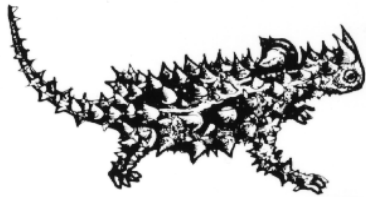


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## **Submission to the Northern Territory Environmental Protection Authority on the Ammaroo Phosphate Project: Draft Environmental Impact Statement**

The Arid Lands Environment Centre (ALEC) is the peak regional environmental organisation servicing central Australia. For more than 37 years, ALEC has been a strong and trusted voice for the conservation and responsible management of the land, water and natural resources of the arid lands.

ALEC regularly engages with the process of environmental assessment of mining projects through reviewing Environment Impact Statements (EIS) to ensure projects will not have a significant adverse impact on the environment.

ALEC has read and considered Verdant Minerals' (the Proponent) Environmental Impact Statement of the Ammaroo Phosphate Project, ALEC's key concerns include:

1. More information from the Proponent is required on groundwater monitoring, with evidence required that there is not going to be any adverse effects on the quality of domestic and stock bores
2. More information from the Proponent is required on the chemical composition and volumes of tailings
3. Greater protection is required for migratory birds, including measures to cover wastewater and line tailings dams.
4. A commitment by the Proponent needs to be made to the Northern Territory Government's target of 50% renewable energy and sourcing 50% of the mine's energy use from renewable sources. ALEC is asking this be a condition of approval.
5. The Proponent commit to a rehabilitation process that returns the land to a condition that enhances and restores environmental value, and not aims only to return to a degraded pre-mining state.

Social acceptance of the Ammaroo project is dependent on the Proponent demonstrating a commitment to best practice sustainable management and ensuring there is no lasting negative impacts on the environment. Whilst the Proponent has prepared a thorough assessment of the environmental, cultural, economic and social impacts of the project independent verification and further research is required to ensure there are no contamination risks.

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## **Water**

The proposed borefield of the Ammaroo project is located in a region that is servicing the needs of multiple industries and interests. Located on the eastern edge of the Western Davenport region the project is linked to the groundwater flux of the Western Davenport Water Control District. The Water Allocation Plan (WAP) for this district is currently being determined through a process of public consultation through a water allocation committee.

While the EIS has anticipated an impact on the groundwater of the region, this relationship has not been sufficiently investigated. There is a hydrographic high on the edge of the control district that will be impacted by water extraction for the mine. Any changes to this hydrographic high may influence groundwater quality.

Changes to the hydrographic high should be further investigated by the Proponent to ensure that groundwater quality is not compromised by the pumping regime. This should include independent, third person verification of the modelling used to predict drawdown on domestic and stock bores.

The EIS has stated that the bore field will not impact any Groundwater Dependent Ecosystems (GDEs) under an assumption that the water level is too deep to support GDEs. An independent assessment of this methodology is required to verify these claims. The Proponent should disclose the mapping and monitoring regime that was relied on to verify the claim that no GDEs are present in the area that may be impacted by drawdown.

The EIS notes the need for 30 months of baseline groundwater modelling data. This must be done before any approval decision can be made. As the number and location of baseline groundwater monitoring bores is yet to be determined, construction should not be able to commence in 2018.

Drawdown of 0.6 to 2.5 metres is anticipated for the domestic bores supplying the community of Ampilatwatja. This is for the current 25 year lifespan of the mine. However, due to the size of the resource there is potential to extend the life of the mine beyond 25 years. Any anticipated extension of mine life should be factored into groundwater pumping models to ensure that drawdown will not impact both the availability and quality of water supplying Ampilatwatja.

The Proponent should model any potential impacts on groundwater quality for domestic community bores as well as stock bores.

The construction of the access corridor occurs in an area that supports several ephemeral swamps. The location of these swamps is unknown and the impact of construction on the hydrology of those swamps is unclear. The Proponent should provide more information on both the location of those swamps and any anticipated hydrological or geomorphological impacts.

The nature and volume of liquid discharges on site are not completely clear. The Proponent should provide more detail on the Reverse Osmosis (RO) discharge, recycling rates, evaporating rates and leaching so that they can be integrated into a more holistic water balance for the project. The Proponent is not intending to recycle all water used on site, so other than evaporation there must be waste water discharges and the Proponent must detail how this will be managed.

Regulatory reform of the *Waste Management and Pollution Control Act* (WMPC) as well as the *Water Act* has commenced. It is important that the Proponent anticipates further investigations to fulfill licencing requirements under those Acts regarding waste and water extraction. This is because the exemptions under those two acts for mining are going to be removed in the medium term, meaning the project will be subject to additional licencing requirements. The Proponent should prepare information to ensure compliance with new requirements such as total volume and composition of waste water discharges.

