beyond that, Mr Kern's criticisms of nest boxes appears to have been directed primarily to 'unmanaged' nest boxes. It is accepted that there is a risk that, if nest boxes are not properly managed, they may not succeed in their goal of providing alternative habitat. It would be reasonable to require the FIMPL to be updated to impose establish an appropriate monitoring and management regime for the management of nest boxes.

Impacts on the Swift Parrot

213. It is appropriate to comment on the assertions made by MFG regarding impacts on the Swift Parrot, given that it concerns a Matter of National Environmental Significance. Put simply, there is no evidence to support a finding of any impact on the Swift Parrot, let alone a significant impact.

214. First, none of the experts – including Mr Kern – gave evidence that the Project would, or was even likely to, have a significant impact on the Swift Parrot. On its face, this makes the submission that the Project will in fact have a 'significant and unacceptable' impact wholly untenable.

215. Second, to the extent that vegetation in the Project area represents 'potential habitat' for the Swift Parrot, there is nothing to support the assertion that the vegetation comprises 'habitat critical to the survival of' the Swift Parrot:

a) The MFG submission accurately states that 'habitat critical to the survival of a species' is defined under the Commonwealth Significant Impact Guidelines:

> *Areas that are necessary … for activities such as foraging, breeding, roosting, or dispersal.*

b) Those Guidelines also state:

> *Such habitat may be, but is not limited to: habitat identified in a recovery plan for the species or ecological community as habitat critical for that species or ecological community; and/or habitat listed on the*

[83] Griffith et al (2020), Table 2, p. 1228.

Register of Critical Habitat maintained by the minister under the EPBC Act.

c) Accepting that the definition does not exhaustively define 'critical habitat', it is nonetheless significant that the National Recovery Plan for the Swift Parrot does define 'priority habitat', which it states is 'of particular importance' to conservation. The definition is:

> *[H]abitats which are used:*
>
> - *for nesting,*
> - *by large proportions of the Swift Parrot population,*
> - *repeatedly between seasons (site fidelity), or*
> - *for prolonged periods of time (site persistence).*

d) The last recorded sighting of a Swift Parrot near the Project area was in 1986, roughly 35 years ago. While this does not demonstrate absence (noting that, in practical terms, absence can never be established), it is inconsistent with the use of the vegetation by large proportions of the Swift Parrot population or with any assertions of site fidelity or persistence. This was accepted by Mr Kern.

e) Mr Kern also accepted that East Gippsland generally was not core habitat for the Swift Parrot. This is consistent with the National Recovery Plan which identifies the regional distribution of foraging habitat for the Swift Parrot across its mainland range and does not identify East Gippsland as part of that distribution.

f) In the absence of any evidence of use of the habitat to be cleared in the last three decades and in view of the fact that East Gippsland does not of itself constitute part of the core habitat for the Swift Parrot, it cannot credibly be argued that the vegetation to be cleared is 'necessary' for Swift Parrot foraging. It follows that the vegetation cannot be said to be 'critical habitat' for the purposes of the Significant Impact Guidelines.

216. Finally, insofar as MFG contends that the clearing of vegetation belonging to EVCs 55 and 61 will have a 'significant' impact on the Swift Parrot, this submission is also untenable:

a) First, while it is true that the National Recovery Plan identifies certain EVCs as containing habitat suitable for Swift Parrot, it does not assert, however, that these are the only EVCs that provide such habitat or that those particular EVCs have any especial role to play in the ecology of the Swift Parrot.

b) Second, those EVCs are present throughout Victoria in a range of different bioregions. The National Recovery Plan does not suggest that the EVCs as found in the Gippsland Plans Bioregion are of any particular significance. In fact, a fair reading of the National Recovery Plan suggests that EVCs are likely to be most important are those located in core habitat for the species which, as stated, does not include East Gippsland.

217. Further, the logic of MFG's submission – that any clearing of potential forage trees for the Swift Parrot is unacceptable – is inconsistent with recent State and Commonwealth decision-making:

a) At end of 2020, an IAC considered the proposed Stage 2 of the Yan Yean Road on the border of the Whittlesea and Nillumbik local government areas. The potential impact of that project on the Swift Parrot was a key issue in the proceeding.

b) As set out in Table 7 of the IAC report on the project, it was expected that the development of the project was likely to impact on 1,693 potential foraging trees, including 14 large preferred trees, 74 large secondary trees, 340 small preferred trees, and 1,165 small secondary trees.

c) Notwithstanding the quantity of trees to be removed, the IAC found that the project was unlikely to have a significant impact on the Swift Parrot.

d) It is apparent that the Commonwealth Minister agreed with this assessment because an EPBC Act approval was issued for the project in April of this year

with the only conditions relating to ensuring that fencing did not adversely impact on the Swift Parrot.

218. In these circumstances, there is simply no basis to assert that the Project will have a significant impact on the Swift Parrot, let alone an unacceptable impact.

The Giant Burrowing Frog

219. One of the submitters asserts that they have detected the presence of the Giant Burrowing Frog within the Project Area.

220. While the submitter in question was critical of the survey effort for the Giant Burrowing Frog, targeted surveys for the Giant Burrowing Frog were undertaken in accordance with approved survey standards from both the Commonwealth Department of Environment, Water, Heritage and the Arts (**Survey guidelines for Australia's threatened frogs**, 2010) and the Department of Environment, Land, Water and Planning (**Survey Standards: Giant Burrowing Frog, *Heleioporus australiacus***, 2011) and no Giant Burrowing Frogs were detected (either visually or aurally). This was agreed by Mr Lane and Mr Kern.

221. As observed in the Ecological Impact Assessment, a variety of approved survey methods were utilised to try to detect the Giant Burrowing Frog, including:

a) Searching for adult frogs while driving slowly along roads and tracks after rain during warm weather;

b) Advertisement call surveys; listening for calling males during the breeding season (although it is acknowledged that this is not typically a reliable survey technique given the cryptic nature of the species),

c) Dip netting for tadpoles; and;

d) Visual encounter surveys (active searching and spotlighting).

222. In addition, while the submitter took issue with the Ecological Impact Assessment's characterisation of the Project Area as being unlikely to support the Giant Burrowing Frog, this characterisation was shared by Mr Lane. In this supplementary evidence, Mr

Lane stated that he considered the Giant Burrowing Frog was unlikely to be present.[84] He confirmed in oral evidence that this was his view.

223. In evaluating the assertion that the submitter has detected the Giant Burrowing Frog, it is relevant to note the following facts:

a) First, the audio recording has not been provided to the IAC, Mr Organ, Mr Lane, or Mr Kern or to any relevant government department. This refusal is difficult to understand as merely providing a copy of the recording would not reveal anything about where it was taken, it would merely enable an assessment of whether the call belonged to the Giant Burrowing Frog, which is known to have a very distinct call.[85]

b) Second, facts critical to evaluating the plausibility of the recording have been deliberately withheld from the IAC and the parties. These facts include precisely where the recording is alleged to have come from.

c) Third, despite several claimed confirmations, no material evidencing any confirmation by any suitably qualified person has been forthcoming.

d) Fourth, the asserted response to the detection – that all work on the Project area must cease for a period of two years – is not supported by any relevant official standard, but would undoubtedly affect the capacity of the Project to proceed in the short term.

224. In these circumstances, the IAC is entitled to be, and should be, sceptical of any claim to have detected a notoriously cryptic species.

225. To the extent that the submitter has now uploaded his record to the Atlas of Living Australia, this should not be misunderstood as indicating that any verification of that record has taken place. The Atlas of Living Australia expressly does not verify records because it does not have the capacity to do so.

84 Supplementary Expert Witness Statement, p. 6, first bullet point.

85 As observed in the DELWP Survey Standards: Giant Burrowing Frog, *Heleioporus australiacus*

226. Ultimately, the issue of whether a Giant Burrowing Frog was detected on the land is significant if and only if the record can be properly confirmed, of which no evidence has been provided. As is well-known, even surveys conducted in accordance with relevant guidelines under optimal conditions cannot rule out the presence of particular species, particularly when those species are cryptic as the Giant Burrowing Frog is known to be.

227. The appropriate response, as Mr Lane agreed, is to have contingency measures in place such that, if the Giant Burrowing Frog is detected, appropriate action is taken. Such contingency plans are already contemplated in the mitigation measures proposed.

Groundwater dependent ecosystems

228. The impact of the Project on groundwater dependent ecosystems is discussed in the submissions on water related issues.

Further surveys

229. In light of the changes to the Threatened Species Advisory List identified by Mr Lane, it is appropriate to undertake further surveys to assess the presence of previously unlisted species.

230. In respect of other species identified as potentially present on the basis of searches using different areas than Mr Organ, both Mr Kern and Mr Lane agreed that the fact that desktop surveys have identified such species as present within 10km of the Project Area did not reflect any deficiency in the original search and survey work. Mr Kern in fact indicated that identification of additional species was a very common part of ecological practice.

231. In terms of additional flora species that may be present, the Proponent would accept a recommendation that additional flora surveys for species with a moderate or greater chance of being present on the Project Area be undertaken at an appropriate time of year prior to the submission of the NVMP to DELWP for approval. This would ensure that any additional significant species were identified before clearing commenced and would need to be considered in as part of the avoid and minimise statement.

AIR QUALITY

Documents

232. Key documents referred to in this section are:

Technical documents

a) EES Appendix A009, Air Quality and Greenhouse Gas Assessment (**AQG**)

b) Mr Welchman's evidence statement,[86] supplementary statement concerning centrifuges,[87] and second supplementary statement providing an updated GHG inventory accounting for introduction of centrifuges.[88]

c) TN04 (Sensitive Receptors)[89] (includes air modelling for R2004)

d) TN07 (Monthly maximum dust deposition tables)[90]

e) TN34 (Response to Council and IAC questions re. modelled dust sources / material fractions)

f) Tabled Document 339 'Kalbar commitment to Carbon Reduction at the Fingerboards

Mitigation and management documents

g) Kalbar's updated Mitigation Register (June 2021)[91]

h) Kalbar's updated Air Risk Treatment Plan (June 2021)[92]

i) Kalbar's mitigation reconciliation table for air (June 2021)[93]

86 Tabled Document 84.
87 Tabled Document 139.
88 Tabled Document 277.
89 Tabled Document 145 (revised 19 April 2021).
90 Tabled Document 146.
91 Tabled Document 505.
92 Tabled Document 506.
93 Tabled Document 598.

Regulator submissions

j) EPA EES submission[94]

k) EPA Part B submission[95]

Legislation, policy and guidelines

l) EPA Publication 1191, 'Protocol for Environmental Management (PEM) – Mining and Extractive Industries' (**PEM**)

m) Environment Reference Standard[96] under the *Environment Protection Act 2017*

n) Statement Environment Protection Policy (Ambient Air Quality) (SEPP AAQ)

o) Statement Environment Protection Policy (Air Quality Management) (SEPP **AQM**)

p) AS/NZS 3580.14:2014, Methods for sampling and analysis of ambient air - Meteorological monitoring for ambient air quality monitoring applications (**AS/NZS 3580**)

q) EPA Publication 1550, Construction of input meteorological data files for EPA Victoria's regulatory air pollution model (AERMOD) (October 2013)

r) EPA Publication 1551, Guidance notes for using the regulatory air pollution model AERMOD in Victoria (October 2013)

Overview

233. Katestone prepared the AQG and Mr Welchman, a director of Katestone and reviewer of the AQG, gave evidence to the IAC.

234. The AQG carried out a level 1 air quality assessment in accordance with the PEM. A level 1 assessment under the PEM requires 12 months of onsite ambient and

94 EES submission no. 514.

95 Tabled Document 486.

96 Gazetted 26 May 2021, Tabled Document 489.

meteorological monitoring data to be collected, with dispersion modelling conducted using the regulatory model, AERMOD.

235. The AQG predicted emissions against SEPP AQM / PEM criteria to the nearest receptors in the vicinity of the Project area, haul road and Fernbank East siding (generally drawing a 2km buffer around the Project area and some lesser distances from the haul road and siding).

236. For metals with no criteria under SEPP AQM or the PEM, the AQG adopted criteria based on the Texas Commission on Environmental Quality Effects Screening Levels (TCEQ ESL), as recommended by the independent peer reviewer and the EPA.[97]

237. The assessment modelled emissions associated with PM10, PM2.5, deposited dust, heavy metals, respirable crystalline silica and SOx and NOx.

238. The assessment modelled four discrete project stages - construction, year 5, year 8 and year 12. This was to capture a range of spatial operating scenarios and indicative worst case conditions.

239. Drawing on benchmarking studies from other mines (including two operating mineral sands mines), relevant industry guidelines and Katestone's own experience, the AQG identified 'standard' mitigations consistent with the best practice and the requirement of SEPP AQM to reduce emissions to the 'maximum extent achievable' for class 3 indicators.[98] The AQG also identified 'additional' mitigations to be adopted to reduce exceedances of PM10, 24hr criteria, being proactive and reactive measures to be adopted based on real time monitoring and weather forecasts.[99]

240. Examples of the real time monitoring, trigger levels and reactive management procedures that would be adopted are contained in the Draft Air Quality Management Plan (**Draft AQM**) at Appendix C of Mr Welchman's evidence. [100] The Draft AQM shows indicative monitoring equipment, monitoring locations and action trigger levels for weather and real time monitoring.

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97 See AQG, p 6 (pdf p 20).

98 AQG, section 3.4.2 (Mitigation Measures), p 35 (pdf p 50).

99 AQG. Table 13.

100 Tabled Document 84.

241. The AQG also calculated scope 1 and 2 greenhouse gas (GHG) emissions associated with the Project and identified mitigations to reduce GHG emissions were possible.

Air quality management

242. The philosophy for dust management from the Project includes standard mitigations incorporated into all practices, as well as proactive and reactive measures applied on an as needs basis, tied to weather forecasts and real time monitoring.

243. This approach is consistent with guidance provided in the PEM. For example, section 6.3 of the PEM concerns 'Monitoring for reactive management purpose'. It relevantly explains:

> "To ensure that the emissions from the site do not adversely impact sensitive locations, monitoring must be undertaken that allows for real-time reactive management practices to be implemented. This type of monitoring should be implemented for developments that have required a Level 1 or Level 2 assessment. This monitoring would be incorporated as part of the site environmental management plan. The need for ongoing monitoring would be reviewed at the end of each 12-month period and the site environmental management plan amended if required.
>
> This type of monitoring allows site managers to identify when a problem has arisen on the site that may lead to an exceedance of the 24-hour air quality criteria. It allows management practices on site to be implemented to reduce the level of dust being generated. This may involve increased use of water sprays, use of chemical suppressants, or under unfavourable meteorological conditions the relocation of active works away from sensitive locations or ceasing works for a few hours until more favourable conditions are experienced. Hourly trigger levels will be provided by EPA that will allow site managers to identify when a problem may be arising on site." (Emphasis added)

Best practice

244. Mr Welchman agreed in cross examination that a global requirement requiring best practice should be adopted, for example, defined as "the most practical and efficient processes or technology used in suppressing dust that demonstrably minimises the environmental impact of the activity being undertaken".[101]

[101] Hearing recording, day 9, 13 May 2021. Cross examination of Mr Welchman by the Council, from 3:34:17: https://www.youtube.com/watch?v=ttSmz2kXvgQ&t=3h34m17s

245. Kalbar supports this approach.

246. It is also relevant to note that the AQG sought to implement best practice, as required by SEPP AQM.

247. Section 3.4.2 of the AQG explained:

> "**3.4.2 Mitigation measures**
>
> The SEPP (AQM) requires the application of best practice control measures, and the PEM states that for Class 3 indicators, in addition to the application of best practice, emissions must be controlled to the MEA.
>
> The SEPP (AQM) defines best practice as:
>
> > The best combination of eco-efficient techniques, methods, processes or technology used in an industry sector or activity that demonstrably minimizes the environmental impact of a generator of emissions in that industry sector or activity.
>
> MEA is defined in the SEPP (AQM) as:
>
> > A degree of reduction in the emission of wastes from a particulate source that uses the most effective, practicable means to minimise the risk to human health from those emissions and is at least equivalent to or greater than that which can be achieved through application of best practice.
>
> Class 3 indicators include respirable crystalline silica, arsenic, radionuclides and some heavy metals. These may be emitted from all activities on-site except product haulage.
>
> Kalbar have committed to implementing a range of dust mitigation measures on a routine basis during construction and operations."

248. Benchmarking sources were listed in the AQM as follows:[102]

> "Best practice and MEA dust management measures have been identified through a review of:
>
> - NSW Coal Mining Benchmarking Study: International Best Practice Measures to Prevent and/or Minimise Emissions of Particulate Matter from Coal Mining (Katestone, 2011)

[102] AQG, p 35 (pdf p 50).

- Best Practice Dust Management Benchmarking Study – Maules Creek Coal Mine (Katestone, 2017)

- Air Quality and Dust Management Plan and Addendum, Keysbrook Mineral Sands Project (MBS Environmental, 2012; MZI Resources, 2013)

- Douglas Mine Environmental Management Plan (Iluka Resources Limited, 2003). Existing 'best practice' requirements under SEPPs provide another example."

249. Case studies for Keysbrook and Douglas were provided in Appendix F of the AQG.

250. EPA Publication 1517.1, 'Demonstrating Best Practice' (October 2017) provides guidance on the meaning of best practice as adopted in the former SEPPs. It explains:

> "**Best practice is preventative**
>
> Best practice contributes to ensuring that the proposed environmental impact is prevented, or minimised, as far as practicable. This may mean going beyond the general or overall minimum requirements of quantified standards. For example, where a risk assessment identifies a particular set of high risk air quality indicators, targeted best practice measures are needed, rather than mere compliance with the ground level concentration design criteria specified in SEPP (AQM).
>
> …
>
> **Best practice means undertaking all practicable measures**
>
> Decisions with regard to practicability, when assessing best practice, should have regard to technical, logistical and financial considerations. This is different from meeting absolute (quantified) limits set out in SEPPs or regulations, where cost is not a consideration in assessing compliance."

251. So far as assessment of a proposed project is concerned (as compared with enforcing an ongoing duty), the former statutory implementation of best practice is, at a high level, consistent with the new approaches embodied in the EP Act 2017. As Publication 1517.1 explains, best practice is about ensuring "environmental impact is prevented, or minimised, as far as practicable" and this "may mean going beyond the general or overall minimum requirements of quantified standards". This is an important context in considering how the EES assessments sit against the general environmental duty in the EP Act 2017.

Response to technical reviews

252. The AQG was reviewed by ERM (as peer reviewer engaged by DELWP), EPA and SLR (engaged by Council). The EPA was part of the TRG and was consulted on the ambient and meteorological monitoring design.

253. A brief response to EPA and SLR's reviews are set out below, as there is overlap with other issues raised with the IAC. The AQG responds directly to the ERM review,[103] and that response is not repeated here.

Response to EPA

254. The EPA has not raised any concern with the technical adequacy of the AQG.

255. EPA's EES submission included 10 specific recommendations concerning criteria and mitigations which Kalbar substantially adopted through its updated mitigation and management documents, relevantly:

a) Tabled Document 200 – first update to Air Risk Treatment Plan (March 2021)

b) Tabled Document 504 – updated EMF (July 2021)

c) Tabled Document 505 – updated Mitigation Register (July 2021)

d) Tabled Document 506 – further updated Air Risk Treatment Plan (July 2021).

256. EPA's Part B submission summarised its remaining issues as follows:[104]

> "54. Mr Welchman's written evidence responded to, and largely accepted, the EPA's recommendations. Provided the recommendations set out in his evidence are reflected in amendments to relevant project documentation, and noting that the Proponent has indicated its acceptance of these recommendations, then the key outstanding areas of dispute between the EPA and the Proponent on air quality impacts (excluding GHG emissions) are:
>
> (a) whether a vehicle speed limit of 10-20km an hour on sealed roads should be imposed;

[103] AQG, p 6 (pdf p 20). See also Katestone's response to the ERM review that was exhibited with the EES at Attachment J.

[104] Tabled Document 486.

(b) whether continuous visual observation monitoring is economically viable (there is no dispute that it should be required if it is); and

(c) the appropriate risk assessment categorisation for risk ID 37 and 38 as set out at pdf 55 of the revised draft Work Plan at Document 198."

257. EPA's Part B submission only included one "modified recommendation" for air quality, which concerned vehicle speed limits. Other than this, it is understood that its original recommendations stand (save for comments on drafting provided by the EPA more recently).[105]

258. EPA's Part B submission also recommended that control / management documents be updated to reflect the EP Act 2017. It said:[106]

"**Updated recommendation**:

The EPA recommends that all relevant documentation, including the EMF, mine Work Plan, Incorporated Document, Mitigation Register and Development Licence application be updated to reflect the new environment protection regulatory framework that applies from 1 July 2021. This is to include consistent reference to the *Environment Protection Act 2017* (not 2018 which is an amending act) and, where necessary reference to the general environmental duty, environmental protection regulations, the Environment Reference Standard and relevant EPA Publications."

259. Kalbar's response to each of these matters is set out below.

<u>AQ Rec 1 - Updated PM10 and PM2.5 criteria</u>

260. EPA's EES submission provided:[107]

"EPA recommends that the Airborne and Deposited Dust Risk Treatment Plan (Table 6- 1) 'Acceptance Criteria' be amended to include the following criteria: 25ug/m3 for PM2.5 and 50 ug/m3 for PM10. EPA also recommends that the Rehabilitation Plan (Table 7-1), under 'Rehabilitation amenity and environmental quality' be amended to include the following criteria: 25 ug/m3 for PM2.5 and 50 ug/m3 for PM10."

105 Tabled Documents 621-627.

106 At [15].

107 EPA EES submission (no. 514), p 19 (pdf p 21).

261. Kalbar included these updates in Tabled Document 200 (updated Air Risk Treatment Plan).[108]

Table 6-1: Acceptance criteria – airborne and deposited dust

Pollutant	Averaging period	Air quality design criteria	Source
PM_{10}	24 hours	~~60~~ 50 µg/m³	SEPP AAQ environmental quality objectives for 24-hour average concentrations~~EPA Protocol for Environmental Management (Mining and Extractive Industries).~~ Proposed Final ERS.
$PM_{2.5}$	24 hours	~~36~~ 25 µg/m³	SEPP AAQ environmental quality objectives for 24-hour average concentrations. Proposed Final ERS. ~~EPA Protocol for Environmental Management (Mining and Extractive Industries).~~

Figure 3 Extract from updated Air Risk Treatment Plan (TD200)

AQ Rec 2 - Further mitigations to achieve SEPP AAQ (now ERS) air quality objectives

262. EPA's EES submission provided:[109]

> "EPA recommends that the Airborne and Deposited Dust Risk Treatment Plan (Table 7-1) include further additional mitigation and management measures which can be implemented in years 5, 8 and 12 to reduce the number of exceedances against the SEPP AAQ environmental quality objectives."

263. The AQG provided mitigations which, when modelled, achieved compliance with all ERS standards already, save for PM10.

264. Katestone developed three additional mitigation scenarios to achieve the lower ERS standard for PM10 of 50ug/m3/24hrs[110] and these have been adopted by Kalbar in the updated mitigation register[111] and the acceptance criteria in the updated Air Risk Treatment Plan.[112]

AQ Rec 3 - Revise the PM10 dust trigger level from 150ug/m3/hr to 80ug/m3/hr

108 The rehabilitation plan document was not updated, however the criteria are adopted for the project in entirety.

109 EPA EES submission (no. 514), p 19 (pdf p 21).

110 Evidence statement of Simon Welchman, Tabled Document 84, section 4.1 (Assessment against SEPP AAQ environmental quality objectives), [59], p 11 (pdf p 15).

111 Tabled Document 505, AQ21.

112 Tabled Document 506.

AQ Rec 4 - EPA to be consulted on the development of the Project's air quality management and monitoring sub-plans.

265. EPA's EES submission provided:

> "EPA recommends that 1-hour average PM10 levels described in in the Airborne and Deposited Dust Risk Treatment Plan (Table 9-1) and the EMF (Table 12.9 Monitoring Programs — Air Quality) be amended to include a dust trigger level of 80ug/m3 rather 150mg/m3." [113]
>
> EPA recommends that the Airborne and Deposited Dust Risk Treatment Plan (Table 9- 1) and the EMF (Table 12.9 Monitoring Programs — Air Quality) be amended to include the following: EPA will be consulted on the development of the Project's air quality management and monitoring sub-plans. [114]

266. Kalbar included these updates in Tabled Document 200 (updated Air Risk Treatment Plan).

Table 9-1: Proposed monitoring for airborne and deposited particulates

#	Aspect to be monitored	Details of monitoring
1	1-hour average PM_{10}	Real-timing monitoring (1-hour average) of PM_{10} concentrations to be conducted at key sensitive receptor locations (whose positions will vary throughout the mining programme) to allow for changes in operation activities and locations that may impact the achievability of the 24-hour average health-based criteria. Assume minimum of 3 real-time PM10 monitors. Management action trigger level for hourly PM10 readings to be set at ~~150~~ 80 µg/m^3 (1 hr average reading). EPA will be consulted on the development of the Project's air quality management and monitoring sub-plans.

Figure 4 Extract from updated Air Risk Treatment Plan

AQ Rec 5- Wind speed trigger level of km/hr be amended to > 25km/hr

267. EPA's EES submission provided:[115]

> "EPA recommends that the wind speed trigger level of > 40 km/hr be amended to > 25 km/hr in the Airborne and Deposited Dust Risk Treatment Plan (Tables 7-1 and 9-1) and the EMF (Table 12.9 Monitoring Programs — Air Quality)."

113 EPA EES submission (no. 514), p 19 (pdf p 21).

114 EPA EES submission (no. 514), p 19 (pdf p 21).

115 EPA EES submission (no. 514), p 20 (pdf p 22).

268. Kalbar included these updates in Tabled Document 200 (updated Air Risk Treatment Plan).

4	Meteorological monitoring	At least hourly monitoring and recording of temperature, humidity, wind speed and direction. Alarms to be sent automatically to shift supervisor if average wind speeds exceed ~~40~~ 25 km/hr, to trigger management responses, including restricting operations if necessary.

Figure 5 Extract from updated Air Risk Treatment Plan

269. Interestingly, EPA cross examined Mr Welchman regarding a possible wind trigger level of 20km/hr cf. 25km/hr. Indeed, Mr Welchman's evidence at [76] referred to 20km/hr, however this appears to be a typographical error, given Mr Welchman was adopting EPA's original recommendation which was 25km/hr. Relevantly, at [76] Mr Welchman said:

> "76. A trigger level based on forecast light winds was also proposed. EPA has advised that a trigger level should be set for wind speeds of 20 km/hour. Kalbar has adopted this as a trigger to prompt additional dust mitigation. This trigger level would be reviewed and adjusted based on Kalbar's experience and obligations to improve outcomes."

270. Under cross examination Mr Welchman was agnostic as to the different values, saying:

> "The difference between 25 and 20? I don't necessarily see is substantial. The issue I think is really about - whether it's 20 or 25 it's about what do you do in response to that."

271. Ultimately, the Proponent does not have a strong preference whether the trigger level is 20 or 25, but it would appear that 25 was the value initially intended by the EPA.

AQ Rec 6 - vehicle speed limit on unsealed roads reduced from 50 km/hr to 10-20 km/hr.[116]

272. EPA's EES submission provided:[117]

> "EPA recommends that the vehicle speed limit of 50 km/hr on unsealed project roads as described in the Airborne and Deposited Dust Risk Treatment Plan (Table 7-1) be amended to 10-20 km/hr."

[116] EPA EES submission (no. 514), p 20 (pdf p 22).

[117] EPA EES submission (no. 514), p 20 (pdf p 22).

273. The EPA revised this recommendation in its Part B submission to only require 20km/hr within 500m of a sensitive receptor, relevantly:[118]

> "Modified recommendation (to replace 10-20 km/hr speed limit) "EPA recommends that the 50km/hr vehicle speed limit on unsealed project roads as described in the Airborne and Deposited Dust Risk Treatment Plan (Table 7-1) be amended to 20km/hr within 500m metres of sensitive areas and 50km/hr elsewhere."

274. EPA further revised this recommendation in Tabled Document 623 to reference 250m rather than 500m from sensitive receptors, and to apply further reductions in dusty conditions. The EPA's latest drafting provides:

> "Tiered speed limits will be implemented and enforced on unsealed project roads to minimise dust generation as follows:
>
> - under normal conditions, 20km/hr within 250 metres of sensitive areas and 50km/hr elsewhere
>
> - under dusty conditions, further reduce vehicle speed limit to the extent reasonably practicable to minimise dust emissions."

275. Prior to EPA's Part B (and Tabled Document 623), Kalbar revised this mitigation in line with Mr Welchman's evidence, as follows:

AQ04	Speed limits of 20 km/hr in the event of dusty conditions and 50 km/hr under normal conditions will be implemented and enforced on unsealed project roads to minimise dust generation -[evidence statement of Simon Welchman. [67], TN13 Item 99].

Figure 6 Extract from updated Mitigation Register, Tabled Document 505

276. Mr Welchman's mitigation requires reduced speeds even when further than 500m from a receptor in the event of dusty conditions.

277. Ultimately, this is not a significant point of difference with the EPA, and Kalbar could work with any of the approaches suggested (including because there are limited instances where mining is within 500m of a receptor). However, Kalbar considers that Mr Welchman's approach better aligns with the philosophy of dust management for the site which involves active management. In dusty conditions, 50km/hr might be too fast even when further than 500m from receptors (noting PM10 and PM2.5 can travel further than 500m) and 20km/hr may be too stringent in non dusty conditions (e.g.,

[118] At [56].

because dust suppression has been applied – either water (rain or trucked), or commercial products).[119]

278. In cross examination by EPA, Mr Welchman was shown photos of dust from vehicles travelling at different speeds and responded:[120]

> "I still come back to my earlier point that by applying suppressant the picture on the right, the 35 mile per hour figure, may not be occurring and therefore, it may be appropriate to drive at the greater speed."

279. Internal haul roads, where vehicles will travel at greater speed, will logically receive special attention for dust suppression. For example, mitigations include:

> "AQ02 Water or appropriate suppressants will be applied to working surfaces, stockpiles, haul roads and other areas where rehabilitation is not yet practical, to minimise dust generation, and in particular, during drier months."
>
> "AQ16 Dust generation from haul roads will be controlled by applying water or chemical suppressants, cessation of haulage during adverse weather conditions, and as required in response to real-time air quality monitoring."
>
> "AQ17 Construction of internal haul roads will use an optimal size grading of aggregate with road stabilisation and compaction agents."

280. The Proponent's preferred mitigation reflects its proposed proactive and reactive strategies that utilise forecast weather conditions and real-time monitoring data to schedule and/or adjust management measures, including in this case, vehicle speeds.[121]

<u>AQ Rec 7 - Continuous visual observation monitoring (e.g. video monitoring) of high dust generation activities.</u>[122]

281. EPA's EES submission provided:

> "EPA recommends that in addition to dust deposition monitoring, that continuous visual observation monitoring (e.g. video monitoring) of high dust generation activities be conducted. A commitment to this

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119 Such as the examples given in Tabled Documents 355, 356 and 357.

120 Hearing recording, day 9, 13 May 2021. Cross examination by EPA, from 4:18:07: https://www.youtube.com/watch?v=ttSmz2kXvgQ&t=4h18m07s

121 EES Attachment H, p.2.

122 EPA EES submission (no. 514), p. 20 (pdf p 22).

should be added to the Deposited Dust Risk Treatment Plan (Table 9-1) and the EMF (Table 12.9 Monitoring Programs — Air Quality)."

282. Kalbar adopted this recommendation in its updated Air Risk Treatment Plan.

9	Dust generation at source	Visual observation monitoring (e.g. video monitoring) of high dust generation activities [response to EPA submission, accepting that this will be economically viable, and otherwise in accordance with expert evidence of Simon Welchman, [68], TN13 100]

Figure 7 Extract from updated Air Risk Treatment Plan (Tabled Document 506)[123]

AQ Rec 8 - Update the likelihood rating for risks 37 and 38 (in the Work Plan) from 'unlikely' to 'possible'

283. EPA's EES submission provided:[124]

> EPA recommends that the rating for "likelihood over life of the activity" for risk lD's 37 and 38 in the Risk Management Plan Table (Attachment A to the draft Work Plan) be amended from "unlikely' to "possible" (before and after additional mitigation). Inherent risk, consequence and residual risk ratings will also need to be updated in the Risk Management Plan Table (Attachment A to the draft Work Plan) and Table 8-1 of the Deposited Dust Risk Treatment Plan to reflect this.

284. Kalbar accepts this recommendation. Whilst the Risk Management Plan Table will not be updated by Kalbar through this hearing, it supports a recommendation from the IAC that this adjustment be made in a work plan submitted to ERR for approval.

285. For context, these risks and associated mitigation measures are extracted in Figure 8 and Figure 9.

37	Airborne and deposited dust	Ground clearing, mining, materials handling, vehicular traffic	Exposure to airborne particulates (total particulates, PM10, PM2.5, crystalline silica) sensitive receptors exceeds human health guideline values

123 Updated Air Risk Treatment Plan, Tabled Document 506, Table 9-1 (Proposed monitoring for airborne and deposited particulates), item 9, pdf p. 16.

124 EPA EES submission (no. 514), p. 21 (pdf p. 23).

• Areas will be cleared in a staged manner only as required to reduce dust generation by minimising the area of exposed ground surfaces at any one time. (AQ01) • Water or appropriate suppressants will be applied to working surfaces, stockpiles, haul roads and other areas where rehabilitation is not yet practical, to minimise dust generation. In particular, during drier months when less rainfall is expected. (AQ02) • Drop heights for topsoil and overburden during creation of stockpiles will be minimised as far as practicable to reduce dust generation. (AQ03) • Topsoil stripping will be planned and conducted in consideration of forecast and actual weather conditions to minimise dust generation. (AQ05) • The mine void will be progressively backfilled and rehabilitated to minimise the area required for topsoil and overburden stockpiles . (AQ07)

Figure 8 Risk 37 and associated mitigations (Draft Work Plan Extract, pdf p 208)

38	Airborne and deposited dust	Wind erosion from disturbed surfaces and /or stockpiles	Exposure to airborne particulates (total particulates, PM10, PM2.5, crystalline silica) sensitive receptors exceeds human health guideline values

• Areas will be cleared in a staged manner only as required to reduce dust generation by minimising the area of exposed ground surfaces at any one time. (AQ01) • Water or appropriate suppressants will be applied to working surfaces, stockpiles, haul roads and other areas where rehabilitation is not yet practical, to minimise dust generation. In particular, during drier months when less rainfall is expected. (AQ02) • Drop heights for topsoil and overburden during creation of stockpiles will be minimised as far as practicable to reduce dust generation. (AQ03) • The mine void will be progressively backfilled and rehabilitated to minimise the area required for topsoil and overburden stockpiles . (AQ07) • Haul vehicles will travel on designated haul roads only and haul routes will be minimised where possible. (AQ08) • Topsoil stockpiles scheduled to be in place for four months or longer (or for an unknown duration) will be restricted to a height of 2 m and treated with a soil stabiliser, or revegetated immediately following their construction. (RH26)

Figure 9 Risk 38 and associated mitigations (Draft Work Plan Extract, pdf p 208)

AQ Rec 9 - Monitoring of rainwater tanks and dams

286. EPA's EES submission provided:[125]

> "EPA recommends that a commitment be described in the Airborne and Deposited Dust Risk Treatment Plan (Table 9-1) and the EMF (Table 12.9 Monitoring Programs — Air Quality) that the monitoring of rainwater tanks and dams be conducted for a minimum of twelve months prior to commencement of site works, and continue during construction and operation of the mine, to establish baseline data. Details of corrective actions should monitoring results exceed recommended health-based Australian Drinking Water Guideline limits should be described."

