

Is the Fingerboards mineral sands
mine worth the environmental
health risk?

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Evidence of contamination associated with mineral sands mining and processing

Epidemiological and ecological research have identified human and agricultural uptake of:

- rare earth elements (REEs)
- coexisting radionuclides

- REEs detected in biomarkers indicates elevated body burden in exposed communities
- REEs detected in human colostrum indicates exposure in utero and risk for newborns
- REEs enter the food chain via bioaccumulation in plants and uptake by grazing animals
- Thorium detected in lung tissues due to inhalation of contaminated dust.

Potential for dispersion of multiple toxic environmental contaminants via multiple sources

- REEs
- Radionuclides
- Metals/metalloids
- Respirable crystalline silica
 - individually or as mixtures

- Airborne dust:
 - PM₁₀ and PM_{2.5}
- Surface water:
 - Runoff, accidental spills, depletion, sedimentation
- Groundwater:
 - Seepage, leakage and leaching
- Tailings and storage dams
 - Collapse and overflow
- Soil contamination

Potential for multiple exposure pathways

- **Inhalation:** contaminated dust, PM₁₀ and PM_{2.5}
- **Ingestion:** contaminated water, soil, horticultural and agricultural products
- **Dermal absorption:** contaminated water, dust, soil

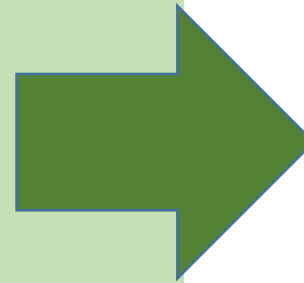


Potential for adverse environmental health impacts

Chronic exposure to inhaled and/or ingested mine contaminants

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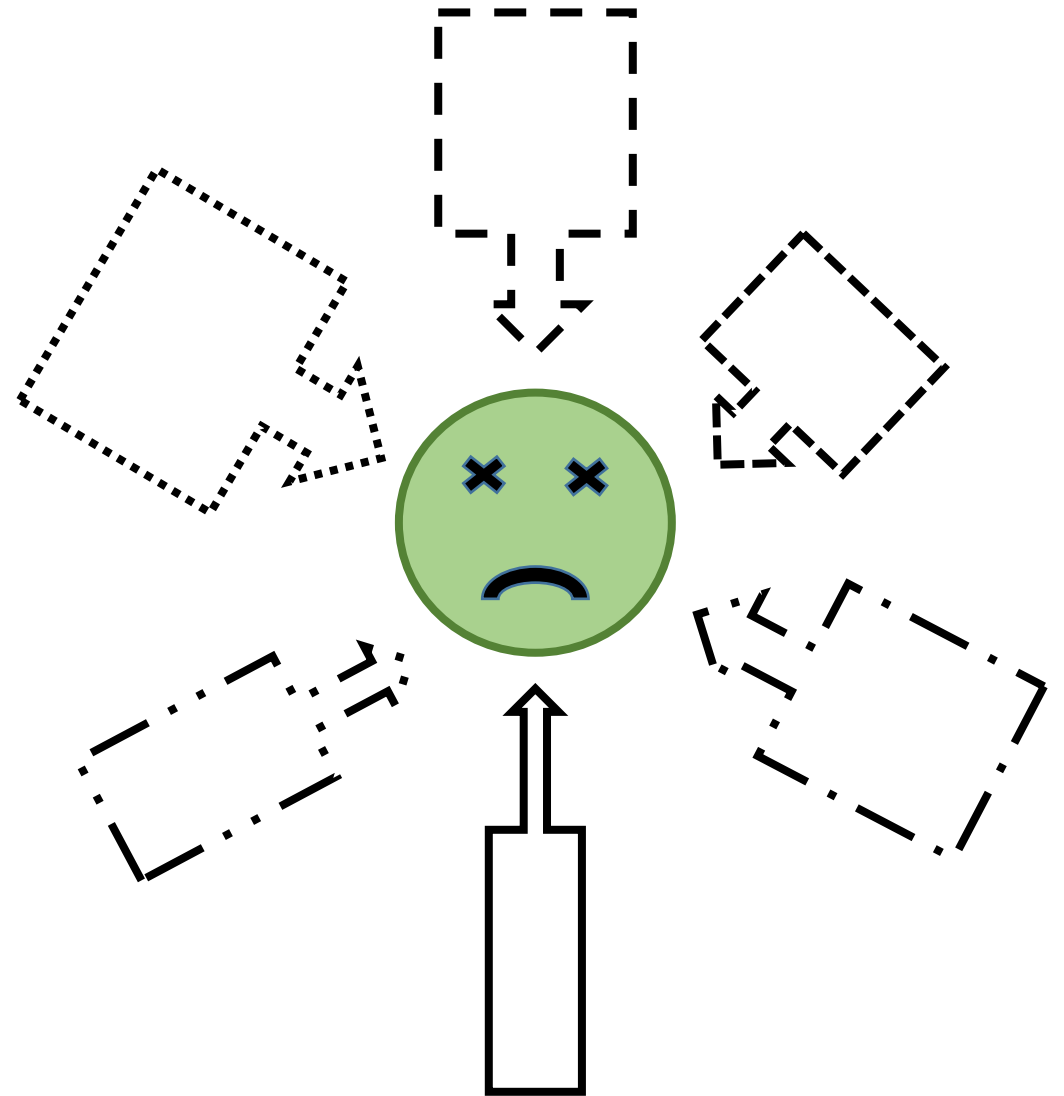
Persistence of some contaminants in environmental media and human organs and tissues