## **Recommendations**

- **That the Proponent discloses the GDE mapping methodology used to enable independent verification of level of protection afforded to GDEs.**
- **That the Proponent commits to a more strategic and comprehensive monitoring regime that models the impact of drawdown on the quality of Ambiplatwija bores and the quality of sources on the eastern edge of the Western Davenport Water Control District.**
- **That the Proponent commits to undertaking a solute transport model to ensure there are no risks to groundwater quality of the stock and domestic bores.**
- **That the Proponent provides more detail on treatment of saline water produced by the RO plant.**
- **That the Proponent discloses the baseline groundwater modelling strategy before an assessment decision is made.**

## **Tailings and process water**

The progressive rehabilitation and infill of the pits is a beneficial and low-impact activity supported by ALEC. It will reduce the overall leachate load which would otherwise be concentrated on a single site of tailings storage.

However tailings and waste rock processing for the phosphate deposit poses specific problems. Further studies are required on waste rock characterisation with synthesised tailings samples.

While the EIS has not anticipated the occurrence of metalliferous, acidic and saline leachate management problems, the chemical analysis of the ore deposit and waste rock has identified significant exceedances of environmental guidelines.

Appendix I has noted exceedances of the Australian Drinking Water Guideline for lead and fluoride: “only lead and fluoride exceeded health based ADWG 2011...”. Lead was recorded at levels 100 times greater than the Australian Standard Leachate Protocol in a few samples. While those exceedances were not characteristic of all the tests the magnitude of the readings indicates a possibility of elevated lead and zinc levels in the leachate.

As there are instances of significant guideline exceedance the Proponent should commit to a precautionary approach when progressing the mine pits. It is important that there are mechanisms in place that guarantee lead levels are not concentrated into the tailings through the beneficiation process.

Only one sample was analysed to determine an estimate of the chemical analysis of the tailings. One synthesised tailings sample is not enough to gain a valid estimate of the tailings composition. 4.2.3 of Appendix I recommended additional leachate and soil erodibility testing, but the reason for this is not clear.

One important question is what were the limitations that lead to recommended additional leachate testing? It would be important to know evaporation rates to give a more precise estimation of the total tailings water that will transport leachate.

ALEC recommends additional synthesised leachate sampling and analysis to get a clear understanding of the leachate risk. There is currently insufficient information to make an informed cumulative assessment of tailings leachate and metal deposition.

While the sample results may be compatible with unlined management strategies, the chemical analysis shows definitively that there are areas with levels of metals above health guidelines. The Proponent should take a precautionary and adaptive approach by adopting lined pits if tailings leachate exceeds environmental guidelines.

Phosphate deposits are often associated with elevated radiation levels due to high concentrations of uranium and thorium. While the target formation is low in those elements, radiological considerations should nevertheless remain a key consideration of the ongoing monitoring and management framework. It is vital that the Proponent verify the conclusions of the radiological assessment to guarantee there are no radiological risks of the project.

Before any assessment decision is made the Proponent should independently validate the radiological conclusions and demonstrate that the potential impacts are indeed negligible. Uranium and thorium analysis should be included in subsequent synthesised tailings sampling.

In summary, ALEC requests more detailed information on process outputs, specifically residence time of leachate, volumes lost to evaporation or leaching and an estimate of the chemical composition of leachate. The Proponent should not dismiss the possibility of lining pits. Lined pits may become necessary at a later point if additional synthesised tailings analysis indicates metal concentrations that exceed environmental and health guidelines.

## **Recommendations**

- **That the Proponent provides a comprehensive estimated analysis of the chemical composition of the tailings leachate.**
- **That the Proponent commits to additional leachate and soil erodibility studies.**
- **That the Proponent model an estimated volume of what that will be leached into the groundwater through the surface tailings storage facility.**
- **That the Proponent commits to an ongoing and progressive testing plan of the leachate from the surface and in pit storage.**

## **Biodiversity**

The use of Tailings Storage Facilities (Tailings Dams) can create a near permanent source of water for migratory birds and other localised species to make use of. There should be ongoing monitoring programs to investigate the possibility of interaction between those species and the tailings storage facilities, both in pit and surface. It is important that preventative actions are taken to ensure that species are not threatened by mining waste water and tailings. This should include lining or covering the facilities.

The biodiversity management plan has not considered the impact of the project on stygofauna populations. Considering there are likely to be increased levels of phosphates and certain metals, it is important that the Proponent investigate the possible existence of stygofauna populations and ensure they are not at risk from the leaching of tailings or process water.