287. This recommendation has been accepted and implemented in updates to project documents (refer Figure 10, Figure 11 and Figure 12). Note that this recommendation was supported by both Mr Welchman and Mr Billingsley (with particular reference to

[125] EPA EES submission (no. 514), p. 21 (pdf p. 23).

Ra-226 and Ra-228 given the higher solubility of these radionuclides compared with U and Th).

Environmental aspect	Monitoring program (related key indicators in parentheses; refer to Table 12.6)
	– Visual observations to assess stability of waterways within or immediately adjacent to operational areas, taken at the furthest accessible downstream point within the mining licence area two-yearly and following major rainfall events (when 72-hour rainfall exceeds 136 mm, which corresponds approximately to a one in five year 72-hour event). Observations at Perry Gully, Simpson Gully, Lucas Creek, Long Marsh Gully, Moilun Creek and an unnamed tributary of Honeysuckle Creek (I25, I43, I44).
Air quality	[Further details of monitoring is contained in the Draft Air Quality Management Plan at Appendix C of the expert evidence statement of Simon Welchman, see sections 7 (Air Quality and Meteorological Monitoring Program) and section 8 (Trigger Action Response Plan)] • General requirements: – Record particulate matter (PM_{10} and $PM_{2.5}$ and respirable crystalline silica, gross alpha and beta radiation and heavy metals) (I1, I31, I33). – Record meteorological conditions in project area (with alarms sent automatically to the shift supervisor if average wind speeds exceed 40 km/hour, to trigger management responses, including restricting operations where necessary) (I1, I31, I33). – Record dust deposition rates (at least three downwind and two upwind locations) (I1, I31, I33). – Sample and analysis of rainwater tanks for total and dissolved metals and suspended solids, and comparison against pre-mining concentrations (I1, I31, I33). – Record complaints and responses in accordance with the complaints handling policy and procedure (I33). • Specific requirements and timing: – One-hour average concentration of PM_{10}: Real-time monitoring (1-hour average) of PM_{10} concentrations at key sensitive receptor locations (positions will vary throughout the project) to allow for changes in operational activities and locations that may impact the achievability of the 24-hour average health-based criteria. A minimum of three real-time PM_{10} monitors is likely to be required. The management action trigger level for hourly PM_{10} readings will be set at ~~150~~ 80 µg/m³ (1 hour average reading) (I1, I31, I33). [evidence statement of Simon Welchman, [65, TN13 Item 97] – Twenty-four-hour average concentrations of PM10 and PM2.5, and weekly analysis of PM10 and PM2.5 filters for respirable crystalline silica, gross alpha and beta radiation and heavy metals. Continuous monitoring will be conducted during construction and operations at locations representative of sensitive receptors likely to experience the highest particulate concentrations (monitoring locations will change, depending upon the locations of mining activities). A network of no fewer than five particulate monitoring stations is likely to be required (I1, I31, I33). – At least hourly monitoring and recording of temperature, humidity, wind speed and direction (I1, I31, I33). – Continuous dust deposition monitoring upwind and downwind of active mining areas to determine monthly average dust deposition rates (I1, I31, I33). – ~~Quarterly sampling of water in rainwater tanks at a minimum of 13 locations (assuming landholders grant access) prior to construction and during operations (I1, I31, I33).~~ Rainwater tanks to be monitored for a minimum of twelve months prior to commencement of site works to establish baseline data. Monitoring to continue during construction and operation of the mine. Corrective actions should be implemented if monitoring results exceed recommended health-based Australian Drinking Water Guideline limits. Analysis should include metals, suspended solids concentrations, Ra-226 and Ra-228 relative to pre-mining concentrations. [expert evidence of Simon Welchman, [71], TN13 Item 102; re radium, see expert evidence of Darren Billingsley, [8.4] and TN13, Item 102]

Figure 10 EMF update (Tabled Document 504, pdf p 42) - rainwater tank monitoring (last point)

6	Total and dissolved metals and suspended solids in rainwater tanks and dams	Rainwater tanks to be monitored ~~quarterly~~ for a minimum of twelve months prior to commencement of site works to establish baseline data, and continue during construction and operation of the mine. Corrective actions that should be implemented if monitoring results exceed recommended health-based Australian Drinking Water Guideline limits. Analysis should include ~~at a minimum of 13 locations (assuming landholders grant access) prior to construction and during operations to check~~ metals and suspended solids concentrations, relative to pre-mining concentrations. In the event of an incident, or if inspections or monitoring results indicate that performance requirements are not being achieved, corrective actions would be enacted and may include any or all of the following: • Immediately stop work where required. • Complete incident report and investigations. • Report to regulatory authorities as required (with notice of proposed corrective actions where relevant). • Investigate cause of exceedance or issue, including review of relevant monitoring data and effectiveness of implemented corrective actions (if any). • Implement corrective actions as appropriate to prevent recurrence. • Undertake maintenance as required. Notify regulatory authorities of corrective actions implemented and outcome as applicable. [additions in accordance with expert evidence of Simon Welchman, [71], TN13 Item 102]

Figure 11 Air Risk Treatment Plan (updated) – monitoring requirements (extract)[126]

AQ22	Corrective actions must be implemented, and authorities notified, if rainwater monitoring at surrounding properties (carried out in accordance with EMF Chapter 12, Table 12.9 – baseline and operational) exceeds Australian Drinking Water Guideline limits). [expert evidence of Simon Welchman, [71], TN13 Item 102. See also Airborne and Deposited Dust Risk Treatment Plan, Table 9-1, Item 6]

Figure 12 Mitigation Register (updated) (Tabled Document 505)

AQ Rec 10 - Monitoring (sampling and testing) of dust deposited on horticultural crops grown near the project site

288. In reviewing the HHIA's synthesis of the AQG, the EPA was of the view that dust from the Project would be unlikely to adversely affect the integrity of crops grown or human health.

289. Note that the human health implications of metals and metalloids in deposited dust were further explored and quantified through TN19 which supports the EPA's view on this issue.

290. The EPA's EES submission relevantly explained:[127]

> "**6.3.4 Horticultural Crops**
>
> Assessments of dust deposition on crops and its associated potential for impacts to the integrity of crops as well as human health was undertaken as outlined in Appendix A019, Human Health Risk Assessment. The Human Health Risk Assessment section 9.1.4 concludes that:
>
> > *A dust deposition rate of 0.1 g/m2 per month was estimated in the crop farming areas associated with project activities based on dust modelling (Katestone, 2020). When combined with background dust deposition in this area, the annual measured deposition rate of 1.0 g/m2 per month was below the Tier 1 assessment criteria of 4.0 g/m2 per month; and*
> >
> > *The increased doses [of radiation] are not considered to be significant based on a comparison of the estimated doses for the years following commencement of project operations with those calculated as baseline intakes (current exposures). In addition, when considering the variation in natural radioactivity levels encountered in soils worldwide, the impact*

[126] Tabled Document 506, Table 9-1 (Proposed monitoring for airborne and deposited particulates), pdf p 16.

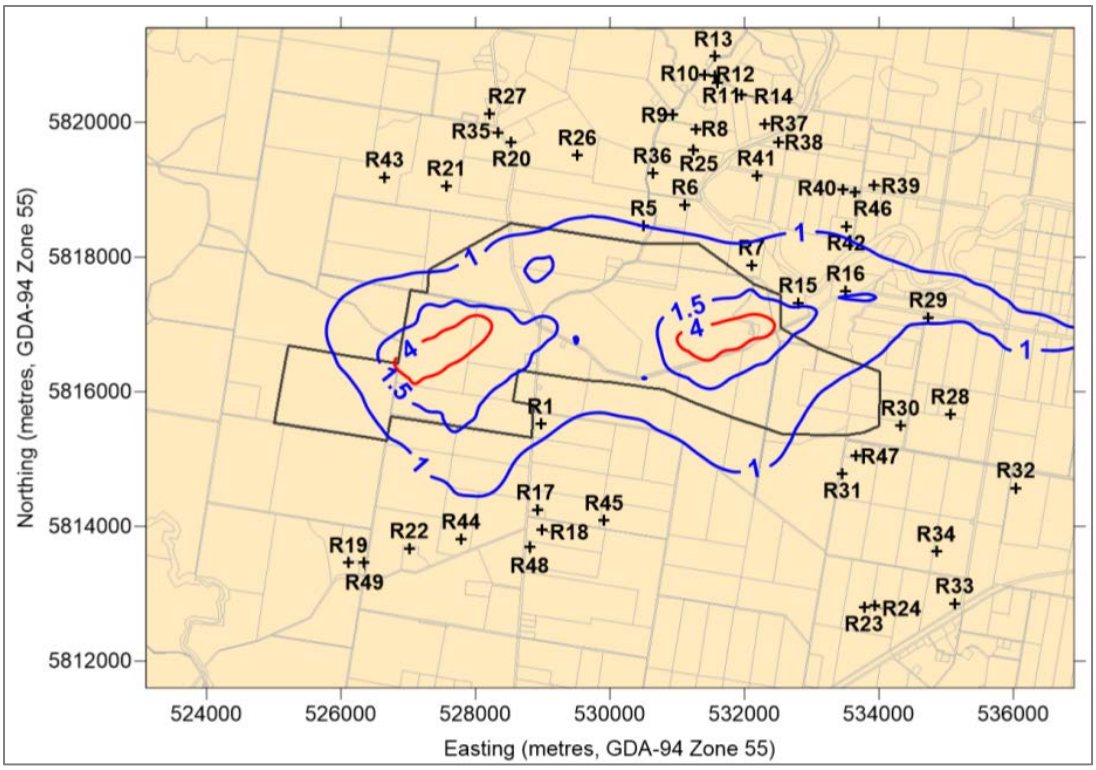
[127] EES submission 514, pp 21-22.

is negligible of dust deposition on existing soil concentrations as a result of emissions predicted from project activities.

Based on the information provided in the Human Health Risk Assessment, EPA does not expect dust from the Project to adversely affect the integrity of crops grown or human health. However, EPA recommends, as a precautionary measure, that periodic monitoring (sampling and testing) of dust deposited on horticultural crops grown near the project site be carried out."

291. The Proponent adopts this summary and its conclusions.

292. The very low levels of deposited dust offsite, including in the horticultural area, can be seen in the deposited dust contours extracted in Figure 13, Figure 15 and Figure 16 below. The contours are for the project contribution plus background. Accordingly, it is necessary to subtract the assumed background level of 0.89 g/m2/month from each contour to ascertain the project contribution.[128] Thus, the 1g contour represents a 0.11g/m2/month contribution from the project.[129]



[128] Table 12 of the EES Air Quality Technical Study (A009), p. 27 (pdf p. 42).

[129] Measured from 13 September 2017 to 13 September 2018 (1 year) at the onsite monitoring station. The full data is reported in Table 3 of the EES Air Quality Technical Study (A009), p. 26 (pdf p. 41).

Figure 13 Dust deposition contours, year 5, g/m2/month (annual average) – project + ambient[130]

Plate 8	Year 5 – Standard Mitigation – Annual average dust deposition rates due to the Project plus ambient background level		
Location: East Gippsland, Victoria	**Averaging period:** 1-year	**Data source:** AERMOD	**Units:** g/m²/month
Type: Average contour	**Design criterion:** 4 g/m²/month	**Prepared by:** Tania Haigh	**Date:** February 2019

Figure 14 Extract of caption associated with Plate 8 (as illustration)

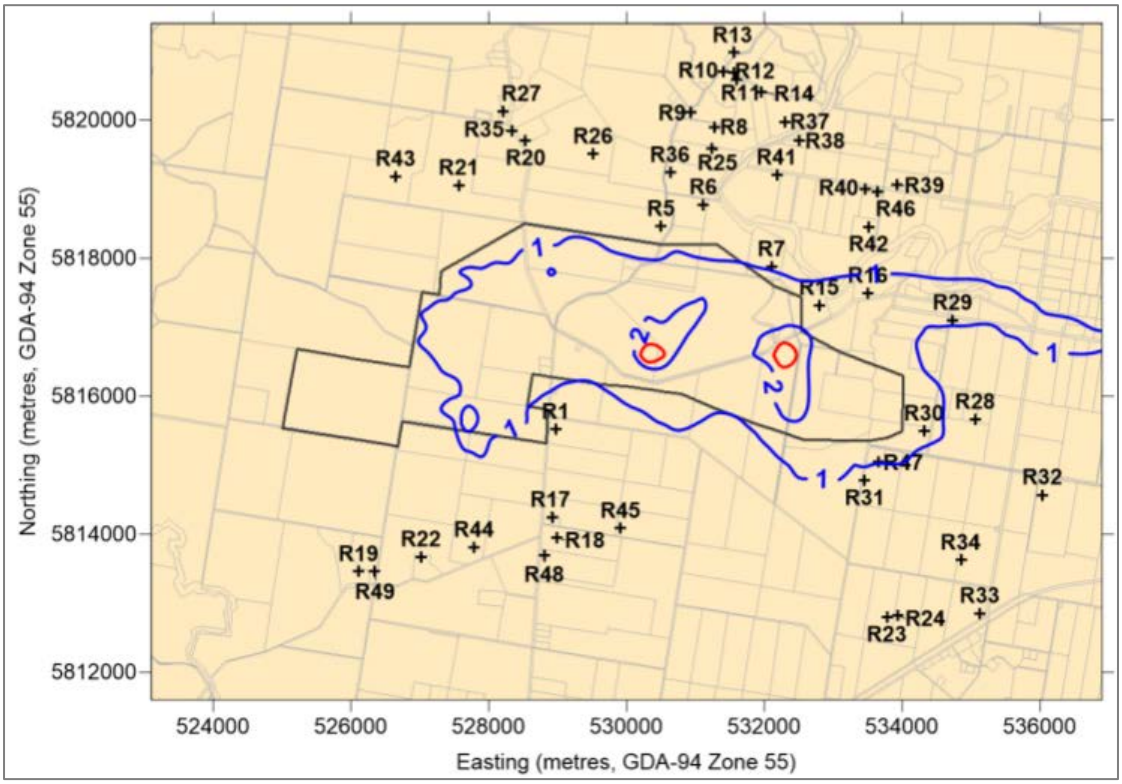


Figure 15 Dust deposition contours, year 8, g/m2/month (annual average) – project + ambient[131]

130 EES Air Quality Technical Study (A009) extract of Plate 7 (Year 12 – Standard Mitigation – Annual average dust deposition rates due to the Project plus ambient background level), p. 103 (pdf p. 118).

131 EES Air Quality Technical Study (A009) extract of Plate 14 (Year 12 – Standard Mitigation – Annual average dust deposition rates due to the Project plus ambient background level), p. 116 (pdf p. 131).

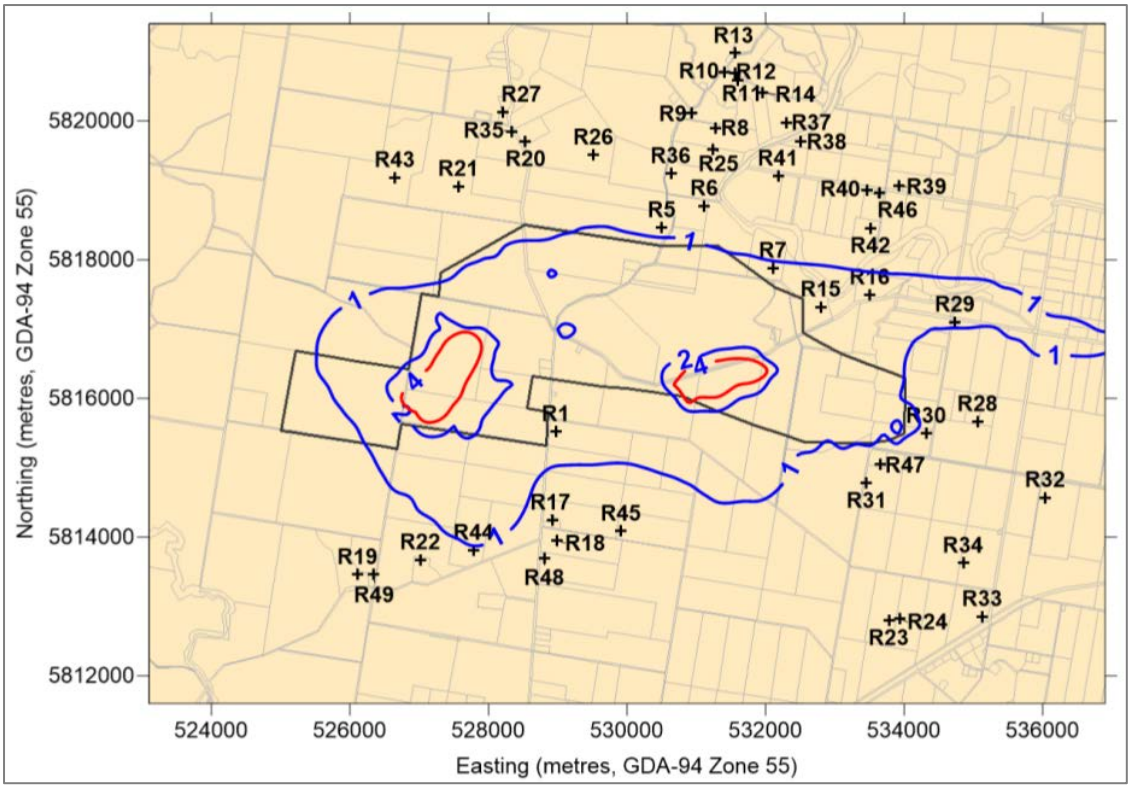


Figure 16 Dust deposition contours, year 12, g/m2/month (annual average) – project + ambient[132]

293. The EPA's recommendation for deposited dust on crops was to undertake monitoring and consultation, as follows:[133]

> "EPA recommends that a commitment be included in the Airborne and Deposited Dust Risk Treatment Plan (Tables 7-1 and 9-1) and the EMF (Table 12.9 Monitoring Programs — Air Quality) that periodic monitoring of deposited dust on nearby crops be conducted to validate the assumptions of dust assessments described in the Human Health Risk Assessment. The frequency and period of this monitoring should be agreed to with the local farmers and Community Reference Group. In the event that monitoring results show a likely risk to crop integrity and/or human health, the proponent should carry out required remedial action in consultation with local farmers and the Community Reference Group."

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132 EES Air Quality Technical Study (A009) extract of Plate 14 (Year 12 – Standard Mitigation – Annual average dust deposition rates due to the Project plus ambient background level), p. 110 (pdf p. 125).

133 EPA EES submission (no. 514), p. 22 (pdf p. 24).

294. This recommendation was adopted in the updated Air Risk Treatment Plan (Tabled Document 506).

8	Periodic monitoring of deposited dust on nearby crops to validate the assumptions of dust assessments described in the Human Health Risk Assessment.	Local horticultural and agricultural producers and the Environmental Review Committee will be consulted to determine the frequency of this monitoring and the duration of the monitoring program.

Figure 17 Air Risk Treatment Plan extract (Tabled Document 506, Table 9-1, pdf p. 15)

295. Further, Kalbar's updated EMF (Tabled Document 504) added the following:

> "Periodic monitoring during construction and operations of deposited dust on crops and soils in the neighbouring Lindenow Valley horticulture area".

296. These references do not state what metrics will be sampled / tested, although Item 8 of the Air Risk Treatment Plan (extracted above) refers to monitoring to "validate the assumptions of dust assessments described in the Human Health Risk Assessment." Accordingly, it would be appropriate to further refine this monitoring requirement to provide that it must include gross alpha and beta radiation and heavy metals / metalloids.

Response to SLR review

297. SLR undertook a review of the AQG on behalf of the Council.[134]

298. It did not list air quality as one of the 'key areas of concern' that it identified with the EES.[135]

299. The principal elements of SLR's technical review of air quality are provided at its Table 11.

300. The SLR review identified no gaps or areas for comment in relation to:

a) physical and chemical characteristics of material(s) to be mined;

b) sensitive receptors;

134 Attached to Council's EES Submission, submission no. 716.

135 See *SLR EES Targeted Technical Review*, section 2.1 (Key Areas of Concern).

c) characterisation of background radiation (in dust);

d) emissions estimation; and

e) management and mitigation measures (SLR queried practicality of large scale slow down for reactive dust reduction, but raised no concern with technical basis of the management and mitigation proposed).[136]

301. The only issues of substance raised were:

a) SEPP (AAQ) 2025 reduced PM2.5 criterion (note these were adopted in Tabled Document 202 in response to EPA's EES submission).

b) Gap filling in the ambient data set (discussed further below).

c) Non presentation of grid receptors (although contour plots were shown)[137]

d) Applying the dust deposition criterion of 4 g/m2/month (2 g/m2/month over background) based on yearly averaged calculations (then scaled back to monthly figures) rather than as a month by month limit (maximum monthly figures were subsequently presented by Katestone in TN07 (**Predicted dust deposition rates**) showing values well below the PEM criteria assessed on a month by month basis).[138]

302. The summary of 'key concerns for Council' at the end of SLR's table listed only two matters (Figure 18).

Question / Aspect	Report Reference	High-Level Summary	Gaps / Comments

…

Key Concerns for Council			
What are the key risk issues?		• Compliance with relevant assessment criteria is predicted for all key indicators of air quality, with the exception of PM10 for which there is the potential for non-compliance with the 24-hour criterion at nearby sensitive receptors during abnormal meteorological conditions (up to four days per year).	• The assessment finds that substantial mitigation measures (e.g. ceasing some operations) may be required to avoid exceedances of the 24-hour PM10 air quality criterion under certain meteorological conditions. These mitigation measures should be documented as part of the management plan along with the trigger for their application (e.g. forecast high winds from directions that would increase the risk of impacts at identified receptors).
Are the proposed EPRs adequate?	EES Chapter 12	• Key indicators of air quality against the EES scoping requirements draft evaluation criteria are considered adequate. • The development of subplans including an airborne and deposited dust risk treatment plan, general and specific monitoring requirements, mine closure targets and criteria and ongoing monitoring and review of mine closure activities are all considered adequate with regard to air quality.	• No gaps/issues identified

136 See rows 7 and 8 in SLR's Table 11.

137 See plates 1-21 in the AQG.

138 Tabled Document 146.

Figure 18 Extract from SLR Table 11 – 'Key concerns for Council

303. The first concern related to the practicality of reactive management to reduce PM10, 24 hour exceedances. As explained above, reactive management based on real time monitoring, weather forecasts and the like are accepted and supportable measures under the PEM.

304. The second row under 'key concerns for Council' asked "Are the proposed EPRs adequate?" to which SLR answered "criteria are considered adequate", management plans / mitigations etc. "are all considered adequate" and then as a conclusion on this issue "No gaps / issues identified".

305. The Council purported to cross examine Mr Welchman in part "on the basis of some work done by SLR",[139] however several of the matters raised during the cross-examination were not concerns identified by SLR, notably:

a) The siting of the weather station and whether it complied with AS/NZS 3580.14:2014[140]

b) The use of one weather station versus multiple (relatedly, the suitability of using AERMOD which only uses one station).[141]

c) The predominance of south westerly winds[142] (and asserted inconsistency with Bairnsdale and Mt Moornapa data).[143] Notably, the AQG considered these comparisons in detail and SLR made no mention of this as an issue.

d) Material placement within Perry Gully[144] (see Katestone response in TN34)[145]

e) Weekend stockpiling of centrifuge cake[146] (see Katestone response in TN34).[147]

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139 Hearing recording, day 9, 13 May 2021. Cross examination of Mr Welchman by Council, from 3:09:44: https://www.youtube.com/watch?v=ttSmz2kXvgQ&t=3h9m44s

140 13 May 2021, 3:38:48.

141 The thrust of this criticism is captured in Council's Part B Submission at [238].

142 13 May 2021, 3:42:43.

143 AQG, pp 135-136.

144 13 May 2021, 3:21:36.

145 Tabled Document 534.

146 13 May 2021, 3:25:18.

147 Tabled Document 534.

306. Kalbar submits the IAC should infer from this that SLR had no technical concerns with these matters.

Other issues

Meteorological monitoring issues

South westerly winds

307. Mr Welchman was cross examined about the predominance of south westerly winds, and this issue was also raised in written submissions.

308. The Council's Part B Submission relevantly states:

> "238 Mr Welchman, for his part, dismissed the knowledge of locals – farmers – in respect of the predominance of south-westerly winds as being relevant to what winds are likely to do on and off site, relying instead on the one station established on the Project area itself. … In a situation like this, with a station in a depression (and therefore measuring winds at less than 10 metres above the predominant height of the landscape), with a row of trees down the side, and which produced a set of results very roundly disagreed with by the local community, it would be appropriate to pause and reconsider the measurements undertaken."

309. MFG drew comparisons with BOM data from Bairnsdale and Mt Moornapa,[148] as did the Council in cross examination (refer below).

310. The AQG compared BOM data for Bairnsdale and Mt Moornapa with site data (measured and TAPM).[149]

311. These sources were compared in terms of speed and direction. Extracts from Appendix A are provided in Figure 19 and Figure 20.

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148 See MFG EES Submission (no. 514), pp 200-202 (pdf pp 199-203); MFG hearing submission (delivered by Mr Barton, Tabled Document 473, p 12 (pdf p 12). See also references in the MFG EES submission to p 197 "The potential for contaminated dust from the mine carried by the prevailing south-westerly winds"; p 244 (referring to BOM data for Bairnsdale, 1 October 2018 to 30 September 2019) "Typically the direction of the peak gusts was south-westerly, which would propel dust raised in the direction of the vegetable areas of the Lindenow flats".

149 AQG, Appendix A.

312. Wind speeds are higher at Bairnsdale than at the site and Mt Moornapa (Figure 19).

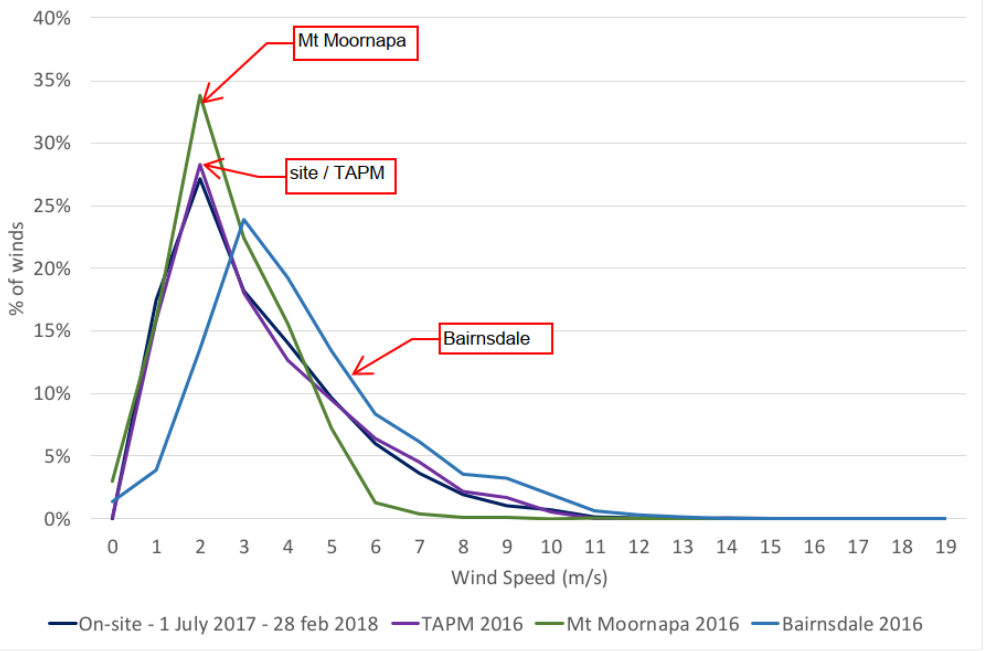

Figure A3 **Wind speed distributions from on-site monitoring station (1 July 2017 – 28 February 2018), TAPM (2016) and the BoM monitoring stations at Mount Moornapa and Bairnsdale (2016)**

Figure 19 Extract from AQG, Appendix A, p. 121, (pdf p. 136)

313. The wind direction comparison is extracted in Figure 20 (south-westerly angle, 247.5 degrees, annotated for reference). The site has a greater percentage of south westerly winds than either Bairnsdale or Mt Moornapa. The TAPM data (used for gap filling) has an even greater percentage of south westerly winds than all sources.

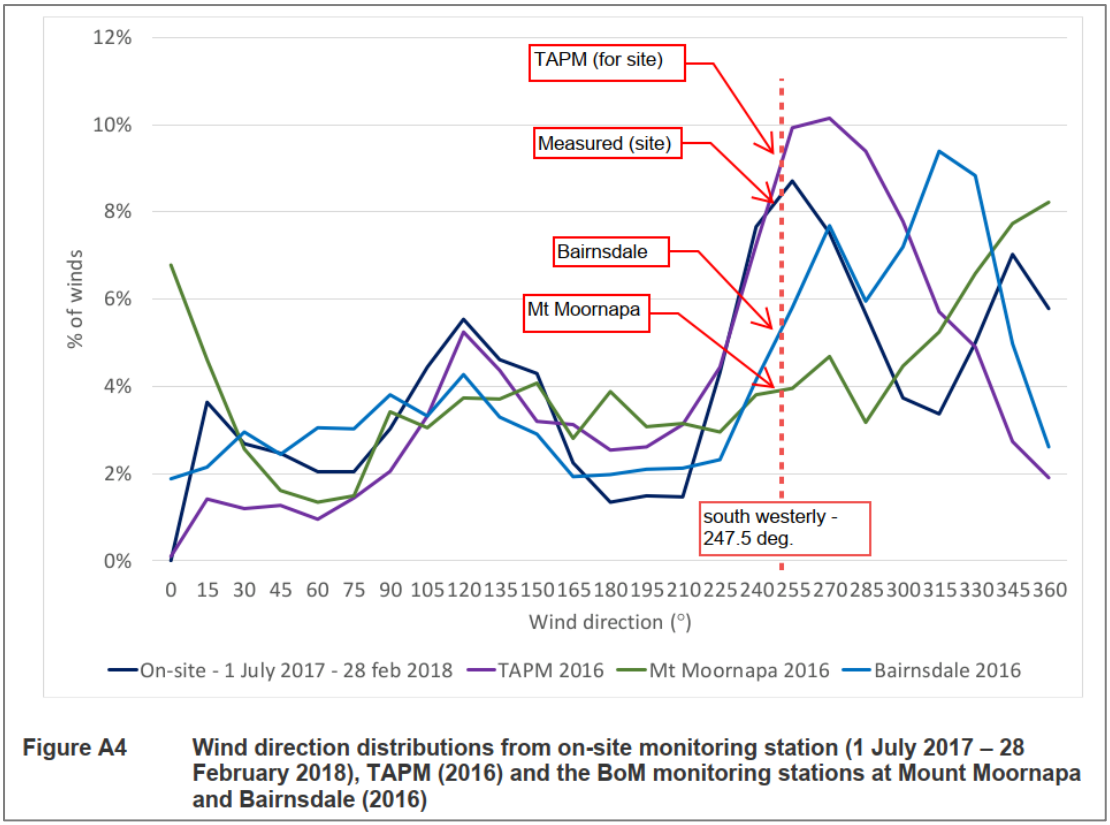

Figure A4 **Wind direction distributions from on-site monitoring station (1 July 2017 – 28 February 2018), TAPM (2016) and the BoM monitoring stations at Mount Moornapa and Bairnsdale (2016)**

Figure 20 Appendix A, p. 121, (pdf p. 136)

314. Summarising these comparisons between the site, Bairnsdale and Mt Moornapa, the AQG explained:[150]

> "The nearest monitoring stations with data available for the 2013 – 2016 period are the Bureau of Meteorology's monitoring stations at Mount Moornapa and Bairnsdale. These sites are not considered representative of the Project site. Figure A3 and Figure A4 [extracted in Figure 19 and Figure 20 above] compare the wind speed and wind direction distributions of these datasets. The wind speed distribution predicted by TAPM at the Project site is very similar to that measured by the on-site monitoring station. Winds measured at the Bairnsdale monitoring site contain a higher frequency of stronger winds, which is to be expected given the more coastal location of the BoM Bairnsdale monitoring site. Winds measured at Mount Moornapa have a higher percentage of light winds (< 5 m/s) compared to the on-site data.
>
> The wind direction distributions show that data measured at the Mount Moornapa site contains a higher frequency of northerly winds, and a very low frequency of winds from southwest compared to the on-site data. The Bairnsdale BoM data and TAPM data are more representative of the on-site meteorological datasets." (Emphasis added)

150 Source: EES Air Quality Technical Study (A009), Appendix A, p. 120, (pdf p. 135).

315. Mr Welchman gave similar answers to the Council in cross examination:[151]

> **Council** 3:42:09
>
> In a situation like this, where – and you've certainly provided a photo and I think that the Committee has been there, you've got a row of trees down beside it – and you've produced a set of results that have been very roundly disagreed with by the local community, that would give you pause and make you reconsider whether that modelling needed to be reconsidered?
>
> **Simon Welchman** 3:42:41
>
> Well, it did, yes.
>
> **Council** 3:42:43
>
> And you decided not to redo that work with a more south-westerly focus in view of what was being said about the predominance of south-westerly winds?
>
> **Simon Welchman** 3:43:00
>
> Well, the model or the sorry, the monitoring data does pick up west, south-westerly winds.
>
> **Council** 3:43:11
>
> It does but it varies significantly from for example, the Bairnsdale or the Lindenow data in terms of the extremity of the south-westerly winds, doesn't it? Have you not done that analysis, if it is set out within, certainly within the MFG submission.
>
> **Simon Welchman** 3:43:34
>
> Both Bairnsdale and sorry, the other station?
>
> **Council** 3:43:39
>
> I don't know if it's referred to as the Lindenow station, but it's on the Mitchell river quite close to the site.
>
> **Simon Welchman** 3:43:45
>
> Well certainly the Bureau of Meteorology site at Bairnsdale is in quite different terrain. It's a much flatter area. So we considered the data at Bairnsdale, we considered a second site operated by the Bureau to the

[151] Hearing recording, day 9, 13 May 2021. Cross examination by Council, from 3:42:09: https://www.youtube.com/watch?v=ttSmz2kXvgQ&t=3h42m09s

> north west, I believe and believed that this monitoring site fits the circumstances, Bairnsdale being potentially more exposed.
>
> And the second monitoring site, the Bureau monitoring site is in a more much more hilly terrain potentially, affected by that terrain.
>
> So, in our work we considered that and we felt that the data fit the circumstances of the site."

316. The IAC should draw from this evidence (the written evidence in the AQG and the oral evidence in cross examination) that Mr Welchman undertook a thorough review of a range of data sources and exercised a professional judgement as to the suitability of the data sources used. The opinions expressed have a clear and intelligible basis.