Increase the burden of disease for current and future generations

Comprehensive Environmental Health Risk Assessment Needed!

- Close proximity to residential communities, agriculture and horticulture
- Uncertainties in predictive modelling of environmental contaminants
- Potential for cumulative human health impacts of concurrent environmental hazards
- Variability in:
 - duration of exposures
 - susceptibility of the exposed population



Environment Protection Act in force from 1 July 2021:
“EPA will ... have enhanced powers to prevent risks to the environment and human health [and] ... be able to issue stronger sanctions and penalties to hold environmental polluters to account.”

The recently published audit of mine rehabilitation in Victoria (*Rehabilitating Mines 2020* Victorian Auditor-General's Office (VAGO)) reported “systemic regulatory failures” by the Earth Resources Regulation (ERR) unit, including “lack of enforcement activities”.

- Strategic environmental monitoring during the operation of Fingerboards to identify exceedances and trigger responsive remedial action?
- Strict enforcement of environmental regulations ?
- Demonstrable compliance with best practice ?

- Timely and restorative rehabilitation of mine site, not just a scar on the landscape causing episodic or perpetual pollution ?

Centrifuges for water recovery and tailings management...

The following **SHOULD** have been identified and considered in the original Fingerboards EES proposal:

- The OVERestimate of “... water released by the amphirols for process recovery...”;
- The UNDERestimate of “...3GLpa water requirement...” now estimated to be “... 4-5 GL per annum when using the amphirols...” (*Document 43 Kalbar Technical Note 01 Implementation of centrifuges... 18_01_21*).



FAILURE by both Kalbar and the Technical Reference Group to identify a potential water supply deficit in this locality of intensive agriculture and horticulture may be construed as systemic failure which has unfairly prolonged the Fingerboards EES process and exacerbated the concerns and financial burden of the impacted community.

The EES process for mining proposals in Victoria...

Minister for Planning's decision regarding the Fingerboards EES MUST be based on:

- reliable evidence of potential environmental health effects
 - comprehensive baseline data
 - validated modelling predictions
- a demonstrated ability to comply with environmental regulations.

Streamlined process...

An INDEPENDENT EXPERT PANEL [*at National level?*] to oversee EES processes for mining

Adequate RESOURCES and access to EXPERT WITNESSES for Community groups.

NO,
the Fingerboards mineral sands mine is
NOT
worth the environmental health risk!

