

Expert Witness report

11 March 2021

By: Assoc Prof John Webb

Re: Fingerboards Mineral Sands Project
north-west of Bairnsdale, East Gippsland,
to be operated by Kalbar Operations Pty Ltd

Prepared for East Gippsland Shire Council
As part of a submission to the
Fingerboards Mineral Sands Project Inquiry and Advisory Committee

Instructed by Darren Wong of Planology

(a) Full name and address of expert witness

John Allan Webb
Department of Ecology, Environment and Evolution,
La Trobe University,
Melbourne, Victoria 3086

(b) Qualifications, experience and area of expertise

My qualifications are BSc Hons (University of Queensland 1973; awarded First Class Honours) and PhD (University of Queensland 3/9/1982). I have over 35 years' experience in geology and 25 years' experience in hydrogeology, both in terms of practice and tertiary level teaching. I publish in high-ranking international journals in hydrogeology, including Water Resources Research (JIF 4.397), Hydrology and Earth System Sciences (JIF 4.437), Earth Science Reviews (JIF 7.051). My h-index is 35 (Google Scholar; orcid.org/0000-0002-6357-5966); on average my papers have received 15.5 citations for 99 articles in Web of Science, with over 4200 citations in total, including >300/year for 2015-2017 (Google Scholar). As Co-Chief Investigator, I have received \$1,512,057 in grants over the last 6 years, including 2 ARC Discovery projects and 2 ARC Linkage projects, as well as 2 LIEF grants. I have supervised 102 honours students, 29 PhD students and 3 MSc students to completion in a variety of geological and hydrogeological projects. I have participated in over 70 consulting projects and have been an invited member of 3 expert panels to assess groundwater and contaminated site management. Over the past 17 years I have acted as an expert witness in 10 court cases and tribunal hearings on hydrogeological and hydrogeochemical topics, including appearing for a dairy farmer seeking a groundwater licence, the Alpha Coal Mine Queensland Land Court appeal heard in 2013 and the Objection to Mining Lease and Environmental Authority for Carmichael Coal Mine heard in 2015.

(c) Expertise to make the report

As detailed above, I am a very experienced geologist and hydrogeologist. In particular, I am familiar with the geology and hydrogeology of East Gippsland; I have published papers on groundwater geochemistry in the Latrobe Valley and the geology and geomorphology of the Hoddle/Strzelecki Ranges and the Buchan region.

(d) Any private or business relationship between the expert witness and the party for whom the report is prepared

I have no relationship with the client other than a business engagement to comment on this matter.

(e) Instructions that define the scope of the report

I was instructed by Darren Wong of Planology on 2 February 2021 that:

“On 31 January 2021, we received revised directions from the IAC in response to advice from Kalbar that it was intending to call four additional witnesses relating to planning and water matters. We are reviewing these new evidence statements and you will be provided

with further instructions if an addendum to your statement is required to address this new material. Alternatively, if after reviewing these statements, you form the view that you need to file an addendum to your statement, please let us know immediately. We need to advise the IAC by 10am on 4 February 2021 if a further evidence statement in response to this material is proposed to be filed.”

I was instructed by Darren Wong of Planology on 9 February 2021 that:

“As foreshadowed in your further instructions dated 2 February 2021, Kalbar has filed additional material regarding the option to use centrifuges as part of the mining process.

Kalbar has filed 17 supplementary witness statements that consider the proposed use of centrifuges as part of the proposal. An updated project description has also been prepared by Kalbar.

Please review this new material, as relevant to your area of expertise, and advise whether it raises any new matters for you or changes your opinion in any way.”

Attachment A is the complete email of both sets of instructions.

(f) Facts, matters and all assumptions upon which the report proceeds

Kalbar Operations Pty Ltd proposes to undertake open pit mining of a mineral sands resource at Fingerboards, approximately 20 kilometres north-west of Bairnsdale in East Gippsland, to extract approximately 170 million tonnes of ore over a projected mine life of 20 years to produce approximately 8 Mt of mineral concentrate. The project requires 3GL of process water per annum; a borefield south of the site will be established to potentially supply this from groundwater within the Latrobe Group aquifer. Tailings from processing of the ore will be disposed of on-site; pore water from the tailings will raise the watertable beneath the site. Groundwater impacts from both processes have been modelled and the results presented in a series of reports within the Environment Effects Statement for the proposed mine.