317. Mr Welchman was asked further about this in re-examination, relevantly:[152]

> "It's been put to you that residents in the area say that the prevailing winds are from the southwest. Can you comment as to the comparison of the scientific results from the wind station, and that expressed view?

318. After explaining the wind roses shown in the AQG, Mr Welchman responded:[153]

> **"**So, you know, there is a very good proportion of winds from that direction – from the west south-west and the south-west direction. There is also, you know, a strong component from the north north-west and from the north.
>
> So in my reading of looking at, I suppose measured data against the observations, I don't see a great deviation, the expressed observations, I don't see a great deviation."

319. 'Overall' and 'seasonal' wind roses shown in the AQG are extracted in Figures 21 and 22 for the IAC's reference. It can be seen that there is a strong representation of south-westerly winds, indicating consistency rather difference from local expectations.

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[152] Hearing recording, day 9, 13 May 2021. Re-examination of Mr Welchman, from 4:37:47: https://www.youtube.com/watch?v=ttSmz2kXvgQ&t=4h37m47s

[153] Hearing recording, day 9, 13 May 2021. Re-examination of Mr Welchman, from 4:39:46: https://www.youtube.com/watch?v=ttSmz2kXvgQ&t=4h39m46s

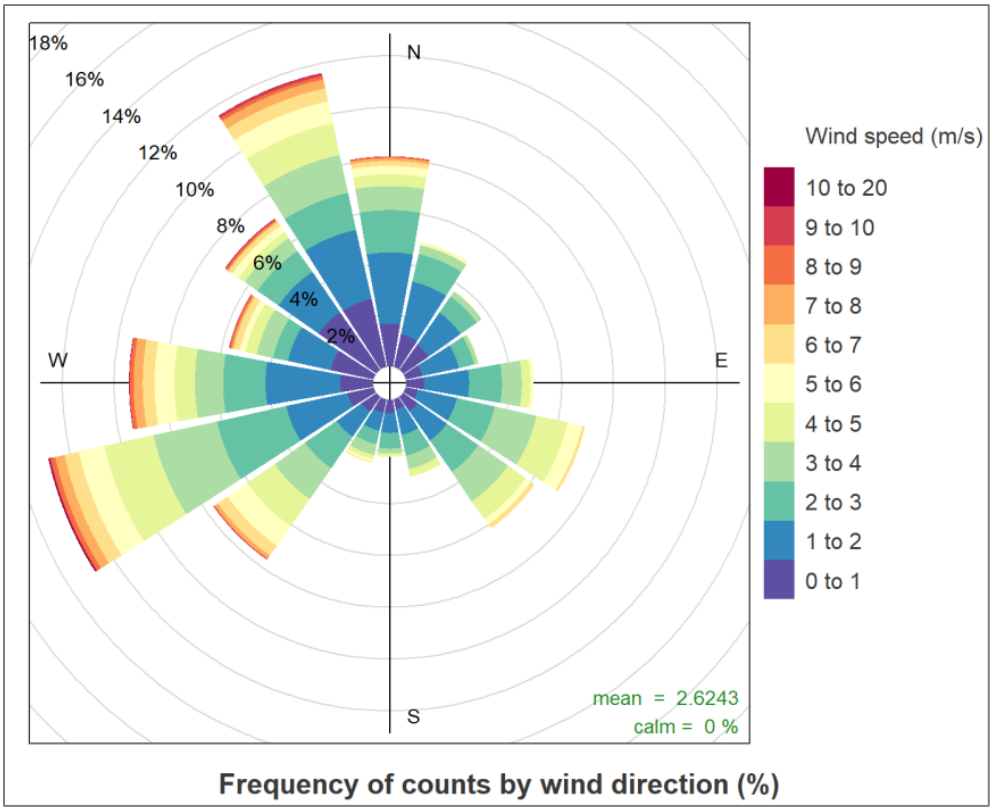

Figure 21 Distribution of winds recorded at the on-site meteorological monitoring station[154]

[154] AQG, extract of Figure 4, p. 14 (pdf p. 28).

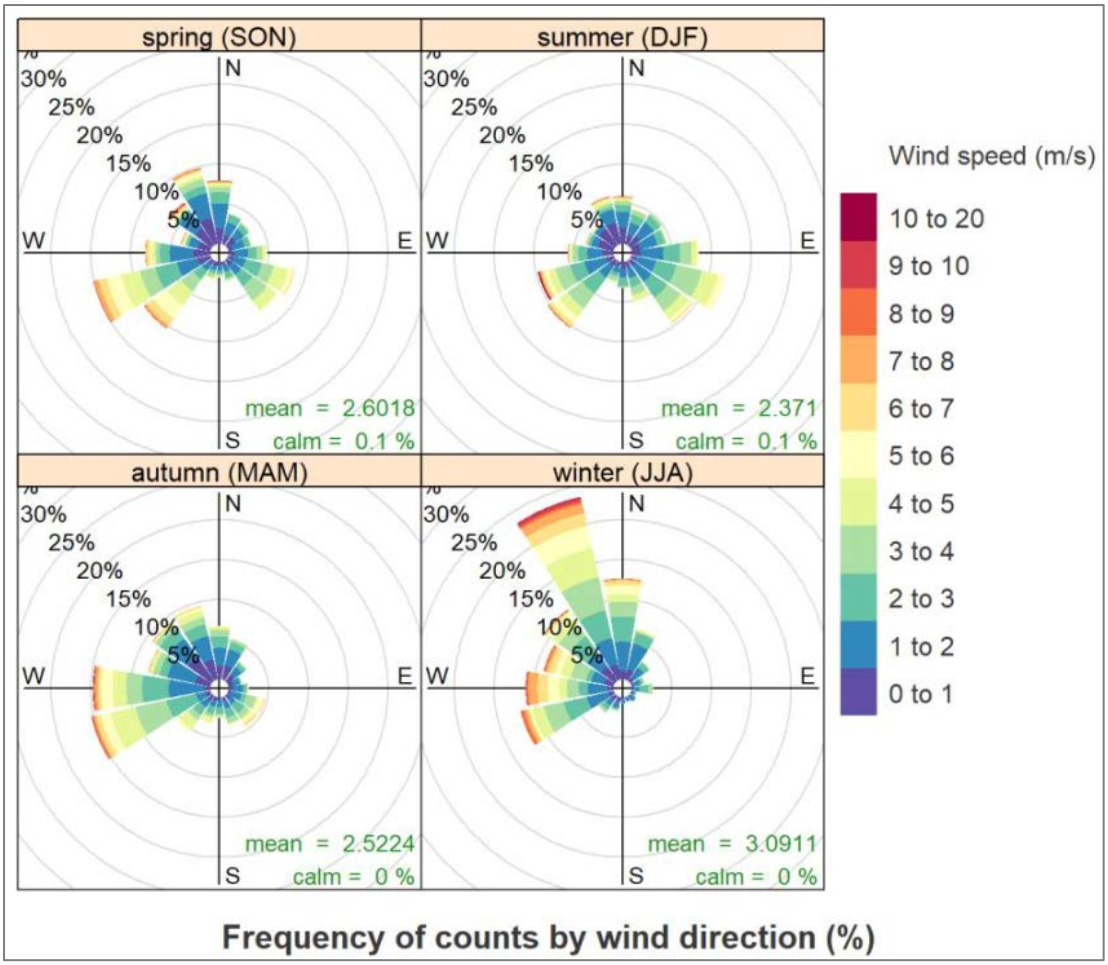

Figure 22 Seasonal distribution of winds recorded at the on-site meteorological monitoring station[155]

Measuring wind at only one weather station

320. It was suggested through cross examination and submissions that wind should have been measured at more than one station on the site. It was suggested that reliance on only one monitoring station represented a limitation on the reliability of the air quality work.

321. However, the approved regulatory model in Victoria is AERMOD which uses data from only one monitoring stations.

[155] AQG, extract of Figure 6, p. 15 (pdf p. 29).

322. Mr Welchman expressed his views on this point in the following exchange under cross examination:[156]

> Simon Welchman 3:44:57
>
> Now, the model that's required to be used is the AERMOD model and the AERMOD model allows for only one meteorological station to be used. Unlike other models where you can generate what's called a wind field where you have air movement that the changes with terrain and location, the AERMOD model allows you to use one meteorological station.
>
> Council 3:45:41
>
> Perhaps if we can cut to the chase, this is a situation, isn't it, where there's enough indicators to suggest that you should be looking at either sensitivity testing or more than one modelling method, in order to verify your results in the view of the very clear indications you've been getting from others as to the appropriateness of the inputs that you've used.
>
> Simon Welchman 3:46:11
>
> I felt that that the approach that was taken to generate meteorological data on site, the fact that the monitoring station is sited in accordance with the Australian Standard, and that the data fits in in context with the other Bureau of Meteorology monitoring sites in the region, was sufficient to suggest that it was appropriate. There's no sense in that data that there's anything, I suppose, incorrect about it.
>
> Council 3:47:00
>
> I'm assuming you say that within the data that you have read the submissions on MFG and you've heard the various criticisms that come out of in a slightly different way, both the peer review work and the Council's review of it.
>
> Simon Welchman 3:47:24
>
> I haven't seen sort of alternative data presented. To me the information that was put forth was anecdotal.
>
> Council 3:47:41
>
> So it's not unless someone else does their own modelling that you're prepared to revisit your work and your assumptions.
>
> Simon Welchman 3:47:50

[156] Hearing recording, day 9, 13 May 2021. Cross examination of Mr Welchman by Council, from 3:44:57: https://www.youtube.com/watch?v=ttSmz2kXvgQ&t=3h44m57s

> Well, we've put a monitoring station on a site. We've sited it appropriately and we generated data in accordance with the Australian standard. Whilst I'm happy to consider, you know, those concerns, I didn't feel that they overrode the fundamentals that this monitoring site, sorry this station was appropriately sited and operated for a year to generate data for the assessment."

323. Kalbar notes the reference in this cross examination to the "various criticisms that come out of in a slightly different way, both the peer review work and the Council's review of it". Neither ERM (DELWP's peer reviewer) nor SLR (Council's reviewer) raised these concerns. There is no substance to Council's submission on these matters.

Weather station siting ('located within a depression', 'shielded by trees')

324. MFG submitted that the weather station's is "not representative of the proposed mine site", "located in a hollow" and "downwind of a wind break".[157] Similar submissions were made by community submitters.

325. The Council's Part B Submission supported this view, stating:

> "[238] … In a situation like this, with a station in a depression (and therefore measuring winds at less than 10 metres above the predominant height of the landscape), with a row of trees down the side, and which produced a set of results very roundly disagreed with by the local community, it would be appropriate to pause and reconsider the measurements undertaken."

326. The weather station is not located in a depression. It is in a reasonably flat paddock, at around AHD 125, similar to much of the Project Area, and higher than most surrounding land (refer Figure 23).

[157] MFG presentation delivered by Professor Helena Parkington, Tabled Document 469, pdf p. 8.

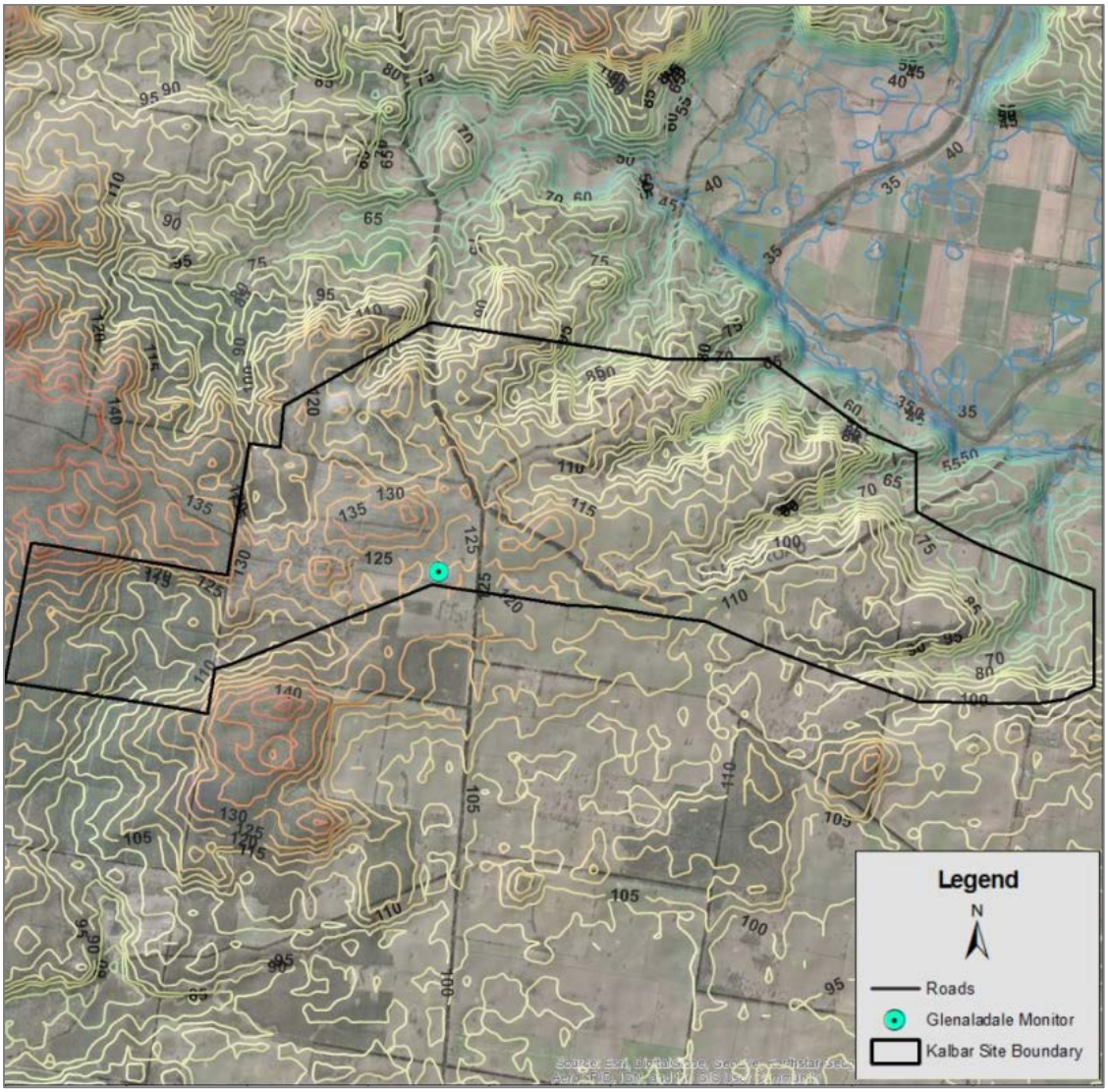

Figure 23 Terrain in the vicinity of the meteorological station[158]

327. Mr Welchman responded to this issue in his first evidence statement as follows:[159]

> "81. In relation to the assertion in various submissions that the meteorological data is not valid because the monitoring location is not fully exposed to the prevailing winds, the following points are relevant:
>
> a. The meteorological monitoring station has been sited and operated in accordance with the relevant Australian Standards.
>
> b. The air quality and meteorological monitoring program that was conducted for the Project was conducted in accordance with the requirements of the PEM and was approved by EPA Victoria.

158 Source: first evidence statement of Simon Welchman, Tabled Document 84, Figure 7, pdf p 21.

159 First evidence statement of Simon Welchman, Tabled Document 84, section 4.4 (Meteorological Data), pdf p. 19.

> c. I inspected the meteorological monitoring station in December 2020. I considered the proximity of the monitoring station to trees and local terrain and I am satisfied that the meteorological monitoring station is sited in accordance with the relevant Australian Standards.
>
> d. I have reviewed terrain and land-use data and have produced a terrain map of the region surrounding the monitoring station (Figure 7). I am satisfied that the monitoring station would produce meteorological data that is representative of the mine site and surrounds. I do not believe that the monitoring site would be subject to significant shielding that would result in wind speeds that are unrepresentative of the mine site and surrounding areas."

328. Mr Welchman maintained these views under cross examination by both Council and MFG.

329. Further, AS/NZS 3580 Part 14 (2014), *Meteorological monitoring for ambient air quality monitoring applications* includes guidance concerning obstructions and shielding affects. Section 2.7 relevantly notes that:[160]

> "As a general rule, obstructions should not project above the horizon by more than 6° at the sensor height."

330. Section 2.7.2 states that the monitor "should be located away from obstructions which are higher than the anemometer". [161]

331. The trees in question are some 80m south of the onsite meteorological station and do not project above the 10m anemometer height; and there are no obstructions that project above the horizon by more than 6° at the sensor height.

332. Kalbar relies on Mr Welchman's evidence that the monitoring location was appropriate. No expert evidence has been called that contradicts Mr Welchman's evidence on the monitoring location, and Kalbar submits the IAC should accepts his expert evidence on this issue.

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[160] Section 2.7.1 (General), p. 13.

[161] Section 2.7.2 (Multiple obstructions), p. 13.

Data gaps in meteorological monitoring

333. Submissions raised concerned with meteorological monitoring data gaps and the impacts of this on the reliability of the dispersion modelling.

334. Mr Welchman responded to this in his evidence statement, explaining:[162]

> "82. Several equipment faults occurred during the monitoring, resulting in data loss of 22%. Lightning strikes are the cause of the majority of this data loss.
>
> 83. The data loss did not have an adverse impact on the EES air quality assessment. Section A1.2 of the EES air quality assessment describes the evaluation of the data generated by the meteorological model, TAPM, during periods where there was no data available from the on-site weather station. This evaluation considered meteorological data that was recorded at another meteorological monitoring station that was collocated with the continuous dust monitor (BAM). The evaluation concluded that the dataset that was used in the modelling was likely to provide a good representation of conditions on-site."

335. The BAM monitor is collocated with the main monitor, measuring at 2m above ground level, and included data during periods when there were gaps in the main monitor. Appendix A1.2 of the AQG sets out an evaluation of the TAPM generated wind data. Comparisons are made with data from the onsite BAM monitor and BOM data for Bairnsdale and Mt Moornapa.

[162] Tabled Document 84 p. 16 (pdf p 19).

336. The wind speed comparisons from the AQG is extracted in Figure 24. It can be seen that the TAPM data provides a good fit to the onsite measured data.

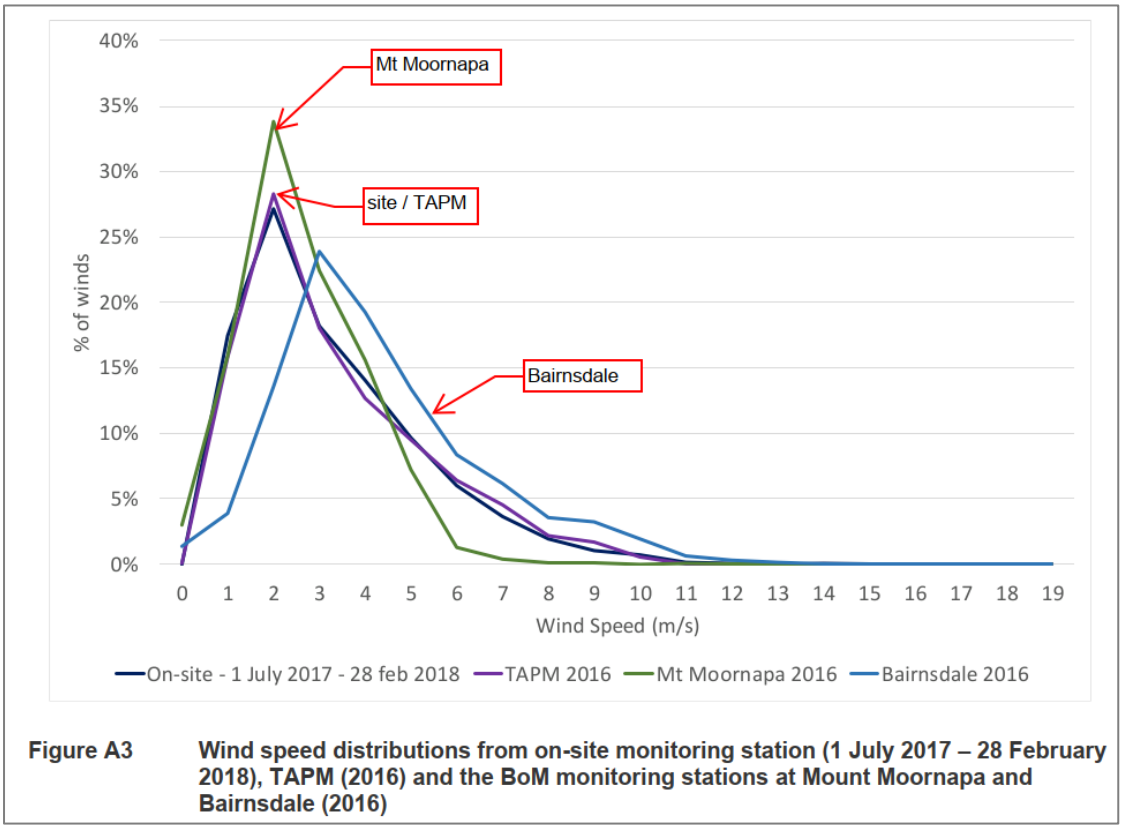

Figure 24 Extract from AQG, Appendix A1.2, p. 121 (pdf p. 136) (callouts added for clarity

337. The wind direction comparisons between TAPM and the onsite BAM monitor were compared in Figure A4 of the AQG and are extracted in Figure 25 below. The TAPM data provided a good fit to the BAM directions measured during the relevant period.

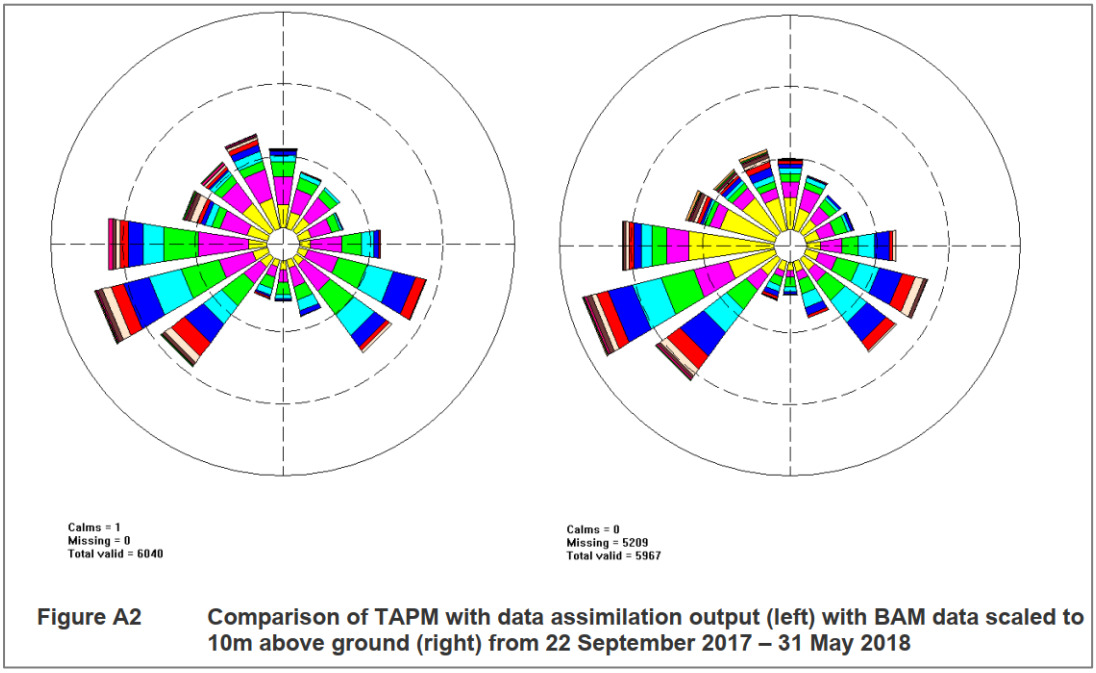

Figure 25 Extract from AQG, Appendix A1.2, p. 120 (pdf p. 135)

338. EPA Publication 1550 is titled 'Construction of input meteorological data files for EPA Victoria's regulatory air pollution model (AERMOD)'. It sets out how meteorological data is to be assembled and processed for use in AERMOD. It specifically contemplates the generation of met data using the TAPM prognostic model, relevantly stating:[163]

> "**1.3 TAPM generated data**
>
> For locations where there are no measured data available, the mandatory data and supplementary data that are required maybe generated by a prognostic meteorological model.
>
> The prognostic model specified is the Meteorological module of TAPM (Version 4 or later, available from CSIRO)."

339. Kalbar relies on Mr Welchman's evidence to submit that the approach to generating data to complete the 12 month meteorological data set was satisfactory.

[163] 1550: Construction of input meteorological data files for EPA Victoria's regulatory air pollution model (AERMOD), available at: https://www.epa.vic.gov.au/about-epa/publications/1550, p. 4.

Data gaps in ambient 12 month ambient monitoring

340. Several submissions took issue with data gaps in the 12 month ambient monitoring program

341. There were data gaps in:

a) PM10 and PM 2.5

b) Respirable crystalline silica

PM10 and PM2.5 gaps

342. For PM10 and PM 2.5, data capture was 92%[164] and 93%[165] complete respectively.

343. The AQG explains these gaps and the approach to generating a complete 365-day data set for use in AERMOD as follows:[166]

a) 24hour averages were not recorded for PM10 on 28 days, and on 26 days PM2.5.

b) The largest consecutive gap was 11 days, so there is not significant seasonality concern with the gaps.

c) on 14 days (of the 28), data was recorded for either PM10 or PM2.5 only. The relationship between PM 10 and 2.5 was calculated from the complete data set (as $PM2.5 = 0.134 \times PM101.261$), and gaps filled according to this equation.

d) The remaining 14 day data gap was filled using a stochastic method described in the AQG as follows:[167]

> "Firstly, cumulative frequency distributions were created for the PM10 and PM2.5 data recorded during March, April and May. These distributions were used as look-up tables, with the position in the table corresponding to the probability or frequency that specific concentrations values were observed. A random number generator was then used to select PM10 and PM2.5 values from these tables to insert into the gaps in the time series. This method allows the data generated to have any value within the entire range of values measured at site

164 AQG, p. 20 (pdf p. 35).

165 AQG, p. 21 (pdf p. 36).

166 AQG, p. 28 (pdf p. 43).

167 AQG, p. 28 (pdf p. 43).

> during the autumn months. There will be a high probability that the more common values and a small probability that the less frequent values, usually the highest or lowest extremes, will be substituted into the gaps."

344. Kalbar submits that the PM data gaps were short and a satisfactory method was used to fill them. There is no expert evidence or material that contradicts this submission.

Respirable Crystalline Silica gaps

345. The PEM requires one week collection per month over 12 months (12x7=84days).

346. The AQG collected 72 days of RCS data between 1 July 2017 and 30 September 2018. Data gaps existed between 9 January 2018 and 2 June 2018.

347. These gaps were filled based on a conservative fraction of the corresponding PM2.5 concentration. The AQG explains:[168]

> "To determine the ambient background concentration for respirable crystalline silica, the data gaps between 9 January 2018 and 3 April 2018, and also between 20 April 2018 and 2 June 2018 were filled in by scaling the available PM2.5 measurements from the high-volume sampler during those periods by a conservative estimate of the fraction of PM2.5 that is respirable crystalline silica. The use of the PM2.5 data will account for any observed increase in particulate levels during the warmer months of the year when respirable crystalline silica data is not available."

348. For RCS gap filling, the AQG assumed a ratio of RCS to PM2.5 of 0.07. The measured ratio between RCS to PM2.5 presented as a scatter plot in the AQG is extracted in

[168] AQG, p. 28 (pdf p. 43).

Figure 26, with a red dashed line marked at 0.07. It can be seen that the use of 0.07 as the assumed fraction was very conservative.

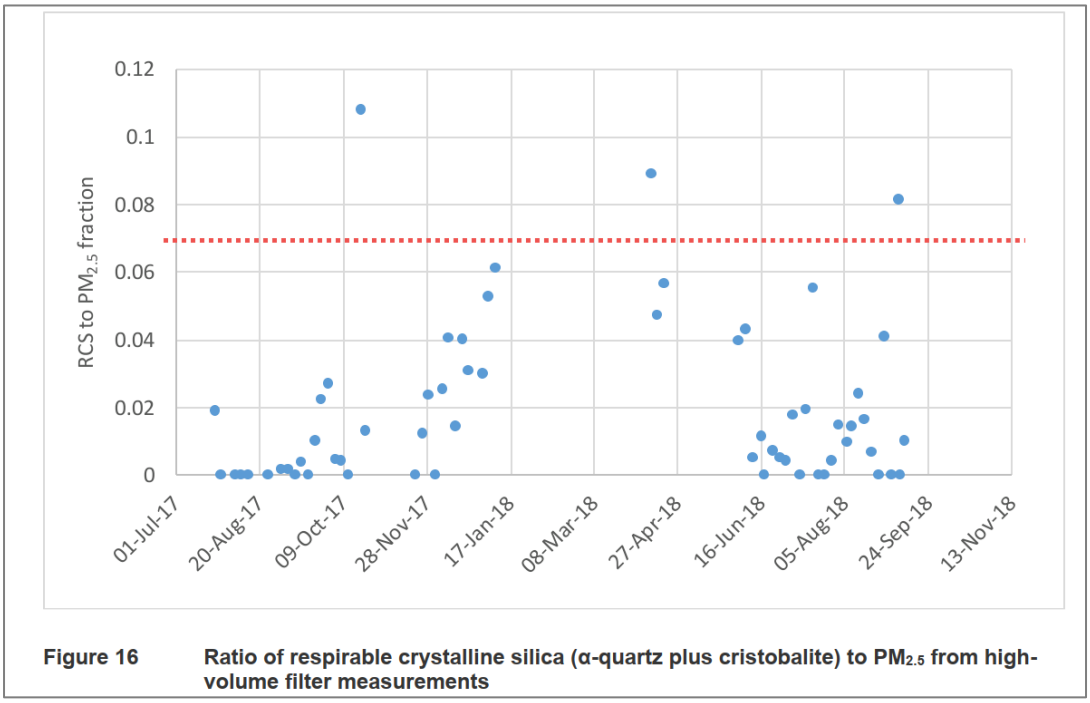

Figure 26 Extract from AQG, p 31, red dashed line added

349. Using the measured and calculated RCS, the annual average ambient concentration was 0.34ug/m3. [169] This is well below (an order of magnitude below) the PEM criterion of 3ug/m3 (annual average).[170]

350. RCS concentrations were predicted at all receivers for modelling years 5, 8 and 12. The maximum at any receiver across these years was 0.9 (project) and 1.1 (cumulative), [171] i.e., about 1/3 of the PEM criterion.

351. The low emission levels for RCS support a view that the ambient monitoring data gaps do not undermine the reliability of the AQG.

169 AQG, p. 28 (pdf p. 43).

170 See AQG, Table 2, p. 11-12 (pdf p. 25-26) which summarises the ambient air quality design criteria for the Project including relevant criteria from the PEM.

171 See AQG, Table 29, p. 70-71 (pdf p. 85-86).

Climate change

352. Council's Part B Submission raised a concern (a concern not raised by its technical reviewer SLR) that modelling had not factored in climate change.[172]

353. Firstly, the Air Quality assessment used the method prescribed in the PEM which uses 12 months of ambient and weather data collected on site. There is no requirement to manipulate this input data for dispersion modelling in AERMOD to account for climate change variability.

354. Secondly, the Project will be employing real time monitoring and reactive management. The Project must be operated to comply with the nominated criteria at any point in time and to reduce emissions to the extent reasonably practicable.

355. When this issue was put to Mr Welchman in cross examination he responded:[173]

> "The Air Quality Assessment accounts for a range of meteorological conditions that may contribute to dust generation. And certainly, the monitoring program and the management program will need to have regard to the specific conditions that are occurring at a point in time."

356. In re-examination Mr Welchman was asked how an allowance for climate change variation might affect his work. He responded:[174]

> "If I just quickly describe what we have, we've got a model that's got meteorological data which has been measured. We've got dust emission estimations that don't rely upon, say, temperature and the like. In my mind, there's not a lot to vary there to account for that [i.e., climate change]. For example, the effect on rainfall, that's not directly accounted for in the model either. … The assessment evaluates the viability, the activity would still be needed to be managed regardless of that aspect."

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172 At [228].

173 Hearing recording, day 9, 13 May 2021. Cross examination of Mr Welchman by Council, from 3:16:29: https://www.youtube.com/watch?v=ttSmz2kXvgQ&t=3h16m29s

174 Hearing recording, day 9, 13 May 2021. Re-examination of Mr Welchman by Kalbar, from 4:35:31: https://www.youtube.com/watch?v=ttSmz2kXvgQ&t=4h35m31s

Chemical dust suppressants

357. Questions were raised concerning the use of chemical dust suppressants. Whilst the Project water balance allocates 375ML per year for dust suppression, Mr Welchman highlighted the opportunity to reduce this by using chemical suppressants.

358. Hydrocarbon dust suppressants were once common, however this field has developed significantly. Dust suppressants currently used in Australia are usually lignosulfonate, which is produced from timber. The Dustex brand (Tabled Document 355) is an example of this - Kalbar understands it is used by Council's road maintenance contractors, Cranes Asphalting - however there are many other commercial products available, and this was provided merely as an example). Lignosulfonate based suppressants are considered environmentally benign. They are applied in a water solution.

359. Tabled Document 357 is a scientific paper that concludes that the overall impact from applying lignosulfonates to roads is negligible.

360. The Mitigation Register highlights the option of using dust suppressants other than water, relevantly:

> "AQ02 Water or appropriate suppressants will be applied to working surfaces, stockpiles, haul roads and other areas where rehabilitation is not yet practical, to minimise dust generation, and in particular, during drier months."
>
> "AQ16 Dust generation from haul roads will be controlled by applying water or chemical suppressants, cessation of haulage during adverse weather conditions, and as required in response to real-time air quality monitoring."

361. The PEM also refers to the option of using chemical dust suppressants in section 6.3, which discusses reactive management and notes that measures "may involve increased use of water sprays, use of chemical suppressants".[175]

[175] PEM, p. 13.

362. The actual dust suppressant used will need to be specified in the Work Plan and will need to be approved by the relevant regulator. There are several commercially available products that are likely to be acceptable.

NOISE

Documents

363. Key documents referred to in this section are:

Technical documents

a) EES Appendix A010, Noise and Vibration Assessment (**NVIA**)

b) Technical Note 04 (revised 19 April 2021)[176] (TN04 relevantly includes updated noise modelling for receptor R2004) (**TN04**)

c) Mr Delaire's evidence statement.[177]

d) Mr Delaire's supplementary evidence statements (concerning centrifuges).[178]

e) Mr Delaire's marked up mitigation register presented to the IAC during his evidence on 13 May 2021.[179]

Mitigation and management documents

f) Kalbar's updated Mitigation Register.[180]

g) Kalbar's updated Noise and Vibration Risk Treatment Plan.[181]

h) Kalbar's mitigation reconciliation table for noise.[182]

[176] Tabled Document 145.

[177] Tabled Document 71.

[178] Tabled Document 124 (original), 284 (revised – tracked) and 284a (revised – clean).

[179] Tabled Document 310.

[180] Tabled Document 505.

