



Office: 90 Gap Road Alice Springs NT
Mail: PO Box 2796 Alice Springs 0870 NT
Web: www.alec.org.au
Phone: 0456 701 951
Email: adrian.tomlinson@alec.org.au

6 June 2023

Department of Industry Tourism and Trade
GPO Box 4550
DARWIN, NT 0801

To Whom it May Concern,

RE: Submission on application for Mineral Title Application - Mineral Authority 33582 sought by P.F. & C.J. Brown PTY LTD

The Arid Lands Environment Centre (ALEC) is Central Australia's peak environmental advocacy organisation, a not-for-profit managed on behalf of its 200+ members by a voluntary Board of Governance, the CEO and ALEC team. ALEC has a 40 year history of successfully advocating for our local environment.

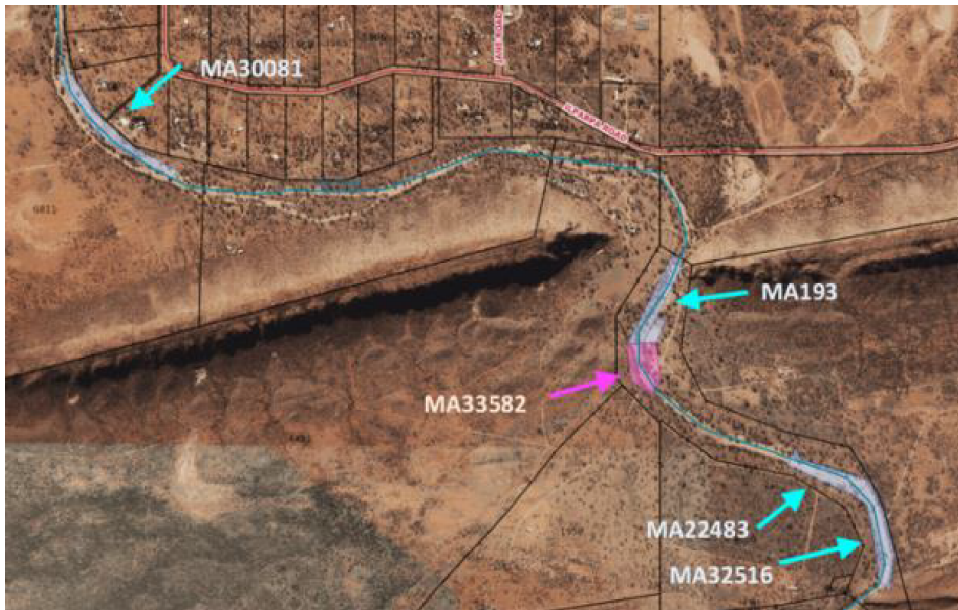
We write to you to express concern regarding the environmental risks and risks to the cultural, historical, and domestic values for Roe Creek and the surrounding flora and fauna should approval be given to progress further sand mining in the creek.

Executive Summary

1. P.F. and C.J. Brown Pty Ltd (**the proponent**) applied to the Department of Industry Tourism and Trade (**the Department**) for a mineral authority over an area of 4 hectares in Roe Creek within the Alice Springs locality (**the application**).
2. The application was published as per s 71 of the *Mineral Titles Act 2010* (NT) (**MT Act**) inviting public submissions to be made within 30 days of the notice, being 8 September 2023.
3. The Arid Lands Environment Centre (**ALEC**) is Central Australia's peak environmental organisation, working to protect arid lands, creatures and communities. ALEC does not support the grant of a further mineral authority in the area and submits the Department should refuse to consider the application until it is referred to the NT Environment Protection Authority (**EPA**) for assessment.

Sand mining in Roe Creek

4. There are several mineral authorities within and near the area of Roe Creek. The below map shows an area of 15 km². Within this area are 4 active mineral authorities in addition to the proponent's application.



5. The impact of the above listed mineral authorities has not been assessed by the NT Environment Protection Authority (**EPA**) under the *Environment Protection Act 2019* (NT) (**EP Act**). This is particularly relevant noting impact is defined under the EP Act to include a “cumulative impact” that “may occur over time.”¹
6. The cumulative impact of this application along with the active mineral authorities in the area must be considered.