In January 2021, several new reports were prepared for Kalbar in order to:

- (i) respond to submissions on the Environment Effects Statement for the proposed mine
- (ii) take into account the revision of the previously assumed recovery of water from the fines slurry (80%) to a more realistic estimate of 50%.

Four of these reports have been reviewed and the data and interpretation within them assessed on the basis of my knowledge and understanding of hydrogeology in general, and the hydrogeology of the proposed minesite in particular.

In February Kalbar filed 17 supplementary witness statements that consider the proposed use of centrifuges as part of the mining process. Four of these reports have been reviewed.

(g) Those documents and other materials the expert has been instructed to consider or take into account in preparing the report

For this review I examined the following reports:

- (i) Expert Witness Statement of Joel Georgiou (EMM), 2/2/2021 – Groundwater (abbreviated below as Georgiou)
- (ii) Expert Witness Statement of Hugh Middlemis (HydroGeoLogic), 28/1/2021 - Groundwater

- (iii) Expert Witness Statement of Jarrah Muller (EMM), 2/2/2021 - Water balance
- (iv) Expert Witness Statement of John Sweeney (Coffey), 2/2/2021 - Water impacts (abbreviated below as Sweeney)
- (v) Supplementary Expert Witness Statement of Joel Georgiou (EMM), 7/2/2021 – Groundwater
- (vi) Supplementary Expert Witness Statement of Hugh Middlemis (HydroGeoLogic), 5/2/2021 - Groundwater
- (vii) Supplementary Expert Witness Statement of Jarrah Muller (EMM), 8/2/2021 - Water balance
- (viii) Supplementary Expert Witness Statement of John Sweeney (Coffey), 8/2/2021 - Water impacts

I also referred to the Environment Effects Statement August 2020 Appendix A006 Groundwater and Surface Water Impact Assessment, which includes Appendix B Groundwater Modelling Report and Appendix A001 Landform, Geology and Soil Investigation (abbreviated below as A001).

- (h) Identity and qualifications of the person who carried out any tests or experiments upon which the expert relied in making the report

No-one carried out any tests or experiments for my report.

- (i) Declaration

My review does not contain any provisional opinions that are not fully researched or any questions falling outside my expertise, and is not incomplete or inaccurate in any respect.

I confirm that I have read and that I understand the Planning Panels ‘Guide to Expert Evidence’ and that I comply with the provisions of that guide.

I have made all the inquiries that I believe are desirable and appropriate and that no matters of significance which I regard as relevant have to my knowledge been withheld from the Panel.



Assoc Prof John Webb

Department of Ecology, Environment and Evolution,

La Trobe University

11 March 2021

**Review of Expert Witness reports
in terms of the groundwater impact
of the Fingerboards Mineral Sands Project**

Presence of a perched water table that maintains spring-fed dams and parts of Moulin/Stoney Creek

1. A review of landowner EES submissions in the Supplementary Expert Witness Statement of Joel Georgiou shows that there are a number of spring-fed dams around the proposed mine site. In addition, parts of Moulin/Stoney Creek apparently never dry out (Georgiou p. 18), which suggest that they are spring fed. These springs are attributed to “isolated areas of perched water” (Sweeney, p. 19); perching is regarded as “a localised phenomenon”, and “clay layering within the Coongulmerang Formation... controls the development of perched groundwater lenses” (Georgiou, p. 19).
2. However, the surface geological unit across a significant part of the proposed mine site is not the Haunted Hills or Coongulmerang Formations but a Pleistocene fine to medium grained yellow brown dune sand up to 10 m thick (Figure 1 below) (A001 p. 9). The project area is effectively a dissected plateau of this old dune material; landform development was subsequent to the emplacement of the dune sand ridges (A001 p. 17).
3. It is likely that at least some of the perched groundwater lies within the porous and permeable dune sand, and that springs emerge at the boundary between the dune sand and the less permeable underlying Haunted Hills Formation. If this is the case, spring-fed dams and perhaps also the perennial parts of Moulin/Stoney Creek will lie along this boundary.
4. Therefore removal of the dune sand across the proposed mine site could affect nearby spring-fed dams and potentially also the perennial parts of Moulin/Stoney Creek that may be spring-fed. The distribution of the dune sand needs to be mapped and compared to the location of the spring-fed dams and the perennial sections of Moulin/Stoney Creek, in order to identify any dams or parts of the creek that might be negatively impacted by removal of the sand over the mine site. Any dams that lose part or all of their catchment area in the dune sand could potentially dry up, in which case mitigation measures will be required, i.e. negotiating make-good agreements with affected landowners.