[181] Tabled Document 507.

[182] Tabled Document 599.

Legislation, policy and guidelines

i) Environment Protection Act 2017 (**EP Act 2017**)

j) Environment Protection Regulations 2021 (**EP Regulations**)

k) Environment Reference Standard (gazetted 26 May 2021).[183]

l) EPA Publication 1254, *Noise control guidelines* (now superseded by EPA Publication 1826)

m) EPA Publication 1834, Civil construction, building and demolition guide, (November 2020)

n) EPA Publication 1411, *Noise from Industry in Regional Victoria* (October 2011) (**NIRV**).

o) EPA Publication 1826.4, Noise limit assessment protocol for the control of noise from commercial, industrial and trade premises and entertainment venues (May 2021) (**Noise protocol**).

p) NSW Road Noise Policy.[184]

q) World Health Organisation (**WHO**), *Guidelines for Community Noise* (1999).[185]

Overview

364. Marshall Day Acoustics (**MDA**) prepared the EES NVIA, which outlined criteria, mitigations and noise predictions for the Project. Mr Delaire was a reviewer of the NVIA, undertook further modelling concerning centrifuges[186] (supplementary evidence) and receptor R2004 (TN04), and gave evidence to the IAC concerning noise.

183 Tabled Document 489.

184 Available at: https://www.epa.nsw.gov.au/your-environment/noise/transport-noise

185 Available at: https://www.euro.who.int/en/health-topics/environment-and-health/noise/environmental-noise-guidelines-for-the-european-region

186 Supplementary evidence, Tabled Document 124.

Criteria

365. The noise criteria adopted in the NVIA were superseded by changes to guidelines and legislation associated with the introduction of the EP Act 2017 on 1 July 2021. Relevantly, the NIRV was superseded by the Noise Protocol (for operational noise) and EPA Publication 1254 was superseded by EPA Publication 1834 (for construction noise). However, the quantitative and technical aspects between these sources was unchanged, meaning the technical work underpinning the NVIA was not affected by the changes.

366. The quantitative noise criteria for the project can be summarised as follows:

<u>For operational noise (under NIRV and Noise Protocol)</u>

a) The noise limit is the 'effective noise level' which is the A-weighted, 30 minute Leq decibel level, with character penalties applied for tonality, intermittency and impulsiveness. The noise limits for the Project are 36dB (night), 41dB (evening) and 46dB (day). Trucks on the private haul road and the use of the Fernbank East siding are subject to the Noise Protocol.

<u>For construction noise (EPA Publication 1254 / 1834)</u>

i. No limit during the day, a background + 10dB target for the evening (for construction activities up to 18months in duration) and inaudibility inside dwellings at night, unless the noise is associated with 'low impact works', 'managed impact works' or 'unavoidable works'.

<u>For traffic noise (on public offsite roads) (NSW Road Noise Policy)</u>

b) Consideration of changes in noise associated with project traffic using the 'relative increase' criteria provided in the NSW Road Noise Policy.[187] Consideration was also given to sleep disturbance values based on guidance in the NSW Road Noise Policy.[188]

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[187] NSW Department of Environment, Climate Change and Water, Section 5.4 (Sleep Disturbance), see in particular the Lmax criteria at p. 35 (pdf p. 39).

[188] NSW Department of Environment, Climate Change and Water, Section 5.4 (Sleep Disturbance), see in particular the Lmax criteria at p. 35 (pdf p. 39).

Modelling

367. The noise modelling for the Project was based on source (sound power level) data drawn from MDA's internal databases and relevant Australian and British standards.[189]

368. Predictions were carried out using the ISO:9613-2 propagation model in line with industry practice.[190] ISO 9613 calculates downwind propagation (in all directions simultaneously) and, also, for moderate temperature inversion, meaning the predictions used in the NVIA account for these possible adverse meteorological conditions. Relevantly section 1 (Scope) of ISO 9613 explains that its predictions are:

> "for downwind propagation, as specified in 5.4.3.3 of ISO 1996-2:1987 or, equivalently, propagation under a well-developed moderate ground-based temperature inversion, such as commonly occurs at night."

369. The NVIA explains why this is a conservative approach:[191]

> "**7.8 Limitations to the accuracy of noise prediction and inherent conservatism**
>
> Uncertainty in the noise predictions comes from real-world variables such as weather conditions, sound power levels for noise sources, the ground surface model and the degree of attenuation due to obstacles between the source and receiver. In response to the inherent uncertainties associated with the noise prediction, a conservative approach has been taken to enable a cautious assessment.
>
> As noted above, ISO 9613-2 predictions assume that receivers are generally downwind from each source (that is, for each source-receiver pair, the noise model assumes that wind blows from the source to the receiver). In the context of this assessment, this implies that each source - receiver pair is exposed to downwind conditions at the same time. In practical terms, such assumptions are pragmatic and appropriate for the purposes of an engineering assessment intended to provide a reliable representation of the upper noise levels expected in practice.
>
> …
>
> **7.9 Meteorological conditions**

189 See EES NIA (A010), Appendix G2 (Noise level data), p. 127 (pdf p. 129).

190 Relevantly, the EES NIA (A010), section 7.1 (Noise prediction method), p. 43 (pdf p. 45) notes that "The ISO 9613-2 propagation model is a general-purpose noise propagation method that has become established as the primary international standard for calculation of industrial noise into the environment."

191 EES NIA (A010), p. 48 (pdf p. 49).

> As noted above, ISO 9613-2 predictions assume meteorological conditions that are favourable to noise propagation. In the context of this assessment, this implies that each receiver location is exposed to downwind conditions at the same time. This is a pragmatic choice for an engineering assessment intended to provide a reliable representation of upper noise levels.
>
> In practice, alternative weather conditions, such as wind blowing from the receiver to the source, or warmer temperatures, would likely result in lower noise levels than those reported. Indeed, the model scenarios feature noise sources located over such a wide area that a downwind condition between each source and receiver pair would not be possible in practice.

What the modelling shows

370. The technical validity of the NVIA was not seriously challenged by any expert or submitter. Kalbar submits that the prediction methodologies applied were appropriate and thorough.

371. The NVIA demonstrates the feasibility of the Project complying with relevant noise criteria using sensible and achievable mitigations which relevantly include:

a) Limiting activities overnight (NV11, NV17, NV30 including overburden extraction and HMC haul to Fernbank East);

b) Applying acoustic treatments to plant and equipment (including muffler kits (NV13) and broadband reversing beepers (NV10));

c) Constructing earth bunds for screening (NV13);

d) Applying targeted noise controls to standalone pumping infrastructure (see NV03);

e) Acoustically insulating the main plant buildings (NV14 – WCP building; NV38 – centrifuge buildings).

Design development and adaptive management

372. As explained by Mr Delaire, the purpose of the NVIA was not to prescribe the only scenario in which mining can achieve acceptable noise outcomes, but to demonstrate

the feasibility of conducting the mine on this site and producing acceptable noise outcomes. Mr Delaire explained in in his evidence in chief:[192]

> "It's important to note that the noise mitigation measures that have been detailed in the documents presented to you to date are essentially conceptual based on the indicative design of the project as it stands, as it stood I suppose at the time of the assessment and I understand that the project is still in the design phase and things will evolve and those mitigation measures will need to be refined and verified as part of a detailed design modelling and then clearly laid down into an environmental management plan or similar document.
>
> There will also be noise monitoring and management measures required throughout the project. Again, it's going to be an important step in terms of informing the mitigation measures, confirming that they are doing what they are supposed to do, or to adjust them as required. But ultimately, the main conclusion of this assessment is that the noise impact from the project can be managed in accordance with the relevant guidelines and assessment criteria, and that that project can be accommodated at the site to address all relevant noise and vibration considerations.

373. Noise modelling and measurements will need to be undertaken throughout the life of the Project and input into day-to-day planning. The Proponent will need to have a consultant engaged for the duration of the Project who can update noise modelling, carry out compliance measurements and input advice to plan activities and stages in an iterative fashion. In response to a question about ongoing modelling and measurements, Mr Delaire relevantly explained:[193]

> "At the moment, we have modelled four years that were deemed to be typical. But in terms of the detailed design, every single year will need to be modelled, or each time that the plant moves in a significant way that changes the operation of the site, it would need to be to be remodelled and confirmed that the mitigation measures that would have been detailed in the work plan or other documents are still relevant. And also there will be an iterative process as well, including the results of the noise monitoring, that will come into that that piece of work to validate the noise modelling."

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[192] Hearing recording, day 9, 13 May 2021. Evidence in chief of Mr Delaire, from 0:13:58: https://www.youtube.com/watch?v=ttSmz2kXvgQ&t=13m58s

[193] Hearing recording, day 9, 13 May 2021. Evidence in chief of Mr Delaire, from 0:40:41: https://www.youtube.com/watch?v=ttSmz2kXvgQ&t=40m41s

Response to issues

Noise criteria - construction versus operation

374. The complexity / appropriateness of adopting different noise criteria for construction and operation was raised through the cross examination of Mr Delaire and in submissions. Kalbar submits at the outset that whilst this issue is reasonably complicated, it is not one involving particularly divergent views in terms of the actual noise that the project will produce, and Kalbar can work with any of the options put forward in the evidence and by the parties.

375. To summarise, the options put forward to date by Kalbar and submitters are:

a) Apply the guidance in Chapter 4 of EPA Publication 1834, *Civil construction, building and demolition guide* strictly, save for defining 'low impact' works under that guideline as covering the situation where noise levels do not exceed 26dB inside a dwelling (EPA's EES submission)

b) Apply the guidance in Chapter 4 of EPA Publication 1834, *Civil construction, building and demolition guide*, strictly (EPA's current position)

c) Apply the Noise Protocol noise limits to all phases of the Project – construction and operation (Kalbar's preferred approach, seemingly supported by the Council).[194]

376. Kalbar outlines its preferred position as follows.

377. The NVIA assessed construction noise in terms of guidance provided in EPA Publication 1254 (Noise Control Guidelines) which can broadly be summarised as:[195]

a) Day (7am-6pm) - no noise limit (although with an expectation of minimising noise to the extent possible);

b) Evening (6-10pm) noise target of background + 10dB (assuming construction activities up to 18months); and

[194] Council Part B Submission, [269].

[195] See EES NVIA section 2.5, p. 20 (pdf p. 22) which summaries the recommendations in the now superseded EPA Publication 1254 (Noise Control Guidelines).

c) Night (10pm-7am) - construction activity not to occur, or either be inaudible inside a dwelling or otherwise be classed as 'unavoidable', 'low noise' or 'managed impact works'.

378. The updated guide EPA Publication no. 1834 (Civil construction, building and demolition guide) replicates the above requirements, although framed with language more reflective of the EP Act 2017 and the general environmental duty.[196]

379. The IAC may recall the lengthy discussion between MFG and Mr Delaire in cross examination about being able to identify the difference between construction and operation for the purpose of applying the different adopted criteria for these activities.

380. In evidence in chief Mr Delaire said:[197]

> "Ultimately, the noise equipment or the equipment that was used for construction and for operation are virtually, basically the same, and therefore the type of noise that will be experienced at receiver locations around the project will be similar between, for construction and for operational noise."

381. In the circumstances, the complexity of applying different criteria to effectively the same type of noise from the same noise sources makes no sense.

382. Kalbar set out its position on this point in comments accompanying NV17 in its updated Mitigation Register (Tabled Document 505). Relevantly, Kalbar's preference would be to simply apply the Noise Protocol limits to all phases of the Project – construction and operation. Alternatively, as a second preference, a modified version of EPA's suggested drafting (in its EES submission, accepting that EPA has revised that position) could be adopted. A third option is to apply the 1834 guidance strictly.

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[196] See [5.38]-[5.39] and Appendix D2 of Mr Delaire's evidence for a summary of the guidance in EPA Publication no. 1834 and how this compares with that in Publication 1254.

[197] Hearing recording, day 9, 13 May 2021. Evidence in chief of Mr Delaire, from 0:22:33: https://www.youtube.com/watch?v=ttSmz2kXvgQ&t=22m33s

383. Kalbar's 'modified EPA' option is extracted in Figure 27 for reference.

NV17	Noisier activities will be scheduled for less sensitive times of day where practicable and works will be limited as much as practicable during the night and at weekends. [Note: EPA drafting as per its EES submission (no. 514) inserted below, with Kalbar's tracking added to EPA's base] *In relation to construction noise, if works are scheduled during night time hours they will be inaudible or approved by a person independent from the Project, prior to commencement, as meeting the definitions of "Unavoidable works", ~~or~~ "low-noise impact works" or "managed-impact works"* in *EPA Publication ~~1254~~1834. Works will be considered "low-noise impact works" or "managed-impact works" in EPA Publication ~~1254~~ 1834 if the predicted noise levels are below 26dB indoors at a residential receiver, the noise does not present a tonal, impulsive or intermittent character and~~,~~ does not include low frequency content that presents a risk of intrusiveness~~, the Proponent can justify why there is a need to conduct the works outside the recommended standard hours and this justification is approved by a person independent from the Project, and the hours for works considered to be low-noise or managed-impact works and it is supported by the Community Reference Group~~. [noise already required to achieve low levels to fall within this definition of 'low-noise impact works'.]

Figure 27 Extract from updated Mitigation Register (Tabled Document 505)

384. MFG seemed to identify that this was a complex set of provisions, suggesting:[198]

> "Now, that is, I mean, absolute appreciation to the EPA for doing its best to try and put some wording around what these terms mean, but that is a really difficult set of provisions to rely on, isn't it?

385. Mr Delaire did not necessarily agree, however Kalbar does. Whilst Kalbar does not outright oppose the modified EPA approach at NV17, applying the Noise Protocol all the time seems a preferable way to proceed in circumstances where the noise sources in question are either identical or very similar.

386. Kalbar also adopts its comments on this issue provided in Tabled Document 599 (mitigation register reconciliation), footnote 4 which stated:

> "Note that Kalbar prefers that construction noise comply with the Noise Protocol limit of 36dB at night which equates to 21-26dB internal with partially open windows (which is below the relevant WHO target of 30dB internal for protection of sleep / health and note also the WHO guideline notes a typical 15dB reduction in sound from outside to inside a dwelling with partially open windows) (see reference below). The 36dB external under the Noise Protocol is similar to the 26dB internal

[198] Hearing recording, day 9, 13 May 2021. Evidence of Mr Delaire under cross examination by MFG, from 1:49:01: https://www.youtube.com/watch?v=ttSmz2kXvgQ&t=1h49m01s

recommended by EPA's EES submission, although noting that EPA has revisited this position in its Part B submissions.

…

Reference: WHO 'Guidelines for Community Noise' (1999), see in particular recommendations for dwellings at p xiii (pdf p 14) and Table 1, p xv (pdf p 16). Available from the WHO website at the following link: https://www.euro.who.int/en/health-topics/environment-and-health/noise/environmental-noise-guidelines-for-the-european-region"

387. EPA Publication no. 1834 is a guide, not a statutory control. The guide itself states:

> "The information in this guide is not exhaustive. You can implement other controls not covered in this guide, so long as you can demonstrate you have eliminated or reduced the risk of harm to human health and the environment, from pollution or waste, as far as reasonably practicable."

388. Accordingly, there is scope for deviating from 1834's regime in this matter.

389. The EPA's Part B submissions further amplify some of the complexities around adopting the 1834 approach in this matter. The EPA's Part B relevantly states:

> "61. The EPA strongly opposes the proposition put forth by Council and MFG during their cross-examination of Mr Delaire that EPA consent be obtained whenever night time construction activities are to be undertaken. This would place an unnecessary burden upon EPA and is inconsistent with the "polluter pays" principle at section 17 of the New EP Act. Any benefits of having the EPA perform this role are outweighed by the cost considerations given the finite resources of the EPA.

- **Unavoidable works** – are **works** which pose an unacceptable risk to life or property or a major traffic hazard and can be justified. Includes an activity which has commenced but cannot be stopped. You will need to demonstrate that planned unavoidable works cannot be reasonably moved to normal work hours. This requires additional consideration of potential noise and vibration generating activities and controls to minimise noise and vibration. These can be recorded within the noise and vibration management plan (may be part of a broader environmental management plan).

  You must contact the relevant authority and seek any necessary approvals for unavoidable works. You should notify affected sensitive receivers of the intended work, its duration and times of occurrence. A noise and vibration management plan may need to be prepared or reviewed by a suitably qualified acoustic consultant or practitioner to address unavoidable works (see Work with an environmental consultant, EPA website).

> 63. Justifying that works are unavoidable is not an environmental consideration and therefore it should not be for EPA to approve what is unavoidable or not. This is something to be assessed by a person who has skills and expertise in risk/safety assessment (such as a health and safety specialist) who can determine whether the works "pose an unacceptable risk to life or property or a major traffic hazard that can

be justified". That person needs to have no prior involvement in either the planning or delivery of the project and who can make decisions free from any influence or pressure related to the delivery of the project.

64. EPA Publication 1834 also refers to 'low noise impact works' and 'managed-impact works' as potential considerations for night time construction. There should be a framework in place for justification of these, with approval from a person independent to the Project. Again any approval of "Low-noise impact works" and "Managed-impact works" should be obtained from the relevant authority, not the EPA. This is consistent with the guidance at EPA Publication 1834 on these matters which states:

- **Low-noise impact works** – these are inherently quiet or unobtrusive, for example, manual painting, internal fitouts, and cabling. Low-noise works do not have intrusive characteristics such as impulsive noise or tonal movement alarms. The relevant authority must be contacted, and any necessary approvals sought.
- **Managed-impact works** – works where the noise emissions are managed through actions specified in a noise and vibration management plan (may be part of a broader environmental management plan), to minimise impacts on sensitive receivers. Managed-impact works do not have intrusive characteristics such as impulsive noise or tonal movement alarms.

  You must contact the relevant authority and seek any necessary approvals. A noise and vibration management plan may need to be prepared or reviewed by a suitably qualified acoustic consultant or practitioner (see Work with an environmental consultant, EPA website).

390. Requiring case by case approval is inefficient, uncertain and unnecessary when the entire project can achieve objectively acceptable noise levels all of the time. The Publication 1834 regime is ill fitting to the facts of this case.

Quietest equipment 'where feasible'

391. The Noise RTP included the mitigation:

> "The quietest available plant and equipment will be selected for the project, where feasible."

392. The Council cross examined Mr Delaire about the inclusion of the words 'where feasible' and said in its Part B Submissions:

> "267 … in respect of the selection of the "quietest possible plant and equipment" called for by NV16 in the Risk Treatment Plan: Noise, there is no sensible need for the words "where feasible" to appear. The "quietest possible" plant and equipment will necessarily be the quietest possible plant and equipment that can do the job."

393. Council's submission is inconsistent with the general environmental duty, which requires risks to human health from noise to be eliminated or reduced to the extent reasonably practicable, having regard to various matters listed in section 6(2) of the EP

Act 2017. These matters include the likelihood and degree of potential harm, but also matters such as the cost, availability and suitability of potential risk reduction measures.

394. There are a number of factors that should inform equipment selection - cost, reliability, energy efficiency, noise emissions, other emissions and so on. To say that the "quietest" equipment option will be selected in every case is not accurate, and flies in the face of what is required by the general environmental duty. Accordingly, Kalbar has redrafted this mitigation as set in the updated Mitigation Register at Document 505, as follows:

> "NV37 Where a meaningful reduction in noise levels at a sensitive receiver will result, then quieter plant and equipment will be selected where options exist, unless the cost or other relevant disadvantage of selecting the quieter plant (e.g., reliability, quality, warranty provision and so on) is disproportionate to the noise reduction achieved.

Equipment no louder than modelled in the EES

395. The Council's Part B Submission states:

> "266 The Council does not accept that there is any reason why the operator of the Project should be permitted to select plant and equipment which is noisier than that used in the course of modelling, particularly where it is asserted that the modelling proceeds on a conservative basis, and given the interdependency of various assessments in reliance upon those noise levels."

396. This submission relates to NV33 which in Appendix H of the EES provides:

> Equipment will be selected with noise emissions that do not exceed the sound values used in the project noise modelling.

397. In Tabled Document 310, Mr Delaire recommended that this mitigation be deleted, stating:

> "This requirement is too restrictive as noise emission from a large number of items may not contribute significantly to noise levels at receivers.
>
> Providing that the equipment with low sound power levels are used, as far as practicable, and detail design modelling demonstrates compliance with the relevant criteria, noise emissions of equipment may reasonably exceed that detailed in the MDA Report."

398. This approach is consistent with the acoustic assessment applied on other projects in regional areas, such as wind farms. In wind farm applications, noise emissions from candidate turbines are modelled to demonstrate they comply with the relevant noise standard, but there has never been a condition that requires the sound power levels of the selected turbine to be no greater than what has been modelled in the application. The critical issue always is that the turbines comply with the noise standard. The same approach should be applied to the Project, that is, the test is not what data was used in approvals phase predictions but what is needed to produce acceptable outcomes – to reduce noise to the extent practicable and, at a minimum, to comply with the adopted noise limit.

399. Kalbar submits that NV33 is not appropriate and should be deleted.

Reducing noise as far as reasonably practicable cf. mere compliance with noise limits

400. The issue of reducing noise as far as reasonably practicable rather than only to the extent needed to achieve compliance with limits was raised by the Council, MFG and EPA in cross examination and submissions.

401. Kalbar acknowledges that all reasonably practicable noise mitigations should be applied and agrees with the EPA's suggestion for clarifying the wording of mitigations to make this clear.

402. However, Kalbar does not accept that there is any deficiency in the Project it has put forward to the IAC, in particular, any inconsistency between the way it and its experts have approached harm minimisation and the general environmental duty.

403. As Kalbar submitted in its Part B submissions, Kalbar considers that the design and assessment processes adopted in the EES have adopted a risk-based approach of harm minimisation consistent with the general environmental duty under the EP Act 2017.[199]

404. In relation to noise, Mr Delaire was asked questions by the Council and EPA why noise controls shouldn't be required for all noisy equipment, rather than only for equipment needed to achieve 'compliance'.

[199] Proponent Part B submissions, [67].

405. Mr Delaire agreed that best practice noise controls should be employed, but should only be required where they will produce an effect. He gave the example of noise controls on equipment located in the middle of the mine site, and the fact that these noise sources will not contribute to experienced noise levels at sensitive receptors. The following exchange took place in cross examination by the Council:[200]

> **Council** 1:02:17
>
> In terms of minimizing noise, so far as reasonably practicable, as compared with just trying to hit the noise limits of the Noise Protocol or the NIRV, would it be fair to say that the type of barriers you're referring to for use in the context of the transformers could just be used wherever those transformers are?
>
> …
>
> **Christophe Delaire** 1:03:08
>
> Well, again, it goes back to not necessarily being overly onerous for no reason. And it goes back to that point as well about the NV referring to the sound power level not exceeding those presented in the report. What is important is that we are recognizing that the pumping units that will be on the edge of the project and closer to the receivers will definitely need some acoustic barriers.
>
> If there was to be a pumping unit, in the middle of the site, quite significant distance from any receiver, then it would not be reasonable to provide barriers for it because that contribution from that plant with or without barrier would be insignificant to the level that is received. Therefore, I think it's quite important when you consider what is best practice and use mitigation as far as practical, it needs to have some level of effect. Therefore, if you find that with detailed modelling, that mitigation treatment would have no effect at all on the end, receiver level then it is not reasonable to consider mitigation there." (Emphasis added)

406. Kalbar adopts this approach. It is consistent with the meaning of harm defined at s 4 of the EP Act 2017 and the general environmental duty. It is also consistent with the principle of proportionality in the EP Act 2017 which provides:

> "**14 Principle of proportionality**

[200] Hearing recording, day 9, 13 May 2021. Cross examination of Mr Delaire by the Council, from 1:02:17: https://www.youtube.com/watch?v=ttSmz2kXvgQ&t=1h02m17s

> A decision, action or thing directed towards minimising harm or a risk of harm to human health or the environment should be proportionate to the harm or risk of harm that is being addressed."

407. The proponent has sought to capture this approach in its updated drafting of NV03 (which was emphasised in cross examination).[201]

Noise and vibration	
NV03	Unless a noise assessment based on plant noise emission data and predicted received noise levels indicates that noise reduction is unwarranted (e.g., because the noise source would not increase the received noise level at a sensitive receptor by ≥1 decibel, with the prediction rounded to the nearest whole decibel), then w~~W~~hen pumping units ~~over 500 kVA~~ are located within 800 m of any dwelling, temporary acoustic barriers will be used, such as earth bunds, ~~Echobarrier or FlexShield~~or other portable barriers (~~when~~ with the barrier height to exceed~~s~~ the pump height by at least 0.5 m). The barrier system will incorporate an acoustically absorptive finish to minimise reflected noise. [consistent with oral evidence of Christophe Delaire and Tabled Document 310] [note that a noise source 10dB below the loudest noise source (assessed at a receiver) does not increase the received level (because decibels are based on a Log10 scale). Accordingly, depending on distance and incidental screening, some items of plant will not contribute any appreciable noise to receivers even without the temporary barriers contemplated by this mitigation. Mitigation re-drafted accordingly.]

Figure 28 Extract from updated Mitigation Register (Tabled Document 505)

408. Other existing mitigations are noted also such as NV09 which requires, inter alia, "Best practice work practices to minimise noise emissions", NV10 which requires broad band reversing beepers on all vehicles and NV13 which requires earth moving equipment to be fitted with noise reduction kits.

Existing low noise environment

409. Submissions emphasised that the measured ambient levels in the vicinity of the site are low, particularly at night.[202] Mr Delaire agreed, and noted that "it is quite typical in a rural environment in the middle of the night, you have levels that would be as low as this."[203]

[201] Hearing recording, day 9, 13 May 2021. Cross examination of Mr Delaire by MFG, from 42:26: https://youtu.be/ttSmz2kXvgQ?t=2546

[202] Hearing recording, day 9, 13 May 2021. MFG cross examination of Mr Delaire from 1:29:57: https://youtu.be/ttSmz2kXvgQ?t=5397

[203] Hearing recording, day 9, 13 May 2021. Cross examination of Mr Delaire by MFG, from 1:31:25: https://www.youtube.com/watch?v=ttSmz2kXvgQ&t=1h31m25s

410. NIRV and now the Noise Protocol set noise limits that are adapted to the type of receiving environment. The Environment Reference Standards for noise also do this. Quieter noise limits apply in rural areas. The standards set in NIRV and the Noise Protocol are suitable for rural areas with low noise environments.

411. The night noise limit of 36dB under NIRV / Noise Protocol is objectively low (it is also a worst case 30 minute energy average (Leq), meaning the 'limit' will not be reached most of the time). This can be seen by comparison to World Health Organisation recommended night time external level of 45dBA (energy averaged over 8hrs), intended to be protective of sleep and health.[204]

Campgrounds, tourist and education centres

412. Mr Delaire was cross examined on the fact that he had not assessed noise to campgrounds and tourist facilities. These were included as 'noise sensitive areas' in the Environment Protection Regulation 2021 (see definition of 'noise sensitive area' at rule 4) and are now subject to the statutory noise limits in the Noise Protocol. This is a change from SEPP N-1 / NIRV, where the definition of 'noise sensitive area' was limited to various types of accommodation.

413. There are no campgrounds or tourist facilities near the Project therefore, they do not need to be considered in the noise assessment.

414. Furthermore, the same noise limits apply at other types of noise sensitive receiver (e.g., campgrounds and tourist facilities, schools, kindergartens and child care – being further inclusions under the Environment Protection Regulations 2021 which differs from SEPP N-1/NIRV) as apply at residences. (All are within the definition of 'noise sensitive area' which is where the noise limit applies; there are not different noise limits for different classes of noise sensitive receiver.). The nearest receptors to the Project in all directions are residences. Therefore, noise which complies at the nearest residences, will also comply with any other types of receptor at greater distances (such as the Woodglen Primary School, R40, located approximately 2km from the Project Boundary). The EPA's recent response to drafting queries whether lower limits will apply at receivers further away. The answer is no, because under the Noise Protocol

[204] WHO 'Guidelines for Community Noise' (1999), p. xiii (pdf p. 14).

(as was the case under NIRV) the noise limits are according to the planning zone in which the receiver is located. All the receivers near the site are all located in the Farming Zone.

Noise to Limpyers State Forest

415. The EPA raised the issue with Mr Delaire in cross examination and in its submissions that noise to Limpyers State Forest had not been considered, but that this was now required to be considered under the Environment Reference Standard.

416. Kalbar accepts that future work should include an assessment of noise levels to Limpyers State Forest against the relevant non-quantitative objective of "human tranquillity and enjoyment". The relevant content from the ERS is extracted in Figure 29 and Figure 30 for reference.

Column 1 **Land use category**	**Column 2** **Indicators**	**Column 3** **Objectives**
Category I	Outdoor $L_{Aeq,8h}$ from 10 pm to 6 am	55 dB(A)
	Outdoor $L_{Aeq,16h}$ from 6 am to 10 pm	60 dB(A)
Category II	Outdoor $L_{Aeq,8h}$ from 10 pm to 6 am	50 dB(A)
	Outdoor $L_{Aeq,16h}$ from 6 am to 10 pm	55 dB(A)
Category III	Outdoor $L_{Aeq,8h}$ from 10 pm to 6 am	40 dB(A)
	Outdoor $L_{Aeq,16h}$ from 6 am to 10 pm	50 dB(A)
Category IV	Outdoor $L_{Aeq,8h}$ from 10 pm to 6 am	35 dB(A)
	Outdoor $L_{Aeq,16h}$ from 6 am to 10 pm	40 dB(A)
Category V	Qualitative	A sound quality that is conducive to human tranquillity and enjoyment having regard to the ambient natural soundscape

Figure 29 Extract from ERS - Table 3.3 'Indicators and objectives for the ambient sound environment'

Column 1 **Land use category**	**Column 2** **General description**	**Column 3** **Planning Zones**

…

Category V	Unique combinations of landscape, biodiversity and geodiversity. These natural areas typically provide undisturbed species habitat and enable people to see and interact with native vegetation and wildlife.	Natural areas are classified as land within Category V irrespective of the planning zones that apply to that land.

Figure 30 Extract from ERS T3.2 'Land use categories for the ambient sound environment'

Prefabrication

417. The EPA suggested in cross examination of Mr Delaire that pre-fabrication of modular building elements and equipment could be included as a mitigation to reduce construction noise impacts. Kalbar see merit in adopting this as a mitigation, where it is reasonably practicable to do so.

RADIATION

Documents

418. Key documents referred to in this section are:

Technical documents

a) EES Appendix A011, Radiation Assessment Report (**RAR**)

b) First export report by Ken Joyner (review of the RAR)[205]

c) Expert evidence statement of Mr Billingsley[206]

d) Expert evidence statement of Associate Professor Mudd[207]

e) Expert evidence statement of Associate Professor Ruff[208]

f) Radiation and human health conclave statement[209]

g) Witness presentation of Mr Billingsley[210]

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205 Tabled Document 9.

206 Tabled Document 72.

207 Tabled Document 87.

208 Tabled Document 89.

209 Tabled Document 234.

210 Tabled Document 305.

h) TN21 (Legal issues concerning the export of HMC)[211]

i) Memorandum from Mr Billingsley (RESRAD predictions of radionuclide uptake via livestock and resultant exposures to humans)[212]

j) Second export report by Mr Joyner (review of expert evidence and DHHS responses)[213]

Regulator documents

k) DHHS, 'Radiation safety regulation in Victoria - explanatory document' (Attachment 1)[214]

l) DHHS, 'Review of Kalbar project' (Attachment 2)[215]

Mitigation and management documents

m) EES Appendix H, Mitigation Register

n) Updated EMF (June 2021)[216]

o) Updated Air Risk Treatment Plan (June 2021)[217]

Legislation, policy and guidelines

p) Radiation Act 2005 (Vic)

q) Radiation Regulations 2017 (Vic)

r) ARPANSA, Code of Practice and Safety Guide, Radiation Protection and Radioactive Waste Management in Mining and Mineral Processing (**Mining Code**).[218]

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211 Tabled Document 334.
212 Tabled Documents 464 and 465.
213 Tabled Document 541.
214 Tabled Document 40.
215 Tabled Document 41.
216 Tabled Document 504.
217 Tabled Document 506.
218 Tabled Document 419.

s) ARPANSA (webpage extract), 'Occupational exposure - Mineral sand mining and processing workers'[219]

t) ARPANSA, Radiation Protection Series G-1: Radiation Protection of the Environment

Overview

The RAR

419. SGS Radiation Services prepared the RAR. Mr Billingsley was the lead author of this report and gave evidence to the IAC.

420. Mr Billingsley carried out radiation measurements on the site and on surrounding land between 2017 and 2018.[220] The locations of measurements and sampling locations were presented in Appendixes B-F of the RAR. Mr Billingsley also analysed surface, groundwater and air quality samples collected by others,[221] and the geochemistry information characterising the ore, tailings and various HMC streams presented in the reports presented at Attachment 2 of the EES.[222]

421. Based on these inputs, Mr Billingsley calculated radiation exposures to members of the public[223] and workers.[224] He also undertook a tier 1 screening assessment of exposures to biota and the terrestrial ecosystem in the Project area in accordance with the ARPANSA *Guide for Radiation Protection of the Environment* (**RPS G-1**).[225]

422. In sections 10-12 of the RAR, Mr Billingsley outlined the management plans that would be required for the Project under a radiation management licence and their content. These include a Radiation Management Plan and Radioactive Waste Management Plan meeting the requirements of the Mining Code and a Radiation Environment Plan in accordance with RPS G-1.

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219 Tabled Document 448.

220 See RAR sections 5.1-5.3 and the summary of measurements provided in Mr Billingsley's hearing presentation, Tabled Document 305.

221 RAR sections 5.5-5.7.

222 RAR section 6.

223 RAR section 9.2

224 RAR section 9.1.

225 RAR section 9.3.

423. In section 13 of the RAR, Mr Billingsley identified future work that would need to be undertaken prior to commencement of mining, and incorporated in management plans, including further baseline studies for gamma radiation, radon, gross alpha and beta radiation in dust, radionuclides in water and investigation of variability in soils and crops in the horticultural region. Section 13 of the RAR also identifies the need for a transport management plan to address radiological hazards during transport and the need for a radiation monitoring program at the relevant export handling facility.

Radioactive material associated with the Project

424. The ore at the Project includes trace quantities of radionuclides.[226]

425. The ore, topsoil and overburden do not have an activity level sufficient to class this material as radioactive material under the *Radiation Act 2005* (greater than 1Bq/g).[227] Only the HMC is radioactive material (refer Figure 31).

Table 11: Radionuclide content (kBq·kg^{-1}) of mineral streams from the Fingerboards project – October 2018.

