

20 June 2021

Mr Nicholas Wimbush
Chair, Fingerboards Inquiry and Advisory Committee
Department of Environment, Land, Water and Planning
Level 5, 1 Spring Street
Melbourne, Victoria 3000

Via email

Dear Mr Wimbush

Re: Technical Note 31: Water Storage Dam Failure

The Bendigo District Environment Council has provided submissions 429 and 554 and has provided supplementary submissions which include, but are not limited to, commentary on the fitness for purpose of assessments prepared for the IAC by consultants selected by the proponent.

The proponent recently responded to another request for information from the IAC, as described in Tabled Document 500 (Technical Note 31), which included an extract from a previously unsighted report. The author of that report was not identified, but from the graphics and the reference to tailings storage facilities (TSFs) it could be assumed it was prepared by a consultant external to the proponent and at a time prior to the incorporation of centrifuges (refer to Technical Note 01). Commentary within the extract suggests the parent report was prepared principally as modelling to consider catastrophic failure of the TSF's. The extract can be considered extraordinary as the report:

1. Describes that for the one model of failure of the water storage dam that was prepared, that large volumes of water at commensurate heights would impact locations such as the Bairnsdale-Dargo Road, the Fernbank-Glenaladale Road and the environs of the Lindenow horticulture area adjacent to the Mitchell River upstream and downstream of the Long Marsh Gully confluence.
2. Was not previously provided to the IAC.
3. Was not incorporated in the Surface Water Assessment A006 or Water Supply Options A008.
4. Was not incorporated in the Human Health Risk Appendix A019.
5. Was not considered as a risk in the EPBC consideration of the Ramsar listed Gippsland Lakes or for the risk to the Chain of Ponds.

The extract provided by the proponent does not approach any minimal standard as a response to the IAC to establish risk from catastrophic failure of the principal water storage dam as:

- a) There are four gullies in the immediate vicinity of the water storage dam to which water could report, as a distinct flow to a particular gully, or shared into two or more, depending on the section of the wall which had failed and the actual landform in the immediate vicinity. That would require consideration as to whether the new plateau level of the landform had been established and if mine voids were in the vicinity of the dam and the flow channels so established directed the flood surge to

critical infrastructure i.e. the Bairnsdale-Dargo Road. Modelling of the likely scenarios should have been prepared.

- b) One mode of catastrophic failure was not modelled (directly east to the Bairnsdale-Dargo Road and via the Perry Gully or the un-named gully to the Mitchell River). The presence of a school bus on the Bairnsdale-Dargo Road, traffic on any affected section of the road network or the seasonal presence of large numbers of horticultural workers on the Lindenow Flats could provide a disastrous relationship with this failure mode.
- c) The possibility of progressive failure (domino effect) of the water storage dam, the TSF (still a consideration in this document) and/or the two storage dams in the Perry Gully was not considered. If debris from the collapse of dams in the Perry Gully, along with displaced trees or farming/mine infrastructure was to impede the normal flow of the Mitchell River there would be the opportunity that the flow is diverted for a period on to the Lindenow Flats. This demonstrates a lack of rigour in modelling.
- d) The highly modified changes to the landscape provided by the excavation and progressive rehabilitation of the mine voids and the capacity of the new landform including open pits to re-direct flows was not considered.
- e) The storage capacity of the water dam was described as 2.2 Gigalitres. The tabling of Technical Note 26 by the proponent ascribes a water retention capacity to the coarse tailing sand. The use of this data describes the amount of water that will be lost (irretrievably) by the placement of coarse sand, during the rehabilitation of mine voids, as greater than 2.66 Gigalitres. Technical Note 26 describes the water that will be irretrievably lost as the slimes are incorporated with the overburden as 1.48 Gigalitres. When consideration is made for seepage through the base of mine voids and dams, evaporation, and dust management this establishes that the total water loss on an annual basis is greater than 5 Gigalitres. That is that the make-up water required by the proponent on an annual basis is in the order of 5 to 6 Gigalitres. It can then be considered that the storage capacity of the water dam is required to be increased in the same proportion, that is, it should be in the order of 4.4 Gigalitres rather than 2.2 Gigalitres. A dam capacity of 4.4 Gigalitres should be the basis of data used in the dam failure modelling. The BDEC will provide a supplementary submission to further detail the proponent's annual requirement for make-up water when our document has been finalised.
- f) The model provided in the extract does not extend to the lower section of the Lindenow Valley horticultural area due to the topographic mapping available to the consultant.
- g) The freshwater storage dam should be correctly described as simply a water storage dam as it is intended to be used to receive DAF treated water in addition to Mitchell River winter-fill.

There are serious concerns regarding the water storage dam being constructed in an area known to contain dispersive soils. It is debatable whether an engineer who is suitably qualified to design dams to ANCOLD standards would be prepared to design and supervise construction of this dam. Also of concern is that the proposed structure consists of a "turkey nest" type construction dam to be established on a cut to fill base constructed from dispersive soil - simply on the assumption that the soil may be stable once it has been treated by the incorporation of

lime, and the assumption that intrusion collars fitted to service pipes placed within the dam walls may prevent tunnelling. These are unproven assumptions.

The BDEC hold a real concern that the report from which the extract was taken holds a model for describing a graphic failure mode(s) of the water storage dam and the human health risks which were subsequently established from this modelling and that it has been deliberately withheld in an attempt to advantage the proponent.

The BDEC request that the IAC require the proponent to provide a report containing a model for catastrophic failure of the water dam which is fit for purpose and that this report is incorporated in the Human Health Risk Appendix. If necessary, this report should be independently considered for fitness of purpose. The BDEC requests that a sufficient time extension is provided to the community to provide comment when an acceptable document is available for consideration by individual submitters.

Yours sincerely

Ian Magee
On behalf of BDEC