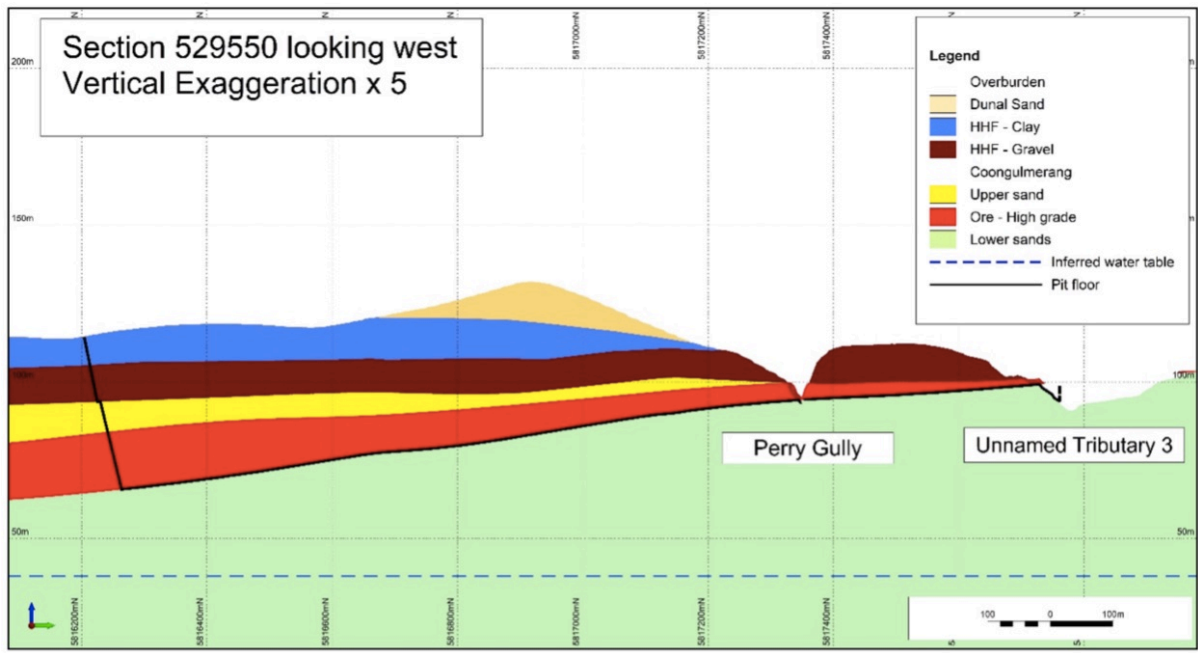


Figure 1. Cross-section showing upper unit of dune sand (A001 Fig 3, p. 11).

Attachment A - complete email of sets of instructions dated 2/2/21 and 9/2/21

2/2/2021

Hi John

Other parties' expert evidence

We have now received the expert evidence from the other parties.

We have updated your brief with the following expert evidence statements in the 'Relevant evidence' folder:

1. Associate Professor Matthew Currell (Hydrogeology)
2. Joel Georgiou (EMM) – Groundwater
3. Hugh Middlemis (HydroGeoLogic) - Groundwater
4. Michael Cheetham (Water Technology) - Erosion and sedimentation
5. Jarrah Muller (EMM) - Water balance
6. John Sweeney (Coffey) - Water impacts

We have not provided you with the evidence statements relating to surface water. Please let us know if you would like a copy of these and they can be provided.