Stage	Description	Tonnes (TPH)	Weight %	Minimum					Maximum				
				Uranium mass conc. (ppm)	Thorium mass conc. (ppm)	U-238 (Bq/g)	Th-232 (Bq·g^{-1})	Total (Bq/g)	Uranium mass conc. (ppm)	Thorium mass conc. (ppm)	U-238 (Bq/g)	Th-232 (Bq/g)	Total (Bq/g)
1	Ore	1500	100	7	36	0.09	0.14	0.23	25	120	0.31	0.48	0.79
2	Screen O/S	30	2	5	30	0.06	0.12	0.18	10	70	0.12	0.28	0.40
3	Screen U/S	1470	98	8	40	0.10	0.16	0.26	27	125	0.33	0.50	0.83
4	Fine Tailings	370	24.7	7	31	0.09	0.12	0.21	15	80	0.18	0.32	0.50
5	Spiral feed	1100	73.3	9	47	0.12	0.19	0.30	32	148	0.39	0.59	0.98
6	Spiral Cons	80	5.3	200	1500	2.46	6.00	8.46	250	1600	3.08	6.40	9.48
7	Sand Tailings	1020	68	5	10	0.06	0.04	0.10	10	100	0.12	0.40	0.52
8	Mag Cons	28	1.9	180	1700	2.21	6.80	9.01	240	1700	2.95	6.80	9.75
9	N/Mag Cons	52	3.5	220	1300	2.71	5.20	7.91	300	1400	3.69	5.60	9.29

Figure 31 Extract from EES RAR, p 29 (pdf p 31) (HMC streams highlighted)

426. As can be seen in Figure 31, the tailings have a lower activity concentration than the ore, as some of the radioactive material is removed as part of the HMC.

427. Because the Project includes handling of material with an activity concentration above 1Bq/g (i.e., HMC), it requires a radiation management licence under the *Radiation Act 2005*.

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226 DHHS review of Kalbar project (Attachment 2), Tabled Document 41, Summary, dot point 2, p 4 (pdf p 4). This is consistent with the expectation for mineral sands in general as stated in ARPANSA's webpage providing information concerning radiation from mineral sands mining (Tabled Document 484), available at: https://www.arpansa.gov.au/understanding-radiation/sources-radiation/occupational-exposure/occupational-exposure-mineral-sand

227 These levels are prescribed by Schedule 1 of the Radiation Regulations 2017 (Vic).

428. DHHS' review explained that conditions on the radiation management licence will require compliance with the Mining Code, which in turn would involve the preparation of a Radiation Management Plan and Radioactive Waste Management Plan.[228]

Predicted radiation doses from the Project

429. The RAR projects low levels of radiation exposure for members of the public and workers, relevantly 0.37uSv for the public,[229] 1.36 for a worker (within a worst case area of the WCP),[230] and 2.93uSv for a truck driver (based on 5.5hrs x 250 days per year located within 1.5m to 2m from a HMC load).[231]

430. These projections involved very conservative assumptions.

431. For example, for members of the public, the highest contribution is from inhaled dust (29uSv out of total predicted dose of 37uSv) (refer Figure 34 below).[232]

432. The calculations for inhaled dust assumed, inter alia:[233]

a) a person breathing dust from the Project at a concentration of 60ug/m3, 24 hours per day every day; and

b) the dust is ore, a material with a higher radionuclide content than other dust sources like topsoil and overburden, whereas only 3-5% of PM10 is ore.[234]

228 Tabled Document 41, pdf 11.

229 EES RAR, Table 19 (Estimated annual radiation doses for a Critical Group individual), p 51 (pdf p 53).

230 EES RAR, Table 15 (Estimated total doses to workers during operations), p 40 (pdf p 42).

231 EES RAR, Table 16 (Estimated doses to personnel during transport and loading operations), p 42 (pdf p 44).

232 EES RAR, Table 19 (Estimated annual radiation doses for a Critical Group individual), p 51 (pdf p 53).

233 EES RAR, section 9.2.1 Exposure to airborne dust inhalation during operations, p 44 (pdf p 46).

234 Technical Note 34, Tabled Document.

Table 19: Estimated annual radiation doses for a Critical Group individual – March 2020.

Exposure pathway	Annual Dose Year 20 (µSv)
Airborne dust inhalation, ore material, 1 µm AMAD, occupancy at residence 8760 hours, breathing rate 0.93 m^3/h	29
Radon and thoron inhalation dose as a result of Project	negligible
Consumption of leafy vegetables grown solely in 'Margin to Flats'. Ore deposition at 0.2 g/m^2/month, distributed evenly through top 20 cm of soil.	5.8
Ingestion of ore as a result of dust deposition, 50 mg/day, 10% ore fraction.	1.2
Drinking water originating from Waterglen WTP which sources water from the Mitchell River.	negligible
Following truck loaded with HMC, 5 metre separation distance, 1 hr/year	negligible
Waiting at rail crossing when HMC shipment passing, 2-metre separation, 1 hr/year	1.2
Total:	**37 µSv**

Figure 32 Extract from EES RAR, Table 19 (Estimated annual radiation doses for a Critical Group individual), p 51 (pdf p 53).

433. No expert has raised concern with the technical validity of the RAR, including dose predictions. There appears to be consensus that the predictions were conservative.

Radiation doses and health

434. Professor Ruff advocated for the Project to achieve levels well below regulatory limits, adopting 0.1mSv for the public and 1-2mSv for workers as relevant trigger levels.[235]

435. The predicted doses in the RAR are below these levels, save for a truck driver (2.93uSv). However, there is potential for this level to be reduced through mitigations, such as shift rotation and cabin shielding. Mitigations were not accounted for in the predictions.

[235] Evidence statement of Professor Ruff, Tabled Document, Summary of Conclusions [4], p 1. See also at p 14 'Recommendations re radiation and health'.

436. Information from ARPANSA concerning radiation doses and health affects is extracted in Figure 33. ARPANSA state that that there are no observed or expected health effects from occupational exposures below 10mSv, which it describes as a "very low dose".

What are the possible health effects?

Dose range (millisieverts)	Description	Possible health effects
Up to 10	Very low dose	None observed or expected (typical background range)
10–100	Low dose	Plausible health effects but not observed
100–1000	Moderate dose	Increase risk of cancer Acute effects at higher end of range (above 500 mSv)
Above 1000	High dose	Acute effects (burns, vomiting) Death possible at very high doses (above 5000 mSv)

No health effects have been observed or are expected to be observed at the very low doses normally received in this occupation.

Figure 33 Extract from ARPSANSA website[236]

437. The doses predicted for the Project are at the low end of "very low" compared to this guidance.

Mitigations and keeping doses ALARA

438. There is the potential for exposures to be reduced lower than the projections using mitigations.

439. Under the *Radiation Act 2005*, and the Mining Code that will apply as a licence condition, doses must be kept as low as reasonably achievable (**ALARA**).

236 Tabled Document 448, webpage 'Occupational exposure: Mineral sand mining and processing workers' also available at https://www.arpansa.gov.au/understanding-radiation/sources-radiation/occupational-exposure/occupational-exposure-mineral-sand

440. This is part of the radiation protection principle in s 7 of the *Radiation Act 2005* which provides:

> "**7 The Radiation Protection Principle**
>
> The Radiation Protection Principle is the principle that persons and the environment should be protected from unnecessary exposure to radiation through the processes of justification, limitation and optimisation where—
>
> (a) justification involves assessing whether the benefits of a radiation practice or the use of a radiation source outweigh the detriment;
>
> (b) limitation involves setting radiation dose limits, or imposing other measures, so that the health risks to any person or the risk to the environment exposed to radiation are below levels considered unacceptable;
>
> (c) optimisation—
>
> > (i) in relation to the conduct of a radiation practice, or the use of a radiation source, that may expose a person or the environment to ionising radiation, means keeping—
> >
> > > (A) the magnitude of individual doses of, or the number of people that may be exposed to, ionising radiation; or
> > >
> > > (B) if the magnitude of individual doses, or the number of people that may be exposed, is uncertain, the likelihood of incurring exposures of ionising radiation—
> >
> > as low as reasonably achievable taking into account economic, social and environmental factors;
> >
> > (ii) in relation to the conduct of a radiation practice, or the use of a radiation source, that may expose a person or the environment to non-ionising radiation, equates to cost-effectiveness."

441. For public exposure, relevant mitigations are those which reduce exposure pathways via water and dust.

442. For workers, mitigations include measures such as shielding, dust masks, ventilation, hygiene protocols and the like; as well as shift rotation (see e.g., RD06 and RD09).

443. The ARPANSA webpage concerning mineral sands mining explains that these types of measures are required as part of a radiation management plan. The webpage states:[237]

> "**What is a radiation management plan?**
>
> Operators of each mineral sand mine and mill are required to have an approved Radiation Management Plan that complies with the requirements of the Code of Practice and Safety Guide for radiation protection and radioactive waste management in mining and mineral processing. All relevant controls for radiation protection must be included in this plan and the plan must be adhered to.
>
> Controls must adhere to the hierarchy of control. Minimising time, increasing distance and shielding can be used to reduce gamma radiation exposure while ventilation is critical to reduce exposure from the inhalation pathway, when required respiratory protection may be needed as an additional control." (Emphasis added)

444. These measures, and others (see Mitigation Register), will be required under the RMP and RWMP in order to comply with the requirements of the Mining Code.

DHHS' review of the Project

445. DHHS participated in the TRG and also attended the radiation expert conclave as an observer.

446. Save for exposures via cattle and dairy, DHHS was satisfied with RAR, its conclusions and the management framework and mitigations proposed in the EES. It stated:[238]

> "**The adequacy of the radiation assessment undertaken for the Environment Effects Statement**:
>
> The department's assessment is that the methods used by Kalbar to estimate the radiation related impacts of the project are well established and appropriate for the task. Furthermore, the department's assessment is that the methods have been implemented appropriately and the conclusions based on these methods are valid. The calculations of potential public doses for the pathways considered demonstrate that the proposed project can be conducted with acceptably low doses to members of the public."

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237 Tabled Document 448.

238 DHHS review of Kalbar project (Attachment 2), Tabled Document 41, Summary, dot point 4, p. 14 (pdf p. 14).

447. However, DHHS' review identified the following gap:

> "The department considers that an additional radiation dose assessment for public radiation dose from consumption of nearby meat and dairy produce is warranted (although the derived potential dose outcome of such an assessment is predicted to be exceedingly low) and will require the submission of a Radiation Environment Plan with any future Management Licence application to include an environmental assessment of agreed flora and fauna in the manner outlined in the Australian Radiation Protection and Nuclear Safety Agency's Guide on Radiation Protection of the Environment (the Guide).This Plan will need to be prepared to the department's satisfaction before a licence will be issued." (Emphasis added)

448. Mr Joyner's first export report also identified this gap.

449. In response, Mr Billingsley carried out preliminary calculations of doses via meat and dairy consumption. The results showed negligible doses via this pathway (0.4 uSv / year from cattle consumption and 0.3 uSv / year for diary).[239] Mr Joyner's second expert report reviewed this work and commented that Mr Billingsley had shown that these exposure pathways pose a negligible risk.[240]

Management plans and licence conditions

450. There is reasonably clear direction regarding the management framework that will apply to the Project if it proceeds.

451. In relation to licence conditions, DHHS stated:[241]

> "Licence conditions
>
> At the moment and based on our understanding of the proposed project, a management licence issued to Kalbar Operations Pty Ltd would be expected to, as a minimum, require the company to comply with:
>
> 1. The obligations of the operator and employer in the Code of Practice for Radiation Protection and Radioactive Waste Management in Mining and Mineral Processing (2005) published by the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA).

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239 Radiation Conclave Statement, Tabled Document 234, pdf p. 16 (which provided the predicted levels). See Tabled Documents 464 and 465 for details of the calculations using RESRAD.

240 Tabled Document 541, p. 16.

241 Tabled Document 41, p. 11.

2. The obligations of the consignor in the Code of Practice for the Safe Transport of Radioactive Materials (2019).

3. The obligations specified in the approved Radiation Management Plan and Radioactive Waste Management Plan.

4. The obligations to report certain types of radiation incidents to the department and to notify the department regarding the disposal and acquisition of radiation sources.

5. The obligation to prepare a report that contains the radiation doses received by occupationally exposed workers arising from gamma radiation, radon gas, inhaled dust, and ingested dust. Such a report would be submitted to the department two times each year.

An additional licence condition is also likely to be applied by the time that the licence would be expected to be required. The condition would require compliance with a relatively new Code; the Code for Radiation Protection in Planned Exposure Situations (2020), RPS C-1 (Rev.1) published by ARPANSA. This Code sets out the requirements in Australia for the protection of occupationally exposed persons, the public and the environment in planned exposure situations."

452. Accordingly, the management licence for the Project can be expected to require compliance with the Mining Code, amongst other matters.

453. Key aspects of the Mining Code are briefly outlined below.

The Mining Code

454. The Mining Code provides a nationally consistent framework for the effective management and control of radiation risks associated with mineral sands mining. It:

a) Provides a "regulatory framework to manage the protection of workers, members of the public and the environment from harmful effects of radiation" (clause 2.2, Objective).

b) Has specific application to "separation of heavy minerals from mineral sands ore." (clause 2.3, Application)

c) Covers operational and rehabilitation matters (clause 2.3.3).

d) Implements the ALARA principle consistent with s 7 of the Radiation Act 2005 (clause 2.5.4).

e) Prescribes what a Radiation Management Plan and a Radioactive Waste Management Plan must include (clauses 2.7.2 and 2.8.2).

f) Sets specific obligations for site operators and employees which is of practical relevance in day to day operations (e.g., record keeping, reporting incidents, monitoring doses, implementing operating procedures and so on) (clause 2.10).

455. Together with the work undertaken by Mr Billingsley to characterise risks and develop mitigations specific to the Project, the Code supports the achievement of acceptable radiation outcomes if the Project proceeds.

Response to issues

Radionuclides in crops

456. Professor Mudd raised a concern that the existing levels of radionuclides in crops in the region had not been measured.

457. Whilst this was identified as a future monitoring program in section 13 of the RAR (and within Table 12.9 of the EMF), Professor Mudd suggested this monitoring should have occurred as part of the EES.[242]

458. Kalbar accepts that radionuclide uptake to crops is an exposure pathway that should be considered, and that it be monitored during the life of the Project. However, it is not necessary that a baseline survey based on direct measurement of existing vegetables be undertaken as part of the EES. The effect of the Project can be confidently predicted; and, after commencement, vegetables will be measured establishing a baseline of evidence to assess whether the Project is meeting its requirements.

459. In this regard, it is important to recognise that the predicted uptake to vegetables arising from the Project and the resultant doses are extremely low.

[242] Evidence statement of Associated Professor Mudd, Tabled Document 87, [27].

460. The RAR conservatively calculated a dose increase of just 5.8uSv per year resulting from the Project.

Table 18: Estimated annual radiation doses from consumption of vegetables grown in the farming district, years 10 and 20 – February 2020.

Soil Sample Location	Sample ID	Vegetable type assumed	Annual Dose Baseline (mSv)	Annual Dose Year 10 (mSv)	Annual Dose Year 20 (mSv)	
River Flats	001	Leafy vegetables	*0.6122*	0.6151	0.6180	difference: 5.8uSv
Margin to flats	002	Leafy vegetables	*0.9152*	0.9181	0.9210	
Grazing land	003	Cereals/grain	*0.1384*	0.1393	0.1401	
Grazing land	004	Cereals/grain	*0.0380*	0.0389	0.0397	
Grazing land	005	Cereals/grain	*0.1268*	0.1276	0.1284	

Figure 34 Extract from EES RAR, p 48 (pdf p 50) (difference calculation added)

461. This was based on a series of conservative assumptions, namely:[243]

a) 0.2 g/m2/month dust deposition (i.e., twice the 0.1g/m2/ month (annual average) modelled in the AQG for R42, which is a reasonable proxy for the horticultural area);

b) the entire dust deposited is ore (a material with a higher radionuclide content than other dust sources like topsoil and overburden, whereas only 3-5% of PM10 is ore);[244]

c) dust deposition occurs at the assumed maximum rate (0.2g/m2/month) for 20 years (whereas dust deposition rate reduces as mining moves further from the horticultural area); and

d) A person's entire diet consists of vegetables or grains affected by Project dust, based on the assumptions above.[245]

462. DHHS were satisfied with the approach adopted, stating:[246]

> "Quantification of the above listed parameters is provided in the Report, with the exception of the radionuclide content within vegetation grown in the district. For this latter component of the pre-mining background radiation level assessment Kalbar has provided in the Report an

243 EES RAR, section 9.2.3 (Exposure via ingestion of vegetables or soils), p. 47 (pdf p. 49).

244 Technical Note 34, Tabled Document 532.

245 EES RAR, section 9.2.3 (Exposure via ingestion of vegetables or soils), p. 46 (pdf p. 48).

246 DHHS review of Kalbar project (Attachment 2), Tabled Document 41, p. 15-16 (pdf p. 15-16).

international best practice estimate using an agreed method developed by the International Atomic Energy Agency. This approach uses soil concentration data measured by Kalbar and soil to plant transfer factors to estimate the baseline radionuclide concentrations in the plant matter with subsequent derivation of pre-mining radiation dose estimates to persons consuming such plant matter."

463. There is also evidence before the IAC that direct measurement of radionuclide concentrations in vegetables is prone to large variation.

464. Item 6 of the Radiation Conclave Statement recorded:

Page	Extract (G Mudd comment)	DB Response and conclave outcome
6	26. This sub-section (5.3) is very short and rather terse – plus the values given in Table 4 are calculated only and nor directly measured. The transfer factors are not given, nor a basic explanation of the calculations undertaken to derive the values in Table 4. Although it is asserted that the transfer factors are appropriate for the region, there is no direct evidence presented to support this – such as previous scientific studies nor direct sample analyses of crops from the Glenaladale region.	Disagreement. DB - Disagree that it is an ineffective means of impact assessment. There are extremely large errors with lab assessment of foliage due to geometry variations from sample to sample. To identify impacts from operations thus would be difficult, based on dust concentrations expected. A theoretical approach has been taken using factors from IAEA2010, Table 17. 'Mean' transfer factors used. 'temperate' environment assumed as only other option is 'tropical'. However importantly, identical factors have been used for the baseline, and the project impact. It is this dose difference (RAR, Table 18) that is of importance – not the factors themselves. GM- I'm familiar with the literature, acknowledge the huge variation, that's why I'm cautious. Ultimate test is testing the vegetable foliage itself. A lot of literature can be a bit European centric or from North American studies. Not a lot of Australian studies that underpin these transfer factors apart from Ranger at Kakadu.

Figure 35 Extract from Radiation Conclave Statement, Tabled Document 234 (pdf p. 7)

465. Professor Mudd gave evidence that a well designed sampling method would need to be employed to achieve consistency between baseline and impact assessment measurements. This is consistent with the view that vegetable sampling might best occur pursuant to an RMP and RWMP, using a method approved to the satisfaction of the relevant regulator, so that it can be carried out in a uniform manner during the life of the Project.

Nuclear Activities (Prohibitions) Act 1983

466. Professor Mudd's evidence raised a concern that the Project was prohibited under the *Nuclear Activities (Prohibitions) Act 1983*. The relevant provisions of this Act are as follows.

"**5 Prohibition against exploration etc. for uranium or thorium**

(1) Subject to section 6, but notwithstanding anything else to the contrary in any Act, and notwithstanding the terms of any mining title, a person shall not explore, mine or quarry for uranium or thorium.

…

6. Mining in the course of mining for minerals other than uranium or thorium etc.

(1) Notwithstanding section 5, a person who is the holder of a mining title and who mines or quarries uranium or thorium in the course of mining or quarrying pursuant to his mining title for some mineral other than uranium or thorium shall not be guilty of an offence under this Act provided that—

(a) uranium of an amount greater than ·02 per centum by weight or thorium of an amount greater than ·05 per centum by weight is not removed from the land covered by the mining title". (Emphasis added)."

467. Professor Mudd presented values in his evidence for HMC rather than ore. However, he agreed in the radiation conclave that the correct comparison is with the ore, being the material "removed from the land" (refer Figure 36).

9	34. In addition, Victoria also has the Nuclear Activities (Prohibitions) Act 1983 which remains in force (to my understanding of the law). The relevant clauses are: "5 (1) Subject to section 6, but notwithstanding anything else to the contrary in any Act, and notwithstanding the terms of any mining title, a person shall not explore, mine or quarry for uranium or thorium." "6 (1) Notwithstanding section 5, a person who is the holder of a mining title and who mines or quarries uranium or thorium in the course of mining or quarrying pursuant to his mining title for some mineral other than uranium or thorium shall not be guilty of an offence under this Act provided that— (a) uranium of an amount greater than ·02 per centum by weight or thorium of an amount greater than ·05 per centum by weight is not removed from the land covered by the mining title;	Agreement the Act probably does not apply based on the wording. GM: addressed concerns more over the IAEA safeguards implications (discussed in 33) DB: For the Fingerboards project U is 0.0025% and Th is 0.012%.

Figure 36 Extract from Extract from Radiation Conclave Statement, Tabled Document 234 (pdf p 12)

468. Accordingly, the relevant comparison is between 0.02 and 0.0002 for Uranium and 0.05 and 0.012 for Thorium. The concentrations in the ore are well below the prohibited levels.

EPBC Act and export matters

469. Professor's Mudd's evidence suggests that the matter of nuclear actions under the EPBC Act had been misunderstood in the EES. He stated:

"33. I believe that the discussion in sub-section 7.4 of the designation of the Fingerboards as a 'nuclear action' under the Commonwealth Environment Protection & Biodiversity Conservation (EPBC) Act is incorrect and fails to understand the purpose of this matter of national environmental significance.

…

> The EPBC Act is intended to provide for public transparency over nuclear actions such as uranium mining – especially since Australia has maintained a position in the international nuclear fraternity through uranium exports for peaceful purposes. As a member of the International Atomic Energy Agency (IAEA), Australia is bound by its many requirements, especially that all nuclear source materials are sold for peaceful purposes only and follow strict accounting practices and safeguards.

470. In other words, Professor Mudd posited that the purposes of control over nuclear actions under the EPBC Act related to, either in whole or in part, international nuclear safeguards matters.

471. Professor Ruff appeared to echo Professor Mudd's concerns stating in his evidence:[247]

> "Not mentioned in any of the project documentation I have been able to review, Prof Mudd raises a substantial issue in relation to Australia's nuclear non-proliferation obligations under International Atomic Energy Agency (IAEA) safeguards."

472. MFG's Part B submission continues with these issues, stating:

> "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" yet the Proponent has only provided international safeguard information on the export of nuclear material from Australia to China.
>
> 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 cannot be confidently foreseen now and could potentially involve nations with which Australia does not have pre-exiting nuclear safeguard agreements."

247 Evidence statement of Professor Ruff, Tabled Document 84, p. 5.

473. Kalbar responded to this matter in TN21.

474. The MFG witnesses' interpretation of the EPBC Act is not correct. The EPBC Act is concerned with the environment of Australia (i.e., the effects of ionising radiation, as assessed in the EES), not overseas environments including export considerations.[248]

475. Further, it is not within the IAC's Terms of Reference to consider and provide advice about matters arising under the *Customs (Prohibited Exports) Regulations 1958* (Cth). Whilst Kalbar responded to matters of substance on this issue in TN21, this is not a matter requiring further consideration.

Baseline data

476. Mr Billingsley and DHHS considered the level of baseline data collected was sufficient to inform the EES, but that a more detailed baseline study would be required as part of licencing and management plan preparation.

477. The additional data that will be collected is listed in section 13 (Future Work Plan) of the RAR[249] and identified in Table 12.9 of the EMF.

478. The key issue for the IAC in this matter should be to inquire whether there is sufficient baseline data to support an assessment of environmental effects of the Project and their acceptability.

479. Principally, this assessment turns on whether the Project can achieve:

a) satisfactory rehabilitation of the site (i.e., a site that is not significantly enriched in radiation levels after closure); and

b) acceptable on and offsite radiation exposures to persons and the environment.

480. As to rehabilitation, the baseline data collected provides confidence that that it will be possible to leave a safe rehabilitated site. Professor Mudd accepted that the available rehabilitation media – topsoil and overburden showing "no significant enrichment

248 *Buzzacott v Minister for Sustainability, Environment, Water, Population and Communities (No 2)* [2012] FCA 403, [89]-[111] (Tabled Document 335). See also Full Court decision in *Buzzacott v Minister for Sustainability, Environment, Water, Population and Communities* [2013] FCAFC 111 (Tabled Document 336).

249 Page 68 (pdf p. 70).

compared to average crustal abundance",[250] and ore / tailings containing trace levels of radionuclides – was "not a big challenge in terms of rehabilitation".[251]

481. In cross examination, Professor Mudd agreed that the purpose of collecting more baseline data:[252]

> "is not to work out whether or not we have suitable material that we can use to rehabilitate the site. The relevance of the comprehensive baseline data is needed to be able to undertake a before and after comparison, during operations and after operations to assess compliance with rehabilitation targets".

482. In Kalbar's submission, the IAC has sufficient data available to make findings in relation to the environmental effects of the Project, including the viability of achieving appropriate rehabilitation targets.

483. On the second point, the predicted doses are not dependent on the baseline data.

Availability of draft RMP and RWMP

484. MFG's submission suggested draft a RMP and RWMP should have been prepared and exhibited with the EES.

485. As Mr Joyner's second expert report notes, this would not be common practice. Relevantly, Mr Joyner's report noted (in the section concerning Professor Mudd's evidence):[253]

> "xv. Also, in re-examination Prof Mudd was asked '*would you expect the radiation management plan and the radioactive waste management plan to be public documents that are available to members of the community or not*?' Prof Mudd responded: '*I would hope they are I think historically I've found that these documents are not made public but I think I would certainly hope they are I think that's important transparency to help validate the claims that are being made about management and low risk or things like that so that way um you know the evidence is there and so we can have confidence or otherwise in these documents I think it's an important part of the process and for the*

[250] See Evidence statement of Professor Mudd, Tabled Document 87, [23] and [25].

[251] Hearing recording, day 21, 2 June 2021, cross examination of Professor Mudd by Kalbar, from 0:47:51: https://www.youtube.com/watch?v=q9MlLnfgGXo&t=47m51s. The full question begins at 0:47:12: https://www.youtube.com/watch?v=q9MlLnfgGXo&t=47m12s.

[252] Hearing recording, day 21, 2 June 2021, cross examination of Professor Mudd by Kalbar, from 48:42: https://www.youtube.com/watch?v=q9MlLnfgGXo&t=48m42s.

[253] Expert report by Mr Joyner, Tabled Document 541, p 13.

committee's purposes in assessing the environmental effects of this project'.

20. I have confirmed with DHS that the RMP, RWMP and REP documents are treated as commercial in confidence and are not released by DHS."

486. Further, as can be seen from the Mining Code, an RMP and RWMP cover many practical and operational matters, such as specific operating practices for specific areas of plant, working hours, personal protective equipment to be worn and so on. Whilst a template could have been produced as an illustration, the details included would have been generic. The mitigation measures and monitoring requirements stated in the EMF outline the elements that need to be delivered to manage radiation risks. DHHS was satisfied that these were adequate[254] and Kalbar submits that this is sufficient for present purposes.

HUMAN HEALTH

Documents

487. Key documents referred to in this section are:

Technical documents

a) EES Appendix A019, Human Health Risk Assessment (**HHIA**)

b) Ms Teague's evidence statement[255] and her supplementary statement concerning centrifuges[256]

c) TN19 Evaluation of potential exposures to sensitive receptors associated with metals in dust particulates and fallout[257]

d) TN7 (Monthly maximum dust deposition tables)[258]

254 Tabled Document 41, p 15. See also at pp 19-20 under the heading 'Mitigation and Management of Potential Public and Environmental Radiation Impacts'.

255 Tabled Document 82.

256 Tabled Document 134.

257 Tabled Document 302.

258 Tabled Document 146.

e) TN34 (Response to Council and IAC questions re. modelled dust sources / material fractions)

Regulator submissions

f) EPA EES submission[259]

g) EPA Part B submission[260]

Legislation, policy and guidelines

h) National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (**ASC NEPM**)

i) EnHealth - Environmental Health Risk Assessment - Guidelines for assessing human health risks from environmental hazards (2012)[261] published by the Environmental Health Standing Committee (**enHealth Guidelines)**

Overview

488. The HHIA:

a) synthesised the baseline[262] and predicted[263] contaminant data reported in the water, air quality, radiation and geochemical technical studies of the EES;[264]

b) developed a site conceptual and exposure pathway model for the Project consistent with guidance provided in the ASC NEPM and enHealth Guidelines;[265]

259 EES submission no. 514.

260 Tabled Document 486.

261 Published by the Environmental Health Standing Committee.

262 HHIA section 8.

263 HHIA section 9.

264 These studies are listed in Table 4.1 of the HHIA at p 11 (pdf p 25).

265 HHIA sections 5 and 6.

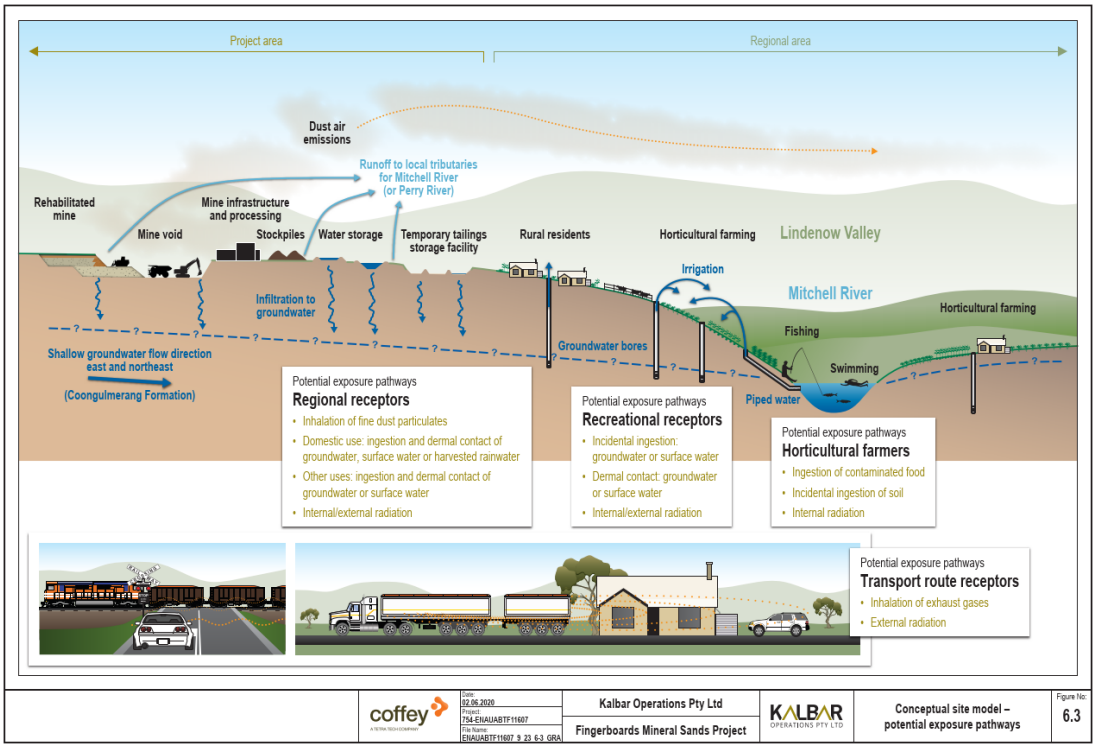
c) calculated contaminant concentrations in dams and drinking water[266] and compared these against the Australian Drinking Water Guidelines;[267]

d) compared baseline and predicted levels against adopted screening levels;[268]

e) discussed uncertainties;[269] and

f) reached conclusions about the health implications of the Project in terms of chemical hazards (noise and social impact related health effects were not assessed in the HHIA).

489. The conceptual site and exposure pathway model was presented schematically as shown in Figure 3. It shows dust, groundwater and surface water as key pathways from the Project area. For transport routes, it identifies gases and gamma radiation as key exposures. Noise and social impact present further pathways, however the HHIA did not assess these pathways.



266 HHIA section 9.3.1.

267 NRMMC, *Australian Drinking Water Guidelines* (2011)

268 HHIA section 8 and 9.

269 HHIA section 10.

Figure 37 Extract from the HHIA[270]

Gaps and further work

490. Ms Teague identified a gap in the HHIA, namely the assessment of exposures via ingestion of cattle products and plants affected by metals in dust fallout. Save for this, Ms Teague gave evidence that the HHIA was complete[271] and adequately and conservatively[272] assessed the health implications of the Project from hazardous substances.

491. Ms Teague responded to the identified gap in the HHIA through TN19. TN19 assessed exposures to sensitive receptors associated with metals in dust particulates and fallout. This involved, inter alia, Ms Teague calculating metal and metalloid concentrations in receiving soils, uptake into crops and livestock and resultant exposures to young children and adult workers in the vicinity of the project.

492. Ms Teague summed all exposures as a conservative approach[273] and calculated a Hazard Quotient for the summed exposure to a young child and adult worker.[274] The Hazard Quotient was described as the "ratio of estimated exposure concentration (EC) to the tolerable concentration (TC) or the estimated chronic daily intake (CDI) to the TRV [toxicity reference value]."[275] The calculated hazard quotient for each contaminant of concern is then summed to calculate a Hazard Index (HI).

493. TN19 states:[276]

> "Where HI is less than 1, there is unlikely to be any adverse health effects associated with exposure to the chemicals of concern. However,

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270 Page 36 (pdf p 50).

271 Evidence statement of Ms Teague, section 5.1.4 (Assessment report completeness and accuracy), p 6 (pdf p 10).

272 Ms Teague explained at several points in her oral evidence that the screening criteria adopted in a level 1 assessment are intended to be conservative. Similarly, in her written evidence, Ms Teague relevantly highlighted at p 4: "Based on the ASC NEPM framework, a Tier 1 assessment uses conservatively derived screening criteria to evaluate chronic exposures to contaminants in a particular setting." See also at pp 9-10 in section 5.4.1 'Tiered approach'.

273 See at p 22 (pdf p 22) where Ms Teague explains: "To sum the HIs estimated for every COPC and every pathway is a conservative approach given the likely variance in toxicity and effected organs/systems. It is noted the total HI for all COPCs across all exposure pathways in this instance does not exceed an HI of 1."

274 TN19, section 7 (Risk Characterisation), from p 20.

275 TN19, p 20.

276 Page 20.

> a HI exceeding 1 does not necessarily indicate an actual risk but rather a potential adverse health outcome requiring additional assessment."

494. TN19 calculates a Hazard Index of 0.54 and 0.4 for a young child and adult workers respectively. It concludes that the health risks associated with particulates and dust fallout from the project would be low and acceptable.[277]

Response to issues

Woodglen Water Storage and rain water tanks

495. Submissions raised concern that the health implications of dust on the Woodglen storage dams had not been assessed.[278] Whilst the HHIA and Air Quality Technical Study did not explicitly model dust fallout on the Woodglen storage dams, there were other lines of evidence that could be, and were, relied upon.

496. The HHIA calculated drinking water quality of rainwater harvested on roofs and collected in tanks.[279] It assumed a conservative dust deposition rate of 59.7mg/m2/day on a 280m2 roof cumulatively over 20 years and no first flush system on the tank (amongst other assumptions such as tank size).[280] The HHIA calculated that 14mm of dust would accumulate in the tank over 20 years. It then used the maximum concentrations of metals in fine and course tailings and the maximum leachability results for tailings, heavy mineral concentrate and overburden reported by EGi (2020)[281] to estimate a maximum dissolved concentration of metals in tanks. It calculated this to be $<1 \times 10^{-10}$ mg/L per year (0.0000000001mg/L per year), stating that this was negligible.[282] (The installation of a first flush device on tanks would further reduce this concentration.)