## **Recommendations**

- **That the Proponent covers lining tailings storage facilities to protect the health of migratory and listed birds eg. the Grey Falcon.**
- **That the Proponent investigates the possible existence of stygofauna in the aquifers of the proposed bore field.**

## **Energy**

The EIS notes the intention of the Proponent to use solar energy but there is no commitment to a minimum level. Since the release of the Government's Roadmap to Renewables report, all new self-generating enterprises should commit to producing 50% renewable energy by 2030. Recommendation 7(d) of the report suggests a minimum renewable/solar energy capacity should be installed by all self-generating enterprises through a condition of environmental approval.

As the lifespan of the project takes it beyond 2030 it would be most cost effective for the Proponent to install a minimum 50% renewable capacity during construction rather than retrofitting at a later stage. This will ensure the project is proactively compliant with NT Government policy.

## **Recommendation**

- **That environmental approval is conditional upon a commitment from the Proponent to source a minimum of 50% of the required energy from renewable sources.**

## **Closure**

Legacy contamination from mining projects is an ongoing environmental crisis in the NT. Metalliferous drainage from the Redbank Mine is continuing to cause regulatory and rehabilitation challenges for the NT EPA with the cost now falling on the taxpayer. Prevention of legacy issues should thus be a priority management issue for the Proponent. The Proponent should be required to demonstrate the financial capacity to comply with the closure plan as outlined in the EIS. Completion of the closure plan should not be conditional upon the profitability of the enterprise.

One of the major reasons for the scale of the legacy issue posed by mining in the NT is the lack of thorough and uniform closure planning guidelines standards. In the absence of clear technical guidelines rehabilitation of mine sites in the NT will continue to be sporadic and inadequate. The sustainable closure of a mine will ultimately determine the long term environmental and social impact of the industry. Demonstrating commitment to sustainable closure including demonstrated financial capability, even in the event of insolvency is fundamental to the project acquiring an ongoing social licence.

In the absence of clear technical guidelines for the NT, it is recommended that the EPA use the ICMM Integrated Mine Closure Toolkit to assess the appropriateness of the closure report.<sup>1</sup> Closure must aim to leave behind an enduring positive legacy for the community and environment.

The rehabilitation objectives listed in Appendix Q are ambiguous and unambitious. Returning the land to a state that is “similar” to the pre-mining condition is indeterminate. Land condition in the region is measured to be at a lightly to moderately degraded condition. It is important for the Proponent to clarify whether therefore the closure objective is to return the land to a light-moderate condition of degradation.

Environmental assessment of projects must be able to do more than mitigate risk. They should identify opportunities to restore or improve environmental values. In acknowledging that mining companies are producing value for the region, there should be an active obligation on the Proponent to provide positive environmental outcomes in addition to avoiding harm. The rehabilitation and closure plan is an opportunity for the company to re-invest profits made from the enterprise in improving the environmental values on the site, this may include feral herbivore control or revegetation of native trees.

## **Recommendations**

- **That rehabilitation returns the land to a condition that enhances and restores environmental value not only aims to return to a degraded pre-mining state.**
- **That improvement of environmental condition is included as an objective of the rehabilitation and closure plan.**

## **Consultation**

ALEC has concerns that the community of Ampilatwatja has not been fully informed about the environmental risks of the mine. The EIS notes that a community consultation in the community was cancelled at the last minute which meant that only informal consultation occurred. It is important the Proponent demonstrate transparent and holistic consultation with the use of interpreters to ensure there is widespread awareness of the environmental risks of the project.

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<sup>1</sup> International Council on Mining and Metals, “Planning for Integrated Mine Closure: Toolkit” <<https://www.icmm.com/website/publications/pdfs/310.pdf>>

The Proponent should commit to additional consultation that is transparent and inclusive. It is also concerning that the cultural heritage management plan has been omitted from the EIS which precludes independent third-party verification of the findings of that chapter.

### **Recommendation**

- **A formal community consultation must be held with independent interpreters provided**
- **The Cultural Heritage Management plan must be publicised**

### **Conclusion**

The Proponent has prepared a thorough assessment of the environmental, cultural, economic and social impacts of the project. Progressive rehabilitation of the mine pits will lower the overall footprint of the mine and allow rehabilitation to commence at an earlier stage than most projects.

However there are a number of key issues that must be addressed before the project is approved. These include a more comprehensive assessment of the chemical analysis of the tailings and the leachate from storage pits, both surface and in pit.

Additional contingency plans need to be developed to protect internationally listed migratory birds from any contamination risks posed by leachate and ensure access corridor construction does not impact the hydrology of the ephemeral swamps.

Finally, a more comprehensive modelling strategy that provides a systematic and adaptive framework of monitoring bores to assess any changes to groundwater quality and quantity to protect stock and Ampilatwatja bores must be developed, and a formal community consultation with Ampilatwatja community members must be held.