

## SUPPLEMENTARY SUBMISSION – CENTRIFUGES

### Introduction

Following the discovery of the major error in the proposed project's water balance, the proponent has put forward the option of using centrifuges to address the water shortfall. It should be noted that the 'new' water use is the same unacceptably high figure of 3GL as the exhibited EES, and is unlikely to be able to be sourced.

Information regarding the new centrifuge option has been limited, and eked out over time. This has not allowed adequate assessment of the risks and impacts of the option. Many of the proponent's consultants appear to have accepted the proponent's statements about the centrifuge option at face-value, and not considered it in detail, researched the topic or questioned the proponent's assumptions.

Under the Mineral Resources (Sustainable Development) Act (MRSDA) there is a requirement that the proponent consult with the community. Despite the proponent investigating (and presumably rejecting) centrifuges in 2018, there was no consultation with the community on the topic until it was presented to the IAC AFTER the close of the exhibition period of the EES. The proponent has been very reluctant to provide meaningful information, such as centrifuge specifications to the community.

The short time in which information has been available, and the limited nature of that information has not allowed detailed assessment of the risks and impacts of the proposed use of centrifuges. Release of the revised Work Plan the day before supplementary submissions close demonstrates either a lack of respect the proponent has for the community and the process, or their lack of competence and preparation (or both).

The economics of the proposed project have always been dubious. The proponent's consultants admit the technology has not been used in the mineral sands industry before due to the costs. The rushed introduction of centrifuges, a component which increases both capital and operating costs, does not seem feasible.

This suggest the community will either be left with a bankrupt un-rehabilitated mine site, or that the proponent will reintroduce the option of the tailings storage facility as a work plan variation following approval (should the project be approved).

Unfortunately work plan variations (such as the introduction of tailings storage facilities) do not appear to entail any independent scrutiny by experts or by the community.

The proposed project, with or without centrifuges will result in the destruction of the local agricultural and horticultural industries in both the short and long term.

## Water

### Quality

The option of utilising centrifuges will lead to the extraction of used process water under higher pressures. Each time the water is cycled around there will be increasingly greater concentrations of unwanted contaminants, such as Vanadium, Chromium, Thorium and Arsenic being dissolved in the process water. There is the potential for the flocculant to increase in concentration with each cycle.

The storage of this contaminated water will lead to unacceptable seepages into groundwater systems, and also has the potential to spill into surface water systems. These leakages of highly contaminated and toxic water would lead to unacceptable impacts on groundwater dependent ecosystems, native fauna, animal production enterprises and local residents' domestic water supplies.

### Infrastructure

The current proposal for a network of water storage dams is highly complex. Doubts have been raised as to whether, in the event of premature or unexpected shut-down, the system could be safely decommissioned.

The proponent states that under the new centrifuges option there will be more spillages and overflows. These are not only likely to be from the water which is high in sediments and possible contaminants from the gully dams, but also from the increasingly contaminated process water storage dam.

The current ANCOLD requirements are that dams be designed for 1 in 100 year events. The proponent's figures indicate they are only designing for 1 in 30 year events. Our understanding is that the new ANCOLD requirements are that structures be designed for 1 in 1,000 year events, unless they would cause significant human impact in which case they are to be designed for 1 in 10,000 year events.

Spillage or overflow from the proposed dams would have significant impacts on downstream users, including but not limited to:

- Contamination of stock-water, pollution of ecosystems, poisoning of domestic water supplies for homes;
- Breach of the 'water' storages could have disastrous impacts on those whose businesses and homes are below the site; and
  - The Fingerboards are approximately 80m higher than the Mitchell River flats, which means that any flood from a breach be driven by a massive 800kPa of pressure.
  - The resulting flood-wave which would sweep across the flats would be devastating.

## Soils

The proponent's consultant's examination of impacts to the soil has been superficial. Comments such as the centrifuge option would lead to reduced flocculant being deposited, and that the consultant is not aware of any information on the long-term mobility, persistence or breakdown products from flocculants if placed at significant depth in the soil demonstrates that the consultant is poorly informed in the topic.

The proponent's documentation states that there would be increased flocculant deposition into the replaced subsoil.

In her two Witness Statements, Dr Jasonsmith clearly shows there is compelling evidence that deposition of the flocculants into anaerobic environments can lead to the breakdown of the polyacrylamide flocculants into their highly toxic acrylamide monomers. There is also research indicating these would be transported by water movement through the soil profile into groundwater and/or surface water systems.