277 TN19, section (Conclusion), p. 23-24.

278 See MFG Part B submission, [177]-[178].

279 HHIA, section 9.3.

280 HHIA, p. 80 (pdf p. 94).

281 EES Attachment 2, Appendix D. Note that this is a very conservative method given the pH of tank water would be considerably less acidic than that adopted in the leaching test: see HHIA, p 81.

282 HHIA, p. 81 (pdf p. 95).

497. The HHIA then went on to consider dams, relevantly explaining:[283]

> "Dust deposition on dams or other surface water storage impoundments may occur as a result of project activities.
>
> …
>
> Given the predicted dust deposition rates are within acceptable levels, the actual exposure increase to metals or radionuclides would be minimal where filters are in place for sensitive water uses such as drinking or domestic purposes. Baseline data indicates that even where dam or surface waters are in contact with ore body soils, all results complied with the Australian drinking water guidelines (refer to SGS (2020) and Coffey (2020b) for further detail)." (Emphasis added)

498. It is worth noting that East Gippsland Water which operates the Woodglen storage was part of the TRG and has not objected to the Proposal.

499. In summary, Kalbar submits that dust deposition on the Woodglen storage and on tanks will not present any unacceptable risk to human health. Nevertheless, if thought necessary Kalbar does not oppose a recommendation for an explicit assessment of dust deposition on the Woodglen storage and resulting impact calculations against drinking water guidelines.

Relationship between Health and Air Quality work

500. The Council's Part B Submission was critical of the relationship between TN19 and Katestone's air quality work, stating:

> "226 The relationship between Mr Welchman's evidence and that of Ms Teague is of particular note. Mr Welchman's understanding is that his work had been, at least considered in Ms Teague's health risk assessment. He had not made any independent assessment as to how his work had been considered, or how it had been amalgamated into Ms Teague's work. In addition, Mr Welchman had not read TN19 dated 11 May 2021 – which assumed a south-west wind in conducting an assessment of dust dispersal." [footnotes omitted]

501. TN19 used the dust dispersion modelling numbers presented by Katestone.[284] It adopted the maximum predicted ground level concentration for any year and any

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283 HHIA, p. 81 (pdf p. 95).

284 This is explained in and stated in Table 3 of TN19 which lists the modelled concentrations at sensitive receptors., p. 12.

receptor. This is a simple matter. There was no separate assumption of "a south-west wind in conducting an assessment of dust dispersal" made by Ms Teague.

Tier 1 assessment

502. Submissions were critical that the HHIA did not proceed to a Tier 2 assessment.[285]

503. Ms Teague responded to this issue in her evidence statement as follows:[286]

> "**5.4.1. Tiered approach**
>
> Under the ASC NEPM framework, the recommended process for assessing site contamination involves a tiered approach (refer to Schedule A of the ASC NEPM). The first stage is a Tier 1 screening assessment using generic screening criteria that have been conservatively derived for a particular land use setting or for general public health. Exceedances of Tier 1 screening criteria are triggers for further investigations, a refined site-specific Tier 2 or Tier 3 risk assessment, remediation, management, or a combination of these strategies.

504. Ms Teague noted a limited number of exceedances of screening criteria in baseline data for in soil (radiation), surface water (arsenic, chromium, lead and manganese) and groundwater (metals), but stated that a Tier 2 evaluation was not warranted for several reasons, including because exceedances were in the baseline data only[287] (in contrast, Ms Teague gave evidence that exceedances in the impact assessment would have triggered a Tier 2).[288]

505. The tiered approach that was adopted in the HHIA is consistent with relevant guidance in the ASC NEPM and the enHealth Guidelines.

506. The ASC NEPM explains:[289]

> "**3.2 Tier 1 assessment**
>
> A Tier 1 (or screening level) assessment comprises a comparison of representative site data with generic investigation levels and/or screening levels for protection of human health and the environment,

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285 In particular, the Council and MFG (see EES submission (no. 514, p. 123-126, pdf p. 124-127).

286 Tabled Document 82.

287 Evidence statement of Ms Teague, p .10, pdf p. 14.

288 Hearing recording, day 9, 13 May 2021, evidence of Ms Teague under cross examination by MFG, from 5:35:02: https://www.youtube.com/watch?v=ttSmz2kXvgQ&t=5h35m02s

289 Volume 2, p. 20 (pdf p. 28).

> together with an assessment of any limitations on their use in relation to site-specific conditions. A Tier 1 assessment provides an initial screening of the data to determine whether further assessment is required." (Emphasis added)

507. In relation to exceedance of tier 1 screening criteria, the ASC NEPM states:[290]

> **3.2.2 Exceedance of Tier 1 investigation and screening levels**
>
> The magnitude of the exceedance should be considered in the context of the CSM (that is, whether the exposure pathways are plausible and whether exposure will result in harm). In cases of minor exceedance of investigation or screening levels, a qualitative risk assessment may be sufficient to evaluate the potential impact."

508. The enHealth Guidelines state that:[291]

> "A risk assessment progresses from Tier 1 to Tier 2 when the less-refined risk estimates at Tier 1 may be unacceptable, and further assessment is needed."

509. The enHealth Guidelines further explain:[292]

> "The degree of health protection achieved is equal at each tier. As the amount of data and assessment detail increases and the conceptual understanding of site conditions (i.e. the conceptual site model) is refined, the level of uncertainty decreases. In turn, the amount of caution which must be substituted for knowledge in the risk assessment process may be reduced (NEPC 2010)."

510. Thus, less conservative screening values can be adopted via a Tier 2 or 3 assessment, as conservatism in the screening value is replaced with a more detailed understanding of the health risk.

511. Overall, Kalbar submits that the Tier 1 screening assessment was entirely appropriate, as it was sufficiently conservative and adequately demonstrates the low health risks associated with this Project.

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290 Schedule B1, Guideline on Investigation Levels for Soil and Groundwater, p. 20.

291 enHealth (2012), section 1.9 (Tiered approaches to EHRA), p 12 (pdf p 13).

292 enHealth (2012), section 1.9 (Tiered approaches to EHRA), p 12 (pdf p 13).

Insufficient information on sensitive receptors

512. The Council's Part B submission states:

> "253 Ms Teague did not proceed to a Tier 2 assessment because, in part, she did not have data in respect of land uses including habits and activities of residents and users of the land."

513. This is not evidence that Ms Teague gave. Rather Ms Teague said in evidence in chief:[293]

> "I think we've got sufficient information in terms of receptors being close to the site and being within enough of the receptors being downwind of the prevailing wind direction from the project area to be satisfied that those receptor locations would be pretty indicative of other receptors within 5km at least".

514. Section 6.3 of the HIA describes the receptors considered in the HHIA, providing:[294]

> "The identified receptor populations assessed in the HHRA include:
>
> **Regional residents -** Residential occupants located within a 5 km radius of the project area. Based on the distance to identified settlements and towns in the area, these may include the residents of Glenaladale, Iguana Creek, Woodglen, Wuk and Walpa.
>
> **Transport route residents -** Residential occupants located adjacent to heavy mineral concentrate transport routes. Residents included in this population will depend on the selected transport route(s).
>
> **Horticultural farmers** located in the Lindenow Valley, within 5 km distance of the project area.
>
> **Recreational users** of waterways located within 5 km distance of the project area."

515. In evidence in chief, Ms Teague explained:[295]

> "Sensitive receptors may include young children or people with chronic health conditions. Young children are actually considered to be the most sensitive given that they have a greater potential intake given their body weight, they have a higher potential for development or health effects. They are present in rural residential, recreational and

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293 Hearing recording, day 9, 13 May 2021, evidence in chief of Ms Teague, from 5:10:09: https://www.youtube.com/watch?v=ttSmz2kXvgQ&t=5h10m09s

294 EES HIA (A019), p. 32 (pdf p. 46).

295 Hearing recording, day 9, 13 May 2021, MFG cross examination of Ms Teague, from 5:11:56: https://www.youtube.com/watch?v=ttSmz2kXvgQ&t=5h11m56s

> horticultural settings, and transport settings for that matter. So they would have much greater exposure periods in a residential setting to than in a school or kindergarten, childcare or bus, what have you. So, in all the guidance young children are considered to be the most sensitive receptor population in most instances."

516. This approach is reflected in TN19, where Ms Teague carried out calculations for young children and adult workers.

517. In summary, there is no substance to Council's Part B Submission that the HHIA did not assess relevant receptors, nor to the assertion that a Tier 1 assessment was insufficient for the purpose of assessing the potential health effects of the Project at the EES stage.

Noise (health impacts)

518. Some submissions expressed a concern that the HHIA did not consider health effects from noise.

519. In response to a question in cross examination why noise was not included, Ms Teague answered that the health risk assessment was "really targeting hazardous substances".[296]

520. The health implications of noise from the Project can be considered by comparing the predicted noise levels against relevant World Health Organisation (**WHO**) benchmarks and criteria.

521. The Project is targeting compliance with noise limits set in the Noise Protocol for earth resources. These are:[297]

a) Day: 46 dB(A)

b) Evening: 41 dB(A)

c) Night: 36 dB(A)

[296] Hearing recording, day 9, 13 May 2021. Question from Ms Eastman to Ms Teague, from 6:11:52: https://www.youtube.com/watch?v=ttSmz2kXvgQ&t=6h11m52s

[297] Noise Protocol, clause 35(d).

522. The noise limits in the Noise Protocol for earth resources are the same as those in the NIRV.[298]

523. As a point of reference, the NIRV stated that its recommended levels were intended to "promote normal domestic use of the home and sleep at night."

524. The WHO's, *Guidelines for Community Noise* (**WHO Guidelines**) is a leading reference concerning the health effects of noise, including from industrial and construction noise.[299]

525. Chapter 4 of the WHO Guidelines provides 'guideline values' for specific health effects and receiving environments. For dwellings, the WHO Guidelines state:[300]

> "**[night time noise]**
>
> At night-time, outside sound levels about 1 metre from facades of living spaces should not exceed 45 dB LAeq, so that people may sleep with bedroom windows open. This value was obtained by assuming that the noise reduction from outside to inside with the window open is 15 dB.
>
> …
>
> **[day time noise]**
>
> To protect the majority of people from being seriously annoyed during the daytime, the outdoor sound level from steady, continuous noise should not exceed 55 dB LAeq on balconies, terraces and in outdoor living areas. To protect the majority of people from being moderately annoyed during the daytime, the outdoor sound level should not exceed 50 dB LAeq. Where it is practical and feasible, the lower outdoor sound level should be considered the maximum desirable sound level for new development."

526. The night time value in the WHO Guidelines of 45dB external can be compared with the Noise Protocol night time limit of 36dB external.

527. The day time value in the Who Guidelines of 50-55dB for can be compared with the Noise Protocol daytime limit of 46dB.

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298 EPA Publication 1411, Noise from Industry in Regional Victoria (October 2011) (**NIRV**).

299 Available at: https://www.euro.who.int/en/health-topics/environment-and-health/noise/environmental-noise-guidelines-for-the-european-region

300 WHO 'Guidelines for Community Noise' (1999), p xiii (pdf p 14).

528. In tabular form, the WHO Guidelines provide the recommendations extracted in Figure 4 for dwellings.

Specific environment	Critical health effect(s)	L_{Aeq} [dB(A)]	Time base [hours]	L_{Amax} fast [dB]
Outdoor living area	Serious annoyance, daytime and evening Moderate annoyance, daytime and evening	55 50	16 16	- -
Dwelling, indoors Inside bedrooms	Speech intelligibility & moderate annoyance, daytime & evening Sleep disturbance, night-time	35 30	16 8	 45
Outside bedrooms	Sleep disturbance, window open (outdoor values)	45	8	60

Figure 38 WHO guideline values for community noise in specific environments[301]

529. The noise level ranges expected from the Project can be contrasted with a road project. EES reports for major road projects routinely provide health assessments for noise. However, noise levels from major roads are appreciably higher than for this Project, therefore the risk profile is different.

530. The road traffic noise standard adopted in Victoria is 63dB($L_{10,18hr}$).

531. The WHO's *Environmental Noise Guidelines for the European Region* (2018) provides guidance more tailored to traffic noise. It recommends guideline values of 53dB (L_{den}) and 45dB (L_{night}). This illustrates the markedly different risk profile for traffic noise health assessments compared with this Project.

NOx and SOx – use of Traralgon data

532. Council was critical of the use of Traralgon NOx and SOx data in the HHIA baseline assessment.

533. Ms Teague responded that this was conservative given that Traralgon can be assumed to have "much higher"[302] concentrations of these contaminants.

534. For NOx and SOx, the air quality criteria are assessed as a total concentration – project + background. Assuming a higher background therefore overestimates the total NOX and SOX concentrations and is therefore conservative.

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301 Source: WHO 'Guidelines for Community Noise' (1999), Table 1, p xv (pdf p 16).

302 Hearing recording, day 9, 13 May 2021. Council cross examination of Ms Teague, from 5:54:22: https://www.youtube.com/watch?v=ttSmz2kXvgQ&t=5h54m22s

535. However, Ms Teague accepted that the use of Traralgon data is "unsatisfactory" (as it would be likely to inflate the concentrations of NOx and Sox) and site-specific data should be collected prior to commencement of the Project.

536. The Proponent accepts this recommendation.

TRAFFIC AND TRANSPORT

Documents

537. Key documents referred to in this section are:

Technical documents

a) EES Appendix A012, Traffic and Transport Impact Assessment (**TTIA**)

b) Mr Carter's evidence statement[303] and hearing presentation[304]

c) Mr Hunt's evidence statement[305] and hearing presentation[306]

d) Traffic and transport conclave statement[307]

e) TN39 (Project Overview)[308]

Regulator submissions

f) Department of Transport, hearing submission[309]

303 Tabled Document 83. See also Mr Carter's supplementary evidence statement concerning centrifuges, Tabled Document 137. In this statement Mr Carter confirmed his view that the changes associated with introduction of centrifuges 1 do not change the profile of traffic and transport risks identified in TTIA and no additional mitigation measures are required (p 2, last sentence).

304 Tabled Document 324.

305 Tabled Document 98.

306 Tabled Document 394.

307 Tabled Document 233.

308 Tabled Document 537.

309 Tabled Document 376.

Control documents

g) Updated Incorporated Document (IAC version 2, 21 June 2021)[310] which incorporates Department of Transport's drafting[311] as a base

Legislation, policy and guidelines

h) Transport Integration Act 2010

Overview

The TTIA

538. Arup prepared the TTIA. In summary, the TTIA:

a) Assessed the traffic and transport impacts of the proposal for both the construction and the operational phases (with distinctive aspects relating to the movement of traffic relating to those two stages).

b) Assessed three product haulage options (all based on 40x B-Double return trips per day), namely:

i. **Option 1** – HMC haul to a new siding at Fernbank East via a private, sealed haul road (under this option, haul would only occur during the day period, 7am-6pm).

ii. **Option 2** – HMC haul to the existing Bairnsdale Fenning siding via Lindenow South, Princes Highway and then two options, closer to Bairnsdale, to access the siding (namely via Main Street / Collins Street, Council's preference or via Racecourse Road, the TTIA's preferred option).

iii. **Pre-Avon River bridge option** – HMC haul to Port Antony and Maryvale (50 / 50 split, i.e. 20 B-Double return trips going to each destination). Product would be transport on the rail line at Maryvale for ultimate export via Port of Melbourne or Port of Geelong. Given the

310 Tabled Documents 530 (clean) and 531 (tracked), IAC version 2, 25 June 2021).

311 Tabled Document 376, Appendix B.

Avon River Bridge has now been completed, this option is no longer pursued.

c) Reviewed existing traffic volumes drawing largely from publicly available data (Council and VicRoads traffic data), save for intersections closer to Bairnsdale where 15-minute turning movement counts were conducted.

d) Surveyed existing roads and intersections to be used by Project traffic.

e) Estimated additional traffic generation from the Project during construction and operation.

f) Assessed link capacity (traffic volumes) and intersection performance (capacity) for each of the identified routes.

g) Completed a detailed transport safety review considering, inter alia, level crossings and the operation of various intersections.

h) Completed a risk assessment using the EES' adopted likelihood x consequence approach.

i) Synthesised the above to recommend 'standard' and 'additional' mitigation measures.

The expert evidence

539. Mr Carter was the TTIA's lead author and was called to give evidence to the IAC on behalf of Kalbar.

540. Mr Hunt was called to give evidence on behalf of the Council in a peer review capacity.[312]

541. Mr Hunt gave evidence that this is not a project warranting outright refusal on traffic grounds, but rather one that can work subject to appropriate road design, and mitigations.[313]

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312 Hearing recording. Day 16, 25 May 2021, evidence of Mr Hunt in cross examination by Kalbar. 1:21:06: https://www.youtube.com/watch?v=NyaYR3AGXSc&t=1h21m6s .

313 Hearing recording. Day 16, 25 May 2021, evidence of Mr Hunt in cross examination by Kalbar.

542. The Council acknowledged this in its Part B Submission, framing its case in terms of uncertainty. It said:

> "**D.5.6 Transport Infrastructure**
>
> 313 Consistent with Mr Hunt's evidence, it is not the Council's case that it is impossible to produce and safe and workable traffic outcome.
>
> 314 Indeed given the areas of land and the apparent lack of constraint as to whether land is currently owned or controlled by the Proponent it would be surprising if that were not so.
>
> 315 The Council's concern is that the EES, taking in the additional material and considerations now proposed, sets up such a wider [sic] range of options and possible outcomes which have been assessed at such varying levels of detail, that it is not possible to understand what an approval of an EES would mean in terms of traffic and roads within and outside the Project area."

543. Mr Hunt identified further traffic counts and analysis that should occur, relevantly:[314]

a) 7 day classified tube counts on all roads used by project traffic (cf. the TTIA which used public data (Council and VicRoads) and 15-minute counts at particular intersections in Bairnsdale.[315] These were supplemented by classified tube counts on Bairnsdale Dargo Road and Lindenow Glenaladale Road post EES exhibition in November 2020).

b) 2 hour turning movement counts at key intersections.[316]

c) SIDRA analysis at key intersections (cf. the CapX analysis used in the TTIA).[317]

In relation to option 1, this view was expressed at 1:08:46: https://www.youtube.com/watch?v=NyaYR3AGXSc&t=1h8m46s.

In relation to option 2, this view was expressed at 1:12:17: https://www.youtube.com/watch?v=NyaYR3AGXSc&t=1h12m17s

314 Traffic conclave statement, Tabled Document 233, item 2, p. 3.

315 Princes Highway / Bairnsdale-Dargo Road Main Street / Collins Street Princes Highway / Racecourse Road. See summary in Mr Carter's hearing presentation, Tabled Document 324, p. 27.

316 Specifically, Fernbank Glenaladale Road / Bairnsdale-Dago Road; Bairnsdale Dargo Road / Lindenow-Glenaladale Road; Princes Highway / Lindenow-Glenaladale Road; Princes Highway / Racecourse Road; Princes Highway / Bairnsdale-Dargo Road; Main Street / Collins Street.

317 Traffic conclave statement, Tabled Document 233, item 7, p 6.

544. Mr Hunt accepted that additional counts and SIDRA analysis would be unlikely to affect the capacity conclusions of the relevant intersections, but would inform detailed design.[318]

545. Kalbar accepts Mr Hunt's recommendations for further counts and has captured this as further monitoring requirements in the updated EMF (Figure 39).

Traffic and transport	• General requirements: – A survey of the existing conditions for the final product transport route should be undertaken prior to construction commencing so that deterioration resulting from the project can be monitored. This includes a structural integrity assessment to understand the pavement comparison. During operation and closure monitoring should continue. [as per evidence statement of Paul Carter, p 28. This point replaces the following two which are too limited in the sense that asset monitoring / protection will be required for roads other than those listed. Note also that these asset protection requirements are captured in DoT's suggested drafting of the Incorporated Document which is accepted in substance (subject to minor drafting matters) by Kalbar] – ~~Prior to construction, survey of pavement condition along Lindenow-Glenaladale Road and Bairnsdale-Dargo Road west of Lindenow-Glenaladale Road to provide a baseline to assess any deterioration resulting from the project (I1).~~ – ~~Regular (e.g., annual, subject to existing pavement condition and agreement with the responsible authority) monitoring of pavement condition along Lindenow-Glenaladale Road, Bairnsdale-Dargo Road west of Lindenow-Glenaladale Road and other roads as required and agreed in accordance with the relevant authority (I1, I3, I36, I37).~~ – Undertake stakeholder consultation and driver surveys (I3). • Specific requirements and timing: – Quarterly meetings with key stakeholder during construction to obtain feedback on the efficiency of the road network, transport safety, the asset performance condition and identifying the need for further monitoring tasks (I3, I37). – Annual driver surveys throughout the project area; to inform any necessary updates to the traffic management plan as required (I3, I36, I37). – Prior to the movement of oversize and overmass vehicles an audit will be completed to assess route options, safety, and clearance between the vehicle and potential obstructions such as wires, trees, structures and rail crossing infrastructure, and then plan the route accordingly. [evidence statement of Paul Carter, p 21; TN13 Item 82] – Pedestrian surveys at Lindenow South conducted with the results utilised in the Traffic and Transport Management Plan approved under the Incorporated Document. – The following surveys and analysis must be undertaken with the results utilised in the Traffic and Transport Management Plan approved under the Incorporated Document: • 7 day classified tube counts on all road links used by the Project, relevantly: • Bairnsdale Dargo Road (west of Lindenow Glenaladale Road) • Lindenow-Glenaladale Road • Fernbank-Glenaladale Road, south of Bairnsdale Dargo Road • Racecourse Road east of Princes Highway • Forge Creek Road, north of Racecourse Road • Collins Street, south of Main Street • Bosworth Road at entry to rail siding • Two-hour turning movement counts and SIDRA analysis during AM and PM weekday for the following intersections: • Princes Highway / Bairnsdale-Dargo Road • Main Street / Collins Street • Princes Highway / Racecourse Road • Bairnsdale Dargo Road / Lindenow-Glenaladale Road • Fernbank Glenaladale Road / Bairnsdale-Dargo Road • Princes Highway / Lindenow-Glenaladale Road. [Kalbar accepts Mr Hunt's evidence that this data should be collected to inform detailed design and preparation of the Traffic and Transport Plan approved under the Incorporated Document]

Figure 39 Updated EMF, Tabled Document 504

546. The changes to the EMF in Figure 36 also incorporate Mr Carter's suggestions, as listed in TN13 (Expert Recommendations).

547. The reference to SIDRA analysis was not included in Tabled Document 504 by oversight. This should be included in the EMF. Kalbar's further response concerning the EMF will make this addition.

548. Mr Hunt also gave evidence that:

a) an underpass of Fernbank-Glenaldale Road haul road crossing would likely be preferrable to traffic signals and flag lighting as put forward by Mr Carter (and

318 Traffic conclave statement, Tabled Document 233, item 7, p 6. See also Mr Hunt's explanation at Hearing recording. Day 16, 25 May 2021, evidence of Mr Hunt in cross examination by Kalbar, from 1:15:55: https://www.youtube.com/watch?v=NyaYR3AGXSc&t=1h15m55s.

now captured in Kalbar's updated Mitigation Register as TT32), although ultimately this would need to be determined through detailed assessment and decided by the road authority;[319]

b) roundabouts at Princes Highway are not, in his view, consistent with road hierarchy principles, however may ultimately be approved / required by DoT on safety grounds;

c) refinement of intersection spacing and geometry around the site access / relocated Fingerboards intersection was necessary (this was agreed with Mr Carter); and

d) the preferred transport route to the Bairnsdale (Fenning) siding was via Main Street / Collins Street in line with Council's preference, in particular given Council may not approve upgrade of a section of Racecourse Road to a B-Double Route (the TTIA assessed both options and preferred the Racecourse Road route).

549. Ultimately, Mr Hunt accepted that each of these matters were capable of resolution under the TTMP controls proposed by DoT (which have been accepted by Kalbar).

550. Kalbar does not outright oppose any aspect of Mr Hunt's evidence. It takes on board and accepts the recommendations for further data collection, detailed design and exploration of different mitigations / routes identified above. It does not accept that an underpass needs to be specified now by the IAC, and neither did Mr Hunt (putting it as likely/probably required, but subject to the road authority's decision).

551. Mr Hunt's evidence assists to refine the understanding of transport risks associated with the Project and the further work that should be undertaken prior to commencement. It also gives confidence that there are no traffic engineering reasons why the Project cannot proceed, subject to mitigations.

[319] See Mr Hunt's summary, hearing recording, day 16, 25 May 2021, evidence of chief of Mr Hunt, from 0:48:49: https://www.youtube.com/watch?v=NyaYR3AGXSc&t=48m49s.

552. A brief further response to each of the differences of opinion between Mr Carter and Mr Hunt is provided below.

Haul underpass at Fernbank Glenaladale Road

553. Mr Hunt agreed that the need or otherwise for an underpass is required at Fernbank Glenaladale Road can be determined at detailed design stage, and will ultimately need to be agreed to by the road authority.

554. Mr Carter formed the view that an underpass was not necessary, giving evidence that traffic signals and flag lighting would be sufficient.

555. Kalbar will implement whichever option the road authority requires at detailed design; but at this stage prefers Mr Carter's view.

Roundabouts on Princes Highway

556. Mr Hunt was not convinced that a roundabout treatment would be needed at the intersections of Lindenow Glenaladale Road and Racecourse Roads with Princes Highway. However consistent with the TTIA, he noted:[320]

> Clearly it [proposed roundabout] is driven on a review of potential safety issues and I expect that probably on that basis, that DOT will, if the option 2 route is pursued, may well endorse the roundabout treatments as proposed.

557. Still, Mr Hunt maintained a concern from a road hierarchy point of view.

558. Mr Carter gave evidence that a roundabout was preferrable from a safe systems point of view.

[320] Hearing recording, day 16, 25 May 2021, evidence of chief of Mr Hunt, from 56:07: https://www.youtube.com/watch?v=NyaYR3AGXSc&t=56m07s

559. DoT suggested in its submission that it would require roundabouts if transport option 2 were adopted, stating:[321]

> "**Design of Roundabouts**
>
> 53. The Department has noted that the proposed Post-Avon River Bridge – Option 2 includes new intersections to be built at:
>
> 53.1. Princess Highway and Lindenow-Glenaladale Road; and
>
> 53.2. Princess Highway and Racecourse Road.
>
> 54. Both roundabout treatments are required to ensure that there is safe access during the operational phase of the project, as a result of B-Double trucks accessing the alternative rail siding at Bairnsdale."

560. Kalbar will implement whichever option the road authority requires at detailed design. If the ultimate intersection treatment is something less than a full roundabout, then Kalbar is content with this. However, it is prepared to construct at its cost (and pay for the land for) a full roundabout, if required.

Local access route to Bairnsdale Fenning siding

561. Mr Hunt thought it would likely be preferable for trucks to access the Fenning siding via the Council's preferred Main Street / Collins Street route. This routes passes through an existing industrial estate on B-Double approved roads. Mr Hunt gave evidence that this would be a viable route, albeit requiring detailed assessment and design of mitigations.[322]

562. Mr Carter gave evidence that the Collins Street route, whilst viable, is not preferred.[323]

563. Kalbar will implement whichever option the road authority requires at detailed design. Both options were assessed in the TTIA.

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321 Tabled Document 376.

322 Hearing recording, day 16, 25 May 2021, evidence in chief of Mr Hunt, from 1:02:22: https://www.youtube.com/watch?v=NyaYR3AGXSc&t=1h2m22s

323 Traffic Conclave Statement, Tabled Document 233, item 16, p. 9.

Intersection spacing, site access and relocated Fingerboards intersection

564. Mr Hunt and Mr Carter agreed that geometry and intersection spacing refinements would be necessary at detailed design around the site access / new Fingerboards intersection. Kalbar accepts this.

565. Neither expert considered this to present a significant issue for the Project, noting that this could be resolved under the TTMP.

Other issues

Land access

566. Questions have been raised about how Kalbar will acquire land for relocated roads.

567. Kalbar proposes all land access to be by negotiation and purchase from current landowners, as required. This includes land for roundabouts for transport Option 2. It will be a matter for a public authority if any power of compulsory acquisition is employed.

Subdivision associated with relocated roads

568. Questions have been raised concerning subdivision related issues arising from new title boundaries.

569. DoT's submissions illustrates this issue schematically as per Figure 41.

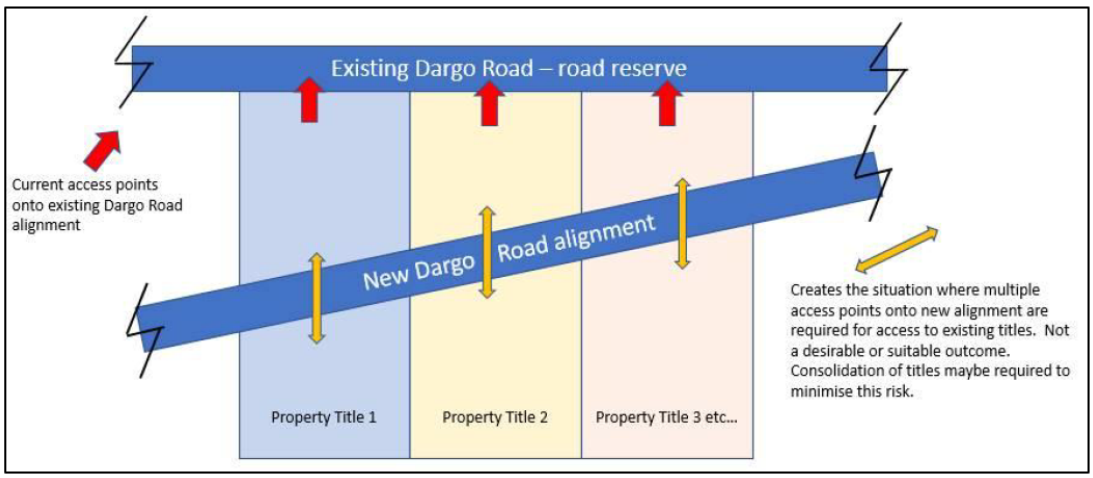

Figure 6: Illustrative example of now additional access points may be created.

Figure 40 Extract from DoT submission[324]

570. In relation to land covered by the Incorporated Document, Kalbar explained in TN35 that subdivision of lots would not be required because the haul road to Fernbank East could be constructed on an easement. TN35 explained:[325]

> "In light of the expansion of the mining licence application area to cover the land north of Chettles Road (TN 032, Tabled Document 518), Kalbar proposes to delete the reference to subdivision from the definition of Project Infrastructure in the Incorporated Document. It is anticipated that the private haul road south of Chettles Road (including any other linear infrastructure) can be delivered on an easement without the need to subdivide land. Consequently, it is not considered there will be any changes to the lots in the Infrastructure Area."

571. If transport option 2 were adopted, there might be need for small boundary realignments to accommodate the two proposed roundabouts on Princes Highway for option 2. However, these could be addressed separately by planning permit (if required, for example, taking into account subdivision permit exemptions at clause 62.04 of the Planning Scheme for boundary realignments).

572. Boundary realignments / subdivisions will be needed for the relocated roads within the mining licence area. Based on the January plans,[326] six parcels are bisected.

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324 Tabled Document, p. 12 (pdf p. 12).

325 Tabled Document 533, p. 1.

326 Tabled Documents 45-54 and attachment 1 to TN35 (Project Overview), Tabled Document 537.

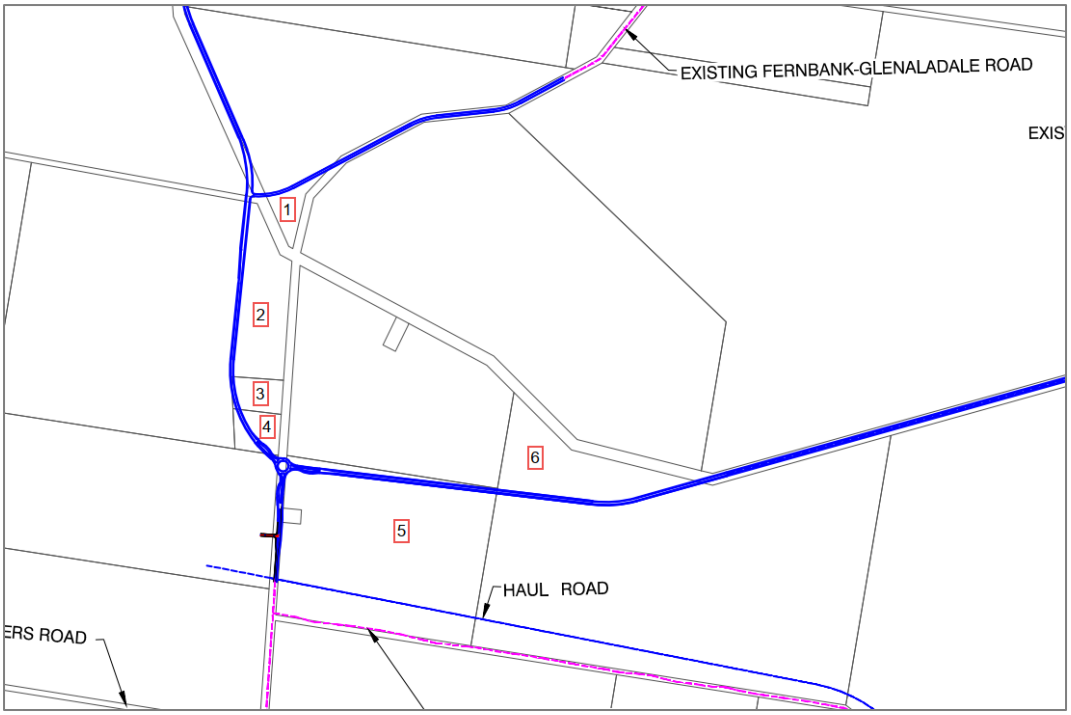

Figure 41 Final road configuration (January Plans), with bisected parcels marked 1-6

573. The parcels marked 2, 3 and 4 are owned, or have been purchased, by Kalbar. Parcel 2 would be about 8ha if subdivided as per the road dissection. Parcels 3 and 4 would remain small lots of less than about 500m2.

574. Several options exist for these small lots owned by Kalbar. They could be consolidated with each other and / or other adjoining parcels (e.g., parcel 5 to the east). They could possibly be retained as small lots without obvious adverse effects, e.g., this would not create landlocked parcels or allow construction of dwellings on small lots as of right.[327]

575. The changes to parcel 1 would be in nature of a boundary rationalisation and does not raise significant concerns.

576. The changes to parcel 5 would be minor requiring only some land take to accommodate the road reserve (given the road follows close to the property boundary). However, this would not create any new lots or significantly alter the existing overall lot size.

577. Parcel 6 would be about 6ha.

[327] The land is subject to Schedule 1 of the Farming Zone where the minimum lot size to construct a dwelling as of right is 40ha. See evidence statement of John Glossop, Tabled Document 80, p. 34 (pdf p. 35) for the relevant zoning map.

578. The reconfigurations concerning parcels 1, 5 and 6 would need to be negotiated with the landowners and the subject of planning approval.