Conclave

We expect that you will be contacted by one of Kalbar's witnesses to arrange a time for the conclave meeting.

New evidence from Kalbar

On 31 January 2021, we received revised directions from the IAC in response to advice from Kalbar that it was intending to call four additional witnesses relating to planning and water matters. We are reviewing these new evidence statements and you will be provided with further instructions if an addendum to your statement is required to address this new material. Alternatively, if after reviewing these statements, you form the view that you need to file an addendum to your statement, please let us know immediately. We need to advise the IAC by 10am on 4 February 2021 if a further evidence statement in response to this material is proposed to be filed.

The evidence statements from Jarrah Muller, John Sweeney and Hugh Middlemis have been filed in response to these directions.

Centrifuges

On 18 January 2021, Kalbar's lawyers wrote to the IAC (**Kalbar's Letter**) advising that their client was intending to include the use of centrifuges as part of the proposal. A 'technical note' was attached to this letter.

In response to Kalbar's Letter, the IAC issued further directions. These directions require Kalbar to provide further evidence statements and information by midday on 8 February 2021. If this material is likely to have any groundwater implications, we will provide the relevant documents to you. If an addendum statement is required from you, it will be required to be filed and served by 12 noon on 12 February 2021.

At this stage we suspect that you will be required to undertake further work. We expect to be in a position to provide you with further instructions, should they be required, shortly after 8 February 2021.

A copy of Kalbar's Letter, technical note and the IAC's updated directions are now included in your brief. These documents have been included in your brief in the 'Centrifuge' folder.

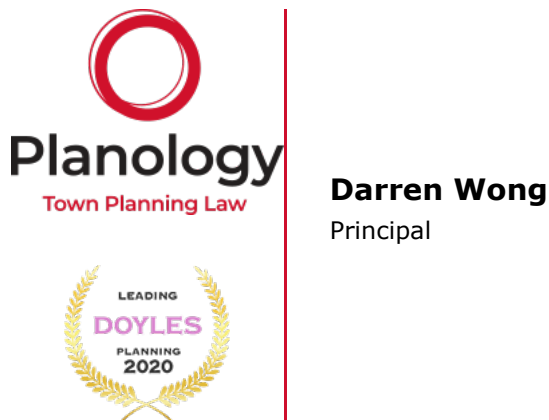
Link to brief

A copy of the relevant link is below.

Other matters

If you have any questions regarding these further instructions or have difficulties accessing the further documents, please contact me.

Regards



9/2/2021

Hi John

Kalbar's response to IAC's request for further information

In your brief, we advised that the IAC had requested further information from Kalbar. Kalbar's response has now been received and a copy of the response and the accompanying technical notes are included in a new folder in your brief called 'Response to IAC RFIs'.

Please review this new material and advise whether it raises any new matters for you or changes your opinion in any way.

Kalbar's response to Submissions

The IAC had directed Kalbar to provide a written response to the submissions. Kalbar's response has now been received and a copy of the response is included in a new folder in your brief called 'Response to submissions'.

Please review this new material and advise whether it raises any new matters for you or changes your opinion in any way.

Kalbar's supplementary evidence – Centrifuges

As foreshadowed in your further instructions dated 2 February 2021, Kalbar has filed additional material regarding the option to use centrifuges as part of the mining process.

Kalbar has filed 17 supplementary witness statements that consider the proposed use of centrifuges as part of the proposal. An updated project description has also been prepared by Kalbar.

Please review this new material, as relevant to your area of expertise, and advise whether it raises any new matters for you or changes your opinion in any way.

If you need to prepare a further witness statement to address any of this material, please advise us immediately. The IAC has directed that reply evidence regarding the use of centrifuges will be required to be filed **by 19 February 2020**. We will require a draft by close of business on **17 February 2021**.

The supplementary evidence is provided within a subfolder called 'Supplementary witness statements' within the 'Centrifuge' folder and the updated project description is provided within the 'Centrifuge' folder. Kalbar's cover letter is also included in the 'Centrifuge' folder.

Link to brief

A copy of the relevant link is below.

Other matters

If you have any questions regarding these further instructions or have difficulties accessing the further documents, please contact me.

Regards



Darren Wong

Principal