Issues associated with the concrete foundations for the centrifuge structures have not been addressed:

- The concrete could act as a water concentration and flow surface for water moving through the soil profile. Once subsurface water becomes concentrated and flows as a body it can transport dispersed soil particles and create tunnel erosion;
- Should the concrete foundations remain after the buildings are removed, they would act as a water catchment area – causing water 'pooling' and concentrated run-off. These are the conditions the rehabilitation plan seeks to avoid as they cause tunnel erosion; and
- How are the concrete foundations to be rehabilitated? There will be many hundreds, if not thousands of tonnes of concrete. Will it be broken up and removed, or will it remain as a menace for generations into the future? It's not possible to run a farm full of concrete.

Vibration from the operation of the centrifuges would be transmitted through the foundations into the soil. This has the potential to trigger liquefaction of the dispersive subsoil in wet years.

Liquefaction of the subsoil could have a range of impacts, such as but not limited to:

- Liquid flow into the mine void which could bury equipment and personnel;
- Boggling of machinery operating on nearby land; and
- Collapse of the burrows of native fauna.

We are aware of tunnel erosion occurring within the project area. Some of these are in areas similar to those described by the proponent's consultant as being the desired final landform as they will not erode. Clearly the dispersive soils and the associated erosion issues are bigger and more complex than the proponent suggests.

Additional triggers to erosion must be avoided. Erosion issues also take a long time to become apparent – at least ten years. How will erosion issues resulting from the proposed project be addressed when they become apparent in ten or fifteen years after closure?

We do not wish to see our family farm become an eroded barren desert, the local waterways filled with sediment and the rivers and lakes contaminated.

## Noise

The noise estimates provided by the proponent are based on an empty centrifuge with no tailings. These are totally inappropriate. The consultant selected by the proponent suggests that 'imposition' of the appropriate noise standards would curtail activity on the site. The consultant appears to believe that activity on site is a higher consideration than the health and well-being of local residents. Standards must be complied with and preferably improved upon.

We are neighbours of the proposed project and treasure the quiet atmosphere of the district. We can hear the train horn at the railway crossings at Fernbank and Munro which is more than 15km away. The prospect of the increased noise from the centrifuge option is appalling.

## Dust

Claims by the proponent of reduced dust are illogical. The centrifuge option will lead to increased truck traffic. In the exhibited EES the proponent states that the main source of dust from mine sites is from the truck traffic.

In addition, the stockpiling of the centrifuged fine tailings overnight and weekends has the potential to cause them to dry out (especially in summer) and create a fine, toxic dust. By definition the fine tailings are small particles and would blow a significant distance. Dust modelling based on the proponent's wind monitor - located in a sheltered basin and hidden behind a shelter belt - is unlikely to be accurate.

We (and most of the district and other surrounding areas) obtain our domestic and drinking water by rainwater collection from our roof. Contamination of that water by toxic dust is unacceptable.

## Environment

There are many groundwater dependent ecosystems (GDEs) within and near the proposed project area. These would be at risk from highly contaminated seepage from the process water. Aquatic and amphibious creatures would be most at risk, due to the toxic nature of the flocculant to these life-forms.

Livestock and native fauna would be exposed to hugely increased noise and vibration. High noise levels have been associated with dark-cutting meat in cattle, which reduces the value of the meat. There are significant numbers of burrowing native fauna within the project area and in the surrounding area. Many native creatures are shy and hence very sensitive to noise and vibration. These creatures would lose the use of habitat near the project area.

Snakes are sensitive to vibration – they are a key predator in ecosystems. Removal of predators from ecosystems can cause total ecosystem collapse. This has been observed in the Grand Banks, where overfishing of the cod resulted in the ecosystem collapse. In Africa removal of predators changed the behaviour of herds resulting in major ecological damage.

## Corporate

Where capital intensive projects incorporating new technology have been successful it has generally been when a large organisation has an experienced, competent and professional team, significant resources behind it and has committed whole-heartedly to appropriately resourcing and developing the project. Unfortunately none of these attributes apply to the proponent.

In our dealings with them they have been unable to coordinate property access prior to organising their drilling rigs, have failed to undertake meaningful consultation with stakeholders and appear to lack resources.

The proposed project - with the late and hurried introduction of centrifuges resulting from a significant water use calculation error - is significantly more complex than the proponent's simplistic viewpoint suggests. Entrusting a resource intensive project to a resource poor and inexperienced company lacking a competent and experienced team is a recipe for disaster.