579. Overall, Kalbar's view is that subdivisional issues raised by these indicative road relocations are not significant in the scheme of the Project overall. There are a limited number of parcel bisections (6 on the current road concept plans), no dwellings could be built as of right as a result of the subdivisions and no landlocked parcels created. There could be pressure for new road access points (e.g., for farming access), but this potential exists for all farming land already under local laws and the planning scheme.[328]

Land needed for Option 2 roundabouts

580. DoT's submission queried whether any additional land outside the road reserve would be required for the construction of roundabouts. The answer is yes, and if such land is needed Kalbar will need to negotiate land acquisition to accommodate the roundabouts. A concept plan prepared by Kalbar's road design consultants Crossco is extracted in Figure 42 showing potential boundary realignments to accommodate the roundabout on Princes Highway. This is provided as an illustration.

[328] For Bairnsdale Dargo Road, a Road Zone Category 1, a permit would be required under clause 52.29.

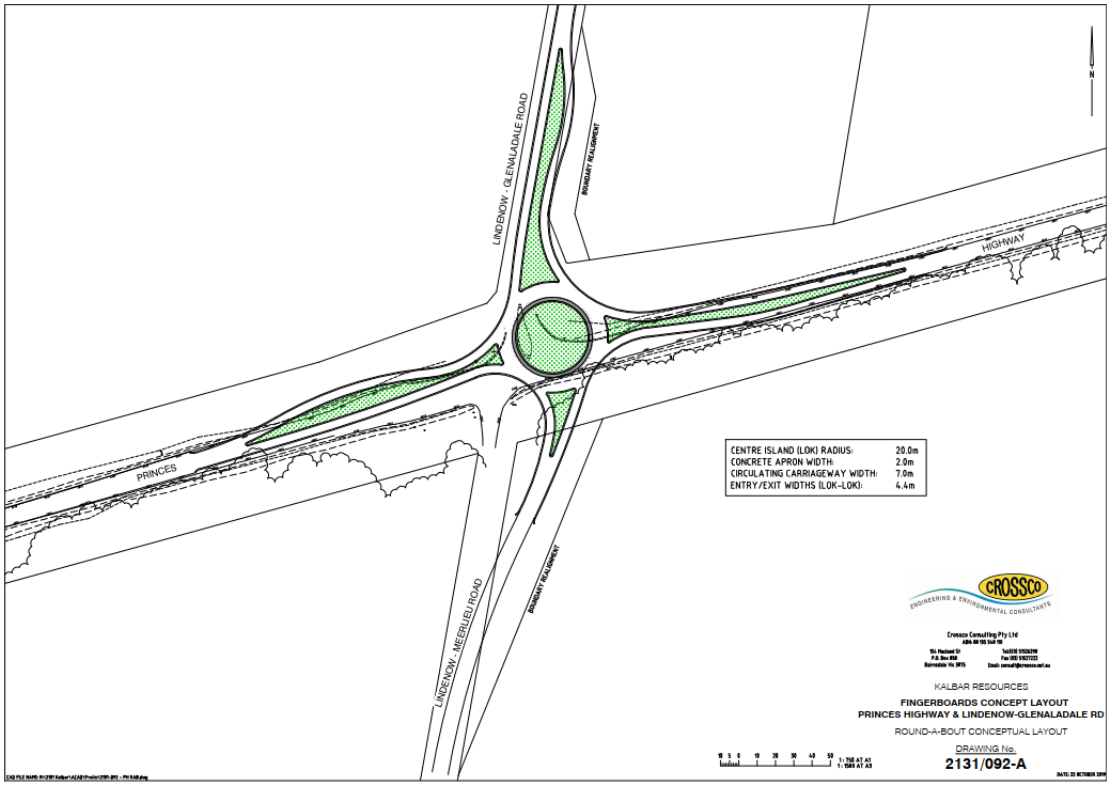

Figure 42 Princes Highway / Lindenow-Glenaladale Road roundabout concept plan

Cattle movement on roads

581. Some landowners in the area move stock via public roads.

582. To maintain existing functionality, new road reserves could be provided that match the current road reserve widths. Kalbar would support such a recommendation from the IAC if considered appropriate to maintain current functionality. This could be expressed in a mitigation measure such as:

> 'New road reserves created as a result of road relocations (both interim and ultimate) must be similar in width to existing to maintain sufficient space for movement of stock.'

Project unknown because of options / uncertainty

583. Council submitted that proposed roads are not known and the environmental impacts uncertain. This theme is picked up in several places in the Council's submissions concerning traffic. For example:[329]

> "315 The Council's concern is that the EES, taking in the additional material and considerations now proposed, sets up such a wider range

329 Council Part B Submission, Tabled Document 407.

> of options and possible outcomes which have been assessed at such varying levels of detail, that it is not possible to understand what an approval of an EES would mean in terms of traffic and roads within and outside the Project area.
>
> …
>
> 324 Contrary to the questions asked of him, he is not an expert in the design of approvals processes but it was his clear view that the TTIA requires amendments and that approval of EES as it stands and with the level of information currently available would result in an approval which is uncertain as to fundamental measures such as whether roundabouts will be pursued on the Princes Highway.
>
> …
>
> 326 It is submitted that the IAC is not yet in a position to form a view as to the appropriate recommendations in respect of traffic. It is simply not in a position to know what the traffic and road outcome would be if the EES is approved. This is significant particular given Mr Carter's evidence that traffic ought be assessed at the local level."

584. The EES is not an approval, it is part of an assessment of environmental effects, which may factor in mitigations that can be included in statutory approvals. Both Mr Hunt and Mr Carter gave evidence that with the mitigations and controls proposed, the Project could be carried out with acceptable traffic outcomes.

585. It is acceptable that the EES put forward transport options. The Pre-Avon River Bridge option is no longer pursued. Option 1 and 2 remain (but Option 1 is Kalbar's preference). The IAC will need to make findings and recommendations in relation to both. This is consistent with the DoT's submission.[330]

Level of road design detail

586. The DoT's submission noted that the level of road design detail was not sufficient for ultimate approvals, but did not consider this precluded assessment for the purposes of the EES, confirming:[331]

> "50. While the Department does not seek to challenge the level of detail provide at this stage of the process of approval for the Project, it submits

[330] DoT hearing submission, Tabled Document 376, [60].

[331] Tabled Document 376.

that it is imperative that this information is provided as part of the next stage of approvals and prior to the commencement of the Project.

51. The Incorporated Document has been amended to provide information and design requirements that aim to ensure that the full assessment of traffic and transport information is understood and assessed prior to construction on the Project."

587. DoT's submission further noted:[332]

> "67. The Department submits that the Incorporated Document with the Department's changes will create greater certainty regarding the road and rail infrastructure requirements of the Project at the outset of the Project. The further documentation and processes required by the Incorporated Document combined with the approval processes under the Road Management Act 2004 will ensure that the impacts of the Project on the transport network are appropriately mitigated and that the proposed road and rail infrastructure is appropriate, safe and to the satisfaction of the Department (or local road authority)."

588. As the IAC is aware, subject to minor drafting matters, Kalbar accepts the TTMP drafting provided in the DoT's Incorporated Document.

DoT's requested changes to the EMF

589. DoT requested changes to Table 12.8 of the EMF, relevantly:[333]

> "a. Include the Department of Transport as a referral authority for the community engagement plan
>
> As the manager of the State Transport Network, the Department would appreciate being a referral authority for the community engagement plan. It is expected that a key issue of interest to stakeholders will be the management of trucks and related transport issues and the Department would the opportunity to contribute to the development of the community engagement plan."

- **Kalbar response: Accepted.**

> "b. Include the Department of Transport as an Approval Authority for the traffic management plan
>
> As the Department has a statutory function under the *Road Management Act 2004*, and has a key role in managing traffic and transport impacts,

[332] Tabled Document 376.

[333] DoT hearing submission, Tabled Document, [70]. See also Appendix D, p. 27-28 (pdf p. 48-49).

it is appropriate that the Department are an approval authority for the traffic management plan."

- **Kalbar response: Accepted.**

"c. Include the Department of Transport as an Approval Authority for the development plan

The development plan will provide a critical framework that will define the use and development of land, including the location of transport infrastructure such as new roads and roundabouts (if required). It is appropriate that the Department are an approval authority for the development plan to ensure that there is alignment between the land use and transport outcomes required for the project."

- **Kalbar response: Not accepted.** DoT will have approval authority over TTMP. If traffic impacts arising from the Project are unacceptable (e.g., because of excessive traffic generation arising from the use and development), then it should not approve the TTMP. The TTMP is a sufficient 'hook' to have overall control of traffic and transport related matters. Kalbar will need to meet the requirements of all regulators cumulatively. This is the normal position. For example, where a road authority has an approval role under a transport condition of a planning permit, it does not usually have an approval role over the architectural plans endorsed under the permit. The same logic applies here.

REHABILITATION

Overview

590. Another matter for consideration is the future rehabilitation of the Project Area and the Infrastructure Area.

591. In respect of the Project Area, trials carried out by Dr Loch for the Proponent have established that rehabilitation of the Project area is feasible, a conclusion with which Dr Drake on behalf of MFG agreed at the conclave and confirmed in cross-examination. In these circumstances, little weight should be given to MFG's attempt to rely on Dr Drake's statements prior to the conclave. Critically, neither Dr Loch nor Dr Drake gave evidence that the introduction of centrifuges rendered rehabilitation infeasible.

592. In saying this, it is acknowledged that further work will be required to be done to refine the proposal and identify the best approach to rehabilitation, particularly in light of the use of centrifuges. As Dr Loch identified in cross-examination, the ability to undertake

additional trials has been held up by the inability of the Proponent to construct a test pit and obtain soil to work with.

593. It would be appropriate to recommend the imposition of a condition on the Work Plan requiring that such work be carried out to the satisfaction of ERR prior to mining taking place on the land.

594. Council did not appear to take issue with the capacity of the Project Area to be rehabilitated, but criticised the draft rehabilitation plan for its failure to include an unplanned closure plan.

595. The Proponent concedes that material regarding unplanned closure in the draft rehabilitation plan is not extensive and defers the planning to a later stage. Having said that, there is no credible basis on which to argue the absence of that plan meaningfully inhibits the ability of the IAC to form conclusions on whether the Project is capable of being rehabilitated. Given that the mine cannot experience unplanned closure before it has commenced mining, the development of such a plan is something that can be safely developed after approvals are granted, but prior to mining.

596. In terms of the Infrastructure Area, the Incorporated Document calls for a decommissioning plan, the details of which appear to be largely agreed between the Council and the Proponent.

Restoration area

597. One other aspect of the rehabilitation project that is worthy of mention is the proposal to restore 200 hectares of the critically endangered Gippsland Red Gum Grassy Woodlands and Associated Native Grassland ecological community. [334] The Proponent's commitment to this aspect of the Project cannot reasonably be doubted, given that it has already established a nursey to produce the required seed.

598. In its submissions, MFG seeks to cast doubt on the ability of the Project to achieve this outcome. This is inconsistent with the evidence of Mr Kern who, having seen Dr

[334] See TN 018 (Tabled Document 271) for further details.

Gibson-Roy's work, pronounced himself 'confident' that restoration could be achieved, but was concerned about the long-term protection of the restored area.

599. In terms of ongoing protection, the Proponent accepts that a long term commitment is required to ensure the proper management of the restored land (whether a Trust for Nature covenant, a conservation agreement under the *Conservation, Forests and Lands Act 1987*, or a s 173 agreement under the *Planning and Environment Act 1987*). It would be appropriate to recommend a condition requiring the Proponent to enter into such an agreement to the satisfaction of ERR (or DELWP) prior to commencing the mine closure process.

600. The Proponent also accepts that it would be appropriate to recommend conditions requiring the Proponent to undertake calculations to the satisfaction of ERR (in consultation with DELWP) of the likely costs of maintain the reserve for a given period (noting that at a certain point it becomes reasonable to expect subsequent landowners to take over management) and to set that amount aside in a trust fund or similar.

601. To the extent that MFG seeks to question the ecological value of the restoration project, this should not be accepted. Not only is it inconsistent with the evidence of Mr Kern to assert that it will take 'centuries' plural to replace lost hollows, but this ignores the fact that a restored area of vegetation managed for conservation and restoration processes can provide additional ecosystem services, including habitat even before hollows form. Nor does the Proponent accept the suggestion that the reserve will be a 'pale shadow' of what previously existed.

602. As the evidence shows (and as was not contested by Mr Kern), the majority of native vegetation in the Project area is generally of low to moderate quality that has been subject to grazing and which, in the absence of the Project, is likely to continue in that state. The 200 ha restoration area is itself currently used as a blue-gum plantation. It is simply implausible to assert that a properly managed reserve will not deliver an outcome at least equivalent to what currently exists.

603. Beyond that, the process of developing the reserve has the potential to deliver other broader benefits in terms of demonstrating the effectiveness of large scale restoration

and providing seed for other restorations projects. These benefits should not be discounted either.

LANDSCAPE AND VISUAL

The LVIA

604. Urbis prepared the Landscape and Visual Impact Assessment (**LVIA**) technical study which formed part of the EES at Appendix A014.

605. Urbis also prepared updated information in response to questions from the IAC, including a 'graphics package' providing additional photo simulations for particular viewpoints requested by the IAC and an updated visual impact assessment for tourist roads (relevantly Fernbank-Glenaldale Road and Bairnsdale Dargo Road).[335]

606. The methodology applied in the LVIA considers sensitivity based on land use settings[336] and an assessment of visual modification determined by modelling viewsheds, altered landforms and screening potential, principally intervening vegetation.

607. The tourist road assessment presented in TN10 adopted the same methodology as the LIVA, providing a viewshed and screening potential analysis (via roadside vegetation) for Fernbank-Glenaladale Road and Bairnsdale-Dargo Road within 5km of the site.[337] The impact assessment which synthesises this information is extracted in Figure ~~1~~43.

[335] Technical Note 10, 'graphics package', Tabled Document 148

[336] See LVIA, Table 2, p 6 (pdf p 22) which defines sensitivity for different land use settings.

[337] Technical Note 10, graphics package, Tabled Document 148, pp 18-19.

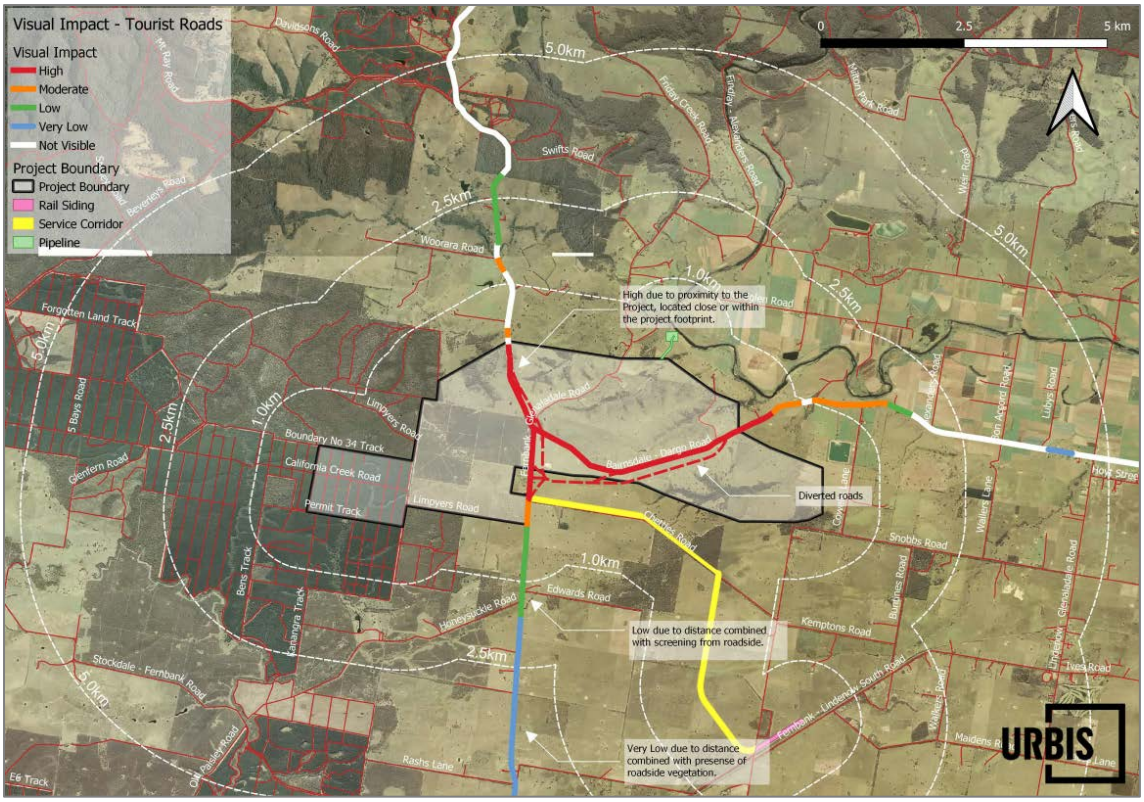

Figure 43 Visual impact assessment summary – diverted tourist roads[338]

608. The assessment indicates a 'high' visual impact on roads within the mining area, with visibility and impact reducing with distance outside the mine boundary, generally becoming 'not visible' or 'low impact' from about 1km from the mine boundary (about 1500m to the east on Bairnsdale Dargo Road).

609. A range of viewing locations were considered in the LVIA, assessed in both a quasi-quantitative and qualitative terms. The viewpoint locations considered in the LVIA are extracted in Figure ~~2~~ 44 for reference.

[338] Technical Note 10, graphics package, Tabled Document 148, p 20 (pdf p 20).

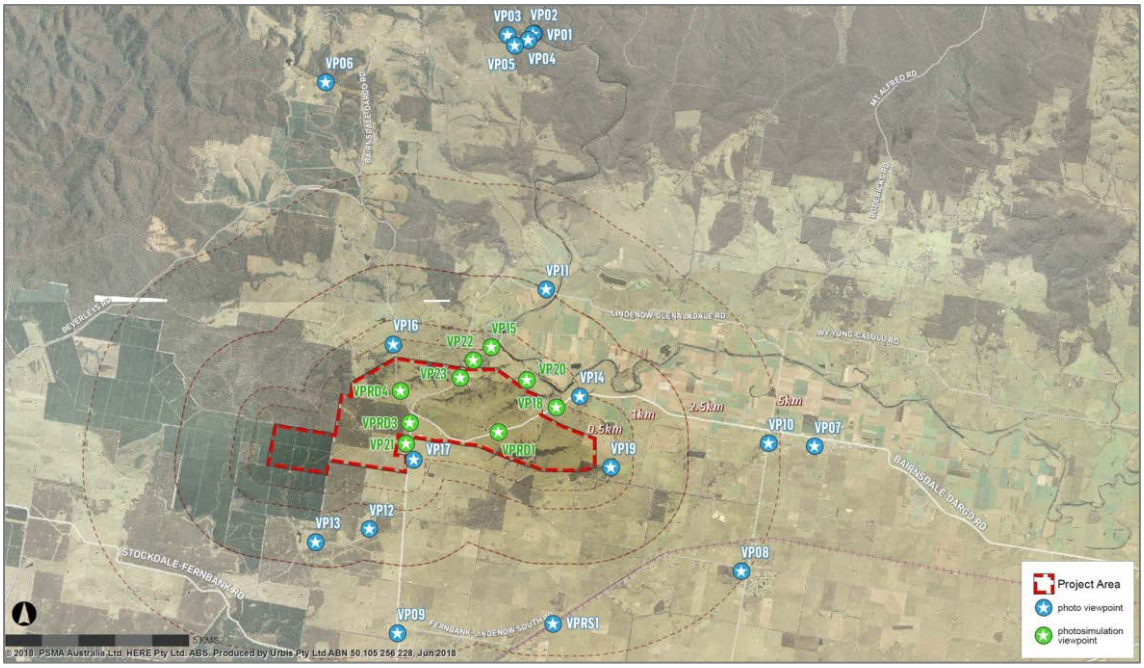

Figure 44 Viewpoint locations[339]

610. The LVIA found many of the viewpoint locations to be screened from views of mining activity, either by topography or vegetation.[340] Of the 27 locations considered, the LVIA identified a 'medium' or 'high' initial impact at 3 receptors (the 'initial impact' being the impact when mining commences near to the receptor).[341] The LVIA also identified a 'high' initial impact along Fernbank-Glenaladale Road and Bairnsdale-Dargo Road. (These 'most impacted' viewing locations were the subject of the IAC's request for information with further information provided through the graphics package and TN10.)

611. Overall, the LVIA described the visual impact of the project in the following terms:[342]

> "**8.4. Visual impact**
>
> Throughout the visual catchment, the majority of residences sit within a landscape that is comprised of medium to tall vegetation, with varying levels of density depending on either the extent of clearing or extent of planting. Vegetation surrounding the "home yard" of many of the residences within the local setting and near sub-regional setting often either partially or fully screens views to the project.
>
> The visual impact of the project will be transitional, with the process of progressing mining fronts, in conjunction with progressive restoration, resulting in the area of

[339] LVIA, Figure 19, p 39 (pdf p 55).

[340] See LVIA, Table 7, p 41 (pdf p 57), which lists the viewshed potential of each viewpoint.

[341] See LVIA, Table 8 'summary of most highly impacted viewpoints', p 100 (pdf p 116).

[342] LVIA, p 99 (pdf p 115).

> disturbance of the project being relatively limited at any point in time, and reducing the amount of time that most individual viewpoint[s] will be exposed to the project.
>
> Fixed plant, such as the WCP and administration and works compound, will be located to take advantage of existing screening vegetation provided by forestry plantations. Additionally, visual bunding and perimeter screen planting will be established to provide long term visual mitigation.
>
> For some sensitive viewpoints within 2.5 km of the project the visual impact will be high to moderate when operations are immediately adjacent to the viewpoint, progressively reducing as they move further away. The impact will be at its highest for a period of approximately 30 months from the commencement of operations."

612. Accordingly, it is acknowledged that impacts will be high where there is opportunity for views of mining activity within 2.5km of the project, however these worst case impacts will be transitional in nature. That is not to say that there will be no impact immediately following rehabilitation, but rather that successful progressive rehabilitation will ameliorate visual impacts over time.

613. The LVIA outlines specific measures (other progressing rehabilitation) that will also be employed to minimise impacts. The LVIA explains:[343]

> "**8.5. Visual amelioration**
>
> This longevity of the operation creates the opportunity to plan ahead and allow for measures to ameliorate visual impacts prior to operations occurring in a particular period or location. Opportunities for amelioration include screen plantings and the construction of vegetated visual bunding at strategic locations around the perimeter of the project area and will apply particularly to sensitive locations subject to a high visual impact within the local and near sub-regional view sheds.
>
> Fixed lighting on permanent plant and buildings will be subject to specific lighting design and will wherever possible focussed and be shielded or have baffles installed in order to reduce the potential for light spill."

614. These types of measures are included within the 14 measures proposed in the mitigation register. For example:

> "VL01 Visual bunds and screen plantings will be established at locations around the perimeter of the project area to visually screen project activities from sensitive viewpoints."
>
> "VL05 The mine void will be progressively backfilled, and rehabilitation will be progressive to re-instate pre-mining landforms and re-establish vegetation."

[343] LVIA, p 100 (pdf p 116).

> "VL13 Temporary visual bunds will be placed to screen operations within the mine void."
>
> "VL14 A program of voluntary landscape mitigation works must be offered, and if accepted, made available, to the owners of dwellings within 1km of the mine. The offered mitigation works must include planting and/or other works on the owner's land to reduce direct views of mining activity from dwellings."

615. Overall, whilst the mine will clearly have a visual impact and result in a change to the landscape character of the area, measures are proposed to minimise this impact to the extent possible.

Response to submissions

616. Understandably, local submitters raised concern with the visual and landscape impacts of the project and the resultant impacts this will have on sense of place and a 'cognitive map' of the locality, to use the expression referred to by Counsel for MFG drawing on Preston CJ in the *Gloucester* case.

617. As noted, Kalbar accepts that this project will have a significant impact at first, which will reduce over time as rehabilitation progresses.

618. Overall, the landscape and visual impact of the proposal needs to be balanced with the overriding strategic support for exploitation of economic mineral resources, as provided for under the MRSD Act. Whilst this is clearly a landscape valued by its local community, Kalbar's case is that landscape and visual considerations in this case do not present an absolute or overriding impediment to the proposed mine.

619. In its submissions on landscape and visual impact, MFG relied extensively on the judgment of Preston CJ in the NSW Land and Environment Court decision G*loucester Resources Ltd v Minister for Planning and Another* [2019] NSWLEC 7 (**Gloucester**). Whilst matters of principle from that case were fairly put by Counsel for MFG, it is necessary to draw attention to some distinguishing features of that case in reply (in addition to those outlined earlier in these submissions).

Gloucester

620. As noted previously, this case involved a proposed open cut coal mine located within a rural valley which was overlooked from a large number of locations. It was

uncontentious in the case, and indeed accepted by the Proponent's expert witnesses, that the site possessed scenic qualities.[344]

621. The Court held that the proposed mine would have unacceptable visual impacts and adversely impact the rural and scenic character of the surrounding valley. The Court found this matter alone was sufficient grounds for refusal[345] although it also refused the proposal on other grounds.

622. A finding such as this turns heavily on its facts. Kalbar does not dispute the points of principle made linking landscape character to matters such as sense of place and a 'cognitive map'. Nonetheless, the Court's findings and discussion were firmly embedded in the facts of the case which are distinguishable in several regards, as follows.

Strategic context

623. The first distinguishing factor relates to the strategic context.

624. In *Gloucester*, 77% of the proposed coal mine was zoned 'E3 - Environmental Management' under the relevant local environmental plan. The objectives of this zone were:[346]

> "- To protect, manage and restore areas with special ecological, scientific, cultural or aesthetic value.
>
> - To provide for a limited range of development that does not have an adverse effect on those values.
>
> - To conserve biological diversity of native vegetation corridors, and their scenic qualities, in a rural setting." (Emphasis added)

625. Mining was prohibited in the E3 – Environmental Management zone save for provisions of the Mining SEPP which made mining permissible with consent.[347] In determining such consent, the authority was required to consider, inter alia, the local

[344] [122].

[345] See headnote,

[346] Gloucester, [111].

[347] Gloucester, [26].

environmental plan including, as relevant here, the objectives of the E3 zone quoted above.[348]

626. The authority was also required to consider:[349]

> "(ii) whether or not the development is likely to have a significant impact on the uses that, in the opinion of the consent authority having regard to land use trends, are likely to be the preferred uses of land in the vicinity of the development, and
>
> (iii) any ways in which the development may be incompatible with any of those existing, approved or likely preferred uses". (Emphasis added)

627. The Court found that 'existing, approved or likely preferred uses' included uses such as:[350]

> "agri-business and agriculture; rural dwellings and farm stays; large lot residential dwelling houses; tourism accommodation and tourism operators, including agri-tourism; and residential and non-residential uses associated with the Gloucester township."

628. The Court held that the coal mine would have a significant impact on,[351] and would be incompatible with,[352] these preferred uses.

629. Plainly, this was a very different strategic setting to that which applies to the current Project. This Project is located in the Farming Zone, on land not covered by any landscape character overlays. Further, the Project does not require permission under the Planning Scheme by virtue of the ouster provisions that operate under the MRSD Act. Accordingly, the principal strategic setting for this Project is that set by the MRSD Act which is supportive of mining.

630. The high point of the Council[353] and MFG's submissions[354] on this point seems to turn on the inclusion of Bairnsdale-Dargo Road in map 3 of clause 21.04 of the East Gippsland Planning Scheme (extracted in Figure ~~3~~45). (note too that all major roads

[348] Gloucester, [28].

[349] Gloucester, [35].

[350] Gloucester, [79].

[351] [82].

[352] [86].

[353] See Council Part B submission, Tabled Document 407, [347].

[354] Hearing recording, Day 22, 3 June 2021, MFG submissions, at 4h3m57s - https://www.youtube.com/watch?v=I0oWIUG1iEg&t=4h3m57s

seem to be listed as such in this map, including Princes Highway and Main Street Bairnsdale).

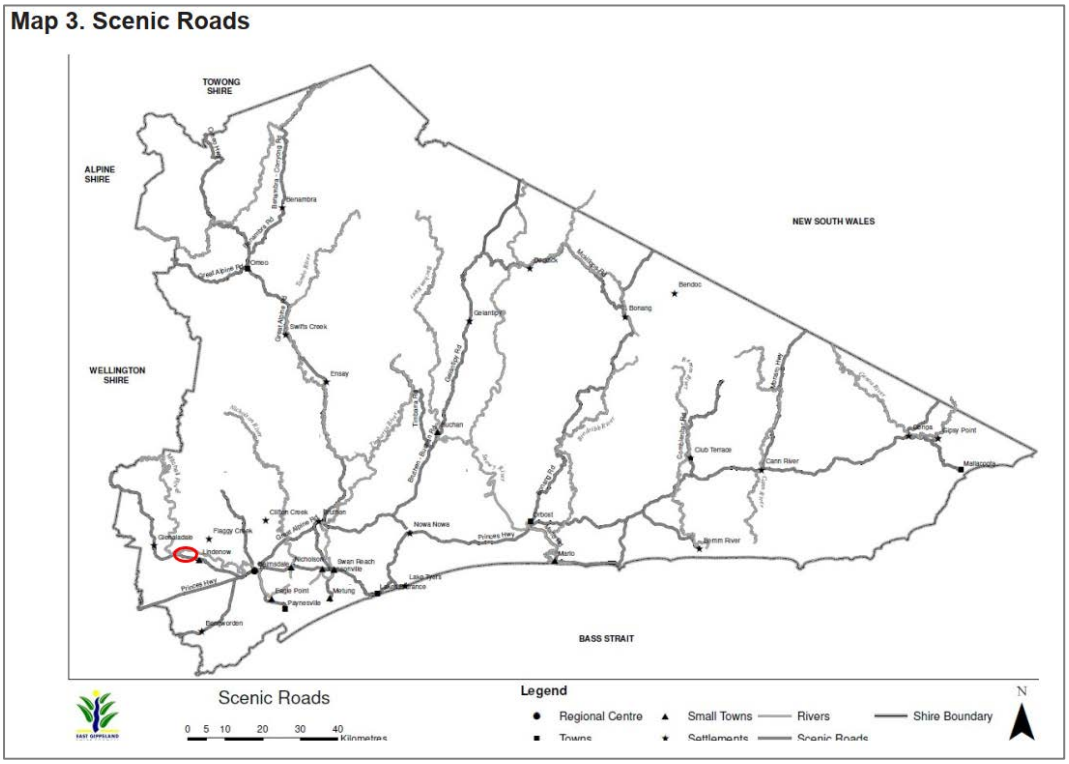

Figure 45 Extract from clause 21.04 – Map 3 (site location indicated by red circle)

631. Importantly, Clause 21.04 also includes map 2 (Figure ~~4~~ 46) which identifies 'significant regional landscapes' within East Gippsland. The subject site is not identified as a 'significant regional landscape' which is consistent with the case advanced by Kalbar.

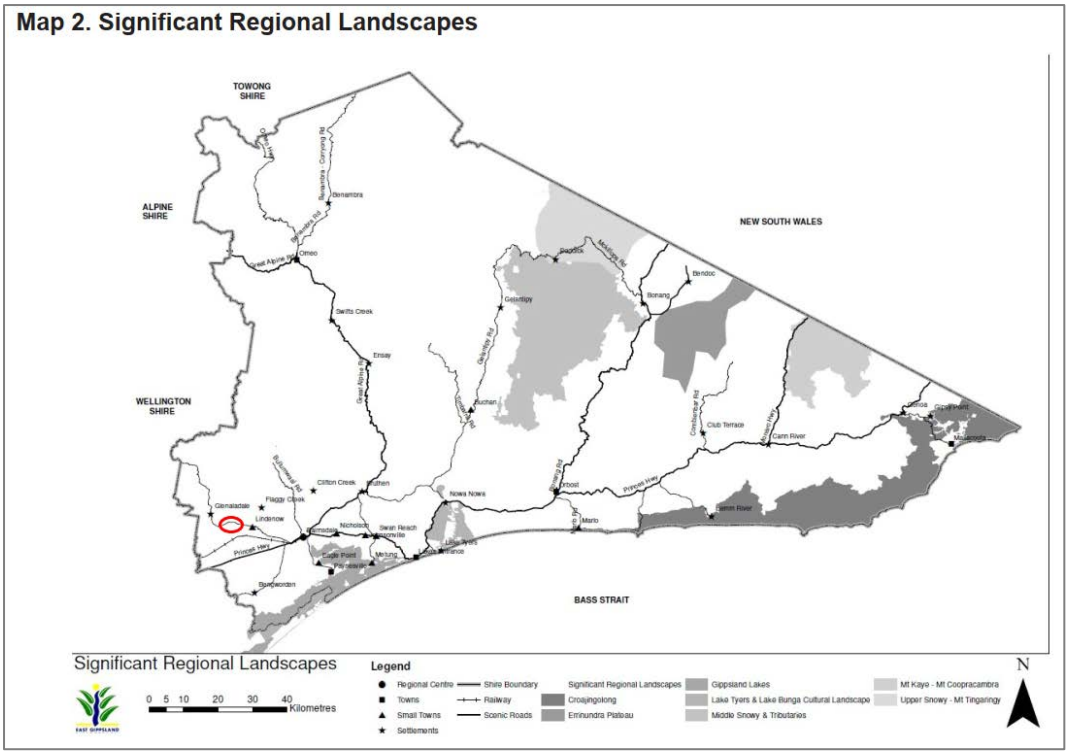

Figure 46 Extract from clause 21.04 – Map 2 (site location indicated by red circle)

The physical setting

632. The second key distinguishing factor is the physical setting.

633. The coal mine in *Gloucester* was proposed within a scenic valley. Counsel for MFG fairly acknowledged this in submissions to the IAC, explaining:[355]

> "What I wanted to do was take you to some of the relevant passages in the *Gloucester Resources* decision that we say are apt. Now I will make the point that obviously the *Gloucester Resources* decision relates to a completely different topographical area. It relates to a valley mine, which would be overlooked and the nature of the rehabilitation would be a fairly fundamental change to the valley landform. And so I have to give you that disclaimer before I go through I so that you understand that there are very different circumstances in that case compared with this case. But nonetheless, there are some matters in this decision, which we say are useful in terms of the sort of factors that you look at when you're looking to visual impact in a circumstance such as a mine across a very large area."

634. Indeed, Preston CJ described the setting in somewhat emotive terms, with the opening paragraph of His Honour's judgment stating:[356]

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[355] Hearing recording, Day 22, 3 June 2021, MFG submissions, at 4h8m46s - https://www.youtube.com/watch?v=I0oWIUG1iEg&t=4h8m46s

[356] Gloucester, [1].

> "There is a valley, near Rocky Hill, that a coal mine proposes to cut and fill. The Gloucester valley is a creature of a unique topographic feature. The valley is the floor of a nest, the sides being ranges east and west. The Bucketts is the rocky range to the west. The Mograni range is the mountain range to the east. Both ranges are forest clad. Over aeons, the ranges have eroded. The foothills are talus and slopes, broken by gullies and creeks. The valley floor is an alluvial plain, through which the Avon River flows. In this topographical embrace nestles the country town of Gloucester. The valley and footslopes surround the town. The higher ranges complete the enclosure. The setting is scenic and serene. An idyll, some suggest."