Issues

7. There are many publications discussing the difficulty in attributing distinct changes in channel morphology to a given human activity. In sandy bed creeks and rivers with highly variable flow (such as in Roe Creek), it is known to be difficult to attribute causality for bed changes in the short-term.
8. However, it is also globally accepted that instream sand mining without a doubt causes impacts. Removal of sand from a river causes a deeper channel, which in turn causes channel incision and bank destabilisation resulting in channel widening.²
9. Moreover, sand mining has also been shown to impact aquatic ecosystems³, which has not been investigated for Roe Creek.
10. An extensive amount of sand has been dug out of the channel; therefore, there is no question that the four active sand mining operations have impacted Roe Creek.

¹ *Environment Protection Act 2019* (NT), s 11.

² Rentier, E. S., & Cammeraat, L. H. (2022). The environmental impacts of river sand mining. *Science of The Total Environment*, 838, 155877.

³ Koehnken, L., Rintoul, M. S., Goichot, M., Tickner, D., Loftus, A. C., & Acreman, M. C. (2020). Impacts of riverine sand mining on freshwater ecosystems: A review of the scientific evidence and guidance for future research. *River Research and Applications*, 36(3), 362-370.

11. The Roe Creek Erosion Investigation Report (**Erosion Report**) compared imagery of the channel in 2005 with 2022. This is not a meaningful length of time to understand changes in channel geomorphology. Therefore, it is unsurprising that the Roe Creek Erosion Investigation was unable to definitively conclude that the sand mining operations were altering the channel.
12. Aerial imagery for this area is readily available both for the 1940's and 1970's/80's (<https://www.ga.gov.au/scientific-topics/earth-observation/aerial-photography#heading-5>). This imagery, especially in combination with the stream gauge data identified in the investigation report, would provide a superior understanding of impacts and drivers of change in Roe Creek.
13. Nonetheless, the Erosion Report concluded that although some erosion and scouring would logically have occurred during 2022/23 floods, the volume of erosion was likely greater and there was no resupply of sand to regions of creek downstream of deepest mining (nor is there any understanding of the sediment budget needed to resupply the downstream reach). Therefore sand mining is directly contributing to impacts on the channel and the large river red gums that populate the channel. There are pronounced signs of erosion close to MA193.
14. Using the historical imagery as a comparison, greater attention must be paid to photographs of where and how erosion is occurring. Consistent with sand mining impacts described in the literature (as described above), upstream of MA193 displays hallmarks of nick point erosion migrating upriver and downstream of the mine erosion with the area appearing starved of sediment.
15. As noted in Wakelin-King (2022)⁴, in sandy bed creeks the distinction between creek bed and floodplain is often blurred; thus, hydraulic and sediment transport models developed to understand the impacts of instream mining cannot focus solely on the channel.
16. Finally, there is a clear and present risk of further erosion if there is a river flow. Studies have indicated a trend in rainfall intensification across Australia and particularly at the hourly scale for Central Australia.⁵ This high intensity rainfall will exceed infiltration capacity and lead to flash flows that will exacerbate erosion and scouring within the creek.
17. Roe Creek needs immediate mitigation and rehabilitation. This work should be done in the public interest, without waiting for the mine operators to come up with a proposal.

Request

18. Based on the issues outlined above, ALEC submits the proponent's application should be refused.
19. Additional sand mining in the area has the potential to have a significant impact on the environment. If the Department will not refuse the application, ALEC submits the Department should not consider the application until it is referred to the NT Environment Protection Authority (**EPA**) for assessment.

⁴ Wakelin-King, G. Landscapes of the Lake Eyre Basin: the catchment-scale context that creates fluvial diversity. TRANSACTIONS OF THE ROYAL SOCIETY OF SOUTH AUSTRALIA 2022, VOL. 146, NO. 1, 109–167
<https://doi.org/10.1080/03721426.2021.2003514>

⁵ Guerreiro, S. B., Fowler, H. J., Barbero, R., Westra, S., Lenderink, G., Blenkinsop, S., ... & Li, X. F. (2018). Detection of continental-scale intensification of hourly rainfall extremes. Nature Climate Change, 8(9), 803-807.

20. Under s 50(2)(a) of the *Environment Protection Act 2019* (NT) (**EP Act**), the Department, as the statutory decision maker in relation to this application, may refuse to consider the application until the application is referred to the NTEPA and a decision is made on the referral.
21. If the proponent does not refer the proposed action to the NTEPA, ALEC submits the Department can and should make the referral itself under s 50(2)(c) of the EP Act.
22. ALEC has sought further technical advice on aspects of this proposal and condition of Roe Creek, we request that this also be considered as a supplement to this submission when it is received.

Your sincerely,

A handwritten signature in black ink, appearing to be 'AT', with a long horizontal flourish extending to the right.

Adrian Tomlinson
Chief Executive Officer