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Submission contents:

Re Stygofauna

The report by AES (2022) describes the desktop assessment undertaken to determine the likely presence of stygofauna and the potential impacts of groundwater drawdown during the construction and operation of the proposal. The desktop assessment applied a multi-criteria analysis protocol (MCAP) to determine the likelihood of stygofauna occurring in the aquifers of bores within and surrounding Singleton Station. The MCAP was based on data compiled from 110 bores from NR Maps (NT Gov 2022) for which water quality monitoring data was available. There were no registered bores near the proposed project borefield, but several were located within identified alluvial aquifer zones and modelled GDEs. Unfortunately, no lithology was available for aquifers in which the bores were located, so this important parameter could not be included in the MCAP. The results of the MCAP indicated that eight bores **were likely or very likely** to contain stygofauna.

The prediction that stygofauna are likely to be present, based on a conservative desktop assessment, indicates that a dedicated field sampling program for stygofauna, based on strategically located bores, should be given the highest priority. Given that 110 bores appear to be located within the area of concern, a stygofauna field sampling program should be practically achievable and economically feasible. Further bores should be drilled if the bores currently available, as indicated by NR Maps, are not sufficient to provide the information needed. A stygofauna field sampling program is required to ensure that a robust and evidence-based assessment of likely impacts on stygofauna is achieved. Suitable mitigation measures and an ongoing monitoring program should then be developed based on the results of the field program.

The impacts of a drop in the water table from 0 to 50 metres on subterranean ecosystems and stygofauna in this region are likely to be both major and irreversible. Species extinctions may occur, accompanied by a loss of ecosystem services, including a reduction in water quality. For this reason, the utmost priority must be given to the accurate determination of the presence and distribution of stygofaunal species. This information must be obtained through the collection and analysis of real time field samples, using a range of methods (netting, pumping and eDNA). The desktop assessment described by AES (2022) represents an important preliminary activity. However, it must be followed by a field data acquisition program before an accurate assessment of the risks to subterranean GDEs and stygofauna associated with the Singleton Station Horticulture Project can be made.

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