635. In sum, the Court's decision in Gloucester was deeply rooted in a fundamentally different strategic and physical setting to that encountered here. On the facts in this case, the Panel should form that view that the landscape and visual impacts of this proposal are, on balance, acceptable subject to the mitigations proposed.

HORTICULTURE

636. RMCG prepared the Horticultural Impact Assessment (**HIA**) technical study of the EES (Appendix A019) and Dr Blaesing, a co-author of the HIA, gave evidence to the IAC.

637. The scope of the HIA included consulting with horticultural landholders near the Project to identify areas of concern, reviewing published data and information relevant to the regional and local industry, reviewing the technical studies in the EES relevant to issues raised (in particular, the air quality, radiation, water and human health technical studies) and undertaking a risk assessment.[357]

638. The HIA noted that "the Lindenow Valley is characterised by high value irrigated vegetable production" producing crops which include "beans, broccoli, capsicum, carrots, cauliflowers, sweet corn, lettuce, spinach (including baby leaf), peas, pumpkin, and onion."[358]

[357] HIA, p. 1 (pdf p. 6).

[358] HIA, p. 21 (pdf p. 26).

Response to issues

Consultation and identification of key issues

639. MFG expressed criticism through cross examination of RMCG's approach to consultation with local growers, suggesting it was overly informal and failed to capture relevant information such as the gross production value of the region.[359]

640. Kalbar's submits that these criticisms were without substance. The HIA clearly identified the key issues for growers in the Lindenow Valley. RMCG met with 11 out of the 12 growers.[360] Whether the meetings were formal or informal does not detract from the point that the key issues were identified and considered as a result of the consultation meetings.

641. Section 6 of the HIA identifies 8 key issues identified through the consultation meetings, relevantly:

a) Section 6.1 – dust generation and deposition;

b) Section 6.2 – contaminants in dust particles;

c) Section 6.3 – water quality impacts;

d) Section 6.4 – water availability (relatedly, section 6.7 – climate change);

e) Section 6.5 – transport impacts;

f) Section 6.6 – competition for labour; and

g) Section 6.8 – impacts on a 'clean green' image.

642. For each topic, there is detailed commentary followed by a synthesis which relates the issues raised by horticultural landowners to the findings of relevant technical studies within the EES, or further analysis by RMCG (i.e., in relation to labour competition and consumer perception). This was an appropriate way to proceed.

[359] Hearing recording, day 8, 12 May 2021, evidence of Dr Blaesing under cross examination by MFG, from 34:52: https://www.youtube.com/watch?v=nPq2PDXeVkA&t=34m52s

[360] Hearing recording, day 8, 12 May 2021, evidence of Dr Blaesing under cross examination by MFG, from 34:26: https://www.youtube.com/watch?v=nPq2PDXeVkA&t=34m26s

643. To the extent it was suggested that the value of gross production of the region was understated in the HIA, Kalbar notes that the value was based on latest official figures and, importantly, the HIA was not intended to provide an economic assessment in the nature of cost benefit analysis. Kalbar's case is not that the economic benefits of the mine outweigh those of horticulture in the Lindenow Valley, but rather that both industries can coexist. This is so notwithstanding that, during the period the mine operates, the gross revenue of the mine is likely to be greater than the gross revenue of production in the Lindenow Valley.

Dust on crops

644. A key issue raised in submissions concerns the impact of dust on horticultural production in the Lindenow Valley.

645. The HIA identified the issue of dust on crops in the following terms:[361]

> "Excessive dust levels on plant leaves can reduce the capacity of the plant to photosynthesise (produce energy for growth processes) because photosynthesis requires light to reach the leaf surface. This applies to all plant species. Reduced photosynthetic activity may lead to a reduction in productive growth and yield. Excessive dust particles landing on some types of vegetable crops may cause market defects, if not removed.
>
> This may particularly be an issue for brassica/white vegetables (cauliflowers, broccoli) but potentially also other head vegetables (lettuce), bunched leaf lines such as kale or silver beet and loose-leaf salad lines (e.g. baby leaf crops such as spinach, kale, lettuce types, rocket) and herbs. Dust issues with prepacked salad leaves would be managed through the washing and sanitation required for food safety. Overhead irrigation and rain is expected to wash dust off leaf surfaces.
>
> Current horticultural land management practices, including land preparation means that dust management (of dust generated by soil management and travel on farm tracks) can be a challenge for horticultural producers in the Lindenow Valley. The amount of dust produced by land management is variable based on factors such as soil moisture, wind speed, ground cover and soil type. Strong winds from the southwest, particularly in spring are common in the Lindenow Valley. According to consultation feedback, most producers actively manage this issue by not working land next to dust susceptible crops, if conditions are expected to cause dust generation."

[361] HIA, p. 31 (pdf p. 36).

646. Drawing together its findings on the relevant horticultural context with the results of the air quality technical study by Katestone, the HIA explained:[362]

> "**Conclusion from the dust risk, avoidance and mitigation review**
>
> This Horticulture Impact study concludes that, given existing mitigation procedures by producers to manage dust generated by their own and neighbouring operations, and that dust will be effectively managed on the project site via the appropriate management and mitigation techniques, and dust generation is monitored in accordance with the on-site environmental management plan and Environmental Protection Authority (EPA) protocol for environmental management, then the aspect of dust generated on the site is unlikely to have an economic impact on horticulture producers in the region. The probability of a dust contamination event, given mitigation procedures already in place by landholders and to be introduced by Kalbar is considered low. Economic consequences that could be attributed solely to a dust contamination event due to the mine's operation were not assessed based on a lack of baseline data (i.e. typical dust contamination by current agricultural activities in the region) and the low likelihood of such an event occurring given mitigation." (Emphasis added)

647. This is a logical conclusion to draw. As described earlier in these submissions, the modelled levels of dust deposition from the Project on the horticultural area are very low and management measures and monitoring are proposed to ensure these targets are achieved in practice. Accepting that some level of dust is inherent in horticulture, the question is not whether there will be some dust from the Project on crops, but whether there will be excessive dust likely to result in commercial impacts for growers. This point was well framed in the following exchange between the Panel and Dr Premier on behalf of MFG:[363]

> **Panel**
>
> "A lot of people have talked about dust right through this Inquiry as you might understand. It seems that the vegetable growers are used to a certain amount of dust in the current operations as in, on some of our visits, we've seen dust lifting off some of the areas there from some of the winds that people have talked about. It's presumably a question of the amount that they can manage at the moment, and the amount that might be in the environment if the mine went ahead?"
>
> **Dr Robert Premier**

[362] HIA, p. 35.

[363] Hearing recording, Day 23, 7 June 2021, MFG submission delivered by Dr Premier, 3:04:50: https://www.youtube.com/watch?v=COvGU1fz7v0&t=3h4m50s

> "Yeah - there's always going to be a little bit of dust on everything, you know, if it's growing out in the open, you can expect dust to get in there.
>
> But the problem is that the wash baths that the processors use. All these vegetables get triple washed. So the wash baths can only cope with a certain amount of dust, or mud, we can also include mud into that. And I can tell you that we do reject when the levels of dust contamination is high. And we do reject products when there is mud in the product itself. So it's a question of how much the companies can deal with in the wash baths."

648. The IAC has the benefit of the tested expert evidence of Mr Welchman providing the results of dispersion modelling indicating very low levels of dust deposition on the horticultural areas. In these circumstances, the types of concerns raised by Dr Premier and other growers concerning dust are not predicted to arise. Importantly, much of the concern of horticulturalists was not so much about dust as about so-called "toxic dust", that is dust with a significant portion of uranium or thorium. But the evidence does not provide any basis for this concern. Rather the expert radiation evidence and the expert air quality evidence requires the conclusion that the likelihood of such "toxic dust" causing any detriment to vegetable crops is negligible. Notwithstanding this, Kalbar does not oppose further monitoring to demonstrate that this is so. Indeed, this will assist in building public confidence in the Project.

Competition for labour

649. The HIA acknowledged that higher wages in mining would generate competition for labour access.[364] This is an entirely acceptable consequence of the Project, and will create economic opportunity for local workers – including those currently unemployed or underemployed - through employment in an alternative industry to horticulture. An EES inquiry is not the place to protect one category of employer from competition for labour from another employer who offers higher wages. Such protection is incompatible with a free market for labour and penalises workers who would otherwise benefit from receiving higher wages. Moreover, labour is mobile, and workers can be drawn from outside East Gippsland, whether for horticulture or mining, to meet any shortfall.

[364] HIA, section 6.6.

Consumer perception – 'clean green' image

650. Section 6.8 of the HIA includes a review of various literature sources concerning consumer perceptions and purchasing choices.

651. It highlights the 'well documented' effects arising from microbiological outbreaks such as salmonella, explaining:[365]

> "It is well documented[366] that after food safety related health issues have been attributed to the consumption of fresh produce, consumers stop buying the fresh product or even product type (i.e. vegetables) in question for some time. Vegetables are of particular concern if they are eaten raw and potentially without prior washing (salad vegetable, carrots, beetroot).
>
> Given the review of technical EES reports on dust and water quality impacts for this study concluded that a food safety outbreak involving human pathogens connected to sand mining is unlikely to occur."

652. The HIA includes discussion on consumer awareness regarding place of origin, explaining:[367]

> "The current market practice of supermarket plain/or homebrand packaging (e.g. Woolworths Select, Coles brand, Aldi) limits the ability of consumers to readily identify the location of production. Retailers who are not local in a region, prefer to not identify the place of production of perishable produce to maintain flexibility of getting supplies from where it is available at the desired price and quality to guarantee continuity of supply to their customers. Organic fresh produce, which is an expanding product line in supermarkets, while labelled as organic, is usually also not identified by production region in supermarkets."

653. This is consistent with information provided to the IAC by Dr Premier on behalf of MFG. Dr Premier stated that in order for a consumer to obtain information about the location in which vegetables were sold, they would need to provide the code on the bag back to the company that produced the product to obtain the information, which Dr Premier stated "doesn't happen often, but it can happen".[368]

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[365] HIA, p. 57 (pdf p. 62).

[366] Footnote in original: "Hussain M.A (2013) Economic implications of microbiological food safety scares, N.Z. Food Technology, v48:33. Recent examples include salmonella linked to pre-packaged lettuce (2016), listeria linked to rockmelon (2018) and contamination of needles in strawberries (2018)."

[367] HIA, p 58 (pdf p 63).

[368] Hearing recording, Day 23, 7 June 2021. MFG submission delivered by Dr Premier. At timestamp – 3h11m53s https://www.youtube.com/watch?v=COvGU1fz7v0&t=3h11m53s

654. In summary, it is submitted that the Project will not, as proposed, impact upon the market perceptions of produce from the Lindenow Valley horticultural area.

CULTURAL HERITAGE

655. Appendix A017 to the EES is a *Cultural Heritage Impact Assessment* report (**CHIAR**) prepared by Andrew Long & Associates (**ALA**) dated April 2020.

656. The CHIAR adopts a methodology consistent with that for the preparation of a CHMP, comprising:

a) a desktop assessment which included a review of relevant registers, literature, and development of a predictive model for identification of likely occurrence of Aboriginal cultural heritage sites;

b) a standard assessment which included an archaeological survey, field survey and collection of sediment samples; and

c) a preliminary complex assessment which included a subsurface testing program.

657. Having proceeded to the stage of a preliminary complex assessment, the CHIAR included a significant survey and review effort.

658. Site surveys were conducted over thirteen days involving a multimember team of archaeologists and members of GlaWAC resulting in the identification of 68 stone artefacts.[369]

659. Subsurface testing included excavation of 45 test pits recovering 281 artefacts.[370]

660. Tangible cultural heritage identified within the site comprised two existing registered places, being a scarred tree and silcrete stone artefact, and the additional artefacts discovered during the site surveys and subsurface investigations.[371]

661. Intangible cultural values were recognised as a gap in the CHIAR, as this work was unable to be completed prior to exhibition of the EES. Earlier this year, Kalbar engaged

[369] CHIAR, p. 122 (pdf p. 138).
[370] CHIAR, p. 156 (pdf p. 172).
[371] CHIAR, p. 166 (pdf p. 182).

Dr Seumas Spark to progress the cultural values assessment and this work is currently ongoing in consultation with the traditional owners.[372]

Assessment of likely effects

662. The CHIAR's impact assessment for Aboriginal cultural heritage adopts a risk assessment methodology based on assessment of cultural heritage significance, magnitude of impact from project activities, a 'consequence rating' incorporating both significance and impact magnitude, likelihood of impact, the influence of mitigation and residual risk.[373]

663. Prior to mitigations, the CHIAR identifies the risk of impacts on known and unknown (estimated via the site predictive model) Aboriginal cultural heritage to be 'high' and up to 'major' respectively.[374] This is influenced by the "almost certain" likelihood ranking assigned to each cultural heritage places, given the nature of the Project as a mine. However, known Aboriginal cultural heritage places (comprising 1x scarred tree and artefact scatters) were not ranked in the CHIAR as having either medium or high cultural heritage significance.

664. The principal Aboriginal cultural heritage risk reduction measure to be implemented for the Project is the preparation and implementation of a cultural heritage management plan ("CHMP"). This is presently under preparation by ALA and will build upon the findings of the CHIAR and the cultural values work being undertaken by Dr Sparks.

665. In accordance with the *Aboriginal Heritage Act 2006* and the Aboriginal Heritage Regulations 2018, the CHMP will include:

a) site-specific management conditions that must be implemented during the Project;

b) cultural heritage induction and ongoing requirements for employees;

[372] Further information is provided in TN 008, in response to IAC question 106 (Tabled Document 120, pdf p. 8).
[373] See CHIAR, section 3.2.
[374] See CHIAR, Table 49 (p. 176, pdf p. 192) and Table 53 (p. 178, pdf p. 194).

c) retention and storage of all recovered cultural heritage materials by a qualified person;

d) repatriation of recovered cultural heritage materials to a Registered Aboriginal Party such as GLaWAC; and

e) contingency measures (chance finds protocol) if Aboriginal cultural heritage places or materials are discovered during the Project.

666. The Mitigation Register refers to these elements, and others.

667. A number of submissions, including from GLaWAC, expressed concerns about the Project's impact on Aboriginal cultural heritage. Kalbar accepts there will be impacts to Aboriginal cultural heritage values, including value placed in landscape and country. Whilst Kalbar submits that the CHIAR shows that this is not a site warranting preservation on cultural heritage grounds, it will be important to respect the land through rehabilitation efforts, minimising offsite impacts on air and water, and applying appropriate procedures on the site to ensure tangible heritage is treated in an appropriate manner when discovered. These outcomes can be achieved through the CHMP.

Historical heritage

668. No part of the site is covered by the heritage overlay, or includes properties on the Victorian Heritage Register.

669. The CHIAR identified a grouping of 19th-century structures on the site on a property south-west of the Fingerboards intersection.[375] In relation to these the CHIAR explains:[376]

> "During the site survey a partially ruined built structure was noted as being located on the property southeast of the Fernbank-Glenaladale Road/Bairnsdale-Dargo Road intersection. It is possible that portions of this structure date to the late 19th or early 20th century. These structures were subsequently inspected for heritage significance following the attainment of access from the landowner. Following the inspection, and consultation with Heritage Victoria and the Local Council, it was established that the structures

[375] CHIAR, section 6.3.3 (Historical cultural heritage), p 127 (pdf p 143). See Plate 70 and 71.

[376] Page 168 (pdf p. 184).

did not warrant any associated management conditions at a local, council, or state, level."

670. Kalbar accepts that there are local values in relation to the locality of the subject site beyond those protected under a heritage control. However, balancing relevant considerations the project is acceptable.

RESOURCE DEVELOPMENT AND ECONOMICS

Feasibility

671. The Resource Development Evaluation Objective is as follows:

> *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.*[377]

672. An important point to note about this objective is that it seeks to achieve the 'best use of available mineral sands resources', rather than the best use of the land in some broader sense.

673. The concept of 'best use' is referred to in s 1 of the MRSD Act which identifies the purpose of that Act as being:

> *to encourage mineral exploration and economically viable mining and extractive industries which make the best use of, and extract the value from, resources in a way that is compatible with the economic, social and environmental objectives of the State.*

674. The MRSD Act does not further define 'best use'. However, the Minister's Assessment of the Donald Mineral Sands provides some implicit guidance on its evaluation. There, the Minister assessed the issue as follows:

> *The MRSD Act provides the primary statutory context for mineral exploration and development in Victoria. The purpose of this Act "is to encourage an economically viable mining industry which makes the best use of mineral resources in a way that is compatible with the economic, social and environmental objectives of the State".*
>
> …

[377] Scoping Requirements

> *The key issue to be considered in this context is whether the proposal is an economically sound development of the State's mineral resources, which enables efficient supply of minerals to markets.*[378]

675. The Minister concluded:

> *Since it is now considered to be economically feasible to both mine the deposit and then backfilling and restoration of the soil profile using conventional earthmoving machinery, it is reasonable to conclude that the Project can offer a best use of the area's mineral sands deposits, subject to: the avoidance of key ecological and cultural heritage assets, the sourcing of a suitable water supply, as well as the effective mitigation and management of groundwater, noise and dust issues.*[379]

676. This approach is consistent with the requirements of s 15(6B) of the MRSD Act, as adverted to by MFG in its submissions on economics. That section provides:

> *Without limiting subsection (6), an applicant for a mining licence (other than an infrastructure mining licence) or a retention 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.*

677. The key point to note about this provision is that it does not require the applicant to demonstrate that the mining of a mineral resource will be economically viable *per se*, but rather that there is a reasonable prospect that it will be economically viable. This is the standard that the IAC should adopt in considering viability.

678. The IAC has before it a number of documents that go toward the economic viability of the Project and the experience of the Proponent. These are:

a) Section 2.3.3 of Chapter 2 of the EES, which describes the resource value and economic drivers behind the Project;

b) The Economic Impact Assessment at Appendix D to Appendix 18 to the EES;

c) Technical Note 20 which describes the financial implications of the introduction of centrifuges on the feasibility of the Project;

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[378] Donald Mineral Sands Project – Minister for Planning Assessment Report, November 2008, available at: https://www.planning.vic.gov.au/__data/assets/pdf_file/0024/119490/Ministers_Assessment_-_Donald_Mineral_Sands.pdf, p. 12.

[379] Ibid.

d) Tabled Document 328, a benchmarking documents comparing the in-situ value of various mineral sands resources across Australia; and

e) Technical Note 33, which provides details of the experience of Kalbar's directors and staff.

679. Taken together, that material establishes that there is a real prospect that mining of the mineral resource will be economically viable.

680. Insofar as an attempt has been made to criticise this material,

a) Council's Part B asserts that no feasibility assessment has been conducted, this is directly inconsistent with the view of Council's advice from SLR. Not only did SLR recognise that a feasibility assessment had been conducted, but it found that the methodology used was 'acceptable and generally robust'.[380] It is open to Council to ignore this, of course, but it would be appropriate to acknowledge it.

b) MFG called Mr Roderick Campbell to give evidence on economics. Mr Campbell was critical of the approach taken in an appendix to the Economic Impact Assessment on a number of bases. While he asserted that this appendix did not provide information about the Project's financial viability, he did not assert that the Project would not be viable or that there was not a reasonable prospect it would be viable.

c) It needs to be noted that Kalbar has completed two Bankable Feasibility Studies, and is currently working on a Definitive Feasibility Study, and these documents could be made available to the Minister (on a confidential basis) if required.

Economic impacts

681. It does not appear to be in dispute that the Project is likely deliver economic benefits for the region (including employment benefits). Council acknowledged that this was the case at least 'at face value' in its Part B submissions.[381]

380 Submission 716B, p. 114 (pdf p. 117).

381 East Gippsland Shire Council – Part B Submissions, Tabled Document 407, [115].

682. Even Mr Campbell did not dispute that the Project would deliver economic benefits. In particular, he agreed that:

a) The capital expenditure figure of $200m during the construction phase seemed reasonable;

b) The employment estimates seemed reasonable; and

c) The company would have to pay royalties, which would provide an economic benefit.

683. To the extent he was critical of the CBA modelling undertaken for the Project, this is an interesting diversion, but nothing in the Scoping Requirements required a CBA to monetise the impacts of the Project, positive and negative. Cost-benefit analysis is an alternative means of project evaluation to the more qualitative approach taken in EES processes. In truth, it is a method suited to public projects rather than private projects to be developed in a competitive market.

684. In relation to the question of employment, it is particularly significant that Mr Campbell acknowledged that any project which has the potential to create 200 jobs in East Gippsland should be 'taken seriously'. This was a proper concession. According to the most recent employments figures in the Socioeconomic Impact Assessment, in June 2018, the unemployment rate for East Gippsland was above the State average (8.2% vs 5.3%), despite previously being broadly in line with the State average in 2016.[382]

685. While Mr Campbell professed scepticism that all these jobs would be drawn from the local region, on the basis that mining required special skills, it is reasonable to expect that a proportion of them will. As the Socioeconomic Impact Assessment states:

> *Specialist skills and previous experience will be required for some positions on the mine. These include roles such as mine manager, mining and metallurgical engineers, geologists and environment, health and safety personnel <u>whereas others will be non-professional such as truck drivers and equipment operators</u>. In line with its Local Content Guidelines (Kalbar Operations Pty, 2019a), Kalbar intends to source the majority of the project workforce locally and is working internally and with employment and training organisations to identify*

382 Socioeconomic Impact Assessment, Appendix 18, section 5.6.2.

> *strategies to increase opportunities for local workers to gain employment on the project. (Emphasis added.)*[383]

686. Consistent with the above, the Social Impact Assessment suggests there is a substantial degree of local interest:

> *To date, 200 people have registered their interest with Kalbar in working on the project and a further 129 curriculum vitae (CV) have been received from interested potential applicants. A review of these CVs by Kalbar indicates that there is strong interest in working on the project from people local to the area. The review indicates that 68 of the 129 CVs received to date are from residents who are local to the area. A further 44 CVs are from residents who are from the area but have moved elsewhere due to work opportunities who have expressed an interest in returning to East Gippsland if the work opportunities are available.*[384]

687. It is also relevant to note that the SLR review of the Economic Impact Assessment suggested it may have underestimated the likely number of indirect jobs associated with the Project. It states:

> *While direct construction jobs have been estimated, indirect jobs for the construction phase have not been calculated. This gap understates the employment benefit of the construction phase of the project. While indirect job creation generally benefits the wider national and state economies, some indirect employment benefits are likely to accrue at a local/regional level.*[385]

688. Further, any spending by employees of the mine in the region will contribute to the local economy, even if the employee is not originally from the region, which will provide an economic benefit at the local level even if at a State level it merely reflects money that would otherwise have been spent somewhere else in Victoria.

689. One conflict that the IAC will need to reconcile is that, while Mr Campbell was critical of the asserted $25m in benefits to workers associated with a higher wage on the basis that he considered it unlikely anyone would be paid a higher wage a result of the Project, Council – relying on Dr Blaesing's evidence – asserts that the prospect of higher wages risks causing an impact on agricultural employment.

690. Opponents of the Project cannot have it both ways: either the Project will pay higher wages and attract agricultural workers, conferring a wage benefit, but affecting the

383 Ibid, p. 150, section 6.4.3.

384 Ibid, p. 151, section 6.4.3.

385 Submission 716B.

ability of agricultural business to source and retain labour; or it does not, in which case it poses no threat to agricultural labour.

691. The IAC should find that the jobs provided by the Project will likely provide a wage premium and may attract agricultural workers. It should also find, contrary to Council's assertions, that the payment of higher wages is unambiguously a good thing, especially in the context of several years of wage stagnation.

692. Council also suggests that the gaps in the availability of local workers to take up jobs and trainers to train them undercuts the employment benefits of the Project. In fact, the SIA specifically acknowledges those gaps and identifies the need to take steps to address skills shortages, potentially providing longer term benefits even after the closure of the Project.

SOCIAL IMPACTS

693. The Proponent acknowledges the Project, if approved, will have social impacts. For some people, these impacts will be positive. This will be particularly so for those who obtain employment, or better employment, and for their families. It will also be so for those who provide services, or increased services, because of the Project. Positive impacts will also include the beneficiaries of community grants which are proposed, and people who use proposed training opportunities to improve their lot generally. For others, the impacts may be negative, such as people who sincerely believe that the Project should not proceed. Such impacts are unavoidable in the context of any major project. For some, negative thoughts may persist and never change. For others (and this is not uncommon with development) people will adapt and realise that their worst fears are not going to be realised. Nevertheless, Kalbar accepts that it should be proactive in seeking to mitigate any negative social impacts.

694. The Proponent has accordingly proposed mitigation measures aimed at facilitating community engagement, detecting negative social impacts (such as increases in prices of goods and services arising from the Project), and endeavouring to ensure that benefits are shared with the local community (e.g., through local purchasing arrangements, training and apprenticeship opportunities). These are intended to be implemented in a number of ways, including through the Environmental Review Committee and the

Community Reference Group required by the MRSD Act and Regulations, as well as through a Social Impact Management Plan. Should the Project be approved, it is hoped that the Council will engage with Kalbar and will be heavily involved in the design of the Social Impact Management Plan.

695. Many submitters claimed that Kalbar did not have a "social licence" to establish the Project. And, in its Part B Submission on social issues, the Council chose to:

a) Criticise the Proponent for not calling social impact evidence;

b) Assert that that SIA was deficient; and

c) Assert that the proposed social mitigation measures are inadequate.

Social licence

696. Before turning to the issues raised by the Council, it is worth commenting on an issue that was raised by a number of submitters opposed to the Project, namely, the issue of social licence.

697. While the concept of 'social licence' may have some political utility, it is not a concept that has any legal content. As Kerr J observed in *No TasWind Farm Group Inc. v Hydro-Electric Corporation (No. 2),*

> *I harbour considerable doubt that what is conveyed by the notion of "social licence" can be identified with such precision as would enable a court to conclude that any particular practice fell within or outside of its scope. It seems to me arguable that the notion of "social licence" may be better understood as construct of social and political discourse rather than of law and that it is potentially too amorphous and protean in nature to be applied as the criterion for a judicial declaration.*[386]

698. In the context of a proceeding of this kind, the assertion that a project lacks social licence is essentially a more sophisticated way of saying it is unpopular. Planning case law makes very clear, however, that planning decision-making is not a popularity

386 [2014] FCA 348, [38].

contest nor is the number of objections to a project by itself evidence of any social effect caused by the Project. As the Tribunal observed in *Minawood Pty Ltd v Bayside CC*,

> *Clearly, public opinion cannot dictate a decision because popular views may be contrary to factors that the decision maker must properly consider. There may be room for popular opinion to influence the establishment or amendment of planning controls or policy, but numbers for or against a proposal are not relevant per se in administrative decision making. Rather, it is the substance or merits of the views expressed, viewed through the prism of planning relevance, that must guide the decision maker. Thus 100 objections based on an irrelevant consideration will not outweigh a single good objection based on a relevant consideration.*[387]

699. One particular danger of placing reliance on claims of social licence is that it may privilege loud voices over quieter ones. As the Crib Point IAC observed:

> *One of the difficulties in assessing social impacts for this Project (and other large scale infrastructure) is that there are, no doubt, many silent voices. Due to the campaign waged by Save Westernport, those who perhaps might support the Project might have been reluctant to put their names on a submission. This is not able to be quantified but there may be some unknown local support for the Project.*[388]

700. In this case, the surveys done by the Proponent as part of its SIA do in fact provide some quantification of the degree of support for the Project in the community. The SIA records:

> *When asked to choose from a series of statements about what best described their attitude to mining (noting that respondents could choose more than one response), the most commonly selected responses were 'I support mining subject to proper environmental controls' (47%) and 'I support mining that brings regional economic benefits' (35%). Following this, 34% of respondents selected the response 'I support the Fingerboards Mineral Sands Mine' and 33% of respondents selected the response 'I oppose the Fingerboards Mineral Sands Mine'.*[389]

701. Accordingly, to the extent popular opinion is relevant, it appears comparatively evenly balanced. Another way that community sentiment might be gauged is to examine the submissions made to the EES, and to analyse these submissions by reference to the land or household of the submitter. This is a transparent and reviewable method as any person can review and assess the EES submissions. It is clear enough that, while is

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387 [2009] VCAT 440, [29]. See also *Stonnington City Council v Lend Lease Apartments (Armadale) Pty Ltd.*

388 Section 16.3.3(ii).

389 Socioeconomic Impact Assessment, Appendix 18, p. 37

clear opposition to the proposal from parts of the community, other, significant, portions of the community (including many landowners and households in or close to the Project Area) do not seek to express opposition to the proposal.

Social evidence

702. Council sought to in some way criticise the Proponent for not calling social impact evidence ostensibly on the basis of some established practice of doing so.

703. Of the six examples cited in the first sentence of the relevant footnote, no social impact evidence was called in *Yan Yean (Stage 2)* and *Mordialloc Bypass*, despite the filing of a statement. This fact is expressly recorded in the IAC report for each project. Further, it is not clear from the report that Dr Mandke was called in *Edithvale Bonbeach*, noting that only two social issues appear to have been raised.

704. In relation to the remaining projects, social evidence was called by at least two parties, in contrast to this case, meaning that there was a contest of evidence to be resolved. Here, Council has also determined not to call social impact evidence. This is perhaps unsurprising, given that the SLR review concluded that the SIA itself was generally adequate.[390]

705. The criticism appears to boil down to the fact that, because numerous submitters oppose the Project, a social impact expert should have been called. The Proponent does not accept this argument. In the absence of any identified deficiency in the SIA or any areas on which technical social impact evidence is required (e.g., the loss of community facilities), members of the community are themselves best placed to articulate the perceived impact of the Project on them and what they value.

706. To the extent that Council's Part B submission claims that no findings can be made on social impacts in the absence of any actual witness, this must be rejected. The Terms of Reference not only permit the IAC to inform itself as it sees fit (rather than confining it to facts in evidence), but specifically requires it to consider the EES which provides considerable detail on the social impacts of the Project. (It might also be observed that there is some irony in the Council insisting on findings being on evidence in

[390] Submission 716B, p. 12

circumstances where it has called no evidence about many areas in which it seeks adverse findings).

707. The Council also seeks to criticise the SIA on the basis that it 'appear[ed]' to have proceeded on 'secondary' material. Much of the criticism centres on an unclear and unarticulated distinction between 'consultation', 'engagement', and 'proper social research'.

708. In this context, an attempt is made to draw an analogy with Crib Point, where it was said that the authors of the SIA 'relied on what was prepared by the Proponents in the Stakeholder Engagement report and various secondary resources'.

709. The attempt to draw an analogy is misconceived. The authors of the SIA for the Project engaged in a number of activities where the views of members of the community were sought directly. As set out in section 2.1.1. of the Socioeconomic Impact Assessment, the following activities were undertaken:

a) A community values workshop in March 2018, facilitated by an independent facilitator and attended by around 50 people from the area, as well as representatives of various groups, including MFG;

b) A community meeting in July 2018, which was advertised in local papers and attended by more than 80 people;

c) One on one interviews with a number of landholders adjacent to the Project Area in December 2018; and

d) Community surveys conducted by the Proponent in 2017 and 2018.

710. These sessions were in part designed to elicit the identification of community values, as well as to understand their hopes and fears around the Project. As the SIA states:

> *Community values are qualities of the social environment that are important to people and conducive to individual wellbeing. Understanding what local community values are is an important part of a SEIA in that it forms the basis of an assessment of how the community could be impacted by a planned intervention (IAIA, 2003).*[391]

391 Socioeconomic Impact Assessment, Appendix 18.

711. These sessions were of course supplemented by additional information which is not only appropriate but entirely consistent with Council's own guidelines on social impact assessment, which are specifically referenced in the SIA.[392]

712. Consequently, the criticism offered by the Council is entirely baseless. In truth, it is a reflection that, despite the Council's claim to be acting fairly, it has pursued an entirely partisan approach to this proceeding.

713. It also follows that Council's suggestion that something has been lost by its inability to ask questions about 'engagement and consultation' is based on a false premise.

714. To the extent it is sought to criticise these activities because they were, in part, aimed at identifying potential mitigation measures, this is a bizarre criticism. Not only it is appropriate to involve the community in the identification of mitigation measures, the SIA shows that the process was used to identify what the community valued about the area.

715. In these circumstances, the Proponent rejects the criticisms sought to be advanced by the Council. It is telling that apart from assertions about the nature of the materials used, it is not suggested that the SIA has in anyway failed to correctly characterise the area or failed to identify any social issues of concern.

Mitigation measures

716. In relation to the issue of mitigation measures, it is convenient to record here that the Council has expressly refused to meet with the Proponent since the publication of the EES.

717. It is self-evident that the drafting of mitigation measures is a matter that can most easily be resolved by discussions between the parties and could be done without prejudice to those parties' respective positions, so as to ensure that if the Project proceeds, it proceeds on terms that are agreed to be appropriate.

718. A clear example of this occurring is in relation to the compulsory acquisition of a large piece of strategically significant industrial land in Manningham as part of the delivery

392 Ibid.

of the North East Link Project. Although Manningham opposed that project, the Council and the North East Link Authority were able to largely agree the EPRs that were required to be applied to mitigate the effects of the acquisition on businesses and employees.

719. Even now, despite raising the concerns it has about the conditions, the Council has made no attempt to specify what it considers appropriate or necessary conditions to assure the attainment of acceptable outcomes in relation to, for example, house prices or employment impacts. The proposed reporting clause in Council's commentary on the Mitigation Register is every bit as vague as the conditions that the Council purports to criticise.

720. Further, it appears that the Council has not fully reviewed the material before making some of its criticisms. Footnote 110 of its Part B submission states that the Proponent has provided no details of the role of the proposed Community Reference Group. In fact, section 7.1.5 of the Community Engagement Plan (Appendix D) in the draft Work Plan sets out draft Terms of Reference for the CRG. These Terms describe the composition of the proposed CRG (which is expected to include, among others, a representative of MFG (if they agree), three landowners from Glenaladale / Lindenow, and three other community representatives) and indicate that, fundamentally, the CRG is intended to provide a forum for the community to express their views to the Proponent and for the Proponent to provide information to the community. The Terms of Reference do expressly identify that the CRG is not intended to be an advisory board.

721. Similarly, Technical Note 027 provides details on the proposed Environment Review Committee and the EMF provides an outline of the proposed complaints handling process, while noting this will be refined when the Community Engagement Plan is updated.

722. In this context, the Proponent considers there is a sufficient level of information to enable Council to understand the intended role and function of the various elements of the social impact management regime.

723. In relation to the community fund, the Proponent is content to adopt the formulation of this condition found in the Crib Point EPRs (noting that, contrary to the implication,

the inclusion of a specific amount for the community fund was a recommendation of the IAC in that matter, and was resisted by the Proponent). In this case, the Proponent would accept a condition requiring it to provide $250,000 per annum in community grants once the Project begins operating. Before the Project commences operation, the Proponent will continue to commit $40,000 a year to community grants.

724. The reality is that there is no reason to assume that the social impacts of the Project cannot be adequately managed subject to appropriate monitoring and management conditions of the kind contemplated in the Mitigation Register.

PART D– CONCLUSION

725. For the above reasons, it is respectfully submitted that the IAC should find that the Project can achieve acceptable outcomes in respect of each of the Evaluation Objectives, subject to the adoption of appropriate mitigation measures.

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